Nassau County

Office of Purchasing

A-27-21

Staff Summary A-27-2021

Subject: IAS Software Licenses & Support (RQIT21000038)	Date: March 26, 2021
Department: Department of Shared Services Office of Purchasing	Vendor Name: Tyler Technologies Inc.
Department Head Name: Melissa Gallucci	Contract Number A-27-2021
Department Head Signature Melissa Gallucci	Contract Manager Name Timothy Funaro

Proposed Legislative Action					
	To	Date	Approval	Info	Other
	Assgn Comm				
	Rules Comm				
	Full Leg				

Internal Approvals			
Date & Init.	**Approval**	**Date & Init.**	**Approval**
AB	Dept. Head		
	Budget	3/31/21	County Atty.
	Deputy C.E.	3/28/21	County Exec.

Narrative

Purpose: To authorize and award a purchase order for the annual software licenses, support and maintenance of the Assessment IAS/ADAPT system.

Discussion: This is a sole source purchase; Tyler Technologies Inc. is the proprietary owner/supplier of this software. This is necessary to maintain the current technology and is a maintenance agreement for modules related to tax billing, collections, delinquent tax, appeals management and EDMS interface. The period of this agreement runs from January 01 to December 31, 2021.

Impact on Funding: The maximum amount authorized under this purchase order shall be Six Hundred Thirty-Five Thousand Two Hundred Fifty Dollars. ($635,250.00) from general fund ITGen1420.

Recommendation: Office of Purchasing recommends an award be given to Tyler Technologies Inc. as the sole source for this purchase order.

APPROVED: 3/31/21 (DATE)

INSURANCE SECTION
REAL ESTATE, INSURANCE AND
PURCHASE MANAGEMENT

2021 JUN -7 A 11:52

COUNTY OF NASSAU

INTER – DEPARTMENTAL MEMO

TO: CLERK OF THE COUNTY LEGISLATURE **A-27-2021**

FROM: MELISSA GALLUCCI - COMMISSIONER OF SHARED SERVICES

DATE: March 29, 2021

SUBJECT: RESOLUTION – THE DEPARTMENT OF ASSESSMENT AND THE DEPARTMENT OF INFORMATION TECHNOLOGY.

THIS RESOLUTION IS RECOMMENDED BY THE COMMISSIONER OF SHARED SERVICES TO AUTHORIZE AN AWARD AND TO EXECUTE A PURCHASE ORDER IN THE AMOUNT OF SIX HUNDRED THIRTY-FIVE THOUSAND TWO HUNDRED FIFTY DOLLARS ($635,250.00) ON BEHALF OF THE DEPARTMENT OF ASSESSMENT AND THE DEPARTMENT OF INFORMATION TECHNOLOGY TO TYLER TECHNOLOGIES INC. FOR IAS SOFTWARE LICENSES & SUPPORT.

THE ABOVE DESCRIBED RESOLUTION AND SUPPORTING DOCUMENTATION ATTACHED HERETO IS FORWARDED FOR YOUR REVIEW, APPROVAL, AND SUBSEQUENT TRANSMITTAL TO THE RULES COMMITTEE FOR INCLUSION IN ITS AGENDA.

Melissa Gallucci

MELISSA GALLUCCI
COMMISSIONER OF SHARED SERVICES

MS: br
ENCL: (1) STAFF SUMMARY
(2) DISCLOSURE STATEMENT
(3) RESOLUTION
(4) BID SUMMARY
(5) BID PROPOSAL
(6) CERTIFICATE OF LIABILITY INSURANCE
(7) RECOMMENDATION OF AWARD
(8) POLITICAL CONTRIBUTION FORM

RULES RESOLUTION -2021

A RESOLUTION AUTHORIZING THE COMMISSIONER OF SHARED SERVICES TO AWARD AND EXECUTE A PURCHASE ORDER BETWEEN THE COUNTY OF NASSAU, ACTING ON BEHALF OF THE DEPARTMENT OF ASSESSMENT AND THE DEPARTMENT OF INFORMATION TECHNOLOGY, AND TYLER TECHNOLOGIES INC.

WHEREAS, the Commissioner of Shared Services is representing to the Rules Committee that the firm, Tyler Technologies Inc. is a sole source provider and meets all specifications for the product described in the said contract as determined by the Commissioner of Shared Services.

RESOLVED, that the Rules Committee of the Nassau County Legislature authorizes the Commissioner of Shared Services to award and execute the said Purchase Order with Tyler Technologies Inc.

COUNTY OF NASSAU

POLITICAL CAMPAIGN CONTRIBUTION DISCLOSURE FORM

1. Has the vendor or any corporate officers of the vendor provided campaign contributions pursuant to the New York State Election Law in (a) the period beginning April 1, 2016 and ending on the date of this disclosure, or (b), beginning April 1, 2018, the period beginning two years prior to the date of this disclosure and ending on the date of this disclosure, to the campaign committees of any of the following Nassau County elected officials or to the campaign committees of any candidates for any of the following Nassau County elected offices: the County Executive, the County Clerk, the Comptroller, the District Attorney, or any County Legislator?

YES [ ] NO [X] If yes, to what campaign committee?

2. VERIFICATION: This section must be signed by a principal of the consultant, contractor or Vendor authorized as a signatory of the firm for the purpose of executing Contracts.

The undersigned affirms and so swears that he/she has read and understood the foregoing statements and they are, to his/her knowledge, true and accurate.

The undersigned further certifies and affirms that the contribution(s) to the campaign committees identified above were made freely and without duress, threat or any promise of a governmental benefit or in exchange for any benefit or remuneration.

Electronically signed and certified at the date and time indicated by:
Abigail Diaz [ABIGAIL.DIAZ@TYLERTECH.COM]

Dated: 11/20/2020 10:53:09 AM

Vendor: Tyler Technologies, Inc.

Title: Chief Legal Officer

COUNTY OF NASSAU

LOBBYIST REGISTRATION AND DISCLOSURE FORM

1. Name, address and telephone number of lobbyist(s)/lobbying organization. The term "lobbyist" means any and every person or organization retained, employed or designated by any client to influence - or promote a matter before - Nassau County, its agencies, boards, commissions, department heads, legislators or committees, including but not limited to the Open Space and Parks Advisory Committee and Planning Commission. Such matters include, but are not limited to, requests for proposals, development or improvement of real property subject to County regulation, procurements. The term "lobbyist" does not include any officer, director, trustee, employee, counsel or agent of the County of Nassau, or State of New York, when discharging his or her official duties.

James F. Capalino & Associates, Inc.
233 Broadway, Suite 710
New York, NY 10279
212-616-5810

2. List whether and where the person/organization is registered as a lobbyist (e.g., Nassau County, New York State):

Registered with New York State Joint Commission on Public Ethics and New York City Office of the City Clerk

3. Name, address and telephone number of client(s) by whom, or on whose behalf, the lobbyist is retained, employed or designated:

Tyler Technologies, Inc.
5101 Tennyson Parkway
Plano, TX 75024
800-772-2260 x4642

4. Describe lobbying activity conducted, or to be conducted, in Nassau County, and identify client(s) for each activity listed. See the last page for a complete description of lobbying activities.

Representation of Tyler Technologies in connection with achieving an innovative technology solutions portfolio with Tyler Technologies' Courts & Justice and Data & Insights divisions and developing relationships with government agencies listed on Question 5 below.

5. The name of persons, organizations or governmental entities before whom the lobbyist expects to lobby:

New York State Unified Court System
New York City Office of the Comptroller
New York City Department of Information Technology & Telecommunications

6. If such lobbyist is retained or employed pursuant to a written agreement of retainer or employment, you must attach a copy of such document; and if agreement of retainer or employment is oral, attach a written statement of the substance thereof. If the written agreement of retainer or employment does not contain a signed authorization from the client by whom you have been authorized to lobby. separately attach such a written authorization from the client.

2 File(s) Attached: Tyler Technologies Inc 2018 Lobbying Retainer Agreement Revised 11.16.18.pdf, Tyler Technologies Inc Name Amendment .pdf

7. Has the lobbyist/lobbying organization or any of its corporate officers provided campaign contributions pursuant to the New York State Election Law in (a) the period beginning April 1, 2016 and ending on the date of this disclosure, or (b), beginning April 1, 2018, the period beginning two years prior to the date of this disclosure and ending on the date of this disclosure, to the campaign committees of any of the following Nassau County elected officials or to the campaign committees of any candidates for any of the following Nassau County elected offices: the County Executive, the County Clerk, the Comptroller, the District Attorney, or any County Legislator?

YES [ ] NO [X] If yes, to what campaign committee? If none, you must so state:

I understand that copies of this form will be sent to the Nassau County Department of Information Technology ("IT") to be posted on the County's website.

I also understand that upon termination of retainer, employment or designation I must give written notice to the County Attorney within thirty (30) days of termination.

VERIFICATION: The undersigned affirms and so swears that he/she has read and understood the foregoing statements and they are, to his/her knowledge, true and accurate.

The undersigned further certifies and affirms that the contribution(s) to the campaign committees listed above were made freely and without duress. threat or any promise of a governmental benefit or in exchange for any benefit or remuneration.

Electronically signed and certified at the date and time indicated by:
Abigail Diaz [ABIGAIL.DIAZ@TYLERTECH.COM]

Dated: 11/20/2020 11:00:03 AM

Vendor: Tyler Technologies, Inc.

Title: Chief Legal Officer

The term <u>lobbying</u> shall mean any attempt to influence: any determination made by the Nassau County Legislature, or any member thereof, with respect to the introduction, passage, defeat, or substance of any local legislation or resolution; any determination by the County Executive to support, oppose, approve or disapprove any local legislation or resolution, whether or not such legislation has been introduced in the County Legislature; any determination by an elected County official or an officer or employee of the County with respect to the procurement of goods, services or construction, including the preparation of contract specifications, including by not limited to the preparation of requests for proposals, or solicitation, award or administration of a contract or with respect to the solicitation, award or administration of a grant, loan, or agreement involving the disbursement of public monies; any determination made by the County Executive, County Legislature, or by the County of Nassau, its agencies, boards, commissions department heads or committees, including but not limited to the Open Space and Parks Advisory Committee, the Planning Commission with respect to the zoning, use, development or improvement of real property subject to County regulation, or any agencies, boards, commissions, department heads or committees with respect to requests for proposals, bidding, procurement or contracting for services for the County; any determination made by an elected county official or an officer or employee of the county with respect to the terms of the acquisition or disposition by the county of any interest in real property, with respect to a license or permit for the use of real property of or by the county, or with respect to a franchise, concession or revocable consent; the proposal, adoption, amendment or rejection by an agency of any rule having the force and effect of law; the decision to hold, timing or outcome of any rate making proceeding before an agency; the agenda or any determination of a board or commission; any determination regarding the calendaring or scope of any legislature oversight hearing; the issuance, repeal, modification or substance of a County Executive Order; or any determination made by an elected county official or an officer or employee of the county to support or oppose any state or federal legislation, rule or regulation, including any determination made to support or oppose that is contingent on any amendment of such legislation, rule or regulation, whether or not such legislation has been formally introduced and whether or not such rule or regulation has been formally proposed.

The term "lobbying" or "lobbying activities" <u>does not include:</u> Persons engaged in drafting legislation, rules, regulations or rates; persons advising clients and rendering opinions on proposed legislation, rules, regulations or rates, where such professional services are not otherwise connected with legislative or executive action on such legislation or administrative action on such rules, regulations or rates; newspapers and other periodicals and radio and television stations and owners and employees thereof, provided that their activities in connection with proposed legislation, rules, regulations or rates are limited to the publication or broadcast of news items, editorials or other comment, or paid advertisements; persons who participate as witnesses. attorneys or other representatives in public rule-making or rate-making proceedings of a County agency, with respect to all participation by such persons which is part of the public record thereof and all preparation by such persons for such participation; persons who attempt to influence a County agency in an adjudicatory proceeding, as defined by § 102 of the New York State Administrative Procedure Act.

Capalino+Company

Government & Community Relations Strategists

2018 RETAINER AGREEMENT

November 16, 2018

Eric Cullinson
Tyler Technologies Inc.
5101 Tennyson Parkway.
Plano, TX 75024

Re: Government Relations/Lobbying Retainer Agreement: Tyler Technologies Inc.

Dear Mr. Cullinson:

This letter, when signed and returned to us (the "Agreement"), will serve as the retainer for James F. Capalino & Associates, Inc. aka Capalino+Company (the "Consultant") to represent Tyler Technologies Inc. (the "Client") in connection with assisting the Client in achieving an innovative technology solutions portfolio with the Client's product 'Courts and Justice and Data and Insights' and developing relationships with the government agencies and officials listed below.

Our firm's engagement under the Agreement includes representation before the New York State Unified Court System, the New York City Office of the Comptroller, the New York City Department of Information Technology and Telecommunications, the New York State Office of General Services and the New York State Office of Technology.

Services. Specifically, the Consultant will assist the Client with government and community relations related to the above. The Consultant shall not engage in any business development or other services without the advance written consent of Client. Should the services expand beyond the scope of this Agreement, a separate agreement may be required and/or the fee may be adjusted to be commensurate with the expanded scope.

Term. The term of the Agreement shall commence on November 19, 2018 and continue through December 31, 2019. The term of the Agreement may be mutually extended, in writing, through the agreement of the parties. Notwithstanding the foregoing, the Agreement may be terminated by either party upon five (5) days written notice to the other party.

Compensation. As compensation for its services the Consultant will receive a monthly retainer of Seven Thousand Dollars ($7,000.00). Services will not commence until the first month's prorated retainer of Two Thousand Eight Hundred Dollars ($2,800.00) is received. Subsequently, the Consultant will submit a monthly invoice for its services to the Client and payment is due by the 1st of each month. Regardless of the termination date, the minimum compensation due for the Agreement is Twenty One Thousand Dollars ($21,000.00). In addition, the Client shall reimburse the Consultant for all reasonable out-of-pocket costs and expenses incurred by the Consultant in connection with the provision of the services, including without limitation, all lobbying registration fees, long distance telephone, facsimile, messenger, photocopying, travel, postage and other reasonable out-of-pocket costs and expenses; provided, however that all expenditures in excess of $200 must be approved in writing and in advance by Client. Such disbursements will be billed by the Consultant, at cost, on a monthly basis.

Legal Fees. Should it become appropriate, either during or after the term of this Agreement, for the Consultant to engage the services of any attorney to represent its interest, for collection of fees due pursuant to this Agreement or responding to inquiries from governmental agencies to the Client, or subpoenas or other judicial process or proceedings, relating to the services hereunder, the Client shall, upon demand, reimburse Consultant for any such reasonable costs. investigation of Client with respect to

Acknowledgments. The Client acknowledges that the Consultant has not made any representations concerning the potential success or failure of the matters to be undertaken by the Consultant on the Client's behalf.

The Client acknowledges and agrees that it will comply with all federal, state and local law in its dealings with the Consultant and the Consultant's employees, including but not limited to laws regarding harassment and discrimination, and that the failure to comply with such laws may also be grounds for immediate termination of the Consultant's relationship with the Client. The Consultant, in performing services hereunder, shall comply with all applicable laws, including but not limited to all State and local ordinances pertaining to lobbyist registration and ethics. The Consultant shall defend, indemnify and hold Client harmless from any third-party claims arising out of or relating to the Consultant's breach of its obligations under this paragraph.

Proprietary Information. Any proprietary information regarding, but not limited to, both parties' services and products will remain confidential unless otherwise agreed to by the Client and the Consultant in writing. Consultant acknowledges that certain of Client's valuable, confidential and proprietary information may come into its possession. Accordingly, Consultant agrees that all such information furnished will remain the exclusive property of Client, and Consultant agrees to hold all information it obtains from or about Client in strictest confidence. Consultant also will not communicate Client's information in any form to any third party without Client's prior written consent. Without limiting the foregoing, the parties agree that the Confidentiality and Non-Disclosure Agreement (the "NDA") executed by the parties is incorporated herein by reference.

Entire Agreement; Modification. The Agreement completely and exclusively states the agreement of the parties regarding its subject matter. It supersedes, and its terms govern, all prior proposals, agreements or other communications between the parties, oral or written, regarding such subject matter. The Agreement may be amended only by a written instrument signed by each of the parties hereto.

Counterparts. The Agreement may be executed in counterparts, conveyed electronically or by facsimile, each of which will be an original copy of the Agreement, with the same effect as if the original signatures were upon the same instrument.

Lobbying Requirements. Pursuant to the requirements of the New York City Administrative Code, information regarding our engagement under the Agreement, and a copy of the Agreement itself, will be registered with the Lobbying Bureau of the Office of the City Clerk of the City of New York (the "Lobbying Bureau").

In order for the Consultant to begin lobbying on the Client's behalf, the Client is required to enroll in the e-Lobbyist system of the Lobbying Bureau. Enrollment should be completed by the Client within 5 days of the start date above in order for the Consultant to register the Client within the timeframe allowed by law. If the Consultant is unable to register the Client on time due to the Client's late enrollment, any late fees incurred by the Consultant will be reimbursed by the Client. The Lobbying Bureau imposes a fine of $25 per day for each day the registration is late.

As a registered lobbying client, the Client is required to file an Annual Report with the Lobbying Bureau. The Annual Report must be filed on-line by January 15th for the previous year. The Client's failure to comply with the New York City lobbying requirements will result in fines that are the responsibility of the Client.

Additionally, the Client may be registered as lobbying client with the New York State Joint Commission on Public Ethics. If so, the Client will be required to file semi-annual reports to the State which must be submitted by July 15th of the current year for the January to June period AND by the 15th day of January for the previous year's July to December period. Failure to comply

with the New York State Joint Commission on Public Ethics' lobbying requirements will result in fines that are the responsibility of the Client. The Consultant will give the Client all the information necessary in order to comply with the lobbying client requirements in a timely fashion.

If you are in agreement with the above terms and conditions for the provision of the services, please sign in the space below whereupon the Agreement shall become binding.

Sincerely,

James F. Capalino & Associates, Inc.

By: _____
Travis Terry
Chief Operating Officer

Date: 11/19/18

Tyler Technologies Inc.

By: Andrea Fravert

Name: Andrea L. Fravert

Title: Director of Legal Affairs

Date: 11/19/2018

CAPALINO+COMPANY

New York State Joint Commission on Public Ethics
540 Broadway
Albany, NY 12207

New York City Office of the City Clerk
Lobbying Bureau
141 Worth Street
New York, NY 10013

Please be advised that the Agreement between James F. Capalino & Associates, Inc. and Tyler Technologies Inc. dated November 16, 2018 has been amended as follows:

> The Client name listed on the retainer is amended from "Tyler Technologies Inc." to "Tyler Technologies, Inc"

All other terms of the Agreement remain in full force and effect.

Sincerely,

James F. Capalino & Associates, Inc.	**Tyler Technologies, Inc.**
By:	By: Andrea L. Fravert
Travis Terry Chief Operating Officer	Name: Andrea L. Fravert
	Title: Director of Legal Affairs
Date: 11/28/18	Date: 11/20/18

Business History Form

The contract shall be awarded to the responsible proposer who, at the discretion of the County, taking into consideration the reliability of the proposer and the capacity of the proposer to perform the services required by the County, offers the best value to the County and who will best promote the public interest.

In addition to the submission of proposals, each proposer shall complete and submit this questionnaire. The questionnaire shall be filled out by the owner of a sole proprietorship or by an authorized representative of the firm, corporation or partnership submitting the Proposal.

NOTE: All questions require a response, even if response is "none" or "not-applicable." No blanks.

(USE ADDITIONAL SHEETS IF NECESSARY TO FULLY ANSWER THE FOLLOWING QUESTIONS).

Date: 11/20/2020

1) Proposer's Legal Name: Tyler Technologies, Inc.

2) Address of Place of Business: 5101 Tennyson Parkway

City: Plano State/Province/Territory: TX Zip/Postal Code: 75024

Country: US

3) Mailing Address (if different):

City: State/Province/Territory: Zip/Postal Code:

Country:

Phone:

Does the business own or rent its facilities? Own If other, please provide details:

4) Dun and Bradstreet number: 041089293

5) Federal I.D. Number: 752303920

6) The proposer is a: Corporation (Describe)

7) Does this business share office space, staff, or equipment expenses with any other business?
YES [ ] NO [X] If yes, please provide details:

8) Does this business control one or more other businesses?
YES [X] NO [ ] If yes, please provide details:

Tyler Technologies A&T Services, LLC - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Appraisal & Tax Services, ULC - wholly owned subsidiary of Tyler Technologies A&T Services, LLC
Socrata, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Micropact Holdings, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Technologies Australia PTY LTD - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Foundation - non-profit charitable organization funded by Tyler Technologies, Inc.

9) Does this business have one or more affiliates, and/or is it a subsidiary of, or controlled by, any other business?
YES [X] NO [ ] If yes, please provide details:

Tyler Technologies A&T Services, LLC - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Appraisal & Tax Services, ULC - wholly owned subsidiary of Tyler Technologies A&T Services, LLC
Socrata, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Micropact Holdings, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Technologies Australia PTY LTD - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Foundation - non-profit charitable organization funded by Tyler Technologies, Inc.

10) Has the proposer ever had a bond or surety cancelled or forfeited, or a contract with Nassau County or any other government entity terminated?
YES [X] NO [ ] If yes, state the name of bonding agency, (if a bond), date, amount of bond and reason for such cancellation or forfeiture: or details regarding the termination (if a contract).

Please see attached file titled Tyler Technologies Terminations.

1 File(s) Uploaded: Tyler Technologies Terminations.docx

11) Has the proposer, during the past seven years, been declared bankrupt?
YES [ ] NO [X] If yes, state date, court jurisdiction, amount of liabilities and amount of assets

12) In the past five years, has this business and/or any of its owners and/or officers and/or any affiliated business, been the subject of a criminal investigation and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency? And/or, in the past 5 years, have any owner and/or officer of any affiliated business been the subject of a criminal investigation and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency, where such investigation was related to activities performed at, for, or on behalf of an affiliated business.
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

13) In the past 5 years, has this business and/or any of its owners and/or officers and/or any affiliated business been the subject of an investigation by any government agency, including but not limited to federal, state and local regulatory agencies? And/or, in the past 5 years, has any owner and/or officer of an affiliated business been the subject of an investigation by any government agency, including but not limited to federal, state and local regulatory agencies, for matters pertaining to that individual's position at or relationship to an affiliated business.
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

14) Has any current or former director, owner or officer or managerial employee of this business had, either before or during such person's employment, or since such employment if the charges pertained to events that allegedly occurred during the time of employment by the submitting business, and allegedly related to the conduct of that business:
a) Any felony charge pending?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

b) Any misdemeanor charge pending?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

c) In the past 10 years, you been convicted, after trial or by plea, of any felony and/or any other crime, an element of which relates to truthfulness or the underlying facts of which related to the conduct of business?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

d) In the past 5 years, been convicted, after trial or by plea, of a misdemeanor?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

e) In the past 5 years, been found in violation of any administrative, statutory, or regulatory provisions?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

15) In the past (5) years, has this business or any of its owners or officers, or any other affiliated business had any sanction imposed as a result of judicial or administrative proceedings with respect to any professional license held?
YES [ ] NO [X] If yes, provide details for each such investigation, an explanation of the circumstances and corrective action taken.

16) For the past (5) tax years, has this business failed to file any required tax returns or failed to pay any applicable federal, state or local taxes or other assessed charges, including but not limited to water and sewer charges?
YES [ ] NO [X] If yes, provide details for each such year. Provide a detailed response to all questions checked 'YES'. If you need more space, photocopy the appropriate page and attach it to the questionnaire.

17 Conflict of Interest:

a) Please disclose any conflicts of interest as outlined below. NOTE: If no conflicts exist, please expressly state "No conflict exists."

(i) Any material financial relationships that your firm or any firm employee has that may create a conflict of interest or the appearance of a conflict of interest in acting on behalf of Nassau County.

No conflict exists.

(ii) Any family relationship that any employee of your firm has with any County public servant that may create a conflict of interest or the appearance of a conflict of interest in acting on behalf of Nassau County.

No conflict exists.

(iii) Any other matter that your firm believes may create a conflict of interest or the appearance of a conflict of interest in acting on behalf of Nassau County.

No conflict exists.

b) Please describe any procedures your firm has, or would adopt, to assure the County that a conflict of interest would not exist for your firm in the future.

Please see attached Tyler Technologies' Code of Business Conduct and Ethics.

1 File(s) Uploaded: Code of Business Conduct & Ethics.pdf

A. Include a resume or detailed description of the Proposer's professional qualifications, demonstrating extensive experience in your profession. Any prior similar experiences, and the results of these experiences, must be identified.

Have you previously uploaded the below information under in the Document Vault?
YES [ ] NO [X]

Is the proposer an individual?
YES [ ] NO [X] Should the proposer be other than an individual, the Proposal MUST include:

i) Date of formation;

03/14/1990

ii) Name, addresses, and position of all persons having a financial interest in the company, including shareholders, members, general or limited partner. If none, explain.

Please see attached file titled Stockholder Information 112020.

No individuals with a financial interest in the company have been attached..

1 File(s) Uploaded: Stockholder Information 112020.pdf

iii) Name, address and position of all officers and directors of the company. If none, explain.

Please see attached file titled Directors and Officers (11.1.20)

No officers and directors from this company have been attached.

1 File(s) Uploaded: Directors and Officers (11.1.20).docx

iv) State of incorporation (if applicable);

DE

v) The number of employees in the firm;

5500

vi) Annual revenue of firm;

1086427000

vii) Summary of relevant accomplishments

Please see attached files titled Tyler Technologies Accomplishments and 2019 Annual Report.

2 File(s) Uploaded: 2019 Annual Report.pdf, Tyler Technologies Accomplishments.docx

viii) Copies of all state and local licenses and permits.

1 File(s) Uploaded: State of New York Business Filing.pdf

B. Indicate number of years in business.

30

C. Provide any other information which would be appropriate and helpful in determining the Proposer's capacity and reliability to perform these services.

Please see attached file titled 2019 Annual Report.

1 File(s) Uploaded: 2019 Annual Report.pdf

D. Provide names and addresses for no fewer than three references for whom the Proposer has provided similar services or who are qualified to evaluate the Proposer's capability to perform this work.

Company	Wayne County, New York		
Contact Person	Michael Jankowski, County Clerk		
Address	9 Pearl St., PO Box 608		
City	Lyons	State/Province/Territory	NY
Country	US		
Telephone	(315) 946-7470		
Fax #			
E-Mail Address	mjankowski@co.wayne.ny.us		

Company	City of Philadelphia, Pennsylvania		
Contact Person	James Leonard, Commissioner		
Address	1400 John F. Kennedy Boulevard		
City	Philadelphia	State/Province/Territory	PA
Country	US		
Telephone	(215) 686-2261		
Fax #			
E-Mail Address	James.leonard@phila.gov		

Company	Wayne County, Michigan		
Contact Person	Bernie Youngblood, Register of Deeds		
Address	2 Woodward Avenue,		
City	Detroit	State/Province/Territory	MI
Country	US		
Telephone	(313) 224-5856		
Fax #			
E-Mail Address	byoungb@co.wayne.mi.us		

I, Abigail Diaz, hereby acknowledge that a materially false statement willfully or fraudulently made in connection with this form may result in rendering the submitting business entity and/or any affiliated entities non-responsible, and, in addition, may subject me to criminal charges.

I, Abigail Diaz, hereby certify that I have read and understand all the items contained in this form; that I supplied full and complete answers to each item therein to the best of my knowledge, information and belief; that I will notify the County in writing of any change in circumstances occurring after the submission of this form; and that all information supplied by me is true to the best of my knowledge, information and belief. I understand that the County will rely on the information supplied in this form as additional inducement to enter into a contract with the submitting business entity.

CERTIFICATION

A MATERIALLY FALSE STATEMENT WILLFULLY OR FRAUDULENTLY MADE IN CONNECTION WITH THIS QUESTIONNAIRE MAY RESULT IN RENDERING THE SUBMITTING BUSINESS ENTITY NOT RESPONSIBLE WITH RESPECT TO THE PRESENT BID OR FUTURE BIDS, AND, IN ADDITION, MAY SUBJECT THE PERSON MAKING THE FALSE STATEMENT TO CRIMINAL CHARGES.

Name of submitting business: Tyler Technologies, Inc.

Electronically signed and certified at the date and time indicated by:
Abigail Diaz [ABIGAIL.DIAZ@TYLERTECH.COM]

Chief Legal Officer
Title

11/20/2020 11:54:49 AM
Date

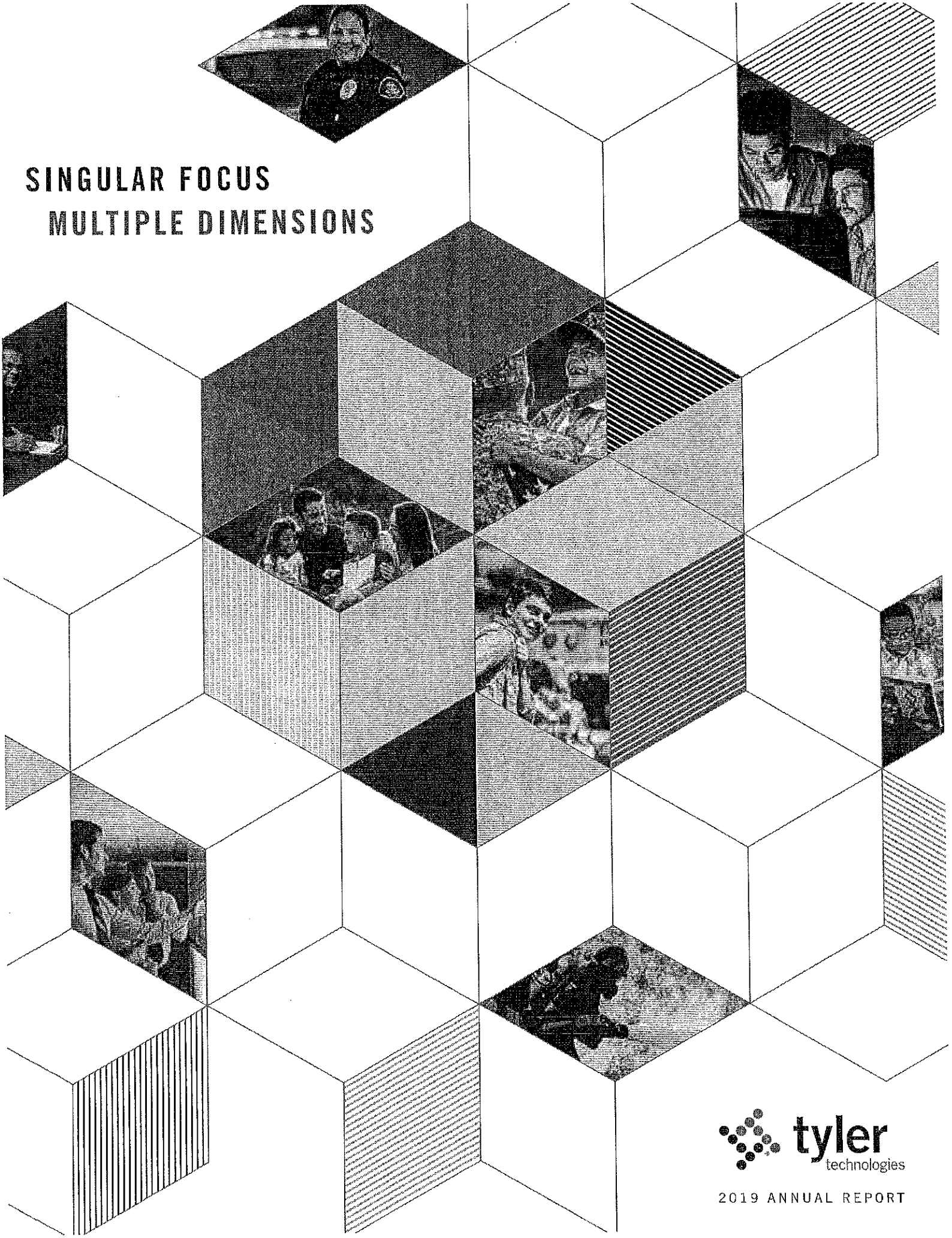
On average, Tyler Technologies adds eleven (11) new clients each week and has a ninety-eight percent (98%) client retention rate.

Tyler Technologies' Appraisal & Tax Division has in the past five (5) years had zero (0) Appraisal & Tax Division software clients opt to terminate their relationship with Tyler Technologies for reasons other than non-appropriation or non-renewal.

In the past five (5) years, five (5) New World Public Safety clients have opted to terminate their relationship with Tyler for reasons other than non-appropriation or non-renewal. That decision was mutually agreed to by Tyler without either party admitting liability. Those clients, and the year in which the termination took effect, are:

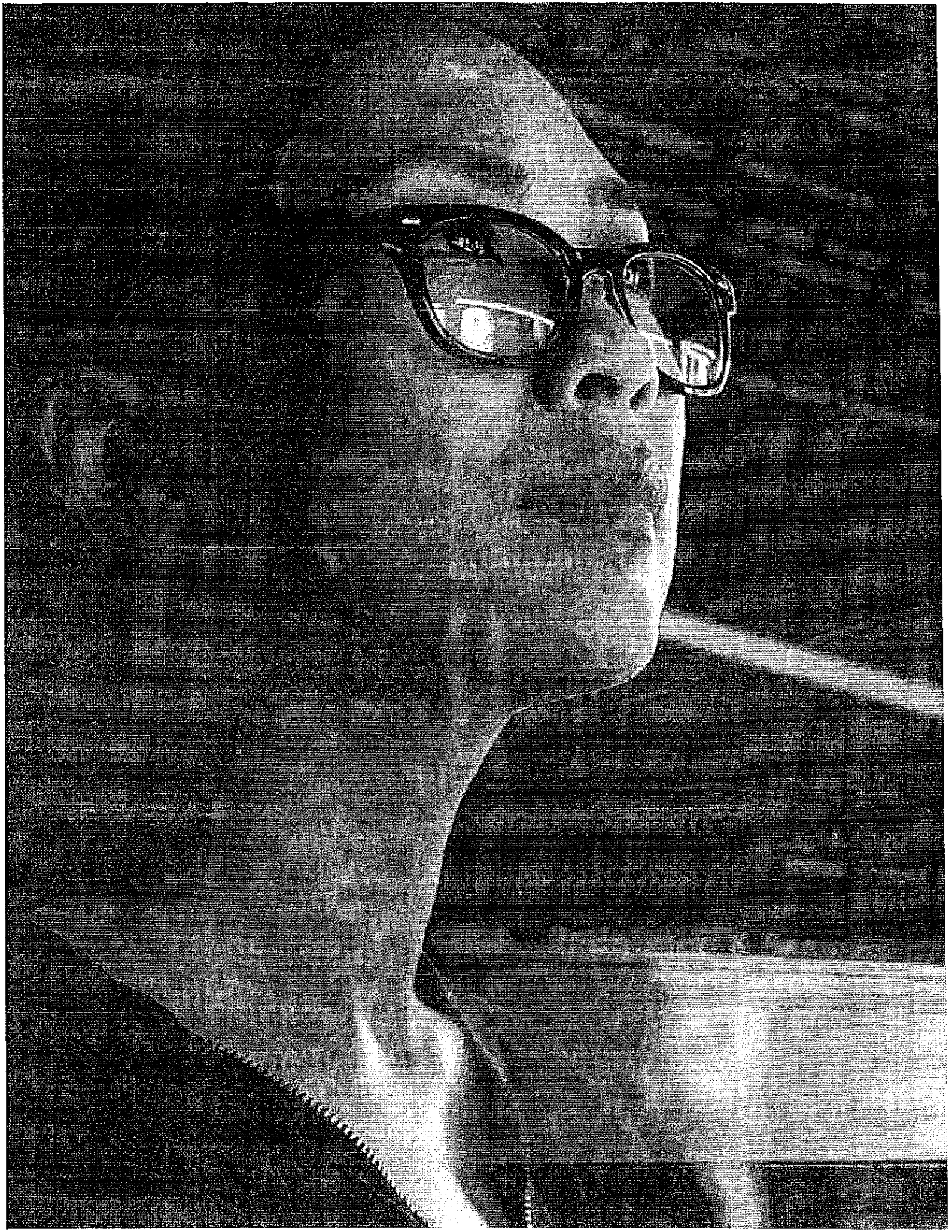
- 2016
  - Great Falls, MT (remains an EnerGov & NWERP Customer)
  - O'Fallon, IL (remains a Tyler Customer on other software)
- 2019
  - Clayton County, GA (remains a Brazos, e-Filing, Munis and A&T Client)
  - Anthony, NM (remains an LGD Customer)
  - Sacramento Regional Public Safety Communications Center, CA

SINGULAR FOCUS
MULTIPLE DIMENSIONS



tyler technologies

2019 ANNUAL REPORT



Since 1997, Tyler Technologies' **singular focus** has been providing software and technology services to the public sector. While this remains our focus, 2019 was a year that highlighted and amplified the **multiple dimensions** of our growing company.

We serve multiple levels of public sector clients, from local to national. The 2019 acquisition of MicroPact added federal clients such as NASA and the Department of Justice to our extensive roster of municipalities, counties, states and other government entities.

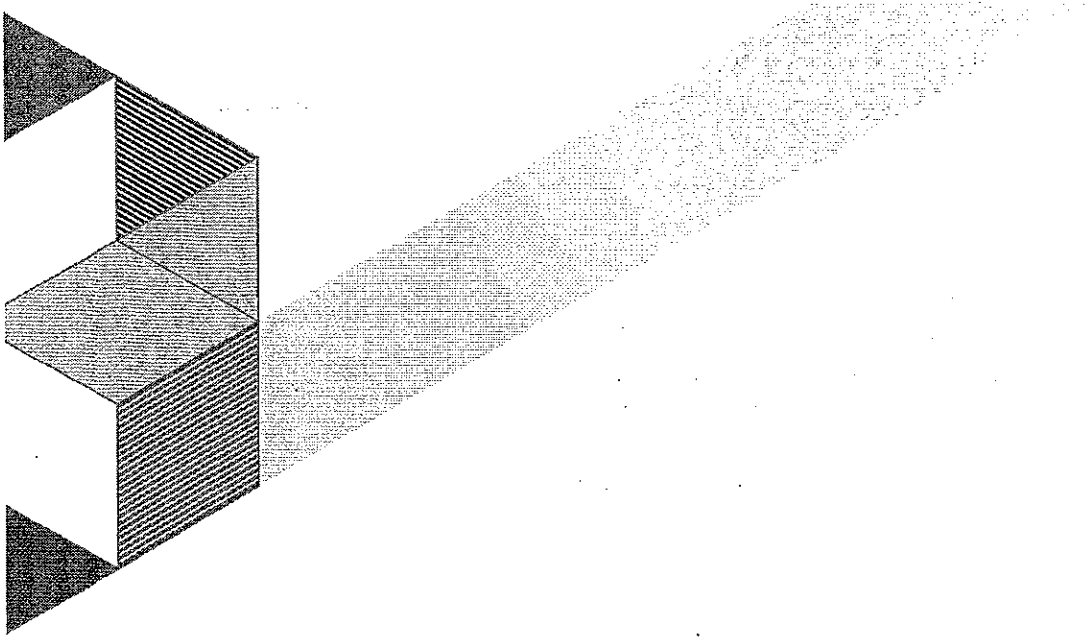
We engage with multiple levels of technology, from back-office systems of record that feed, access, and aggregate data, to process integration with workflows across systems, to the applications that provide better access to government for community residents. We provide end-to-end software and services options designed to accommodate each client's unique situation, whether they're moving from manual processes or already engaged in advanced digital workflow.

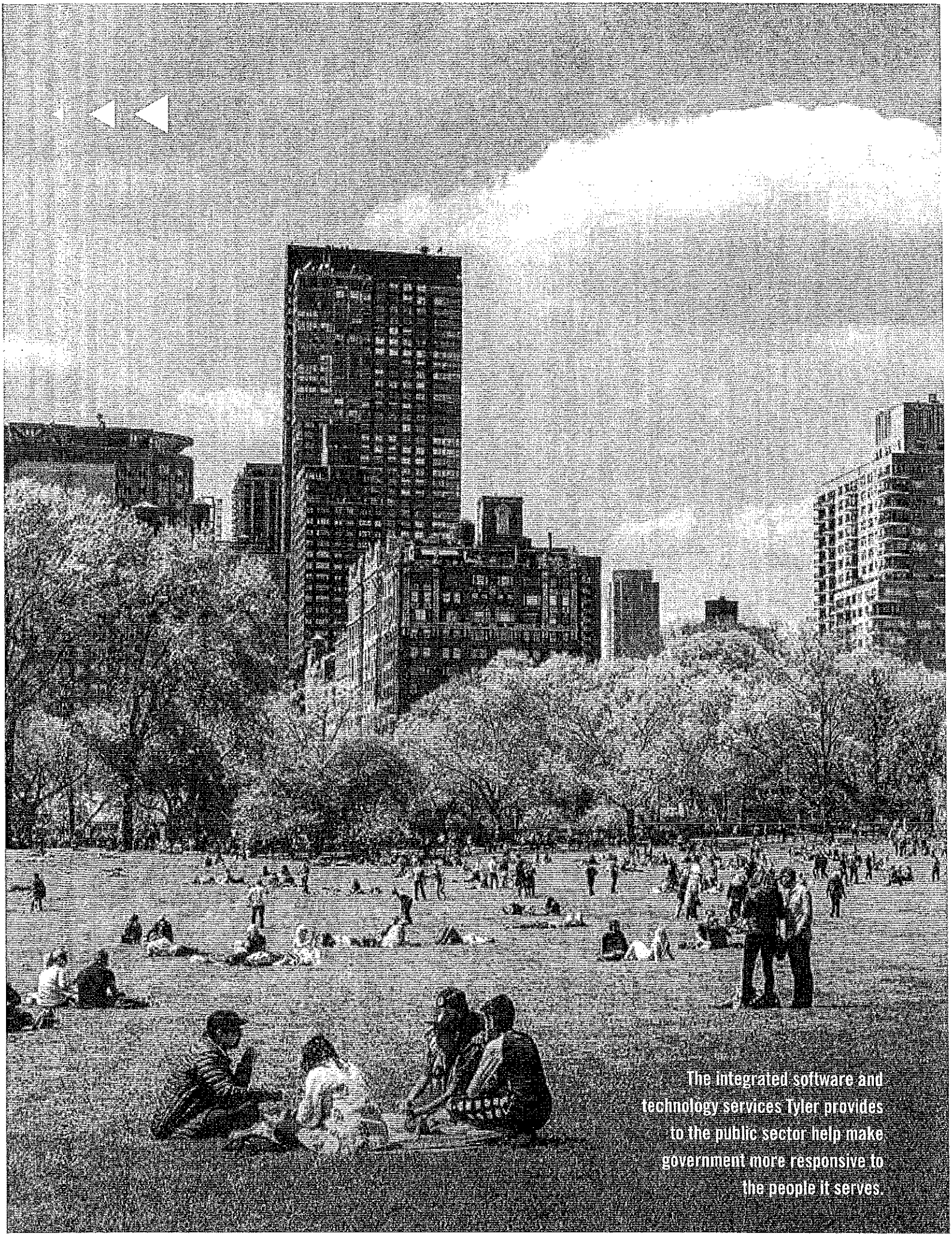
We deliver solutions in multiple ways. From locally installed, client-hosted systems to secure, reliable cloud-based offerings, we facilitate hosting environments that work best for our clients.

We envision a dynamic future. Our vision of helping our clients create connected communities – where data, processes, and people work together to make communities safer, smarter, and more responsive – is multilayered, with a long-term roadmap for connecting data between departments and agencies and across jurisdictions and geographical boundaries.

Finally, **we are accountable** to multiple stakeholders, including public servants, community residents, our employees, and our shareholders, and we take our responsibilities to each of these groups very seriously.

We empower the people who serve the public in multiple ways every day.




The integrated software and
technology services Tyler provides
to the public sector help make
government more responsive to
the people it serves.

At Tyler Technologies, our **singular focus** is on providing powerful software and information technology to the public sector. Our successful growth is a direct result of our ability to consistently deliver on this mission with **multiple dimensions** of solutions.

Expanding Our Market in the Public Sector

Municipal

District

County

State

Federal

International

Serving a Range of Stakeholders

Public Servants

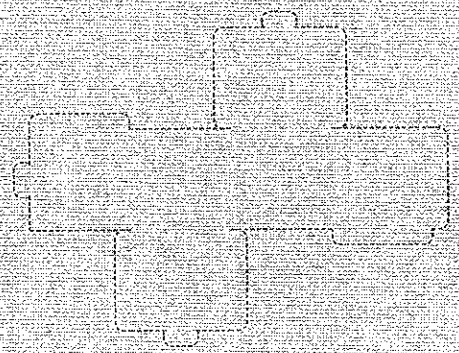
Community Residents

Employees

Shareholders

1 Separate page at perforation.

2 Separate cube at perforations, fold, and assemble into cube.



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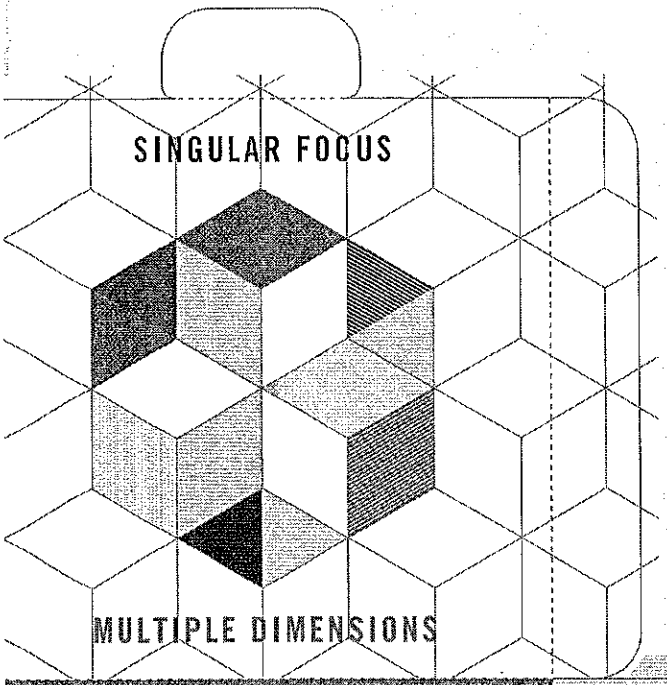


Empowering Greater Client Performance

- Performance Optimization
- Citizen Engagement
- Operational Intelligence
- Financial Insights
- Analysis & Visualization

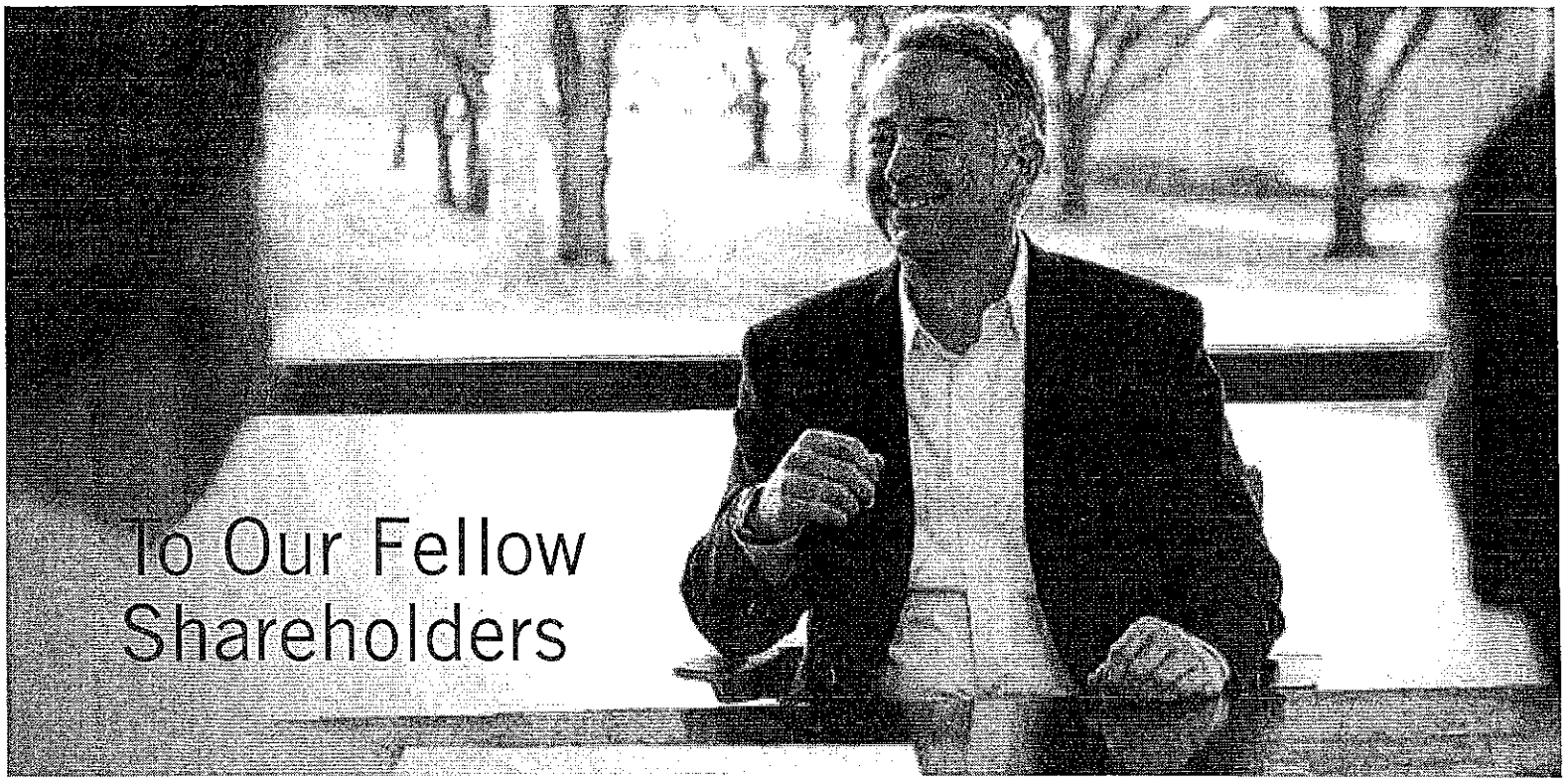
Reaching New Levels of Success

$1.09B GAAP Revenues in 2019

16.2% Revenue Growth Over 2018

33 Consecutive Quarters of Double-Digit Growth

tyler
technologies



To Our Fellow Shareholders

A MESSAGE FROM PRESIDENT & CEO LYNN MOORE JR.

In 2019, Tyler Technologies achieved another year of double-digit growth and strong financial results, with significant acquisitions, powerful research and development investments, and the major milestone of realizing more than $1 billion in revenues for the first time. Our continued success validates our strategy of a singular focus of serving the mission-critical needs of the public sector, backed by a strong balance sheet and strategic investments that bolster our market leadership. This singular focus is executed through multiple dimensions of products and services, technologies, and markets served.

33

consecutive quarters of double-digit growth

28.6%

increase in R&D investment

$254.7M

cash provided by operations

Becoming a Billion Dollar Company

In 2019, Tyler achieved total GAAP revenues of $1.086 billion, an increase of 16.2% from 2018. The fourth quarter of 2019 was our 33rd consecutive quarter of double-digit revenue growth. Non-GAAP revenue increased to $1.091 billion, a 16.1% increase. In addition, organic growth accelerated in each of the last three quarters of the year.

GAAP net income for 2019 was $146.5 million, or $3.65 per diluted share, down 0.6%. The decline is primarily due to higher amortization of intangible assets related to acquisitions. Non-GAAP net income for the year was $212.6 million, or $5.30 per diluted share, a 10.3% increase.

In 2019, cash provided from operations rose 1.8% from 2018 to $254.7 million; free cash flow declined 4.5%. Our backlog at year's end was $1.46 billion, up 16.9% from the previous year's record level.

Strong Win Rates

Win rates in 2019 were solid across all our solution suites. One notable win was the largest contract in Tyler history: a 10-year software-as-a-service (SaaS) arrangement with the state of North Carolina for our Odyssey® courts suite and e-filing services, valued at approximately $85 million and our 15th statewide Odyssey contract. Another major Odyssey SaaS subscription with Bexar County, Texas, was valued at $20 million.

"One notable win was the largest contract in Tyler history... valued at approximately $85 million."

Other prominent 2019 wins include:

City of Stockton, California
A $9.9 million contract with Tyler solutions, including Munis® ERP, Tyler EAM™ (Enterprise Asset Management), ExecuTime™, and Socrata®

District of Columbia
A $7.7 million SaaS arrangement for Odyssey court case management

Guilford County, North Carolina
A $5 million contract for Munis ERP

Union County Public Schools, North Carolina
A $4.3 million SaaS arrangement for Munis ERP

Minneapolis, Minnesota
A $3.3 million SaaS contract for iasWorld Tax™

Berks County, Pennsylvania
A $2.9 million contract for iasWorld Tax

Cleveland, Ohio, Municipal Courts
A $2.8 million arrangement for Odyssey court case management

Ramsay County, Minnesota
A $2.5 million contract with Tyler solutions, including iasWorld Tax and iasWorld Public Access™

Broken Arrow, Oklahoma
A $1.8 million deal with Tyler solutions, including Munis, Tyler EAM, ExecuTime, and Socrata Open Finance™

"In 2019, for the first time, subscription-based arrangements made up a majority of our new software contract values."

The Shift to the Cloud

As the landmark North Carolina and Bexar County contracts mentioned above suggest, we are seeing a continuing shift to preferences for our SaaS model as opposed to our licensed, on-premises model.

In 2019, for the first time, subscription-based arrangements made up a majority of our new software contract value – 63%. Of our software revenue, $296 million was from subscriptions and $531 million from license and maintenance arrangements.

Although the ongoing shift to subscription arrangements creates a near-term headwind to revenue growth, it provides a long-term opportunity for significantly higher revenues over the life of a client relationship. Bookings growth in 2019 of 32.3% was strong, as we signed 1,109 new software contracts in 2019, with 54% being subscription arrangements.

Going forward, Tyler remains committed to meeting our clients' software needs, whether their preference is for SaaS or on-premises solutions.

SOFTWARE REVENUES

$296M
subscription revenue

$531M
license & maintenance revenue

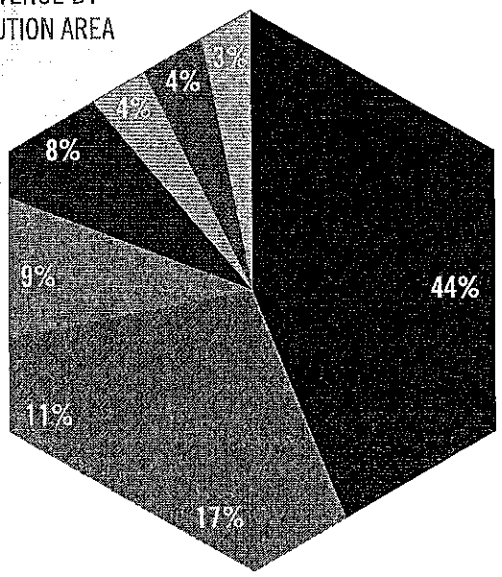
NEW CLOUD CONTRACTS

63%
of total contract value of new software arrangements, up from 41% in 2018

Accelerating Our Move to the Cloud Through a New Strategic Partnership

To more efficiently accommodate our public sector clients who desire public-cloud-based solutions, Tyler entered into a strategic collaboration agreement with Amazon Web Services (AWS) in the fourth quarter of 2019. The agreement deepens our existing relationship, leveraging the AWS cloud to lay the groundwork for the future of cloud services for the public sector. As Tyler continues to evolve its applications in response to our clients' needs, this collaboration will allow clients to deliver better experiences for citizens and further enable governments to use data as a strategic asset in the design, management and delivery of programs.

REVENUE BY SOLUTION AREA



- ERP/Financial: 44%
- Courts & Justice: 17%
- Public Safety: 11%
- Appraisal & Tax: 9%
- Platform Technologies*: 8%
- K-12 Schools: 4%
- Civic Services: 4%
- Land & Vital Records: 3%

*Includes Socrata and MicroPact revenue

Strategic Acquisitions

As our 11 acquisitions in the past three years demonstrate, Tyler is always ready to build value by opportunistically acquiring strategic assets that broaden our capabilities, strengthen our competitive position, and expand our addressable market.

2019 acquisitions include:

MicroPact, which augments our product solutions with a versatile, low-code development platform, positions us in new practice areas, and presents opportunities to expand across new markets, including the federal space.

MyCivic™, which elevates our citizen-facing solutions by enabling clients to provide a single app for citizens to interact with their local government in multiple ways.

Courthouse Technologies, which enhances our existing offerings for courts with a SaaS jury management systems solution.

Growth-Focused Research and Development

In 2019, we saw our second consecutive year of increasing R&D investment. Our total R&D spend in 2019 grew by 28.6% to $81.3 million. We devoted our increased R&D dollars broadly across our solutions suites, adding new features and applications that will meet the evolving needs of our clients, solidify our market leadership, and drive future growth.

Though our increased R&D investment has created a short-term headwind to margin expansion, we believe the long-term results that new and enhanced products will realize in the market in the years ahead will strengthen our ability to compete and succeed. As we move into 2020, we will continue to invest strategically as opportunities arise; however, we expect R&D growth to moderate over time, expanding more in line with revenue growth.

0
debt

$314M
in cash and investments

$400M
in available liquidity from our new revolving credit facility

Maintaining a Strong Balance Sheet

We finished 2019 with an extraordinarily strong balance sheet, giving us tremendous flexibility to take advantage of opportunities to build shareholder value – whether through internal investments, acquisitions, or stock repurchases. As of December 31, 2019, Tyler Technologies had zero debt, $314 million in cash and investments, and $400 million in available liquidity from our new revolving credit facility.

Looking Ahead

As I complete my first full year as Tyler's CEO, I'm honored to work each day with such a talented and dedicated team. This was a year of milestones for Tyler, and we pause here to celebrate them – and the Tyler team members who make these milestones possible – as we remain focused on finding new ways to serve the public sector even more effectively in the years ahead.

H. Lynn Moore, Jr.
President & Chief Executive Officer
February 18, 2020

Annual Earnings per Diluted Share

2017
GAAP $4.32
NON-GAAP $3.94

2018
GAAP $3.68
NON-GAAP $4.80

2019
GAAP $3.65
NON-GAAP $5.30

2019 Bookings

Up 32.3%

GAAP Operating Margin

14.4%

Non-GAAP Operating Margin

25.3%

2019 Financial Highlights

GAAP Revenues

$1.09B

+16.2% from 2018

Backlog

$1.46B

+16.9% from 2018

GAAP Net Income

$146.5M

$3.65 per diluted share

Non-GAAP Net Income

$212.6M

$5.30 per diluted share

Reaching New Heights

A YEAR OF MILESTONES

IN 2019, TYLER TECHNOLOGIES REACHED SEVERAL MAJOR MILESTONES

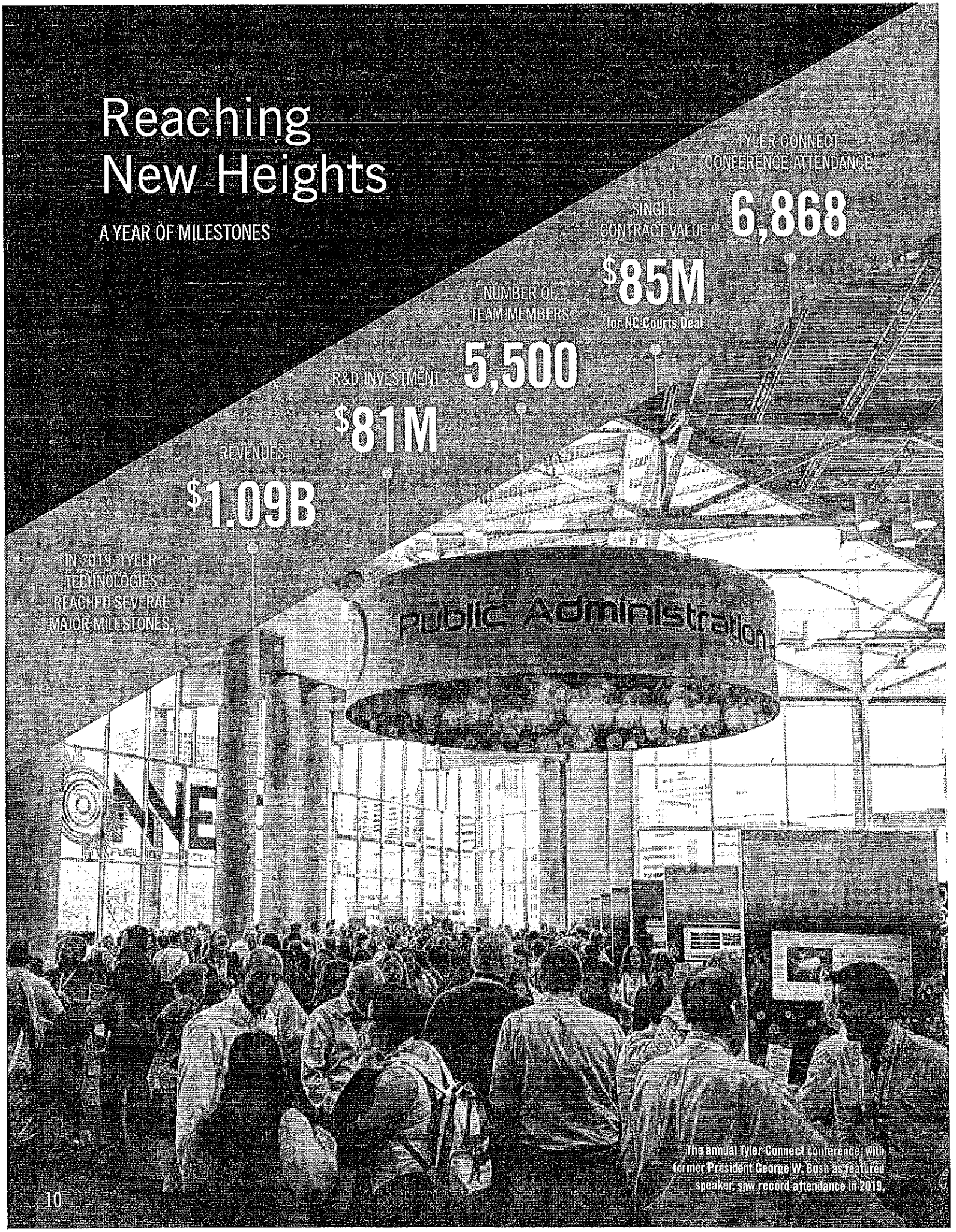
REVENUES
$1.09B

R&D INVESTMENT
$81M

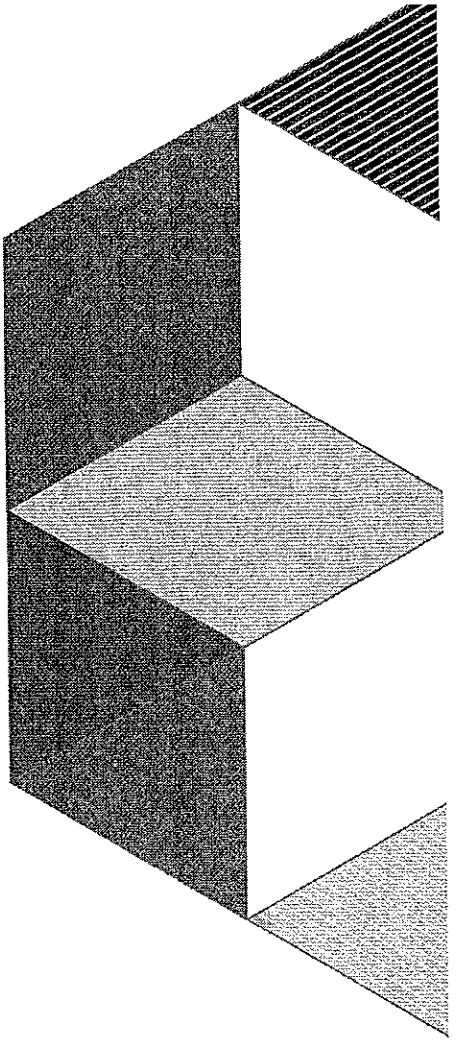
NUMBER OF TEAM MEMBERS
5,500

SINGLE CONTRACT VALUE
$85M
for NC Courts Deal

TYLER CONNECT CONFERENCE ATTENDANCE
6,868

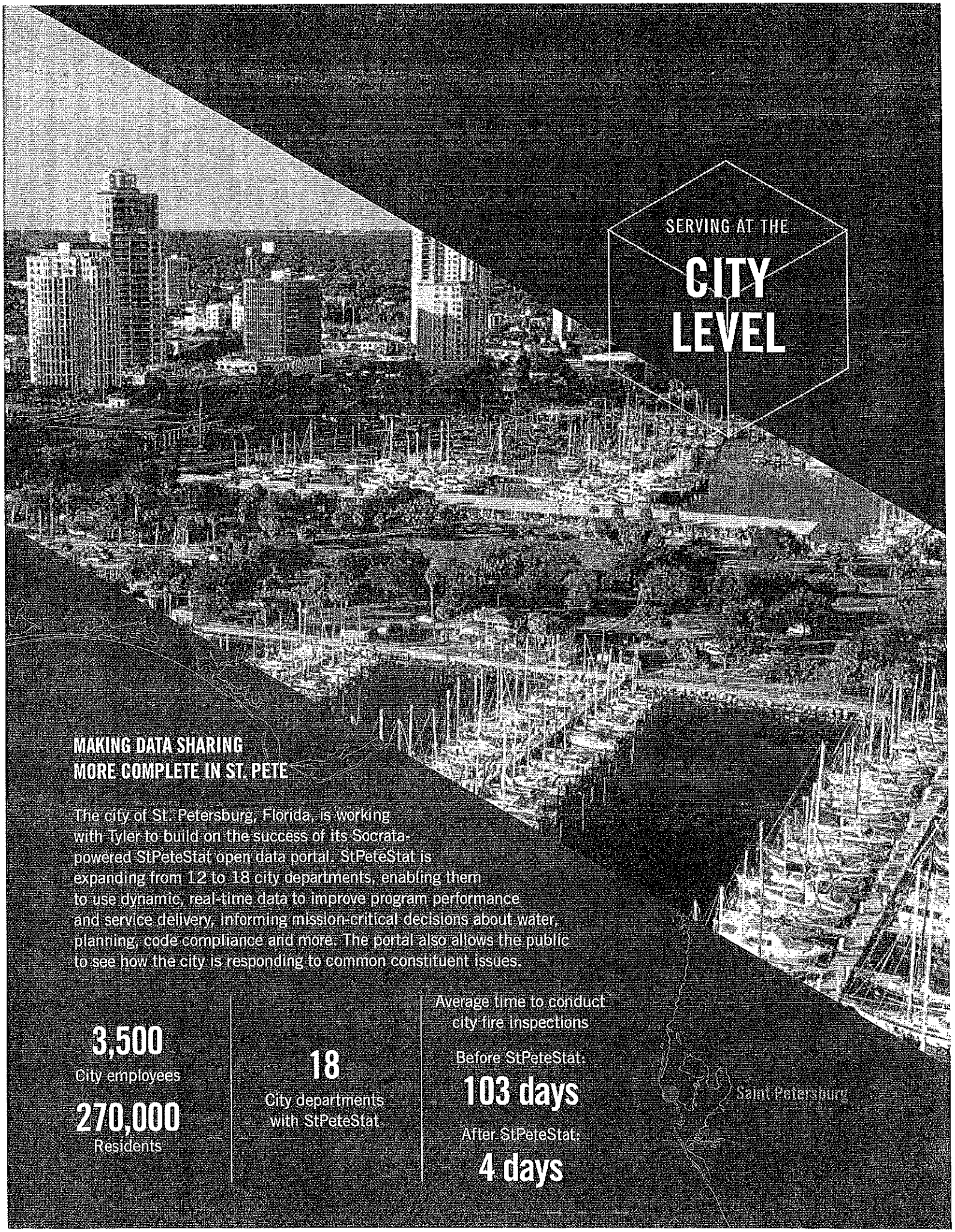


The annual Tyler Connect conference, with former President George W. Bush as featured speaker, saw record attendance in 2019.



A Singular Focus, a Solid Foundation

Tyler Technologies is the largest software company focused exclusively on serving the public sector. Our financial strength, deep expertise, and breadth of solutions have provided the foundation for steady growth and market leadership.



SERVING AT THE

CITY LEVEL

MAKING DATA SHARING MORE COMPLETE IN ST. PETE

The city of St. Petersburg, Florida, is working with Tyler to build on the success of its Socrata-powered StPeteStat open data portal. StPeteStat is expanding from 12 to 18 city departments, enabling them to use dynamic, real-time data to improve program performance and service delivery, informing mission-critical decisions about water, planning, code compliance and more. The portal also allows the public to see how the city is responding to common constituent issues.

3,500
City employees

270,000
Residents

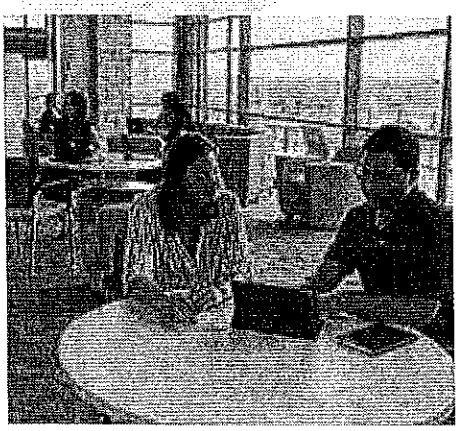
18
City departments with StPeteStat

Average time to conduct city fire inspections

Before StPeteStat:
103 days

After StPeteStat:
4 days

Dimensions of Experience



With decades of experience exclusively focused on the public sector, Tyler is a stable presence in a fragmented market. The fact is, we know the public sector like no one else.

Of our 5,500+ team members, 1 out of 3 has worked in the public sector.

Tyler has successfully completed 26K+ implementations, across 10K+ locations.

We have public sector clients in all 50 states plus Canada, the Caribbean, Australia, Europe, and other international locations.

Moreover, Tyler offers the widest range of solutions for the public sector, including:

- Appraisal & Tax
- Civic Services
- Corrections
- Courts & Justice
- Cybersecurity
- Data & Insights
- ERP Financial
- Health & Human Services
- Land & Official Records
- Public Safety
- Regulatory
- School Financial
- Student Information
- Student Transportation

Clients appreciate both the depth of our experience and the breadth of our solutions. Indeed, our client retention rate is 98%.

Tyler Corporate Officers and Operational Leadership

The Human Dimension

Tyler cares about our people.

We were voted a *Best Place to Work* at locations around the country in 2019, including in the State of Maine, in Troy, Michigan, and in Washington, D.C. Also in 2019, Tyler was named to *Forbes* Best Midsized Employers list and to *Forbes* Best Employers for Diversity as well.

Our people care about their communities.

Tyler employees support many local community efforts. Examples include supporting families in need, feeding the hungry, and funding STEM education for at-risk children.

In 2019, our employees volunteered 4,000+ hours in community service, and fundraised over $30,000.

Tyler employees also donated:
- 10,000+ pairs of socks for the homeless
- 1,000+ pounds of non-perishable food for low-income, homeless or other in-need individuals
- 500+ pounds of dog food for pets in need
- Hundreds of holiday gifts for underprivileged youths
- Hundreds of meals for low income, homeless or other in-need individuals

As a company, Tyler supports community causes.

Over the past five years, Tyler Foundation charitable contributions have totaled $1.27M.

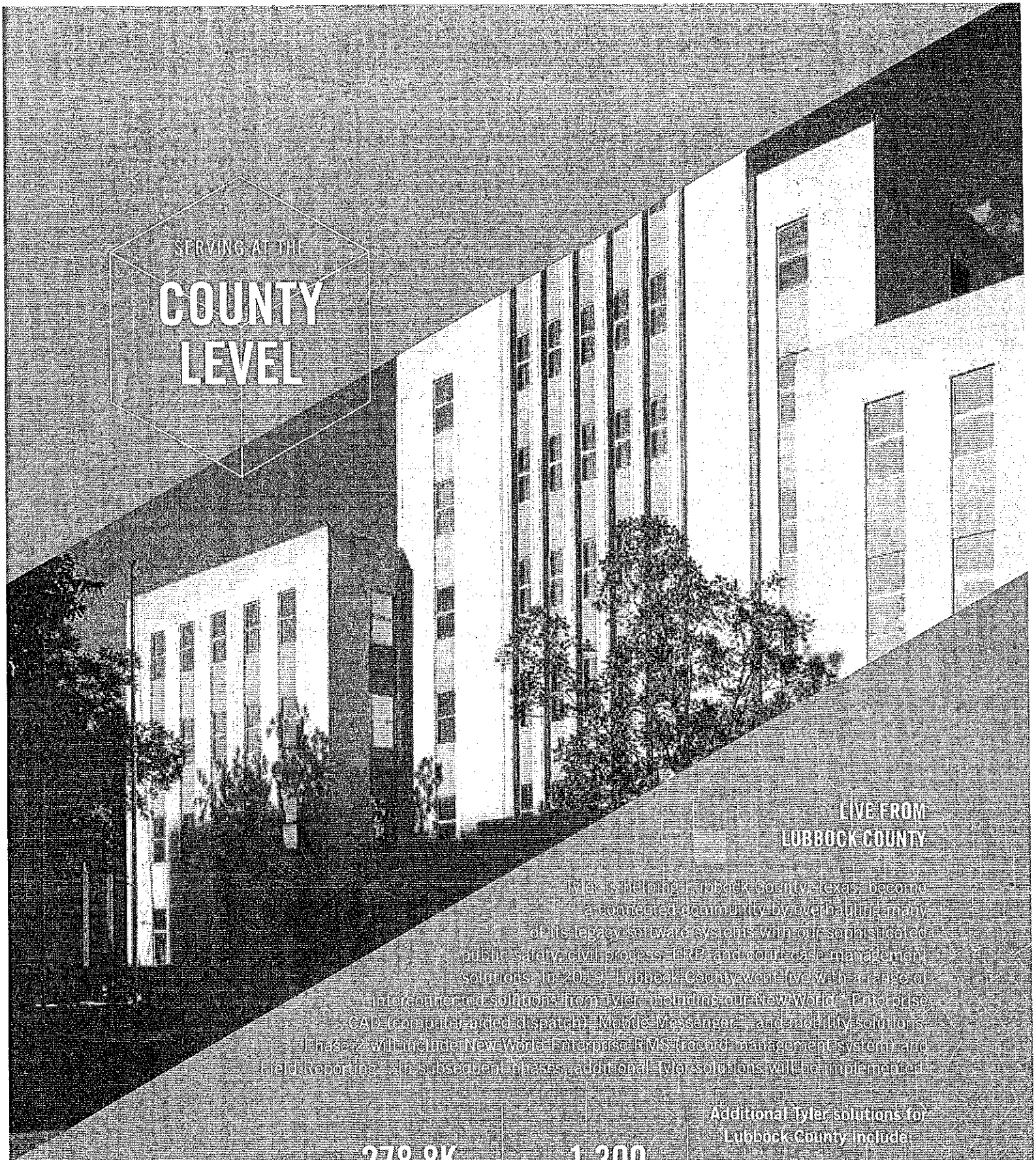
In 2019, the company's efforts included Tyler Foundation's $372,500 in monetary donations, including disaster relief.

Also in 2019, Tyler donated both software and time to *Both Ends Believing*, Tyler's nonprofit partner benefiting children in institutional care.

100 travel-sized toiletry bags were made out of a recycled banner from the Tyler Connect 2019 user conference, filled with essentials donated by employees, and donated to the Genesis Women's Shelter in Dallas.

SERVING AT THE

COUNTY LEVEL



LIVE FROM LUBBOCK COUNTY

Tyler is helping Lubbock County, Texas, become a connected community by overhauling many of its legacy software systems with our sophisticated public safety, civil process, HR and court case management solutions. In 2015, Lubbock County went live with a range of interconnected solutions from Tyler, including our New World® Enterprise CAD (Computer-aided Dispatch), Mobile Messenger™ and mobility solutions. Phase 2 will include New World Enterprise RMS (record management system) and Field Reporting. In subsequent phases, additional Tyler solutions will be implemented.

278.8K
Residents

~1,300
County employees

Additional Tyler solutions for Lubbock County include:

Brazos
SofTrack
Odyssey
MUNIS

Adding Dimensions, Investing in the Future

Tyler's market leadership puts us in a unique position to take a long-term view on how to serve our public sector clients in better and broader ways in the years ahead, while we continue to grow. Tyler builds shareholder value through investments in research and development that allow us to improve and expand our solutions; through strategic acquisitions that broaden our capabilities and expand our addressable markets; and by the opportunistic repurchasing of Tyler stock.

Deepening Our Capabilities Through Acquisitions

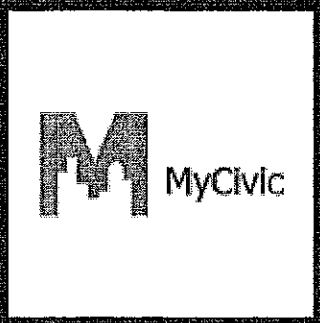
2018 Acquisitions

Socrata
Sage Data Security
CaseloadPRO™
MobileEyes™
SceneDoc™

2019 Acquisitions

MicroPact
MyCivic
Courthouse Technologies

2019 Acquisition Details



Acquired:
February 2019

Investment:
$4M

Expertise:
Citizen engagement applications

Added dimension:
One app that lets citizens interact with local government in myriad ways

Acquired:
February 2019

Investment:
$195M

Expertise:
Case management and business process management software

Added dimension:
New ability to serve federal and health and human services clients

Acquired:
October 2019

Investment:
$20M

Expertise:
Jury management systems

Added dimension:
Leverages Tyler's existing courts and justice sales organization and client base

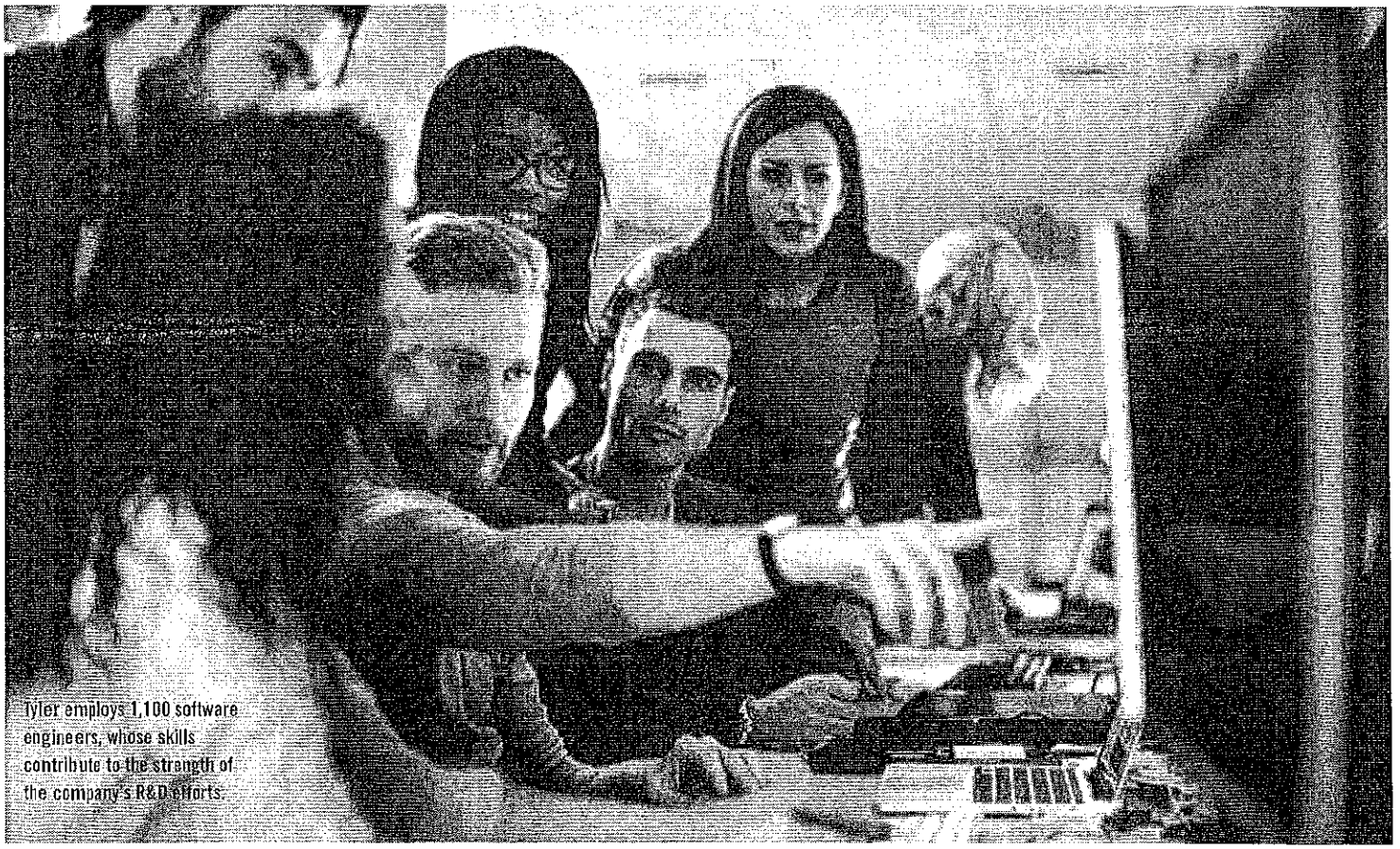
Developing New Dimensions Through R&D

R&D Investment

2nd consecutive year of record R&D investment

Tyler's 2019 R&D investment was:

- Focused across all product suites
- Oriented toward long-term growth
- Improving existing products
- Developing new products
- Integrating products from acquired companies
- Broadening our addressable market



Tyler employs 1,100 software engineers, whose skills contribute to the strength of the company's R&D efforts.

Tyler's R&D investments span all our solutions, including those optimized for schools and public safety.

R&D Impact Snapshot

2015

Tyler acquires New World Systems, a public safety solutions provider to mid-market clients

2016-2018

Significant R&D devoted to product roadmap strategy, support for positioning to compete in larger jurisdictions, and integration with other Tyler solutions, including jails, court case management, and e-citations

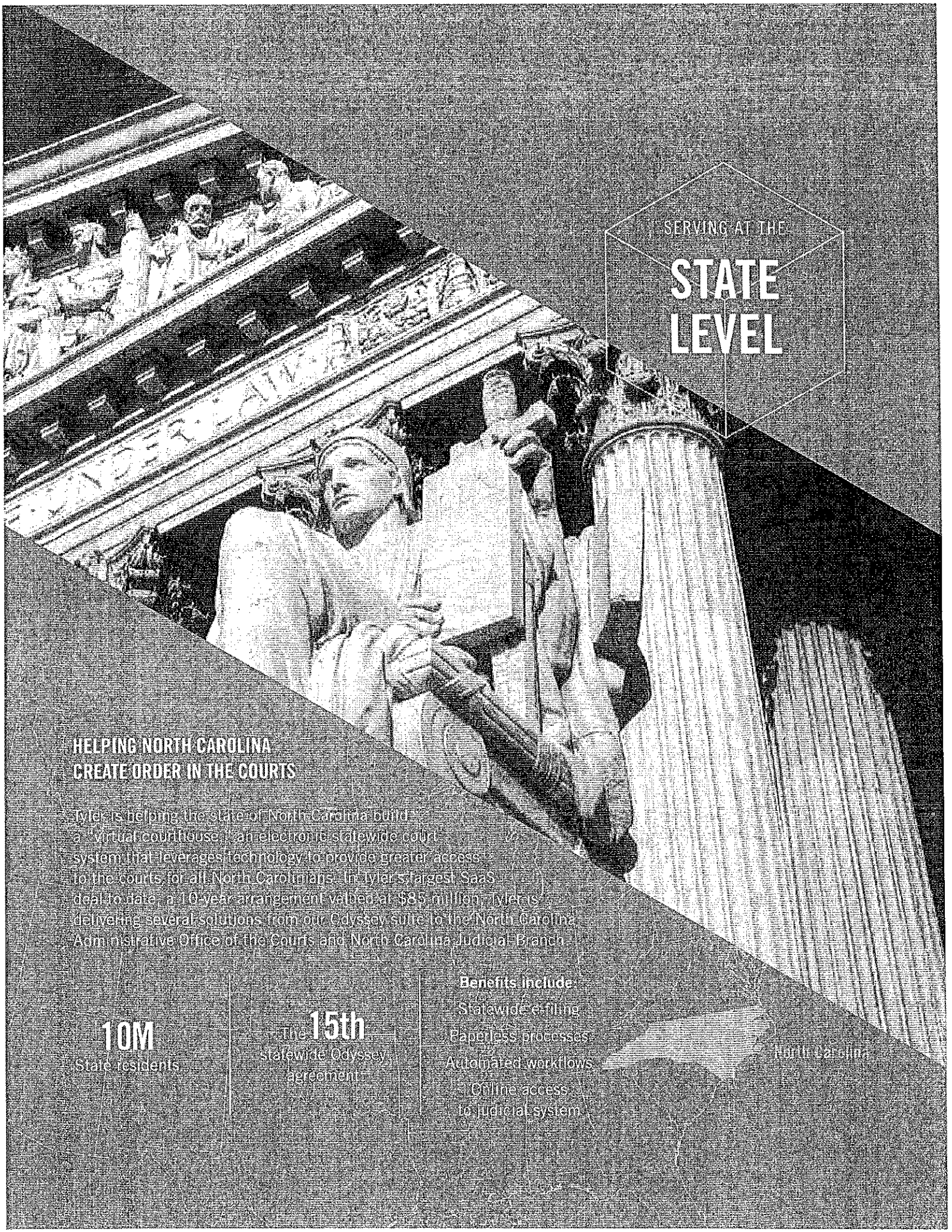
Adding features and functionality in computer dispatch, record management, and mobility solutions

2018

Product enhancements lead to larger contracts and higher win rates

2019

Orlando, Florida, first Tier 1 client (1 million+ 911 calls per year), goes live with New World public safety solution



SERVING AT THE

STATE LEVEL

HELPING NORTH CAROLINA CREATE ORDER IN THE COURTS

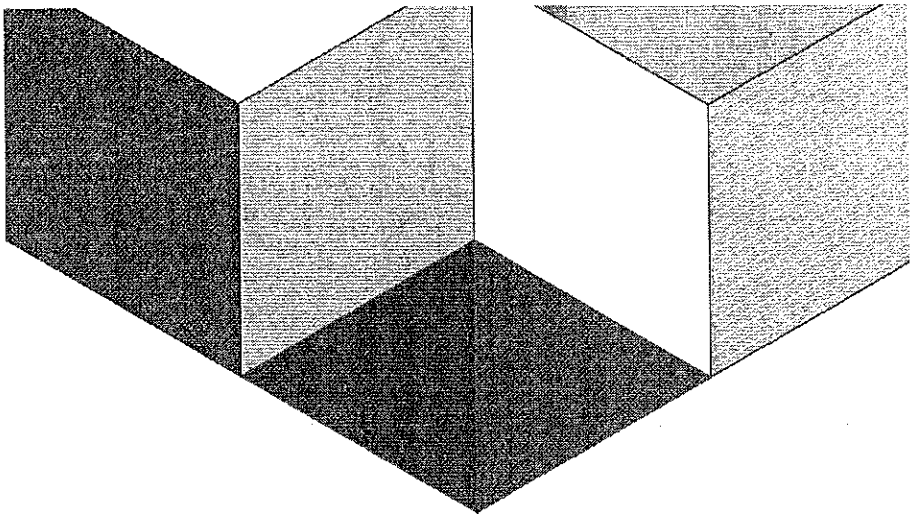
Tyler is helping the state of North Carolina build a "virtual courthouse," an electronic statewide court system that leverages technology to provide greater access to the courts for all North Carolinians. In Tyler's largest SaaS deal to date, a 10-year arrangement valued at $85 million, Tyler is delivering several solutions from our Odyssey suite to the North Carolina Administrative Office of the Courts and North Carolina Judicial Branch.

10M
State residents

The **15th**
statewide Odyssey agreement

Benefits include:
Statewide e-filing
Paperless processes
Automated workflows
Online access to judicial system

North Carolina



Moving Closer to Truly Connected Communities

Our vision is to help create connected communities that use technology to seamlessly connect data, people, and processes across department and geographic boundaries. Realizing this vision depends on a digital infrastructure of multi-layered, cloud-based solutions, and requires state-of-the-art security, systems, and protocols.

Connecting Through Technology

We have continued work on Tyler's citizen portal, a single point for digital services for community residents from their local governments. Using a single login and a shared profile provided by **Tyler Identity™**, citizens receive personalized experiences that span jurisdictional and geographic boundaries, either from the web or a mobile device. Citizens can sign up to receive notifications via SMS or email when bills are due or licenses need renewing, when important events are happening in their city, or when issues are impacting their neighborhood. A shared shopping cart and checkout experience make it easy to securely transact business with their local government.

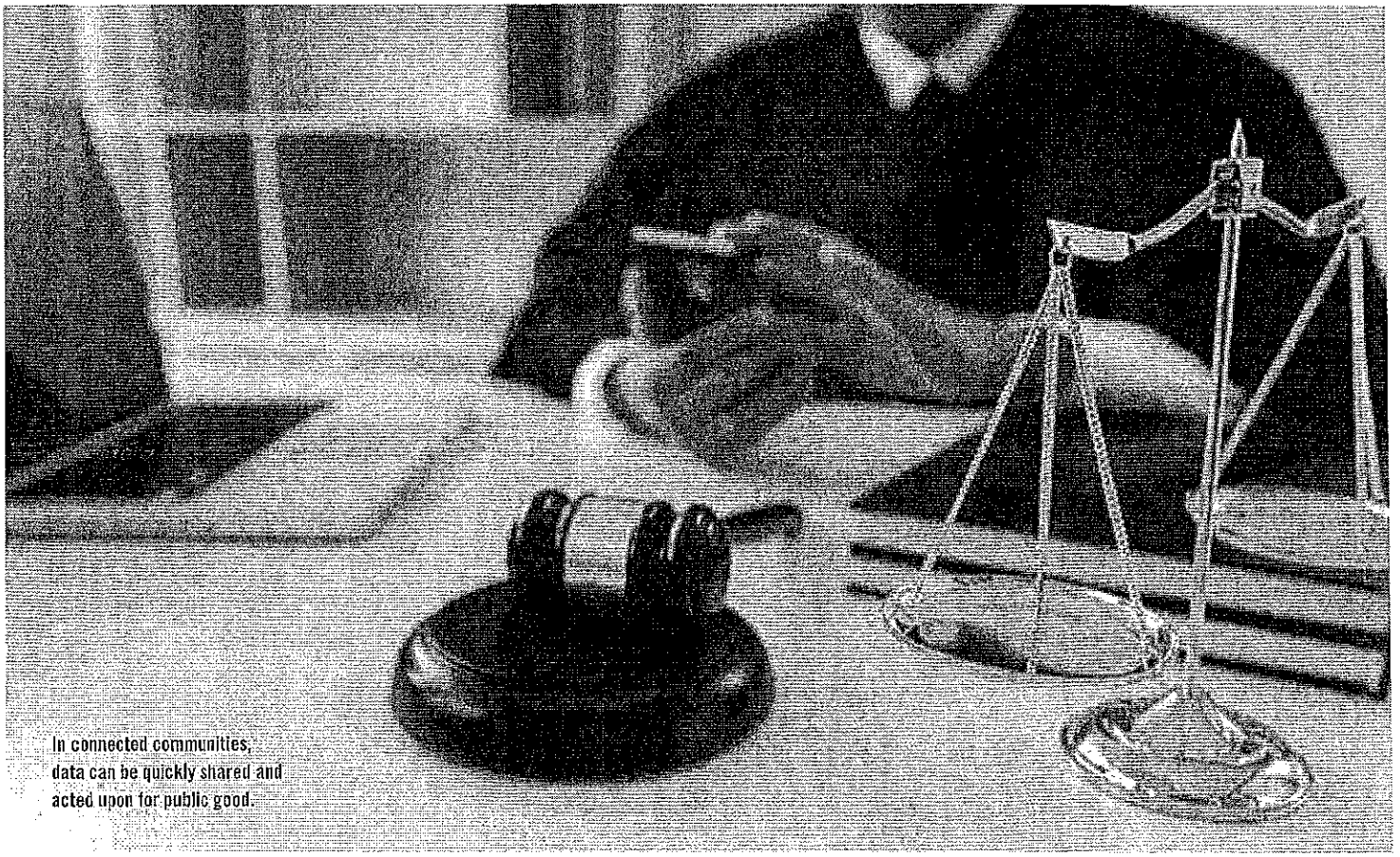
Tyler's Virtual Court™ application will help citizens stay connected to their government on their schedule. Rather than go to the courthouse to deal with a traffic ticket, constituents can now have their case adjudicated online from the comfort of their home or business. Using integrated video conferencing and document sharing, defendants can work with a judge and clerk in real time, online, from the web or a mobile device. Any resulting fines and fees can be paid immediately using the online payment system provided by the application.

The **Tyler Nexus™** initiative simplifies processes commonly executed by local governments by connecting related business functions required in public administration. By sharing data and streamlining processes across previously siloed departments, clients are able to more efficiently manage important services that citizens expect. The Nexus initiative has brought focus and improved connections between **Munis**, **EnerGov™**, and **Tyler EAM**, offering seamless connections in critical processes such as streamlined citizen engagement, integrated asset management, and comprehensive collections functions. Additionally, the Nexus initiative has prioritized development efforts that support the land development process by bringing together recording, tax, and planning and permitting to support data sharing in typically distinct areas of city and county government. In addition to streamlining workflow across Tyler products, the Nexus initiatives continue to drive innovation and new development efforts such as **Tyler Hub™**, Tyler Identity and **Socrata** applications, all designed to enhance usability and unify client experience across products.

The **Tyler Alliance™** initiative continues to make progress on our 'dispatch-to-disposition' goals for data and process sharing. Investments in **Tyler Corrections™** provide a link between the **New World** public safety suite of dispatch and records applications and **Tyler Supervision™** and **Odyssey** applications, seamlessly sharing data and business processes across these typically siloed departments and domains.

Tyler is also investing in connecting data and insights products with all Tyler solution areas, creating analytical capabilities across public safety, appraisal and tax, and ERP domains that help promote better data-driven decision making. Built on the **Socrata** platform, these out-of-the-box solutions can be deployed quickly and easily and provide users with a data- and visualization-rich experience that helps them focus on improved outcomes in policing, property taxes, and financial management areas.

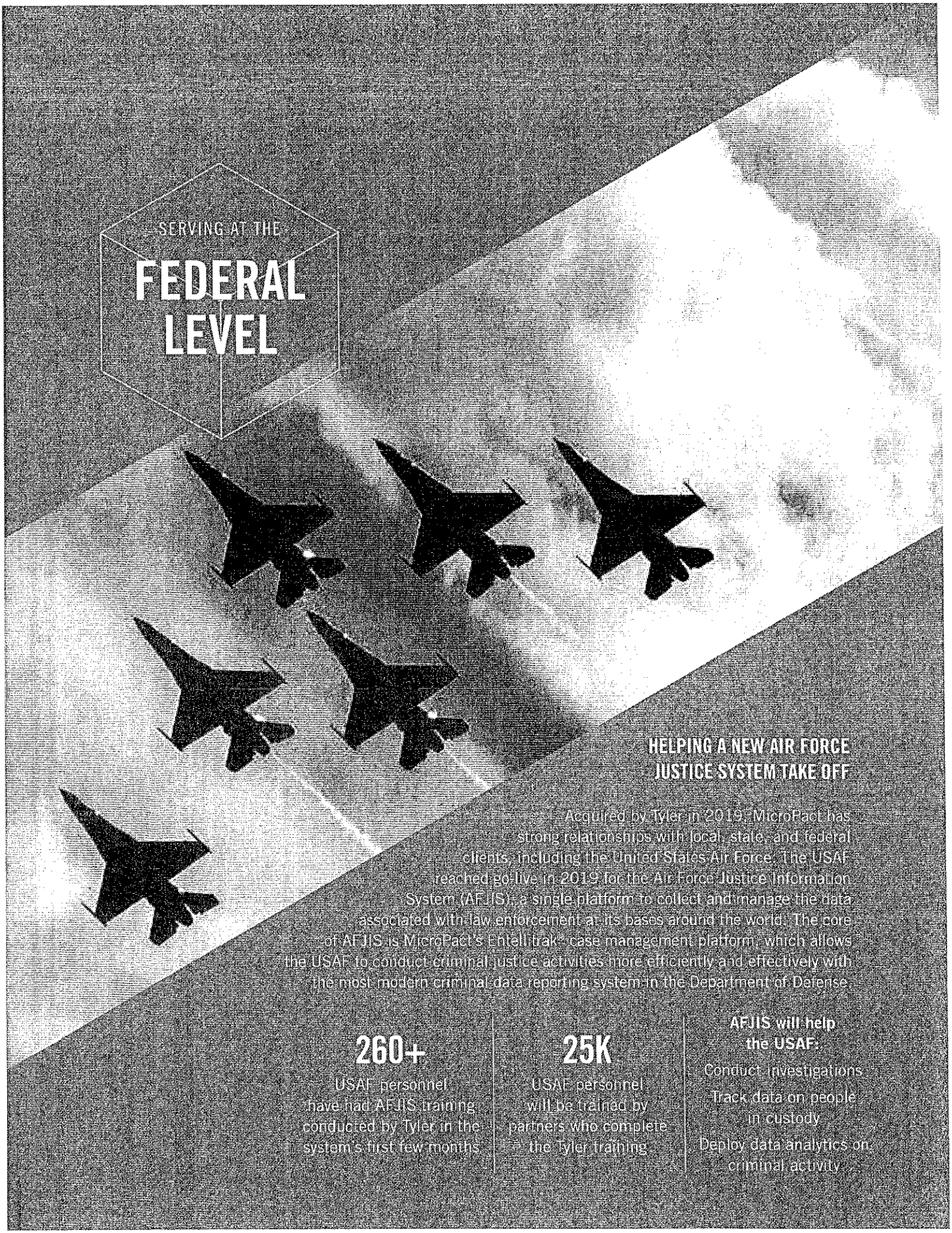
In addition to a company-wide development effort supporting our Connected Communities vision, developers continue to engineer and enhance our core applications. These include features to help clients manage assets, optimize performance, and improve the user experience. We also continue to better position our products for cloud-friendly implementations.



In connected communities, data can be quickly shared and acted upon for public good.

SERVING AT THE

FEDERAL LEVEL



HELPING A NEW AIR FORCE JUSTICE SYSTEM TAKE OFF

Acquired by Tyler in 2019, MicroPact has strong relationships with local, state, and federal clients, including the United States Air Force. The USAF reached go-live in 2019 for the Air Force Justice Information System (AFJIS), a single platform to collect and manage the data associated with law enforcement at its bases around the world. The core of AFJIS is MicroPact's entellitrak® case management platform, which allows the USAF to conduct criminal justice activities more efficiently and effectively with the most modern criminal data reporting system in the Department of Defense.

260+

USAF personnel have had AFJIS training conducted by Tyler in the system's first few months

25K

USAF personnel will be trained by partners who complete the Tyler training

AFJIS will help the USAF:

Conduct investigations

Track data on people in custody

Deploy data analytics on criminal activity

Forming Powerful Partnerships

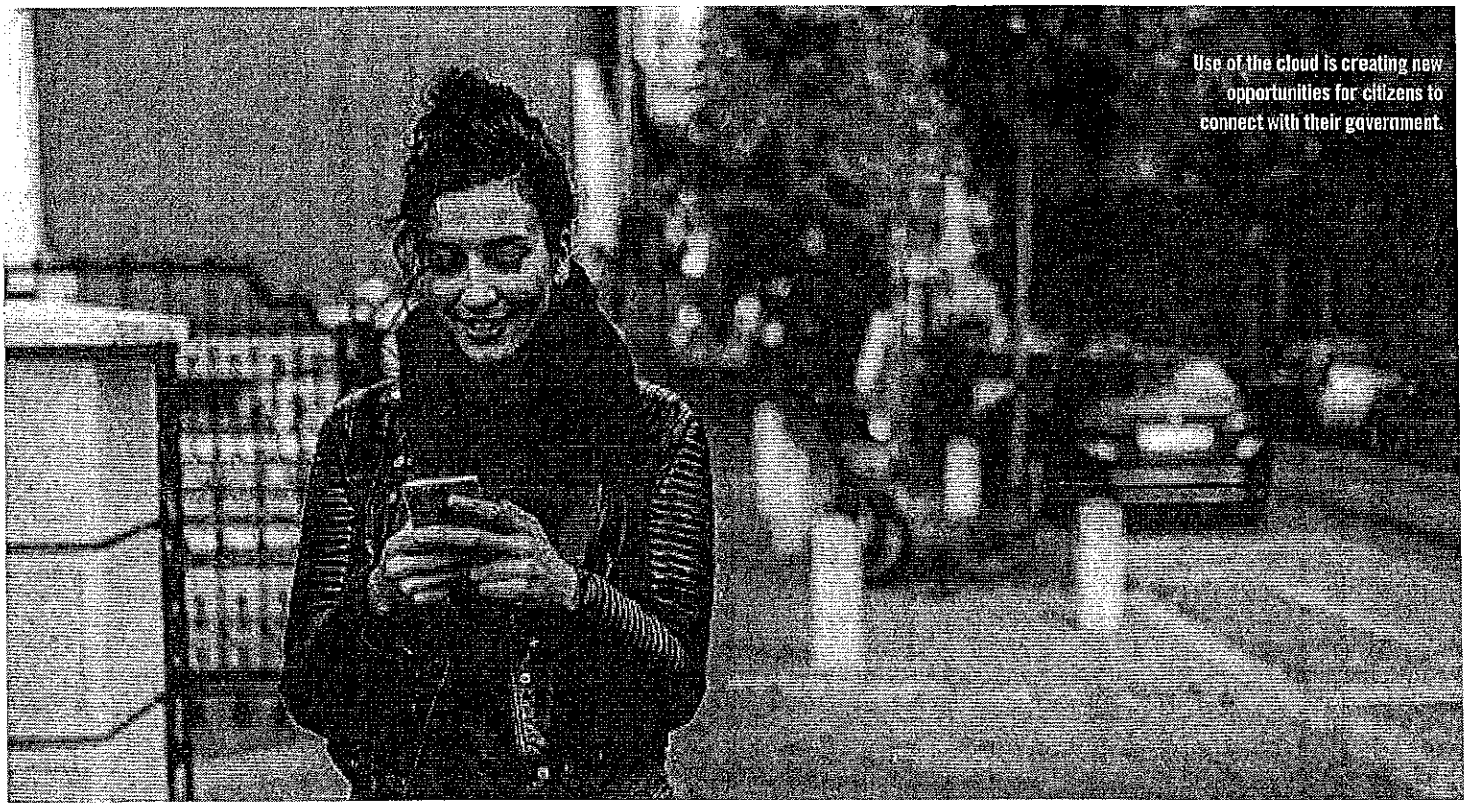
Cloud-based solutions can provide a number of benefits for public sector clients, including always up-to-date technology, continuous delivery, and business continuity in the event of natural disaster or other unexpected events.

As we see a clear trend in increasing client preference for cloud solutions, Tyler's cloud strategy continues to evolve in response to market forces and client needs.

To support cloud-based public sector solutions going forward, Tyler announced our strategic collaboration with Amazon Web Services (AWS) in 2019.

Our agreement with AWS provides an enhanced framework for ongoing development, training and collaboration. We will be able to provide even stronger service to our clients, as we support next-generation applications with superior scalability, resiliency and security.

aws partner network



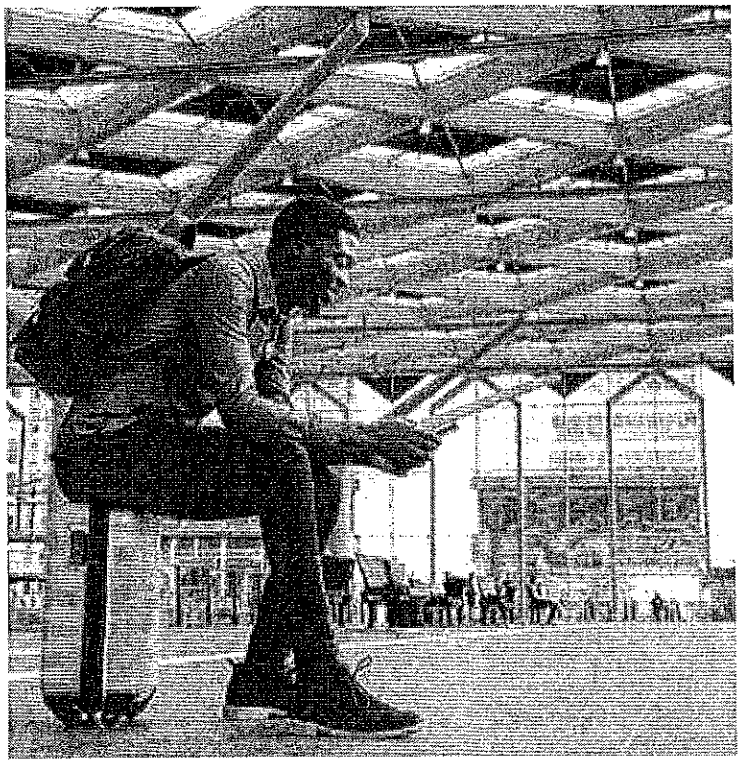
Use of the cloud is creating new opportunities for citizens to connect with their government.

Supporting Security

Ransomware, cyberattacks and other security threats are on the rise for the public sector.

In 2019, to better address growing public sector security needs, we introduced Tyler Cybersecurity™, formerly Sage Data Security (acquired in 2018).

Tyler Cybersecurity offers the public sector:
- Tyler Detect™, our managed threat detection service
- Program development
- Education and training
- Technology testing and assessment
- Advisory services
- Digital forensics



Securing Our Solutions

With a constantly changing landscape of cybersecurity challenges, Tyler takes a continual improvement approach to managing product security, including its cloud-based applications. Tyler has a full-time application security team dedicated to continuously reviewing and enhancing the security posture of Tyler's products. Tyler uses enterprise-level dynamic and static security scanning tools as part of our software development lifecycle. In addition to scanning tools, Tyler's application security team executes manual assessments on Tyler products using a testing methodology based upon the OWASP (Open Web Application Security Project) Testing Framework.

Focusing Our Efforts

Tyler consolidated its security efforts under a newly organized Information Security Office in 2019 to monitor internal security infrastructure, improve processes, and consult with product security teams.

Security measures can be organized into four major categories of control:

1. **Administrative** Information security begins when a company organizes itself to emphasize security and ensure human resource processes are in place to help facilitate security. Tyler's human resource practices are designed and implemented to support the security of company and client data.
2. **Physical Access** The time-tested basics of locked doors and physically secure facilities should not be overlooked in favor of relying only on technology. Tyler invests in secure data centers and associated practices.
3. **Logical Access** Tyler's software is designed and built with authentication, authorization, and accountability in mind. The software includes robust controls to secure access to client data.
4. **Secure Architecture** Tyler's secure network architecture hosts solutions that are secured through a layered series of barriers and monitoring tools that are designed to detect and defeat unauthorized attempts to reach client data. Tyler administers multiple controls through secure portals for clients, managed coding practices, source code controls, applied industry standards, and continual review and monitoring.

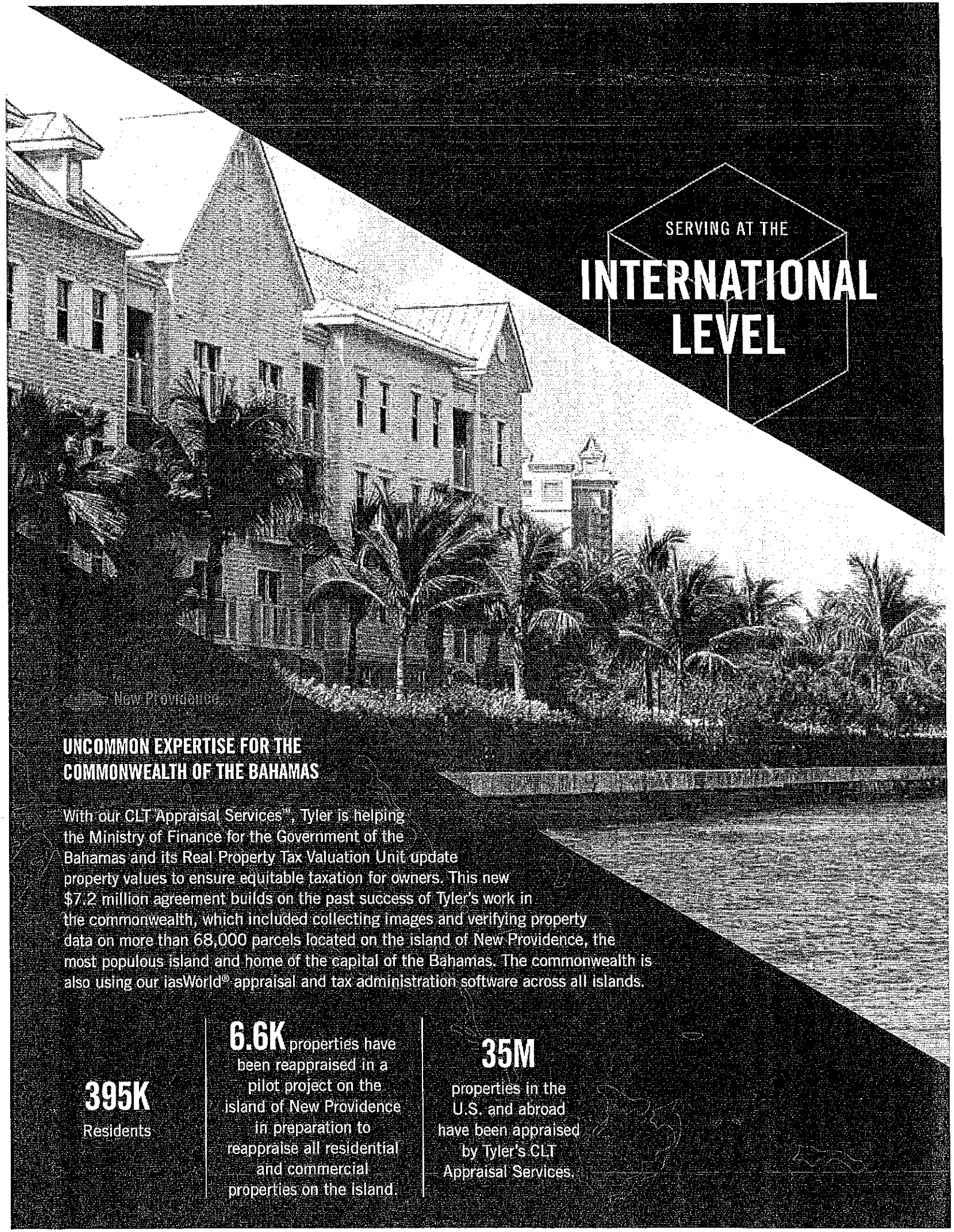
Applying Standards

Local governments are increasingly adopting more rigorous security standards such as FedRAMP, even though FedRAMP standards were developed by and for federal implementations. Two Tyler solutions meet stringent FedRAMP federal security assessment, authorization, and continuous monitoring standards for cloud products used by federal agencies:

- Socrata, a data and insights solution
- Entellitrak, a case management solution

While FedRAMP requirements were intended for federal contracts, both of these Tyler products are available to clients at all levels of government.

Tyler is vigilant about security in all areas of our business.



UNCOMMON EXPERTISE FOR THE COMMONWEALTH OF THE BAHAMAS

With our CLT Appraisal Services™, Tyler is helping the Ministry of Finance for the Government of the Bahamas and its Real Property Tax Valuation Unit update property values to ensure equitable taxation for owners. This new $7.2 million agreement builds on the past success of Tyler's work in the commonwealth, which included collecting images and verifying property data on more than 68,000 parcels located on the island of New Providence, the most populous island and home of the capital of the Bahamas. The commonwealth is also using our iasWorld® appraisal and tax administration software across all islands.

395K
Residents

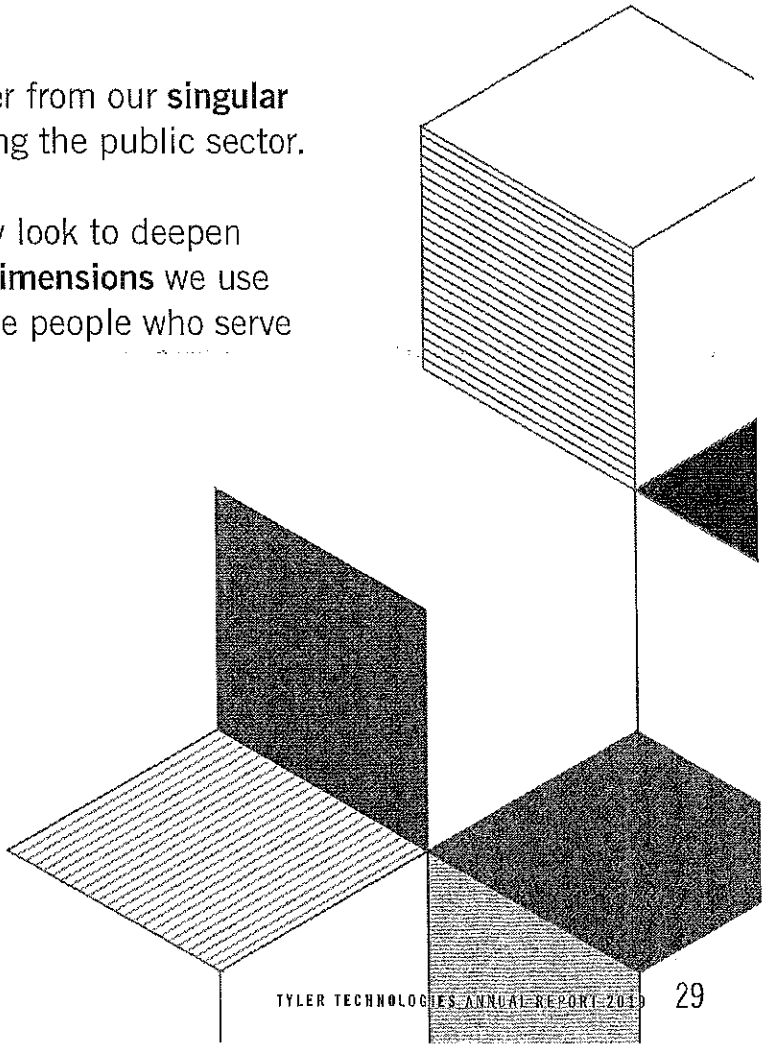
6.6K properties have been reappraised in a pilot project on the island of New Providence in preparation to reappraise all residential and commercial properties on the island.

35M
properties in the U.S. and abroad have been appraised by Tyler's CLT Appraisal Services.

For Tyler, our most important partnership is with our public sector clients, allowing us to work together to make government more responsive to citizens everywhere.

We never waver from our **singular focus** on serving the public sector.

We continually look to deepen the **multiple dimensions** we use to empower the people who serve the public.



2019

Financial Information

Reconciliation of GAAP to NON-GAAP Financial Measures (Unaudited)

(In thousands, except per share data)	2019	2018	2017	2016	2015
RECONCILIATION OF NON-GAAP TOTAL REVENUES					
GAAP total revenues	$1,086,427	$935,282	$840,899	$759,880	$591,022
Non-GAAP adjustments:					
Add: Write-downs of acquisition-related deferred revenue	4,557	4,000	663	15,063	3,186
Add: Amortization of acquired leases	372	426	444	444	37
Non-GAAP total revenues	$1,091,356	$939,708	$842,006	$775,387	$594,245
RECONCILIATION OF NON-GAAP GROSS PROFIT AND MARGIN					
GAAP gross profit	$ 516,900	$439,578	$399,377	$359,188	$277,187
Non-GAAP adjustments:					
Add: Write-downs of acquisition-related deferred revenue	4,557	4,000	663	15,063	3,186
Add: Amortization of acquired leases	372	426	444	444	37
Add: Share-based compensation expense included in cost of revenues	15,002	13,588	9,415	6,548	3,380
Add: Amortization of acquired software	30,642	22,972	21,686	22,235	4,440
Non-GAAP gross profit	$ 567,473	$480,564	$431,585	$403,478	$288,230
GAAP gross margin	47.6%	47.0%	47.5%	47.3%	46.9%
Non-GAAP gross margin	52.0%	51.1%	51.3%	52.0%	48.5%
RECONCILIATION OF NON-GAAP OPERATING INCOME AND MARGIN					
GAAP operating income	$ 156,367	$152,492	$162,758	$137,656	$108,043
Non-GAAP adjustments:					
Add: Write-downs of acquisition-related deferred revenue	4,557	4,000	663	15,063	3,186
Add: Amortization of acquired leases	372	426	444	444	37
Add: Share-based compensation expense	59,967	52,740	37,348	29,747	20,182
Add: Employer portion of payroll tax related to employee stock transactions	1,745	1,412	1,102	1,001	1,506
Add: Acquisition-related costs	1,142	-	-	-	5,875
Add: Amortization of acquired software	30,642	22,972	21,686	22,235	4,440
Add: Amortization of customer and trade name intangibles	21,445	16,217	13,381	13,202	5,905
Non-GAAP adjustments subtotal	$ 119,870	$ 97,767	$ 74,624	$ 81,692	$ 41,131
Non-GAAP operating income	$ 276,237	$250,259	$237,382	$219,348	$149,174
GAAP operating margin	14.4%	16.3%	19.4%	18.1%	18.3%
Non-GAAP operating margin	25.3%	26.6%	28.2%	28.3%	25.1%
RECONCILIATION OF NON-GAAP NET INCOME AND EARNINGS PER SHARE					
GAAP net income	$ 146,527	$147,462	$169,571	$113,701	$ 64,869
Non-GAAP adjustments:					
Add: Total non-GAAP adjustments to operating income	119,870	97,767	74,624	81,692	41,131
Less: Tax impact related to non-GAAP adjustments	(53,819)	(52,464)	(89,440)	(56,045)	(13,318)
Non-GAAP net income	$ 212,578	$192,765	$154,755	$139,348	$ 92,682
GAAP earnings per diluted share	$ 3.65	$ 3.68	$ 4.32	$ 2.92	$ 1.77
Non-GAAP earnings per diluted share	$ 5.30	$ 4.80	$ 3.94	$ 3.58	$ 2.54
DETAIL OF SHARE-BASED COMPENSATION EXPENSE					
Cost of software services, maintenance and subscriptions	$ 15,002	$ 13,588	$ 9,415	$ 6,548	$ 3,380
Selling, general and administrative expenses	44,965	39,152	27,933	23,199	16,802
Total share-based compensation expense	$ 59,967	$ 52,740	$ 37,348	$ 29,747	$ 20,182

Stock Market Data

Our common stock is traded on the New York Stock Exchange under the symbol "TYL." At December 31, 2019, we had approximately 1,215 shareholders of record. Most of our shareholders hold their shares in street name; therefore, there are substantially more than 1,215 beneficial owners of our common stock.

The following table shows, for the calendar periods indicated, the high and low sales price per share of our common stock as reported on the New York Stock Exchange.

		High	Low
2018	First Quarter	$ 214.33	$ 176.93
	Second Quarter	240.35	201.91
	Third Quarter	252.47	219.59
	Fourth Quarter	246.62	173.26
2019	First Quarter	$ 217.89	$ 176.27
	Second Quarter	233.15	203.77
	Third Quarter	265.00	217.19
	Fourth Quarter	301.39	245.00

We did not pay any cash dividends in 2019 or 2018. Our bank credit agreement contains restrictions on the payment of cash dividends. We intend to retain earnings for use in the operation and expansion of our business and do not anticipate paying a cash dividend in the foreseeable future.

Selected Financial Data

Years Ended December 31,	2019[a]	2018	2017[b],[c]	2016[b]	2015
(In thousands, except per share data)					
STATEMENT OF OPERATIONS DATA:					
Revenues	$1,086,427	$ 935,282	$ 840,899	$ 759,880	$ 591,022
Cost and expenses:					
Cost of revenues	569,527	495,704	441,522	400,692	313,835
Selling, general and administrative expenses	257,746	207,605	175,914	165,176	133,317
Research and development expense	81,342	63,264	47,324	43,154	29,922
Amortization of customer and trade name intangibles	21,445	16,217	13,381	13,202	5,905
Operating income	156,367	152,492	162,758	137,656	108,043
Other income, net	3,471	3,378	698	(1,998)	381
Income before income taxes	159,838	155,870	163,456	135,658	108,424
Income tax (benefit) provision (c)	13,311	$ 8,408	$ (6,115)	$ 21,957	$ 43,555
Net income	146,527	147,462	169,571	113,701	64,869
Net earnings per diluted share	$ 3.65	$ 3.68	$ 4.32	$ 2.92	$ 1.77
Weighted average diluted shares	40,105	40,123	39,246	38,961	36,552
STATEMENT OF CASH FLOWS DATA:					
Cash flows provided by operating activities	$ 254,720	$ 250,203	$ 195,755	$ 191,859	$ 134,327
Cash flows used by investing activities	(245,015)	(238,255)	(85,395)	(50,720)	(398,459)
Cash flows (used) provided by financing activities	88,698	(63,595)	39,415	138,075	91,052
BALANCE SHEET DATA:					
Total assets	$2,191,614	$1,790,963	$1,611,351	$1,378,502	$1,356,570
Revolving line of credit	—	—	—	10,000	66,000
Shareholders' equity	1,617,058	1,324,846	1,191,736	934,540	858,857

(a) Reflects the impact of the adoption of Accounting Standards Update ("ASU") ASU No. 2016-02, Leases ("Topic 842") in fiscal year 2019. Refer to Note - 1 "Summary of Significant Accounting Policies" for further discussion.

(b) Reflects the impact of the adoption of ASU No. 2014-09, Revenue from Contracts with Customers in fiscal year 2018.

(c) 2017 includes the significant impact of the enactment of the Tax Cuts and Jobs Act ("Tax Act"). The most significant impact of the Tax Act to us is the reduction in the U.S. federal corporate income tax rate from 35% to 21%. The impact of the rate reduction on our 2017 income tax provision is a $26.0 million tax benefit due to the remeasurement of deferred tax assets and liabilities.

FORWARD-LOOKING STATEMENTS

In addition to historical information, this Annual Report contains forward-looking statements. The forward-looking statements are made in reliance upon safe harbor provisions of the Private Securities Litigation Reform Act of 1995. The forward-looking statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those reflected in the forward-looking statements. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect management's opinion only as of the date hereof. We undertake no obligation to revise or publicly release the results of any revisions to these forward-looking statements. Readers should carefully review the risk factors described in documents we file from time to time with the Securities and Exchange Commission.

When used in this Annual Report, the words "believes," "expects," "anticipates," "foresees," "forecasts," "estimates," "plans," "intends," "continues," "may," "will," "should," "projects," "might," "could" or other similar words or phrases are intended to identify forward-looking statements. Similarly, statements that describe our business strategy, outlook, objectives, plans, intentions or goals also are forward-looking statements.

OVERVIEW

General

We provide integrated information management solutions and services for the public sector, with a focus on local governments. We develop and market a broad line of software products and services to address the IT needs of cities, counties, schools and other local government entities. In addition, we provide professional IT services to our clients, including software and hardware installation, data conversion, training and for certain clients, product modifications, along with continuing maintenance and support for clients using our systems. We also provide subscription-based services such as software as a service ("SaaS"), which primarily utilize the Tyler private cloud, and electronic document filing solutions ("e-filing"), which simplify the filing and management of court related documents. Revenues for e-filing are derived from transaction fees and, in some cases, fixed fee arrangements. Other transaction-based fees primary relate to online payment services. We also provide property appraisal outsourcing services for taxing jurisdictions.

Our products generally automate eight major functional areas: (1) financial management and education, (2) courts and justice, (3) public safety, (4) property appraisal and tax, (5) planning, regulatory and maintenance, (6) land and vital records management, (7) data and insights and (8) case management and business process management. We report our results in two segments. The Enterprise Software ("ES") segment provides public sector entities with software systems and services to meet their information technology and automation needs for mission-critical "back-office" functions such as: financial management and education, courts and justice, public safety, planning, regulatory and maintenance, land and vital records management, data and insights and case management and business management processes. The Appraisal and Tax ("A&T") segment provides systems and software that automate the appraisal and assessment of real and personal property as well as property appraisal outsourcing services for local governments and taxing authorities. Property appraisal outsourcing services include: the physical inspection of commercial and residential properties; data collection and processing; computer analysis for property valuation; preparation of tax rolls; community education; and arbitration between taxpayers and the assessing jurisdiction.

Our total employee count increased to 5,368 at December 31, 2019, from 4,525 at December 31, 2018.

For the twelve months ended December 31, 2019, total revenues increased 16% compared to the prior year. Excluding the impact of acquisitions, total revenues increased 8% compared to prior year. Revenues from acquisitions contributed 8% of growth for the twelve months ended December 31, 2019.

Subscriptions revenue grew 34% for the twelve months ended December 31, 2019, due to a gradual shift toward cloud-based, software as a service business, as well as continued strong growth in our e-filing revenues from courts and other transaction-based revenues. Excluding the impact of acquisitions, subscriptions revenue increased 26% for the twelve months ended December 31, 2019.

Our backlog at December 31, 2019 was $1.46 billion, a 17% increase from last year.

Recent Acquisitions

On October 30, 2019, we acquired certain assets of Courthouse Technologies, Ltd ("CHT"), an industry-leading provider of jury management systems that offers a fully integrated, end-to-end software-as-a-service (SaaS) solution to manage all facets of juror management, from source list generation to juror processing and payment. The total purchase price was approximately $20.5 million of which $19.1 million was paid in cash and approximately $1.4 million was accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments.

On February 28, 2019, we acquired all of the capital stock of MP Holdings Parent, Inc. dba MicroPact ("MicroPact"), a leading provider of commercial off-the-shelf ("COTS") solutions, including Entellitrak, a low-code application development platform for case management and business process management used extensively in the public sector. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million consisting of $198.2 million paid in cash and accrued contingent consideration of $6.0 million, subject to the achievement of certain financial performance objectives.

On February 1, 2019, we acquired all the assets of Civic, LLC ("MyCivic"), a company that provides software solutions to connect communities. The total purchase price was $3.7 million in cash.

As of December 31, 2019, the purchase price allocations for MicroPact and MyCivic are complete. As of December 31, 2019, the purchase price allocation for CHT is not yet complete, therefore the preliminary valuation estimates of fair value assumed at the acquisition date including intangible assets, receivables and deferred revenue are subject to change as the valuation is finalized.

The operating results of all 2019 acquisitions are included with the operating results of the Enterprise Software segment since their date of acquisition. Revenues from MicroPact included in Tyler's results of operations totaled approximately $63.0 million and the net loss was approximately $98,000 for the twelve months ended December 31, 2019. The impact of the MyCivic and CHT acquisitions, individually and in the aggregate, on our operating results, assets and liabilities is not material.

Our balance sheet as of December 31, 2019, reflects the allocation of the purchase price to the assets acquired based on their fair value at the date of each acquisition. The fair value of the assets and liabilities acquired are based on valuations using Level III, unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

We monitor and analyze several key performance indicators in order to manage our business and evaluate our financial and operating performance. These indicators include the following:

Revenues — We derive our revenues from five primary sources: sale of software licenses and royalties; subscription-based arrangements; software services; maintenance; and appraisal services. Subscriptions and maintenance are considered recurring revenue sources and comprised approximately 67% of our revenue in 2019. The number of new SaaS clients and the number of existing clients who convert from our traditional software arrangements to our SaaS model are a significant driver to our business, together with new software license sales and maintenance rate increases. In addition, we also monitor our customer base and churn as we historically have experienced very low customer turnover. During 2019, based on our number of customers, turnover was approximately 2%.

Cost of Revenues and Gross Margins — Our primary cost component is personnel expenses in connection with providing software implementation, subscription-based services, maintenance and support, and appraisal services to our clients. We can improve gross margins by controlling headcount and related costs and by expanding our revenue base, especially from those products and services that produce incremental revenue with minimal incremental cost, such as software licenses and royalties, subscription-based services, and maintenance and support. Our appraisal projects are cyclical in nature, and we often employ appraisal personnel on a short-term basis to coincide with the life of a project. As of December 31, 2019, our total employee count increased to 5,368 from 4,525 at December 31, 2018.

Selling, General and Administrative ("SG&A") Expenses — The primary components of SG&A expenses are administrative and sales personnel salaries and commissions, share-based compensation expense, marketing expense, rent and professional fees. Sales commissions typically fluctuate with revenues and share-based compensation expense generally increases as the market price of our stock increases. Other administrative expenses tend to grow at a slower rate than revenues.

Liquidity and Cash Flows — The primary driver of our cash flows is net income. Uses of cash include acquisitions, capital investments in property and equipment and discretionary purchases of treasury stock. Our working capital needs are fairly stable throughout the year with the significant components of cash outflows being payment of personnel expenses offset by cash inflows representing collection of accounts receivable and cash receipts from clients in advance of revenue being earned. In recent years, we have also received significant amounts of cash from employees exercising stock options and contributing to our Employee Stock Purchase Plan.

Balance Sheet — Cash, accounts receivable and days sales outstanding and deferred revenue balances are important indicators of our business.

Adoption of New Lease Accounting Standard

We adopted Topic 842 using the transition method that allows us to initially apply the guidance at the adoption date of January 1, 2019, and recognized a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We used the package of practical expedients that allows us to not reassess: (1) lease classification for any expired or existing leases and (2) initial direct costs for any expired or existing leases. We did not elect to use the hindsight application for evaluating the life of lease arrangements. The impact of adoption is reflected in the financial information herein. For additional details, see Note 1 - "Summary of Significant Accounting Policies" to our consolidated financial statements in this report.

The impact of Topic 842 on our consolidated balance sheet beginning January 1, 2019, included the recognition of right-of-use ("ROU") assets and lease liabilities for operating leases, while our accounting for finance leases remained substantially unchanged. We had no finance leases prior to the adoption of Topic 842 and currently do not have any.

Recent Accounting Guidance not yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses*, ("ASU 2016-13"). ASU 2016-13 changes the impairment model for most financial assets and certain other instruments, including trade and other receivables, held-to-maturity debt securities and loans, and requires entities to use a new forward-looking expected loss model that will result in the earlier recognition of allowance for losses. This update is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted for a fiscal year beginning after December 15, 2018, including interim periods within that fiscal year. Entities will apply the standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is adopted. We will adopt the new standard in the first quarter of 2020 and believe the impact on our consolidated financial statements and results of operations will not be material.

Outlook

The local government software market continues to be active, and our backlog at December 31, 2019 reached $1.46 billion, a 17% increase from last year. We expect to continue to achieve solid growth in revenue and earnings. With our strong financial position and cash flow, we plan to continue to make significant investments in product development to better position us to continue to expand our addressable market and strengthen our competitive position in the public sector software market over the long term.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our discussion and analysis of financial condition and results of operations is based upon our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP"). The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities at the date of the financial statements, the reported amounts of revenues, cost of revenues and expenses during the reporting period, and related disclosure of contingencies. The Notes to the Financial Statements included as part of this Annual Report describe our significant accounting policies used in the preparation of the financial statements. Significant items subject to such estimates and assumptions include the application of the progress toward completion methods of revenue recognition, estimated standalone selling price ("SSP") for distinct performance obligations, the carrying amount and estimated useful lives of intangible assets, determination of share-based compensation expense and valuation allowance for receivables. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies require significant judgments and estimates used in the preparation of our financial statements.

Revenue Recognition. We earn revenue from software licenses, royalties, subscription-based services, software services, post-contract customer support ("PCS" or "maintenance"), hardware, and appraisal services. Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, we satisfy a performance obligation

Most of our software arrangements with customers contain multiple performance obligations that range from software licenses, installation, training, and consulting to software modification and customization to meet specific customer needs (services), hosting, and PCS. For these contracts, we account for individual performance obligations separately when they are distinct. We evaluate whether separate performance obligations can be distinct or should be accounted for as one performance obligation. Arrangements that include software services, such as training or installation, are evaluated to determine whether the customer can benefit from the services either on their own or together with other resources readily available to the customer and whether the services are separately identifiable from other promises in the contract. Many of our software arrangements involve "off-the-shelf" software. We recognize the revenue allocable to "off-the-shelf" software licenses and specified upgrades at a point in time when control of the software license transfers to the customer, unless the software is not considered distinct. We consider off-the-shelf software to be distinct when it can be added to an arrangement with minor changes in the underlying code, it can be used by the customer for the customer's purpose upon installation, and remaining services such as training are not considered highly interdependent or highly interrelated to the product's functionality.

For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, we recognize revenue over time by measuring progress-to-completion. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often implemented over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent. When software services are distinct, the fee allocable to the service element is recognized over the time we perform the services and is billed on a time and material or milestones basis.

Subscription-based services consist of revenues derived from SaaS arrangements, which primarily utilize the Tyler private cloud, and electronic filing transactions. Revenue from subscription-based services is generally recognized over time on a ratable basis over the contract term, beginning on the date that our service is made available to the customer. For SaaS arrangements, we evaluate whether the customer has the contractual right to take possession of our software at any time during the hosting period without significant penalty and whether the customer can feasibly maintain the software on the customer's hardware or enter into another arrangement with a third-party to host the software. We allocate contract value to each performance obligation of the arrangement that qualifies for treatment as a distinct element based on estimated SSP. We recognize SaaS arrangements ratably over the term of the arrangement, which range from one to ten but are typically for a period of three to five years. For software services associated with certain SaaS arrangements, we have concluded that the services are not distinct, and we recognize the revenue ratably over the remaining contractual period once we have provided the customer access to the software. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

The transaction price is allocated to the separate performance obligations on a relative SSP basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we determine SSP using the expected cost-plus margin approach. Revenue is recognized net of allowances for sales adjustments and any taxes collected from customers, which are subsequently remitted to governmental authorities.

Typically, the structure of our arrangements does not give rise to variable consideration. However, in those instances whereby variable consideration exists, we include in our estimates additional revenue for variable consideration when we believe we have an enforceable right, the amount can be estimated reliably and its realization is probable.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from credit risk associated with the inability of a customer to make required payments. Events or changes in circumstances that indicate that the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products. The allowance for doubtful accounts reflects our best estimate of probable losses inherent in the accounts receivable balance. We determine the allowance based on known troubled accounts, historical experience, and other currently available evidence.

In connection with certain of our contracts, we have recorded retentions receivable or unbilled receivables consisting of costs and estimated profit in excess of billings as of the balance sheet date. Many of the contracts which give rise to unbilled receivables at a given balance sheet date are subject to billings in the subsequent accounting period. We review unbilled receivables and related contract provisions to ensure we are justified in recognizing revenue prior to billing the customer and that we have objective evidence which allows us to recognize such revenue. In addition, we have a sizable amount of deferred revenue, which represents billings in excess of revenue earned. The majority of this liability consists of maintenance billings for which payments are made in advance and the revenue is ratably earned over the maintenance period, generally one year. We also have deferred revenue for those contracts in which we receive a deposit and the conditions in which to record revenue for the service or product have not been met. On a periodic basis, we review by customer the detail components of our deferred revenue to ensure our accounting remains appropriate.

Intangible Assets and Goodwill. Our business acquisitions typically result in the creation of goodwill and other intangible asset balances, and these balances affect the amount and timing of future period amortization expense, as well as expense we could possibly incur as a result of an impairment charge. The cost of acquired companies is allocated to identifiable tangible and intangible assets based on estimated fair value, with the excess allocated to goodwill. Accordingly, we have a significant balance of acquisition date intangible assets, including software, customer related intangibles, trade name, leases and goodwill. These intangible assets (other than goodwill) are amortized over their estimated useful lives. We currently have no intangible assets with indefinite lives other than goodwill.

We assess goodwill for impairment annually as of April 1st, or more frequently whenever events or changes in circumstances indicate its carrying value may not be recoverable. We begin with the qualitative assessment of whether it is more likely than not that a reporting unit's fair value is less than its carrying value before applying the quantitative assessment described below. When testing goodwill for impairment quantitatively, we first compare the fair value of each reporting unit with its carrying amount. If the carrying amount of a reporting unit exceeds its fair value, a second step is performed to measure the amount of potential impairment. In the second step, we compare the implied fair value of reporting unit goodwill with the carrying amount of the reporting unit's goodwill. If the carrying amount of reporting unit goodwill exceeds the implied fair value of that goodwill, an impairment loss is recognized. The fair values calculated in our impairment tests are determined using discounted cash flow models involving several assumptions. The assumptions that are used are based upon what we believe a hypothetical marketplace participant would use in estimating fair value. We base our fair value estimates on assumptions we believe to be reasonable but that are unpredictable and inherently uncertain. We evaluate the reasonableness of the fair value calculations of our reporting units by comparing the total of the fair value of all of our reporting units to our total market capitalization. Our annual goodwill impairment analysis, which we performed qualitatively during the second quarter of 2019, did not result in an impairment charge. During 2019, we did not identify any triggering events that would require an update to our annual impairment review.

All intangible assets (other than goodwill) are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of other intangible assets is measured by comparison of the carrying amount to estimated undiscounted future cash flows. The assessment of recoverability or of the estimated useful life for amortization purposes will be affected if the timing or the amount of estimated future operating cash flows is not achieved. Such indicators may include, among others: a significant decline in expected future cash flows; a sustained, significant decline in stock price and market capitalization; a significant adverse change in legal factors or in the business climate; unanticipated competition; and reductions in growth rates. In addition, products, capabilities, or technologies developed by others may render our software products obsolete or non-competitive. Any adverse change in these factors could have a significant impact on the recoverability of goodwill or other intangible assets. During 2019, we did not identify any triggering events that would indicate that the carrying amount of our intangible assets may not be recoverable.

Share-Based Compensation. We have a stock incentive plan that provides for the grant of stock options, restricted stock units and performance stock units to key employees, directors and non-employee consultants. We estimate the fair value of share-based awards on the date of grant. Share-based compensation expense includes the estimated effects of forfeitures, which will be adjusted over the requisite service period to the extent actual forfeitures differ or are expected to differ from such estimates. Changes in estimated forfeitures are recognized in the period of change and will also impact the amount of expense to be recognized in future periods. Forfeiture rate assumptions are derived from historical data.

We estimate stock price volatility at the date of grant based on the historical volatility of our common stock. Estimated option life is determined using the weighted-average period the stock options are expected to be outstanding based primarily on the options' vesting terms, remaining contractual life and the employees' expected exercise based on historical patterns. Determining the appropriate fair-value model and calculating the fair value of share-based awards at the grant date requires considerable judgment, including estimating stock price volatility, expected option life and forfeiture rates.

ANALYSIS OF RESULTS OF OPERATIONS AND OTHER

The following discussion compares the historical results of operations on a basis consistent with GAAP for the years ended December 31, 2019, 2018 and 2017:

	Percentage of Total Revenues		
Years Ended December 31,	2019	2018	2017
Revenues			
Software licenses and royalties	9.2%	10.0%	10.3%
Subscriptions	27.3	23.6	20.5
Software services	19.6	20.5	21.5
Maintenance	39.6	41.1	42.6
Appraisal services	2.2	2.3	3.0
Hardware and other	2.1	2.5	2.1
Total revenues:	100.0	100.0	100.0
Operating expenses:			
Cost of software licenses, royalties and acquired software:	3.2	2.9	3.0
Cost of software services, maintenance and subscriptions	46.2	46.9	46.1
Cost of appraisal services	1.4	1.5	1.9
Cost of hardware and other	1.6	1.7	1.5
Selling, general and administrative expenses	23.7	22.2	20.9
Research and development expense	7.5	6.8	5.6
Amortization of customer and trade name intangibles	2.0	1.7	1.6
Operating income	14.4	16.3	19.4
Other income, net	0.3	0.4	0.1
Income before income taxes	14.7	16.7	19.5
Income tax (benefit) provision	1.2	0.9	(0.7)
Net income	13.5%	15.8%	20.2%

2019 COMPARED TO 2018

Revenues

On February 28, 2019, we acquired all of the capital stock of MicroPact, a leading provider of COTS solutions, including Entellitrak, a low-code application development platform for case management and business process management used extensively in the public sector. The following table details revenue for MicroPact for the period presented as of December 31, 2019, which is included in our consolidated statements of income from the date of acquisition:

	2019
Revenues	
Software licenses and royalties:	$ 8,737
Subscriptions	7,472
Software services	18,143
Maintenance	28,642
Appraisal services	—
Hardware and other	24
Total revenues:	$ 63,018

On October 30, 2019, we acquired certain assets of CHT, an industry-leading provider of jury management systems that offers a fully integrated, end-to-end SaaS solution to manage all facets of juror management, from source list generation to juror processing and payment. On February 1, 2019, we acquired all the assets of MyCivic, a company that provides software solutions to connect communities. The impact of the CHT and MyCivic acquisitions on our operating results is not considered material, individually and in the aggregate, and is not included in the table above. The results of the MicroPact, CHT and MyCivic acquisitions are included with the operating results of the ES segment from their dates of acquisition. For comparative purposes, we have provided explanations for changes in operations to exclude results of operations for these acquisitions noting the exclusion.

Software licenses and royalties.

The following table sets forth a comparison of our software licenses and royalties revenue for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
ES	$ 92,567	$ 83,735	$ 8,832	11 %
A&T	7,638	9,706	(2,068)	(21)
Total software licenses and royalties revenue	$100,205	$ 93,441	$ 6,764	7 %

Excluding the impact of acquisitions, software licenses and royalties revenue decreased 2% compared to prior year. The decline was primarily due to a shift in the mix of new software contracts toward more subscription agreements compared to the prior year. Our total new contract value mix in 2019, was approximately 37% perpetual software license arrangements and approximately 63% subscription-based arrangements compared to total new contract value mix in 2018, of approximately 59% perpetual software license arrangements and approximately 41% subscription-based arrangements.

Although the mix of new contracts between subscription-based and perpetual license arrangements may vary from quarter to quarter and year to year, we expect our longer-term software license growth rate to be negatively impacted by a growing number of customers choosing our subscription-based options, rather than purchasing the software under a traditional perpetual software license arrangement. Subscription-based arrangements result in lower software license revenue in the initial year as compared to perpetual software license arrangements but generate higher overall revenue over the term of the contract.

Subscriptions.

The following table sets forth a comparison of our subscriptions revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ 285,092	$ 210,740	$ 74,352	35%
A&T	11,260	9,807	1,453	15
Total subscription revenue	$ 296,352	$ 220,547	$ 75,805	34%

Subscription-based revenue primarily consists of revenue derived from our SaaS arrangements, which generally utilize the Tyler private cloud. As part of our subscription-based services, we also provide electronic document filing solutions ("e-filing") that simplify the filing and management of court related documents for courts and law offices. E-filing revenue is derived from transaction fees and fixed fee arrangements.

Excluding the results of acquisitions, subscription-based revenue increased 26% compared to 2018. New SaaS clients as well as existing clients who converted to our SaaS model provided the majority of the subscription revenue increase. In 2019, we added 596 new SaaS clients and 78 existing clients elected to convert to our SaaS model. Also, e-filing services contributed approximately $7.0 million of the subscription revenue increase in 2019. The increase in e-filing revenue is attributed to new e-filing clients, as well as increased volumes as the result of several existing clients mandating e-filing.

Software services.

The following table sets forth a comparison of our software services revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ 185,892	$ 166,921	$ 18,971	11%
A&T	27,169	24,348	2,821	12
Total software services revenue	$ 213,061	$ 191,269	$ 21,792	11%

Software services revenue primarily consists of professional services billed in connection with implementing our software, converting client data, training client personnel, custom development activities and consulting. New clients who purchase our proprietary software licenses or subscriptions generally also contract with us to provide for the related software services. Existing clients also periodically purchase additional training, consulting and minor programming services. Excluding the results of acquisitions, software services revenue grew 0.4% compared to the prior year period. The slight increase is due to higher new contract volume and the addition of professional services staff to grow our capacity to deliver backlog. Excluding employees added with acquisitions, our implementation and support staff has grown by 232 employees since December 31, 2018.

Maintenance.

The following table sets forth a comparison of our maintenance revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ 405,063	$ 359,904	$ 45,159	13%
A&T	25,255	24,617	638	3
Total maintenance revenue	$ 430,318	$ 384,521	$ 45,797	12%

We provide maintenance and support services for our software products and certain third-party software. Excluding the results of acquisitions, maintenance revenue grew 4% compared to the prior year. Maintenance and support revenue increased mainly due to growth in our installed customer base from new software license sales as well as annual maintenance rate increases, partially offset by clients converting from on-premises license arrangements to SaaS.

Appraisal services.

The following table sets forth a comparison of our appraisal services revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ —	$ —	$ —	—%
A&T	23,479	21,846	1,633	7
Total appraisal services revenue	$ 23,479	$ 21,846	$ 1,633	7%

In 2019, appraisal services revenue increased 7% compared to the prior year primarily due to the addition of several new revaluation contracts started during the second quarter of 2019. The appraisal services business is somewhat cyclical and driven in part by statutory revaluation cycles in various states.

Cost of Revenues and Gross Margins

The following table sets forth a comparison of the key components of our cost of revenues for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Software licenses and royalties	$ 3,938	$ 3,802	$ 136	4%
Acquired software	30,642	22,972	7,670	33
Software services, maintenance and subscriptions	502,138	438,923	63,215	14
Appraisal services	15,337	14,299	1,038	7
Hardware and other	17,472	15,708	1,764	11
Total cost of revenues	$569,527	$495,704	$ 73,823	15%

The following table sets forth a comparison of gross margin percentage by revenue type for the years ended December 31:

Gross margin percentage	2019	2018	Change
Software licenses, royalties and acquired software	65.5%	71.3%	(5.8)%
Software services, maintenance and subscriptions	46.6	44.9	1.7
Appraisal services	34.7	34.5	0.2
Hardware and other	24.1	33.6	(9.5)
Overall gross margin	47.6%	47.0%	0.6 %

Software licenses, royalties and acquired software. Cost of software licenses, royalties and acquired software is primarily comprised of amortization expense for acquired software and third-party software costs. We do not have any direct costs associated with royalties. The gross margin decrease of 5.8% is due to an increase in amortization expense for acquired software resulting from acquisitions completed in the last half of 2018 and in 2019.

Software services, maintenance and subscriptions. Cost of software services, maintenance and subscriptions primarily consists of personnel costs related to installation of our software, conversion of client data, training client personnel and support activities and various other services such as custom client development and on-going operation of SaaS and e-filing arrangements. In 2019, the software services, maintenance and subscriptions gross margin increased 1.7% compared to the prior year. Excluding employees added through acquisitions, our implementation and support staff has grown by 232 employees since December 31, 2018 as we accelerated hiring to ensure that we are well-positioned to deliver our current backlog and anticipated new business. Costs related to maintenance and various other services such as SaaS and e-filing typically grow at a slower rate than related revenue due to leverage in the utilization of support and maintenance staff and economies of scale.

Appraisal services. Appraisal services revenue comprised approximately 2.2% of total revenue. The appraisal services gross margin increased 0.2% compared to 2018 due to ramp up of several new revaluation projects during second quarter 2019.

Our 2019 blended gross margin slightly increased 0.6% compared to 2018. Our overall gross margin increase is attributed to a higher revenue mix for subscription revenues compared to the prior year period resulting in an increase in incremental margin related to software services, maintenance and subscriptions. Costs related to maintenance and various other services such as SaaS and e-filing typically grow at a slower rate than related revenue due to leverage in the utilization of support and maintenance staff and economies of scale. The increase in overall margins are partially offset by lower margins from software licenses, in part due to lower software license revenue and higher amortization expense for acquired software resulting from acquisitions.

Selling, General and Administrative Expenses

Selling, general and administrative ("SG&A") expenses consist primarily of salaries, employee benefits, travel, share-based compensation expense, commissions and related overhead costs for administrative and sales and marketing employees, as well as, professional fees, trade show activities, advertising costs and other marketing related costs. The following table sets forth a comparison of our SG&A expenses for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Selling, general and administrative expenses	$ 257,746	$ 207,605	$ 50,141	24%

SG&A as a percentage of revenue was 23.7% in 2019 compared to 22.2% in 2018. SG&A expense increased approximately 24% compared to the prior year period. In 2019, our operating results include $19.9 million of SG&A expenses for MicroPact from the date of acquisition. The remaining SG&A expense increase is mainly due to compensation cost related to increased staff levels, higher stock compensation expense and increased commission expense as a result of higher sales. Excluding employees added with acquisitions, we added 81 employees mainly to our sales and finance teams since December 31, 2018. In addition, our 2019 stock compensation expense rose $5.8 million, mainly due to increases in our stock price over recent years.

Research and Development Expense

Research and development expense consists primarily of salaries, employee benefits and related overhead costs associated with new product development. The following table sets forth a comparison of our research and development expense for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Research and development expense	$ 81,342	$ 63,264	$ 18,078	29%

Research and development expense increased 29% in 2019 compared to the prior year period, mainly due to a number of new Tyler product development initiatives across our product suites, including increased investments in research and development at recently acquired businesses. To support these initiatives, our research and development staff has grown by 153 since December 31, 2018.

Amortization of Customer and Trade Name Intangibles

Acquisition intangibles are comprised of the excess of the purchase price over the fair value of net tangible assets acquired that is allocated to acquired software, leases and customer and trade name intangibles. The remaining excess purchase price is allocated to goodwill that is not subject to amortization. Amortization expense related to acquired software is included with cost of revenues, while amortization expense of customer and trade name intangibles is recorded as operating expense. The estimated useful lives of both customer and trade name intangibles range from five to 25 years. The following table sets forth a comparison of amortization of customer and trade name intangibles for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Amortization of customer and trade name intangibles	$ 21,445	$ 16,217	$ 5,228	32%

Amortization of customer and trade name intangibles increased due to the impact of intangibles added with several acquisitions completed in 2018 and 2019.

Estimated annual amortization expense relating to customer and trade name acquisition intangibles, excluding acquired software for which the amortization expense is recorded as cost of revenues, for the next five years and thereafter is as follows (in thousands):

2020	$ 21,357
2021	21,237
2022	20,747
2023	20,673
2024	20,121
Thereafter	135,264

Amortization expense relating to acquired leases will be recorded as a reduction to hardware and other revenue and is expected to be $525,000 in 2020, $525,000 in 2021, $525,000 in 2022, $525,000 in 2023, $525,000 in 2024 and $512,000 thereafter.

Other

The following table sets forth a comparison of other income, net for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Other income, net	$ 3,471	$ 3,378	$ 93	3%

Other income is comprised of interest income from invested cash net of interest expense and non-usage and other fees associated with our revolving credit agreement. Other income, net, increased compared to the prior period due to increased interest income from higher levels of cash and investments resulting from cash generated in the current year offset by increased interest expense from new debt outstanding during the current year under our credit agreement.

Income Tax Provision

The following table sets forth a comparison of our income tax provision for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Income tax provision (benefit)	$13,311	$ 8,408	$ 4,903	58%
Effective income tax rate	8.3%	5.4%		

The increase in the income tax provision and the effective income tax rate in 2019 compared to the prior year is primarily due to lower excess tax benefits from stock option exercises in 2019. Stock option exercise activity in 2019 generated excess tax benefits of $29.8 million, while stock option exercise activity in 2018 generated $32.5 million excess tax benefits. In addition, the 2018 income tax provision contains a tax benefit of $1.8 million resulting from the remeasurement of deferred tax assets and liabilities associated with the enactment of the 2017 Tax Act which reduced the statutory U.S. federal corporate income tax rate from 35% to 21%. Excluding the impact of the excess tax benefits and the Tax Act, our income tax provision and effective tax rate in 2019 would have been $43.1 million and 27.0% and in 2018, would have been $42.6 million and 27.4%, respectively.

The effective income tax rates in both 2019 and 2018 differed from the United States federal statutory corporate income tax rate of 21% due to state income taxes, the research tax credit, non-deductible share-based compensation expense, disqualifying incentive stock option dispositions, and other non-deductible business expenses.

2018 COMPARED TO 2017

Revenues

Software licenses and royalties.

The following table sets forth a comparison of our software licenses and royalties revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 83,735	$ 78,338	$ 5,347	7%
A&T	9,706	7,854	1,852	24
Total software licenses and royalties revenue	$ 93,441	$ 86,242	$ 7,199	8%

Software license and royalties revenue increased 8% compared to the prior year. The majority of this growth was due to an active marketplace as the result of generally positive local government economic conditions, as well as our increasingly strong competitive position, which we attribute in part to our investment in product development in recent years. An increase in the number of larger contracts related to our planning, regulatory and maintenance solutions and public safety solutions also contributed to the growth in license revenue.

Although the mix of new contracts between subscription-based and perpetual license arrangements may vary from quarter to quarter and year to year, we expect our longer-term software license growth rate to be negatively impacted by a growing number of customers choosing our subscription-based options, rather than purchasing the software under a traditional perpetual software license arrangement. Subscription-based arrangements result in lower software license revenue in the initial year as compared to perpetual software license arrangements but generate higher overall revenue over the term of the contract. Our new client mix in 2018 was approximately 47% selecting perpetual software license arrangements and approximately 53% selecting subscription-based arrangements compared to a client mix in 2017 of approximately 53% selecting perpetual software license arrangements and approximately 47% selecting subscription-based arrangements.

Subscriptions.

The following table sets forth a comparison of our subscriptions revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 210,740	$ 164,317	$ 46,423	28%
A&T	9,807	7,859	1,948	25
Total subscriptions revenue	$ 220,547	$ 172,176	$ 48,371	28%

Subscription-based revenue primarily consists of revenue derived from our SaaS arrangements, which generally utilize the Tyler private cloud. As part of our subscription-based services, we also provide electronic document filing solutions ("e-filing") that simplify the filing and management of court related documents for courts and law offices. E-filing revenue is derived from transaction fees and fixed fee arrangements. Excluding the results of acquisitions, subscription-based revenue increased 21% compared to 2017.

New SaaS clients as well as existing clients who converted to our SaaS model provided the majority of the subscription revenue increase. In 2018, we added 410 new SaaS clients and 97 existing clients elected to convert to our SaaS model. Also, e-filing services contributed approximately $6.2 million of the subscription revenue increase in 2018. The increase in e-filing revenue is attributed to new e-filing clients, as well as increased volumes as the result of several existing clients mandating e-filing. The acquisition of Socrata, which primarily has a subscription revenue model, also contributed to the increase in subscription revenues.

Software services.

The following table sets forth a comparison of our software services revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$166,921	$161,245	$ 5,676	4%
A&T	24,348	19,215	5,133	27
Total software services revenue	$191,269	$180,460	$ 10,809	6%

Software services revenue primarily consists of professional services billed in connection with implementing our software, converting client data, training client personnel, custom development activities and consulting. New clients who purchase our proprietary software licenses generally also contract with us to provide for the related software services. Existing clients also periodically purchase additional training, consulting and minor programming services. Excluding the results of acquisitions, software services revenue grew 3% compared to the prior year period. This growth is due to a higher level of new software sales, through both our license and subscription models.

Maintenance.

The following table sets forth a comparison of our maintenance revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$359,904	$337,701	$ 22,203	7%
A&T	24,617	21,618	2,999	14
Total maintenance revenue	$384,521	$359,319	$ 25,202	7%

We provide maintenance and support services for our software products and certain third-party software. Maintenance revenue grew 7% compared to the prior year. Maintenance and support revenue increased mainly due to growth in our installed customer base from new software license sales as well as annual maintenance rate increases.

Appraisal services.

The following table sets forth a comparison of our appraisal services revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ —	$ —	$ —	— %
A&T	21,846	25,023	(3,177)	(13)
Total appraisal services revenue	$ 21,846	$ 25,023	$ (3,177)	(13)%

In 2018, appraisal services revenue decreased 13% compared to the prior year primarily due to the successful completion of several large revaluation projects in mid-2017. The appraisal services business is somewhat cyclical and driven in part by statutory revaluation cycles in various states

COST OF REVENUES AND GROSS MARGINS

The following table sets forth a comparison of the key components of our cost of revenues for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Software licenses and royalties	$ 3,802	$ 3,321	$ 481	14%
Acquired software	22,972	21,686	1,286	6
Software services, maintenance and subscriptions	438,923	387,634	51,289	13
Appraisal services	14,299	16,286	(1,987)	(12)
Hardware and other	15,708	12,595	3,113	25
Total cost of revenues	$495,704	$441,522	$ 54,182	12%

The following table sets forth a comparison of gross margin percentage by revenue type for the years ended December 31:

Gross margin percentage	2018	2017	Change
Software licenses, royalties and acquired software	71.3%	71.0%	0.3 %
Software services, maintenance and subscriptions	44.9	45.6	(0.7)
Appraisal services	34.5	34.9	(0.4)
Hardware and other	33.6	28.8	4.8
Overall gross margin	47.0%	47.5%	(0.5)%

Software licenses, royalties and acquired software. Cost of software licenses, royalties and acquired software is primarily comprised of amortization expense for acquired software and third-party software costs. We do not have any direct costs associated with royalties. The gross margin increase of 0.3% is due to higher software license revenues offset by an increase in amortization expense for acquired software attributed to new acquisitions completed in 2018.

Software services, maintenance and subscriptions. Cost of software services, maintenance and subscriptions primarily consists of personnel costs related to installation of our software, conversion of client data, training client personnel and support activities and various other services such as custom client development and on-going operation of SaaS and e-filing arrangements. In 2018, the software services, maintenance and subscriptions gross margin decreased 0.7% compared to the prior year. Excluding employees added through acquisitions, our implementation and support staff grew by 57 employees in 2018 as we accelerated hiring to ensure that we are well-positioned to deliver our current backlog and anticipated new business. Recognition of acquisition-related deferred revenue associated with subscriptions and maintenance also resulted in lower gross margins.

Appraisal services. Appraisal services revenue comprised approximately 2.3% of total revenue. The appraisal services gross margin decreased 0.4% compared to 2017 due to the reduction in higher margin projects substantially complete by early 2017 and lower volume of revenues in the current period to cover relatively fixed costs.

Our 2018 blended gross margin slightly decreased by 0.5% compared to 2017. Our overall gross margin decrease is mainly attributed to additions to our implementation staff and lower margin revenues from appraisal services, offset by improved margin on revenues from software licenses.

Selling, General and Administrative Expenses

The following table sets forth a comparison of selling, general and administrative expenses for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Selling, general and administrative expenses	$207,605	$175,914	$31,691	18%

SG&A as a percentage of revenue was 22.2% in 2018 compared to 20.9% in 2017. SG&A expense increased approximately 18% compared to the prior year period. In 2018, our operating results include $9.1 million of SG&A expenses for Socrata from the date of acquisition. The remaining SG&A expense increase is mainly due to compensation cost related to increased staff levels, higher stock compensation expense and increased commission expense as a result of higher sales. Excluding employees added with acquisitions, we added 47 employees mainly to our sales and finance teams since in 2018. In addition, our 2018 stock compensation expense rose $11.2 million, mainly due to increases in our stock price over the last few years.

Research and Development Expense

The following table sets forth a comparison of our research and development expense for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Research and development expense	$63,264	$47,324	$15,940	34%

Research and development expense increased 34% in 2018 compared to the prior year period, mainly due to a number of new Tyler product development initiatives across our product suites, including increased investments in research and development at recently acquired businesses. To support these initiatives, our research and development staff grew by 159 in 2018.

Amortization of Customer and Trade Name Intangibles

The following table sets forth a comparison of amortization of customer and trade name intangibles for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Amortization of customer and trade name intangibles	$16,217	$13,381	$ 2,836	21%

Amortization of customer and trade name intangibles increased due to the impact of intangibles added with several acquisitions completed in 2017 and 2018.

Other

The following table sets forth a comparison of other income, net for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Other income, net	$ 3,378	$ 698	$ 2,680	384%

Other income is comprised of interest income from invested cash net of interest expense and non-usage and other fees associated with our revolving credit agreement. Other income, net, increased compared to the prior period due to increased interest income from significantly higher levels of cash and investments resulting from cash generated in the last year. We had no debt in 2018, as we repaid all borrowings under the revolving line of credit in January 2017.

Income Tax Provision (Benefit)

The following table sets forth a comparison of our income tax provision for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Income tax provision (benefit)	$ 8,408	$ (6,115)	$ 14,523	(237)%
Effective income tax rate	5.4%	(3.7)%		

The increase in the income tax provision in 2018 is primarily due to the one-time tax benefit of $26.0 million recognized in the fourth quarter of 2017 resulting from the remeasurement of deferred tax assets and liabilities associated with the enactment of the Tax Act which reduced the statutory U.S. federal corporate income tax rate from 35% to 21%. The increase is somewhat offset by the decrease in statutory U.S. federal corporate income tax rate for 2018. In addition, excess tax benefits from stock option exercises were lower in 2018 as compared to the prior period. Stock option exercise activity in 2018 generated excess tax benefits of $32.5 million, while stock option exercise activity in 2017 generated $40.6 million excess tax benefits.

The increase in the effective income tax rate in 2018 compared to 2017 is also primarily attributable to the one-time tax benefit associated with the Tax Act recognized in 2017 and the decrease in excess tax benefits related to stock option exercises realized, offset by the decrease in statutory U.S. federal corporate income tax rate for 2018. Excluding the impact of the Tax Act and the excess tax benefits, our income tax provision and effective tax rate in 2018 would have been $42.6 million and 27.4% and in 2017, would have been $60.5 million and 37.0%, respectively.

The effective income tax rates in both 2018 and 2017 differed from the statutory United States federal corporate income tax rate of 21% and 35%, respectively, due to state income taxes, the research tax credit, non-deductible share-based compensation expense, disqualifying incentive stock option dispositions, and other non-deductible business expenses, and in 2017, the domestic production activities deduction.

FINANCIAL CONDITION AND LIQUIDITY

As of December 31, 2019, we had cash and cash equivalents of $232.7 million compared to $134.3 million at December 31, 2018. We also had $81.6 million invested in investment grade corporate bonds, municipal bonds and asset-backed securities as of December 31, 2019 compared to $97.7 million at December 31, 2018. These investments mature between 2020 through 2023 and we intend to hold these investments until maturity. Cash and cash equivalents consist of cash on deposit with several domestic banks and money market funds. As of December 31, 2019, we had no outstanding borrowings and no outstanding letters of credit. We believe our revolving line of credit, cash from operating activities, cash on hand and access to the credit markets provide us with sufficient flexibility to meet our long-term financial needs.

The following table sets forth a summary of cash flows for the years ended December 31:

($ in thousands)	2019	2018	2017
Cash flows provided (used) by:			
Operating activities	$ 254,720	$ 250,203	$ 195,755
Investing activities	(245,015)	(238,255)	(85,395)
Financing activities	88,698	(63,595)	39,415
Net increase (decrease) in cash and cash equivalents	$ 98,403	$ (51,647)	$ 149,775

Net cash provided by operating activities continues to be our primary source of funds to finance operating needs and capital expenditures. Other potential capital resources include cash on hand, public and private issuances of debt or equity securities, and bank borrowings. It is possible that our ability to access the capital and credit markets in the future may be limited by economic conditions or other factors. We currently believe that cash provided by operating activities, cash on hand and available credit are sufficient to fund our working capital requirements, capital expenditures, income tax obligations, and share repurchases for at least the next twelve months.

In 2019, operating activities provided cash of $254.7 million compared to $250.2 million in 2018. Operating activities that provided cash were primarily comprised of net income of $146.5 million, non-cash depreciation and amortization charges of $76.7 million and non-cash share-based compensation expense of $60.0 million. Working capital, excluding cash, increased approximately $35.5 million due to higher accounts receivable resulting from an increase in unbilled receivables attributed to revenues recognized prior to billings, higher accounts receivable related to annual maintenance and subscription billings, timing of income tax payments, and the deferred taxes associated with stock option activity during the period. These increases were offset by the growth in deferred revenue balances and timing of payments of payroll related taxes and vendor invoices.

In general, changes in the balance of deferred revenue are cyclical and primarily driven by the timing of our maintenance and subscription billings. Our renewal dates occur throughout the year, but our largest maintenance renewal cycles occur in the second and fourth quarters.

Days sales outstanding in accounts receivable were 117 days at December 31, 2019, compared to 111 days at December 31, 2018. The increase in our DSO is mainly due to an increase in unbilled receivables attributed to the increase in software license revenue for which we have recognized revenue at the point in time when the software is made available to the customer, but the billing has not yet been submitted to the customer. An increase in software services contracts accounted for using progress-to-completion method of revenue recognition in which the services are performed in one accounting period, but the billing normally occurs subsequently in another accounting period also contributed to the increase in DSO. Furthermore, our maintenance billing cycle typically peaks at its highest level in June and second highest level in December of each year and is followed by collections in the subsequent quarter. DSO is calculated based on quarter-end accounts receivable (excluding long-term receivables but including unbilled receivables) divided by the quotient of annualized quarterly revenues divided by 360 days.

Investing activities used cash of $245.0 million in 2019 compared to $238.3 million in 2018. We invested $54.7 million and received $70.8 million in proceeds from investment grade corporate bonds, municipal bonds and asset-backed securities with maturity dates ranging from 2020 through 2023. On February 28, 2019, we acquired all of the capital stock of MicroPact. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million, including $198.2 million paid in cash and accrued contingent consideration of $6.0 million at December 31, 2019. On February 1, 2019, we acquired all the assets of MyCivic for the total purchase price of $3.7 million paid in cash. On October 30, 2019, we acquired certain assets of CHT. The total purchase price was approximately $20.5 million of which $19.1 million was

paid in cash and approximately $1.4 million accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments. Approximately $37.2 million was invested in property and equipment, including $20.8 million related to real estate. In addition, approximately $4.8 million of software development was capitalized in 2019. The remaining additions were for computer equipment and furniture and fixtures in support of internal growth, particularly with respect to data centers supporting growth in our cloud-based offerings. These expenditures were funded from cash generated from operations.

In 2018, we invested $115.6 million and received $81.2 million in proceeds from investment grade corporate bonds, municipal bonds and asset-backed securities. Approximately $27.4 million was invested in property and equipment, primarily for computer equipment, furniture and fixtures in support of internal growth, particularly with respect to our cloud-based offerings. We paid $2.2 million for the expansion of existing buildings. On December 7, 2018, we acquired certain assets and intellectual property of SceneDoc, Inc., a company that provides mobile-first, SaaS field reporting for law enforcement agencies. The total purchase price was approximately $6.2 million in cash. On October 1, 2018, we acquired all of the equity interests of MobileEyes, a company that develops software to improve public safety by supporting fire prevention and suppression, emergency response, and structural safety. The total purchase price was approximately $5.3 million in cash. On August 31, 2018, we acquired all of the assets of CaseloadPRO, a company that provides a fully featured probation case management system. The purchase price of $9.3 million was paid in cash. On April 30, 2018, we acquired all of the capital stock of Socrata, a company that provides open data and data-as-a-service solutions including cloud-based data integration, visualization, analysis, and reporting solutions for state and local government agencies. The purchase price, net of cash acquired of $1.7 million, was $147.6 million paid in cash. On April 30, 2018, we acquired all of the equity interests of Sage, a cybersecurity company offering a suite of services that supports an entire cybersecurity lifecycle, including program development, education and training, technical testing, advisory services, and digital forensics. The total purchase price was $11.6 million paid in cash. These expenditures were funded from cash generated from operations.

Financing activities provided cash of $88.7 million in 2019 compared to cash used of $63.6 million in 2018. Financing activities in 2019 were primarily comprised of collections of $106.5 million from stock option exercises and employee stock purchase plan activity. We also purchased approximately 72,000 shares of our common stock for an aggregate purchase price of $14.3 million.

Financing activities used cash of $63.6 million in 2018 compared to cash provided of $39.4 million in 2017. Financing activities in 2018 were primarily comprised of collections of $83.0 million from stock option exercises and employee stock purchase plan activity. We also purchased approximately 781,000 shares of our common stock for an aggregate purchase price of $150.1 million, of which $3.5 million was accrued as of December 31, 2018.

In February 2019, our board of directors authorized the repurchase of an additional 1.5 million shares of Tyler common stock. The repurchase program, which was approved by our board of directors, was announced in October 2002, and was amended at various times from 2003 through 2019. As of February 19, 2020, we had remaining authorization to repurchase up to 2.6 million additional shares of our common stock. Our share repurchase program allows us to repurchase shares at our discretion. Market conditions influence the timing of the buybacks and the number of shares repurchased, as well as the volume of employee stock option exercises. Share repurchases are generally funded using our existing cash balances and borrowings under our credit facility and may occur through open market purchases and transactions structured through investment banking institutions, privately negotiated transactions and/or other mechanisms. There is no expiration date specified for the authorization and we intend to repurchase stock under the plan from time to time.

On September 30, 2019, we entered into a $400.0 million credit agreement (the "Credit Facility") with the various lenders party thereto and Wells Fargo Bank, National Association, as Administrative Agent. The Credit Facility provides for an unsecured revolving credit line of up to $400.0 million, including a $25.0 million sublimit for letters of credit. The Credit Facility matures on September 30, 2024. Borrowings under the Credit Facility may be used for general corporate purposes, including working capital requirements, acquisitions and share repurchases. Borrowings under the Credit Facility bear interest at a rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the 30, 60, 90 or 180 day LIBOR rate plus a margin of 1.125% to 1.75%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. The Credit Facility is secured by substantially all of our assets. The Credit Facility requires us to maintain certain financial ratios and other financial conditions and prohibits us from making certain investments, advances, cash dividends or loans, and limits incurrence of additional indebtedness and liens. As of December 31, 2019, we were in compliance with those covenants.

As of December 31, 2019, we had no outstanding borrowings and had unused borrowing capacity of $400.0 million under the Credit Facility. We paid interest of $1,750,000 in 2019, $770,000 in 2018, and $804,000 in 2017.

We paid income taxes, net of refunds received, of $21.3 million in 2019, $6.8 million in 2018, and $36.0 million in 2017. In 2019, we experienced significant stock option exercise activity that generated net tax benefits of $29.8 million and reduced tax payments accordingly. In 2018 and 2017, excess tax benefits were $32.5 million and $40.6 million, respectively.

We anticipate that 2020 capital spending will be between $36 million and $38 million, including approximately $9 million related to real estate and approximately $7 million of capitalized software development. We expect the majority of the other capital spending will consist of computer equipment and software for infrastructure replacements and expansion. Capital spending is expected to be funded from existing cash balances and cash flows from operations.

From time to time we engage in discussions with potential acquisition candidates. In order to pursue such opportunities, which could require significant commitments of capital, we may be required to incur debt or to issue additional potentially dilutive securities in the future. No assurance can be given as to our future acquisition opportunities and how such opportunities will be financed. We lease office facilities for use in our operations, as well as transportation and other equipment. Most of our leases are non-cancelable operating lease agreements and they expire from one year to eight years. Some of these leases include options to extend for up to 10 years.

Summarized in the table below are our obligations to make future payments under the Credit Facility and lease obligations at December 31, 2019 (in thousands):

	2020	2021	2022	2023	2024	Thereafter	Total
Revolving line of credit	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Lease obligations	7,684	6,246	3,960	2,923	2,478	2,042	25,333
Total future payment obligations	$ 7,684	$ 6,246	$ 3,960	$ 2,923	$ 2,478	$ 2,042	$ 25,333

As of December 31, 2019, we do not have any off-balance sheet arrangements, guarantees to third-parties or material purchase commitments.

CAPITALIZATION

At December 31, 2019, our capitalization consisted of no outstanding borrowings and $1.6 billion of shareholders' equity.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Market risk represents the risk of loss that may affect us due to adverse changes in financial market prices and interest rates.

In 2019, our effective average interest rate for borrowings was 3.84%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. Loans under the Credit Facility bear interest, at Tyler's option, at a per annum rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the one-, two-, three-, or six-month LIBOR rate plus a margin of 1.125% to 1.75%.

As of December 31, 2019, we had no outstanding borrowings under the Credit Facility and therefore are not subject to any interest risk.

CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures — We maintain disclosure controls and procedures (as defined in Rule 13a-15(e) of the Securities Exchange Act) designed to provide reasonable assurance that the information required to be disclosed by us in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. These include controls and procedures designed to ensure that this information is accumulated and communicated to our management, including our chief executive officer and chief financial officer, as appropriate to allow timely decisions regarding required disclosures. Management, with the participation of the chief executive officer and chief financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019. Based on this evaluation, the chief executive officer and chief financial officer have concluded that our disclosure controls and procedures were effective as of December 31, 2019.

Management's Report on Internal Control Over Financial Reporting — Tyler's management is responsible for establishing and maintaining effective internal control over financial reporting as defined in Securities Exchange Act Rule 13a-15(f). Tyler's internal control over financial reporting is designed to provide reasonable assurance to Tyler's management and board of directors regarding the preparation and fair presentation of published financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation.

Management assessed the effectiveness of Tyler's internal control over financial reporting as of December 31, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Based on our assessment, we concluded that, as of December 31, 2019, Tyler's internal control over financial reporting was effective based on those criteria.

Management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of MicroPact, which is included in our 2019 consolidated financial statements and constituted 11.5% of total assets as of December 31, 2019 and 5.8% of revenues for the year then ended.

Tyler's internal control over financial reporting as of December 31, 2019 has been audited by Ernst & Young LLP, the independent registered public accounting firm who also audited Tyler's financial statements. Ernst & Young's attestation report on Tyler's internal control over financial reporting appears on page 57 hereof.

Changes in Internal Control Over Financial Reporting — During the quarter ended December 31, 2019, there were no changes in our internal control over financial reporting, as defined in Securities Exchange Act Rule 13a-15(f), that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Tyler Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Tyler Technologies, Inc. (the Company) as of December 31, 2019 and 2018, the related consolidated statements of comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 19, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Estimation of hours for certain progress-to-completion (POC) arrangements

Description of the Matter

As described in Note 1 "Summary of Significant Accounting Policies" to the consolidated financial statements under "Revenue Recognition," many of the Company's software arrangements involve "off-the-shelf" software. For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, the Company recognizes revenue over time based on a measurement of progress-to-completion (POC). The Company measures POC primarily using labor hours incurred, believing it best depicts the pattern of transfer of control to the customer, which occurs as the Company incurs costs on its contracts. Estimates of budgeted total hours for these arrangements requires management judgment.

Auditing management's estimates of total budgeted contract hours required additional audit effort due to the existence of management judgment required to make these estimates for arrangements that are completed over an extended period. These estimates require ongoing monitoring by management and may require revision over time.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company's process to review contract progress-to-date and total budgeted hours, inclusive of executed contract amendments and change orders.

To test the appropriateness of management's assessment of contract progress-to-date, our audit procedures included, among others, obtaining an understanding of any increase or decrease to budgeted hours via contract amendments or change orders, observing quarterly POC meetings where the Company discussed contract progress-to-date and evaluated the appropriateness of contract estimated hours to complete, reviewing signed Company attestations as to the contracts' progress toward completion, performing a sensitivity analysis to assess the impact of changes to the budgeted hours on the amount of revenue recognized, and performing an analysis of completed contracts to compare actual hours incurred upon completion to the original budget.

Accounting for the acquisition of MP Holdings Parent, Inc.

Description of the Matter

As described in Note 2 "Acquisitions" to the consolidated financial statements, the Company completed three acquisitions during 2019 for net consideration of $226.5 million. The most significant of these was the acquisition of MP Holdings Parent, Inc. (MicroPact) for net consideration of $202.2 million. The transactions were accounted for as business combinations.

Auditing the Company's accounting for the MicroPact acquisition was more complex due to the significant estimations used by management in determining the fair values of assets acquired and liabilities assumed, in particular the fair values of identified intangible assets of $136.1 million, the most significant of which consisted of customer relationships and developed technology, both of which utilize prospective financial information. The Company valued customer relationships using the multi-period excess earnings model. The significant assumptions used in this model included the attrition rate, weighted average cost of capital and existing customer growth. The Company valued the developed technology using the relief-from-royalty method. The significant assumptions used in this method included the obsolescence rate and weighted average cost of capital. The significant assumptions used in the valuation of the intangible assets are forward-looking and could be affected by future economic and market conditions.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of the Company's controls over its accounting for the MicroPact acquisition. For example, we tested controls over the recognition and measurement of consideration transferred, as well as management's review of the valuation methods and significant underlying assumptions for each identified intangible asset.

To test the estimated fair values of the acquired customer relationships and developed technology, we performed audit procedures that included, among others, evaluating the Company's selection of the valuation methodology, evaluating the significant assumptions used in the Company's valuation calculations and evaluating the completeness and accuracy of the underlying data supporting the significant assumptions. We involved our valuation specialists to assist with our evaluation of the methodology used by the Company and significant assumptions included in the fair value estimates. Additionally, we performed sensitivity analyses and compared significant assumptions to forecasts, the assumptions used to value similar assets in other acquisitions and to historical financial results of both the Company and the acquiree, among other procedures. We also evaluated the Company's acquisition and related purchase accounting disclosures included in Note 2 "Acquisitions".

Ernst & Young LLP

We have served as the Company's auditor since 1966.

Dallas, Texas
February 19, 2020

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Tyler Technologies, Inc.

Opinion on Internal Control over Financial Reporting

We have audited Tyler Technologies, Inc.'s internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Tyler Technologies, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on the COSO criteria.

As indicated in the accompanying Management's Report on Internal Control Over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of MP Holdings Parent, Inc. (MicroPact), which is included in the 2019 consolidated financial statements of the Company and constituted 11.5% of total assets as of December 31, 2019 and 5.8% of total revenue for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of MicroPact.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and our report dated February 19, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Ernst + Young LLP

Dallas, Texas
February 19, 2020

Consolidated Statements of Comprehensive Income

For the years ended December 31,	2019	2018	2017
(In thousands, except per share amounts)			
Revenues:			
Software licenses and royalties	$ 100,205	$ 93,441	$ 86,242
Subscriptions	296,352	220,547	172,176
Software services	213,061	191,269	180,460
Maintenance	430,318	384,521	359,319
Appraisal services	23,479	21,846	25,023
Hardware and other	23,012	23,658	17,679
Total revenues	1,086,427	935,282	840,899
Cost of revenues:			
Software licenses and royalties	3,938	3,802	3,321
Acquired software	30,642	22,972	21,686
Software services, maintenance and subscriptions	502,138	438,923	387,634
Appraisal services	15,337	14,299	16,286
Hardware and other	17,472	15,708	12,595
Total cost of revenues	569,527	495,704	441,522
Gross profit	516,900	439,578	399,377
Selling, general and administrative expenses	257,746	207,605	175,914
Research and development expense	81,342	63,264	47,324
Amortization of customer and trade name intangibles	21,445	16,217	13,381
Operating income	156,367	152,492	162,758
Other income, net	3,471	3,378	698
Income before income taxes	159,838	155,870	163,456
Income tax provision (benefit)	13,311	8,408	(6,115)
Net income	$ 146,527	$ 147,462	$ 169,571
Earnings per common share:			
Basic	$ 3.79	$ 3.84	$ 4.55
Diluted	$ 3.65	$ 3.68	$ 4.32

See accompanying notes.

Consolidated Balance Sheets

December 31,	2019	2018
(In thousands, except par value and share amounts)		
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 232,682	$ 134,279
Accounts receivable (less allowance for losses and sales adjustments of $5,738 in 2019 and $4,647 in 2018)	374,089	298,912
Short-term investments	39,399	44,306
Prepaid expenses	24,717	33,258
Income tax receivable	6,482	4,697
Other current assets	2,328	3,406
Total current assets	679,697	518,858
Accounts receivable, long-term	22,432	16,020
Operating lease right-of-use assets	18,992	—
Property and equipment, net	171,861	155,177
Other assets:		
Goodwill	840,117	753,718
Other intangibles, net	378,914	276,852
Non-current investments and other assets	79,601	70,338
	$ 2,191,614	$ 1,790,963
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 14,977	$ 6,910
Accrued liabilities	75,234	66,480
Operating lease liabilities	6,387	—
Deferred revenue	412,495	350,512
Total current liabilities	509,093	423,902
Revolving line of credit	—	—
Deferred revenue, long-term	199	424
Deferred income taxes	48,442	41,791
Operating lease liabilities, long-term	16,822	—
Commitments and contingencies		
Shareholders'equity:		
Preferred stock, $10.00 par value; 1,000,000 shares authorized, none issued	—	—
Common stock, $0.01 par value; 100,000,000 shares authorized; 48,147,969 shares issued in 2019 and 2018	481	481
Additional paid-in capital	739,478	731,435
Accumulated other comprehensive loss, net of tax	(46)	(46)
Retained earnings	917,336	771,925
Treasury stock, at cost; 8,839,352 and 9,872,505 shares in 2019 and 2018, respectively	(40,191)	(178,949)
Total shareholders' equity	1,617,058	1,324,846
	$ 2,191,614	$ 1,790,963

See accompanying notes.

Consolidated Statements of Cash Flows

For the years ended December 31,	2019	2018	2017
(In thousands)			
Cash flows from operating activities:			
Net income	$ 146,527	$ 147,462	$ 169,571
Adjustments to reconcile net income to cash provided by operations:			
Depreciation and amortization	76,672	61,759	53,395
Share-based compensation expense	59,967	52,740	37,348
Provision for losses and sales adjustments - accounts receivable	1,636	(569)	2,031
Operating lease right-of-use assets - non cash	5,397	—	—
Deferred income tax benefit	(6,088)	(5,069)	(33,664)
Changes in operating assets and liabilities, exclusive of effects of acquired companies:			
Accounts receivable	(65,738)	(50,916)	(33,091)
Income tax receivable	(1,925)	6,642	(8,444)
Prepaid expenses and other current assets	(8,976)	(588)	(6,958)
Accounts payable	7,403	(2,416)	878
Operating lease liabilities	(6,113)	—	—
Accrued liabilities	1,516	(2,445)	6,050
Deferred revenue	44,442	43,603	8,639
Net cash provided by operating activities	254,720	250,203	195,755
Cash flows from investing activities:			
Additions to property and equipment	(37,236)	(27,424)	(43,057)
Purchase of marketable security investments	(54,742)	(115,625)	(59,779)
Proceeds from marketable security investments	70,796	81,205	28,786
Capitalized software development costs	(4,804)	—	—
Cost of acquisitions, net of cash acquired	(218,734)	(178,093)	(11,344)
(Increase) decrease in other	(295)	1,682	(1)
Net cash used by investing activities	(245,015)	(238,255)	(85,395)
Cash flows from financing activities:			
Decrease in net borrowings on revolving line of credit	—	—	(10,000)
Purchase of treasury shares	(17,786)	(146,553)	(7,474)
Proceeds from exercise of stock options	96,908	74,907	49,845
Contributions from employee stock purchase plan	9,576	8,051	7,044
Net cash provided (used) by financing activities	88,698	(63,595)	39,415
Net increase (decrease) in cash and cash equivalents	98,403	(51,647)	149,775
Cash and cash equivalents at beginning of period	134,279	185,926	36,151
Cash and cash equivalents at end of period	$ 232,682	$ 134,279	$ 185,926

See accompanying notes.

Consolidated Statements of Shareholders' Equity

For the years ended December 31, 2019, 2018 and 2017

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Treasury stock		Total Shareholders' Equity
	Shares	Amount				Shares	Amount	
(In thousands)								
Balance at December 31, 2016	48,148	$ 481	$ 556,663	$ (46)	$ 454,892	(11,382)	$ (77,449)	$ 934,541
Net income	—	—	—	—	$ 169,571	—	—	$ 169,571
Issuance of shares pursuant to stock compensation plan	—	—	28,174	—	—	1,113	21,671	49,845
Stock compensation	—	—	37,348	—	—	—	—	37,348
Issuance of shares pursuant to employee stock purchase plan	—	—	4,682	—	—	51	2,362	7,044
Treasury stock purchases	—	—	—	—	—	(44)	(6,613)	(6,613)
Balance at December 31, 2017	48,148	481	626,867	(46)	624,463	(10,262)	(60,029)	1,191,736
Net income	—	—	—	—	147,462	—	—	147,462
Issuance of shares pursuant to stock compensation plan	—	—	44,458	—	—	1,126	30,449	74,907
Stock compensation	—	—	52,740	—	—	—	—	52,740
Issuance of shares pursuant to employee stock purchase plan	—	—	7,370	—	—	45	681	8,051
Treasury stock purchases	—	—	—	—	—	(781)	(150,050)	(150,050)
Balance at December 31, 2018	48,148	481	731,435	(46)	771,925	(9,872)	(178,949)	1,324,846
Net income	—	—	—	—	146,527	—	—	146,527
Retained earnings adjustment-adoption of Topic 842 Leases, net of taxes	—	—	—	—	(1,116)	—	—	(1,116)
Exercise of stock options and vesting of restricted stock units	—	—	(52,833)	—	—	1,075	149,741	96,908
Employee taxes paid for withheld shares for taxes upon equity award	—	—	—	—	—	(23)	(5,361)	(5,361)
Stock compensation	—	—	59,967	—	—	—	—	59,967
Issuance of shares pursuant to employee stock purchase plan	—	—	909	—	—	53	8,667	9,576
Treasury stock purchases	—	—	—	—	—	(72)	(14,289)	(14,289)
Balance at December 31, 2019	48,148	$ 481	$ 739,478	$ (46)	$ 917,336	(8,839)	$ (40,191)	$1,617,058

See accompanying notes.

(Tables in thousands, except per share data)

(1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

DESCRIPTION OF BUSINESS

We provide integrated software systems and related services for the public sector, with a focus on local governments. We develop and market a broad line of software solutions and services to address the information technology ("IT") needs primarily of cities, counties, schools and other local government entities. In addition, we provide professional IT services, including software and hardware installation, data conversion, training, and for certain customers, product modifications, along with continuing maintenance and support for customers using our systems. We also provide subscription-based services such as software as a service ("SaaS") arrangements, which primarily utilize the Tyler private cloud, and electronic document filing solutions ("e-filing"). In addition, we provide property appraisal outsourcing services for taxing jurisdictions.

PRINCIPLES OF CONSOLIDATION

The consolidated financial statements include our parent company and sixteen subsidiaries, which are wholly-owned. All significant intercompany balances and transactions have been eliminated in consolidation. Comprehensive income is defined as the change in equity of a business enterprise during a period from transactions, and other events and circumstances from non-owner sources and includes all components of net income (loss) and other comprehensive income (loss). We had no items of other comprehensive income (loss) during the years ended December 31, 2019, 2018 and 2017.

CASH AND CASH EQUIVALENTS

Cash in excess of that necessary for operating requirements is invested in short-term, highly liquid, income-producing investments. Investments with original maturities of three months or less are classified as cash and cash equivalents, which primarily consist of cash on deposit with several banks and money market funds. Cash and cash equivalents are stated at cost, which approximates market value.

REVENUE RECOGNITION

Nature of Products and Services

We earn revenue from software licenses, royalties, subscription-based services, software services, post-contract customer support ("PCS" or "maintenance"), hardware, and appraisal services. Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, we satisfy a performance obligation

Most of our software arrangements with customers contain multiple performance obligations that range from software licenses, installation, training, and consulting to software modification and customization to meet specific customer needs (services), hosting, and PCS. For these contracts, we account for individual performance obligations separately when they are distinct. We evaluate whether separate performance obligations can be distinct or should be accounted for as one performance obligation. Arrangements that include software services, such as training or installation, are evaluated to determine whether those services are highly interdependent or interrelated to the product's functionality. The transaction price is allocated to the distinct performance obligations on a relative standalone selling price ("SSP") basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. Revenue is recognized net of allowances for sales adjustments and any taxes collected from customers, which are subsequently remitted to governmental authorities.

Software Arrangements:

Software Licenses and Royalties

Many of our software arrangements involve "off-the-shelf" software. We recognize the revenue allocable to "off-the-shelf" software licenses and specified upgrades at a point in time when control of the software license transfers to the customer, unless the software is not considered distinct. We consider off-the-shelf software to be distinct when it can be added to an arrangement with minor changes in the underlying code, it can be used by the customer for the customer's purpose upon installation, and remaining services such as training are not considered highly interdependent or interrelated to the product's functionality.

For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, we recognize revenue over time by measuring progress-to-completion. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often implemented over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent.

Software license fees are billed in accordance with the contract terms. Typically, a majority of the fee is due when access to the software license is made available to the customer and the remainder of the fee due over a passage of time stipulated by the contract. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

We recognize royalty revenue when the sale occurs under the terms of our third-party royalty arrangements. Currently, our third-party royalties are recognized on an estimated basis and are trued up when we receive notice of amounts we are entitled to receive. We typically receive notice of royalty revenues we are entitled to and billed on a quarterly basis in the quarter immediately following the royalty reporting period.

Software Services

As noted above, some of our software arrangements include services considered highly interdependent or highly interrelated or require significant customization to meet the customer's desired functionality. For these software arrangements, both the software licenses and related software services revenue are not distinct and are recognized over time using the progress-to-completion method. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. Contract fees are typically billed on a milestone basis as defined within contract terms. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met. When software services are distinct, the fee allocable to the service element is recognized over the time we perform the services and is billed on a time and material basis.

Post-Contract Customer Support

Our customers generally enter into PCS agreements when they purchase our software licenses. PCS includes telephone support, bug fixes, and rights to upgrades on a when-and-if available basis. PCS is considered distinct when purchased with our software licenses. Our PCS agreements are typically renewable annually. PCS is recognized over time on a straight-line basis over the period the PCS is provided. All significant costs and expenses associated with PCS are expensed as incurred.

Computer Hardware Equipment

Revenue allocable to computer hardware equipment is recognized at a point in time when control of the equipment is transferred to the customer.

Subscription-Based Services:

Subscription-based services consist primarily of revenues derived from SaaS arrangements, typically utilizing the Tyler private cloud, and electronic filing transactions. Revenue from subscription-based services is generally recognized over time on a ratable basis over the contract term, beginning on the date that our service is made available to the customer. Our subscription contracts are generally three to five years or longer in length, billed annually in advance, and non-cancelable.

For SaaS arrangements, we evaluate whether the customer has the contractual right to take possession of our software at any time during the hosting period without significant penalty and whether the customer can feasibly maintain the software on the customer's hardware or enter into another arrangement with a third-party to host the software. We allocate contract value to each performance obligation of the arrangement that qualifies for treatment as a distinct element based on estimated SSP. We recognize SaaS arrangements services ratably over the term of the arrangement, which range from one to ten years, but are typically for a period of three to five years. For software services associated with certain SaaS arrangements, we have concluded that the services are not distinct, and we recognize the revenue ratably over the remaining contractual period once we have provided the customer access to the software. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

Electronic filing transaction fees primarily pertain to documents filed with the courts by attorneys and other third-parties via our e-filing services and retrieval of filed documents via our access services. For each document filed with a court, the filer generally pays a transaction fee and a court filing fee to us and we remit a portion of the transaction fee and the filing fee to the court. We record as revenue the transaction fee, while the portion of the transaction fee remitted to the courts is recorded as cost of revenues as we are acting as a principal in the arrangement. Court filing fees collected on behalf of the courts and remitted to the courts are recorded on a net basis and thus do not affect the statement of comprehensive income.

Other transaction-based fees primary relate to online payment services, which are offered with the assistance of third-party vendors. In general, when we are the principal in a transaction based on the factors identified in ASC 606-10-55-36 through 55-40, we record the revenue and related costs on a gross basis. Otherwise, we net the cost of revenue associated with the service against the gross revenue (amount billed to the customer) and record the net amount as revenue.

For e-filing transaction fees and other transaction-based revenues, we have the right to charge the customer an amount that directly corresponds with the value to the customer of our performance to date. Therefore, we recognize revenue for these services over time based on the amount billable to the customer in accordance with the 'as invoiced' practical expedient in ASC 606-10-55-18. In some cases, we are paid on a fixed fee basis and recognize the revenue ratably over the contractual period.

Costs of performing services under subscription-based arrangements are expensed as incurred, except for certain direct and incremental contract origination and set-up costs associated with SaaS arrangements. Such direct and incremental costs are capitalized and amortized ratably over the useful life.

Appraisal Services:

For our property appraisal projects, we recognize revenue using the progress-to-completion method since many of these projects are executed over one to three-year periods and consist of various unique activities. Appraisal services require a significant level of integration and interdependency with various individual service components; therefore, the service components are not considered distinct. Appraisal services are recognized over time by measuring progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often executed over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent. Contract fees are typically billed on a milestone basis as defined within contract terms. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

Significant Judgments:

Our contracts with customers often include multiple performance obligations to a customer. When a software arrangement (license or subscription) includes both software licenses and software services, judgment is required to determine whether the software license is considered distinct and accounted for separately, or not distinct and accounted for together with the software services and recognized over time.

The transaction price is allocated to the separate performance obligations on a relative SSP basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we determine SSP using the expected cost-plus margin approach.

For arrangements that involve significant production, modification or customization of the software, or where software services otherwise cannot be considered distinct, we recognize revenue as control is transferred to the customer over time using progress-to-completion methods. Depending on the contract, we measure progress-to-completion primarily using labor hours incurred, or value added. The progress-to-completion method generally results in the recognition of reasonably consistent profit margins over the life of a contract because we can provide reasonably dependable estimates of contract billings and contract costs. We use the level of profit margin that is most likely to occur on a contract. If the most likely profit margin cannot be precisely determined, the lowest probable level of profit margin in the range of estimates is used until the results can be estimated more precisely. These arrangements are often implemented over an extended time period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent.

Typically, the structure of our arrangements does not give rise to variable consideration. However, in those instances whereby variable consideration exists, we include in our estimates additional revenue for variable consideration when we believe we have an enforceable right, the amount can be estimated reliably and its realization is probable.

Refer to Note 15 – "Disaggregation of Revenue" for further information, including the economic factors that affect the nature, amount, timing, and uncertainty of revenue and cash flows of our various revenue categories.

Contract Balances:

Accounts receivable and allowance for doubtful accounts and sales adjustments

Timing of revenue recognition may differ from the timing of invoicing to customers. We record an unbilled receivable when revenue is recognized prior to invoicing, or deferred revenue when revenue is recognized subsequent to invoicing. For multi-year agreements, we generally invoice customers annually at the beginning of each annual coverage period. We record an unbilled receivable related to revenue recognized for on-premises licenses as we have an unconditional right to invoice and receive payment in the future related to those licenses.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from credit risk associated with the inability of a customer to make required payments. Events or changes in circumstances that indicate the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products.

The following table summarizes the changes in the allowances for doubtful accounts and sales adjustments (in thousands):

Years Ended December 31,	2019	2018	2017
Balance at beginning of year	$ 4,647	$ 5,427	$ 3,396
Provisions for losses and sales adjustments - accounts receivable	1,636	(569)	2,031
Collection of accounts previously written off	(545)	(211)	—
Balance at end of year	$ 5,738	$ 4,647	$ 5,427

The allowance for doubtful accounts and sales adjustments reflects our best estimate of probable losses inherent in the accounts receivable balance. We determine the allowance based on known troubled accounts, historical experience, and other currently available evidence.

In connection with our appraisal services contracts and certain software services contracts, we may perform work prior to when the software and services are billable and/or payable pursuant to the contract. Unbilled revenue is not billable at the balance sheet date but is recoverable over the remaining life of the contract through billings made in accordance with contractual agreements. The termination clauses in most of our contracts provide for the payment for the value of products delivered or services performed in the event of early termination. We have historically recorded such unbilled receivables (costs and estimated profit in excess of billings) in connection with (1) property appraisal services contracts accounted for using progress-to-completion method of revenue recognition using labor hours as a measure of progress towards completion in which the services are performed in one accounting period but the billing normally occurs subsequently and may span another accounting period; (2) software services contracts accounted for using progress-to-completion method of revenue recognition using labor hours as a measure of progress towards completion in which the services are performed in one accounting period but the billing for the software element of the arrangement may be based upon the specific phase of the implementation; (3) software revenue for which we have recognized revenue at the point in time when the software is made available to the customer but the billing has not yet been submitted to the customer; (4) some of our contracts which provide for an amount to be withheld from a progress billing (generally between 5% and 20% retention) until final and satisfactory project completion is achieved; and (5) in a limited number of cases, extended payment terms, which may be granted to customers with whom we generally have a long-term relationship and favorable collection history.

As of December 31, 2019, and December 31, 2018, total current and long-term accounts receivable, net of allowance for doubtful accounts, was $396.5 million and $314.9 million, respectively. We have recorded unbilled receivables of $134.0 million and $104.2 million at December 31, 2019, and December 31, 2018, respectively. Included in unbilled receivables are retention receivables of $13.1 million and $12.2 million at December 31, 2019, and December 31, 2018, respectively, which become payable upon the completion of the contract or completion of our fieldwork and formal hearings. Unbilled receivables expected to be collected within one year have been included with accounts receivable, current portion in the accompanying consolidated balance sheets. Unbilled receivables and retention receivables expected to be collected past one year have been included with accounts receivable, long-term portion in the accompanying consolidated balance sheets.

Payment terms and conditions vary by contract type, although terms generally include a requirement of payment within 30 to 90 days. In instances where the timing of revenue recognition differs from the timing of invoicing, we have determined our contracts generally do not include a significant financing component. The primary purpose of our invoicing terms is to provide customers with simplified and predictable ways of purchasing our products and services, not to receive financing from our customers or to provide customers with financing. Examples include invoicing at the beginning of a subscription term with revenue recognized ratably over the contract period, and multi-year on-premises term licenses that are invoiced annually with revenue recognized upfront.

Deferred Revenue

The majority of deferred revenue consists of deferred maintenance revenue that has been billed based on contractual terms in the underlying arrangement, with the remaining balance consisting of payments received in advance of revenue being earned under software licensing, subscription-based services, software and appraisal services and hardware installation. Refer to Note 16 – "Deferred Revenue and Performance Obligations" for further information, including deferred revenue by segment and changes in deferred revenue during the period.

Deferred Commissions

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. Sales commissions for initial contracts are deferred and then amortized on a straight-line basis over a period of benefit that we have determined to be three to seven years. We utilized the "portfolio approach" practical expedient in ASC 606-10-10-4, which allows entities to apply the guidance to a portfolio of contracts with similar characteristics because the effects on the financial statements of this approach would not differ materially from applying the guidance to individual contracts. Using the 'portfolio approach', we determined the period of benefit by taking into consideration our customer contracts, our technology life-cycle and other factors. Sales commissions for renewal contracts are generally not paid in connection with the renewal of a contract. In the small number of instances where a commission is paid on a renewal, it is not commensurate with the commission paid on the initial sale and is recognized over the term of renewal, which is generally one year. Amortization expense related to deferred commissions is included in selling, general and administrative expenses in the accompanying consolidated statements of income. Refer to Note 17 – "Deferred Commissions" for further information.

Prepaid expenses and other current assets include direct and incremental costs such as commissions associated with arrangements for which revenue recognition has been deferred. Such costs are expensed at the time the related revenue is recognized.

USE OF ESTIMATES

The preparation of our financial statements in conformity with accounting principles generally accepted in the United States ("GAAP") requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to such estimates and assumptions include revenue recognition, determining the nature and timing of satisfaction of performance obligations, determining the SSP of performance obligations, variable consideration, and other obligations such as returns and refunds; loss contingencies; the estimated useful life of deferred commissions; the carrying amount and estimated useful lives of intangible assets; the carrying amount of operating lease right-of-use assets and operating lease liabilities; determining share-based compensation expense; the valuation allowance for receivables; and determining the potential outcome of future tax consequences of events that have been recognized on our consolidated financial statements or tax returns. Actual results could differ from estimates.

PROPERTY AND EQUIPMENT, NET

Property, equipment and purchased software are recorded at original cost and increased by the cost of any significant improvements after purchase. We expense maintenance and repairs when incurred. Depreciation and amortization is calculated using the straight-line method over the shorter of the asset's estimated useful life or the term of the lease in the case of leasehold improvements. For income tax purposes, we use accelerated depreciation methods as allowed by tax laws.

RESEARCH AND DEVELOPMENT COSTS

We expensed research and development expense of $81.3 million in 2019, $63.3 million in 2018, and $47.3 million in 2017.

INCOME TAXES

Income taxes are accounted for under the asset and liability method. Deferred taxes arise because of different treatment between financial statement accounting and tax accounting, known as "temporary differences". We record the tax effect of these temporary differences as "deferred tax assets" (generally items that can be used as a tax deduction or credit in the future periods) and "deferred tax liabilities" (generally items that we received a tax deduction for, which have not yet been recorded in the income statement). The deferred tax assets and liabilities are measured using enacted tax rules and laws that are expected to be in effect when the temporary differences are expected to be recovered or settled. A valuation allowance would be established to reduce deferred tax assets if it is more likely than not that a deferred tax asset will not be "realized." On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted into law. The Tax Act amends the Internal Revenue Code to reduce tax rates and modify policies, credits and deductions for individuals and businesses. For businesses, the Tax Act reduces the corporate U.S. federal tax rate from a maximum of 35% to a flat 21% rate and transitions from a worldwide tax system to a territorial tax system. Under ASC 740 Income Taxes, the effects of changes in tax rates and laws are recognized in the period in which the new legislation is enacted.

SHARE-BASED COMPENSATION

We have a share-based award plan that provides for the grant of stock options, restricted stock units, and performance share units to key employees, directors and non-employee consultants. Stock options generally vest after three to six years of continuous service from the date of grant and have a contractual term of 10 years. Restricted stock unit grants generally vest ratably over three to five years of continuous service from the date of grant. Each performance share unit represents the right to receive one share of our common stock based on our achievement of certain financial performance targets during applicable performance periods. We account for share-based compensation utilizing the fair value recognition pursuant to ASC 718, Stock Compensation. See Note 9 – "Share-Based Compensation" for further information.

GOODWILL AND OTHER INTANGIBLE ASSETS

Goodwill

Goodwill represents the excess of the purchase price over the fair value of net assets acquired, including identifiable intangible assets, in connection with our business combinations. Upon acquisition, goodwill is assigned to the reporting unit that is expected to benefit from the synergies of the business combination, which is the reporting unit to which the related acquired technology is assigned. A reporting unit is the operating segment, or a business unit one level below that operating segment, for which discrete financial information is prepared and regularly reviewed by executive management.

We assess goodwill for impairment annually as of April 1st, or more frequently whenever events or changes in circumstances indicate its carrying value may not be recoverable. We begin with the qualitative assessment of whether it is more likely than not that a reporting unit's fair value is less than its carrying value before applying the quantitative assessment described below. If it is determined through the evaluation of events or circumstances that the carrying value may not be recoverable, we perform a comparison of the estimated fair value of the reporting unit to which the goodwill has been assigned to the sum of the carrying value of the assets and liabilities of that unit. If the sum of the carrying value of the assets and liabilities of a reporting unit exceeds the estimated fair value of that reporting unit, the carrying value of the reporting unit's goodwill is reduced to its fair value through an adjustment to the goodwill balance, resulting in an impairment charge. The fair values calculated in our impairment tests are determined using discounted cash flow models involving several assumptions. The assumptions that are used are based upon what we believe a hypothetical marketplace participant would use in estimating fair value. We evaluate the reasonableness of the fair value calculations of our reporting units by comparing the total of the fair value of all of our reporting units to our total market capitalization. Our annual goodwill impairment analysis, which we performed qualitatively during the second quarter of 2019, did not result in an impairment charge.

There have been no impairments of intangible assets in any of the periods presented. See Note 4 – "Goodwill and Other Intangible Assets" for additional information.

Other Intangible Assets

We make judgments about the recoverability of purchased intangible assets other than goodwill whenever events or changes in circumstances indicate that an impairment may exist. Customer base and acquired software each comprise approximately half of our purchased intangible assets other than goodwill. We review our customer turnover each year for indications of impairment. Our customer turnover has historically been very low. If indications of impairment are determined to exist, we measure the recoverability of assets by a comparison of the carrying amount of the asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of the assets exceeds their estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the assets exceeds the fair value of the assets. There have been no impairments of intangible assets in any of the periods presented.

IMPAIRMENT OF LONG-LIVED ASSETS

We periodically evaluate whether current facts or circumstances indicate that the carrying value of our property and equipment or other long-lived assets to be held and used may not be recoverable. If such circumstances are determined to exist, we measure the recoverability of assets to be held and used by a comparison of the carrying amount of the asset or appropriate grouping of assets and the estimated undiscounted future cash flows expected to be generated by the assets. If the carrying amount of the assets exceeds their estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of would be separately presented in the balance sheet and reported at the lower of the carrying amount or fair value less costs to sell and would no longer be depreciated. The assets and liabilities of a disposed group or classified as held for sale would be presented separately in the appropriate asset and liability sections of the balance sheet. There have been no significant impairments of long-lived assets in any of the periods presented.

COSTS OF COMPUTER SOFTWARE

We capitalize software development costs upon the establishment of technological feasibility and prior to the availability of the product for general release to customers. Software development costs primarily consist of personnel costs and rent for related office space. We capitalized approximately $4.8 million of software development costs in 2019. We begin to amortize capitalized costs when a product is available for general release to customers. Amortization expense is determined on a product-by-product basis at a rate not less than straight-line basis over the product's remaining estimated economic life of, generally, five years. Amortization of software development costs was approximately $296,000 in 2019, and is included in cost of software license revenue in the accompanying consolidated statements of comprehensive income. We have not capitalized any internal use software development costs in any of the periods presented.

CONTINGENT PURCHASE CONSIDERATION

Contingent future cash payments related to acquisitions are recognized at fair value as of the acquisition date and included in the determination of the acquisition date purchase price. Subsequent changes in the fair value of the contingent future cash payments are recognized in earnings in the period that the change occurs.

FAIR VALUE OF FINANCIAL INSTRUMENTS

Cash and cash equivalents, accounts receivables, accounts payables, short-term obligations and certain other assets at cost approximate fair value because of the short maturity of these instruments. The fair value of our revolving line of credit would approximate book value as of December 31, 2019, because our interest rates reset approximately every 30 days or less. See Note 6 – "Revolving Line of Credit" for further discussion.

As of December 31, 2019, we have $81.6 million in investment grade corporate bonds, municipal bonds and asset-backed securities with maturity dates ranging from 2020 through 2023. We intend to hold these bonds to maturity and have classified them as such. We believe cost approximates fair value. The fair values of these securities are considered Level II as they are based on inputs from quoted prices in markets that are not active or from other observable market data. These investments are included in short-term investments and non-current investments and other assets.

As of December 31, 2019, we have $15.0 million invested in convertible preferred stock representing a 20% interest in Record Holdings Pty Limited, a privately held Australian company specializing in digitizing the spoken word in court and legal proceedings. The investment in convertible preferred stock is accounted under the cost method because we do not have the ability to exercise significant influence over the investee and the securities do not have readily determinable fair values. Our investment is carried at cost less any impairment write-downs. Our cost method investments are assessed annually for impairment. We do not reassess the fair value of cost method investments if there are no identified events or changes in circumstances that may have a significant adverse effect on the fair value of the investments. There has been no impairment of our cost method investment for the periods presented. This investment is included in non-current investments and other assets in the accompanying consolidated balance sheets.

CONCENTRATIONS OF CREDIT RISK

Financial instruments that potentially subject us to significant concentrations of credit risk consist principally of cash and cash equivalents, accounts receivable from trade customers, and investments in marketable securities. Our cash and cash equivalents primarily consist of operating account balances and money market funds, which are maintained at several major domestic financial institutions and the balances often exceed insured amounts. As of December 31, 2019, we had cash and cash equivalents of $232.7 million. We perform periodic evaluations of the credit standing of these financial institutions.

Concentrations of credit risk with respect to receivables are limited due to the size and geographical diversity of our customer base. Historically, our credit losses have not been significant. As a result, we do not believe we have any significant concentrations of credit risk as of December 31, 2019.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from the inability of a customer to make required payments. Events or changes in circumstances that indicate the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products.

LEASES

We determine if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, and operating lease liabilities, current and long-term, on our consolidated balance sheets. We currently do not have any finance lease arrangements.

Operating lease ROU assets and operating lease liabilities are recognized based on the present value of the future minimum lease payments over the lease term at commencement date. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at commencement date of the lease in determining the present value of future payments. The operating lease ROU asset also includes any lease payments made and excludes lease incentives and initial direct costs incurred. Our lease terms may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term. Leases with an initial term of 12 months or less are not recorded on the balance sheet; we recognize lease expense for these leases on a straight-line basis over the lease term. We have lease agreements with lease and non-lease components, which are generally accounted for as a single lease component.

INDEMNIFICATION

Most of our software license agreements indemnify our customers in the event that the software sold infringes upon the intellectual property rights of a third-party. These agreements typically provide that in such event we will either modify or replace the software so that it becomes non-infringing or procure for the customer the right to use the software. We have recorded no liability associated with these indemnifications, as we are not aware of any pending or threatened infringement actions that are possible losses. We believe the estimated fair value of these intellectual property indemnification clauses is minimal.

We have also agreed to indemnify our officers and board members if they are named or threatened to be named as a party to any proceeding by reason of the fact that they acted in such capacity. We maintain directors' and officers' liability insurance coverage to protect against any such losses. We have recorded no liability associated with these indemnifications. Because of our insurance coverage, we believe the estimated fair value of these indemnification agreements is minimal.

RECLASSIFICATIONS

Certain amounts for previous years have been reclassified to conform to the current year presentation.

RECENTLY ADOPTED ACCOUNTING PRONOUNCEMENTS

Leases. We adopted ASU No. 2016-02, *Leases* ("Topic 842") using the transition method that allows us to initially apply the guidance at the adoption date of January 1, 2019, and recognized a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We used the package of practical expedients that allows us to not reassess: (1) lease classification for any expired or existing leases and (2) initial direct costs for any expired or existing leases. We did not elect to use the hindsight application for evaluating the life of the lease arrangement. The impact of adoption is reflected in the financial information herein. For additional details, see Note 11 to our consolidated financial statements.

The impact of Topic 842 on our consolidated balance sheet beginning January 1, 2019, included the recognition of ROU assets and operating lease liabilities, while our accounting for finance leases remained substantially unchanged. We had no finance leases prior to the adoption of Topic 842 and continue to have none as of December 31, 2019.

Amounts recognized at January 1, 2019, for operating leases were as follows:

In thousands	
Operating lease right-of-use assets	$ 15,633
Operating lease liabilities	(4,344)
Operating lease liabilities, long-term	(12,405)
Retained earnings	$ (1,116)

NEW ACCOUNTING PRONOUNCEMENTS

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses*, ("ASU 2016-13"). ASU 2016-13 changes the impairment model for most financial assets and certain other instruments, including trade and other receivables, held-to-maturity debt securities and loans, and requires entities to use a new forward-looking expected loss model that will result in the earlier recognition of allowance for losses. This update is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted for a fiscal year beginning after December 15, 2018, including interim periods within that fiscal year. Entities will apply the standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is adopted. We will adopt the new standard in the first quarter of 2020. We have evaluated the impact of this standard on our consolidated financial statements, including accounting policies, processes and systems. Based on the nature of the Company's customer base and historical nature of losses, we do not expect the impact to be material upon adoption.

(2) ACQUISITIONS

2019

On October 30, 2019, we acquired certain assets of Courthouse Technologies, Ltd ("CHT"), an industry-leading provider of jury management systems that offers a fully integrated, end-to-end SaaS solution to manage all facets of juror management, from source list generation to juror processing and payment. The total purchase price was approximately $20.5 million of which $19.1 million was paid in cash and approximately $1.4 million was accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments.

On February 28, 2019, we acquired all of the capital stock of MP Holdings Parent, Inc. dba MicroPact ("MicroPact"), a leading provider of commercial off-the-shelf ("COTS") solutions, including Entellitrak, a low-code application development platform for case management and business process management used extensively in the public sector. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million consisting of $198.2 million paid in cash and accrued consideration of $6.0 million contingent upon the achievement of certain financial performance objectives.

We have performed a valuation analysis of the fair market value of MicroPact's assets and liabilities. The following table summarizes the final allocation of the purchase price as of the acquisition date:

In thousands	
Cash	$ 1,983
Accounts receivable	10,535
Other current assets	8,979
Other noncurrent assets	10,417
Identifiable intangible assets	136,143
Goodwill	76,319
Accounts payable	(602)
Accrued expenses	(4,092)
Other noncurrent liabilities	(8,879)
Deferred revenue	(13,510)
Deferred tax liabilities, net	(13,125)
Total consideration	$ 204,168

In connection with this transaction, we acquired total tangible assets of $31.9 million and assumed liabilities of approximately $27.1 million. We recorded goodwill of $76.3 million, none of which is expected to be deductible for tax purposes, and other identifiable intangible assets of approximately $136.1 million. The $136.1 million of intangible assets are attributable to customer relationships, acquired software, trade name and favorable fair value of an operating lease and will be amortized over a weighted average period of approximately 11 years. We recorded deferred tax liabilities of $13.1 million related to estimated fair value allocations.

The acquisition of MicroPact augments our product solutions, positions us in new practice areas such as health and human services, and presents opportunities to expand our business across new and complementary markets. We intend to expand our total addressable market through MicroPact's strong presence in the federal market. Therefore, the goodwill of $76.3 million arising from this acquisition is primarily attributed to our ability to generate increased revenues, earnings and cash flow by expanding our addressable market and client base. In 2019, we recorded adjustments to the preliminary opening balance sheet attributed to changes in accounts receivable, deferred revenue, customer relationships, accrued expenses, working capital holdback and related deferred taxes resulting in a net decrease to goodwill of approximately $5.7 million.

The following unaudited pro forma consolidated operating results information has been prepared as if the MicroPact acquisition had occurred at January 1, 2018, after giving effect to certain adjustments, including amortization of intangibles, interest, transaction costs and tax effects.

Twelve Months Ended December 31, unaudited	2019	2018
Revenues	$1,098,226	$1,009,427
Net income	146,200	146,998
Basic earnings per share	$ 3.78	$ 3.82
Dilutes earnings per share	$ 3.65	$ 3.66

The pro forma information above does not include acquisitions that are not considered material to our results of operations. The pro forma information does not purport to represent what our results of operations actually would have been had such transaction occurred on the date specified or to project our results of operations for any future period.

On February 1, 2019, we acquired all the assets of Civic, LLC ("MyCivic"), a company that provides software solutions to connect communities. The total purchase price was $3.7 million in cash.

As of December 31, 2019, the purchase price allocations for MicroPact and MyCivic are complete. As of December 31, 2019, the purchase price allocation for CHT is not yet complete; therefore, the preliminary valuation estimates of fair value assumed at the acquisition date for intangible assets, receivables and deferred revenue and related deferred taxes are subject to change as valuations are finalized.

The operating results of all 2019 acquisitions are included with the operating results of the Enterprise Software segment since their date of acquisition. Revenues from MicroPact included in Tyler's results of operations totaled approximately $63.0 million and the net loss was approximately $98,000 from the date of acquisition through December 31, 2019. The impact of the MyCivic and CHT acquisitions, individually and in the aggregate, on our operating results, assets and liabilities is not material. In 2019, we incurred fees of approximately $1.1 million for financial advisory, legal, accounting, due diligence, valuation and other various services necessary to complete these acquisitions. These fees were expensed in 2019 and are included in selling, general and administrative expenses on the consolidated statement of comprehensive income.

Our balance sheet as of December 31, 2019, reflects the allocation of the purchase price to the assets acquired based on their fair value at the date of each acquisition. The fair value of the assets and liabilities acquired are based on valuations using Level III, unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

At December 31, 2019, the maximum aggregate amount of remaining contingent cash payments associated with our acquisitions is $6.0 million and are payable in fiscal year 2020.

2018

On December 7, 2018, we acquired certain assets and intellectual property of SceneDoc, Inc., a company that provides mobile-first, SaaS field reporting for law enforcement agencies. The total purchase price was approximately $6.2 million in cash.

On October 1, 2018, we acquired all of the equity interests of TradeMaster, Inc. dba MobileEyes, a company that develops SaaS software to improve public safety by supporting fire prevention and suppression, emergency response, and structural safety. The total purchase price was approximately $5.3 million in cash.

On August 31, 2018, we acquired all of the assets of CaseloadPRO, L. P., a company that provides a fully featured SaaS probation case management system. The purchase price of $9.3 million was paid in cash.

On April 30, 2018, we acquired all of the capital stock of Socrata, Inc.("Socrata"), a company that provides open data and data-as-a-service solutions including cloud-based data integration, visualization, analysis, and reporting solutions for state and local government agencies. The purchase price, net of cash acquired of $1.7 million, was $147.6 million paid in cash.

On April 30, 2018, we acquired all of the equity interests of Sage Data Security, LLC, a cybersecurity company offering a suite of services that supports an entire cybersecurity lifecycle, including program development, education and training, technical testing, advisory services, and digital forensics. The total purchase price was $11.6 million paid in cash.

The operating results of these acquisition are included in our results of operations of the Enterprise Software segment from their respective dates of acquisition.

2017

On November 29, 2017, we acquired audio and digital two-way radio communications technology and related assets from Radio 10-33, LLC. The total purchase price was $1.4 million, all of which was paid in cash.

On August 2, 2017, we acquired substantially all of the assets and assumed certain liabilities of Digital Health Department, Inc., a company that provides environmental health software, offering a SaaS solution for public health compliance and inspections processes. The total purchase price, net of debt assumed, was $3.9 million, all of which was paid in cash.

On May 30, 2017, we acquired all of the capital stock of Modria.com, Inc., a company that specializes in online dispute resolution for government and commercial entities. The total purchase price, net of debt assumed, was $6.1 million, all of which was paid in cash.

The operating results of these acquisition are included in our results of operations of the Enterprise Software segment from their respective dates of acquisition.

(3) PROPERTY AND EQUIPMENT, NET

Property and equipment, net consists of the following at December 31:

	Useful lives (years)	2019	2018
Land	—	$ 18,653	$ 9,958
Building and leasehold improvements	5-39	137,448	122,241
Computer equipment and purchased software	3-5	99,435	84,649
Furniture and fixtures	5	28,506	27,238
Transportation equipment	5	402	438
		284,444	244,524
Accumulated depreciation and amortization		(112,583)	(89,347)
Property and equipment, net		$ 171,861	$ 155,177

Depreciation expense was $23.4 million in 2019, $21.2 million in 2018, and $17.3 million in 2017.

We paid $20.8 million and $2.2 million for real estate and the expansion of existing buildings in 2019 and 2018, respectively.

In 2017, we purchased an office building in Latham, New York for approximately $2.9 million and paid $2.1 million for improvements to that building. We also paid $19.4 million for construction to expand our office building in Yarmouth, Maine.

(4) GOODWILL AND OTHER INTANGIBLE ASSETS

The changes in the carrying amount of goodwill for the two years ended December 31, 2019 are as follows:

	Enterprise Software	Appraisal and Tax	Total
Balance as of 12/31/2017	$ 651,430	$ 6,557	$ 657,987
Goodwill acquired related to the purchase of Socrata	75,657	—	75,657
Goodwill acquired related to other acquisitions	20,074	—	20,074
Balance as of 12/31/2018	747,161	6,557	753,718
Goodwill acquired related to the purchase of MicroPact	76,319	—	76,319
Goodwill acquired related to other acquisitions	10,080	—	10,080
Balance as of 12/31/2019	$ 833,560	$ 6,557	$ 840,117

Other intangible assets and related accumulated amortization consists of the following at December 31:

	2019	2018
Gross carrying amount of other intangibles:		
Customer related intangibles	$ 321,019	$ 238,219
Acquired software	262,286	202,416
Trade names	22,905	16,905
Capitalized software development costs	4,804	—
Leases acquired	5,037	3,694
	616,051	461,234
Accumulated amortization	(237,137)	(184,382)
Total other intangibles, net	$ 378,914	$ 276,852

Amortization expense for acquired software and capitalized software development costs are recorded to cost of revenues. Amortization expense for customer relationships and trade names are recorded to selling, general and administrative expenses. Total amortization expense for other intangibles was $52.8 million in 2019, $39.6 million in 2018, and $35.5 million in 2017.

The amortization periods of other intangible assets are summarized in the following table:

	December 31, 2019			December 31, 2018		
	Gross Carrying Amount	Weighted Average Amortization Period	Accumulated Amortization	Gross Carrying Amount	Weighted Average Amortization Period	Accumulated Amortization
Non-amortizable intangibles:						
Goodwill	$ 840,117	$ —	$ —	$753,718	—	$ —
Amortizable intangibles:						
Customer related intangibles	321,019	16 years	97,320	238,219	15 years	78,120
Acquired software	262,286	7 years	130,416	202,416	7 years	99,772
Trade names	22,905	11 years	7,205	16,905	11 years	5,139
Capitalized software development costs	$ 4,804	5 years	$ 296	$ —	—	$ —
Leases acquired	5,037	9 years	1,900	3,694	10 years	1,351

Estimated annual amortization expense related to acquired leases will be recorded as a reduction to hardware and other revenue and is expected to be $525,000 in 2020, $525,000 in 2021, $525,000 in 2022, $525,000 in 2023, $525,000 in 2024, and $512,000 thereafter.

Estimated annual amortization expense related to other intangibles, including customer relationships, acquired software, trade names and capitalized software development costs is as follows:

2020	$ 54,045
2021	53,687
2022	49,989
2023	31,838
2024	31,213
Thereafter	$ 155,005

(5) ACCRUED LIABILITIES

Accrued liabilities consist of the following at December 31:

	2019	2018
Accrued wages, bonuses and commissions	$ 49,126	$ 40,100
Other accrued liabilities	26,108	26,380
	$ 75,234	$ 66,480

(6) REVOLVING LINE OF CREDIT

On September 30, 2019, we entered into a $400 million credit agreement (the "Credit Facility") with the various lenders party thereto and Wells Fargo Bank, National Association, as Administrative Agent. The Credit Agreement provides for an unsecured revolving credit facility in an aggregate principal amount of up to $400.0 million, including a $25.0 million sublimit for letters of credit. The Credit Facility matures on September 30, 2024. Borrowings under the Credit Facility may be used for general corporate purposes, including working capital requirements, acquisitions and share repurchases.

Borrowings under the Credit Facility bear interest at a rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the 30, 60, 90 or 180-day LIBOR rate plus a margin of 1.125% to 1.75%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. The Credit Facility requires us to maintain certain financial ratios and other financial conditions and prohibits us from making certain investments, advances, cash dividends or loans, and limits incurrence of additional indebtedness and liens. As of December 31, 2019, we were in compliance with those covenants.

As of December 31, 2019, we had no outstanding borrowings and had unused borrowing capacity of $400 million under the Credit Facility. In addition, as of December 31, 2019, we had no outstanding letter of credit.

We paid interest of $1,750,000 in 2019, $770,000 in 2018, and $804,000 in 2017.

(7) INCOME TAX

The Income tax provision (benefit) on income from operations consists of the following:

Years Ended December 31,	2019	2018	2017
Current:			
Federal	$ 12,814	$ 9,110	$ 22,883
State	6,585	4,367	4,666
	19,399	13,477	27,549
Deferred	(6,088)	(5,069)	(33,664)
	$ 13,311	$ 8,408	$ (6,115)

Reconciliation of the U.S. statutory income tax rate to our effective income tax expense rate for operations follows:

Years Ended December 31,	2019	2018	2017
Federal income tax expense at statutory rate	$ 33,566	$ 32,733	$ 57,209
State income tax, net of federal income tax benefit	6,999	7,953	4,754
Domestic production activities deduction	—	—	(2,617)
Excess tax benefits related to stock option exercises	(29,819)	(32,487)	(40,624)
Tax Act adjustments	—	(1,750)	(25,992)
Tax credits	(3,446)	(3,715)	(3,578)
Non-deductible business expenses	6,011	5,655	4,573
Other, net	—	19	160
	$ 13,311	$ 8,408	$ (6,115)

The tax effects of the major items recorded as deferred tax assets and liabilities as of December 31 are:

	2019	2018
Deferred income tax assets:		
Operating expenses not currently deductible	$ 10,214	$ 8,989
Stock option and other employee benefit plans	19,308	19,496
Loss and credit carryforwards	23,841	17,999
Total deferred income tax assets	53,363	46,484
Valuation allowance	(1,923)	(1,049)
Total deferred income tax assets, net of valuation allowance	51,440	45,435
Deferred income tax liabilities:		
Intangible assets	(84,019)	(70,752)
Property and equipment	(9,265)	(8,455)
Prepaid expenses	(4,922)	(4,079)
Deferred revenue	(1,676)	(3,940)
Total deferred income tax liabilities	(99,882)	(87,226)
Net deferred income tax liabilities	$ (48,442)	$ (41,791)

As of December 31, 2019, we had federal net operating loss carryforwards of approximately $85.2 million, after-tax state net operating loss carryforwards of approximately $3.1 million, and tax credit carryforwards of approximately $4.8 million. The federal net operating loss carryforward will begin to expire in 2032 if not utilized, and a portion of the state net operating loss and tax credit carryforwards begin expiring in 2020 if not utilized.

The acquired carryforwards are subject to an annual limitation but are expected to be realized with the exception of certain state net operating loss and tax credit carryforwards. The valuation allowance disclosed in the table above relates to state net operating losses and tax credit carryforwards that are likely to expire before utilization. We believe it is more likely than not that all other deferred tax assets will be realized. However, the amount of the deferred tax asset considered realizable could be adjusted in the future if estimates of reversing taxable temporary differences are revised.

In connection with the acquisition of Socrata in 2018, we recorded a $1.9 million liability for an uncertain tax position associated with acquired tax credit carryforwards. The unrecognized tax benefits are included in deferred income taxes in our consolidated balance sheets. The entire amount, if recognized, would affect the effective tax rate. There was no change in the balance of unrecognized tax benefits during 2019. Based on the information currently available, we do not anticipate a significant increase or decrease to our tax contingencies for these issues for the next 12 months.

We are subject to U.S. federal income tax, as well as income tax of multiple state, local and foreign jurisdictions. We are routinely subject to income tax examinations by these taxing jurisdictions, but we do not have a history of, nor do we expect any material adjustments as a result of these examinations. With few exceptions, major U.S. federal, state, local and foreign jurisdictions are no longer subject to examination for years before 2015. As of February 19, 2020, no significant adjustments have been proposed by any taxing jurisdiction.

We paid income taxes, net of refunds received, of $21.3 million in 2019, $6.8 million in 2018, and $36.0 million in 2017.

(8) SHAREHOLDERS' EQUITY

The following table details activity in our common stock:

	Years Ended December 31,					
	2019		2018		2017	
	Shares	Amount	Shares	Amount	Shares	Amount
Stock option exercises	999	$ 96,908	1,126	$ 74,907	1,113	$ 49,845
Purchases of common stock	(72)	(14,289)	(781)	(150,050)	(44)	(6,613)
Employee stock plan purchase	53	9,576	45	8,051	51	7,044
Employee stock plan purchase	53	(5,361)	—	—	—	—

As of February 19, 2020, we had authorization from our board of directors to repurchase up to 2.6 million additional shares of our common stock.

(9) SHARE-BASED COMPENSATION

Share-Based Compensation Plan

In May 2018, shareholders approved the Tyler Technologies, Inc. 2018 Stock Incentive Plan ("the 2018 Plan") which amended and restated the existing Tyler Technologies, Inc. 2010 Stock Option Plan ("the 2010 Plan"). Upon shareholder approval of the 2018 Plan, the remaining shares available for grant under the 2010 Plan were added to the shares authorized for grant under the 2018 Plan. Additionally, any awards previously granted under the 2010 Plan that expire unexercised or are forfeited are added to the shares authorized for grant under the 2018 Plan.

During fiscal year 2019, we granted stock awards under the 2018 Plan in the form of stock options, restricted stock units and performance share units. Stock options generally vest after three to six years of continuous service from the date of grant and have a contractual term of 10 years. Once options become exercisable, the employee can purchase shares of our common stock at the market price on the date we granted the option. Restricted stock unit grants generally vest ratably over three to five years of continuous service from the date of grant. Each performance share unit represents the right to receive one share of our common stock based on our achievement of certain financial performance targets during applicable performance periods. We account for share-based compensation utilizing the fair value recognition pursuant to ASC 718, Stock Compensation.

As of December 31, 2019, there were 3.1 million shares available for future grants under the plan from the 22.9 million shares previously approved by the shareholders.

Determining Fair Value of Stock Compensation

Valuation and Amortization Method. We estimate the fair value of stock option awards granted using the Black-Scholes option valuation model. For restricted stock unit and performance stock unit awards, we amortize the fair value of all awards on a straight-line basis over the requisite service periods, which are generally the vesting periods.

Expected Life. The expected life of awards granted represents the period of time that they are expected to be outstanding. The expected life represents the weighted-average period the stock options are expected to be outstanding based primarily on the options' vesting terms, remaining contractual life and the employees' expected exercise based on historical patterns.

Expected Volatility. Using the Black-Scholes option valuation model, we estimate the volatility of our common stock at the date of grant based on the historical volatility of our common stock.

Risk-Free Interest Rate. We base the risk-free interest rate used in the Black-Scholes option valuation model on the implied yield currently available on U.S. Treasury zero-coupon issues with an equivalent remaining term equal to the expected life of the award.

Expected Dividend Yield. We have not paid any cash dividends on our common stock in more than ten years and we do not anticipate paying any cash dividends in the foreseeable future. Consequently, we use an expected dividend yield of zero in the Black-Scholes option valuation model.

Expected Forfeitures. We use historical data to estimate pre-vesting option forfeitures. We record share-based compensation only for those awards that are expected to vest.

The following weighted average assumptions were used for options granted:

Years Ended December 31,	2019	2018	2017
Expected life (in years)	6.0	6.0	6.0
Expected volatility	26.6%	26.7%	28.1%
Risk-free interest rate	1.8%	2.7%	2.0%
Expected forfeiture rate	—%	—%	—%

Share-Based Award Activity

The following table summarizes restricted stock unit and performance stock unit activity during fiscal year 2019 (shares in thousands):

	Number of Shares	Weighted Average Grant Date Fair Value per Share
Unvested at January 1, 2018	—	$ —
Granted	336	221.29
Vested	—	—
Forfeited	(2)	229.75
Unvested at December 31, 2018	334	221.25
Granted	256	241.19
Vested	(76)	221.15
Forfeited	(14)	229.75
Unvested at December 31, 2019	500	$ 231.57

Options granted, exercised, forfeited and expired are summarized as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2016	5,156	$ 83.64		
Granted	824	176.26		
Exercised	(1,113)	44.80		
Forfeited	(50)	134.83		
Outstanding at December 31, 2017	4,817	107.91		
Granted	432	208.21		
Exercised	(1,126)	66.53		
Forfeited	(31)	158.80		
Outstanding at December 31, 2018	4,092	129.51		
Granted	162	251.58		
Exercised	(999)	96.92		
Forfeited	(29)	174.54		
Outstanding at December 31, 2019	3,226	$145.27	6	$ 499,124
Exercisable at December 31, 2019	2,067	$121.07	6	$ 369,938

We had unvested options to purchase 1.2 million shares with a weighted average grant date exercise price of $188.48 as of December 31, 2019, and unvested options to purchase 1.7 million shares with a weighted average grant date exercise price of $169.24 as of December 31, 2018.

Other information pertaining to option activity was as follows during the twelve months ended December 31:

	2019	2018	2017
Weighted average grant-date fair value of stock options granted	$ 74.54	$ 66.52	$ 55.56
Total intrinsic value of stock options exercised	$ 155,899	$ 176,716	$ 137,699

Share-Based Compensation Expense

The following table summarizes share-based compensation expense related to share-based awards which is recorded in the consolidated statements of comprehensive income:

Years Ended December 31,	2019	2018	2017
Cost of software services, maintenance and subscriptions	$ 15,002	$ 13,588	$ 9,415
Selling, general and administrative expenses	44,965	39,152	27,933
Total share-based compensation expenses	59,967	52,740	37,348
Excess tax benefit	(29,819)	(32,487)	(40,624)
Net decrease (increase) in net income	$ 30,148	$ 20,253	$ (3,276)

As of December 31, 2019, we had $148.7 million of total unrecognized compensation cost related to unvested options and restricted stock units, net of expected forfeitures, which is expected to be amortized over a weighted average amortization period of 2.5 years.

Employee Stock Purchase Plan

Under our Employee Stock Purchase Plan ("ESPP") participants may contribute up to 15% of their annual compensation to purchase common shares of Tyler. The purchase price of the shares is equal to 85% of the closing price of Tyler shares on the last day of each quarterly offering period. As of December 31, 2019, there were 702,000 shares available for future issuances the ESPP from the 2.0 million shares previously approved by the shareholders.

(10) EARNINGS PER SHARE

Basic earnings and diluted earnings per share data were computed as follows:

Years Ended December 31,	2019	2018	2017
Numerator for basic and diluted earnings per share:			
Net income	$146,527	$147,462	$169,571
Denominator:			
Weighted-average basic common shares outstanding	38,640	38,445	37,273
Assumed conversion of dilutive securities:			
Stock options	1,465	1,678	1,973
Denominator for diluted earnings per share – Adjusted weighted-average shares	40,105	40,123	39,246
Earnings per common share:			
Basic	$ 3.79	$ 3.84	$ 4.55
Diluted	$ 3.65	$ 3.68	$ 4.32

Share-based awards representing the right to purchase common stock of 633,000 shares in 2019, 888,000 shares in 2018, and 1,343,000 shares in 2017 were not included in the computation of diluted earnings per share because their inclusion would have had an anti-dilutive effect.

(11) LEASES

We lease office facilities for use in our operations, as well as transportation and other equipment. Most of our leases are non-cancelable operating lease agreements and they expire in one year to eight years. Some of these leases include options to extend for up to 10 years. We had no finance leases and no related party lease agreements as of December 31, 2019. Operating lease costs were approximately $9.9 million in 2019, $7.4 million in 2018, and $6.9 million in 2017.

The components of operating lease expense were as follows (in thousands):

Lease Costs	Financial Statement Classification	For the year ended 2019
Operating lease cost	Selling, general and administrative expenses	$ 6,379
Short-term lease cost	Selling, general and administrative expenses	2,269
Variable lease cost	Selling, general and administrative expenses	1,274
Net lease cost		$ 9,922

As of December 31, 2019, ROU lease assets and lease liabilities for our operating leases were recorded in the consolidated balance sheet as follows (in thousands):

	December 31, 2019
Assets:	
Operating lease right-of-use assets	$ 18,992
Liabilities:	
Operating leases, short-term	6,387
Operating leases, long-term	16,822
Total lease liabilities	$ 23,209

Supplemental information related to leases was as follows:

Other Information	For the year ended 2019
Cash Flows (in thousands):	
Cash paid amounts included in the measurement of lease liabilities:	
Operating cash outflows from operating leases	$ 7,267
Right-of-use assets obtained in exchange for lease obligations (non-cash):	
Operating leases	$ 3,466
Lease Term and Discount Rate:	
Weighted average remaining lease term (years)	4
Weighted average discount rate	4.00%

As of December 31, 2019, maturities of lease liabilities were as follows (in thousands):

Years Ending December 31,	Amount
2020	$ 7,684
2021	6,246
2022	3,960
2023	2,923
2024	2,478
Thereafter	2,042
Total lease payments	25,333
Less: Interest	(2,124)
Present value of operating lease liabilities	$ 23,209

As of December 31, 2018, the future minimum lease commitments related to lease agreements under Topic 840, the predecessor of Topic 842, were as follows (in thousands):

Years Ending December 31,	Amount
2019	$ 5,994
2020	5,146
2021	3,976
2022	1,925
2023	1,164
Thereafter	2,132
Total	$ 20,337

Rental Income from third parties

We own office buildings in Bangor, Falmouth and Yarmouth, Maine; Lubbock and Plano, Texas; Troy, Michigan; Latham, New York; and Moraine, Ohio. We lease space in some of these buildings to third-party tenants. The property we lease to others under operating leases consists primarily of specific facilities where one tenant obtains substantially all of the economic benefit from the asset and has the right to direct the use of the asset. These non-cancelable leases expire between 2020 and 2025, some of which have options to extend the lease for up to five years. We determine if an arrangement is a lease at inception. None of our leases allow the lessee to purchase the leased asset.

Rental income from third-party tenants was $1.1 million in 2019, $1.2 million in 2018, and $1.5 million in 2017. Rental income is included in Hardware and other revenue on the consolidated statements of comprehensive income. Future minimum operating rental income based on contractual agreements is as follows (in thousands):

Years Ending December 31,	Amount
2020	$1,341
2021	1,372
2022	1,402
2023	1,432
2024	1,462
Thereafter	857
Total	$7,866

As of December 31, 2019, we had no additional significant operating or finance leases that had not yet commenced.

(12) EMPLOYEE BENEFIT PLANS

We provide a defined contribution plan for the majority of our employees meeting minimum service requirements. Eligible employees can contribute up to 30% of their current compensation to the plan subject to certain statutory limitations. We contribute up to a maximum of 3% of an employee's compensation to the plan. We made contributions to the plan and charged operating results $11.5 million in 2019, $9.3 million in 2018, and $7.9 million in 2017.

(13) COMMITMENTS AND CONTINGENCIES

Other than routine litigation incidental to our business, there are no material legal proceedings pending to which we are party or to which any of our properties are subject.

(14) SEGMENT AND RELATED INFORMATION

We provide integrated information management solutions and services for the public sector, with a focus on local governments.

We provide our software systems and services and appraisal services through six business units, which focus on the following products:

- financial management, education and planning, regulatory and maintenance software solutions;
- financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions;
- courts and justice and public safety software solutions;
- data and insights solutions;
- case management and business management solutions; and
- appraisal and tax software solutions and property appraisal services.

In accordance with ASC 280-10, *Segment Reporting*, the financial management, education and planning, regulatory and maintenance software solutions unit; financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions unit; courts and justice and public safety software solutions unit; the data and insights solutions unit; and case management and business management solutions unit meet the criteria for aggregation and are presented in one reportable segment, Enterprise Software ("ES"). The ES segment provides public sector entities with software systems and services to meet their information technology and automation needs for mission-critical "back-office" functions such as: financial management and education, courts and justice, public safety, planning, regulatory and maintenance, land and vital records management, data and insights and case management and business management processes. The Appraisal and Tax ("A&T") segment provides systems and software that automate the appraisal and assessment of real and personal property as well as property appraisal outsourcing services for local governments and taxing authorities. Property appraisal outsourcing services include: the physical inspection of commercial and residential properties; data collection and processing; computer analysis for property valuation; preparation of tax rolls; community education; and arbitration between taxpayers and the assessing jurisdiction.

We evaluate performance based on several factors, of which the primary financial measure is business segment operating income. We define segment operating income for our business units as income before noncash amortization of intangible assets associated with their acquisition, interest expense and income taxes. Segment operating income includes intercompany transactions. The majority of intercompany transactions relate to contracts involving more than one unit and are valued based on the contractual arrangement. Segment operating income for corporate primarily consists of compensation costs for the executive management team and certain accounting and administrative staff and share-based compensation expense for the entire company. Corporate segment operating income also includes revenues and expenses related to a company-wide user conference. The accounting policies of the reportable segments are the same as those described in Note 1, "Summary of Significant Accounting Policies."

Segment assets include net accounts receivable, prepaid expenses and other current assets and net property and equipment. Corporate assets consist of cash and investments, prepaid insurance, intangibles associated with acquisitions, capitalized software development costs, deferred income taxes and net property and equipment mainly related to unallocated information and technology assets.

ES segment capital expenditures included $12.6 million in 2019 and $2.2 million in 2018 for the expansion of existing buildings and purchases of buildings and land. A&T segment capital expenditures included $8.2 million in 2019 for the expansion of existing buildings.

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 92,567	$ 7,638	$ —	$ 100,205
Subscriptions	285,092	11,260	—	296,352
Software services	185,892	27,169	—	213,061
Maintenance	405,063	25,255	—	430,318
Appraisal services	—	23,479	—	23,479
Hardware and other	16,735	21	6,256	23,012
Intercompany	15,496	—	(15,496)	—
Total revenues	$1,000,845	$ 94,822	$ (9,240)	$1,086,427
Depreciation and amortization expense	64,289	926	11,457	76,672
Segment operating income	261,494	20,789	(73,829)	208,454
Capital expenditures	19,335	8,384	10,379	38,098
Segment assets	$ 834,010	$ 90,536	$1,267,068	$2,191,614

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 83,735	$ 9,706	$ —	$ 93,441
Subscriptions	210,740	9,807	—	220,547
Software services	166,921	24,348	—	191,269
Maintenance	359,904	24,617	—	384,521
Appraisal services	—	21,846	—	21,846
Hardware and other	18,745	32	4,881	23,658
Intercompany	13,155	—	(13,155)	—
Total revenues	$853,200	$ 90,356	$ (8,274)	$ 935,282
Depreciation and amortization expense	50,130	914	10,715	61,759
Segment operating income	237,159	23,094	(68,572)	191,681
Capital expenditures	13,973	782	10,377	25,132
Segment assets	$556,100	$ 63,670	$1,171,193	$1,790,963

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 78,388	$ 7,854	$ —	$ 86,242
Subscriptions	614,317	7,859	—	172,176
Software services	161,245	19,215	—	180,460
Maintenance	337,701	21,618	—	359,319
Appraisal services	—	25,023	—	25,023
Hardware and other	13,057	10	4,612	17,679
Intercompany	10,425	—	(10,425)	—
Total revenues	$765,133	$ 81,579	$ (5,813)	$ 840,899
Depreciation and amortization expense	43,987	760	8,648	53,359
Segment operating income	229,001	20,788	(51,964)	197,825
Capital expenditures	28,096	1,181	16,341	45,618
Segment assets	$365,736	$ 46,279	$1,199,336	$1,611,351

Reconciliation of reportable segment operating income to the Company's consolidated totals:	Years Ended December 31, 2019	2018	2017
Total segment operating income	$208,454	$191,681	$197,825
Amortization of acquired software	(30,642)	(22,972)	(21,686)
Amortization of customer and trade name intangibles	(21,445)	(16,217)	(13,381)
Other income (expense), net	3,471	3,378	698
Income before income taxes	$159,838	$155,870	$163,456

(15) DISAGGREGATION OF REVENUE

The tables below show disaggregation of revenue into categories that reflect how economic factors affect the nature, amount, timing, and uncertainty of revenue and cash flows.

Timing of Revenue Recognition

Timing of revenue recognition by revenue category during the period is as follows:

For the year ended December 31, 2019	Products and Services Transferred at a Point in Time	Products and Services Transferred Over Time	Total
Revenues			
Software licenses and royalties	$ 84,900	$ 15,305	$ 100,205
Subscriptions	—	296,352	296,352
Software services	—	213,061	213,061
Maintenance	—	430,318	430,318
Appraisal services	—	23,479	23,479
Hardware and other	23,012	—	23,012
Total	$ 107,912	$ 978,515	$1,086,427

For the year ended December 31, 2018	Products and Services Transferred at a Point in Time	Products and Services Transferred Over Time	Total
Revenues			
Software licenses and royalties	$ 75,188	$ 18,253	$ 93,441
Subscriptions	—	220,547	220,547
Software services	—	191,269	191,269
Maintenance	—	384,521	384,521
Appraisal services	—	21,846	21,846
Hardware and other	23,658	—	23,658
Total	$ 98,846	$836,436	$935,282

For the year ended December 31, 2017	Products and Services Transferred at a Point in Time	Products and Services Transferred Over Time	Total
Revenues			
Software licenses and royalties	$ 69,167	$ 17,075	$ 86,242
Subscriptions	—	172,176	172,176
Software services	—	180,460	180,460
Maintenance	—	359,319	359,319
Appraisal services	—	25,023	25,023
Hardware and other	17,679	—	17,679
Total	$ 86,846	$754,053	$840,899

Recurring Revenue

The majority of our revenue is comprised of recurring revenues from maintenance and subscriptions. Virtually all of our on-premises software clients contract with us for maintenance and support, which provides us with a significant source of recurring revenue. We generally provide maintenance and support for our on-premises clients under annual, or in some cases, multi-year contracts. The contract terms for subscription arrangements range from one to 10 years but are typically contracted for initial periods of three to five years. Non-recurring revenues are derived from all other revenue categories.

Recurring revenues and non-recurring revenues recognized during the period are as follows:

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 690,156	$ 36,514	$ —	$ 726,670
Non-recurring revenues	295,193	58,308	6,256	359,757
Intercompany	15,496	—	(15,496)	—
Total revenues	$1,000,845	$ 94,822	$ (9,240)	$1,086,427

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$570,645	$ 34,424	$ —	$605,069
Non-recurring revenues	269,400	55,932	4,881	330,213
Intercompany	13,155	—	(13,155)	—
Total revenues	$853,200	$ 90,356	$ (8,274)	$935,282

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 502,018	$ 29,477	$ —	$ 531,495
Non-recurring revenues	252,690	52,102	4,612	309,404
Intercompany	10,425	—	(10,425)	—
Total revenues	$ 756,133	$ 81,579	$ (5,813)	$ 840,899

(16) DEFERRED REVENUE AND PERFORMANCE OBLIGATIONS

Total deferred revenue, including long-term, by segment is as follows::

December 31,	2019	2018
Enterprise software	$ 386,115	$ 327,521
Appraisal and tax	25,210	20,018
Corporate	1,369	3,397
Totals	$ 412,694	$ 350,936

Changes in total deferred revenue, including long-term, were as follows:

	2019
Balance at beginning of year	$ 350,936
Deferral of revenue	993,109
Recognition of deferred revenue	(931,351)
Balance at end of year	$ 412,694

Transaction Price Allocated to the Remaining Performance Obligations

The aggregate amount of transaction price allocated to the remaining performance obligations represents contracted revenue that has not yet been recognized ("Backlog"), which includes deferred revenue and amounts that will be invoiced and recognized as revenue in future periods. Backlog as of December 31, 2019 was $1.46 billion, of which we expect to recognize approximately 49% as revenue over the next 12 months and the remainder thereafter.

(17) DEFERRED COMMISSIONS

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. Sales commissions for initial contracts are deferred and then amortized commensurate with the recognition of associated revenue over a period of benefit that we have determined to be three to seven years. Deferred commissions were $29.8 million, $21.9 million, as of December 31, 2019, and 2018 respectively. Amortization expense was $17.8 million $15.6 million, $11.2 million for the twelve months ended December 31, 2019, 2018, and 2017, respectively. There were no indicators of impairment in relation to the costs capitalized for the periods presented. Deferred commissions have been included with prepaid expenses in the accompanying consolidated balance sheets. Amortization expense related to deferred commissions is included in selling, general and administrative expenses in the accompanying consolidated statements of comprehensive income.

(18) SUBSEQUENT EVENTS

There are no material events or transactions that have occurred subsequent to December 31, 2019.

(19) QUARTERLY FINANCIAL INFORMATION (UNAUDITED)

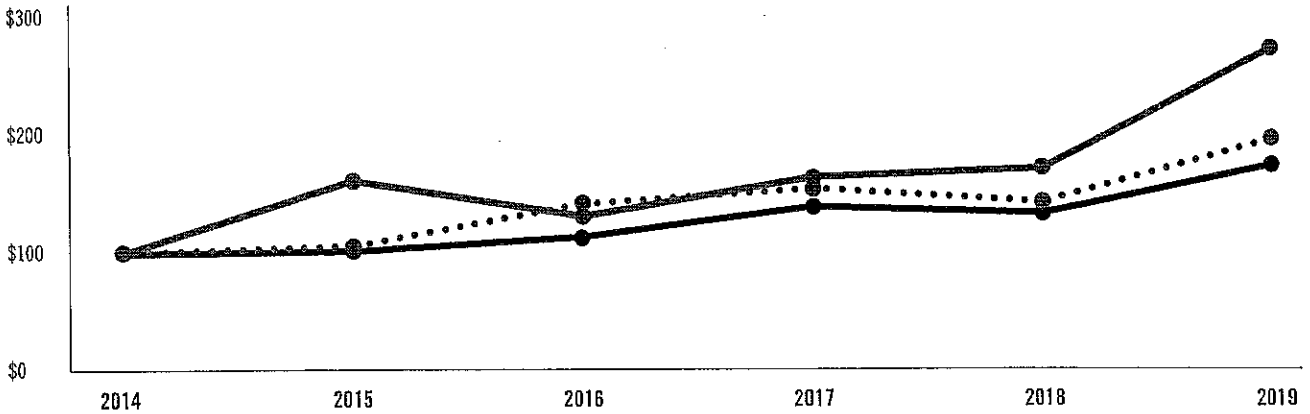
The following table contains selected financial information from unaudited statements of income for each quarter of 2019 and 2018:

	Quarters Ended							
	2019				2018			
	Dec. 31	Sept. 30	June 30	Mar. 31	Dec. 31	Sept. 30	June 30	Mar. 31
Revenues	$288,837	$275,400	$275,124	$247,066	$241,981	$236,067	$236,060	$221,174
Gross profit	142,275	130,717	127,860	116,048	115,871	111,626	109,276	102,805
Income before income taxes	47,790	40,552	36,419	35,077	40,107	38,626	37,700	39,437
Net income	46,790	40,390	31,999	27,348	31,552	38,924	39,161	37,825
Earnings per diluted share	$ 1.15	$ 1.00	$ 0.80	$ 0.69	$ 0.79	$ 0.96	$ 0.97	$ 0.95
Shares used in computing diluted earnings per share	40,736	40,280	39,813	39,585	39,891	40,528	40,224	39,836

Performance Graph

The following table compares total shareholder returns for Tyler over the last five years to the Standard and Poor's 500 Stock Index and the Standard and Poor's 600 Information Technology Index assuming a $100 investment made on December 31, 2014. Each of the three measures of cumulative total return assumes reinvestment of dividends. The stock performance shown on the graph below is not necessarily indicative of future price performance.

COMPARISON OF CUMULATIVE FIVE YEAR TOTAL RETURN



	2014	2015	2016	2017	2018	2019
Tyler Technologies, Inc.	100	159.28	130.46	161.78	169.79	274.14
S&P 500 Stock Index	100	101.38	113.51	138.29	132.23	173.86
S&P 600 Information Technology Index	100	104.65	140.08	154.48	140.68	196.38

Tyler Technologies, Inc.
S&P 500 Stock Index
S&P 600 Information Technology Index

CORPORATE OFFICERS

H. Lynn Moore Jr.
President and
Chief Executive Officer

Brian K. Miller
Executive Vice President
Chief Financial Officer
and Treasurer

Matthew B. Bieri
Chief Information Officer

S. Brett Cate
Chief Sales Officer

Samantha B. Crosby
Chief Marketing Officer

Abigail M. Diaz
Chief Legal Officer and Secretary

Bruce E. Graham
Senior Strategy Advisor

Jason P. Durham
Corporate Controller

Jeffrey S. Green
Chief Technology Officer

Jeffrey D. Puckett
Chief Strategy Officer

Kelley B. Shimansky
Chief Human Resources Officer

W. Michael Smith
Chief Accounting Officer

BOARD OF DIRECTORS

John S. Marr Jr.[1]
Executive Chairman of the Board
Tyler Technologies, Inc.

H. Lynn Moore Jr.[1]
President and
Chief Executive Officer
Tyler Technologies, Inc.

Donald R. Brattain[2,4]
President
Brattain and Associates, LLC

Glenn A. Carter[3,4]
Retired Chief Executive Officer
DataProse, Inc.

Brenda A. Cline[2,3]
Executive Vice President
Kimbell Art Foundation

J. Luther King Jr.[2,4]
Chief Executive Officer
Luther King Capital Management

Daniel M. Pope[3]
Mayor
City of Lubbock, Texas

Dustin R. Womble
Retired Executive Vice President
Tyler Technologies, Inc.

[1] Executive Committee
[2] Audit Committee
[3] Nominating and Governance Committee
[4] Compensation Committee

OPERATIONAL LEADERSHIP

S. Franklin Williams III
President
Data & Insights Division

Enterprise Group

Christopher P. Hepburn
President
Enterprise Group

Mark A. Hawkins
President
Appraisal & Tax Division

Christopher J. Webster
President
ERP Division

Dane L. Womble
President
Local Government Division

Kristoffer L. Collo
President
Federal Division

Justice Group

D. Bret Dixon
President
Justice Group

Russell J. Smith
President
Courts & Justice Division

Bryan K. Proctor
President
Public Safety Division

CORPORATE HEADQUARTERS

5101 Tennyson Parkway
Plano, Texas 75024
972.713.3700
tylertech.com

TRANSFER AGENT AND REGISTRAR

American Stock Transfer & Trust Company
6201 15th Avenue
Brooklyn, New York 11219
800.937.5449
help@astfinancial.com
amstock.com

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Ernst & Young LLP
Dallas, Texas

ANNUAL MEETING OF SHAREHOLDERS

Tuesday, May 12, 2020
9:00 a.m. Central Time
Renaissance Dallas at
Plano Legacy West
607 Legacy Drive
Plano, Texas 75024

CERTIFICATIONS

We submitted an unqualified Annual CEO Certification to the New York Stock Exchange (NYSE) as required by the NYSE Listed Company rules. We also filed with the Securities and Exchange Commission the Chief Executive Officer and Chief Financial Officer certifications required under Section 302 of the Sarbanes-Oxley Act as exhibits to our Annual Report on Form 10-K.

INVESTOR INFORMATION

Our annual report on Form 10-K is available on the company's website at www.tylertech.com. A copy of the Form 10-K or other information may also be obtained by contacting the Investor Relations Department at corporate headquarters.

INVESTOR RELATIONS

972.713.3714
info@tylertech.com

COMMON STOCK

Listed on the New York Stock Exchange under the symbol "TYL"

TYL
LISTED
NYSE

tyler
technologies

Empowering people who serve the public

5101 Tennyson Parkway
Plano, TX 75024
972.713.3700
www.tylertech.com

Tyler Technologies' Appraisal & Tax Division provides systems and software that automate the appraisal and assessment of real and personal property and the recording of land and vital records. These activities include record keeping, mass appraisal, inquiry and protest tracking, appraisal and tax roll generation, tax statement processing and electronic state-level reporting. These systems are image and video-enabled to facilitate the storage of and access to the many property-related and vital record documents and for the online storage of digital photographs of properties for use in defending values in protest situations. Other related tax applications are available for agencies that bill and collect taxes, including cities, counties, school tax offices, and special taxing and collection agencies. These systems support billing, collections, lock box operations, mortgage company electronic payments, and various reporting requirements.

Tyler Technologies' Public Safety Division provides public safety software that is a fully unified and comprehensive solution for law enforcement, fire and EMS, including 911/computer aided dispatch ("CAD"), records management, mobile computing, corrections management, Web-based information sharing and decision support. The modules are fully integrated, utilizing a common database and providing full functionality between modules, reducing data entry. The software provides fast, efficient dispatching, and quick access to records, reports and actionable information from an agency's database.

Please also see attached 2019 Annual Report.

NYS Department of State

Division of Corporations

Entity Information

The information contained in this database is current through November 17, 2020.

Selected Entity Name: TYLER TECHNOLOGIES, INC.
Selected Entity Status Information

Current Entity Name:	TYLER TECHNOLOGIES, INC.
DOS ID #:	3168959
Initial DOS Filing Date:	FEBRUARY 25, 2005
County:	ALBANY
Jurisdiction:	DELAWARE
Entity Type:	FOREIGN BUSINESS CORPORATION
Current Entity Status:	ACTIVE

Selected Entity Address Information

DOS Process (Address to which DOS will mail process if accepted on behalf of the entity)

TYLER TECHNOLOGIES, INC.
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Chief Executive Officer

JOHN S MARR JR
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Principal Executive Office

TYLER TECHNOLOGIES, INC.
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Registered Agent

CAPITOL SERVICES, INC.
1218 CENTRAL AVENUE, SUITE 100
ALBANY, NEW YORK, 12205

This office does not record information regarding the names and addresses of officers, shareholders or directors of nonprofessional corporations except the chief executive officer, if provided, which would be listed above. Professional corporations must include the name(s) and address(es) of the initial officers, directors, and shareholders in the initial certificate of incorporation, however this information is not recorded and only available by viewing the certificate.

***Stock Information**

# of Shares	Type of Stock	$ Value per Share
No Information Available		

*Stock information is applicable to domestic business corporations.

Name History

Filing Date	Name Type	Entity Name
FEB 25, 2005	Actual	TYLER TECHNOLOGIES, INC.

A **Fictitious** name must be used when the **Actual** name of a foreign entity is unavailable for use in New York State. The entity must use the fictitious name when conducting its activities or business in New York State.

NOTE: New York State does not issue organizational identification numbers.

Communications & Technology Fund

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U.S. markets close in 5 hours 32 minutes

S&P 500	Dow 30	Nasdaq	Russell 2000
3,571.58	29,347.44	11,912.36	1,775.88
-10.29 (-0.29%)	-135.79 (-0.46%)	+7.64 (+0.06%)	-8.25 (-0.46%)

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Tyler Technologies, Inc. (TYL)
NYSE - Nasdaq Real Time Price. Currency in USD

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414.00 -0.38 (-0.09%)
As of 10:25AM EST. Market open.

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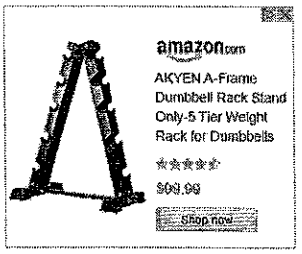
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Major Holders
Breakdown

Currency in USD

1.47%	% of Shares Held by All Insider
97.27%	% of Shares Held by Institutions
98.72%	% of Float Held by Institutions
790	Number of Institutions Holding Shares

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Top Institutional Holders

Holder	Shares	Date Reported	% Out	Value
Blackrock Inc.	4,634,460	Sep 29, 2020	11.49%	1,615,387,377
Vanguard Group, Inc. (The)	4,496,600	Sep 29, 2020	11.15%	1,567,334,896
State Street Corporation	1,735,571	Sep 29, 2020	4.30%	604,950,627
Brown Capital Management, Inc.	1,573,552	Sep 29, 2020	3.90%	548,477,285
Capital World Investors	1,019,511	Sep 29, 2020	2.53%	355,360,754
Neuberger Berman Group, LLC	867,201	Sep 29, 2020	2.15%	302,271,580
Franklin Resources, Inc.	829,678	Sep 29, 2020	2.06%	289,192,563
Janus Henderson Group PLC	776,709	Sep 29, 2020	1.93%	270,729,689
AllianceBernstein, L.P.	756,343	Sep 29, 2020	1.88%	263,630,916
Artisan Partners Limited Partnership	746,275	Sep 29, 2020	1.85%	260,121,614

Top Mutual Fund Holders

Holder	Shares	Date Reported	% Out	Value
Vanguard Total Stock Market Index Fund	1,133,575	Jun 29, 2020	2.81%	393,214,496
iShares MSCI USA Min Vol Factor ETF	871,246	Sep 29, 2020	2.16%	303,681,505
Brown Capital Management Small Company Fund	859,537	Sep 29, 2020	2.13%	299,600,216
Vanguard 500 Index Fund	817,021	Jun 29, 2020	2.03%	283,408,244
Growth Fund Of America Inc	740,655	Sep 29, 2020	1.84%	258,162,706
Neuberger & Berman Genesis Fund	599,270	Sep 29, 2020	1.49%	208,881,551
Vanguard Small-Cap Index Fund	497,771	Jun 29, 2020	1.23%	172,666,804
Vanguard Mid-Cap Index Fund	493,322	Jun 29, 2020	1.22%	171,123,535
Principal Mid Cap Fund	445,539	Sep 29, 2020	1.10%	155,297,073
MFS Mid Cap Growth Fund	413,887	Aug 30, 2020	1.03%	142,919,319

Tyler Technologies, Inc. Directors as of 11/01/2020

- Donald R. Brattain – 5101 Tennyson Parkway, Plano TX 75024
- Glenn A. Carter – 5101 Tennyson Parkway, Plano TX 75024
- Brenda A. Cline – 5101 Tennyson Parkway, Plano TX 75024
- J. Luther King, Jr. – 5101 Tennyson Parkway, Plano TX 75024
- Mary Landrieu - 5101 Tennyson Parkway, Plano TX 75024
- John S. Marr, Jr. – One Tyler Drive, Yarmouth, ME 04096
- Daniel M. Pope – 5101 Tennyson Parkway, Plano TX 75024
- Dustin R. Womble – 5519 53rd Street, Lubbock, TX 79414
- H. Lynn Moore, Jr. – 5101 Tennyson Parkway, Plano TX 75024

Tyler Technologies, Inc. Officers as of 11/01/2020

- John S. Marr Jr. – One Tyler Drive, Yarmouth, ME 04096
  Executive Chairman of the Board
- Brian K. Miller – 5101 Tennyson Parkway, Plano TX 75024
  Executive Vice President, Chief Financial Officer and Treasurer
- H. Lynn Moore Jr. – 5101 Tennyson Parkway, Plano TX 75024
  Chief Executive Officer, President
- Matthew B. Bieri – 5101 Tennyson Parkway, Plano TX 75024
  Chief Information Officer
- Samantha B. Crosby – 5101 Tennyson Parkway, Plano TX 75024
  Chief Marketing Officer
- Bruce Graham – 5101 Tennyson Parkway, Plano TX 75024
  Senior Strategy Officer
- Jeff Puckett – 5101 Tennyson Parkway, Plano TX 75024
- **Chief Strategy Officer**
- Kelly Shimansky – One Tyler Drive, Yarmouth, ME 04096
  Chief Human Resources Officer
- W. Michael Smith – 5101 Tennyson Parkway, Plano TX 75024
  Chief Accounting Officer
- Brett Cate - 5519 53rd Street, Lubbock, TX 79414
  Chief Sales Officer
- Abigail Diaz - One Tyler Drive, Yarmouth, ME 04096
  Chief Legal Officer, Secretary
- Jeff Green – 1601 East Valley Rd., Ste. 200, Renton, WA 98057
  Chief Technology Officer

- Christopher P. Hepburn – One Tyler Drive, Yarmouth, ME 04096
  President, Enterprise Group
- Chris Webster – One Tyler Drive, Yarmouth, ME 04096
  President, ERP & School Division
- Dane Womble – 5519 53rd Street, Lubbock, TX 79414
  President, Local Government Division
- Mark Hawkins – One Tyler Way, Moraine, OH 45439
  President, Appraisal & Tax Division
- Bret Dixon - 5101 Tennyson Parkway, Plano, TX 75024
  President, Justice Group
- Rusty Smith - 5101 Tennyson Parkway, Plano, TX 75024
  President, Courts & Justice Division
- Bryan Procter – 840 West Long Lake Rd., Troy MI 48098
  President, Public Safety Division
- Franklin Williams – 255 South King Street, Suite 1100, Seattle, WA 98104
  President, Data & Insights Division
- Kris Collo - 5101 Tennyson Parkway, Plano, TX 75024
  President, Federal Division

Code of Business Conduct and Ethics
of
Tyler Technologies, Inc.

Tyler Technologies, Inc. ("Tyler") expects all officers, directors, and employees to exercise the highest degree of professional business ethics in all actions they undertake on behalf of Tyler. Accordingly, Tyler expects its officers, directors, and employees to act at all times in accordance with the policies outlined herein. These policies apply to all officers, directors, and employees, including, without limitation, Tyler's principal executive officer, principal financial officer, principal accounting officer, and all persons performing similar functions.

Any employee who has questions regarding these policies should contact their human resources representative or Tyler's chief human resources officer. An employee should immediately report any violations of these policies to Tyler's chief human resources officer. The policies in this Code of Business Conduct and Ethics will be strictly enforced. Tyler will take appropriate disciplinary action with respect to those involved in any violations of these policies, including, where appropriate, dismissal. Tyler will not retaliate against an employee for reporting violations. This Code of Business Conduct and Ethics is not intended to affect the status of any employee or to enhance or diminish any employee's contract rights or rights under otherwise applicable law.

Anonymous Reporting of Accounting or Auditing Concerns

If any employee has any concerns about any accounting, auditing, internal accounting controls, or related matter, they are encouraged to bring the matter to the attention of Tyler's audit committee chairperson. The audit committee is composed of three (3) or more independent members of Tyler's board of directors and assists the board in fulfilling its oversight responsibility to Tyler's stockholders, potential stockholders, the investment community, and others relating to Tyler's financial statements, financial reporting, and processes. The audit committee chairperson can be contacted in any of the following ways:

1. By phone at (866) 376-4128
2. By Internet at http://www.openboard.info/tyl
3. By mail at
   Tyler Technologies, Inc.
   Board of Directors, Audit Committee Chairperson
   5101 Tennyson Parkway
   Plano, TX 75024

Reports regarding accounting, auditing, or related matters will be kept strictly confidential. In addition, the employee or other person raising the issue is under no obligation to reveal their identity in connection with the reporting process. Please reference Tyler's Whistleblower Policy for additional information, including how to maintain anonymity in reporting.

Introduction and Purpose

This Code of Business Conduct and Ethics is designed to deter wrongdoing and promote the following:

- Honest and ethical conduct, including ethical handling of actual or apparent conflicts of interest between personal and professional relationships;
- Avoidance of conflicts of interest, including disclosure to the appropriate person identified herein of any material transaction or relationship that reasonably could be expected to give rise to such a conflict;
- Full, fair, accurate, timely, and understandable disclosure in reports and documents that Tyler files with, or submits to, the Securities and Exchange Commission and in other public communications by Tyler;
- Compliance with applicable governmental laws, rules, and regulations;
- Prompt internal reporting to the appropriate person identified herein of any violations of this Code of Business Conduct and Ethics; and
- Accountability for adherence to the policies contained in this Code of Business Conduct and Ethics.

General Principles for Business Conduct

- Tyler and its employee shall comply with all applicable legal requirements of any federal, state, local, or foreign jurisdiction where Tyler conducts business.
- The use of any Tyler assets for any unlawful or improper purpose is strictly prohibited.
- No undisclosed fund or asset shall be established or maintained for any purpose.

No false or misleading entries shall be made for any reason in Tyler's books, records, or other financial documents, or in any materials prepared for or submitted to Tyler's accountants or independent auditors, and no employee shall engage in any arrangement that results in such prohibited act. In addition, all employees dealing with or providing information or documentation to Tyler's accountants or independent auditors must provide complete and accurate information, and must immediately report any request, suggestion, or threat that they do otherwise to the chairperson of the Tyler audit committee, as outlined above under "Anonymous Reporting of Accounting or Auditing Concerns."

Just as Tyler expects all employees to speak honestly to clients, potential clients, and vendors, Tyler also expects all employees to display the same integrity in anything they write, whether for internal or external use. Therefore, all internal records, memoranda, and other documents must be accurate, complete, and truthful and must be maintained in that condition without any alteration, falsification, omission, or other change that would mislead someone reviewing the record about its original contents or meaning. Any employee who is asked or directed to engage in such prohibited conduct should immediately report it to their human resources

representative or Tyler's chief human resources officer, or, if it concerns questionable accounting or auditing matters, to the chairperson of the Tyler audit committee, as outlined above under "Anonymous Reporting of Accounting or Auditing Concerns."

Retaliation against any employee as a result of their bringing forward any questions, concerns, or complaints about accounting or auditing matters, recording of information, record retention, or any other matter concerning the honesty and integrity of Tyler's operations or financial reporting is strictly prohibited. Similarly, retaliation is prohibited against any employee who provides accurate information to any law enforcement agency about the commission of any state or federal offense. Any employee who feels that they have been retaliated against or threatened with retaliation for these reasons should immediately report it to Tyler's chief human resources officer, or, if it concerns questionable accounting or auditing matters, to the chairperson of the Tyler audit committee, as outlined above under "Anonymous Reporting of Accounting or Auditing Concerns."

No payment on behalf of Tyler shall be approved without adequate supporting documentation or made with the intention or understanding that any part of such payment is to be used for any purpose other than as described by the documentation supporting the payment.

No Tyler confidential information shall be used or revealed within or outside of Tyler without proper authorization and purpose.

The use of Tyler employees, materials, or equipment for personal purposes is strictly prohibited, unless specifically authorized.

Compliance with established internal control procedures is required at all times.

Political Activities and Contributions

Tyler will not make any contribution to or for any political party, committee, or candidate for any public office. Any employee requested by another employee to contribute Tyler funds to a political party, committee, or candidate for public office should decline to do so and promptly notify their human resources representative or Tyler's chief human resources officer of the details of any such request.

Payments to Government Officials and Personnel

Tyler's relationships with governmental agencies and their personnel in any federal, state, local, or foreign jurisdiction where Tyler conducts business shall be conducted so that full disclosure of the conduct will not impugn or jeopardize Tyler's integrity or reputation. Accordingly, payments to government personnel, including gifts of substantial value or lavish entertainment, is strictly prohibited, whether the payment is made from personal funds or assets or those of Tyler, and whether made directly or indirectly through consultants, advisors, suppliers, clients, or other third parties.

Use of Agents and Others to Assist in Obtaining and Performing Contracts
From time to time, Tyler may elect to use consultants, distributors, representatives, and agents to assist in obtaining or performing contracts. These representatives must be *bona fide* professional individuals or organizations, they must render *bona fide* services, and their compensation must be limited to a reasonable fee for their services. A representative may not be employed by Tyler if they are connected directly or indirectly to the prospective client or to an official or agent of a prospective client.

Conflicts of Interest
Tyler expects the undivided loyalty of its employees in the conduct of business. It is important that employees be free from any financial interests or other relationships that might conflict with the best interests of Tyler. Accordingly, each employee shall avoid any investment or other interest in any business that would conflict with the proper performance of their duties or responsibilities for Tyler, or which might interfere with their independence of judgment with respect to the transactions between Tyler and such other business.

While it is impossible to enumerate all situations in which possible conflicts might arise, the following are some examples:

- To give or receive gifts of more than token value that are in any way connected with the business relationship;
- To lend or borrow money or other assets from individuals or concerns that do business with or compete against Tyler, except banks and other financial institutions;
- To serve as an officer, director, employee, or consultant of, or receive any income from any enterprise doing business with or competing against Tyler, or seeking to do so, or to own an interest in or engage in the management of an organization providing services or products to Tyler, or to which Tyler sells, or with which Tyler competes, except when such interest (1) comprises publicly traded securities listed on a national securities exchange, NASDAQ, or the OTC margin list and (2) is not in excess of 5% of the securities of such company;
- To accept compensation from outsiders for services for which the employee is being paid by Tyler;
- To speculate or deal in materials, equipment, supplies, products, lands, leases, or property purchased or sold by Tyler, or for which negotiations to purchase, acquire, or sell are pending or may reasonably be anticipated, or to receive (other than from Tyler) any compensation, bonus, or commission in connection with any transaction relating to Tyler's business;
- To knowingly cause, directly or indirectly, Tyler to enter into a business transaction with a close relative of a Tyler employee or business enterprise of such relative;
- To knowingly buy or sell for the employee's own account or the account of a relative of a Tyler employee any security or other interest which Tyler may be considering buying or selling, or has decided to buy or sell, until Tyler's decision has

been completely executed and publicly announced; and/or

- To transmit any knowledge of any consideration or decisions of any information that might be prejudicial to the interests of Tyler to any person, except as may be necessary for the proper discharge of the employee's responsibilities on behalf of Tyler.

If an employee finds that they have, or are considering the assumption of, a financial interest or outside relationship that might involve a conflict of interest, or if the employee has any doubt as to the proper application of this policy, they should promptly make all facts known to Tyler's chief human resources officer and refrain from any exercise of responsibility in any manner that might reasonably be considered to be affected by such adverse interest.

Protection of Confidential or Proprietary Information

Tyler's confidential and proprietary information is vital to its current operations and future success. Each employee shall use reasonable care to protect or otherwise prevent the unauthorized disclosure of such information. In no event shall confidential information be disclosed or revealed within or outside Tyler without proper authorization or a permitted purpose. If an employee is uncertain whether certain information should be treated as confidential, the employee should presume that such information is confidential and not disclose it without confirmation that there is proper authorization or a permitted purpose.

By way of example, confidential or proprietary information includes information relating to Tyler's business methods, business plans, research, development, inventions, databases, systems, systems designs, technology, intellectual property, know-how, management, business development, operations, products, services, pricing strategies, client sources, employee records, terms and conditions of arrangements of any business or clients, client lists, methods of competing, financial statements, financial projections, financing methods, and other proprietary information.

Prohibition Against Insider Trading

Insider trading is the trading of Tyler stock while in possession of material "inside" or nonpublic information. This includes the purchase or sale of Tyler stock on the open market through a stockbroker of your choice or through an online brokerage account, the exercise of stock options and corresponding sale of the underlying stock, the sale of stock acquired through Tyler's Employee Stock Purchase Plan (following the applicable holding periods), or the short sale of Tyler stock. *The prohibition against trading other than during the trading window also encompasses the fulfillment of "limit orders" placed with a broker, and the brokers with whom any such limit order is placed must be so instructed at the time it is placed.* The prohibition does not, however, include the purchase of stock under the Employee Stock Purchase Plan pursuant to previously authorized payroll deductions.

In addition to the prohibition against trading, it is also a violation of the federal securities laws to disclose (or tip) material nonpublic information to another person who subsequently uses

that information to their profit.

What is "material nonpublic information?"
In general, information is "material" if its disclosure to the public would affect an investor's decision to purchase or sell Tyler stock. It is difficult to describe all the types of material nonpublic information a Tyler employee may possess that could cause problems with trading or tipping others to trade Tyler stock. Some examples of material nonpublic information about Tyler include information or knowledge about the following events:

- Tyler's quarterly or annual earnings or other important financial information;
- Changes in previously disclosed financial information, including earnings estimates;
- Tyler has suffered, or is about to suffer, extraordinary losses or costs;
- Tyler has realized, or is about to realize, extraordinary earnings;
- Tyler is making changes in previously disclosed financial information;
- Tyler has entered into, or is about to enter into, an important contract with a client, or that such a contract has been terminated or is about to be terminated;
- A merger, acquisition, or takeover;
- Acquisition or sale of a company, a division, or a significant amount of assets;
- Tyler plans to declare stock splits, stock dividends, or cash dividends;
- Tyler becomes a party to major litigation;
- Tyler is making significant changes in management;
- Tyler plans to make significant changes in operations; and/or
- Tyler has achieved a milestone. .

In most cases, employees should presume that information concerning any of these events is material. If an employee has any questions about what information is material, or whether the information has been disclosed to the public, they should contact Tyler's chief legal officer.

General Trading Limitations
All employees, officers, and directors must comply with the following restrictions:

1. They may not buy or sell Tyler stock during the period beginning on the first business day after the end of each fiscal quarter through the close of trading on the second full business day after release of the quarter's operating results to the public. This blackout period is intended to remove any appearance that you may have traded based on material nonpublic information concerning the financial results.

2. If, during times other than the blackout period referred to above, they possess material information (good or bad) that is unknown to the general public (in other words, information that they have not read in the newspaper, Tyler's press releases, or annual or quarterly reports, or seen publicly displayed on the bulletin boards around Tyler's facilities), then they are prohibited from buying or selling Tyler stock until after the close of trading on the second full business day after such material information has been released to the public.

3. They are prohibited from sharing material nonpublic information with others (friends,

family, stockbrokers, strangers) that buy or sell our stock or recommending that they trade or hold Tyler stock based on the material nonpublic information or at any time when the employee, officer, or director possesses material nonpublic information.

4. They may not give material nonpublic information to others, even if they are not buying or selling Tyler stock, without Tyler's permission. In other words, they may not give this information except where it is required in the performance of duties as an employee, officer, or director of Tyler and they have permission to do so.

These restrictions also apply to family members and others living in the household of the employee, officer, or director.

These general trading limitations are based upon U.S. securities laws. Compliance with these general rules should mean compliance with applicable U.S. laws, as well as the regulations of the New York Stock Exchange.

Property Rights

During and subsequent to employment by Tyler, an employee must disclose to Tyler all ideas, concepts, inventions, improvements, and discoveries, including those related to software, and any and all writings including those related to software, regardless of the media that are conceived, made, or reduced to practice by the employee, provided that such ideas, concepts, inventions, improvements, and discoveries arise from or relate to work done for or on behalf of Tyler, relate to Tyler's business, involve the employee's use of Tyler equipment, facilities, or time, or arise out of any information received regarding Tyler's business. It is each employee's responsibility to fully disclose to Tyler as promptly as available all information known or possessed by the employee concerning these property rights. Where appropriate, ideas or questions should be directed to Tyler's chief legal officer for patent, copyright, trademark, or trade secret protection.

Employee Health and Safety

Creating and maintaining a safe environment for our employees is a priority at Tyler. As a company, Tyler makes every effort to comply with all applicable health and safety laws, enlisting the assistance of employees to help keep facilities free of hazardous conditions. Employees should immediately report all work-related accidents or injuries as well as any hazardous or unsafe conditions. In addition, Tyler will not tolerate any violent behavior in the workplace.

Equal Employment and Non-Discrimination

Tyler believes it is important to have a diverse workforce and an inclusive workplace, and is committed to encouraging diversity of background, culture, experiences, insights, and skills in its workforce. In keeping with Tyler's commitment to the personal dignity of employees, Tyler supports each individual's right to be treated with courtesy and respect.

Tyler is an equal opportunity / affirmative action employer and prohibits discrimination and

promotes equality in its employment policies and practices. Management and supervisory employees are responsible for making decisions affecting employees without regard to race, religion, color, gender/sex, gender identity, gender expression, sexual orientation, marital status, creed, national origin, ancestry, citizenship status, age, disability, veteran's status, and any other status protected under local, state, or federal laws. This includes decisions regarding all aspects of the employment relationship, including recruitment, selection, promotion and transfers, performance appraisals, compensation, and termination.

These policies are implemented in compliance with applicable federal, state and local nondiscrimination and affirmative action laws and regulations.

If an employee believes that they have been subjected to discrimination by employees, officers or agents for Tyler, they should report the incident to their manager, their human resources representative, or directly to their division president, who will investigate and attempt to resolve the matter.

Anti-Harassment Policy

In order to promote a professional and productive work environment in which all employees are treated with dignity, courtesy, and respect, Tyler has adopted an Anti-Harassment Policy prohibiting all forms of harassment. Such policy is included in Tyler's Employee Handbook and has been distributed to all employees.

If at any time an employee feels that they have been subjected to or has observed harassment, he or she should report the incident to any supervisor or manager. If the employee is not comfortable taking the complaint to a supervisor or manager, they should contact their human resources representative, their division president, or the chief human resources officer. Employees may also make a complaint, anonymous or not, via Tyler's Whistleblower Hotline either online or by telephone.

Tyler also prohibits any adverse action or retaliation against an employee who makes a complaint or otherwise participates in an investigation of discrimination or harassment. Tyler will take disciplinary action against anyone who attempts to retaliate.

NYS Department of State

Division of Corporations

Entity Information

The information contained in this database is current through November 17, 2020.

Selected Entity Name: TYLER TECHNOLOGIES, INC.
Selected Entity Status Information

Current Entity Name:	TYLER TECHNOLOGIES, INC.
DOS ID #:	3168959
Initial DOS Filing Date:	FEBRUARY 25, 2005
County:	ALBANY
Jurisdiction:	DELAWARE
Entity Type:	FOREIGN BUSINESS CORPORATION
Current Entity Status:	ACTIVE

Selected Entity Address Information

DOS Process (Address to which DOS will mail process if accepted on behalf of the entity)

TYLER TECHNOLOGIES, INC.
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Chief Executive Officer

JOHN S MARR JR
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Principal Executive Office

TYLER TECHNOLOGIES, INC.
5101 TENNYSON PARKWAY
PLANO, TEXAS, 75024

Registered Agent

CAPITOL SERVICES, INC.
1218 CENTRAL AVENUE, SUITE 100
ALBANY, NEW YORK, 12205

This office does not record information regarding the names and addresses of officers, shareholders or directors of nonprofessional corporations except the chief executive officer, if provided, which would be listed above. Professional corporations must include the name(s) and address(es) of the initial officers, directors, and shareholders in the initial certificate of incorporation, however this information is not recorded and only available by viewing the certificate.

***Stock Information**

# of Shares	Type of Stock	$ Value per Share
No Information Available		

*Stock information is applicable to domestic business corporations.

Name History

Filing Date	Name Type	Entity Name
FEB 25, 2005	Actual	TYLER TECHNOLOGIES, INC.

A **Fictitious** name must be used when the **Actual** name of a foreign entity is unavailable for use in New York State. The entity must use the fictitious name when conducting its activities or business in New York State.

NOTE: New York State does not issue organizational identification numbers.

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PRINCIPAL QUESTIONNAIRE FORM

All questions on these questionnaires must be answered by all officers and any individuals who hold a ten percent (10%) or greater ownership interest in the proposer. Answers typewritten or printed in ink. If you need more space to answer any question, make as many photocopies of the appropriate page(s) as necessary and attach them to the questionnaire.

COMPLETE THIS QUESTIONNAIRE CAREFULLY AND COMPLETELY. FAILURE TO SUBMIT A COMPLETE QUESTIONNAIRE MAY MEAN THAT YOUR BID OR PROPOSAL WILL BE REJECTED AS NON-RESPONSIVE AND IT WILL NOT BE CONSIDERED FOR AWARD

1. Principal Name: Bryan Proctor
Date of birth: 05/17/1976
Home address: 1021 Marywood Drive
City: Royal Oak State/Province/Territory: MI Zip/Postal Code: 48067
Country: US

Business Address: 840 West Long Lake Road
City: Troy State/Province/Territory: MI Zip/Postal Code: 48098
Country US
Telephone: 2482691000

Other present address(es):
City: State/Province/Territory: Zip/Postal Code:
Country:
Telephone:

List of other addresses and telephone numbers attached

2. Positions held in submitting business and starting date of each (check all applicable)

President
Chairman of Board
Chief Exec. Officer
Chief Financial Officer
Vice President
(Other)
Treasurer
Shareholder
Secretary
Partner

Type	Description	Start Date
Other	President, Public Safety Division	09/09/2019

3. Do you have an equity interest in the business submitting the questionnaire?
YES [X] NO [ ] If Yes, provide details.

Bryan Proctor owns less than a 10% interest. Only 1.47% of Tyler Technologies, Inc.'s shares are held by insiders. Please see attached document.

1 File(s) Uploaded: Stockholder Information 112020.pdf

4. Are there any outstanding loans, guarantees or any other form of security or lease or any other type of contribution made in whole or in part between you and the business submitting the questionnaire?
YES [ ] NO [X] If Yes, provide details.

5. Within the past 3 years, have you been a principal owner or officer of any business or notfor-profit organization other than the one submitting the questionnaire?

YES [ ] NO [X] If Yes, provide details.

6. Has any governmental entity awarded any contracts to a business or organization listed in Section 5 in the past 3 years while you were a principal owner or officer?

YES [ ] NO [X] If Yes, provide details.

NOTE: An affirmative answer is required below whether the sanction arose automatically, by operation of law, or as a result of any action taken by a government agency. Provide a detailed response to all questions checked "YES". If you need more space, photocopy the appropriate page and attach it to the questionnaire.

7. In the past (5) years, have you and/or any affiliated businesses or not-for-profit organizations listed in Section 5 in which you have been a principal owner or officer:

a. Been debarred by any government agency from entering into contracts with that agency?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

b. Been declared in default and/or terminated for cause on any contract, and/or had any contracts cancelled for cause?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

c. Been denied the award of a contract and/or the opportunity to bid on a contract, including, but not limited to, failure to meet pre-qualification standards?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

d. Been suspended by any government agency from entering into any contract with it; and/or is any action pending that could formally debar or otherwise affect such business's ability to bid or propose on contract?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

8. Have any of the businesses or organizations listed in response to Question 5 filed a bankruptcy petition and/or been the subject of involuntary bankruptcy proceedings during the past 7 years, and/or for any portion of the last 7 year period, been in a state of bankruptcy as a result of bankruptcy proceedings initiated more than 7 years ago and/or is any such business now the subject of any pending bankruptcy proceedings, whenever initiated?
YES [ ] NO [X] If 'Yes', provide details for each such instance. (Provide a detailed response to all questions check "Yes". If you need more space, photocopy the appropriate page and attached it to the questionnaire.)

9.

a. Is there any felony charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

b. Is there any misdemeanor charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

c. Is there any administrative charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

d. In the past 10 years, have you been convicted, after trial or by plea, of any felony, or of any other crime, an element of which relates to truthfulness or the underlying facts of which related to the conduct of business? Y
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

e. In the past 5 years, have you been convicted, after trial or by plea, of a misdemeanor?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

f. In the past 5 years, have you been found in violation of any administrative or statutory charges?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

10. In addition to the information provided in response to the previous questions, in the past 5 years, have you been the subject of a criminal investigation and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency and/or the subject of an investigation where such investigation was related to activities performed at, for, or on behalf of the submitting business entity and/or an affiliated business listed in response to Question 5?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

11. In addition to the information provided, in the past 5 years has any business or organization listed in response to Question 5, been the subject of a criminal investigation and/or a civil anti-trust investigation and/or any other type of investigation by any government agency, including but not limited to federal, state, and local regulatory agencies while you were a principal owner or officer?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

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YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

I, Bryan Proctor, hereby acknowledge that a materially false statement willfully or fraudulently made in connection with this form may result in rendering the submitting business entity and/or any affiliated entities non-responsible, and, in addition, may subject me to criminal charges.

I, Bryan Proctor, hereby certify that I have read and understand all the items contained in this form; that I supplied full and complete answers to each item therein to the best of my knowledge, information and belief; that I will notify the County in writing of any change in circumstances occurring after the submission of this form; and that all information supplied by me is true to the best of my knowledge, information and belief. I understand that the County will rely on the information supplied in this form as additional inducement to enter into a contract with the submitting business entity.

CERTIFICATION

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Tyler Technologies, Inc.

Name of submitting business

Electronically signed and certified at the date and time indicated by:
Bryan Proctor [BRYAN.PROCTOR@TYLERTECH.COM]

President, Public Safety Division

Title

11/20/2020 01:28:00 PM

Date

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-10.29 (-0.29%)	-135.79 (-0.46%)	+7.64 (+0.06%)	-8.25 (-0.46%)

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Tyler Technologies, Inc. (TYL)

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414.00 -0.38 (-0.09%)

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Major Holders

Breakdown

Currency in USD

1.47%	% of Shares Held by All Insider
97.27%	% of Shares Held by Institutions
98.72%	% of Float Held by Institutions
790	Number of Institutions Holding Shares

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Top Institutional Holders

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Vanguard Group, Inc. (The)	4,496,600	Sep 29, 2020	11.15%	1,567,334,896
State Street Corporation	1,735,571	Sep 29, 2020	4.30%	604,950,627
Brown Capital Management, Inc.	1,573,552	Sep 29, 2020	3.90%	548,477,285
Capital World Investors	1,019,511	Sep 29, 2020	2.53%	355,360,754
Neuberger Berman Group, LLC	867,201	Sep 29, 2020	2.15%	302,271,580
Franklin Resources, Inc.	829,678	Sep 29, 2020	2.06%	289,192,563
Janus Henderson Group PLC	776,709	Sep 29, 2020	1.93%	270,729,689
AllianceBernstein, L.P.	756,343	Sep 29, 2020	1.88%	263,630,916
Artisan Partners Limited Partnership	746,275	Sep 29, 2020	1.85%	260,121,614

Top Mutual Fund Holders

Holder	Shares	Date Reported	% Out	Value
Vanguard Total Stock Market Index Fund	1,133,575	Jun 29, 2020	2.81%	393,214,496
iShares MSCI USA Min Vol Factor ETF	871,246	Sep 29, 2020	2.16%	303,681,505
Brown Capital Management Small Company Fund	859,537	Sep 29, 2020	2.13%	299,600,216
Vanguard 500 Index Fund	817,021	Jun 29, 2020	2.03%	283,408,244
Growth Fund Of America Inc	740,655	Sep 29, 2020	1.84%	258,162,706
Neuberger & Berman Genesis Fund	599,270	Sep 29, 2020	1.49%	208,881,551
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PRINCIPAL QUESTIONNAIRE FORM

All questions on these questionnaires must be answered by all officers and any individuals who hold a ten percent (10%) or greater ownership interest in the proposer. Answers typewritten or printed in ink. If you need more space to answer any question, make as many photocopies of the appropriate page(s) as necessary and attach them to the questionnaire.

COMPLETE THIS QUESTIONNAIRE CAREFULLY AND COMPLETELY. FAILURE TO SUBMIT A COMPLETE QUESTIONNAIRE MAY MEAN THAT YOUR BID OR PROPOSAL WILL BE REJECTED AS NON-RESPONSIVE AND IT WILL NOT BE CONSIDERED FOR AWARD

1. Principal Name: Mark Hawkins
Date of birth: 07/23/1975
Home address: 2125 Stags Leap
City: Celina State/Province/Territory: TX Zip/Postal Code: 75009
Country: US

Business Address: 5101 Tennyson Parkway
City: Plano State/Province/Territory: TX Zip/Postal Code: 75024
Country US
Telephone: (972) 713-3770

Other present address(es):
City: State/Province/Territory: Zip/Postal Code:
Country:
Telephone:

List of other addresses and telephone numbers attached

2. Positions held in submitting business and starting date of each (check all applicable)

President
Chairman of Board
Chief Exec. Officer
Chief Financial Officer
Vice President
(Other)
Treasurer
Shareholder
Secretary
Partner

Type	Description	Start Date
Other	Senior Vice President of Operations, Appraisal & Tax Division	08/01/2015
Other	President, Appraisal & Tax Division	02/18/2019

3. Do you have an equity interest in the business submitting the questionnaire?
YES [X] NO [ ] If Yes, provide details.

Mark Hawkins owns less than a 10% interest. Only 1.47% of Tyler Technologies, Inc.'s shares are held by insiders. Please see attached document.

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4. Are there any outstanding loans, guarantees or any other form of security or lease or any other type of contribution made in whole or in part between you and the business submitting the questionnaire?
YES [ ] NO [X] If Yes, provide details.

5. Within the past 3 years, have you been a principal owner or officer of any business or notfor-profit organization other than the one submitting the questionnaire?

YES [ ] NO [X] If Yes, provide details.

6. Has any governmental entity awarded any contracts to a business or organization listed in Section 5 in the past 3 years while you were a principal owner or officer?

YES [ ] NO [X] If Yes, provide details.

NOTE: An affirmative answer is required below whether the sanction arose automatically, by operation of law, or as a result of any action taken by a government agency. Provide a detailed response to all questions checked "YES". If you need more space, photocopy the appropriate page and attach it to the questionnaire.

7. In the past (5) years, have you and/or any affiliated businesses or not-for-profit organizations listed in Section 5 in which you have been a principal owner or officer:

a. Been debarred by any government agency from entering into contracts with that agency?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

b. Been declared in default and/or terminated for cause on any contract, and/or had any contracts cancelled for cause?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

c. Been denied the award of a contract and/or the opportunity to bid on a contract, including, but not limited to, failure to meet pre-qualification standards?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

d. Been suspended by any government agency from entering into any contract with it; and/or is any action pending that could formally debar or otherwise affect such business's ability to bid or propose on contract?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

8. Have any of the businesses or organizations listed in response to Question 5 filed a bankruptcy petition and/or been the subject of involuntary bankruptcy proceedings during the past 7 years, and/or for any portion of the last 7 year period, been in a state of bankruptcy as a result of bankruptcy proceedings initiated more than 7 years ago and/or is any such business now the subject of any pending bankruptcy proceedings, whenever initiated?
YES [ ] NO [X] If 'Yes', provide details for each such instance. (Provide a detailed response to all questions check "Yes". If you need more space, photocopy the appropriate page and attached it to the questionnaire.)

9.

a. Is there any felony charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

b. Is there any misdemeanor charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

c. Is there any administrative charge pending against you?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

d. In the past 10 years, have you been convicted, after trial or by plea, of any felony, or of any other crime, an element of which relates to truthfulness or the underlying facts of which related to the conduct of business? Y
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

e. In the past 5 years, have you been convicted, after trial or by plea, of a misdemeanor?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

f. In the past 5 years, have you been found in violation of any administrative or statutory charges?
YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

10. In addition to the information provided in response to the previous questions, in the past 5 years, have you been the subject of a criminal investigation and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency and/or the subject of an investigation where such investigation was related to activities performed at, for, or on behalf of the submitting business entity and/or an affiliated business listed in response to Question 5?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

11. In addition to the information provided, in the past 5 years has any business or organization listed in response to Question 5, been the subject of a criminal investigation and/or a civil anti-trust investigation and/or any other type of investigation by any government agency, including but not limited to federal, state, and local regulatory agencies while you were a principal owner or officer?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

12. In the past 5 years, have you or this business, or any other affiliated business listed in response to Question 5 had any sanction imposed as a result of judicial or administrative proceedings with respect to any professional license held?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

13. For the past 5 tax years, have you failed to file any required tax returns or failed to pay any applicable federal, state or local taxes or other assessed charges, including but not limited to water and sewer charges?

YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

I, Mark Hawkins, hereby acknowledge that a materially false statement willfully or fraudulently made in connection with this form may result in rendering the submitting business entity and/or any affiliated entities non-responsible, and, in addition, may subject me to criminal charges.

I, Mark Hawkins, hereby certify that I have read and understand all the items contained in this form; that I supplied full and complete answers to each item therein to the best of my knowledge, information and belief; that I will notify the County in writing of any change in circumstances occurring after the submission of this form; and that all information supplied by me is true to the best of my knowledge, information and belief. I understand that the County will rely on the information supplied in this form as additional inducement to enter into a contract with the submitting business entity.

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Tyler Technologies, Inc.

Name of submitting business

Electronically signed and certified at the date and time indicated by:
Mark Hawkins [MARK.HAWKINS@TYLERTECH.COM]

President, Appraisal & Tax Division

Title

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Major Holders
Breakdown

Currency in USD

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97.27%	% of Shares Held by Institutions
98.72%	% of Float Held by Institutions
798	Number of Institutions Holding Shares

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Trade like it's not your first rodeo

Top Institutional Holders

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1. Principal Name: John S. Marr, Jr.
Date of birth: 03/07/1960
Home address: 5 Orchard Lane
City: Falmouth State/Province/Territory: ME Zip/Postal Code: 04105
Country: US

Business Address: One Tyler Drive
City: Yarmouth State/Province/Territory: ME Zip/Postal Code: 04096
Country US
Telephone: (207) 772-2260

Other present address(es):
City: State/Province/Territory: Zip/Postal Code:
Country:
Telephone:

List of other addresses and telephone numbers attached

2. Positions held in submitting business and starting date of each (check all applicable)

President	07/01/2004	Treasurer	
Chairman of Board	01/01/2017	Shareholder	
Chief Exec. Officer	07/01/2004	Secretary	
Chief Financial Officer		Partner	
Vice President			
(Other)			

Type	Description	Start Date
Other	Chief Operating Officer	07/01/2003
Other	Executive Chairman of the Board	05/09/2018
Other	President of Munis	01/01/1994
Other	Director, Board of Directors	05/01/2002

3. Do you have an equity interest in the business submitting the questionnaire?
YES [X] NO [ ] If Yes, provide details.

John Marr Jr. owns less than a 10% interest. Only 1.47% of Tyler Technologies Inc.'s shares are held by insiders. Please see attached document.

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4. Are there any outstanding loans, guarantees or any other form of security or lease or any other type of contribution made in whole or in part between you and the business submitting the questionnaire?
YES [ ] NO [X] If Yes, provide details.

5. Within the past 3 years, have you been a principal owner or officer of any business or notfor-profit organization other than the one submitting the questionnaire?

YES [X] NO [ ] If Yes, provide details.

Handy Boat (Boat Yard and Restaurant)
215 Foreside Road
Falmouth, ME 04105
Co-Owner with wife, Rebecca Marr

6. Has any governmental entity awarded any contracts to a business or organization listed in Section 5 in the past 3 years while you were a principal owner or officer?

YES [ ] NO [X] If Yes, provide details.

NOTE: An affirmative answer is required below whether the sanction arose automatically, by operation of law, or as a result of any action taken by a government agency. Provide a detailed response to all questions checked "YES". If you need more space, photocopy the appropriate page and attach it to the questionnaire.

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YES [ ] NO [X] If yes, provide an explanation of the circumstances and corrective action taken.

I, John S. Marr, Jr. , hereby acknowledge that a materially false statement willfully or fraudulently made in connection with this form may result in rendering the submitting business entity and/or any affiliated entities non-responsible, and, in addition, may subject me to criminal charges.

I, John S. Marr, Jr. , hereby certify that I have read and understand all the items contained in this form; that I supplied full and complete answers to each item therein to the best of my knowledge, information and belief; that I will notify the County in writing of any change in circumstances occurring after the submission of this form; and that all information supplied by me is true to the best of my knowledge, information and belief. I understand that the County will rely on the information supplied in this form as additional inducement to enter into a contract with the submitting business entity.

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Tyler Technologies, Inc.

Name of submitting business

Electronically signed and certified at the date and time indicated by:
John S. Marr, Jr. [JOHN.MARRJR@TYLERTECH.COM]

Executive Chairman of the Board

Title

11/20/2020 10:39:25 AM

Date

U.S. markets close in 5 hours 32 minutes

S&P 500	Dow 30	Nasdaq	Russell 2000
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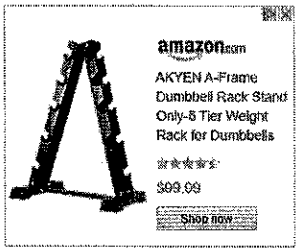

Major Holders | Insider Roster | Insider Transactions

Major Holders
Breakdown

Currency in USD

1.47%	% of Shares Held by All Insider
97.27%	% of Shares Held by Institutions
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790	Number of Institutions Holding Shares

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Janus Henderson Group PLC	776,709	Sep 29, 2020	1.93%	270,729,689
AllianceBernstein, L.P.	756,343	Sep 29, 2020	1.88%	263,630,916
Artisan Partners Limited Partnership	746,275	Sep 29, 2020	1.85%	260,121,614

Top Mutual Fund Holders

Holder	Shares	Date Reported	% Out	Value
Vanguard Total Stock Market Index Fund	1,133,575	Jun 29, 2020	2.81%	393,214,496
iShares MSCI USA Min Vol Factor ETF	871,246	Sep 29, 2020	2.16%	303,681,505
Brown Capital Management Small Company Fund	859,537	Sep 29, 2020	2.13%	299,600,216
Vanguard 500 Index Fund	817,021	Jun 29, 2020	2.03%	283,408,244
Growth Fund Of America Inc	740,655	Sep 29, 2020	1.84%	258,162,706
Neuberger & Berman Genesis Fund	599,270	Sep 29, 2020	1.49%	208,881,551
Vanguard Small-Cap Index Fund	497,771	Jun 29, 2020	1.23%	172,666,804
Vanguard Mid-Cap Index Fund	493,322	Jun 29, 2020	1.22%	171,123,535
Principal Mid Cap Fund	445,539	Sep 29, 2020	1.10%	155,297,073
MFS Mid Cap Growth Fund	413,887	Aug 30, 2020	1.03%	142,919,319

COUNTY OF NASSAU

CONSULTANT'S, CONTRACTOR'S AND VENDOR'S DISCLOSURE FORM

1. Name of the Entity: Tyler Technologies, Inc.

Address: 5101 Tennyson Parkway

City: Plano State/Province/Territory: TX Zip/Postal Code: 75024

Country: US

2. Entity's Vendor Identification Number: 752303920

3. Type of Business: Public Corp (specify)

4. List names and addresses of all principals; that is, all individuals serving on the Board of Directors or comparable body, all partners and limited partners, all corporate officers, all parties of Joint Ventures, and all members and officers of limited liability companies (attach additional sheets if necessary):

1 File(s) uploaded Directors and Officers (11.1.20).docx

No principals have been attached to this form.

5. List names and addresses of all shareholders, members, or partners of the firm. If the shareholder is not an individual, list the individual shareholders/partners/members. If a Publicly held Corporation, include a copy of the 10K in lieu of completing this section.
If none, explain.

1 File(s) uploaded Tyler Technologies 10K (2.19.20).pdf

No shareholders, members, or partners have been attached to this form.

6. List all affiliated and related companies and their relationship to the firm entered on line 1. above (if none, enter "None"). Attach a separate disclosure form for each affiliated or subsidiary company that may take part in the performance of this contract. Such disclosure shall be updated to include affiliated or subsidiary companies not previously disclosed that participate in the performance of the contract.

Tyler Technologies A&T Services, LLC - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Appraisal & Tax Services, ULC - wholly owned subsidiary of Tyler Technologies A&T Services, LLC
Socrata, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Micropact, Inc. - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Technologies Australia PTY LTD - wholly owned subsidiary of Tyler Technologies, Inc.
Tyler Foundation - non-profit, charitable organization funded by Tyler Technologies, Inc.

7. List all lobbyists whose services were utilized at any stage in this matter (i.e., pre-bid, bid, post-bid, etc.). If none, ente "None." The term "lobbyist" means any and every person or organization retained, employed or designated by any clien to influence - or promote a matter before - Nassau County, its agencies, boards, commissions, department heads, legislators or committees, including but not limited to the Open Space and Parks Advisory Committee and Planning Commission. Such matters include, but are not limited to, requests for proposals, development or improvement of real property subject to County regulation, procurements. The term "lobbyist" does not include any officer, director, trustee, employee, counsel or agent of the County of Nassau, or State of New York, when discharging his or her official duties.

Are there lobbyists involved in this matter?
YES [ ] NO [X]

(a) Name, title, business address and telephone number of lobbyist(s):

None

(b) Describe lobbying activity of each lobbyist. See below for a complete description of lobbying activities.

None

(c) List whether and where the person/organization is registered as a lobbyist (e.g., Nassau County, New York State):

None

8. VERIFICATION: This section must be signed by a principal of the consultant, contractor or Vendor authorized as a signatory of the firm for the purpose of executing Contracts.

The undersigned affirms and so swears that he/she has read and understood the foregoing statements and they are, to his/her knowledge, true and accurate.

Electronically signed and certified at the date and time indicated by:
Abigail Diaz [ABIGAIL.DIAZ@TYLERTECH.COM]

Dated: 11/20/2020 11:12:49 AM

Title: Chief Legal Officer

The term lobbying shall mean any attempt to influence: any determination made by the Nassau County Legislature, or any member thereof, with respect to the introduction, passage, defeat, or substance of any local legislation or resolution; any determination by the County Executive to support, oppose, approve or disapprove any local legislation or resolution, whether or not such legislation has been introduced in the County Legislature; any determination by an elected County official or an officer or employee of the County with respect to the procurement of goods, services or construction, including the preparation of contract specifications, including by not limited to the preparation of requests for proposals, or solicitation, award or administration of a contract or with respect to the solicitation, award or administration of a grant, loan, or agreement involving the disbursement of public monies; any determination made by the County Executive, County Legislature, or by the County of Nassau, its agencies, boards, commissions, department heads or committees, including but not limited to the Open Space and Parks Advisory Committee, the Planning Commission, with respect to the zoning, use, development or improvement of real property subject to County regulation, or any agencies, boards, commissions, department heads or committees with respect to requests for proposals, bidding, procurement or contracting for services for the County; any determination made by an elected county official or an officer or employee of the county with respect to the terms of the acquisition or disposition by the county of any interest in real property, with respect to a license or permit for the use of real property of or by the county, or with respect to a franchise, concession or revocable consent; the proposal, adoption, amendment or rejection by an agency of any rule having the force and effect of law; the decision to hold, timing or outcome of any rate making proceeding before an agency; the agenda or any determination of a board or commission; any determination regarding the calendaring or scope of any legislature oversight hearing; the issuance, repeal, modification or substance of a County Executive Order; or any determination made by an elected county official or an officer or employee of the county to support or oppose any state or federal legislation, rule or regulation, including any determination made to support or oppose that is contingent on any amendment of such legislation, rule or regulation, whether or not such legislation has been formally introduced and whether or not such rule or regulation has been formally proposed.

Tyler Technologies, Inc. Directors as of 11/01/2020

- Donald R. Brattain – 5101 Tennyson Parkway, Plano TX 75024
- Glenn A. Carter – 5101 Tennyson Parkway, Plano TX 75024
- Brenda A. Cline – 5101 Tennyson Parkway, Plano TX 75024
- J. Luther King, Jr. – 5101 Tennyson Parkway, Plano TX 75024
- Mary Landrieu - 5101 Tennyson Parkway, Plano TX 75024
- John S. Marr, Jr. – One Tyler Drive, Yarmouth, ME 04096
- Daniel M. Pope – 5101 Tennyson Parkway, Plano TX 75024
- Dustin R. Womble – 5519 53rd Street, Lubbock, TX 79414
- H. Lynn Moore, Jr. – 5101 Tennyson Parkway, Plano TX 75024

Tyler Technologies, Inc. Officers as of 11/01/2020

- John S. Marr Jr. – One Tyler Drive, Yarmouth, ME 04096
  Executive Chairman of the Board
- Brian K. Miller – 5101 Tennyson Parkway, Plano TX 75024
  Executive Vice President, Chief Financial Officer and Treasurer
- H. Lynn Moore Jr. – 5101 Tennyson Parkway, Plano TX 75024
  Chief Executive Officer, President
- Matthew B. Bieri – 5101 Tennyson Parkway, Plano TX 75024
  Chief Information Officer
- Samantha B. Crosby – 5101 Tennyson Parkway, Plano TX 75024
  Chief Marketing Officer
- Bruce Graham – 5101 Tennyson Parkway, Plano TX 75024
  Senior Strategy Officer
- Jeff Puckett – 5101 Tennyson Parkway, Plano TX 75024
- **Chief Strategy Officer**
- Kelly Shimansky – One Tyler Drive, Yarmouth, ME 04096
  Chief Human Resources Officer
- W. Michael Smith – 5101 Tennyson Parkway, Plano TX 75024
  Chief Accounting Officer
- Brett Cate - 5519 53rd Street, Lubbock, TX 79414
  Chief Sales Officer
- Abigail Diaz - One Tyler Drive, Yarmouth, ME 04096
  Chief Legal Officer, Secretary
- Jeff Green – 1601 East Valley Rd., Ste. 200, Renton, WA 98057
  Chief Technology Officer

- Christopher P. Hepburn – One Tyler Drive, Yarmouth, ME 04096
  President, Enterprise Group
- Chris Webster – One Tyler Drive, Yarmouth, ME 04096
  President, ERP & School Division
- Dane Womble – 5519 53rd Street, Lubbock, TX 79414
  President, Local Government Division
- Mark Hawkins – One Tyler Way, Moraine, OH 45439
  President, Appraisal & Tax Division
- Bret Dixon - 5101 Tennyson Parkway, Plano, TX 75024
  President, Justice Group
- Rusty Smith - 5101 Tennyson Parkway, Plano, TX 75024
  President, Courts & Justice Division
- Bryan Procter – 840 West Long Lake Rd., Troy MI 48098
  President, Public Safety Division
- Franklin Williams – 255 South King Street, Suite 1100, Seattle, WA 98104
  President, Data & Insights Division
- Kris Collo - 5101 Tennyson Parkway, Plano, TX 75024
  President, Federal Division

REQUISITION

RQIT21000038 31/MAR/2021

VENDOR:		REQUISITIONER:	
TYLER TECHNOLOGIES, INC		IT DEPARTMENT OF INFORMATION TECH	
12 GOOSE LN		240 OLD COUNTRY ROAD	
		6TH FLOOR	
TOLLAND	CT 06084-0000	MINEOLA	NY 11501
		S.BARNETT/MARY MAHONEY	
TEL:(800)273-8605		TEL:(516)571-3159	
FAX:(860)872-9526		FAX:(516)571-3918	

ITEM	DESCRIPTION	QTY	U/M	UNIT COST	TOTAL
001	920-45	1.00	LOT	635,250.0000	635,250.00

COMPUTER SOFTWARE MAINTENANCE/SUPPORT

2021 IAS MAINTENANCE RENEWAL 1/1/2021-12/31/2021	$342,235.00
2021 ADAPT MAINTENANCE RENEWAL 1/1/2021-12/31/2021	$293,015.00
ADAPT MAINTENANCE:	==========
TAX BILLING & COLLECTION	$635,250.00

DELINQUENT TAX
APPEALS MANAGEMENT
EDMS INTERFACE (IDOC)
INCLUDES: UPGRADES, NEW ENHANCEMENT RELEASES, HOT BUG FIXES/PATCHES
MON-FRI 8:00 AM - 5:00 PM TOLL FREE TELEPHONE SUPPORT,
USER GROUP

BILL TO: I.T. ACCOUNTS PAYABLE
240 OLD COUNTRY ROAD 6TH FL
MINEOLA, NY, 11501
EMAIL: ITACCOUNTING@NASSAUCOUNTYNY.GOV

ESTIMATED TOTAL: 635,250.00

REQUISITION

RQIT21000038 31/MAR/2021

VENDOR:		REQUISITIONER:	
TYLER TECHNOLOGIES, INC		IT DEPARTMENT OF INFORMATION TECH	
12 GOOSE LN		240 OLD COUNTRY ROAD	
		6TH FLOOR	
TOLLAND	CT 06084-0000	MINEOLA	NY 11501
		S.BARNETT/MARY MAHONEY	
TEL:(800)273-8605		TEL:(516)571-3159	
FAX:(860)872-9526		FAX:(516)571-3918	

tyler technologies

One Tyler Way
Moraine, Ohio 45439
P: 800.800.2581
F: 937.278.3711
www.tylertech.com

May 1, 2020

Ms. Nancy Stanton
Nassau County Commissioner
Information Technology Department
240 Old Country Road, 6th Floor
Mineola, NY 11501

Dear Ms. Stanton:

Please accept this letter as confirmation that Tyler Technologies, Inc. is the sole provider of the iasWorld® software ("iasWorld software"). Additionally, Tyler is the only party authorized to host, support, update or modify iasWorld software.

The iasWorld software products currently in use by Nassau County, NY provides for a single source of data to perform its business functions. The ability to use a single source of data (i) reduces the possible need for duplicate data entry, (ii) provides a seamless transition of data from the valuation office function to the billing and collection office function, and (iii) gives the tax office function immediate access to changes in valuations. In addition, Tyler Technologies staff are the foremost users of the Tyler software and have the abilities and access to access the solution in advanced ways that no other software service provider can.

Tyler is the sole developer and implementer of its proprietary iasWorld® software.

If you have any questions, please feel free to call (800-800-2581), or email me at kim.frisby@tylertech.com

Sincerely,

Kimberly L. Frisby

Kimberly L. Frisby
Vice President Support Services

KLF:smm:krs

Remittance:
Tyler Technologies, Inc.
(FEIN 75-2303920)
P.O. Box 203556
Dallas, TX 75320-3556

Invoice

Invoice No	Date	Page
070-5199	12/01/2020	1 of 1

Questions:
Tyler Technologies -
Phone: 1-800-772-2260 Press 2
Email: ar@tylertech.com

Bill To: Nassau County IT Dept.
Ms. Mary Mahoney
240 Old Country Road
Mineola, NY 11501

Ship To: Nassau County IT Dept.
Ms. Mary Mahoney
240 Old Country Road
Mineola, NY 11501

ustomer No.	Ord No	PO Number	Currency	Terms	Due Date
48769	4090		USD	NET30	12/31/2020

Date	Description	Units	Rate	Extended Price
	iasWorld Maintenance & Support Maintenance: Start: 01/Jan/2021, End: 31/Dec/2021	1	342,235.00	342,235.00
	ADAPT Maintenance & Support Maintenance: Start: 01/Jan/2021, End: 31/Dec/2021	1	293,015.00	293,015.00

ATTENTION
Order your checks and forms from Tyler Business Forms at 877-749-2090 or tylerbusinessforms.com to guarantee 100% compliance with your software.

Subtotal	635,250.00
Sales Tax	0.00
Invoice Total	635,250.00

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 3/26/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Hays Companies Inc.
133 Federal Street, 4th Floor
Boston MA 02110

CONTACT NAME: Moira Crosby
PHONE (A/C, No, Ext): FAX (A/C, No):
E-MAIL ADDRESS: mcrosby@hayscompanies.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Hartford Fire Insurance Company	19682
INSURER B: Hartford Casualty Insurance Company	29424
INSURER C: Lloyds of London Syndicates	4000 &
INSURER D:	9667 &
INSURER E:	1686
INSURER F:	

INSURED
Tyler Technologies, Inc.
5101 Tennyson Parkway
Plano TX 75024

COVERAGES **CERTIFICATE NUMBER:** 21-22 GL Auto UMB WC **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE / X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY / PRO-JECT / LOC OTHER:	X		08UENAY8572	4/1/2021	4/1/2022	EACH OCCURRENCE	$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 1,000,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
							PRODUCTS - COMP/OP AGG	$ 2,000,000
								$
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS / SCHEDULED AUTOS X HIRED AUTOS / X NON-OWNED AUTOS			08UENAY8572	4/1/2021	4/1/2022	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
B	X UMBRELLA LIAB / OCCUR EXCESS LIAB / CLAIMS-MADE DED / RETENTION $			08XHUAZ8392	4/1/2021	4/1/2022	EACH OCCURRENCE	$ 25,000,000
							AGGREGATE	$ 25,000,000
								$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		08WBAK8AGK	4/1/2021	4/1/2022	X PER STATUTE / OTH-ER	
							E.L. EACH ACCIDENT	$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
C	Cyber/Privacy Prof Liab			B0621PTYLE000220	12/17/2020	12/17/2021	Primary Limit	$10,000,000
C	Cyber/Privacy Prof Liab			B0621PTYLE000320	12/17/2020	12/17/2021	Excess Limit	$10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
County of Nassau is Additional Insured as respects general liability where required by written contract.

CERTIFICATE HOLDER

County of Nassau
240 Old County Rd
Mineola, NY 11501

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
James Hays/MCROSB

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The ACORD name and logo are registered marks of ACORD

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

X ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES AND EXCHANGE ACT OF 1934

For the Fiscal Year Ended December 31, 2019

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number 1-10485

TYLER TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware	75-2303920
(State or other jurisdiction of incorporation or organization)	(I.R.S. employer identification no.)
5101 Tennyson Parkway	
Plano, Texas	75024
(Address of principal executive offices)	(Zip code)

Registrant's telephone number, including area code: (972) 713-3700

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading symbol	Name of each exchange on which registered
COMMON STOCK, $0.01 PAR VALUE	TYL	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No X

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No X

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes X No ☐

Indicate by check mark if disclosure of delinquent filer pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of the Form 10-K or any amendment to the Form 10-K. Yes ☐ No X

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data file required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes X No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	X	Accelerated Filer	☐
Non-accelerated Filer (Do not check if smaller reporting company)	☐	Smaller Reporting Company	☐
		Emerging Growth Company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act.) Yes ☐ No X

The aggregate market value of the voting stock held by non-affiliates of the registrant was $8,172,267,000 based on the reported last sale price of common stock on June 30, 2019, which is the last business day of the registrant's most recently completed second fiscal quarter.

The number of shares of common stock of the registrant outstanding on February 18, 2020 was 39,396,000.

DOCUMENTS INCORPORATED BY REFERENCE

Certain information required by Part III of this annual report is incorporated by reference from the registrant's definitive proxy statement for its annual meeting of stockholders to be held on May 12, 2020.

TYLER TECHNOLOGIES, INC.
FORM 10-K
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ITEM 1. BUSINESS.

DESCRIPTION OF BUSINESS

Tyler Technologies, Inc. ("Tyler") is a major provider of integrated information management solutions and services for the public sector, with a focus on local governments. We partner with clients to make government more accessible to the public, more responsive to the needs of citizens and more efficient in its operations. We have a broad line of software solutions and services to address the information technology ("IT") needs of major areas of operations for cities, counties, schools and other government entities. A majority of our clients have our software installed in-house. For clients who prefer not to physically acquire the software and hardware, most of our software applications can be delivered as software as a service ("SaaS"), which primarily utilize the Tyler private cloud. We provide professional IT services to our clients, including software and hardware installation, data conversion, training and, at times, product modifications. In addition, we are the nation's largest provider of outsourced property appraisal services for taxing jurisdictions. We also provide continuing client support services to ensure product performance and reliability, which provides us with long-term client relationships and a significant base of recurring maintenance revenue. In addition, we provide electronic document filing ("e-filing") solutions, which simplify the filing and management of court documents.

MARKET OVERVIEW

The state and local government market is one of the largest and most decentralized IT markets in the country, consisting of all 50 states, approximately 3,000 counties, 36,000 cities and towns and 13,600 school districts. This market is also comprised of approximately 37,000 special districts and other agencies, each with specialized delegated responsibilities and unique information management requirements.

Traditionally, local government bodies and agencies performed state-mandated duties, including property assessment, record keeping, road maintenance, law enforcement, administration of election and judicial functions, and the provision of welfare assistance. Today, a host of emerging and urgent issues are confronting local governments, each of which demands a service response. These areas include criminal justice and corrections, administration and finance, public safety, health and human services, planning, regulatory and maintenance and records and document management. Transfers of responsibility from the federal and state governments to county and municipal governments and agencies in these and other areas also place additional service and financial requirements on these local government units. In addition, constituents of local governments are increasingly demanding improved service and better access to information from public entities. As a result, local governments recognize the increasing value of information management systems and services to, among other things, improve revenue collection, provide increased access to information, and streamline delivery of services to their constituents. Local government bodies are now recognizing that "e-government" is an additional responsibility for community development. From integrated tax systems to integrated civil and criminal justice information systems, many counties and cities have benefited significantly from the implementation of jurisdiction-wide systems that allow different agencies or government offices to share data and provide a more comprehensive approach to information management. Many city and county governmental agencies also have unique individual information management requirements, which must be tailored to the specific functions of each particular office.

Many local governments also have difficulties attracting and retaining the staff necessary to support their IT functions. As a result, they seek to establish long-term relationships with reliable providers of high quality IT products and services such as Tyler.

Although local governments often face budgetary constraints in their operations, their primary revenue sources are usually property taxes, and to a lesser extent, utility billings and other fees, which historically tend to be relatively stable. In addition, the acquisition of new technology typically enables local governments to operate more efficiently, and often provides a measurable return on investment that justifies the purchase of software and related services.

Gartner, Inc., a leading information technology research and advisory company, estimates that state and local government application and vertical specific software spending will grow from $17.9 billion in 2020 to $21.1 billion in 2023. The professional services and support segments of the market are expected to expand from $27.5 billion in 2020 to $29.9 billion in 2023. Application and vertical specific software sales in the primary and secondary education segments of the market is expected to expand from $3.0 billion in 2020 to $3.7 billion in 2023 while professional services and support are expected to grow from $2.5 billion in 2020 to $2.8 billion in 2023.

PRODUCTS AND SERVICES

We provide a comprehensive and flexible suite of products and services that addresses the information technology needs of cities, counties, schools and other local government entities. We derive our revenues from five primary sources:

- Sales of software licenses and royalties
- Subscription-based arrangements
- Software services
- Maintenance and support
- Appraisal services

We design, develop, market and support a broad range of software solutions to serve mission-critical "back-office" functions of the public sector with focus on local governments. Many of our software applications include Internet-accessible solutions that allow for real-time public access to a variety of information or that allow the public to transact business with local governments via the Internet. Our software solutions and services are generally grouped in eight major areas:

- Financial Management and Education
- Courts and Justice
- Public Safety
- Property Appraisal and Tax
- Planning, Regulatory and Maintenance
- Land and Vital Records Management
- Data and Insights
- Case Management and Business Process Management

Each of our core software systems consists of several fully integrated applications. For clients who acquire software for use on premises, we generally license our systems under standard perpetual license agreements that provide the client with a fully paid, nonexclusive, nontransferable right to use the software. In some of the product areas, such as financial management and education and property appraisal and tax, we offer multiple solutions designed to meet the needs of different sized governments.

We also offer SaaS arrangements, which generally utilize the Tyler private cloud, for clients who do not wish to maintain, update and operate these systems or to make up-front capital expenditures to implement these advanced technologies. For these clients, the software and client data are hosted at our data centers or at third-party locations, and clients typically sign multi-year contracts for these subscription-based services.

Historically, we have had a greater proportion of our annual revenues in the second half of our fiscal year due to governmental budget and spending cycles and the timing of system implementations for clients desiring to "go live" at the beginning of the calendar year.

A description of our suites of products and services follows:

Software Licenses

Financial Management and Education

Our financial management and education solutions are enterprise resource planning systems for local governments, which integrate information across all facets of a client organization. Our financial management solutions include modular fund accounting systems that can be tailored to meet the needs of virtually any government agency or not-for-profit entity. Our financial management systems include modules for general ledger, budget preparation, fixed assets, requisitions, purchase orders, bid management, accounts payable, contract management, accounts receivable, investment management, inventory control, project and grant accounting, work orders, job

costing, GASB reporting, payroll and human resources. All of our financial management systems are intended to conform to government auditing and financial reporting requirements and generally accepted accounting principles.

We sell utility billing systems that support the billing and collection of metered and non-metered services, along with multiple billing cycles. Our Web-enabled utility billing solutions allow clients to access information online such as average consumption and transaction history. In addition, our systems can accept secured Internet payments via credit cards and checks.

We also offer specialized products that automate numerous city and county functions, including municipal courts, parking tickets, equipment and project costing, animal licenses, business licenses, permits and inspections, code enforcement, citizen complaint tracking, ambulance billing, fleet maintenance, and cemetery records management.

In addition to providing financial management systems to K-12 schools, we sell student information systems for K-12 schools, which manage such activities as scheduling, grades and attendance. We also offer student transportation solutions to manage school bus routing optimization, fleet management, field trips and other related functions.

Tyler's financial management and education solutions include Web components that enhance local governments' service capabilities by facilitating online access to information for both employees and citizens and enabling online transactions.

Courts and Justice

We offer a complete, fully integrated suite of judicial solutions designed to handle complex, multi-jurisdictional county or statewide implementations as well as single county systems. Our solutions help eliminate duplicate data entry, promote more effective business procedures, and improve efficiency across the entire justice process.

Our unified court case management system is designed to automate the tracking and management of information involved in all case types, including criminal, traffic, civil, family, probate and juvenile courts. It also tracks the status of cases, processes fines and fees and generates the specialized judgment and sentencing documents, notices and forms required in the court process. Documents received by the court can be scanned into the electronic case file and easily retrieved for viewing. Documents generated by the court can be electronically signed and automatically attached to the electronic case file. Additional modules automate the management of court calendars, coordinate judges' schedules and generate court dockets. Our targeted courtroom technologies allow courts to rapidly review calendars, cases and view documents in the courtroom. Courts may also take advantage of our related jury management system. We also offer a solution for online dispute resolution that automates the flow and resolution of common and historically time-consuming disputes including debt, landlord, tenant, small claims, child custody and other case types.

Our court and law enforcement systems allow the public to access, via the Internet, a variety of information, including non-confidential criminal and civil court records, jail booking and release information, bond and bondsmen information, and court calendars and dockets. In addition, our systems allow cities and counties to accept payments for traffic and parking tickets over the Internet, with a seamless and automatic interface to back-office justice and financial systems.

Our prosecutor system enables state attorney offices to track and manage criminal cases, including detailed victim information and private case notes. Investigative reports and charging instrument documents can be generated and stored for later viewing. Prosecutors can schedule and record the outcome of grand jury hearings. When integrated with the court system, prosecutors can view the electronic case file and related documents, as well as manage witness lists and subpoenas needed for court hearings.

Our supervision system allows pre-trial and probation offices to manage offender caseloads. Supervision officers can track contact schedules, risk/needs assessments and reassessments, detailed drug test results, employment histories, compliance with conditions and payments of fees and restitution. Documents and forms, like pre-sentence investigations or revocation orders, can be generated and stored for easy viewing. When integrated with the jail and court systems, supervision officers obtain easy access and quick notification of offenders that have court hearings scheduled, are arrested locally, and have new warrants issued.

We also offer a court case management solution that automates and tracks all aspects of municipal courts and offices. It is a fully integrated, graphical application that provides effective case management, document processing and cash/bond management. This system complies with all state reporting and conviction reports and includes electronic reporting and also integrates with certain of our financial management solutions and public safety solutions.

Public Safety

Our public safety software is a fully unified and comprehensive solution for law enforcement, fire and EMS, including 911 / computer aided dispatch ("CAD"), records management, mobile computing, corrections management, Web-based information sharing and decision support. The modules are fully integrated, utilizing a common database and providing full functionality between modules, reducing data entry. The software provides fast, efficient dispatching, and quick access to records, reports and actionable information from an agency's database.

Our 911 / CAD solutions provide real-time, critical response dispatch functions in either single- or multi-jurisdictional environments. When integrated with our records management software, a vital link exists between dispatch and the most comprehensive records database available. Within seconds, the dispatch operator and the officer in the field can access critical information, such as prior incidents and outstanding warrants, increasing officer knowledge and safety. The solutions offer strong geographic information systems integration to help dispatchers quickly locate and send the best response during an emergency. Tyler's 911 / CAD solutions dramatically improve performance, response time and unit safety.

Our records management solutions for law enforcement and fire track statistical, operational, investigative and management data for inquiry and reporting. The systems create an efficient case processing workflow and help solve crimes with an accessible database that maintains central files on people, places, property, vehicles and criminal activity. Tyler's public safety records management solutions enable easy access to information and simplify reporting.

Our mobile computing solutions for law enforcement and fire provide instant access to local, state, regional and federal databases via mobile devices. Officers and firefighters can experience the benefits of obtaining critical, real-time information in the field, while saving time by preparing reports directly in their vehicles.

Our jail management systems document and manage information that meets the requirements of a modern jail facility. This includes the booking and housing of persons in custody, supervising defendants on a pre-trial release, maintaining offenders sentenced to local incarceration and billing other agencies for housing inmates. Searching, reporting and tracking features are integrated, allowing reliable, up-to-date access to current arrest and incarceration data, including digital mug shots. Our systems also provide warrant checks for visitors or book-ins, inmate classification and risk assessment, commissary, property and medical processing, automation of statistics, and state and federal reporting.

Our civil processing solutions manage civil process needs from document receipt through service, payment process and final closeout. We also have a mobile electronic citation solution through which law enforcement officers can easily enter citation information in a mobile device, which is automatically uploaded into the court or public safety records management systems, rather than hand-writing citations that must be re-entered into the systems.

Property Appraisal and Tax

We provide systems and software that automate the appraisal and assessment of real and personal property, including record keeping, mass appraisal, inquiry and protest tracking, appraisal and tax roll generation, tax statement processing, and electronic state-level reporting. These systems are image and video-enabled to facilitate the storage of and access to the many property-related documents and for the online storage of digital photographs of properties for use in defending values in protest situations. Other related tax applications are available for agencies that bill and collect taxes, including cities, counties, school tax offices, and special taxing and collection agencies. These systems support billing, collections, lock box operations, mortgage company electronic payments, and various reporting requirements.

Planning, Regulatory and Maintenance

Our planning, regulatory and maintenance software solutions are designed for public sector agencies such as community development, planning, building, code enforcement, tax and revenues, public works, transportation, land control, environmental, fire safety, storm water management, regulatory controls and engineering. These solutions help public sector agencies better manage their day-to-day business functions while streamlining and automating the many aspects of their land management, permitting and planning systems. Our mobile solutions extend automation to the field and Web access brings online services to citizens 24 hours a day, 365 days a year.

Land and Vital Records Management

We also offer a number of specialized software applications designed to help local governments enhance and automate operations involving records and document management. These systems record, scan and index information for the many documents maintained by local governments, such as deeds, mortgages, liens, UCC financing statements and vital records (birth, death and marriage certificates). These applications include fully integrated imaging systems with batch and scan processing capabilities and fully integrated receipting and cashiering systems, as well as Web-enabled public access.

Our content management solutions allow state and local governments and school districts to capture, deliver, manage and archive electronic information. These solutions streamline the flow of digital information throughout the organization to increase efficiency by transforming paper forms and documents into electronic images that drive key business processes.

Data and Insights

Our data and insights solutions make existing government data discoverable, usable, and actionable for government workers and the people they serve. The data and insights solution includes a data-as-a-service platform and cloud applications for open data and citizen engagement, exclusively for city, county, state, and federal government organizations. Our data and insights solutions allow government to analyze, visualize, and securely share data across multiple departments and programs. These solutions deliver data-driven innovation and cost-savings by bringing together disparate systems and leveraging the cloud to dramatically enhance the effectiveness of government programs, to improve quality of life for residents, to positively impact local economies, and to achieve excellence in government operations.

Case Management and Business Process Management

We offer a low-code application development platform solution for case management and business process management. Whether based on premises or in the cloud, its Data-First™ approach allows the application to be implemented immediately and configured continuously, enabling clients to get to work quickly while keeping costs low. Our low code application platform allows government agencies the ability to track, collaborate, and report on the data that drives activities forward.

Subscription-Based Services

Subscription-based revenue is primarily derived from our SaaS arrangements, which generally utilize the Tyler private cloud, as well as our transaction-based offerings such as e-filing solutions, online dispute resolution solutions, and online payment services.

We are able to provide the majority of our software products through our SaaS model. The clients who choose this model typically do not wish to maintain, update and operate these systems or make up-front capital expenditures to implement these advanced technologies. The contract terms for these arrangements range from one to 10 years but are typically contracted for initial periods of three to five years. The majority of our SaaS or hosting arrangements include additional professional services as well as maintenance and support services. In certain arrangements, the client may also acquire a license to the software.

As part of our subscription-based services, we provide e-filing solutions that simplify the filing and management of court related documents for courts and law offices. Revenues for e-filing are included in subscription-based revenues and are derived from transaction fees and in some cases, fixed fee arrangements. Other transaction-based fees primary relate to online payment services, which are offered with the assistance of third-party vendors.

Software Services

We provide a variety of professional IT services to clients who utilize our software products. Virtually all of our clients contract with us for installation, training, and data conversion services in connection with their implementation of Tyler's software solutions. The complete implementation process for a typical system includes planning, design, data conversion, set-up and testing. At the culmination of the implementation process, a data implementation team is generally onsite at the client's facility to ensure the smooth go-live with the new system. Implementation fees are charged separately to clients on either a fixed-fee or hourly charge basis, depending on the contract.

Both in connection with the installation of new systems and on an ongoing basis, we provide extensive training services and programs related to our products and services. Training can be provided in our training centers, onsite at clients' locations, or at meetings and conferences and can be customized to meet clients' requirements. The vast majority of our clients contract with us for training services, both to improve their employees' proficiency and productivity and to fully utilize the functionality of our systems. Training services are generally billed on an hourly or daily basis, along with travel and other expenses.

Maintenance and Support

Following the implementation of our software systems, we provide ongoing software support services to assist our clients in operating the systems and to periodically update the software. Support is provided to clients over the phone or via the Web through help desks staffed by our client support representatives. For more complicated issues, our staff, with the clients' permission, can log on to clients' systems remotely. We maintain our clients' software largely through releases that contain improvements and incremental additions of features and functionality, along with updates necessary because of legislative or regulatory changes.

Virtually all of our software clients contract with us for maintenance and support, which provides us with a significant source of recurring revenue. We generally provide maintenance and support for our on-premises clients under annual, or in some cases, multi-year contracts, with a typical fee based on a percentage of the software product's license fee. These fees can generally be increased on renewal and may also increase as new license fees increase. Maintenance and support fees are generally paid annually in advance. Most maintenance contracts automatically renew unless the client or Tyler gives notice of termination prior to expiration. Similar support is provided to our SaaS clients and is included in their subscription fees, which are classified as subscription-based revenues.

Appraisal Services

We are the nation's largest provider of property appraisal outsourcing services for local government taxing authorities. These services include

- The physical inspection of commercial and residential properties
- Data collection and processing
- Sophisticated computer analyses for property valuation
- Preparation of tax rolls
- Community education regarding the assessment process
- Arbitration between taxpayers and the assessing jurisdiction

Local government taxing authorities normally reappraise properties from time to time to update values for tax assessment purposes and to maintain equity in the taxing process. In some jurisdictions, law mandates reassessment cycles; in others, they are discretionary. While some taxing jurisdictions perform reappraisals in-house, many local governments outsource this function because of its cyclical nature and because of the specialized knowledge and expertise requirements associated with it. Our appraisal services business unit has operated in this business since 1938.

In some instances, we also provide property tax and/or appraisal software products in connection with appraisal outsourcing projects, while other clients may only engage us to provide appraisal services. Appraisal outsourcing services are somewhat seasonal in nature to the extent that winter weather conditions reduce the productivity of data collection activities in connection with those projects.

STRATEGY

Our objective is to grow our revenue and earnings organically, supplemented by focused strategic acquisitions. The key components of our business strategy are to:

- Provide high quality, value-added products and services to our clients. We compete on the basis of, among other things, delivering to clients our deep domain expertise in local government operations through the highest value products and services in the market. We believe we have achieved a reputation as a premium product and service provider to the local government market.

- Continue to expand our product and service offerings. While we already have what we believe to be the broadest line of software products for local governments, we continually upgrade our core software applications and expand our complementary product and service offerings to respond to technological advancements and the changing needs of our clients. In 2010, we began providing e-filing for courts and law offices, which simplifies the filing and management of court related documents. We believe revenue from e-filing solutions will continue to grow over time as more local and state governments mandate electronic document filings. We also offer solutions that allow the public to access data and conduct transactions with local governments, such as paying traffic tickets, property taxes and utility bills online. We believe that the addition of such features enhances the market appeal of our core products. We have also broadened our offerings of consulting and business process reengineering services.

- Expand our client base. We seek to establish long-term relationships with new clients primarily through our sales and marketing efforts. While we currently have clients in all 50 states, Canada, the Caribbean, the United Kingdom, Australia, and other international locations, not all of our solutions have achieved nationwide geographic penetration. We intend to continue to expand into new geographic markets by adding sales staff and targeting marketing efforts by solutions in those areas. We also intend to continue to expand our customer base to include more large governments. While our traditional market focus has primarily been on small and mid-sized governments, our increased size and market presence, together with the technological advances and improved scalability of certain of our solutions, are allowing us to achieve increasing success in selling to larger clients. We also expect to expand our presence in international markets by leveraging our leadership position in the United States through the disciplined pursuit of selected opportunities in other countries.

- Expand our existing client relationships. Our existing customer base offers significant opportunities for additional sales of solutions and services that we currently offer, but that existing clients do not fully utilize. Add-on sales to existing clients typically involve lower sales and marketing expenses than sales to new clients.

- Grow recurring revenues. We have a large recurring revenue base from maintenance and support and subscription-based services, which generated revenues of $726.7 million, or 67% of total revenues, in 2019. We have historically experienced very low customer turnover (approximately 2% annually) and recurring revenues continue to grow as the installed customer base increases. Subscription-based revenues have been our fastest growing revenue category over the past five years, increasing from $111.9 million in 2015 to $296.4 million in 2019.

- Maximize economies of scale and take advantage of financial leverage in our business. We seek to build and maintain a larger client base to create economies of scale, enabling us to provide value-added products and services to our clients while expanding our operating margins. Because we sell primarily "off-the-shelf" software, increased sales of the same solutions result in incrementally higher gross margins. In addition, we believe that we have a marketing and administrative infrastructure in place that can be leveraged to accommodate significant long-term growth without proportionately increasing selling, general and administrative expenses.

- Attract and retain highly qualified employees. We believe that the depth and quality of our management and staff is one of our significant strengths, and that the ability to retain such employees is crucial to our continued growth and success. We believe that our stable management team, financial strength and growth opportunities, as well as our leadership position in the local government market, enhance our attractiveness as an employer for highly skilled employees.

- Pursue selected strategic acquisitions. While we expect to primarily grow internally, from time to time we selectively pursue strategic acquisitions that provide us with one or more of the following:

  - New products and services to complement our existing offerings
  - Entry into new markets related to the public sector
  - New clients and/or geographic expansion

- Establish strategic alliances. In October 2019, we announced a strategic collaboration agreement with Amazon Web Services ("AWS") for cloud hosting services. This agreement brings together Tyler, the nation's largest software company exclusively focused on the public sector, and AWS, the broadest and deepest cloud platform. Specifically, the agreement with AWS provides the framework for development, training and collaboration in order to support next-generation applications that have the scalability, resiliency, and security AWS offers. It will assist Tyler in accelerating innovation and the development of strategic initiatives. These initiatives will bring the most advanced cloud-native services to Tyler clients, improving the flow of information and providing a better experience for state, local, and federal governments.

SALES, MARKETING, AND CLIENTS

We market our products and services through direct sales and marketing personnel located throughout the United States. Other in-house sales staff focus on add-on sales, professional services and support.

Sales of new systems are typically generated from referrals from other government offices or departments within a county or municipality, referrals from other local governments, relationships established between sales representatives and county or local officials, contacts at trade shows, direct mailings, and direct contact from prospects already familiar with us. We are active in numerous national, state, county, and local government associations, and participate in annual meetings, trade shows, and educational events.

Clients consist primarily of federal, state, county and municipal agencies, school districts and other local government offices. In counties, clients include the auditor, treasurer, tax assessor/collector, county clerk, district clerk, county and district court judges, probation officers, sheriff, and county appraiser. At municipal government sites, clients include directors from various departments, including administration, finance, utilities, public works, code enforcement, personnel, purchasing, taxation, municipal court, and police. Contracts for software products and services are generally implemented over periods of three months to one year, although some complex implementations may span multiple years, with annually renewing maintenance and support update agreements thereafter. Although either the client or we can terminate these agreements, historically almost all support and maintenance agreements are automatically renewed annually. During 2019, approximately 40% of our revenue was attributable to ongoing support and maintenance agreements.

COMPETITION

We compete with numerous local, regional, and national firms that provide or offer some or many of the same solutions and services that we provide. Many of these competitors are smaller companies that may be able to offer less expensive solutions than ours. Many of these firms operate within a specific geographic area and/or in a narrow product or service niche. We also compete with national firms, some of which have greater financial and technical resources than we do, including Oracle Corporation, Infor, SAP AG, Workday, Inc., CentralSquare Technologies, Thomson Reuters Corporation, Motorola Solutions, Inc., Axon Enterprise, Inc., and Constellation Software, Inc. In addition, we sometimes compete with consulting and systems integration firms, which develop custom systems, primarily for larger governments. We also occasionally compete with central internal information service departments of local governments, which requires us to persuade the end-user department to discontinue service by its own personnel and outsource the service to us.

We compete on a variety of factors, including price, service, name recognition, reputation, technological capabilities, and the ability to modify existing products and services to accommodate the individual requirements of the client. Our ability to offer an integrated system of applications for several offices or departments is often a competitive advantage. Local governmental units often are required to seek competitive proposals through a request for proposal process and some prospective clients use consultants to assist them with the proposal and vendor selection process.

SUPPLIERS

Substantially all of the computers, peripherals, printers, scanners, operating system software, office automation software, and other equipment necessary for the implementation and provision of our software systems and services are presently available from several third-party sources. Hardware is purchased on original equipment manufacturer or distributor terms at discounts from retail. We have not experienced any significant supply problems.

BACKLOG

At December 31, 2019, our revenue backlog was approximately $1.46 billion, compared to $1.25 billion at December 31, 2018. The backlog represents signed contracts under which the revenue has not been recognized as of year-end. Approximately $720.6 million, or 49%, of the backlog is expected to be recognized during 2020.

INTELLECTUAL PROPERTY, PROPRIETARY RIGHTS, AND LICENSES

We regard certain features of our internal operations, software, and documentation as confidential and proprietary and rely on a combination of contractual restrictions, trade secret laws and other measures to protect our proprietary intellectual property. We generally do not rely on patents. We believe that, due to the rapid rate of technological change in the computer software industry, trade secrets and copyright protection are less significant than factors such as knowledge, ability and experience of our employees, frequent product enhancements, and timeliness and quality of support services. We typically license our software products under non-exclusive license agreements, which are generally non-transferable and have a perpetual term.

EMPLOYEES

At December 31, 2019, we had 5,368 employees. None of our employees are represented by a labor union or are subject to collective bargaining agreements. We consider our relations with our employees to be positive.

INTERNET WEBSITE AND AVAILABILITY OF PUBLIC FILINGS

We file annual, quarterly, current and other reports, proxy statements and other information with the Securities and Exchange Commission, or SEC, pursuant to the Securities Exchange Act. You may read and copy any materials we file with the SEC at the SEC's Public Reference Room by calling the SEC at 1-800-732-0330. The SEC maintains an Internet site that contains reports, proxy and other information statements, and other information regarding issuers, including us, that file electronically with the SEC. The address of this site is http://www.sec.gov.

We also maintain a website at www.tylertech.com. We make available free of charge through this site our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Forms 4 and 5, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to the SEC. In addition, copies of our annual report will be made available, free of charge, upon written request.

Our "Code of Business Conduct and Ethics" is also available on our website. We intend to satisfy the disclosure requirements regarding amendments to, or waivers from, a provision of our Code of Business Conduct and Ethics by posting such information on our website.

ITEM 1A. RISK FACTORS.

An investment in our common stock involves a high degree of risk. Investors evaluating our company should carefully consider the factors described below and all other information contained in this Annual Report. Any of the following factors could materially harm our business, operating results, and financial condition. Additional factors and uncertainties not currently known to us or that we currently consider immaterial could also harm our business, operating results, and financial condition. This section should be read in conjunction with the Financial Statements and related Notes and Management's Discussion and Analysis of Financial Condition and Results of Operations included in this Annual Report. We may make forward-looking statements from time to time, both written and oral. We undertake no obligation to revise or publicly release the results of any revisions to these forward-looking statements. Our actual results may differ materially from those projected in any such forward-looking statements due to a number of factors, including those set forth below and elsewhere in this Annual Report.

Risks Associated with Our Software Products

Cyber-attacks and security vulnerabilities can disrupt our business and harm our competitive position.

Threats to IT security can take a variety of forms. Individuals and groups of hackers, and sophisticated organizations including state-sponsored organizations, may take steps that pose threats to our clients and our IT. They may, for example, develop and deploy malicious software to attack our products and services and/or gain access to our networks and data centers, or act in a coordinated manner to launch distributed denial of service or other coordinated attacks. Cyber threats are constantly evolving, thereby increasing the difficulty of detecting and successfully defending against them. Cyber threats can have cascading impacts that unfold with increasing speed across our internal networks and systems and those of our partners and clients. Breaches of our network or data security could disrupt the security of our internal systems and business applications, impair our ability to provide services to our clients and protect the privacy of their data, result in product development delays, compromise confidential or technical business information harming our competitive position, result in theft or misuse of our intellectual property or other assets, require us to allocate more resources to improve technologies, or otherwise adversely affect our business. Our business policies and internal security controls may not keep pace with these evolving threats.

Disclosure of personally identifiable information and/or other sensitive client data could result in liability and harm our reputation.

We store and process increasingly large amounts of personally identifiable information and other confidential information of our clients. The continued occurrence of high-profile data breaches provides evidence of an external environment increasingly hostile to information security. Despite our efforts to improve security controls, it is possible our security controls over personal data, our training of employees on data security, and other practices we follow may not prevent the improper disclosure of sensitive client data that we store and manage. Disclosure of personally identifiable information and/or other sensitive client data could result in liability and harm our reputation.

Hosting services for some of our products are dependent upon the uninterrupted operation of data centers.

A material portion of our business is provided through software hosting services. These hosting services depend on the uninterrupted operation of data centers and the ability to protect computer equipment and information stored in these data centers against damage that may be caused by natural disaster, fire, power loss, telecommunications or Internet failure, acts of terrorism, unauthorized intrusion, computer viruses, and other similar damaging events. If any of our data centers were to become inoperable for an extended period, we might be unable to fulfill our contractual commitments. Although we take what we believe to be reasonable precautions against such occurrences, we can give no assurance that damaging events such as these will not result in a prolonged interruption of our services, which could result in client dissatisfaction, loss of revenue, and damage to our business.

We run the risk of errors or defects with new products or enhancements to existing products.

Our software products are complex and may contain errors or defects, especially when first introduced or when new versions or enhancements are released. Any such defects could result in a loss of revenues or delay market acceptance. Our license agreements typically contain provisions designed to limit our exposure to potential liability. However, it is possible we may not always successfully negotiate such provisions in our client contracts or the limitation of liability provisions may not be effective due to existing or future federal, state, or local laws, ordinances, or judicial decisions. Although we maintain errors and omissions and general liability insurance, and we try to structure contracts to limit liability, we cannot assure you that a successful claim could not be made or would not have a material adverse effect on our future operating results.

We must timely respond to technological changes to be competitive.

The market for our products is characterized by technological change, evolving industry standards in software technology, changes in client requirements, and frequent new product introductions and enhancements. The introduction of products embodying new technologies and the emergence of new industry standards can render existing products obsolete and unmarketable. As a result, our future success will depend, in part, upon our ability to enhance existing products and develop and introduce new products that keep pace with technological developments, satisfy increasingly sophisticated client requirements, and achieve market acceptance. We cannot assure you that we will successfully identify new product opportunities and develop and bring new products to market in a timely and cost-effective manner. The products, capabilities, or technologies developed by others could also render our products or technologies obsolete or noncompetitive. Our business may be adversely affected if we are unable to develop or acquire new software products or develop enhancements to existing products on a timely and cost-effective basis, or if such new products or enhancements do not achieve market acceptance.

We may be unable to protect our proprietary rights.

Many of our product and service offerings incorporate proprietary information, trade secrets, know-how, and other intellectual property rights. We rely on a combination of contracts, copyrights, and trade secret laws to establish and protect our proprietary rights in our technology. We cannot be certain that we have taken all appropriate steps to deter misappropriation of our intellectual property. There has also been an apparent evolution in the legal standards and regulations courts and the U.S. patent office may apply in favorably evaluating software patent rights. We are not currently involved in any material intellectual property litigation; however, we may be a party to such litigation in the future to protect our proprietary information, trade secrets, know-how, and other intellectual property rights. We cannot assure you that third parties will not assert infringement or misappropriation claims against us with respect to current or future products. Any claims or litigation, with or without merit, could be time-consuming, costly, and a diversion to management. Any such claims and litigation could also cause product shipment delays or require us to enter into royalty or licensing arrangements. Such royalty or licensing arrangements, if required, may not be available on terms acceptable to us, if at all. Therefore, litigation to defend and enforce our intellectual property rights could have a material adverse effect on our business, regardless of the final outcome of such litigation.

Clients may elect to terminate our maintenance contracts and manage operations internally.

It is possible that our clients may elect to not renew maintenance contracts for our software, trying instead to maintain and operate the software themselves using their perpetual license rights (excluding software applications that we provide on a hosted or cloud basis). Alternatively, clients may elect to drop maintenance on certain modules that they ultimately decide not to use. This could adversely affect our revenues and profits. Additionally, they may inadvertently allow our intellectual property or other information to fall into the hands of third parties, including our competitors, which could adversely affect our business.

Material portions of our business require the Internet infrastructure to be reliable.

Part of our future success continues to depend on the use of the Internet as a means to access public information and perform transactions electronically, including, for example, electronic filing of court documents. This in part requires ongoing maintenance of the Internet infrastructure, especially to prevent interruptions in service, as well as additional development of that infrastructure. This requires a reliable network backbone with the necessary speed, data capacity, security, and timely development of complementary products for providing reliable Internet access and services. If this infrastructure fails to be sufficiently developed or be adequately maintained, our business would be harmed because users may not be able to access our government portals.

Risks Associated with Selling Products and Services into the Public Sector Marketplace

Selling products and services into the public sector poses unique challenges.

We derive substantially all of our revenues from sales of software and services to state, county, and city governments, other federal or municipal agencies, and other public entities. We expect that sales to public sector clients will continue to account for substantially all of our revenues in the future. We face many risks and challenges associated with contracting with governmental entities, including

- Resource limitations caused by budgetary constraints, which may provide for a termination of executed contracts due to a lack of future funding
- Long and complex sales cycles
- Contract payments at times being subject to achieving implementation milestones, and we may have differences with clients as to whether milestones have been achieved
- Political resistance to the concept of contracting with third parties to provide IT solutions
- Legislative changes affecting a local government's authority to contract with third parties
- Varying bid procedures and internal processes for bid acceptance
- Various other political factors, including changes in governmental administrations and personnel

Each of these risks is outside our control. If we fail to adequately adapt to these risks and uncertainties, our financial performance could be adversely affected.

A prolonged economic slowdown could harm our operations.

A prolonged economic slowdown or recession could reduce demand for our software products and services. Governments may face financial pressures that could in turn affect our growth rate and profitability in the future. There is no assurance that government spending levels will be unaffected by declining or stagnant general economic conditions, and if budget shortfalls occur, they may negatively impact government IT spending and could adversely affect our business.

The open bidding process creates uncertainty in predicting future contract awards.

Many governmental agencies purchase products and services through an open bidding process. Generally, a governmental entity will publish an established list of requirements requesting potential vendors to propose solutions for the established requirements. To respond successfully to these requests for proposals, we must accurately estimate our cost structure for servicing a proposed contract, the time required to establish operations for the proposed client, and the likely terms of any other third-party proposals submitted. We cannot guarantee that we will win any bids in the future through the request for proposal process, or that any winning bids will ultimately result in contracts on favorable terms. Our failure to secure contracts through the open bidding process, or to secure such contracts on favorable terms, may adversely affect our revenue and gross margins.

We face significant competition from other vendors and potential new entrants into our markets.

We believe we are a leading provider of integrated solutions for the public sector. However, we face competition from a variety of software vendors that offer products and services similar to those offered by us, as well as from companies offering to develop custom software. We compete based on a number of factors, including

- The attractiveness of our "evergreen" business strategy
- The breadth, depth, and quality of our product and service offerings
- The ability to modify our offerings to accommodate particular clients' needs
- Technological innovation
- Name recognition, reputation and references
- Price
- Our financial strength and stability

We believe our market is highly fragmented with a large number of competitors that vary in size, product platform, and product scope. Our competitors include consulting firms, publicly held companies that focus on selected segments of the public sector market, and a significant number of smaller, privately held companies. Certain competitors have greater technical, marketing, and financial resources than we do. We cannot assure you that such competitors will not develop products or offer services that are superior to our products or services or that achieve greater market acceptance.

We also compete with internal, centralized IT departments of governmental entities, which requires us to persuade the end-user to stop the internal service and outsource to us. In addition, our clients and prospective clients could elect to provide information management services internally through new or existing departments, which could reduce the market for our services.

We could face additional competition as other established and emerging companies enter the public sector software application market and new products and technologies are introduced. Increased competition could result in pricing pressure, fewer client orders, reduced gross margins, and loss of market share. Current and potential competitors may make strategic acquisitions or establish cooperative relationships among themselves or with third parties, thereby increasing the ability of their products to address the needs of our prospective clients. It is possible that new competitors or alliances may emerge and rapidly gain significant market share. We cannot assure you that we will be able to compete successfully against current and future competitors, and the failure to do so would have a material adverse effect upon our business.

Fixed-price contracts may affect our profits.

Some of our contracts are structured on a fixed-price basis, which can lead to various risks, including

- The failure to accurately estimate the resources and time required for an engagement
- The failure to effectively manage our clients' expectations regarding the scope of services delivered for a fixed fee
- The failure to timely and satisfactorily complete fixed-price engagements within budget

If we do not adequately assess and manage these and other risks, we may be subject to cost overruns and penalties, which may harm our financial performance.

Changes in the insurance markets may affect our business.

Some of our clients, primarily those for our property appraisal services, require that we secure performance bonds before they will select us as their vendor. In addition, we have in the past been required to provide letters of credit as security for the issuance of a performance bond. We cannot guarantee that we will be able to secure such performance bonds in the future on terms that are favorable to us, if at all. Our inability to obtain performance bonds on favorable terms or at all could impact our future ability to win some contract awards, particularly large property appraisal services contracts, which could negatively impact revenues. In addition, the general insurance markets may experience volatility, which may lead to future increases in our general and administrative expenses and negatively impact our operating results.

Risks Associated with Our Periodic Results and Stock Price

Fluctuations in quarterly revenue could adversely impact our operating results and stock price.

Our revenues and operating results are difficult to predict and may fluctuate substantially from quarter to quarter for a variety of reasons, including

- Prospective clients' contracting decisions are often made in the last few weeks of a quarter
- The size of license transactions can vary significantly
- Clients may unexpectedly postpone or cancel procurement processes due to changes in strategic priorities, project objectives, budget, or personnel
- Client purchasing processes vary significantly and a client's internal approval, expenditure authorization, and contract negotiation processes can be difficult and time consuming to complete, even after selection of a vendor
- The number, timing, and significance of software product enhancements and new software product announcements by us and our competitors may affect purchase decisions
- We may have to defer revenues under our revenue recognition policies and GAAP
- Clients may elect subscription-based arrangements, which result in lower software license revenues in the initial year as compared to traditional, on-premise software license arrangements, but generate higher overall subscription-based revenues over the term of the contract

In each fiscal quarter, our expense levels, operating costs, and hiring plans are based to some extent on projections of future revenues and are relatively fixed. If our actual revenues fall below expectations, we could experience a reduction in operating results. Also, if actual revenues or earnings for any given quarter fall below expectations, it may lead to a decline in our stock price.

Increases in service revenue as a percentage of total revenues could decrease overall margins.

We realize lower margins on software and appraisal service revenues than on license revenue. The majority of our contracts include both software licenses and software services. Therefore, an increase in the percentage of software service and appraisal service revenue compared to license revenue could have a detrimental impact on our overall gross margins and could adversely affect operating results.

Increases in investment in research and development could decrease overall margins.

An important element of our corporate strategy is to continue to dedicate a significant amount of resources to research and development and related product and service opportunities both through internal investments and the acquisition of intellectual property from companies that we have acquired. We believe that we must continue to dedicate a significant amount of resources to our research and development efforts to maintain our competitive position. Because we expense the majority of our research and development costs, increased investment could adversely affect operating margins.

Our stock price may be volatile.

The market price of our common stock may be volatile. Examples of factors that may significantly impact our stock price include

- Actual or anticipated fluctuations in our operating results
- Announcements of technological innovations, new products, or new contracts by us or our competitors
- Developments with respect to patents, copyrights, or other proprietary rights
- Conditions and trends in the software and other technology industries
- Adoption of new accounting standards
- Changes in financial estimates by securities analysts

- General market conditions and other factors

In addition, the stock market has from time to time experienced significant price and volume fluctuations that have particularly affected the market prices of technology company stocks and may in the future adversely affect the market price of our stock. Sometimes, securities class action litigation is filed following periods of volatility in the market price of a particular company's securities. We cannot assure you that similar litigation will not occur in the future with respect to us. Such litigation could result in substantial costs and a diversion of management's attention and resources, which could have a material adverse effect upon our financial performance.

Our financial outlook may not be realized.

From time to time, in press releases and otherwise, we may publish forecasts or other forward-looking statements regarding our results, including estimated revenues or earnings. Any forecast of our future performance reflects various assumptions. These assumptions are subject to significant uncertainties, and as a matter of course, any number of them may prove to be incorrect. Further, the achievement of any forecast depends on numerous risks and other factors (including those described in this discussion), many of which are beyond our control. As a result, we cannot be certain that our performance will be consistent with any management forecasts or that the variation from such forecasts will not be material and adverse. Current and potential stockholders are cautioned not to base their entire analysis of our business and prospects upon isolated predictions, but instead are encouraged to utilize our entire publicly available mix of historical and forward-looking information, as well as other available information regarding us, our products and services, and the software industry when evaluating our prospective results of operations.

Risks Associated with Our Growth Strategy and Other General Corporate Risks

We may experience difficulties in executing our acquisition strategy.

A material portion of our historical growth has resulted from strategic acquisitions. Although our focus is on internal growth, we will continue to identify and pursue strategic acquisitions with suitable candidates. These transactions involve significant challenges and risks, including risks that a transaction does not advance our business strategy; that we do not achieve the expected return on our investment; that we have difficulty integrating business systems and technology; that we have difficulty retaining or integrating new employees; that the transactions distract management from our other businesses; that we acquire unforeseen liabilities; and other unanticipated events. Our future success will depend, in part, on our ability to successfully integrate future acquisitions into our operations. It may take longer than expected to realize the full benefits of these transactions, such as increased revenue, enhanced efficiencies, or increased market share, or the benefits may be ultimately less than we expected. Although we conduct due diligence reviews of potential acquisition candidates, we may not identify all material liabilities or risks related to acquisition candidates. There can be no assurance that any such strategic acquisitions will be accomplished on favorable terms or will result in profitable operations.

Our failure to properly manage growth could adversely affect our business.

We continue to expand our operations by pursuing existing and potential market opportunities. This growth places significant demands on management and operational resources. In order to manage growth effectively, we must implement and improve our operational systems, procedures, and controls on a timely basis. If we fail to implement these systems, our business may be materially adversely affected.

We may be unable to hire, integrate, and retain qualified personnel.

Our continued success will depend upon the availability and performance of our key management, sales, marketing, client support, and product development personnel. The loss of key management or technical personnel could adversely affect us. We believe that our continued success will depend in large part upon our ability to attract, integrate, and retain such personnel. We have at times experienced and continue to experience challenges, in recruiting qualified personnel. Competition for qualified software development, sales, and other personnel is intense, and we cannot assure you that we will be successful in attracting and retaining such personnel.

Compliance with changing regulation of corporate governance may result in additional expenses.

Changing laws, regulations, and standards relating to corporate governance, compliance, and public disclosure can create uncertainty for public companies. The costs required to comply with such evolving laws are difficult to predict. To maintain high standards of corporate governance, compliance, and public disclosure, we intend to invest all reasonably necessary resources to comply with evolving standards. This investment may result in an unforeseen increase in general and administrative expenses and a diversion of management's time and attention from revenue-generating activities, which may harm our operating results.

We don't foresee paying dividends on our common stock.

We have not declared nor paid a cash dividend since we entered the business of providing software solutions and services to the public sector in 1998. We intend to retain earnings for use in the operation and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future.

Provisions in our certificate of incorporation, bylaws, and Delaware law could deter takeover attempts.

Our board of directors may issue up to 1,000,000 shares of preferred stock and may determine the price, rights, preferences, privileges, and restrictions, including voting and conversion rights, of these preferred shares. These determinations may be made without any further vote or action by our stockholders. The rights of the holders of our common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that may be issued in the future. The issuance of preferred stock may make it more difficult for a third-party to acquire a majority of our outstanding voting stock. In addition, some provisions of our Certificate of Incorporation, Bylaws, and the Delaware General Corporation Law could also delay, prevent, or make more difficult a merger, tender offer, or proxy contest involving us.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

Not applicable.

ITEM 2. PROPERTIES.

We occupy a total of approximately 1.2 million square feet of office space, of which approximately 746,000 square feet is in various office facilities we own. We own or lease offices for our major operations in the states of Arizona, Arkansas, California, Colorado, Georgia, Iowa, Maine, Massachusetts, Michigan, Missouri, Montana, New Hampshire, New York, North Carolina, Ohio, Tennessee, Texas, Virginia, Washington, Washington D.C., Wisconsin, Ontario and British Columbia, Canada and the Philippines.

ITEM 3. LEGAL PROCEEDINGS.

Other than routine litigation incidental to our business, there are no material legal proceedings pending to which we are party or to which any of our properties are subject.

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS.

Not applicable.

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES.

Our common stock is traded on the New York Stock Exchange under the symbol "TYL." At December 31, 2019, we had approximately 1,215 stockholders of record. Most of our stockholders hold their shares in street name; therefore, there are substantially more than 1,215 beneficial owners of our common stock.

We did not pay any cash dividends in 2019 or 2018. Our bank credit agreement contains restrictions on the payment of cash dividends. We intend to retain earnings for use in the operation and expansion of our business and do not anticipate paying a cash dividend in the foreseeable future.

The following table summarizes certain information related to our stock incentive plan, restricted stock units and our employee stock purchase plan. There are no warrants or rights related to our equity compensation plans as of December 31, 2019.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants, purchase rights and vesting of restricted stock units as of December 31, 2019	Weighted average exercise price of outstanding options and unvested restricted stock units	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in initial column as of December 31, 2019)
Equity compensation plans approved by security shareholders:			
2018 Incentive Stock Plan	4,052,461	$ 155.92	3,097,303
Employee Stock Purchase Plan	9,681	255.02	701,837
Equity compensation plans not approved by security shareholders	—	—	—
	4,062,142	$ 156.15	3,799,140

As of December 31, 2019, we had authorization to repurchase up to approximately 2.6 million additional shares of Tyler common stock. During 2019, we purchased approximately 72,000 shares of our common stock for an aggregate purchase price of $14.3 million.

A summary of the repurchase activity during 2019 is as follows:

Period	Total number of shares repurchased	Additional number of shares authorized that may be repurchased	Average price paid per share	Maximum number of shares that may be repurchased under current authorization
Three months ended March 31	71,793	1,500,000	$ 199.03	2,620,925
Three months ended June 30	—	—	—	2,620,925
Three months ended September 30	—	—	—	2,620,925
October 1 through October 31	—	—	—	2,620,925
November 1 through November 30	—	—	—	2,620,925
December 1 through December 31	—	—	—	2,620,925
	71,793	1,500,000	$ 199.03	

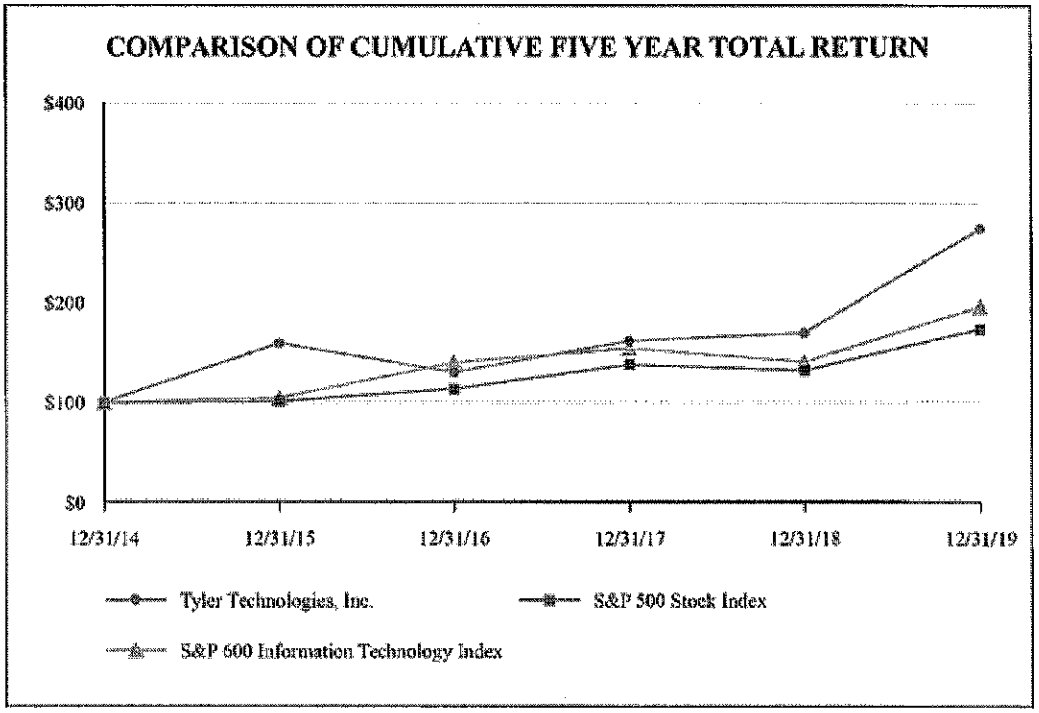
In February 2019, our board of directors authorized the repurchase of an additional 1.5 million of Tyler common stock. The repurchase program, which was approved by our board of directors, was announced in October 2002 and was amended at various times from 2003 through 2019. There is no expiration date specified for the authorization, and we intend to repurchase stock under the program from time to time.

As of February 19, 2020, we had remaining authorization to repurchase up to 2.6 million additional shares of our common stock.

Performance Graph

The following Performance Graph and related information shall not be deemed "soliciting material" or to be "filed" with the Securities and Exchange Commission, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that we specifically incorporate it by reference into such filing.

The following table compares total shareholder returns for Tyler over the last five years to the Standard and Poor's 500 Stock Index and the Standard and Poor's 600 Information Technology Index assuming a $100 investment made on December 31, 2014. Each of the three measures of cumulative total return assumes reinvestment of dividends. The stock performance shown on the graph below is not necessarily indicative of future price performance.



Company / Index	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19
Tyler Technologies, Inc.	100	159.28	130.46	161.78	169.79	274.14
S&P 500 Stock Index	100	101.38	113.51	138.29	132.23	173.86
S&P 600 Information Technology Index	100	104.65	140.08	154.48	140.68	196.38

ITEM 6. SELECTED FINANCIAL DATA.

	FOR THE YEARS ENDED DECEMBER 31,				
	2019 (a)	2018	2017 (b),(c)	2016 (b)	2015
STATEMENT OF OPERATIONS DATA:					
Revenues	$ 1,086,427	$ 935,282	$ 840,899	$ 759,880	$ 591,022
Cost and expenses:					
Cost of revenues	569,527	495,704	441,522	400,692	313,835
Selling, general and administrative expenses	257,746	207,605	175,914	165,176	133,317
Research and development expense	81,342	63,264	47,324	43,154	29,922
Amortization of customer and trade name intangibles	21,445	16,217	13,381	13,202	5,905
Operating income	156,367	152,492	162,758	137,656	108,043
Other income, net	3,471	3,378	698	(1,998)	381
Income before income taxes	159,838	155,870	163,456	135,658	108,424
Income tax (benefit) provision (c)	13,311	8,408	(6,115)	21,957	43,555
Net income	146,527	147,462	169,571	113,701	64,869
Net earnings per diluted share	$ 3.65	$ 3.68	$ 4.32	$ 2.92	$ 1.77
Weighted average diluted shares	40,105	40,123	39,246	38,961	36,552
STATEMENT OF CASH FLOWS DATA:					
Cash flows provided by operating activities	$ 254,720	$ 250,203	$ 195,755	$ 191,859	$ 134,327
Cash flows used by investing activities	(245,015)	(238,255)	(85,395)	(50,720)	(398,459)
Cash flows (used) provided by financing activities	88,698	(63,595)	39,415	138,075	91,052
BALANCE SHEET DATA:					
Total assets	$ 2,191,614	$ 1,790,963	$ 1,611,351	$ 1,378,502	$ 1,356,570
Revolving line of credit	—	—	—	10,000	66,000
Shareholders' equity	1,617,058	1,324,846	1,191,736	934,540	858,857

(a) Reflects the impact of the adoption of Accounting Standards Update ("ASU") ASU No. 2016-02, *Leases* ("Topic 842") in fiscal year 2019. Refer to Note - 1 "Summary of Significant Accounting Policies" for further discussion.

(b) Reflects the impact of the adoption of ASU No. 2014-09, *Revenue from Contracts with Customers* in fiscal year 2018.

(c) 2017 includes the significant impact of the enactment of the Tax Cuts and Jobs Act ("Tax Act"). The most significant impact of the Tax Act to us is the reduction in the U.S. federal corporate income tax rate from 35% to 21%. The impact of the rate reduction on our 2017 income tax provision is a $26.0 million tax benefit due to the remeasurement of deferred tax assets and liabilities.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

FORWARD-LOOKING STATEMENTS

This document contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 that are not historical in nature and typically address future or anticipated events, trends, expectations or beliefs with respect to our financial condition, results of operations or business. Forward-looking statements often contain words such as "believes," "expects," "anticipates," "foresees," "forecasts," "estimates," "plans," "intends," "continues," "may," "will," "should," "projects," "might," "could" or other similar words or phrases. Similarly, statements that describe our business strategy, outlook, objectives, plans, intentions or goals also are forward-looking statements. We believe there is a reasonable basis for our forward-looking statements, but they are inherently subject to risks and uncertainties and actual results could differ materially from the expectations and beliefs reflected in the forward-looking statements. We presently consider the following to be among the important factors that could cause actual results to differ materially from our expectations and beliefs: (1) changes in the budgets or regulatory environments of our clients, primarily local and state governments, that could negatively impact information technology spending; (2) our ability to protect client information from security breaches and provide uninterrupted operations of data centers; (3) our ability to achieve growth or operational synergies through the integration of acquired businesses, while avoiding unanticipated costs and disruptions to existing operations; (4) material portions of our business require the Internet infrastructure to be adequately maintained; (5) our ability to achieve our financial forecasts due to various factors, including project delays by our clients, reductions in transaction size, fewer transactions, delays in delivery of new products or releases or a decline in our renewal rates for service agreements; (6) general economic, political and market conditions; (7) technological and market risks associated with the development of new products or services or of new versions of existing or acquired products or services; (8) competition in the industry in which we conduct business and the impact of competition on pricing, client retention and pressure for new products or services; (9) the ability to attract and retain qualified personnel and dealing with the loss or retirement of key members of management or other key personnel; and (10) costs of compliance and any failure to comply with government and stock exchange regulations. A detailed discussion of these factors and other risks that affect our business are described in Item 1A, "Risk Factors." We expressly disclaim any obligation to publicly update or revise our forward-looking statements.

OVERVIEW

General

We provide integrated information management solutions and services for the public sector, with a focus on local governments. We develop and market a broad line of software products and services to address the IT needs of cities, counties, schools and other local government entities. In addition, we provide professional IT services to our clients, including software and hardware installation, data conversion, training and for certain clients, product modifications, along with continuing maintenance and support for clients using our systems. We also provide subscription-based services such as software as a service ("SaaS"), which primarily utilize the Tyler private cloud, and electronic document filing solutions ("e-filing"), which simplify the filing and management of court related documents. Revenues for e-filing are derived from transaction fees and, in some cases, fixed fee arrangements. Other transaction based fees primary relate to online payment services. We also provide property appraisal outsourcing services for taxing jurisdictions.

Our products generally automate eight major functional areas: (1) financial management and education, (2) courts and justice, (3) public safety, (4) property appraisal and tax, (5) planning, regulatory and maintenance, (6) land and vital records management, (7) data and insights and (8) case management and business process management. We report our results in two segments. The Enterprise Software ("ES") segment provides public sector entities with software systems and services to meet their information technology and automation needs for mission-critical "back-office" functions such as: financial management and education, courts and justice, public safety, planning, regulatory and maintenance, land and vital records management, data and insights and case management and business management processes. The Appraisal and Tax ("A&T") segment provides systems and software that automate the appraisal and assessment of real and personal property as well as property appraisal outsourcing services for local governments and taxing authorities. Property appraisal outsourcing services include: the physical inspection of commercial and residential properties; data collection and processing; computer analysis for property valuation; preparation of tax rolls; community education; and arbitration between taxpayers and the assessing jurisdiction.

Our total employee count increased to 5,368 at December 31, 2019, from 4,525 at December 31, 2018.

For the twelve months ended December 31, 2019, total revenues increased 16% compared to the prior year. Excluding the impact of acquisitions, total revenues increased 8% compared to prior year. Revenues from acquisitions contributed 8% of growth for the twelve months ended December 31, 2019.

Subscriptions revenue grew 34% for the twelve months ended December 31, 2019, due to a gradual shift toward cloud-based, software as a service business, as well as continued strong growth in our e-filing revenues from courts and other transaction-based revenues. Excluding the impact of acquisitions, subscriptions revenue increased 26% for the twelve months ended December 31, 2019.

Our backlog at December 31, 2019 was $1.46 billion, a 17% increase from last year.

Recent Acquisitions

On October 30, 2019, we acquired certain assets of Courthouse Technologies, Ltd ("CHT"), an industry-leading provider of jury management systems that offers a fully integrated, end-to-end software-as-a-service (SaaS) solution to manage all facets of juror management, from source list generation to juror processing and payment. The total purchase price was approximately $20.5 million of which $19.1 million was paid in cash and approximately $1.4 million was accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments.

On February 28, 2019, we acquired all of the capital stock of MP Holdings Parent, Inc. dba MicroPact ("MicroPact"), a leading provider of commercial off-the-shelf ("COTS") solutions, including entellitrak®, a low-code application development platform for case management and business process management used extensively in the public sector. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million consisting of $198.2 million paid in cash and accrued contingent consideration of $6.0 million, subject to the achievement of certain financial performance objectives.

On February 1, 2019, we acquired all the assets of Civic, LLC ("MyCivic"), a company that provides software solutions to connect communities. The total purchase price was $3.7 million in cash.

As of December 31, 2019, the purchase price allocations for MicroPact and MyCivic are complete. As of December 31, 2019, the purchase price allocation for CHT is not yet complete, therefore the preliminary valuation estimates of fair value assumed at the acquisition date including intangible assets, receivables and deferred revenue are subject to change as the valuation is finalized.

The operating results of all 2019 acquisitions are included with the operating results of the Enterprise Software segment since their date of acquisition. Revenues from MicroPact included in Tyler's results of operations totaled approximately $63.0 million and the net loss was approximately $98,000 for the twelve months ended December 31, 2019. The impact of the MyCivic and CHT acquisitions, individually and in the aggregate, on our operating results, assets and liabilities is not material.

Our balance sheet as of December 31, 2019, reflects the allocation of the purchase price to the assets acquired based on their fair value at the date of each acquisition. The fair value of the assets and liabilities acquired are based on valuations using Level III, unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

We monitor and analyze several key performance indicators in order to manage our business and evaluate our financial and operating performance. These indicators include the following:

Revenues – We derive our revenues from five primary sources: sale of software licenses and royalties; subscription-based arrangements; software services; maintenance; and appraisal services. Subscriptions and maintenance are considered recurring revenue sources and comprised approximately 67% of our revenue in 2019. The number of new SaaS clients and the number of existing clients who convert from our traditional software arrangements to our SaaS model are a significant driver to our business, together with new software license sales and maintenance rate increases. In addition, we also monitor our customer base and churn as we historically have experienced very low customer turnover. During 2019, based on our number of customers, turnover was approximately 2%.

Cost of Revenues and Gross Margins – Our primary cost component is personnel expenses in connection with providing software implementation, subscription-based services, maintenance and support, and appraisal services to our clients. We can improve gross margins by controlling headcount and related costs and by expanding our revenue base, especially from those products and services that produce incremental revenue with minimal incremental cost, such as software licenses and royalties, subscription-based services, and maintenance and support. Our appraisal projects are cyclical in nature, and we often employ appraisal personnel on a short-term basis to coincide with the life of a project. As of December 31, 2019, our total employee count increased to 5,368 from 4,525 at December 31, 2018.

Selling, General and Administrative ("SG&A") Expenses – The primary components of SG&A expenses are administrative and sales personnel salaries and commissions, share-based compensation expense, marketing expense, rent and professional fees. Sales commissions typically fluctuate with revenues and share-based compensation expense generally increases as the market price of our stock increases. Other administrative expenses tend to grow at a slower rate than revenues.

Liquidity and Cash Flows – The primary driver of our cash flows is net income. Uses of cash include acquisitions, capital investments in property and equipment and discretionary purchases of treasury stock. Our working capital needs are fairly stable throughout the year with the significant components of cash outflows being payment of personnel expenses offset by cash inflows representing collection of accounts receivable and cash receipts from clients in advance of revenue being earned. In recent years, we have also received significant amounts of cash from employees exercising stock options and contributing to our Employee Stock Purchase Plan.

Balance Sheet – Cash, accounts receivable and days sales outstanding and deferred revenue balances are important indicators of our business.

Adoption of New Lease Accounting Standard

We adopted Topic 842 using the transition method that allows us to initially apply the guidance at the adoption date of January 1, 2019, and recognized a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We used the package of practical expedients that allows us to not reassess: (1) lease classification for any expired or existing leases and (2) initial direct costs for any expired or existing leases. We did not elect to use the hindsight application for evaluating the life of lease arrangements. The impact of adoption is reflected in the financial information herein. For additional details, see Note 1 - Summary of Significant Accounting Policies" to our consolidated financial statements in this report.

The impact of Topic 842 on our consolidated balance sheet beginning January 1, 2019, included the recognition of right-of-use ("ROU") assets and lease liabilities for operating leases, while our accounting for finance leases remained substantially unchanged. We had no finance leases prior to the adoption of Topic 842 and currently do not have any.

Recent Accounting Guidance not yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses,* ("ASU 2016-13"). ASU 2016-13 changes the impairment model for most financial assets and certain other instruments, including trade and other receivables, held-to-maturity debt securities and loans, and requires entities to use a new forward-looking expected loss model that will result in the earlier recognition of allowance for losses. This update is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted for a fiscal year beginning after December 15, 2018, including interim periods within that fiscal year. Entities will apply the standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is adopted. We will adopt the new standard in the first quarter of 2020 and believe the impact on our consolidated financial statements and results of operations will not be material.

Outlook

The local government software market continues to be active, and our backlog at December 31, 2019 reached $1.46 billion, a 17% increase from last year. We expect to continue to achieve solid growth in revenue and earnings. With our strong financial position and cash flow, we plan to continue to make significant investments in product development to better position us to continue to expand our addressable market and strengthen our competitive position in the public sector software market over the long term.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our discussion and analysis of financial condition and results of operations is based upon our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP"). The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities at the date of the financial statements, the reported amounts of revenues, cost of revenues and expenses during the reporting period, and related disclosure of contingencies. The Notes to the Financial Statements included as part of this Annual Report describe our significant accounting policies used in the preparation of the financial statements. Significant items subject to such estimates and assumptions include the application of the progress toward completion methods of revenue recognition, estimated standalone selling price ("SSP") for distinct performance obligations, the carrying amount and estimated useful lives of intangible assets, determination of share-based compensation expense and valuation allowance for receivables. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies require significant judgments and estimates used in the preparation of our financial statements.

Revenue Recognition. We earn revenue from software licenses, royalties, subscription-based services, software services, post-contract customer support ("PCS" or "maintenance"), hardware, and appraisal services. Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, we satisfy a performance obligation

Most of our software arrangements with customers contain multiple performance obligations that range from software licenses, installation, training, and consulting to software modification and customization to meet specific customer needs (services), hosting, and PCS. For these contracts, we account for individual performance obligations separately when they are distinct. We evaluate whether separate performance obligations can be distinct or should be accounted for as one performance obligation. Arrangements that include software services, such as training or installation, are evaluated to determine whether the customer can benefit from the services either on their own or together with other resources readily available to the customer and whether the services are separately identifiable from other promises in the contract. Many of our software arrangements involve "off-the-shelf" software. We recognize the revenue allocable to "off-the-shelf" software licenses and specified upgrades at a point in time when control of the software license transfers to the customer, unless the software is not considered distinct. We consider off-the-shelf software to be distinct when it can be added to an arrangement with minor changes in the underlying code, it can be used by the customer for the customer's purpose upon installation, and remaining services such as training are not considered highly interdependent or highly interrelated to the product's functionality.

For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, we recognize revenue over time by measuring progress-to-completion. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often implemented over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent. When software services are distinct, the fee allocable to the service element is recognized over the time we perform the services and is billed on a time and material or milestones basis.

Subscription-based services consist of revenues derived from SaaS arrangements, which primarily utilize the Tyler private cloud, and electronic filing transactions. Revenue from subscription-based services is generally recognized over time on a ratable basis over the contract term, beginning on the date that our service is made available to the customer. For SaaS arrangements, we evaluate whether the customer has the contractual right to take possession of our software at any time during the hosting period without significant penalty and whether the customer can feasibly maintain the software on the customer's hardware or enter into another arrangement with a third-party to host the software. We allocate contract value to each performance obligation of the arrangement that qualifies for treatment as a distinct element based on estimated SSP. We recognize SaaS arrangements ratably over the term of the arrangement, which range from one to ten but are typically for a period of three to five years. For software services associated with certain SaaS arrangements, we have concluded that the services are not distinct, and we recognize the revenue ratably over the remaining contractual period once we have provided the customer access to the software. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

The transaction price is allocated to the separate performance obligations on a relative SSP basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we determine SSP using the expected cost-plus margin approach. Revenue is recognized net of allowances for sales adjustments and any taxes collected from customers, which are subsequently remitted to governmental authorities.

Typically, the structure of our arrangements does not give rise to variable consideration. However, in those instances whereby variable consideration exists, we include in our estimates additional revenue for variable consideration when we believe we have an enforceable right, the amount can be estimated reliably and its realization is probable.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from credit risk associated with the inability of a customer to make required payments. Events or changes in circumstances that indicate that the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products. The allowance for doubtful accounts reflects our best estimate of probable losses inherent in the accounts receivable balance. We determine the allowance based on known troubled accounts, historical experience, and other currently available evidence.

In connection with certain of our contracts, we have recorded retentions receivable or unbilled receivables consisting of costs and estimated profit in excess of billings as of the balance sheet date. Many of the contracts which give rise to unbilled receivables at a given balance sheet date are subject to billings in the subsequent accounting period. We review unbilled receivables and related contract provisions to ensure we are justified in recognizing revenue prior to billing the customer and that we have objective evidence which allows us to recognize such revenue. In addition, we have a sizable amount of deferred revenue, which represents billings in excess of revenue earned. The majority of this liability consists of maintenance billings for which payments are made in advance and the revenue is ratably earned over the maintenance period, generally one year. We also have deferred revenue for those contracts in which we receive a deposit and the conditions in which to record revenue for the service or product have not been met. On a periodic basis, we review by customer the detail components of our deferred revenue to ensure our accounting remains appropriate.

Intangible Assets and Goodwill. Our business acquisitions typically result in the creation of goodwill and other intangible asset balances, and these balances affect the amount and timing of future period amortization expense, as well as expense we could possibly incur as a result of an impairment charge. The cost of acquired companies is allocated to identifiable tangible and intangible assets based on estimated fair value, with the excess allocated to goodwill. Accordingly, we have a significant balance of acquisition date intangible assets, including software, customer related intangibles, trade name, leases and goodwill. These intangible assets (other than goodwill) are amortized over their estimated useful lives. We currently have no intangible assets with indefinite lives other than goodwill.

We assess goodwill for impairment annually as of April 1st, or more frequently whenever events or changes in circumstances indicate its carrying value may not be recoverable. We begin with the qualitative assessment of whether it is more likely than not that a reporting unit's fair value is less than its carrying value before applying the quantitative assessment described below. When testing goodwill for impairment quantitatively, we first compare the fair value of each reporting unit with its carrying amount. If the carrying amount of a reporting unit exceeds its fair value, a second step is performed to measure the amount of potential impairment. In the second step, we compare the implied fair value of reporting unit goodwill with the carrying amount of the reporting unit's goodwill. If the carrying amount of reporting unit goodwill exceeds the implied fair value of that goodwill, an impairment loss is recognized. The fair values calculated in our impairment tests are determined using discounted cash flow models involving several assumptions. The assumptions that are used are based upon what we believe a hypothetical marketplace participant would use in estimating fair value. We base our fair value estimates on assumptions we believe to be reasonable but that are unpredictable and inherently uncertain. We evaluate the reasonableness of the fair value calculations of our reporting units by comparing the total of the fair value of all of our reporting units to our total market capitalization. Our annual goodwill impairment analysis, which we performed qualitatively during the second quarter of 2019, did not result in an impairment charge. During 2019, we did not identify any triggering events that would require an update to our annual impairment review.

All intangible assets (other than goodwill) are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of other intangible assets is measured by comparison of the carrying amount to estimated undiscounted future cash flows. The assessment of recoverability or of the estimated useful life for amortization purposes will be affected if the timing or the amount of estimated future operating cash flows is not achieved. Such indicators may include, among others: a significant decline in expected future cash flows; a sustained, significant decline in stock price and market capitalization; a significant adverse change in legal factors or in the business climate; unanticipated competition; and reductions in growth rates. In addition, products, capabilities, or technologies developed by others may render our software products obsolete or non-competitive. Any adverse change in these factors could have a significant impact on the recoverability of goodwill or other intangible assets. During 2019, we did not identify any triggering events that would indicate that the carrying amount of our intangible assets may not be recoverable.

Share-Based Compensation. We have a stock incentive plan that provides for the grant of stock options, restricted stock units and performance stock units to key employees, directors and non-employee consultants. We estimate the fair value of share-based awards on the date of grant. Share-based compensation expense includes the estimated effects of forfeitures, which will be adjusted over the requisite service period to the extent actual forfeitures differ or are expected to differ from such estimates. Changes in estimated forfeitures are recognized in the period of change and will also impact the amount of expense to be recognized in future periods. Forfeiture rate assumptions are derived from historical data.

We estimate stock price volatility at the date of grant based on the historical volatility of our common stock. Estimated option life is determined using the weighted-average period the stock options are expected to be outstanding based primarily on the options' vesting terms, remaining contractual life and the employees' expected exercise based on historical patterns. Determining the appropriate fair-value model and calculating the fair value of share-based awards at the grant date requires considerable judgment, including estimating stock price volatility, expected option life and forfeiture rates.

ANALYSIS OF RESULTS OF OPERATIONS AND OTHER

The following discussion compares the historical results of operations on a basis consistent with GAAP for the years ended December 31, 2019, 2018 and 2017.

	Percentage of Total Revenues Years Ended December 31,		
	2019	2018	2017
Revenues:			
Software licenses and royalties	9.2%	10.0%	10.3 %
Subscriptions	27.3	23.6	20.5
Software services	19.6	20.5	21.5
Maintenance	39.6	41.1	42.6
Appraisal services	2.2	2.3	3.0
Hardware and other	2.1	2.5	2.1
Total revenues	100.0	100.0	100.0
Operating expenses:			
Cost of software licenses, royalties and acquired software	3.2	2.9	3.0
Cost of software services, maintenance and subscriptions	46.2	46.9	46.1
Cost of appraisal services	1.4	1.5	1.9
Cost of hardware and other	1.6	1.7	1.5
Selling, general and administrative expenses	23.7	22.2	20.9
Research and development expense	7.5	6.8	5.6
Amortization of customer and trade name intangibles	2.0	1.7	1.6
Operating income	14.4	16.3	19.4
Other income, net	0.3	0.4	0.1
Income before income taxes	14.7	16.7	19.5
Income tax (benefit) provision	1.2	0.9	(0.7)
Net income	13.5%	15.8%	20.2 %

2019 Compared to 2018

Revenues

On February 28, 2019, we acquired all of the capital stock of MicroPact, a leading provider of COTS solutions, including entellitrak®, a low-code application development platform for case management and business process management used extensively in the public sector. The following table details revenue for MicroPact for the period presented as of December 31, 2019, which is included in our consolidated statements of income from the date of acquisition:

	2019
Revenues:	
Software licenses and royalties	$ 8,737
Subscriptions	7,472
Software services	18,143
Maintenance	28,642
Appraisal services	
Hardware and other	24
Total revenues	$ 63,018

On October 30, 2019, we acquired certain assets of CHT, an industry-leading provider of jury management systems that offers a fully integrated, end-to-end SaaS solution to manage all facets of juror management, from source list generation to juror processing and payment. On February 1, 2019, we acquired all the assets of MyCivic, a company that provides software solutions to connect communities. The impact of the CHT and MyCivic acquisitions on our operating results is not considered material, individually and in the aggregate, and is not included in the table above. The results of the MicroPact, CHT and MyCivic acquisitions are included with the operating results of the ES segment from their dates of acquisition. For comparative purposes, we have provided explanations for changes in operations to exclude results of operations for these acquisitions noting the exclusion.

Software licenses and royalties.

The following table sets forth a comparison of our software licenses and royalties revenue for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
ES	$ 92,567	$ 83,735	$ 8,832	11 %
A&T	7,638	9,706	(2,068)	(21)
Total software licenses and royalties revenue	$ 100,205	$ 93,441	$ 6,764	7 %

Excluding the impact of acquisitions, software licenses and royalties revenue decreased 2% compared to prior year. The decline was primarily due to a shift in the mix of new software contracts toward more subscription agreements compared to the prior year. Our total new contract value mix in 2019, was approximately 37% perpetual software license arrangements and approximately 63% subscription-based arrangements compared to total new contract value mix in 2018, of approximately 59% perpetual software license arrangements and approximately 41% subscription-based arrangements.

Although the mix of new contracts between subscription-based and perpetual license arrangements may vary from quarter to quarter and year to year, we expect our longer-term software license growth rate to be negatively impacted by a growing number of customers choosing our subscription-based options, rather than purchasing the software under a traditional perpetual software license arrangement. Subscription-based arrangements result in lower software license revenue in the initial year as compared to perpetual software license arrangements but generate higher overall revenue over the term of the contract.

Subscriptions.

The following table sets forth a comparison of our subscriptions revenue for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
ES	$ 285,092	$ 210,740	$ 74,352	35%
A&T	11,260	9,807	1,453	15
Total subscriptions revenue	$ 296,352	$ 220,547	$ 75,805	34%

Subscription-based revenue primarily consists of revenue derived from our SaaS arrangements, which generally utilize the Tyler private cloud. As part of our subscription-based services, we also provide electronic document filing solutions ("e-filing") that simplify the filing and management of court related documents for courts and law offices. E-filing revenue is derived from transaction fees and fixed fee arrangements.

Excluding the results of acquisitions, subscription-based revenue increased 26% compared to 2018. New SaaS clients as well as existing clients who converted to our SaaS model provided the majority of the subscription revenue increase. In 2019, we added 596 new SaaS clients and 78 existing clients elected to convert to our SaaS model. Also, e-filing services contributed approximately $7.0 million of the subscription revenue increase in 2019. The increase in e-filing revenue is attributed to new e-filing clients, as well as increased volumes as the result of several existing clients mandating e-filing.

Software services.

The following table sets forth a comparison of our software services revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ 185,892	$ 166,921	$ 18,971	11%
A&T	27,169	24,348	2,821	12
Total software services revenue	$ 213,061	$ 191,269	$ 21,792	11%

Software services revenue primarily consists of professional services billed in connection with implementing our software, converting client data, training client personnel, custom development activities and consulting. New clients who purchase our proprietary software licenses or subscriptions generally also contract with us to provide for the related software services. Existing clients also periodically purchase additional training, consulting and minor programming services. Excluding the results of acquisitions, software services revenue grew 0.4% compared to the prior year period. The slight increase is due to higher new contract volume and the addition of professional services staff to grow our capacity to deliver backlog. Excluding employees added with acquisitions, our implementation and support staff has grown by 232 employees since December 31, 2018.

Maintenance.

The following table sets forth a comparison of our maintenance revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ 405,063	$ 359,904	$ 45,159	13%
A&T	25,255	24,617	638	3
Total maintenance revenue	$ 430,318	$ 384,521	$ 45,797	12%

We provide maintenance and support services for our software products and certain third-party software. Excluding the results of acquisitions, maintenance revenue grew 4% compared to the prior year. Maintenance and support revenue increased mainly due to growth in our installed customer base from new software license sales as well as annual maintenance rate increases, partially offset by clients converting from on-premises license arrangements to SaaS.

Appraisal services.

The following table sets forth a comparison of our appraisal services revenue for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
ES	$ —	$ —	$ —	—%
A&T	23,479	21,846	1,633	7
Total appraisal services revenue	$ 23,479	$ 21,846	$ 1,633	7%

In 2019, appraisal services revenue increased 7% compared to the prior year primarily due to the addition of several new revaluation contracts started during the second quarter of 2019. The appraisal services business is somewhat cyclical and driven in part by statutory revaluation cycles in various states.

Cost of Revenues and Gross Margins

The following table sets forth a comparison of the key components of our cost of revenues for the years ended December 31:

($ in thousands)	2019	2018	Change $	Change %
Software licenses and royalties	$ 3,938	$ 3,802	$ 136	4%
Acquired software	30,642	22,972	7,670	33
Software services, maintenance and subscriptions	502,138	438,923	63,215	14
Appraisal services	15,337	14,299	1,038	7
Hardware and other	17,472	15,708	1,764	11
Total cost of revenues	$ 569,527	$ 495,704	$ 73,823	15%

The following table sets forth a comparison of gross margin percentage by revenue type for the years ended December 31:

Gross margin percentage	2019	2018	Change
Software licenses, royalties and acquired software	65.5%	71.3%	(5.8)%
Software services, maintenance and subscriptions	46.6	44.9	1.7
Appraisal services	34.7	34.5	0.2
Hardware and other	24.1	33.6	(9.5)
Overall gross margin	47.6%	47.0%	0.6 %

Software licenses, royalties and acquired software. Cost of software licenses, royalties and acquired software is primarily comprised of amortization expense for acquired software and third-party software costs. We do not have any direct costs associated with royalties. The gross margin decrease of 5.8% is due to an increase in amortization expense for acquired software resulting from acquisitions completed in the last half of 2018 and in 2019.

Software services, maintenance and subscriptions. Cost of software services, maintenance and subscriptions primarily consists of personnel costs related to installation of our software, conversion of client data, training client personnel and support activities and various other services such as custom client development and on-going operation of SaaS and e-filing arrangements. In 2019, the software services, maintenance and subscriptions gross margin increased 1.7% compared to the prior year. Excluding employees added through acquisitions, our implementation and support staff has grown by 232 employees since December 31, 2018 as we accelerated hiring to ensure that we are well-positioned to deliver our current backlog and anticipated new business. Costs related to maintenance and various other services such as SaaS and e-filing typically grow at a slower rate than related revenue due to leverage in the utilization of support and maintenance staff and economies of scale.

Appraisal services. Appraisal services revenue comprised approximately 2.2% of total revenue. The appraisal services gross margin increased 0.2% compared to 2018 due to ramp up of several new revaluation projects during second quarter 2019.

Our 2019 blended gross margin slightly increased 0.6% compared to 2018. Our overall gross margin increase is attributed to a higher revenue mix for subscription revenues compared to the prior year period resulting in an increase in incremental margin related to software services, maintenance and subscriptions. Costs related to maintenance and various other services such as SaaS and e-filing typically grow at a slower rate than related revenue due to leverage in the utilization of support and maintenance staff and economies of scale. The increase in overall margins are partially offset by lower margins from software licenses, in part due to lower software license revenue and higher amortization expense for acquired software resulting from acquisitions.

Selling, General and Administrative Expenses

Selling, general and administrative ("SG&A") expenses consist primarily of salaries, employee benefits, travel, share-based compensation expense, commissions and related overhead costs for administrative and sales and marketing employees, as well as, professional fees, trade show activities, advertising costs and other marketing related costs. The following table sets forth a comparison of our SG&A expenses for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Selling, general and administrative expenses	$ 257,746	$ 207,605	$ 50,141	24%

SG&A as a percentage of revenue was 23.7% in 2019 compared to 22.2% in 2018. SG&A expense increased approximately 24% compared to the prior year period. In 2019, our operating results include $19.9 million of SG&A expenses for MicroPact from the date of acquisition. The remaining SG&A expense increase is mainly due to compensation cost related to increased staff levels, higher stock compensation expense and increased commission expense as a result of higher sales. Excluding employees added with acquisitions, we added 81 employees mainly to our sales and finance teams since December 31, 2018. In addition, our 2019 stock compensation expense rose $5.8 million, mainly due to increases in our stock price over recent years.

Research and Development Expense

Research and development expense consists primarily of salaries, employee benefits and related overhead costs associated with new product development. The following table sets forth a comparison of our research and development expense for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Research and development expense	$ 81,342	$ 63,264	$ 18,078	29%

Research and development expense increased 29% in 2019 compared to the prior year period, mainly due to a number of new Tyler product development initiatives across our product suites, including increased investments in research and development at recently acquired businesses. To support these initiatives, our research and development staff has grown by 153 since December 31, 2018.

Amortization of Customer and Trade Name Intangibles

Acquisition intangibles are comprised of the excess of the purchase price over the fair value of net tangible assets acquired that is allocated to acquired software, leases and customer and trade name intangibles. The remaining excess purchase price is allocated to goodwill that is not subject to amortization. Amortization expense related to acquired software is included with cost of revenues, while amortization expense of customer and trade name intangibles is recorded as operating expense. The estimated useful lives of both customer and trade name intangibles range from five to 25 years. The following table sets forth a comparison of amortization of customer and trade name intangibles for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Amortization of customer and trade name intangibles	$ 21,445	$ 16,217	$ 5,228	32%

Amortization of customer and trade name intangibles increased due to the impact of intangibles added with several acquisitions completed in 2018 and 2019.

Estimated annual amortization expense relating to customer and trade name acquisition intangibles, excluding acquired software for which the amortization expense is recorded as cost of revenues, for the next five years and thereafter is as follows (in thousands):

2020	$ 21,357
2021	21,237
2022	20,747
2023	20,673
2024	20,121
Thereafter	135,264

Amortization expense relating to acquired leases will be recorded as a reduction to hardware and other revenue and is expected to be $525,000 in 2020, $525,000 in 2021, $525,000 in 2022, $525,000 in 2023, $525,000 in 2024 and $512,000 thereafter.

Other

The following table sets forth a comparison of other income, net for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Other income, net	$ 3,471	$ 3,378	$ 93	3%

Other income is comprised of interest income from invested cash net of interest expense and non-usage and other fees associated with our revolving credit agreement. Other income, net, increased compared to the prior period due to increased interest income from higher levels of cash and investments resulting from cash generated in the current year offset by increased interest expense from new debt outstanding during the current year under our credit agreement.

Income Tax Provision

The following table sets forth a comparison of our income tax provision for the years ended December 31:

			Change	
($ in thousands)	2019	2018	$	%
Income tax provision	$ 13,311	$ 8,408	$ 4,903	58%
Effective income tax rate	8.3%	5.4%		

The increase in the income tax provision and the effective income tax rate in 2019 compared to the prior year is primarily due to lower excess tax benefits from stock option exercises in 2019. Stock option exercise activity in 2019 generated excess tax benefits of $29.8 million, while stock option exercise activity in 2018 generated $32.5 million excess tax benefits. In addition, the 2018 income tax provision contains a tax benefit of $1.8 million resulting from the remeasurement of deferred tax assets and liabilities associated with the enactment of the 2017 Tax Act which reduced the statutory U.S. federal corporate income tax rate from 35% to 21%. Excluding the impact of the excess tax benefits and the Tax Act, our income tax provision and effective tax rate in 2019 would have been $43.1 million and 27.0% and in 2018, would have been $42.6 million and 27.4%, respectively.

The effective income tax rates in both 2019 and 2018 differed from the United States federal statutory corporate income tax rate of 21% due to state income taxes, the research tax credit, non-deductible share-based compensation expense, disqualifying incentive stock option dispositions, and other non-deductible business expenses.

2018 Compared to 2017

Revenues

Software licenses and royalties.

The following table sets forth a comparison of our software licenses and royalties revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 83,735	$ 78,388	$ 5,347	7%
A&T	9,706	7,854	1,852	24
Total software licenses and royalties revenue	$ 93,441	$ 86,242	$ 7,199	8%

Software license and royalties revenue increased 8% compared to the prior year. The majority of this growth was due to an active marketplace as the result of generally positive local government economic conditions, as well as our increasingly strong competitive position, which we attribute in part to our investment in product development in recent years. An increase in the number of larger contracts related to our planning, regulatory and maintenance solutions and public safety solutions also contributed to the growth in license revenue.

Although the mix of new contracts between subscription-based and perpetual license arrangements may vary from quarter to quarter and year to year, we expect our longer-term software license growth rate to be negatively impacted by a growing number of customers choosing our subscription-based options, rather than purchasing the software under a traditional perpetual software license arrangement. Subscription-based arrangements result in lower software license revenue in the initial year as compared to perpetual software license arrangements but generate higher overall revenue over the term of the contract. Our new client mix in 2018 was approximately 47% selecting perpetual software license arrangements and approximately 53% selecting subscription-based arrangements compared to a client mix in 2017 of approximately 53% selecting perpetual software license arrangements and approximately 47% selecting subscription-based arrangements.

Subscriptions.

The following table sets forth a comparison of our subscriptions revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 210,740	$ 164,317	$ 46,423	28%
A&T	9,807	7,859	1,948	25
Total subscriptions revenue	$ 220,547	$ 172,176	$ 48,371	28%

Subscription-based revenue primarily consists of revenue derived from our SaaS arrangements, which generally utilize the Tyler private cloud. As part of our subscription-based services, we also provide electronic document filing solutions ("e-filing") that simplify the filing and management of court related documents for courts and law offices. E-filing revenue is derived from transaction fees and fixed fee arrangements. Excluding the results of acquisitions, subscription-based revenue increased 21% compared to 2017.

New SaaS clients as well as existing clients who converted to our SaaS model provided the majority of the subscription revenue increase. In 2018, we added 410 new SaaS clients and 97 existing clients elected to convert to our SaaS model. Also, e-filing services contributed approximately $6.2 million of the subscription revenue increase in 2018. The increase in e-filing revenue is attributed to new e-filing clients, as well as increased volumes as the result of several existing clients mandating e-filing. The acquisition of Socrata, which primarily has a subscription revenue model, also contributed to the increase in subscription revenues.

Software services.

The following table sets forth a comparison of our software services revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 166,921	$ 161,245	$ 5,676	4%
A&T	24,348	19,215	5,133	27
Total software services revenue	$ 191,269	$ 180,460	$ 10,809	6%

Software services revenue primarily consists of professional services billed in connection with implementing our software, converting client data, training client personnel, custom development activities and consulting. New clients who purchase our proprietary software licenses generally also contract with us to provide for the related software services. Existing clients also periodically purchase additional training, consulting and minor programming services. Excluding the results of acquisitions, software services revenue grew 3% compared to the prior year period. This growth is due to a higher level of new software sales, through both our license and subscription models.

Maintenance.

The following table sets forth a comparison of our maintenance revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ 359,904	$ 337,701	$ 22,203	7%
A&T	24,617	21,618	2,999	14
Total maintenance revenue	$ 384,521	$ 359,319	$ 25,202	7%

We provide maintenance and support services for our software products and certain third-party software. Maintenance revenue grew 7% compared to the prior year. Maintenance and support revenue increased mainly due to growth in our installed customer base from new software license sales as well as annual maintenance rate increases.

Appraisal services.

The following table sets forth a comparison of our appraisal services revenue for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
ES	$ —	$ —	$ —	—%
A&T	21,846	25,023	(3,177)	(13)
Total appraisal services revenue	$ 21,846	$ 25,023	$ (3,177)	(13)%

In 2018, appraisal services revenue decreased 13% compared to the prior year primarily due to the successful completion of several large revaluation projects in mid-2017. The appraisal services business is somewhat cyclical and driven in part by statutory revaluation cycles in various states.

Cost of Revenues and Gross Margins

The following table sets forth a comparison of the key components of our cost of revenues for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Software licenses and royalties	$ 3,802	$ 3,321	$ 481	14 %
Acquired software	22,972	21,686	1,286	6 %
Software services, maintenance and subscriptions	438,923	387,634	51,289	13
Appraisal services	14,299	16,286	(1,987)	(12)
Hardware and other	15,708	12,595	3,113	25
Total cost of revenues	$ 495,704	$ 441,522	$ 54,182	12 %

The following table sets forth a comparison of gross margin percentage by revenue type for the years ended December 31:

Gross margin percentage	2018	2017	Change
Software licenses, royalties and acquired software	71.3%	71.0%	0.3 %
Software services, maintenance and subscriptions	44.9	45.6	(0.7)
Appraisal services	34.5	34.9	(0.4)
Hardware and other	33.6	28.8	4.8
Overall gross margin	47.0%	47.5%	(0.5)%

Software licenses, royalties and acquired software. Cost of software licenses, royalties and acquired software is primarily comprised of amortization expense for acquired software and third-party software costs. We do not have any direct costs associated with royalties. The gross margin increase of 0.3% is due to higher software license revenues offset by an increase in amortization expense for acquired software attributed to new acquisitions completed in 2018.

Software services, maintenance and subscriptions. Cost of software services, maintenance and subscriptions primarily consists of personnel costs related to installation of our software, conversion of client data, training client personnel and support activities and various other services such as custom client development and on-going operation of SaaS and e-filing arrangements. In 2018, the software services, maintenance and subscriptions gross margin decreased 0.7% compared to the prior year. Excluding employees added through acquisitions, our implementation and support staff grew by 57 employees in 2018 as we accelerated hiring to ensure that we are well-positioned to deliver our current backlog and anticipated new business. Recognition of acquisition-related deferred revenue associated with subscriptions and maintenance also resulted in lower gross margins.

Appraisal services. Appraisal services revenue comprised approximately 2.3% of total revenue. The appraisal services gross margin decreased 0.4% compared to 2017 due to the reduction in higher margin projects substantially complete by early 2017 and lower volume of revenues in the current period to cover relatively fixed costs.

Our 2018 blended gross margin slightly decreased by 0.5% compared to 2017. Our overall gross margin decrease is mainly attributed to additions to our implementation staff and lower margin revenues from appraisal services, offset by improved margin on revenues from software licenses.

Selling, General and Administrative Expenses

The following table sets forth a comparison of selling, general and administrative expenses for the years ended December 31:

($ in thousands)	2018	2017	Change $	Change %
Selling, general and administrative expenses	$ 207,605	$ 175,914	$ 31,691	18%

SG&A as a percentage of revenue was 22.2% in 2018 compared to 20.9% in 2017. SG&A expense increased approximately 18% compared to the prior year period. In 2018, our operating results include $9.1 million of SG&A expenses for Socrata from the date of acquisition. The remaining SG&A expense increase is mainly due to compensation cost related to increased staff levels, higher stock compensation expense and increased commission expense as a result of higher sales. Excluding

employees added with acquisitions, we added 47 employees mainly to our sales and finance teams since in 2018. In addition, our 2018 stock compensation expense rose $11.2 million, mainly due to increases in our stock price over the last few years.

Research and Development Expense

The following table sets forth a comparison of our research and development expense for the years ended December 31:

			Change	
($ in thousands)	2018	2017	$	%
Research and development expense	$ 63,264	$ 47,324	$ 15,940	34%

Research and development expense increased 34% in 2018 compared to the prior year period, mainly due to a number of new Tyler product development initiatives across our product suites, including increased investments in research and development at recently acquired businesses. To support these initiatives, our research and development staff grew by 159 in 2018.

Amortization of Customer and Trade Name Intangibles

The following table sets forth a comparison of amortization of customer and trade name intangibles for the years ended December 31:

			Change	
($ in thousands)	2018	2017	$	%
Amortization of customer and trade name intangibles	$ 16,217	$ 13,381	$ 2,836	21%

Amortization of customer and trade name intangibles increased due to the impact of intangibles added with several acquisitions completed in 2017 and 2018.

Other

The following table sets forth a comparison of other income, net for the years ended December 31:

			Change	
($ in thousands)	2018	2017	$	%
Other income, net	$ 3,378	$ 698	$ 2,680	384%

Other income is comprised of interest income from invested cash net of interest expense and non-usage and other fees associated with our revolving credit agreement. Other income, net, increased compared to the prior period due to increased interest income from significantly higher levels of cash and investments resulting from cash generated in the last year. We had no debt in 2018, as we repaid all borrowings under the revolving line of credit in January 2017.

Income Tax Provision (Benefit)

The following table sets forth a comparison of our income tax provision for the years ended December 31:

			Change	
($ in thousands)	2018	2017	$	%
Income tax provision (benefit)	$ 8,408	$ (6,115)	$ 14,523	(237)%
Effective income tax rate	5.4%	(3.7)%		

The increase in the income tax provision in 2018 is primarily due to the one-time tax benefit of $26.0 million recognized in the fourth quarter of 2017 resulting from the remeasurement of deferred tax assets and liabilities associated with the enactment of the Tax Act which reduced the statutory U.S. federal corporate income tax rate from 35% to 21%. The increase is somewhat offset by the decrease in statutory U.S. federal corporate income tax rate for 2018. In addition, excess tax benefits from stock option exercises were lower in 2018 as compared to the prior period. Stock option exercise activity in 2018 generated excess tax benefits of $32.5 million, while stock option exercise activity in 2017 generated $40.6 million excess tax benefits.

The increase in the effective income tax rate in 2018 compared to 2017 is also primarily attributable to the one-time tax benefit associated with the Tax Act recognized in 2017 and the decrease in excess tax benefits related to stock option exercises realized, offset by the decrease in statutory U.S. federal corporate income tax rate for 2018. Excluding the impact of the Tax Act and the excess tax benefits, our income tax provision and effective tax rate in 2018 would have been $42.6 million and 27.4% and in 2017, would have been $60.5 million and 37.0%, respectively.

The effective income tax rates in both 2018 and 2017 differed from the statutory United States federal corporate income tax rate of 21% and 35%, respectively, due to state income taxes, the research tax credit, non-deductible share-based compensation expense, disqualifying incentive stock option dispositions, and other non-deductible business expenses, and in 2017, the domestic production activities deduction.

FINANCIAL CONDITION AND LIQUIDITY

As of December 31, 2019, we had cash and cash equivalents of $232.7 million compared to $134.3 million at December 31, 2018. We also had $81.6 million invested in investment grade corporate bonds, municipal bonds and asset-backed securities as of December 31, 2019 compared to $97.7 million at December 31, 2018. These investments mature between 2020 through 2023 and we intend to hold these investments until maturity. Cash and cash equivalents consist of cash on deposit with several domestic banks and money market funds. As of December 31, 2019, we had no outstanding borrowings and no outstanding letters of credit. We believe our revolving line of credit, cash from operating activities, cash on hand and access to the credit markets provide us with sufficient flexibility to meet our long-term financial needs.

The following table sets forth a summary of cash flows for the years ended December 31:

($ in thousands)	2019	2018	2017
Cash flows provided (used) by:			
Operating activities	$ 254,720	$ 250,203	$ 195,755
Investing activities	(245,015)	(238,255)	(85,395)
Financing activities	88,698	(63,595)	39,415
Net increase (decrease) in cash and cash equivalents	$ 98,403	$ (51,647)	$ 149,775

Net cash provided by operating activities continues to be our primary source of funds to finance operating needs and capital expenditures. Other potential capital resources include cash on hand, public and private issuances of debt or equity securities, and bank borrowings. It is possible that our ability to access the capital and credit markets in the future may be limited by economic conditions or other factors. We currently believe that cash provided by operating activities, cash on hand and available credit are sufficient to fund our working capital requirements, capital expenditures, income tax obligations, and share repurchases for at least the next twelve months.

In 2019, operating activities provided cash of $254.7 million compared to $250.2 million in 2018. Operating activities that provided cash were primarily comprised of net income of $146.5 million, non-cash depreciation and amortization charges of $76.7 million and non-cash share-based compensation expense of $60.0 million. Working capital, excluding cash, increased approximately $35.5 million due to higher accounts receivable resulting from an increase in unbilled receivables attributed to revenues recognized prior to billings, higher accounts receivable related to annual maintenance and subscription billings, timing of income tax payments, and the deferred taxes associated with stock option activity during the period. These increases were offset by the growth in deferred revenue balances and timing of payments of payroll related taxes and vendor invoices.

In general, changes in the balance of deferred revenue are cyclical and primarily driven by the timing of our maintenance and subscription billings. Our renewal dates occur throughout the year, but our largest maintenance renewal cycles occur in the second and fourth quarters.

Days sales outstanding in accounts receivable were 117 days at December 31, 2019, compared to 111 days at December 31, 2018. The increase in our DSO is mainly due to an increase in unbilled receivables attributed to the increase in software license revenue for which we have recognized revenue at the point in time when the software is made available to the customer, but the billing has not yet been submitted to the customer. An increase in software services contracts accounted for using progress-to-completion method of revenue recognition in which the services are performed in one accounting period, but the billing normally occurs subsequently in another accounting period also contributed to the increase in DSO. Furthermore, our maintenance billing cycle typically peaks at its highest level in June and second highest level in December of each year and is followed by collections in the subsequent quarter. DSO is calculated based on quarter-end accounts receivable (excluding long-term receivables but including unbilled receivables) divided by the quotient of annualized quarterly revenues divided by 360 days.

Investing activities used cash of $245.0 million in 2019 compared to $238.3 million in 2018. We invested $54.7 million and received $70.8 million in proceeds from investment grade corporate bonds, municipal bonds and asset-backed securities with maturity dates ranging from 2020 through 2023. On February 28, 2019, we acquired all of the capital stock of MicroPact. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million, including $198.2 million paid in cash and accrued contingent consideration of $6.0 million at December 31, 2019. On February 1, 2019, we acquired all the assets of MyCivic for the total purchase price of $3.7 million paid in cash. On October 30, 2019, we acquired certain assets of CHT. The total purchase price was approximately $20.5 million of which $19.1 million was paid in cash and approximately $1.4 million accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments. Approximately $37.2 million was invested in property and equipment, including $20.8 million related to real estate. In addition, approximately $4.8 million of software development was capitalized in 2019. The remaining additions were for computer equipment and furniture and fixtures in support of internal growth, particularly with respect to data centers supporting growth in our cloud-based offerings. These expenditures were funded from cash generated from operations.

In 2018, we invested $115.6 million and received $81.2 million in proceeds from investment grade corporate bonds, municipal bonds and asset-backed securities. Approximately $27.4 million was invested in property and equipment, primarily for computer equipment, furniture and fixtures in support of internal growth, particularly with respect to our cloud-based offerings. We paid $2.2 million for the expansion of existing buildings. On December 7, 2018, we acquired certain assets and intellectual property of SceneDoc, Inc., a company that provides mobile-first, SaaS field reporting for law enforcement agencies. The total purchase price was approximately $6.2 million in cash. On October 1, 2018, we acquired all of the equity interests of MobileEyes, a company that develops software to improve public safety by supporting fire prevention and suppression, emergency response, and structural safety. The total purchase price was approximately $5.3 million in cash. On August 31, 2018, we acquired all of the assets of CaseloadPRO, a company that provides a fully featured probation case management system. The purchase price of $9.3 million was paid in cash. On April 30, 2018, we acquired all of the capital stock of Socrata, a company that provides open data and data-as-a-service solutions including cloud-based data integration, visualization, analysis, and reporting solutions for state and local government agencies. The purchase price, net of cash acquired of $1.7 million, was $147.6 million paid in cash. On April 30, 2018, we acquired all of the equity interests of Sage, a cybersecurity company offering a suite of services that supports an entire cybersecurity lifecycle, including program development, education and training, technical testing, advisory services, and digital forensics. The total purchase price was $11.6 million paid in cash. These expenditures were funded from cash generated from operations.

Financing activities provided cash of $88.7 million in 2019 compared to cash used of $63.6 million in 2018. Financing activities in 2019 were primarily comprised of collections of $106.5 million from stock option exercises and employee stock purchase plan activity. We also purchased approximately 72,000 shares of our common stock for an aggregate purchase price of $14.3 million.

Financing activities used cash of $63.6 million in 2018 compared to cash provided of $39.4 million in 2017. Financing activities in 2018 were primarily comprised of collections of $83.0 million from stock option exercises and employee stock purchase plan activity. We also purchased approximately 781,000 shares of our common stock for an aggregate purchase price of $150.1 million, of which $3.5 million was accrued as of December 31, 2018.

In February 2019, our board of directors authorized the repurchase of an additional 1.5 million shares of Tyler common stock. The repurchase program, which was approved by our board of directors, was announced in October 2002, and was amended at various times from 2003 through 2019. As of February 19, 2020, we had remaining authorization to repurchase up to 2.6 million additional shares of our common stock. Our share repurchase program allows us to repurchase shares at our discretion. Market conditions influence the timing of the buybacks and the number of shares repurchased, as well as the volume of employee stock option exercises. Share repurchases are generally funded using our existing cash balances and borrowings under our credit facility and may occur through open market purchases and transactions structured through investment banking institutions, privately negotiated transactions and/or other mechanisms. There is no expiration date specified for the authorization and we intend to repurchase stock under the plan from time to time.

On September 30, 2019, we entered into a $400.0 million credit agreement (the "Credit Facility") with the various lenders party thereto and Wells Fargo Bank, National Association, as Administrative Agent. The Credit Facility provides for an unsecured revolving credit line of up to $400.0 million, including a $25.0 million sublimit for letters of credit. The Credit Facility matures on September 30, 2024. Borrowings under the Credit Facility may be used for general corporate purposes, including working capital requirements, acquisitions and share repurchases. Borrowings under the Credit Facility bear interest at a rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the 30, 60, 90 or 180 day LIBOR rate plus a margin of 1.125% to 1.75%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. The Credit Facility is secured by substantially all of our assets. The Credit Facility requires us to maintain certain financial ratios and other financial conditions and prohibits us from making certain investments, advances, cash dividends or loans, and limits incurrence of additional indebtedness and liens. As of December 31, 2019, we were in compliance with those covenants.

As of December 31, 2019, we had no outstanding borrowings and had unused borrowing capacity of $400.0 million under the Credit Facility. We paid interest of $1,750,000 in 2019, $770,000 in 2018, and $804,000 in 2017.

We paid income taxes, net of refunds received, of $21.3 million in 2019, $6.8 million in 2018, and $36.0 million in 2017. In 2019, we experienced significant stock option exercise activity that generated net tax benefits of $29.8 million and reduced tax payments accordingly. In 2018 and 2017, excess tax benefits were $32.5 million and $40.6 million, respectively.

We anticipate that 2020 capital spending will be between $36 million and $38 million, including approximately $9 million related to real estate and approximately $7 million of capitalized software development. We expect the majority of the other capital spending will consist of computer equipment and software for infrastructure replacements and expansion. Capital spending is expected to be funded from existing cash balances and cash flows from operations.

From time to time we engage in discussions with potential acquisition candidates. In order to pursue such opportunities, which could require significant commitments of capital, we may be required to incur debt or to issue additional potentially dilutive securities in the future. No assurance can be given as to our future acquisition opportunities and how such opportunities will be financed. We lease office facilities for use in our operations, as well as transportation and other equipment. Most of our leases are non-cancelable operating lease agreements and they expire from one year to eight years. Some of these leases include options to extend for up to 10 years.

Summarized in the table below are our obligations to make future payments under the Credit Facility and lease obligations at December 31, 2019 (in thousands):

	2020	2021	2022	2023	2024	Thereafter	Total
Revolving line of credit	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Lease obligations	7,684	6,246	3,960	2,923	2,478	2,042	25,333
Total future payment obligations	$ 7,684	$ 6,246	$ 3,960	$ 2,923	$ 2,478	$ 2,042	$ 25,333

As of December 31, 2019, we do not have any off-balance sheet arrangements, guarantees to third-parties or material purchase commitments.

CAPITALIZATION

At December 31, 2019, our capitalization consisted of no outstanding borrowings and $1.6 billion of shareholders' equity.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Market risk represents the risk of loss that may affect us due to adverse changes in financial market prices and interest rates.

In 2019, our effective average interest rate for borrowings was 3.84%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. Loans under the Credit Facility bear interest, at Tyler's option, at a per annum rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the one-, two-, three-, or six-month LIBOR rate plus a margin of 1.125% to 1.75%.

As of December 31, 2019, we had no outstanding borrowings under the Credit Facility and therefore are not subject to any interest risk.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

The reports of our independent registered public accounting firm and our financial statements, related notes, and supplementary data are included as part of this Annual Report beginning on page F-1.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

None.

ITEM 9A. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures — We maintain disclosure controls and procedures (as defined in Rule 13a-15(e) of the Securities Exchange Act) designed to provide reasonable assurance that the information required to be disclosed by us in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. These include controls and procedures designed to ensure that this information is accumulated and communicated to our management, including our chief executive officer and chief financial officer, as appropriate to allow timely decisions regarding required disclosures. Management, with the participation of the chief executive officer and chief financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019. Based on this evaluation, the chief executive officer and chief financial officer have concluded that our disclosure controls and procedures were effective as of December 31, 2019.

Management's Report on Internal Control Over Financial Reporting — Tyler's management is responsible for establishing and maintaining effective internal control over financial reporting as defined in Securities Exchange Act Rule 13a-15(f). Tyler's internal control over financial reporting is designed to provide reasonable assurance to Tyler's management and board of directors regarding the preparation and fair presentation of published financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation.

Management assessed the effectiveness of Tyler's internal control over financial reporting as of December 31, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Based on our assessment, we concluded that, as of December 31, 2019, Tyler's internal control over financial reporting was effective based on those criteria.

Management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of MicroPact, which is included in our 2019 consolidated financial statements and constituted 11.5% of total assets as of December 31, 2019 and 5.8% of revenues for the year then ended.

Tyler's internal control over financial reporting as of December 31, 2019 has been audited by Ernst & Young LLP, the independent registered public accounting firm who also audited Tyler's financial statements. Ernst & Young's attestation report on Tyler's internal control over financial reporting appears on page F-1 hereof.

Changes in Internal Control Over Financial Reporting — During the quarter ended December 31, 2019, there were no changes in our internal control over financial reporting, as defined in Securities Exchange Act Rule 13a-15(f), that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

None.

PART III

See the information under the following captions in Tyler's definitive Proxy Statement, which is incorporated herein by reference. Only those sections of the Proxy Statement that specifically address the items set forth herein are incorporated by reference. Such incorporation by reference does not include the Compensation Discussion and Analysis, the Compensation Committee Report or the Audit Committee Report, which are included in the Proxy Statement.

	Headings in Proxy Statement
ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE.	"Tyler Management" and "Corporate Governance Principles and Board Matters"
ITEM 11. EXECUTIVE COMPENSATION.	"Executive Compensation"
ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS.	"Security Ownership of Certain Beneficial Owners and Management"
ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE.	"Executive Compensation" and "Certain Relationships and Related Transactions"

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES.

The information required under this item may be found under the section captioned "Proposals For Consideration – Proposal Two – Ratification of Our Independent Auditors for Fiscal Year 2020" in our Proxy Statement when filed.

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES.

The following documents are filed as part of this Annual Report:

(a) (1) The financial statements are filed as part of this Annual Report.

	Page
Reports of Independent Registered Public Accounting Firm	F-1
Consolidated Statements of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017	F-4
Consolidated Balance Sheets as of December 31, 2019 and 2018	F-5
Consolidated Statements of Shareholders' Equity for the years ended December 31, 2019, 2018 and 2017	F-7
Consolidated Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017	F-6
Notes to Consolidated Financial Statements	F-8

(2) Financial statement schedules:

There are no financial statement schedules filed as part of this Annual Report, since the required information is included in the financial statements, including the notes thereto, or the circumstances requiring inclusion of such schedules are not present.

(3) Exhibits

Certain of the exhibits to this Annual Report are hereby incorporated by reference, as specified:

Exhibit Number	Description
3.1	Restated Certificate of Incorporation of Tyler Three, as amended through May 14, 1990, and Certificate of Designation of Series A Junior Participating Preferred Stock (filed as Exhibit 3.1 to our Form 10-Q for the quarter ended June 30, 1990, and incorporated by reference herein).
3.2	Certificate of Amendment to the Restated Certificate of Incorporation (filed as Exhibit 3.1 to our Form 8-K, dated February 19, 1998, and incorporated by reference herein).
3.3	Amended and Restated By-Laws of Tyler Corporation, dated October 20, 2015 (filed as Exhibit 3.3 to our Form 10-Q for the quarter ended September 30, 2015, and incorporated by reference herein).
3.4	Certificate of Amendment dated May 19, 1999 to the Restated Certificate of Incorporation (filed as Exhibit 3.4 to our Form 10-K for the year ended December 31, 2000, and incorporated by reference herein).
4.1	Specimen of Common Stock Certificate (filed as Exhibit 4.1 to our registration statement no. 33-33505 and incorporated by reference herein).
4.2	Credit Agreement dated September 30, 2019, among Tyler Technologies, Inc. and Wells Fargo Bank, N. A. as Administrative Agent and other lenders party hereto (filed as Exhibit 10.1 to our Form 8-K dated October 02, 2019, and incorporated by reference herein).
10.1	Employee Stock Purchase Plan (filed as Exhibit 10.1 to our registration statement 333-182318 dated June 25, 2012 and incorporated by reference herein).
10.2	Employment and Non-Competition Agreement between Tyler Technologies, Inc. and John S. Marr Jr. effective February 26, 2018 (filed as Exhibit 10.1 to our Form 8-K dated March 9, 2018 and incorporated by reference herein).

Exhibit Number	Description
10.3	Employment and Non-Competition Agreement between Tyler Technologies, Inc. and Brian K. Miller effective February 26, 2018 (filed as Exhibit 10.3 to our Form 8-K dated March 9, 2018 and incorporated by reference herein).
10.4	Employment and Non-Competition Agreement between Tyler Technologies, Inc. and H. Lynn Moore, Jr effective February 26, 2018 (filed as Exhibit 10.2 to our Form 8-K dated March 9, 2018 and incorporated by reference herein).
10.5	Agreement and plan of merger by and among Tyler Technologies, Inc. TMP Subsidiary, Inc., MP Holding Parent, Inc. (filed as Exhibit 10.7 to our Form 10-K dated February 20, 2019 and incorporated by reference herein).
10.6	Tyler Technologies, Inc. 2018 Stock Option Plan effective as of May 9, 2018 (filed as Appendix A to the registrant's Proxy Statement filed with the Commission on March 28, 2018 and incorporated by reference herein).
*23	Consent of Independent Registered Public Accounting Firm.
*31.1	Rule 13a-14(a) Certification by Principal Executive Officer.
*31.2	Rule 13a-14(a) Certification by Principal Financial Officer.
*32	Section 1350 Certification of Principal Executive Officer and Principal Financial Officer.
*101.INS	Inline XBRL Instance Document - the Instance Document does not appear in the interactive data file because its XBRL tags, including Cover Page XBRL tags, are embedded within the Inline XBRL Document.
*101.SCH	Inline XBRL Taxonomy Extension Schema Document.
*101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
*101.LAB	Inline XBRL Extenstion Labels Linkbase Document.
*101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
*101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

* —Filed herewith.

A copy of each exhibit may be obtained at a price of 15 cents per page, with a $10.00 minimum order, by writing Investor Relations, 5101 Tennyson Parkway, Plano, Texas, 75024.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TYLER TECHNOLOGIES, INC.

Date: February 19, 2020	By:	/s/ H. Lynn Moore, Jr. H. Lynn Moore, Jr. President and Chief Executive Officer (principal executive officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, the following persons on behalf of the registrant and in the capacities and on the dates indicated have signed this report below.

Date: February 19, 2020	By:	/s/ John S. Marr, Jr. John S. Marr, Jr. Executive Chairman of the Board Director
Date: February 19, 2020	By:	/s/ H. Lynn Moore, Jr. H. Lynn Moore, Jr. President and Chief Executive Officer (principal executive officer)
Date: February 19, 2020	By:	/s/ Brian K. Miller Brian K. Miller Executive Vice President and Chief Financial Officer (principal financial officer)
Date: February 19, 2020	By:	/s/ W. Michael Smith W. Michael Smith Chief Accounting Officer (principal accounting officer)
Date: February 19, 2020	By:	/s/ Donald R. Brattain Donald R. Brattain Director
Date: February 19, 2020	By:	/s/ Glenn A. Carter Glenn A. Carter Director
Date: February 19, 2020	By:	/s/ Brenda A. Cline Brenda A. Cline Director
Date: February 19, 2020	By:	/s/ J. Luther King J. Luther King Director
Date: February 19, 2020	By:	/s/ Daniel M. Pope Daniel M. Pope Director
Date: February 19, 2020	By:	/s/ Dustin R. Womble Dustin R. Womble Director

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Tyler Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Tyler Technologies, Inc. (the Company) as of December 31, 2019 and 2018, the related consolidated statements of comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 19, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Estimation of hours for certain progress-to-completion (POC) arrangements

Description of the Matter

As described in Note 1"Summary of Significant Accounting Policies" to the consolidated financial statements under "Revenue Recognition," many of the Company's software arrangements involve "off-the-shelf" software. For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, the Company recognizes revenue over time based on a measurement of progress-to-completion (POC). The Company measures POC primarily using labor hours incurred, believing it best depicts the pattern of transfer of control to the customer, which occurs as the Company incurs costs on its contracts. Estimates of budgeted total hours for these arrangements requires management judgment.

Auditing management's estimates of total budgeted contract hours required additional audit effort due to the existence of management judgment required to make these estimates for arrangements that are completed over an extended period. These estimates require ongoing monitoring by management and may require revision over time.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company's process to review contract progress-to-date and total budgeted hours, inclusive of executed contract amendments and change orders.

To test the appropriateness of management's assessment of contract progress-to-date, our audit procedures included, among others, obtaining an understanding of any increase or decrease to budgeted hours via contract amendments or change orders, observing quarterly POC meetings where the Company discussed contract progress-to-date and evaluated the appropriateness of contract estimated hours to complete, reviewing signed Company attestations as to the contracts' progress toward completion, performing a sensitivity analysis to assess the impact of changes to the budgeted hours on the amount of revenue recognized, and performing an analysis of completed contracts to compare actual hours incurred upon completion to the original budget.

Accounting for the acquisition of MP Holdings Parent, Inc.

Description of the Matter

As described in Note 2 "Acquisitions" to the consolidated financial statements, the Company completed three acquisitions during 2019 for net consideration of $226.5 million. The most significant of these was the acquisition of MP Holdings Parent, Inc. (MicroPact) for net consideration of $202.2 million. The transactions were accounted for as business combinations.

Auditing the Company's accounting for the MicroPact acquisition was more complex due to the significant estimations used by management in determining the fair values of assets acquired and liabilities assumed, in particular the fair values of identified intangible assets of $136.1 million, the most significant of which consisted of customer relationships and developed technology, both of which utilize prospective financial information. The Company valued customer relationships using the multi-period excess earnings model. The significant assumptions used in this model included the attrition rate, weighted average cost of capital and existing customer growth. The Company valued the developed technology using the relief-from-royalty method. The significant assumptions used in this method included the obsolescence rate and weighted average cost of capital. The significant assumptions used in the valuation of the intangible assets are forward-looking and could be affected by future economic and market conditions.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of the Company's controls over its accounting for the MicroPact acquisition. For example, we tested controls over the recognition and measurement of consideration transferred, as well as management's review of the valuation methods and significant underlying assumptions for each identified intangible asset.

To test the estimated fair values of the acquired customer relationships and developed technology, we performed audit procedures that included, among others, evaluating the Company's selection of the valuation methodology, evaluating the significant assumptions used in the Company's valuation calculations and evaluating the completeness and accuracy of the underlying data supporting the significant assumptions. We involved our valuation specialists to assist with our evaluation of the methodology used by the Company and significant assumptions included in the fair value estimates. Additionally, we performed sensitivity analyses and compared significant assumptions to forecasts, the assumptions used to value similar assets in other acquisitions and to historical financial results of both the Company and the acquiree, among other procedures. We also evaluated the Company's acquisition and related purchase accounting disclosures included in Note 2 "Acquisitions".

/s/ ERNST & YOUNG LLP

We have served as the Company's auditor since 1966.

Dallas, Texas

February 19, 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Tyler Technologies, Inc.

Opinion on Internal Control over Financial Reporting

We have audited Tyler Technologies, Inc.'s internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Tyler Technologies, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on the COSO criteria.

As indicated in the accompanying Management's Report on Internal Control Over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of MP Holdings Parent, Inc. (MicroPact), which is included in the 2019 consolidated financial statements of the Company and constituted 11.5% of total assets as of December 31, 2019 and 5.8% of total revenue for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of MicroPact.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and our report dated February 19, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ ERNST & YOUNG LLP

Dallas, Texas

February 19, 2020

Tyler Technologies, Inc.
Consolidated Statements of Comprehensive Income
For the years ended December 31
(In thousands, except per share amounts)

	2019	2018	2017
Revenues:			
Software licenses and royalties	$ 100,205	$ 93,441	$ 86,242
Subscriptions	296,352	220,547	172,176
Software services	213,061	191,269	180,460
Maintenance	430,318	384,521	359,319
Appraisal services	23,479	21,846	25,023
Hardware and other	23,012	23,658	17,679
Total revenues	1,086,427	935,282	840,899
Cost of revenues:			
Software licenses and royalties	3,938	3,802	3,321
Acquired software	30,642	22,972	21,686
Software services, maintenance and subscriptions	502,138	438,923	387,634
Appraisal services	15,337	14,299	16,286
Hardware and other	17,472	15,708	12,595
Total cost of revenues	569,527	495,704	441,522
Gross profit	516,900	439,578	399,377
Selling, general and administrative expenses	257,746	207,605	175,914
Research and development expense	81,342	63,264	47,324
Amortization of customer and trade name intangibles	21,445	16,217	13,381
Operating income	156,367	152,492	162,758
Other income, net	3,471	3,378	698
Income before income taxes	159,838	155,870	163,456
Income tax provision (benefit)	13,311	8,408	(6,115)
Net income	$ 146,527	$ 147,462	$ 169,571
Earnings per common share:			
Basic	$ 3.79	$ 3.84	$ 4.55
Diluted	$ 3.65	$ 3.68	$ 4.32

See accompanying notes.

Tyler Technologies, Inc.
Consolidated Balance Sheets
(In thousands, except par value and share amounts)

	12/31/2019	12/31/2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 232,682	$ 134,279
Accounts receivable (less allowance for losses and sales adjustments of $5,738 in 2019 and $4,647 in 2018)	374,089	298,912
Short-term investments	39,399	44,306
Prepaid expenses	24,717	33,258
Income tax receivable	6,482	4,697
Other current assets	2,328	3,406
Total current assets	679,697	518,858
Accounts receivable, long-term	22,432	16,020
Operating lease right-of-use assets	18,992	—
Property and equipment, net	171,861	155,177
Other assets:		
Goodwill	840,117	753,718
Other intangibles, net	378,914	276,852
Non-current investments and other assets	79,601	70,338
	$ 2,191,614	$ 1,790,963
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 14,977	$ 6,910
Accrued liabilities	75,234	66,480
Operating lease liabilities	6,387	—
Deferred revenue	412,495	350,512
Total current liabilities	509,093	423,902
Revolving line of credit	—	—
Deferred revenue, long-term	199	424
Deferred income taxes	48,442	41,791
Operating lease liabilities, long-term	16,822	—
Commitments and contingencies		
Shareholders' equity:		
Preferred stock, $10.00 par value; 1,000,000 shares authorized; none issued	—	—
Common stock, $0.01 par value; 100,000,000 shares authorized; 48,147,969 shares issued in 2019 and 2018	481	481
Additional paid-in capital	739,478	731,435
Accumulated other comprehensive loss, net of tax	(46)	(46)
Retained earnings	917,336	771,925
Treasury stock, at cost; 8,839,352 and 9,872,505 shares in 2019 and 2018, respectively	(40,191)	(178,949)
Total shareholders' equity	1,617,058	1,324,846
	$ 2,191,614	$ 1,790,963

See accompanying notes.

Tyler Technologies, Inc.
Consolidated Statements of Cash Flows
For the years ended December 31
(In thousands)

	2019	2018	2017
Cash flows from operating activities:			
Net income	$ 146,527	$ 147,462	$ 169,571
Adjustments to reconcile net income to cash provided by operations:			
Depreciation and amortization	76,672	61,759	53,395
Share-based compensation expense	59,967	52,740	37,348
Provision for losses and sales adjustments - accounts receivable	1,636	(569)	2,031
Operating lease right-of-use assets - non cash	5,397	—	—
Deferred income tax benefit	(6,088)	(5,069)	(33,664)
Changes in operating assets and liabilities, exclusive of effects of acquired companies:			
Accounts receivable	(65,738)	(50,916)	(33,091)
Income tax receivable	(1,925)	6,642	(8,444)
Prepaid expenses and other current assets	(8,976)	(588)	(6,958)
Accounts payable	7,403	(2,416)	878
Operating lease liabilities	(6,113)	—	—
Accrued liabilities	1,516	(2,445)	6,050
Deferred revenue	44,442	43,603	8,639
Net cash provided by operating activities	254,720	250,203	195,755
Cash flows from investing activities:			
Additions to property and equipment	(37,236)	(27,424)	(43,057)
Purchase of marketable security investments	(54,742)	(115,625)	(59,779)
Proceeds from marketable security investments	70,796	81,205	28,786
Capitalized software development costs	(4,804)	—	—
Cost of acquisitions, net of cash acquired	(218,734)	(178,093)	(11,344)
(Increase) decrease in other	(295)	1,682	(1)
Net cash used by investing activities	(245,015)	(238,255)	(85,395)
Cash flows from financing activities:			
Decrease in net borrowings on revolving line of credit	—	—	(10,000)
Purchase of treasury shares	(17,786)	(146,553)	(7,474)
Proceeds from exercise of stock options	96,908	74,907	49,845
Contributions from employee stock purchase plan	9,576	8,051	7,044
Net cash provided (used) by financing activities	88,698	(63,595)	39,415
Net increase (decrease) in cash and cash equivalents	98,403	(51,647)	149,775
Cash and cash equivalents at beginning of period	134,279	185,926	36,151
Cash and cash equivalents at end of period	$ 232,682	$ 134,279	$ 185,926

See accompanying notes.

Tyler Technologies, Inc.
Consolidated Statements of Shareholders' Equity
For the years ended December 31, 2019, 2018 and 2017
(In thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Treasury Stock		Total Shareholders' Equity
	Shares	Amount				Shares	Amount	
Balance at December 31, 2016	48,148	$ 481	$ 556,663	$ (46)	$ 454,892	(11,382)	$ (77,449)	$ 934,541
Net income	—	—	—	—	169,571	—	—	169,571
Issuance of shares pursuant to stock compensation plan	—	—	28,174	—	—	1,113	21,671	49,845
Stock compensation	—	—	37,348	—	—	—	—	37,348
Issuance of shares pursuant to employee stock purchase plan	—	—	4,682	—	—	51	2,362	7,044
Treasury stock purchases	—	—	—	—	—	(44)	(6,613)	(6,613)
Balance at December 31, 2017	48,148	481	626,867	(46)	624,463	(10,262)	(60,029)	1,191,736
Net income	—	—	—	—	147,462	—	—	147,462
Issuance of shares pursuant to stock compensation plan	—	—	44,458	—	—	1,126	30,449	74,907
Stock compensation	—	—	52,740	—	—	—	—	52,740
Issuance of shares pursuant to employee stock purchase plan	—	—	7,370	—	—	45	681	8,051
Treasury stock purchases	—	—	—	—	—	(781)	(150,050)	(150,050)
Balance at December 31, 2018	48,148	481	731,435	(46)	771,925	(9,872)	(178,949)	1,324,846
Net income	—	—	—	—	146,527	—	—	146,527
Retained earnings adjustment-adoption of Topic 842 Leases, net of taxes	—	—	—	—	(1,116)	—	—	(1,116)
Exercise of stock options and vesting of restricted stock units	—	—	(52,833)	—	—	1,075	149,741	96,908
Employee taxes paid for withheld shares for taxes upon equity award	—	—	—	—	—	(23)	(5,361)	(5,361)
Stock compensation	—	—	59,967	—	—	—	—	59,967
Issuance of shares pursuant to employee stock purchase plan	—	—	909	—	—	53	8,667	9,576
Treasury stock purchases	—	—	—	—	—	(72)	(14,289)	(14,289)
Balance at December 31, 2019	48,148	$ 481	$ 739,478	$ (46)	$ 917,336	(8,839)	$ (40,191)	$ 1,617,058

See accompanying notes.

(1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

DESCRIPTION OF BUSINESS

We provide integrated software systems and related services for the public sector, with a focus on local governments. We develop and market a broad line of software solutions and services to address the information technology ("IT") needs primarily of cities, counties, schools and other local government entities. In addition, we provide professional IT services, including software and hardware installation, data conversion, training, and for certain customers, product modifications, along with continuing maintenance and support for customers using our systems. We also provide subscription-based services such as software as a service ("SaaS") arrangements, which primarily utilize the Tyler private cloud, and electronic document filing solutions ("e-filing"). In addition, we provide property appraisal outsourcing services for taxing jurisdictions.

PRINCIPLES OF CONSOLIDATION

The consolidated financial statements include our parent company and sixteen subsidiaries, which are wholly-owned. All significant intercompany balances and transactions have been eliminated in consolidation. Comprehensive income is defined as the change in equity of a business enterprise during a period from transactions, and other events and circumstances from non-owner sources and includes all components of net income (loss) and other comprehensive income (loss). We had no items of other comprehensive income (loss) during the years ended December 31, 2019, 2018 and 2017.

CASH AND CASH EQUIVALENTS

Cash in excess of that necessary for operating requirements is invested in short-term, highly liquid, income-producing investments. Investments with original maturities of three months or less are classified as cash and cash equivalents, which primarily consist of cash on deposit with several banks and money market funds. Cash and cash equivalents are stated at cost, which approximates market value.

REVENUE RECOGNITION

Nature of Products and Services

We earn revenue from software licenses, royalties, subscription-based services, software services, post-contract customer support ("PCS" or "maintenance"), hardware, and appraisal services. Revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligations in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligations in the contract
- Recognition of revenue when, or as, we satisfy a performance obligation

Most of our software arrangements with customers contain multiple performance obligations that range from software licenses, installation, training, and consulting to software modification and customization to meet specific customer needs (services), hosting, and PCS. For these contracts, we account for individual performance obligations separately when they are distinct. We evaluate whether separate performance obligations can be distinct or should be accounted for as one performance obligation. Arrangements that include software services, such as training or installation, are evaluated to determine whether those services are highly interdependent or interrelated to the product's functionality. The transaction price is allocated to the distinct performance obligations on a relative standalone selling price ("SSP") basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. Revenue is recognized net of allowances for sales adjustments and any taxes collected from customers, which are subsequently remitted to governmental authorities.

Software Arrangements:

Software Licenses and Royalties

Many of our software arrangements involve "off-the-shelf" software. We recognize the revenue allocable to "off-the-shelf" software licenses and specified upgrades at a point in time when control of the software license transfers to the customer, unless the software is not considered distinct. We consider off-the-shelf software to be distinct when it can be added to an arrangement with minor changes in the underlying code, it can be used by the customer for the customer's purpose upon installation, and remaining services such as training are not considered highly interdependent or interrelated to the product's functionality.

For arrangements that involve significant production, modification or customization of the software, or where software services are otherwise not considered distinct, we recognize revenue over time by measuring progress-to-completion. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often implemented over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent.

Software license fees are billed in accordance with the contract terms. Typically, a majority of the fee is due when access to the software license is made available to the customer and the remainder of the fee due over a passage of time stipulated by the contract. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

We recognize royalty revenue when the sale occurs under the terms of our third-party royalty arrangements. Currently, our third-party royalties are recognized on an estimated basis and are trued up when we receive notice of amounts we are entitled to receive. We typically receive notice of royalty revenues we are entitled to and billed on a quarterly basis in the quarter immediately following the royalty reporting period.

Software Services

As noted above, some of our software arrangements include services considered highly interdependent or highly interrelated or require significant customization to meet the customer's desired functionality. For these software arrangements, both the software licenses and related software services revenue are not distinct and are recognized over time using the progress-to-completion method. We measure progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. Contract fees are typically billed on a milestone basis as defined within contract terms. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met. When software services are distinct, the fee allocable to the service element is recognized over the time we perform the services and is billed on a time and material basis.

Post-Contract Customer Support

Our customers generally enter into PCS agreements when they purchase our software licenses. PCS includes telephone support, bug fixes, and rights to upgrades on a when-and-if available basis. PCS is considered distinct when purchased with our software licenses. Our PCS agreements are typically renewable annually. PCS is recognized over time on a straight-line basis over the period the PCS is provided. All significant costs and expenses associated with PCS are expensed as incurred.

Computer Hardware Equipment

Revenue allocable to computer hardware equipment is recognized at a point in time when control of the equipment is transferred to the customer.

Subscription-Based Services:

Subscription-based services consist primarily of revenues derived from SaaS arrangements, typically utilizing the Tyler private cloud, and electronic filing transactions. Revenue from subscription-based services is generally recognized over time on a ratable basis over the contract term, beginning on the date that our service is made available to the customer. Our subscription contracts are generally three to five years or longer in length, billed annually in advance, and non-cancelable.

For SaaS arrangements, we evaluate whether the customer has the contractual right to take possession of our software at any time during the hosting period without significant penalty and whether the customer can feasibly maintain the software on the customer's hardware or enter into another arrangement with a third-party to host the software. We allocate contract value to each performance obligation of the arrangement that qualifies for treatment as a distinct element based on estimated SSP. We recognize SaaS arrangements services ratably over the term of the arrangement, which range from one to ten years, but are typically for a period of three to five years. For software services associated with certain SaaS arrangements, we have concluded that the services are not distinct, and we recognize the revenue ratably over the remaining contractual period once we have provided the customer access to the software. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

Electronic filing transaction fees primarily pertain to documents filed with the courts by attorneys and other third-parties via our e-filing services and retrieval of filed documents via our access services. For each document filed with a court, the filer generally pays a transaction fee and a court filing fee to us and we remit a portion of the transaction fee and the filing fee to the court. We record as revenue the transaction fee, while the portion of the transaction fee remitted to the courts is recorded as cost of revenues as we are acting as a principal in the arrangement. Court filing fees collected on behalf of the courts and remitted to the courts are recorded on a net basis and thus do not affect the statement of comprehensive income.

Other transaction-based fees primary relate to online payment services, which are offered with the assistance of third-party vendors. In general, when we are the principal in a transaction based on the factors identified in ASC 606-10-55-36 through 55-40, we record the revenue and related costs on a gross basis. Otherwise, we net the cost of revenue associated with the service against the gross revenue (amount billed to the customer) and record the net amount as revenue.

For e-filing transaction fees and other transaction-based revenues, we have the right to charge the customer an amount that directly corresponds with the value to the customer of our performance to date. Therefore, we recognize revenue for these services over time based on the amount billable to the customer in accordance with the 'as invoiced' practical expedient in ASC 606-10-55-18. In some cases, we are paid on a fixed fee basis and recognize the revenue ratably over the contractual period.

Costs of performing services under subscription-based arrangements are expensed as incurred, except for certain direct and incremental contract origination and set-up costs associated with SaaS arrangements. Such direct and incremental costs are capitalized and amortized ratably over the useful life.

Appraisal Services:

For our property appraisal projects, we recognize revenue using the progress-to-completion method since many of these projects are executed over one to three-year periods and consist of various unique activities. Appraisal services require a significant level of integration and interdependency with various individual service components; therefore, the service components are not considered distinct. Appraisal services are recognized over time by measuring progress-to-completion primarily using labor hours incurred as it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. These arrangements are often executed over an extended period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent. Contract fees are typically billed on a milestone basis as defined within contract terms. We record amounts that have been invoiced in accounts receivable and in deferred revenue or revenues, depending on whether the revenue recognition criteria have been met.

Significant Judgments:

Our contracts with customers often include multiple performance obligations to a customer. When a software arrangement (license or subscription) includes both software licenses and software services, judgment is required to determine whether the software license is considered distinct and accounted for separately, or not distinct and accounted for together with the software services and recognized over time.

The transaction price is allocated to the separate performance obligations on a relative SSP basis. We determine the SSP based on our overall pricing objectives, taking into consideration market conditions and other factors, including the value of our contracts, the applications sold, customer demographics, and the number and types of users within our contracts. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we determine SSP using the expected cost-plus margin approach.

For arrangements that involve significant production, modification or customization of the software, or where software services otherwise cannot be considered distinct, we recognize revenue as control is transferred to the customer over time using progress-to-completion methods. Depending on the contract, we measure progress-to-completion primarily using labor hours incurred, or value added. The progress-to-completion method generally results in the recognition of reasonably consistent profit margins over the life of a contract because we can provide reasonably dependable estimates of contract billings and contract costs. We use the level of profit margin that is most likely to occur on a contract. If the most likely profit margin cannot be precisely determined, the lowest probable level of profit margin in the range of estimates is used until the results can be estimated more precisely. These arrangements are often implemented over an extended time period and occasionally require us to revise total cost estimates. Amounts recognized in revenue are calculated using the progress-to-completion measurement after giving effect to any changes in our cost estimates. Changes to total estimated contract costs, if any, are recorded in the period they are determined. Estimated losses on uncompleted contracts are recorded in the period in which we first determine that a loss is apparent.

Typically, the structure of our arrangements does not give rise to variable consideration. However, in those instances whereby variable consideration exists, we include in our estimates additional revenue for variable consideration when we believe we have an enforceable right, the amount can be estimated reliably and its realization is probable.

Refer to Note 15 - "Disaggregation of Revenue" for further information, including the economic factors that affect the nature, amount, timing, and uncertainty of revenue and cash flows of our various revenue categories.

Contract Balances:

Accounts receivable and allowance for doubtful accounts and sales adjustments

Timing of revenue recognition may differ from the timing of invoicing to customers. We record an unbilled receivable when revenue is recognized prior to invoicing, or deferred revenue when revenue is recognized subsequent to invoicing. For multi-year agreements, we generally invoice customers annually at the beginning of each annual coverage period. We record an unbilled receivable related to revenue recognized for on-premises licenses as we have an unconditional right to invoice and receive payment in the future related to those licenses.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from credit risk associated with the inability of a customer to make required payments. Events or changes in circumstances that indicate the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products.

The following table summarizes the changes in the allowances for doubtful accounts and sales adjustments (in thousands):

	Years Ended December 31,		
	2019	2018	2017
Balance at beginning of year	$ 4,647	$ 5,427	$ 3,396
Provisions for losses and sales adjustments - accounts receivable	1,636	(569)	2,031
Collection of accounts previously written off	(545)	(211)	—
Balance at end of year	$ 5,738	$ 4,647	$ 5,427

The allowance for doubtful accounts and sales adjustments reflects our best estimate of probable losses inherent in the accounts receivable balance. We determine the allowance based on known troubled accounts, historical experience, and other currently available evidence.

In connection with our appraisal services contracts and certain software services contracts, we may perform work prior to when the software and services are billable and/or payable pursuant to the contract. Unbilled revenue is not billable at the balance sheet date but is recoverable over the remaining life of the contract through billings made in accordance with contractual agreements. The termination clauses in most of our contracts provide for the payment for the value of products delivered or services performed in the event of early termination We have historically recorded such unbilled receivables (costs and estimated profit in excess of billings) in connection with (1) property appraisal services contracts accounted for using progress-to-completion method of revenue recognition using labor hours as a measure of progress towards completion in which the services are performed in one accounting period but the billing normally occurs subsequently and may span another accounting period; (2) software services contracts accounted for using progress-to-completion method of revenue recognition using labor hours as a measure of progress towards completion in which the services are performed in one accounting period but the billing for the software element of the arrangement may be based upon the specific phase of the implementation; (3) software revenue for which we have recognized revenue at the point in time when the software is made available to the customer but the billing has not yet been submitted to the customer; (4) some of our contracts which provide for an amount to be withheld from a progress billing (generally between 5% and 20% retention) until final and satisfactory project completion is achieved; and (5) in a limited number of cases, extended payment terms, which may be granted to customers with whom we generally have a long-term relationship and favorable collection history.

As of December 31, 2019, and December 31, 2018, total current and long-term accounts receivable, net of allowance for doubtful accounts, was $396.5 million and $314.9 million, respectively. We have recorded unbilled receivables of $134.0 million and $104.2 million at December 31, 2019, and December 31, 2018, respectively. Included in unbilled receivables are retention receivables of $13.1 million and $12.2 million at December 31, 2019, and December 31, 2018, respectively, which become payable upon the completion of the contract or completion of our fieldwork and formal hearings. Unbilled receivables expected to be collected within one year have been included with accounts receivable, current portion in the accompanying consolidated balance sheets. Unbilled receivables and retention receivables expected to be collected past one year have been included with accounts receivable, long-term portion in the accompanying consolidated balance sheets.

Payment terms and conditions vary by contract type, although terms generally include a requirement of payment within 30 to 90 days. In instances where the timing of revenue recognition differs from the timing of invoicing, we have determined our contracts generally do not include a significant financing component. The primary purpose of our invoicing terms is to provide customers with simplified and predictable ways of purchasing our products and services, not to receive financing from our customers or to provide customers with financing. Examples include invoicing at the beginning of a subscription term with revenue recognized ratably over the contract period, and multi-year on-premises term licenses that are invoiced annually with revenue recognized upfront.

Deferred Revenue

The majority of deferred revenue consists of deferred maintenance revenue that has been billed based on contractual terms in the underlying arrangement, with the remaining balance consisting of payments received in advance of revenue being earned under software licensing, subscription-based services, software and appraisal services and hardware installation. Refer to Note 16 - "Deferred Revenue and Performance Obligations" for further information, including deferred revenue by segment and changes in deferred revenue during the period.

Deferred Commissions

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. Sales commissions for initial contracts are deferred and then amortized on a straight-line basis over a period of benefit that we have determined to be three to seven years. We utilized the "portfolio approach" practical expedient in ASC 606-10-10-4, which allows entities to apply the guidance to a portfolio of contracts with similar characteristics because the effects on the financial statements of this approach would not differ materially from applying the guidance to individual contracts. Using the 'portfolio approach', we determined the period of benefit by taking into consideration our customer contracts, our technology life-cycle and other factors. Sales commissions for renewal contracts are generally not paid in connection with the renewal of a contract. In the small number of instances where a commission is paid on a renewal, it is not commensurate with the commission paid on the initial sale and is recognized over the term of renewal, which is generally one year. Amortization expense related to deferred commissions is included in selling, general and administrative expenses in the accompanying consolidated statements of income. Refer to Note 17 - "Deferred Commissions" for further information.

Prepaid expenses and other current assets include direct and incremental costs such as commissions associated with arrangements for which revenue recognition has been deferred. Such costs are expensed at the time the related revenue is recognized.

USE OF ESTIMATES

The preparation of our financial statements in conformity with accounting principles generally accepted in the United States ("GAAP") requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to such estimates and assumptions include revenue recognition, determining the nature and timing of satisfaction of performance obligations, determining the SSP of performance obligations, variable consideration, and other obligations such as returns and refunds; loss contingencies; the estimated useful life of deferred commissions; the carrying amount and estimated useful lives of intangible assets; the carrying amount of operating lease right-of-use assets and operating lease liabilities; determining share-based compensation expense; the valuation allowance for receivables; and determining the potential outcome of future tax consequences of events that have been recognized on our consolidated financial statements or tax returns. Actual results could differ from estimates.

PROPERTY AND EQUIPMENT, NET

Property, equipment and purchased software are recorded at original cost and increased by the cost of any significant improvements after purchase. We expense maintenance and repairs when incurred. Depreciation and amortization is calculated using the straight-line method over the shorter of the asset's estimated useful life or the term of the lease in the case of leasehold improvements. For income tax purposes, we use accelerated depreciation methods as allowed by tax laws.

RESEARCH AND DEVELOPMENT COSTS

We expensed research and development expense of $81.3 million in 2019, $63.3 million in 2018, and $47.3 million in 2017.

INCOME TAXES

Income taxes are accounted for under the asset and liability method. Deferred taxes arise because of different treatment between financial statement accounting and tax accounting, known as "temporary differences". We record the tax effect of these temporary differences as "deferred tax assets" (generally items that can be used as a tax deduction or credit in the future periods) and "deferred tax liabilities" (generally items that we received a tax deduction for, which have not yet been recorded in the income statement). The deferred tax assets and liabilities are measured using enacted tax rules and laws that are expected to be in effect when the temporary differences are expected to be recovered or settled. A valuation allowance would be established to reduce deferred tax assets if it is more likely than not that a deferred tax asset will not be "realized." On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted into law. The Tax Act amends the Internal Revenue Code to reduce tax rates and modify policies, credits and deductions for individuals and businesses. For businesses, the Tax Act reduces the corporate U.S. federal tax rate from a maximum of 35% to a flat 21% rate and transitions from a worldwide tax system to a territorial tax system. Under ASC 740 Income Taxes, the effects of changes in tax rates and laws are recognized in the period in which the new legislation is enacted.

SHARE-BASED COMPENSATION

We have a share-based award plan that provides for the grant of stock options, restricted stock units, and performance share units to key employees, directors and non-employee consultants. Stock options generally vest after three to six years of continuous service from the date of grant and have a contractual term of 10 years. Restricted stock unit grants generally vest ratably over three to five years of continuous service from the date of grant. Each performance share unit represents the right to receive one share of our common stock based on our achievement of certain financial performance targets during applicable performance periods. We account for share-based compensation utilizing the fair value recognition pursuant to ASC 718, *Stock Compensation*. See Note 9 – "Share-Based Compensation" for further information.

GOODWILL AND OTHER INTANGIBLE ASSETS

Goodwill

Goodwill represents the excess of the purchase price over the fair value of net assets acquired, including identifiable intangible assets, in connection with our business combinations. Upon acquisition, goodwill is assigned to the reporting unit that is expected to benefit from the synergies of the business combination, which is the reporting unit to which the related acquired technology is assigned. A reporting unit is the operating segment, or a business unit one level below that operating segment, for which discrete financial information is prepared and regularly reviewed by executive management.

We assess goodwill for impairment annually as of April 1st, or more frequently whenever events or changes in circumstances indicate its carrying value may not be recoverable. We begin with the qualitative assessment of whether it is more likely than not that a reporting unit's fair value is less than its carrying value before applying the quantitative assessment described below. If it is determined through the evaluation of events or circumstances that the carrying value may not be recoverable, we perform a comparison of the estimated fair value of the reporting unit to which the goodwill has been assigned to the sum of the carrying value of the assets and liabilities of that unit. If the sum of the carrying value of the assets and liabilities of a reporting unit exceeds the estimated fair value of that reporting unit, the carrying value of the reporting unit's goodwill is reduced to its fair value through an adjustment to the goodwill balance, resulting in an impairment charge. The fair values calculated in our impairment tests are determined using discounted cash flow models involving several assumptions. The assumptions that are used are based upon what we believe a hypothetical marketplace participant would use in estimating fair value. We evaluate the reasonableness of the fair value calculations of our reporting units by comparing the total of the fair value of all of our reporting units to our total market capitalization. Our annual goodwill impairment analysis, which we performed qualitatively during the second quarter of 2019, did not result in an impairment charge.

There have been no impairments of intangible assets in any of the periods presented. See Note 4 - "Goodwill and Other Intangible Assets" for additional information.

Other Intangible Assets

We make judgments about the recoverability of purchased intangible assets other than goodwill whenever events or changes in circumstances indicate that an impairment may exist. Customer base and acquired software each comprise approximately half of our purchased intangible assets other than goodwill. We review our customer turnover each year for indications of impairment. Our customer turnover has historically been very low. If indications of impairment are determined to exist, we measure the recoverability of assets by a comparison of the carrying amount of the asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of the assets exceeds their estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the assets exceeds the fair value of the assets. There have been no impairments of intangible assets in any of the periods presented.

IMPAIRMENT OF LONG-LIVED ASSETS

We periodically evaluate whether current facts or circumstances indicate that the carrying value of our property and equipment or other long-lived assets to be held and used may not be recoverable. If such circumstances are determined to exist, we measure the recoverability of assets to be held and used by a comparison of the carrying amount of the asset or appropriate grouping of assets and the estimated undiscounted future cash flows expected to be generated by the assets. If the carrying amount of the assets exceeds their estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of would be separately presented in the balance sheet and reported at the lower of the carrying amount or fair value less costs to sell and would no longer be depreciated. The assets and liabilities of a disposed group or classified as held for sale would be presented separately in the appropriate asset and liability sections of the balance sheet. There have been no significant impairments of long-lived assets in any of the periods presented.

COSTS OF COMPUTER SOFTWARE

We capitalize software development costs upon the establishment of technological feasibility and prior to the availability of the product for general release to customers. Software development costs primarily consist of personnel costs and rent for related office space. We capitalized approximately $4.8 million of software development costs in 2019. We begin to amortize capitalized costs when a product is available for general release to customers. Amortization expense is determined on a product-by-product basis at a rate not less than straight-line basis over the product's remaining estimated economic life of, generally, five years. Amortization of software development costs was approximately $296,000 in 2019, and is included in cost of software license revenue in the accompanying consolidated statements of comprehensive income. We have not capitalized any internal use software development costs in any of the periods presented.

CONTINGENT PURCHASE CONSIDERATION

Contingent future cash payments related to acquisitions are recognized at fair value as of the acquisition date and included in the determination of the acquisition date purchase price. Subsequent changes in the fair value of the contingent future cash payments are recognized in earnings in the period that the change occurs.

FAIR VALUE OF FINANCIAL INSTRUMENTS

Cash and cash equivalents, accounts receivables, accounts payables, short-term obligations and certain other assets at cost approximate fair value because of the short maturity of these instruments. The fair value of our revolving line of credit would approximate book value as of December 31, 2019, because our interest rates reset approximately every 30 days or less. See Note 6 – "Revolving Line of Credit" for further discussion.

As of December 31, 2019, we have $81.6 million in investment grade corporate bonds, municipal bonds and asset-backed securities with maturity dates ranging from 2020 through 2023. We intend to hold these bonds to maturity and have classified them as such. We believe cost approximates fair value. The fair values of these securities are considered Level II as they are based on inputs from quoted prices in markets that are not active or from other observable market data. These investments are included in short-term investments and non-current investments and other assets.

As of December 31, 2019, we have $15.0 million invested in convertible preferred stock representing a 20% interest in Record Holdings Pty Limited, a privately held Australian company specializing in digitizing the spoken word in court and legal proceedings. The investment in convertible preferred stock is accounted under the cost method because we do not have the ability to exercise significant influence over the investee and the securities do not have readily determinable fair values. Our investment is carried at cost less any impairment write-downs. Our cost method investments are assessed annually for impairment. We do not reassess the fair value of cost method investments if there are no identified events or changes in circumstances that may have a significant adverse effect on the fair value of the investments. There has been no impairment of our cost method investment for the periods presented. This investment is included in non-current investments and other assets in the accompanying consolidated balance sheets.

CONCENTRATIONS OF CREDIT RISK

Financial instruments that potentially subject us to significant concentrations of credit risk consist principally of cash and cash equivalents, accounts receivable from trade customers, and investments in marketable securities. Our cash and cash equivalents primarily consist of operating account balances and money market funds, which are maintained at several major domestic financial institutions and the balances often exceed insured amounts. As of December 31, 2019, we had cash and cash equivalents of $232.7 million. We perform periodic evaluations of the credit standing of these financial institutions.

Concentrations of credit risk with respect to receivables are limited due to the size and geographical diversity of our customer base. Historically, our credit losses have not been significant. As a result, we do not believe we have any significant concentrations of credit risk as of December 31, 2019.

We maintain allowances for doubtful accounts, which are provided at the time the revenue is recognized. Since most of our customers are domestic governmental entities, we rarely incur a loss resulting from the inability of a customer to make required payments. Events or changes in circumstances that indicate the carrying amount for the allowances for doubtful accounts may require revision include, but are not limited to, deterioration of a customer's financial condition, failure to manage our customer's expectations regarding the scope of the services to be delivered, and defects or errors in new versions or enhancements of our software products.

LEASES

We determine if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, and operating lease liabilities, current and long-term, on our consolidated balance sheets. We currently do not have any finance lease arrangements.

Operating lease ROU assets and operating lease liabilities are recognized based on the present value of the future minimum lease payments over the lease term at commencement date. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at commencement date of the lease in determining the present value of future payments. The operating lease ROU asset also includes any lease payments made and excludes lease incentives and initial direct costs incurred. Our lease terms may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term. Leases with an initial term of 12 months or less are not recorded on the balance sheet; we recognize lease expense for these leases on a straight-line basis over the lease term. We have lease agreements with lease and non-lease components, which are generally accounted for as a single lease component.

INDEMNIFICATION

Most of our software license agreements indemnify our customers in the event that the software sold infringes upon the intellectual property rights of a third-party. These agreements typically provide that in such event we will either modify or replace the software so that it becomes non-infringing or procure for the customer the right to use the software. We have recorded no liability associated with these indemnifications, as we are not aware of any pending or threatened infringement actions that are possible losses. We believe the estimated fair value of these intellectual property indemnification clauses is minimal.

We have also agreed to indemnify our officers and board members if they are named or threatened to be named as a party to any proceeding by reason of the fact that they acted in such capacity. We maintain directors' and officers' liability insurance coverage to protect against any such losses. We have recorded no liability associated with these indemnifications. Because of our insurance coverage, we believe the estimated fair value of these indemnification agreements is minimal.

RECLASSIFICATIONS

Certain amounts for previous years have been reclassified to conform to the current year presentation.

RECENTLY ADOPTED ACCOUNTING PRONOUNCEMENTS

Leases. We adopted ASU No. 2016-02, *Leases* ("Topic 842") using the transition method that allows us to initially apply the guidance at the adoption date of January 1, 2019, and recognized a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We used the package of practical expedients that allows us to not reassess: (1) lease classification for any expired or existing leases and (2) initial direct costs for any expired or existing leases. We did not elect to use the hindsight application for evaluating the life of the lease arrangement. The impact of adoption is reflected in the financial information herein. For additional details, see Note 11 to our consolidated financial statements.

The impact of Topic 842 on our consolidated balance sheet beginning January 1, 2019, included the recognition of ROU assets and operating lease liabilities, while our accounting for finance leases remained substantially unchanged. We had no finance leases prior to the adoption of Topic 842 and continue to have none as of December 31, 2019.

Amounts recognized at January 1, 2019, for operating leases were as follow (in thousands):

Operating lease right-of-use assets	$	15,633
Operating lease liabilities		(4,344)
Operating lease liabilities, long-term		(12,405)
Retained earnings	$	(1,116)

NEW ACCOUNTING PRONOUNCEMENTS

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses,* ("ASU 2016-13"). ASU 2016-13 changes the impairment model for most financial assets and certain other instruments, including trade and other receivables, held-to-maturity debt securities and loans, and requires entities to use a new forward-looking expected loss model that will result in the earlier recognition of allowance for losses. This update is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted for a fiscal year beginning after December 15, 2018, including interim periods within that fiscal year. Entities will apply the standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is adopted. We will adopt the new standard in the first quarter of 2020. We have evaluated the impact of this standard on our consolidated financial statements, including accounting policies, processes and systems. Based on the nature of the Company's customer base and historical nature of losses, we do not expect the impact to be material upon adoption.

(2) ACQUISITIONS

2019

On October 30, 2019, we acquired certain assets of Courthouse Technologies, Ltd ("CHT"), an industry-leading provider of jury management systems that offers a fully integrated, end-to-end SaaS solution to manage all facets of juror management, from source list generation to juror processing and payment. The total purchase price was approximately $20.5 million of which $19.1 million was paid in cash and approximately $1.4 million was accrued for working capital and indemnity holdbacks, subject to certain post-closing adjustments.

On February 28, 2019, we acquired all of the capital stock of MP Holdings Parent, Inc. dba MicroPact ("MicroPact"), a leading provider of commercial off-the-shelf ("COTS") solutions, including entellitrak®, a low-code application development platform for case management and business process management used extensively in the public sector. The total purchase price, net of cash acquired of $2.0 million, was approximately $202.2 million consisting of $198.2 million paid in cash and accrued consideration of $6.0 million contingent upon the achievement of certain financial performance objectives.

We have performed a valuation analysis of the fair market value of MicroPact's assets and liabilities. The following table summarizes the final allocation of the purchase price as of the acquisition date:

(In thousands)		
Cash	$	1,983
Accounts receivable		10,535
Other current assets		8,979
Other noncurrent assets		10,417
Identifiable intangible assets		136,143
Goodwill		76,319
Accounts payable		(602)
Accrued expenses		(4,092)
Other noncurrent liabilities		(8,879)
Deferred revenue		(13,510)
Deferred tax liabilities, net		(13,125)
Total consideration	$	204,168

In connection with this transaction, we acquired total tangible assets of $31.9 million and assumed liabilities of approximately $27.1 million. We recorded goodwill of $76.3 million, none of which is expected to be deductible for tax purposes, and other identifiable intangible assets of approximately $136.1 million. The $136.1 million of intangible assets are attributable to customer relationships, acquired software, trade name and favorable fair value of an operating lease and will be amortized over a weighted average period of approximately 11 years. We recorded deferred tax liabilities of $13.1 million related to estimated fair value allocations.

The acquisition of MicroPact augments our product solutions, positions us in new practice areas such as health and human services, and presents opportunities to expand our business across new and complementary markets. We intend to expand our total addressable market through MicroPact's strong presence in the federal market. Therefore, the goodwill of $76.3 million arising from this acquisition is primarily attributed to our ability to generate increased revenues, earnings and cash flow by expanding our addressable market and client base. In 2019, we recorded adjustments to the preliminary opening balance sheet attributed to changes in accounts receivable, deferred revenue, customer relationships, accrued expenses, working capital holdback and related deferred taxes resulting in a net decrease to goodwill of approximately $5.7 million.

The following unaudited pro forma consolidated operating results information has been prepared as if the MicroPact acquisition had occurred at January 1, 2018, after giving effect to certain adjustments, including amortization of intangibles, interest, transaction costs and tax effects.

	Twelve Months Ended December 31,(unaudited)			
	2019		2018	
Revenues	$	1,098,226	$	1,009,427
Net income		146,200		146,998
Basic earnings per share	$	3.78	$	3.82
Diluted earnings per share	$	3.65	$	3.66

The pro forma information above does not include acquisitions that are not considered material to our results of operations. The pro forma information does not purport to represent what our results of operations actually would have been had such transaction occurred on the date specified or to project our results of operations for any future period.

On February 1, 2019, we acquired all the assets of Civic, LLC ("MyCivic"), a company that provides software solutions to connect communities. The total purchase price was $3.7 million in cash.

As of December 31, 2019, the purchase price allocations for MicroPact and MyCivic are complete. As of December 31, 2019, the purchase price allocation for CHT is not yet complete; therefore, the preliminary valuation estimates of fair value assumed at the acquisition date for intangible assets, receivables and deferred revenue and related deferred taxes are subject to change as valuations are finalized.

The operating results of all 2019 acquisitions are included with the operating results of the Enterprise Software segment since their date of acquisition. Revenues from MicroPact included in Tyler's results of operations totaled approximately $63.0 million and the net loss was approximately $98,000 from the date of acquisition through December 31, 2019. The impact of the MyCivic and CHT

acquisitions, individually and in the aggregate, on our operating results, assets and liabilities is not material. In 2019, we incurred fees of approximately $1.1 million for financial advisory, legal, accounting, due diligence, valuation and other various services necessary to complete these acquisitions. These fees were expensed in 2019 and are included in selling, general and administrative expenses on the consolidated statement of comprehensive income.

Our balance sheet as of December 31, 2019, reflects the allocation of the purchase price to the assets acquired based on their fair value at the date of each acquisition. The fair value of the assets and liabilities acquired are based on valuations using Level III, unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

At December 31, 2019, the maximum aggregate amount of remaining contingent cash payments associated with our acquisitions is $6.0 million and are payable in fiscal year 2020.

2018

On December 7, 2018, we acquired certain assets and intellectual property of SceneDoc, Inc., a company that provides mobile-first, SaaS field reporting for law enforcement agencies. The total purchase price was approximately $6.2 million in cash.

On October 1, 2018, we acquired all of the equity interests of TradeMaster, Inc. dba MobileEyes, a company that develops SaaS software to improve public safety by supporting fire prevention and suppression, emergency response, and structural safety. The total purchase price was approximately $5.3 million in cash.

On August 31, 2018, we acquired all of the assets of CaseloadPRO, L. P., a company that provides a fully featured SaaS probation case management system. The purchase price of $9.3 million was paid in cash.

On April 30, 2018, we acquired all of the capital stock of Socrata, Inc.("Socrata"), a company that provides open data and data-as-a-service solutions including cloud-based data integration, visualization, analysis, and reporting solutions for state and local government agencies. The purchase price, net of cash acquired of $1.7 million, was $147.6 million paid in cash.

On April 30, 2018, we acquired all of the equity interests of Sage Data Security, LLC, a cybersecurity company offering a suite of services that supports an entire cybersecurity lifecycle, including program development, education and training, technical testing, advisory services, and digital forensics. The total purchase price was $11.6 million paid in cash.

The operating results of these acquisition are included in our results of operations of the Enterprise Software segment from their respective dates of acquisition.

2017

On November 29, 2017, we acquired audio and digital two-way radio communications technology and related assets from Radio 10-33, LLC. The total purchase price was $1.4 million, all of which was paid in cash.

On August 2, 2017, we acquired substantially all of the assets and assumed certain liabilities of Digital Health Department, Inc., a company that provides environmental health software, offering a SaaS solution for public health compliance and inspections processes. The total purchase price, net of debt assumed, was $3.9 million, all of which was paid in cash.

On May 30, 2017, we acquired all of the capital stock of Modria.com, Inc., a company that specializes in online dispute resolution for government and commercial entities. The total purchase price, net of debt assumed, was $6.1 million, all of which was paid in cash.

The operating results of these acquisition are included in our results of operations of the Enterprise Software segment from their respective dates of acquisition.

(3) PROPERTY AND EQUIPMENT, NET

Property and equipment, net consists of the following at December 31:

	Useful Lives (years)	2019	2018
Land	—	$ 18,653	$ 9,958
Building and leasehold improvements	5-39	137,448	122,241
Computer equipment and purchased software	3-5	99,435	84,649
Furniture and fixtures	5	28,506	27,238
Transportation equipment	5	402	438
		284,444	244,524
Accumulated depreciation and amortization		(112,583)	(89,347)
Property and equipment, net		$ 171,861	$ 155,177

Depreciation expense was $23.4 million in 2019, $21.2 million in 2018, and $17.3 million in 2017.

We paid $20.8 million and $2.2 million for real estate and the expansion of existing buildings in 2019 and 2018, respectively.

In 2017, we purchased an office building in Latham, New York for approximately $2.9 million and paid $2.1 million for improvements to that building. We also paid $19.4 million for construction to expand our office building in Yarmouth, Maine.

(4) GOODWILL AND OTHER INTANGIBLE ASSETS

The changes in the carrying amount of goodwill for the two years ended December 31, 2019 are as follows:

	Enterprise Software	Appraisal and Tax	Total
Balance as of 12/31/2017	$ 651,430	$ 6,557	$ 657,987
Goodwill acquired related to the purchase of Socrata	75,657	—	75,657
Goodwill acquired related to other acquisitions	20,074	—	20,074
Balance as of 12/31/2018	747,161	6,557	753,718
Goodwill acquired related to the purchase of MicroPact	76,319	—	76,319
Goodwill acquired related to other acquisitions	10,080	—	10,080
Balance as of 12/31/2019	$ 833,560	$ 6,557	$ 840,117

Other intangible assets and related accumulated amortization consists of the following at December 31:

	2019	2018
Gross carrying amount of other intangibles:		
Customer related intangibles	$ 321,019	$ 238,219
Acquired software	262,286	202,416
Trade names	22,905	16,905
Capitalized software development costs	4,804	—
Leases acquired	5,037	3,694
	616,051	461,234
Accumulated amortization	(237,137)	(184,382)
Total other intangibles, net	$ 378,914	$ 276,852

Amortization expense for acquired software and capitalized software development costs are recorded to cost of revenues. Amortization expense for customer relationships and trade names are recorded to selling, general and administrative expenses. Total amortization expense for other intangibles was $52.8 million in 2019, $39.6 million in 2018, and $35.5 million in 2017.

The amortization periods of other intangible assets is summarized in the following table:

	December 31, 2019			December 31, 2018		
	Gross Carrying Amount	Weighted Average Amortization Period	Accumulated Amortization	Gross Carrying Amount	Weighted Average Amortization Period	Accumulated Amortization
Non-amortizable intangibles:						
Goodwill	$ 840,117	—	$ —	$ 753,718	—	$ —
Amortizable intangibles:						
Customer related intangibles	321,019	16 years	97,320	238,219	15 years	78,120
Acquired software	262,286	7 years	130,416	202,416	7 years	99,772
Trade names	22,905	11 years	7,205	16,905	11 years	5,139
Capitalized software development costs	$ 4,804	5 years	$ 296	$ —	—	$ —
Leases acquired	5,037	9 years	1,900	3,694	10 years	1,351

Estimated annual amortization expense related to acquired leases will be recorded as a reduction to hardware and other revenue and is expected to be $525,000 in 2020, $525,000 in 2021, $525,000 in 2022, $525,000 in 2023, $525,000 in 2024, and $512,000 thereafter.

Estimated annual amortization expense related to other intangibles, including customer relationships, acquired software, trade names and capitalized software development costs is as follows:

2020	$ 54,045
2021	53,687
2022	49,989
2023	31,838
2024	31,213
Thereafter	$ 155,005

(5) ACCRUED LIABILITIES

Accrued liabilities consist of the following at December 31:

	2019	2018
Accrued wages, bonuses and commissions	$ 49,126	$ 40,100
Other accrued liabilities	26,108	26,380
	$ 75,234	$ 66,480

(6) REVOLVING LINE OF CREDIT

On September 30, 2019, we entered into a $400 million credit agreement (the "Credit Facility") with the various lenders party thereto and Wells Fargo Bank, National Association, as Administrative Agent. The Credit Agreement provides for an unsecured revolving credit facility in an aggregate principal amount of up to $400.0 million, including a $25.0 million sublimit for letters of credit. The Credit Facility matures on September 30, 2024. Borrowings under the Credit Facility may be used for general corporate purposes, including working capital requirements, acquisitions and share repurchases.

Borrowings under the Credit Facility bear interest at a rate of either (1) Wells Fargo Bank's prime rate (subject to certain higher rate determinations) plus a margin of 0.125% to 0.75% or (2) the 30, 60, 90 or 180-day LIBOR rate plus a margin of 1.125% to 1.75%. As of December 31, 2019, our interest rate was 4.88% under the prime rate option or approximately 2.89% under the 30-day LIBOR option. The Credit Facility requires us to maintain certain financial ratios and other financial conditions and prohibits us from making certain investments, advances, cash dividends or loans, and limits incurrence of additional indebtedness and liens. As of December 31, 2019, we were in compliance with those covenants.

As of December 31, 2019, we had no outstanding borrowings and had unused borrowing capacity of $400 million under the Credit Facility. In addition, as of December 31, 2019, we had no outstanding letter of credit.

We paid interest of $1,750,000 in 2019, $770,000 in 2018, and $804,000 in 2017.

(7) INCOME TAX

The Income tax provision (benefit) on income from operations consists of the following:

	Years Ended December 31,		
	2019	2018	2017
Current:			
Federal	$ 12,814	$ 9,110	$ 22,883
State	6,585	4,367	4,666
	19,399	13,477	27,549
Deferred	(6,088)	(5,069)	(33,664)
	$ 13,311	$ 8,408	$ (6,115)

Reconciliation of the U.S. statutory income tax rate to our effective income tax expense rate for operations follows:

	Years Ended December 31,		
	2019	2018	2017
Federal income tax expense at statutory rate	$ 33,566	$ 32,733	$ 57,209
State income tax, net of federal income tax benefit	6,999	7,953	4,754
Domestic production activities deduction	—	—	(2,617)
Excess tax benefits related to stock option exercises	(29,819)	(32,487)	(40,624)
Tax Act adjustments	—	(1,750)	(25,992)
Tax credits	(3,446)	(3,715)	(3,578)
Non-deductible business expenses	6,011	5,655	4,573
Other, net	—	19	160
	$ 13,311	$ 8,408	$ (6,115)

The tax effects of the major items recorded as deferred tax assets and liabilities as of December 31 are:

	2019	2018
Deferred income tax assets:		
Operating expenses not currently deductible	$ 10,214	$ 8,989
Stock option and other employee benefit plans	19,308	19,496
Loss and credit carryforwards	23,841	17,999
Total deferred income tax assets	53,363	46,484
Valuation allowance	(1,923)	(1,049)
Total deferred income tax assets, net of valuation allowance	51,440	45,435
Deferred income tax liabilities:		
Intangible assets	(84,019)	(70,752)
Property and equipment	(9,265)	(8,455)
Prepaid expenses	(4,922)	(4,079)
Deferred revenue	(1,676)	(3,940)
Total deferred income tax liabilities	(99,882)	(87,226)
Net deferred income tax liabilities	$ (48,442)	$ (41,791)

As of December 31, 2019, we had federal net operating loss carryforwards of approximately $85.2 million, after-tax state net operating loss carryforwards of approximately $3.1 million, and tax credit carryforwards of approximately $4.8 million. The federal net operating loss carryforward will begin to expire in 2032 if not utilized, and a portion of the state net operating loss and tax credit carryforwards begin expiring in 2020 if not utilized.

The acquired carryforwards are subject to an annual limitation but are expected to be realized with the exception of certain state net operating loss and tax credit carryforwards. The valuation allowance disclosed in the table above relates to state net operating losses and tax credit carryforwards that are likely to expire before utilization. We believe it is more likely than not that all other deferred tax assets will be realized. However, the amount of the deferred tax asset considered realizable could be adjusted in the future if estimates of reversing taxable temporary differences are revised.

In connection with the acquisition of Socrata in 2018, we recorded a $1.9 million liability for an uncertain tax position associated with acquired tax credit carryforwards. The unrecognized tax benefits are included in deferred income taxes in our consolidated balance sheets. The entire amount, if recognized, would affect the effective tax rate. There was no change in the balance of unrecognized tax benefits during 2019. Based on the information currently available, we do not anticipate a significant increase or decrease to our tax contingencies for these issues for the next 12 months.

We are subject to U.S. federal income tax, as well as income tax of multiple state, local and foreign jurisdictions. We are routinely subject to income tax examinations by these taxing jurisdictions, but we do not have a history of, nor do we expect any material adjustments as a result of these examinations. With few exceptions, major U.S. federal, state, local and foreign jurisdictions are no longer subject to examination for years before 2015. As of February 19, 2020, no significant adjustments have been proposed by any taxing jurisdiction.

We paid income taxes, net of refunds received, of $21.3 million in 2019, $6.8 million in 2018, and $36.0 million in 2017.

(8) SHAREHOLDERS' EQUITY

The following table details activity in our common stock:

	Years Ended December 31,					
	2019		2018		2017	
	Shares	Amount	Shares	Amount	Shares	Amount
Stock option exercises	999	$ 96,908	1,126	$ 74,907	1,113	$ 49,845
Purchases of common stock	(72)	(14,289)	(781)	(150,050)	(44)	(6,613)
Employee stock plan purchases	53	9,576	45	8,051	51	7,044
Restricted stock units vested, net of withheld shares upon award settlement	53	(5,361)	—	—	—	—

As of February 19, 2020, we had authorization from our board of directors to repurchase up to 2.6 million additional shares of our common stock.

(9) SHARE-BASED COMPENSATION

Share-Based Compensation Plan

In May 2018, stockholders approved the Tyler Technologies, Inc. 2018 Stock Incentive Plan ("the 2018 Plan") which amended and restated the existing Tyler Technologies, Inc. 2010 Stock Option Plan ("the 2010 Plan"). Upon stockholder approval of the 2018 Plan, the remaining shares available for grant under the 2010 Plan were added to the shares authorized for grant under the 2018 Plan. Additionally, any awards previously granted under the 2010 Plan that expire unexercised or are forfeited are added to the shares authorized for grant under the 2018 Plan.

During fiscal year 2019, we granted stock awards under the 2018 Plan in the form of stock options, restricted stock units and performance share units. Stock options generally vest after three to six years of continuous service from the date of grant and have a contractual term of 10 years. Once options become exercisable, the employee can purchase shares of our common stock at the market price on the date we granted the option. Restricted stock unit grants generally vest ratably over three to five years of continuous service from the date of grant. Each performance share unit represents the right to receive one share of our common stock based on our achievement of certain financial performance targets during applicable performance periods. We account for share-based compensation utilizing the fair value recognition pursuant to ASC 718, *Stock Compensation*.

As of December 31, 2019, there were 3.1 million shares available for future grants under the plan from the 22.9 million shares previously approved by the shareholders.

Determining Fair Value of Stock Compensation

Valuation and Amortization Method. We estimate the fair value of stock option awards granted using the Black-Scholes option valuation model. For restricted stock unit and performance stock unit awards, we amortize the fair value of all awards on a straight-line basis over the requisite service periods, which are generally the vesting periods.

Expected Life. The expected life of awards granted represents the period of time that they are expected to be outstanding. The expected life represents the weighted-average period the stock options are expected to be outstanding based primarily on the options' vesting terms, remaining contractual life and the employees' expected exercise based on historical patterns.

Expected Volatility. Using the Black-Scholes option valuation model, we estimate the volatility of our common stock at the date of grant based on the historical volatility of our common stock.

Risk-Free Interest Rate. We base the risk-free interest rate used in the Black-Scholes option valuation model on the implied yield currently available on U.S. Treasury zero-coupon issues with an equivalent remaining term equal to the expected life of the award.

Expected Dividend Yield. We have not paid any cash dividends on our common stock in more than ten years and we do not anticipate paying any cash dividends in the foreseeable future. Consequently, we use an expected dividend yield of zero in the Black-Scholes option valuation model.

Expected Forfeitures. We use historical data to estimate pre-vesting option forfeitures. We record share-based compensation only for those awards that are expected to vest.

The following weighted average assumptions were used for options granted:

	Years Ended December 31,		
	2019	2018	2017
Expected life (in years)	6.0	6.0	6.0
Expected volatility	26.6%	26.7%	28.1%
Risk-free interest rate	1.8%	2.7%	2.0%
Expected forfeiture rate	—%	—%	—%

Share-Based Award Activity

The following table summarizes restricted stock unit and performance stock unit activity during fiscal year 2019 (shares in thousands):

	Number of Shares	Weighted Average Grant Date Fair Value per Share
Unvested at January 1, 2018	—	$ —
Granted	336	221.29
Vested	—	—
Forfeited	(2)	229.75
Unvested at December 31, 2018	334	221.25
Granted	256	241.19
Vested	(76)	221.15
Forfeited	(14)	229.75
Unvested at December 31, 2019	500	$ 231.57

Options granted, exercised, forfeited and expired are summarized as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2016	5,156	$ 83.64		
Granted	824	176.26		
Exercised	(1,113)	44.80		
Forfeited	(50)	134.83		
Outstanding at December 31, 2017	4,817	107.91		
Granted	432	208.21		
Exercised	(1,126)	66.53		
Forfeited	(31)	158.80		
Outstanding at December 31, 2018	4,092	129.51		
Granted	162	251.58		
Exercised	(999)	96.92		
Forfeited	(29)	174.54		
Outstanding at December 31, 2019	3,226	$ 145.27	6	$ 499,124
Exercisable at December 31, 2019	2,067	$ 121.07	6	$ 369,938

We had unvested options to purchase 1.2 million shares with a weighted average grant date exercise price of $188.48 as of December 31, 2019, and unvested options to purchase 1.7 million shares with a weighted average grant date exercise price of $169.24 as of December 31, 2018.

Other information pertaining to option activity was as follows during the twelve months ended December 31:

	2019	2018	2017
Weighted average grant-date fair value of stock options granted	$ 74.54	$ 66.52	$ 55.56
Total intrinsic value of stock options exercised	$ 155,899	$ 176,716	$ 137,699

Share-Based Compensation Expense

The following table summarizes share-based compensation expense related to share-based awards which is recorded in the consolidated statements of comprehensive income:

	Years Ended December 31,		
	2019	2018	2017
Cost of software services, maintenance and subscriptions	$ 15,002	$ 13,588	$ 9,415
Selling, general and administrative expenses	44,965	39,152	27,933
Total share-based compensation expenses	59,967	52,740	37,348
Excess tax benefit	(29,819)	(32,487)	(40,624)
Net decrease (increase) in net income	$ 30,148	$ 20,253	$ (3,276)

As of December 31, 2019, we had $148.7 million of total unrecognized compensation cost related to unvested options and restricted stock units, net of expected forfeitures, which is expected to be amortized over a weighted average amortization period of 2.5 years.

Employee Stock Purchase Plan

Under our Employee Stock Purchase Plan ("ESPP") participants may contribute up to 15% of their annual compensation to purchase common shares of Tyler. The purchase price of the shares is equal to 85% of the closing price of Tyler shares on the last day of each quarterly offering period. As of December 31, 2019, there were 702,000 shares available for future issuances the ESPP from the 2.0 million shares previously approved by the stockholders.

(10) EARNINGS PER SHARE

Basic earnings and diluted earnings per share data were computed as follows:

	Years Ended December 31,		
	2019	2018	2017
Numerator for basic and diluted earnings per share:			
Net income	$ 146,527	$ 147,462	$ 169,571
Denominator:			
Weighted-average basic common shares outstanding	38,640	38,445	37,273
Assumed conversion of dilutive securities:			
Stock options	1,465	1,678	1,973
Denominator for diluted earnings per share - Adjusted weighted-average shares	40,105	40,123	39,246
Earnings per common share:			
Basic	$ 3.79	$ 3.84	$ 4.55
Diluted	$ 3.65	$ 3.68	$ 4.32

Share-based awards representing the right to purchase common stock of 633,000 shares in 2019, 888,000 shares in 2018, and 1,343,000 shares in 2017 were not included in the computation of diluted earnings per share because their inclusion would have had an anti-dilutive effect.

(11) LEASES

We lease office facilities for use in our operations, as well as transportation and other equipment. Most of our leases are non-cancelable operating lease agreements and they expire in one year to eight years. Some of these leases include options to extend for up to 10 years. We had no finance leases and no related party lease agreements as of December 31, 2019. Operating lease costs were approximately $9.9 million in 2019, $7.4 million in 2018, and $6.9 million in 2017.

The components of operating lease expense were as follows (in thousands):

Lease Costs	Financial Statement Classification	For the year ended 2019
Operating lease cost	Selling, general and administrative expenses	$ 6,379
Short-term lease cost	Selling, general and administrative expenses	2,269
Variable lease cost	Selling, general and administrative expenses	1,274
Net lease cost		$ 9,922

As of December 31, 2019, ROU lease assets and lease liabilities for our operating leases were recorded in the consolidated balance sheet as follows (in thousands):

		December 31, 2019
Assets:		
Operating lease right-of-use assets	$	18,992
Liabilities:		
Operating leases, short-term		6,387
Operating leases, long-term		16,822
Total lease liabilities	$	23,209

Supplemental information related to leases was as follows:

Other Information		For the year ended 2019
Cash Flows (in thousands):		
Cash paid amounts included in the measurement of lease liabilities:		
Operating cash outflows from operating leases	$	7,267
Right-of-use assets obtained in exchange for lease obligations (non-cash):		
Operating leases	$	3,466
Lease Term and Discount Rate:		
Weighted average remaining lease term (years)		4
Weighted average discount rate		4.00%

As of December 31, 2019, maturities of lease liabilities were as follows (in thousands):

Year ending December 31,		Amount
2020	$	7,684
2021		6,246
2022		3,960
2023		2,923
2024		2,478
Thereafter		2,042
Total lease payments		25,333
Less: Interest		(2,124)
Present value of operating lease liabilities	$	23,209

As of December 31, 2018, the future minimum lease commitments related to lease agreements under Topic 840, the predecessor of Topic 842, were as follows (in thousands):

Year ending December 31,	Amount
2019	$ 5,994
2020	5,146
2021	3,976
2022	1,925
2023	1,164
Thereafter	2,132
Total	$ 20,337

Rental Income from third parties

We own office buildings in Bangor, Falmouth and Yarmouth, Maine; Lubbock and Plano, Texas; Troy, Michigan; Latham, New York; and Moraine, Ohio. We lease space in some of these buildings to third-party tenants. The property we lease to others under operating leases consists primarily of specific facilities where one tenant obtains substantially all of the economic benefit from the asset and has the right to direct the use of the asset. These non-cancelable leases expire between 2020 and 2025, some of which have options to extend the lease for up to five years. We determine if an arrangement is a lease at inception. None of our leases allow the lessee to purchase the leased asset.

Rental income from third-party tenants was $1.1 million in 2019, $1.2 million in 2018, and $1.5 million in 2017. Rental income is included in Hardware and other revenue on the consolidated statements of comprehensive income. Future minimum operating rental income based on contractual agreements is as follows (in thousands):

Year ending December 31,	Amount
2020	$ 1,341
2021	1,372
2022	1,402
2023	1,432
2024	1,462
Thereafter	857
Total	$ 7,866

As of December 31, 2019, we had no additional significant operating or finance leases that had not yet commenced.

(12) EMPLOYEE BENEFIT PLANS

We provide a defined contribution plan for the majority of our employees meeting minimum service requirements. Eligible employees can contribute up to 30% of their current compensation to the plan subject to certain statutory limitations. We contribute up to a maximum of 3% of an employee's compensation to the plan. We made contributions to the plan and charged operating results $11.5 million in 2019, $9.3 million in 2018, and $7.9 million in 2017.

(13) COMMITMENTS AND CONTINGENCIES

Other than routine litigation incidental to our business, there are no material legal proceedings pending to which we are party or to which any of our properties are subject.

(14) SEGMENT AND RELATED INFORMATION

We provide integrated information management solutions and services for the public sector, with a focus on local governments.

We provide our software systems and services and appraisal services through six business units, which focus on the following products:

- financial management, education and planning, regulatory and maintenance software solutions;
- financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions;
- courts and justice and public safety software solutions;
- data and insights solutions;
- case management and business management solutions; and
- appraisal and tax software solutions and property appraisal services.

In accordance with ASC 280-10, *Segment Reporting*, the financial management, education and planning, regulatory and maintenance software solutions unit; financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions unit; courts and justice and public safety software solutions unit; the data and insights solutions unit; and case management and business management solutions unit meet the criteria for aggregation and are presented in one reportable segment, Enterprise Software ("ES"). The ES segment provides public sector entities with software systems and services to meet their information technology and automation needs for mission-critical "back-office" functions such as: financial management and education, courts and justice, public safety, planning, regulatory and maintenance, land and vital records management, data and insights and case management and business management processes. The Appraisal and Tax ("A&T") segment provides systems and software that automate the appraisal and assessment of real and personal property as well as property appraisal outsourcing services for local governments and taxing authorities. Property appraisal outsourcing services include: the physical inspection of commercial and residential properties; data collection and processing; computer analysis for property valuation; preparation of tax rolls; community education; and arbitration between taxpayers and the assessing jurisdiction.

We evaluate performance based on several factors, of which the primary financial measure is business segment operating income. We define segment operating income for our business units as income before noncash amortization of intangible assets associated with their acquisition, interest expense and income taxes. Segment operating income includes intercompany transactions. The majority of intercompany transactions relate to contracts involving more than one unit and are valued based on the contractual arrangement. Segment operating income for corporate primarily consists of compensation costs for the executive management team and certain accounting and administrative staff and share-based compensation expense for the entire company. Corporate segment operating income also includes revenues and expenses related to a company-wide user conference. The accounting policies of the reportable segments are the same as those described in Note 1, "Summary of Significant Accounting Policies."

Segment assets include net accounts receivable, prepaid expenses and other current assets and net property and equipment. Corporate assets consist of cash and investments, prepaid insurance, intangibles associated with acquisitions, capitalized software development costs, deferred income taxes and net property and equipment mainly related to unallocated information and technology assets.

ES segment capital expenditures included $12.6 million in 2019 and $2.2 million in 2018 for the expansion of existing buildings and purchases of buildings and land. A&T segment capital expenditures included $8.2 million in 2019 for the expansion of existing buildings.

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 92,567	$ 7,638	$ —	$ 100,205
Subscriptions	285,092	11,260	—	296,352
Software services	185,892	27,169	—	213,061
Maintenance	405,063	25,255	—	430,318
Appraisal services	—	23,479	—	23,479
Hardware and other	16,735	21	6,256	23,012
Intercompany	15,496	—	(15,496)	—
Total revenues	$ 1,000,845	$ 94,822	$ (9,240)	$ 1,086,427
Depreciation and amortization expense	64,289	926	11,457	76,672
Segment operating income	261,494	20,789	(73,829)	208,454
Capital expenditures	19,335	8,384	10,379	38,098
Segment assets	$ 834,010	$ 90,536	$ 1,267,068	$ 2,191,614

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 83,735	$ 9,706	$ —	$ 93,441
Subscriptions	210,740	9,807	—	220,547
Software services	166,921	24,348	—	191,269
Maintenance	359,904	24,617	—	384,521
Appraisal services	—	21,846	—	21,846
Hardware and other	18,745	32	4,881	23,658
Intercompany	13,155	—	(13,155)	—
Total revenues	$ 853,200	$ 90,356	$ (8,274)	$ 935,282
Depreciation and amortization expense	50,130	914	10,715	61,759
Segment operating income	237,159	23,094	(68,572)	191,681
Capital expenditures	13,973	782	10,377	25,132
Segment assets	$ 556,100	$ 63,670	$ 1,171,193	$ 1,790,963

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 78,388	$ 7,854	$ —	$ 86,242
Subscriptions	164,317	7,859	—	172,176
Software services	161,245	19,215	—	180,460
Maintenance	337,701	21,618	—	359,319
Appraisal services	—	25,023	—	25,023
Hardware and other	13,057	10	4,612	17,679
Intercompany	10,425	—	(10,425)	—
Total revenues	$ 765,133	$ 81,579	$ (5,813)	$ 840,899
Depreciation and amortization expense	43,987	760	8,648	53,395
Segment operating income	229,001	20,788	(51,964)	197,825
Capital expenditures	28,096	1,181	16,341	45,618
Segment assets	$ 365,736	$ 46,279	$ 1,199,336	$ 1,611,351

Reconciliation of reportable segment operating income to the Company's consolidated totals:	Years Ended December 31, 2019	2018	2017
Total segment operating income	$ 208,454	$ 191,681	$ 197,825
Amortization of acquired software	(30,642)	(22,972)	(21,686)
Amortization of customer and trade name intangibles	(21,445)	(16,217)	(13,381)
Other income (expense), net	3,471	3,378	698
Income before income taxes	$ 159,838	$ 155,870	$ 163,456

(15) DISAGGREGATION OF REVENUE

The tables below show disaggregation of revenue into categories that reflect how economic factors affect the nature, amount, timing, and uncertainty of revenue and cash flows.

Timing of Revenue Recognition

Timing of revenue recognition by revenue category during the period is as follows:

For the year ended December 31, 2019	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 84,900	$ 15,305	$ 100,205
Subscriptions	—	296,352	296,352
Software services	—	213,061	213,061
Maintenance	—	430,318	430,318
Appraisal services	—	23,479	23,479
Hardware and other	23,012	—	23,012
Total	$ 107,912	$ 978,515	$ 1,086,427

For the year ended December 31, 2018	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 75,188	$ 18,253	$ 93,441
Subscriptions	—	220,547	220,547
Software services	—	191,269	191,269
Maintenance	—	384,521	384,521
Appraisal services	—	21,846	21,846
Hardware and other	23,658	—	23,658
Total	$ 98,846	$ 836,436	$ 935,282

For the year ended December 31, 2017	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 69,167	$ 17,075	$ 86,242
Subscriptions	—	172,176	172,176
Software services	—	180,460	180,460
Maintenance	—	359,319	359,319
Appraisal services	—	25,023	25,023
Hardware and other	17,679	—	17,679
Total	$ 86,846	$ 754,053	$ 840,899

Recurring Revenue

The majority of our revenue is comprised of recurring revenues from maintenance and subscriptions. Virtually all of our on-premises software clients contract with us for maintenance and support, which provides us with a significant source of recurring revenue. We generally provide maintenance and support for our on-premises clients under annual, or in some cases, multi-year contracts. The contract terms for subscription arrangements range from one to 10 years but are typically contracted for initial periods of three to five years. Non-recurring revenues are derived from all other revenue categories.

Recurring revenues and non-recurring revenues recognized during the period are as follows:

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 690,156	$ 36,514	$ —	$ 726,670
Non-recurring revenues	295,193	58,308	6,256	359,757
Intercompany	15,496	—	(15,496)	—
Total revenues	$ 1,000,845	$ 94,822	$ (9,240)	$ 1,086,427

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 570,645	$ 34,424	$ —	$ 605,069
Non-recurring revenues	269,400	55,932	4,881	330,213
Intercompany	13,155	—	(13,155)	—
Total revenues	$ 853,200	$ 90,356	$ (8,274)	$ 935,282

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 502,018	$ 29,477	$ —	$ 531,495
Non-recurring revenues	252,690	52,102	4,612	309,404
Intercompany	10,425	—	(10,425)	—
Total revenues	$ 765,133	$ 81,579	$ (5,813)	$ 840,899

(16) DEFERRED REVENUE AND PERFORMANCE OBLIGATIONS

Total deferred revenue, including long-term, by segment is as follows:

	December 31, 2019	December 31, 2018
Enterprise Software	$ 386,115	$ 327,521
Appraisal and Tax	25,210	20,018
Corporate	1,369	3,397
Totals	$ 412,694	$ 350,936

Changes in total deferred revenue, including long-term, were as follows:

	2019
Balance at beginning of year	$ 350,936
Deferral of revenue	993,109
Recognition of deferred revenue	(931,351)
Balance at end of year	$ 412,694

Transaction Price Allocated to the Remaining Performance Obligations

The aggregate amount of transaction price allocated to the remaining performance obligations represents contracted revenue that has not yet been recognized ("Backlog"), which includes deferred revenue and amounts that will be invoiced and recognized as revenue in future periods. Backlog as of December 31, 2019 was $1.46 billion, of which we expect to recognize approximately 49% as revenue over the next 12 months and the remainder thereafter.

(17) DEFERRED COMMISSIONS

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. Sales commissions for initial contracts are deferred and then amortized commensurate with the recognition of associated revenue over a period of benefit that we have determined to be three to seven years. Deferred commissions were $29.8 million, $21.9 million, as of December 31, 2019, and 2018 respectively. Amortization expense was $17.8 million $15.6 million, $11.2 million for the twelve months ended December 31, 2019, 2018, and 2017, respectively. There were no indicators of impairment in relation to the costs capitalized for the periods presented. Deferred commissions have been included with prepaid expenses in the accompanying consolidated balance sheets. Amortization expense related to deferred commissions is included in selling, general and administrative expenses in the accompanying consolidated statements of comprehensive income.

(18) SUBSEQUENT EVENTS

There are no material events or transactions that have occurred subsequent to December 31, 2019.

(19) QUARTERLY FINANCIAL INFORMATION (unaudited)

The following table contains selected financial information from unaudited statements of income for each quarter of 2019 and 2018:

	Quarters Ended							
	2019				2018			
	Dec. 31	Sept. 30	June 30	Mar. 31	Dec. 31	Sept. 30	June 30	Mar. 31
Revenues	$ 288,837	$ 275,400	$ 275,124	$ 247,066	$ 241,981	$ 236,067	$ 236,060	$ 221,174
Gross profit	142,275	130,717	127,860	116,048	115,871	111,626	109,276	102,805
Income before income taxes	47,790	40,552	36,419	35,077	40,107	38,626	37,700	39,437
Net income	46,790	40,390	31,999	27,348	31,552	38,924	39,161	37,825
Earnings per diluted share	$ 1.15	$ 1.00	$ 0.80	$ 0.69	$ 0.79	$ 0.96	$ 0.97	$ 0.95
Shares used in computing diluted earnings per share	40,736	40,280	39,813	39,585	39,891	40,528	40,224	39,836

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-8 No. 333-225011) pertaining to the Tyler Technologies, Inc. 2018 Stock Option Plan,
(2) Registration Statement (Form S-8 No. 333-182318) pertaining to the Tyler Technologies, Inc. Employee Stock Purchase Plan;

of our reports dated February 19, 2020, with respect to the consolidated financial statements of Tyler Technologies, Inc., and the effectiveness of internal control over financial reporting of Tyler Technologies, Inc., included in this Annual Report (Form 10-K) of Tyler Technologies, Inc. for the year ended December 31, 2019.

/s/ ERNST & YOUNG LLP

Dallas, Texas
February 19, 2020

CERTIFICATIONS

I, H. Lynn Moore, Jr., certify that:

1. I have reviewed this annual report on Form 10-K of Tyler Technologies, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over our financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Tyler and have:

   a. Designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its divisions, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (The registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):

   a. All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 19, 2020

By: /s/ H. Lynn Moore, Jr.

H. Lynn Moore, Jr.

President and Chief Executive Officer

CERTIFICATIONS

I, Brian K. Miller, certify that:

1. I have reviewed this annual report on Form 10-K of Tyler Technologies, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over our financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Tyler and have:

   a. Designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its divisions, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (The registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):

   a. All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 19, 2020

By: /s/ Brian K. Miller

Brian K. Miller

Executive Vice President and Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

H. Lynn Moore, Jr., President and Chief Executive Officer of Tyler Technologies, Inc., (the "Company") and Brian K. Miller, Executive Vice President and Chief Financial Officer of the Company, each certify pursuant to section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Corporation.

Date: February 19, 2020

By: /s/ H. Lynn Moore, Jr.
H. Lynn Moore, Jr.
President and Chief Executive Officer

By: /s/ Brian K. Miller
Brian K. Miller
Executive Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to Tyler Technologies, Inc. and will be retained by Tyler Technologies, Inc. and furnished to the Securities and Exchange Commission upon request.

Options granted, exercised, forfeited and expired are summarized as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2016	5,156	$ 83.64		
Granted	824	176.26		
Exercised	(1,113)	44.80		
Forfeited	(50)	134.83		
Outstanding at December 31, 2017	4,817	107.91		
Granted	432	208.21		
Exercised	(1,126)	66.53		
Forfeited	(31)	158.80		
Outstanding at December 31, 2018	4,092	129.51		
Granted	162	251.58		
Exercised	(999)	96.92		
Forfeited	(29)	174.54		
Outstanding at December 31, 2019	3,226	$ 145.27	6	$ 499,124
Exercisable at December 31, 2019	2,067	$ 121.07	6	$ 369,938

We had unvested options to purchase 1.2 million shares with a weighted average grant date exercise price of $188.48 as of December 31, 2019, and unvested options to purchase 1.7 million shares with a weighted average grant date exercise price of $169.24 as of December 31, 2018.

Other information pertaining to option activity was as follows during the twelve months ended December 31:

	2019	2018	2017
Weighted average grant-date fair value of stock options granted	$ 74.54	$ 66.52	$ 55.56
Total intrinsic value of stock options exercised	$ 155,899	$ 176,716	$ 137,699

Share-Based Compensation Expense

The following table summarizes share-based compensation expense related to share-based awards which is recorded in the consolidated statements of comprehensive income:

	Years Ended December 31,		
	2019	2018	2017
Cost of software services, maintenance and subscriptions	$ 15,002	$ 13,588	$ 9,415
Selling, general and administrative expenses	44,965	39,152	27,933
Total share-based compensation expenses	59,967	52,740	37,348
Excess tax benefit	(29,819)	(32,487)	(40,624)
Net decrease (increase) in net income	$ 30,148	$ 20,253	$ (3,276)

As of December 31, 2019, we had $148.7 million of total unrecognized compensation cost related to unvested options and restricted stock units, net of expected forfeitures, which is expected to be amortized over a weighted average amortization period of 2.5 years.

Employee Stock Purchase Plan

Under our Employee Stock Purchase Plan ("ESPP") participants may contribute up to 15% of their annual compensation to purchase common shares of Tyler. The purchase price of the shares is equal to 85% of the closing price of Tyler shares on the last day of each quarterly offering period. As of December 31, 2019, there were 702,000 shares available for future issuances the ESPP from the 2.0 million shares previously approved by the stockholders.

(10) EARNINGS PER SHARE

Basic earnings and diluted earnings per share data were computed as follows:

	Years Ended December 31,		
	2019	2018	2017
Numerator for basic and diluted earnings per share:			
Net income	$ 146,527	$ 147,462	$ 169,571
Denominator:			
Weighted-average basic common shares outstanding	38,640	38,445	37,273
Assumed conversion of dilutive securities:			
Stock options	1,465	1,678	1,973
Denominator for diluted earnings per share - Adjusted weighted-average shares	40,105	40,123	39,246
Earnings per common share:			
Basic	$ 3.79	$ 3.84	$ 4.55
Diluted	$ 3.65	$ 3.68	$ 4.32

Share-based awards representing the right to purchase common stock of 633,000 shares in 2019, 888,000 shares in 2018, and 1,343,000 shares in 2017 were not included in the computation of diluted earnings per share because their inclusion would have had an anti-dilutive effect.

(11) LEASES

We lease office facilities for use in our operations, as well as transportation and other equipment. Most of our leases are non-cancelable operating lease agreements and they expire in one year to eight years. Some of these leases include options to extend for up to 10 years. We had no finance leases and no related party lease agreements as of December 31, 2019. Operating lease costs were approximately $9.9 million in 2019, $7.4 million in 2018, and $6.9 million in 2017.

The components of operating lease expense were as follows (in thousands):

Lease Costs	Financial Statement Classification	For the year ended
		2019
Operating lease cost	Selling, general and administrative expenses	$ 6,379
Short-term lease cost	Selling, general and administrative expenses	2,269
Variable lease cost	Selling, general and administrative expenses	1,274
Net lease cost		$ 9,922

As of December 31, 2019, ROU lease assets and lease liabilities for our operating leases were recorded in the consolidated balance sheet as follows (in thousands):

	December 31, 2019
Assets:	
Operating lease right-of-use assets	$ 18,992
Liabilities:	
Operating leases, short-term	6,387
Operating leases, long-term	16,822
Total lease liabilities	$ 23,209

Supplemental information related to leases was as follows:

Other Information	For the year ended 2019
Cash Flows (in thousands):	
Cash paid amounts included in the measurement of lease liabilities:	
Operating cash outflows from operating leases	$ 7,267
Right-of-use assets obtained in exchange for lease obligations (non-cash):	
Operating leases	$ 3,466
Lease Term and Discount Rate:	
Weighted average remaining lease term (years)	4
Weighted average discount rate	4.00%

As of December 31, 2019, maturities of lease liabilities were as follows (in thousands):

Year ending December 31,	Amount
2020	$ 7,684
2021	6,246
2022	3,960
2023	2,923
2024	2,478
Thereafter	2,042
Total lease payments	25,333
Less: Interest	(2,124)
Present value of operating lease liabilities	$ 23,209

As of December 31, 2018, the future minimum lease commitments related to lease agreements under Topic 840, the predecessor of Topic 842, were as follows (in thousands):

Year ending December 31,	Amount
2019	$ 5,994
2020	5,146
2021	3,976
2022	1,925
2023	1,164
Thereafter	2,132
Total	$ 20,337

Rental Income from third parties

We own office buildings in Bangor, Falmouth and Yarmouth, Maine; Lubbock and Plano, Texas; Troy, Michigan; Latham, New York; and Moraine, Ohio. We lease space in some of these buildings to third-party tenants. The property we lease to others under operating leases consists primarily of specific facilities where one tenant obtains substantially all of the economic benefit from the asset and has the right to direct the use of the asset. These non-cancelable leases expire between 2020 and 2025, some of which have options to extend the lease for up to five years. We determine if an arrangement is a lease at inception. None of our leases allow the lessee to purchase the leased asset.

Rental income from third-party tenants was $1.1 million in 2019, $1.2 million in 2018, and $1.5 million in 2017. Rental income is included in Hardware and other revenue on the consolidated statements of comprehensive income. Future minimum operating rental income based on contractual agreements is as follows (in thousands):

Year ending December 31,	Amount
2020	$ 1,341
2021	1,372
2022	1,402
2023	1,432
2024	1,462
Thereafter	857
Total	$ 7,866

As of December 31, 2019, we had no additional significant operating or finance leases that had not yet commenced.

(12) EMPLOYEE BENEFIT PLANS

We provide a defined contribution plan for the majority of our employees meeting minimum service requirements. Eligible employees can contribute up to 30% of their current compensation to the plan subject to certain statutory limitations. We contribute up to a maximum of 3% of an employee's compensation to the plan. We made contributions to the plan and charged operating results $11.5 million in 2019, $9.3 million in 2018, and $7.9 million in 2017.

(13) COMMITMENTS AND CONTINGENCIES

Other than routine litigation incidental to our business, there are no material legal proceedings pending to which we are party or to which any of our properties are subject.

(14) SEGMENT AND RELATED INFORMATION

We provide integrated information management solutions and services for the public sector, with a focus on local governments.

We provide our software systems and services and appraisal services through six business units, which focus on the following products:

- financial management, education and planning, regulatory and maintenance software solutions;
- financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions;
- courts and justice and public safety software solutions;
- data and insights solutions;
- case management and business management solutions; and
- appraisal and tax software solutions and property appraisal services.

In accordance with ASC 280-10, *Segment Reporting*, the financial management, education and planning, regulatory and maintenance software solutions unit; financial management, municipal courts, planning, regulatory and maintenance, and land and vital records management software solutions unit; courts and justice and public safety software solutions unit; the data and insights solutions unit; and case management and business management solutions unit meet the criteria for aggregation and are presented in one reportable segment, Enterprise Software ("ES"). The ES segment provides public sector entities with software systems and services to meet their information technology and automation needs for mission-critical "back-office" functions such as: financial management and education, courts and justice, public safety, planning, regulatory and maintenance, land and vital records management, data and insights and case management and business management processes. The Appraisal and Tax ("A&T") segment provides systems and software that automate the appraisal and assessment of real and personal property as well as property appraisal outsourcing services for local governments and taxing authorities. Property appraisal outsourcing services include: the physical inspection of commercial and residential properties; data collection and processing; computer analysis for property valuation; preparation of tax rolls; community education; and arbitration between taxpayers and the assessing jurisdiction.

We evaluate performance based on several factors, of which the primary financial measure is business segment operating income. We define segment operating income for our business units as income before noncash amortization of intangible assets associated with their acquisition, interest expense and income taxes. Segment operating income includes intercompany transactions. The majority of intercompany transactions relate to contracts involving more than one unit and are valued based on the contractual arrangement. Segment operating income for corporate primarily consists of compensation costs for the executive management team and certain accounting and administrative staff and share-based compensation expense for the entire company. Corporate segment operating income also includes revenues and expenses related to a company-wide user conference. The accounting policies of the reportable segments are the same as those described in Note 1, "Summary of Significant Accounting Policies."

Segment assets include net accounts receivable, prepaid expenses and other current assets and net property and equipment. Corporate assets consist of cash and investments, prepaid insurance, intangibles associated with acquisitions, capitalized software development costs, defered income taxes and net property and equipment mainly related to unallocated information and technology assets.

ES segment capital expenditures included $12.6 million in 2019 and $2.2 million in 2018 for the expansion of existing buildings and purchases of buildings and land. A&T segment capital expenditures included $8.2 million in 2019 for the expansion of existing buildings.

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 92,567	$ 7,638	$ —	$ 100,205
Subscriptions	285,092	11,260	—	296,352
Software services	185,892	27,169	—	213,061
Maintenance	405,063	25,255	—	430,318
Appraisal services	—	23,479	—	23,479
Hardware and other	16,735	21	6,256	23,012
Intercompany	15,496	—	(15,496)	—
Total revenues	$ 1,000,845	$ 94,822	$ (9,240)	$ 1,086,427
Depreciation and amortization expense	64,289	926	11,457	76,672
Segment operating income	261,494	20,789	(73,829)	208,454
Capital expenditures	19,335	8,384	10,379	38,098
Segment assets	$ 834,010	$ 90,536	$ 1,267,068	$ 2,191,614

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 83,735	$ 9,706	$ —	$ 93,441
Subscriptions	210,740	9,807	—	220,547
Software services	166,921	24,348	—	191,269
Maintenance	359,904	24,617	—	384,521
Appraisal services	—	21,846	—	21,846
Hardware and other	18,745	32	4,881	23,658
Intercompany	13,155	—	(13,155)	—
Total revenues	$ 853,200	$ 90,356	$ (8,274)	$ 935,282
Depreciation and amortization expense	50,130	914	10,715	61,759
Segment operating income	237,159	23,094	(68,572)	191,681
Capital expenditures	13,973	782	10,377	25,132
Segment assets	$ 556,100	$ 63,670	$ 1,171,193	$ 1,790,963

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Revenues				
Software licenses and royalties	$ 78,388	$ 7,854	$ —	$ 86,242
Subscriptions	164,317	7,859	—	172,176
Software services	161,245	19,215	—	180,460
Maintenance	337,701	21,618	—	359,319
Appraisal services	—	25,023	—	25,023
Hardware and other	13,057	10	4,612	17,679
Intercompany	10,425	—	(10,425)	—
Total revenues	$ 765,133	$ 81,579	$ (5,813)	$ 840,899
Depreciation and amortization expense	43,987	760	8,648	53,395
Segment operating income	229,001	20,788	(51,964)	197,825
Capital expenditures	28,096	1,181	16,341	45,618
Segment assets	$ 365,736	$ 46,279	$ 1,199,336	$ 1,611,351

Reconciliation of reportable segment operating income to the Company's consolidated totals:	Years Ended December 31, 2019	2018	2017
Total segment operating income	$ 208,454	$ 191,681	$ 197,825
Amortization of acquired software	(30,642)	(22,972)	(21,686)
Amortization of customer and trade name intangibles	(21,445)	(16,217)	(13,381)
Other income (expense), net	3,471	3,378	698
Income before income taxes	$ 159,838	$ 155,870	$ 163,456

(15) DISAGGREGATION OF REVENUE

The tables below show disaggregation of revenue into categories that reflect how economic factors affect the nature, amount, timing, and uncertainty of revenue and cash flows.

Timing of Revenue Recognition

Timing of revenue recognition by revenue category during the period is as follows:

For the year ended December 31, 2019	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 84,900	$ 15,305	$ 100,205
Subscriptions	—	296,352	296,352
Software services	—	213,061	213,061
Maintenance	—	430,318	430,318
Appraisal services	—	23,479	23,479
Hardware and other	23,012	—	23,012
Total	$ 107,912	$ 978,515	$ 1,086,427

For the year ended December 31, 2018	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 75,188	$ 18,253	$ 93,441
Subscriptions	—	220,547	220,547
Software services	—	191,269	191,269
Maintenance	—	384,521	384,521
Appraisal services	—	21,846	21,846
Hardware and other	23,658	—	23,658
Total	$ 98,846	$ 836,436	$ 935,282

For the year ended December 31, 2017	Products and services transferred at a point in time	Products and services transferred over time	Total
Revenues:			
Software licenses and royalties	$ 69,167	$ 17,075	$ 86,242
Subscriptions	—	172,176	172,176
Software services	—	180,460	180,460
Maintenance	—	359,319	359,319
Appraisal services	—	25,023	25,023
Hardware and other	17,679	—	17,679
Total	$ 86,846	$ 754,053	$ 840,899

Recurring Revenue

The majority of our revenue is comprised of recurring revenues from maintenance and subscriptions. Virtually all of our on-premises software clients contract with us for maintenance and support, which provides us with a significant source of recurring revenue. We generally provide maintenance and support for our on-premises clients under annual, or in some cases, multi-year contracts. The contract terms for subscription arrangements range from one to 10 years but are typically contracted for initial periods of three to five years. Non-recurring revenues are derived from all other revenue categories.

Recurring revenues and non-recurring revenues recognized during the period are as follows:

For the year ended December 31, 2019	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 690,156	$ 36,514	$ —	$ 726,670
Non-recurring revenues	295,193	58,308	6,256	359,757
Intercompany	15,496	—	(15,496)	—
Total revenues	$ 1,000,845	$ 94,822	$ (9,240)	$ 1,086,427

For the year ended December 31, 2018	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 570,645	$ 34,424	$ —	$ 605,069
Non-recurring revenues	269,400	55,932	4,881	330,213
Intercompany	13,155	—	(13,155)	—
Total revenues	$ 853,200	$ 90,356	$ (8,274)	$ 935,282

For the year ended December 31, 2017	Enterprise Software	Appraisal and Tax	Corporate	Totals
Recurring revenues	$ 502,018	$ 29,477	$ —	$ 531,495
Non-recurring revenues	252,690	52,102	4,612	309,404
Intercompany	10,425	—	(10,425)	—
Total revenues	$ 765,133	$ 81,579	$ (5,813)	$ 840,899

(16) DEFERRED REVENUE AND PERFORMANCE OBLIGATIONS

Total deferred revenue, including long-term, by segment is as follows:

	December 31, 2019	December 31, 2018
Enterprise Software	$ 386,115	$ 327,521
Appraisal and Tax	25,210	20,018
Corporate	1,369	3,397
Totals	$ 412,694	$ 350,936

Changes in total deferred revenue, including long-term, were as follows:

	2019
Balance at beginning of year	$ 350,936
Deferral of revenue	993,109
Recognition of deferred revenue	(931,351)
Balance at end of year	$ 412,694

Transaction Price Allocated to the Remaining Performance Obligations

The aggregate amount of transaction price allocated to the remaining performance obligations represents contracted revenue that has not yet been recognized ("Backlog"), which includes deferred revenue and amounts that will be invoiced and recognized as revenue in future periods. Backlog as of December 31, 2019 was $1.46 billion, of which we expect to recognize approximately 49% as revenue over the next 12 months and the remainder thereafter.

(17) DEFERRED COMMISSIONS

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. Sales commissions for initial contracts are deferred and then amortized commensurate with the recognition of associated revenue over a period of benefit that we have determined to be three to seven years. Deferred commissions were $29.8 million, $21.9 million, as of December 31, 2019, and 2018 respectively. Amortization expense was $17.8 million $15.6 million, $11.2 million for the twelve months ended December 31, 2019, 2018, and 2017, respectively. There were no indicators of impairment in relation to the costs capitalized for the periods presented. Deferred commissions have been included with prepaid expenses in the accompanying consolidated balance sheets. Amortization expense related to deferred commissions is included in selling, general and administrative expenses in the accompanying consolidated statements of comprehensive income.

(18) SUBSEQUENT EVENTS

There are no material events or transactions that have occurred subsequent to December 31, 2019.

(19) QUARTERLY FINANCIAL INFORMATION (unaudited)

The following table contains selected financial information from unaudited statements of income for each quarter of 2019 and 2018:

	Quarters Ended							
	2019				2018			
	Dec. 31	Sept. 30	June 30	Mar. 31	Dec. 31	Sept. 30	June 30	Mar. 31
Revenues	$ 288,837	$ 275,400	$ 275,124	$ 247,066	$ 241,981	$ 236,067	$ 236,060	$ 221,174
Gross profit	142,275	130,717	127,860	116,048	115,871	111,626	109,276	102,805
Income before income taxes	47,790	40,552	36,419	35,077	40,107	38,626	37,700	39,437
Net income	46,790	40,390	31,999	27,348	31,552	38,924	39,161	37,825
Earnings per diluted share	$ 1.15	$ 1.00	$ 0.80	$ 0.69	$ 0.79	$ 0.96	$ 0.97	$ 0.95
Shares used in computing diluted earnings per share	40,736	40,280	39,813	39,585	39,891	40,528	40,224	39,836

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-8 No. 333-225011) pertaining to the Tyler Technologies, Inc. 2018 Stock Option Plan,
(2) Registration Statement (Form S-8 No. 333-182318) pertaining to the Tyler Technologies, Inc. Employee Stock Purchase Plan;

of our reports dated February 19, 2020, with respect to the consolidated financial statements of Tyler Technologies, Inc., and the effectiveness of internal control over financial reporting of Tyler Technologies, Inc., included in this Annual Report (Form 10-K) of Tyler Technologies, Inc. for the year ended December 31, 2019.

/s/ ERNST & YOUNG LLP

Dallas, Texas
February 19, 2020

CERTIFICATIONS

I, H. Lynn Moore, Jr., certify that:

1. I have reviewed this annual report on Form 10-K of Tyler Technologies, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over our financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Tyler and have:

   a. Designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its divisions, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (The registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):

   a. All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 19, 2020

By: /s/ H. Lynn Moore, Jr.

H. Lynn Moore, Jr.
President and Chief Executive Officer

CERTIFICATIONS

I, Brian K. Miller, certify that:

1. I have reviewed this annual report on Form 10-K of Tyler Technologies, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over our financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Tyler and have:

   a. Designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its divisions, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (The registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):

   a. All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 19, 2020

By: /s/ Brian K. Miller

Brian K. Miller

Executive Vice President and Chief Financial Officer

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

H. Lynn Moore, Jr., President and Chief Executive Officer of Tyler Technologies, Inc., (the "Company") and Brian K. Miller, Executive Vice President and Chief Financial Officer of the Company, each certify pursuant to section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Corporation.

Date: February 19, 2020

By: /s/ H. Lynn Moore, Jr.
H. Lynn Moore, Jr.
President and Chief Executive Officer

By: /s/ Brian K. Miller
Brian K. Miller
Executive Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to Tyler Technologies, Inc. and will be retained by Tyler Technologies, Inc. and furnished to the Securities and Exchange Commission upon request.