Consulting Engineers Report
TOLL HIGHWAY SENIOR REVENUE BONDS
2018 SERIES A
NOVEMBER 27, 2018
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1 Important: This report is subject to limitations contained in the Official Statement and Part 7.0 below.
1 Illinois Tollway History and Capital Program Background

The Illinois Tollway is a user-financed administrative agency of the State of Illinois whose purpose is to operate, maintain and service a system of toll roads located in Northern Illinois (Illinois Tollway system). The Illinois Tollway began in 1953 as the Illinois State Toll Highway Commission, created by an act of the Illinois State Legislature. The Illinois State Toll Highway Commission was directed by the Legislature to construct the original 187 miles of the Illinois Tollway system that included the Tri-State, Northwest (now the Jane Addams Memorial) and East-West (now the Reagan Memorial) Tollways. These routes opened to traffic in 1958. On April 1, 1968, the Illinois State Toll Highway Commission became the Illinois State Toll Highway Authority (hereafter referred to as the Illinois Tollway).

The Illinois Tollway system has played a key role in the transportation network in Northern Illinois. When it opened in 1958, it was originally envisioned as a bypass to route traffic around the urban core of Chicago. Over the last six decades, the Illinois Tollway system has evolved to also serve commercial and commuter traffic throughout Northern Illinois and within the Chicago metropolitan region. Expansion of the system through the construction of extensions, new routes and capacity improvements were implemented to keep pace with overall traffic growth in the region and the demand for reliable and efficient transportation. Improvements to the Illinois Tollway system have been made in coordination with and in response to regional and state-level transportation planning objectives.

1.1 Prior Legislative Directives

The Illinois Tollway system has grown over the last six decades as a result of several legislative directives:

- In 1970, the Governor approved the construction of the Reagan Memorial Extension (originally called the East-West Extension), between IL Route 56 west of Aurora and US Route 30 near Sterling – Rock Falls, which added an additional 69.5 miles to the system. This extension was included in the original authorization for the Illinois Tollway system but was not included in the original construction. This route was opened to traffic in 1974.

- In 1984, the Illinois State Legislature directed the Illinois Tollway to construct the Veterans Memorial Tollway (originally called the North-South Tollway), which added an additional 17.5 miles to the system. This route opened to traffic in 1989.

- In July 1993, the Illinois General Assembly authorized the Illinois Tollway to construct the south extension of the Veterans Memorial Tollway from I-55 to I-57 (the portion from I-55 to I-80 opened to traffic in November 2007), the north extension of the Illinois Route 53 from Lake-Cook Road to Illinois Route 120 in Grayslake and east to I-94, and the Richmond Extension from Illinois Route 120 in Grayslake to the Illinois-Wisconsin border near Richmond, Illinois.

- In 1995, the Illinois Tollway was authorized to construct the Elgin O’Hare Extension and the Western O’Hare Bypass. Studies by the Illinois Department of Transportation have been completed for the Elgin O’Hare Extension and the Western O’Hare Bypass. The projects are now known as Illinois Route 390 (IL 390) and I-490 respectively and are identified within the Move Illinois Program described below. In addition, the Move Illinois
Program includes studies for a northern extension of the Veterans Memorial Tollway (Illinois Route 53), referred to as the Tri-County Access Study.

1.2 Illinois Tollway Capital Projects & Programs Overview

Illinois Tollway capital projects are generally categorized into two categories, Improvement (I) and Renewal and Replacement (RR). Improvement projects are typically those that add capacity/lane miles and/or improve operations of the existing system. Renewal and Replacement projects are those intended for the purposes of maintaining the existing, baseline system at a state of good repair.

Multi-year capital programs are packages of capital projects that are periodically developed and implemented over a period of years to address the evolving transportation goals and needs of the region and, ensure the longevity of the system, as well as create jobs, stimulate local economy and alleviate congestion. Funding for these programs is provided through user fees (i.e., tolls), concession and miscellaneous revenues, investment earnings and revenue bonds.

1.2.1 Congestion-Relief Program: 2004 - 2016

In 2004, the Illinois Tollway Board approved a $5.3 billion 10-Year Congestion-Relief Plan to address the condition of existing infrastructure, congestion, the needs of growing communities and the enhancement of local economies. Known as the Congestion-Relief Program (CRP), this program evolved through the regional long-range planning process, coordination with local communities and planning agencies, a comprehensive re-evaluation of the entire Illinois Tollway system and an extensive review of the condition of the Illinois Tollway’s then 274-miles of roadways and structures.

The key components of the CRP were to reconstruct or rehabilitate nearly all of the aging infrastructure across the Illinois Tollway system and to convert the mainline toll plazas to open road tolling in order to eliminate the need for users to stop and pay tolls on the mainline. Many existing corridors were widened to provide additional capacity, and I-355 was extended 12 miles south from I-55 to I-80. In the Spring of 2007, Illinois Tollway reassessed the CRP, and a number of projects were re-evaluated and modified or enhanced due to the condition of the roadway and overpass bridges, or to accommodate input from municipalities. Also, construction cost estimates were revisited and adjusted due to increases in material and overall construction costs during the 2005 and 2006 construction seasons. Several key additions were made to the CRP to address various portions of the system and to provide additional access improvements to the Illinois Tollway. Based upon these changes, the overall CRP budget was increased by approximately $1.0 billion, and the schedule was lengthened by two years. The revised Congestion-Relief Plan was approved by the Illinois Tollway Board at the September 7, 2007 Board meeting.
The CRP delivered numerous improvements, including:

- Customers have realized the time-saving benefits of open road tolling at all 22 mainline plazas – completed in less than 22 months.

- Customers have benefited from a newly rebuilt and widened South Tri-State Tollway (I-294/I-80) from IL Route 394 to 95th Street and on the North Tri-State Tollway (I-294/I-94) from Balmoral Avenue to Russell Road.

- The Reagan Memorial Tollway (I-88) has been widened and reconstructed from York Road to IL Route 59 and from the Aurora Toll Plaza to Deerpath Road. The section of I-88 from US Route 30 to IL Route 251 was rubblized to make the existing pavement a base to support new full-depth asphalt pavement.

- The section of the Jane Addams Memorial Tollway (I-90) from the Cherry Valley Interchange to Rockton Road was reconstructed and widened with full-depth asphalt pavement. These improvements included a reconfigured interchange at I-90 and I-39 and the removal of the Cherry Valley Toll Plaza.

- Completion of the 12.5-mile extension of the Veterans Memorial Tollway (I-355). Additionally, a 4-mile section of I-355 from 75th Street to I-88 was widened and resurfaced.

The CRP was substantially complete in 2017 and is anticipated to be closed out in 2018 having achieved all program goals.

### Table 1: Congestion Relief Program – Estimated Program Expenditures

<table>
<thead>
<tr>
<th>Year</th>
<th>Congestion-Relief Program Estimated Program Draws (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-2017</td>
<td>$5,688.4</td>
</tr>
<tr>
<td>2018</td>
<td>$6.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$5,694.7</strong></td>
</tr>
</tbody>
</table>

Notes:

a. Numbers may not add to total due to rounding. The CRP is expected to be deemed substantially complete in 2017

b. Under the CRP program, Tollway has received $107.5 million of state and local reimbursements from 2005 through July 2018. Credit for such reimbursements is not included in the above expenditures.

1.2.2 Move Illinois: The Illinois Tollway Driving the Future

In 2011, the Illinois Tollway Board approved the 15-year Move Illinois capital improvement program to address the overall age and condition of the system not reconstructed in the CRP, as well as provide additional mobility and congestion-relieving improvements. The Move Illinois Program is discussed in more detail in the subsequent section of this report.
2 Move Illinois: The Illinois Tollway Driving the Future

As required by the Toll Highway Act, the Illinois Tollway undertook a process to develop a long-term capital plan which resulted in a comprehensive 15-year capital program to complete the rebuilding of the 55-year old system and commit approximately $12 billion in transportation funding to improve mobility, relieve congestion, reduce pollution and link economies across Northern Illinois. *Move Illinois: The Illinois Tollway Driving the Future* (Move Illinois Program) mapped out the Illinois Tollway’s next capital program for 2012 – 2026.

The basis for *Move Illinois: The Illinois Tollway Driving the Future* was a capital needs analysis performed by Illinois Tollway staff and consultants that included a comprehensive assessment of the current and future physical and operational characteristics of the entire Illinois Tollway system. Previous long-range plans were reevaluated, the needs of communities and stakeholders were catalogued, and new technology and transit opportunities were explored.

On August 25, 2011, the Illinois Tollway Board of Directors approved a $12.1 billion long-range plan for the Illinois Tollway system known as “*Move Illinois: The Illinois Tollway Driving the Future.*” Upon Board approval, it became known as the “*Move Illinois Program*”. The key goals of the *Move Illinois* Program are to:

- Save drivers time and money
- Stimulate and drive the economic engine
- Build a 21st-century transportation system
- Take care of the existing system
- Be the “cleanest and greenest” program in history

These goals ensure national and international competitiveness with other major cities in the U.S. and around the world. To achieve these goals, a program was developed using a two-pronged approach: maintain the existing Illinois Tollway system and enhance regional mobility with new priority projects. The program and the projects that make up *Move Illinois* are described in detail in later sections of this report.

Bond proceeds and Illinois Tollway revenues are being used to fund *Move Illinois*. The program outlined in this report funds necessary improvements to the existing Illinois Tollway system. These needs are programmed to be performed at the time appropriate to maintain the existing 294 centerline miles in a state of good repair. These projects include:

- Reconstructing the Central Tri-State Tollway (I-294) from 95th Street to Balmoral Avenue and the Edens Spur (I-94)
- Reconstruct and widen the Jane Addams Memorial Tollway (I-90) from near O’Hare to the I-39 interchange in Rockford (substantially completed)
- Preserving the Reagan Memorial Tollway (I-88)
- Preserving the Veterans Memorial Tollway (I-355)
- Repairing roads, bridges and maintenance facilities
- Other capital projects
In addition, the program funds new priority projects that focus on enhancing regional mobility, including:

- Constructing a new interchange at I-294/I-57 and 147th Street ramps
- Completing Elgin O’Hare Western Access, including completion of IL 390 and construction of I-490 between I-90 and I-294 and rehabilitation and widening of the existing IL 390
- Implementing features to accommodate transit and provide increased flexibility for passenger vehicles on the Jane Addams Memorial Tollway (I-90)
- Planning for the Illinois Route 53 (Tri-County) Corridor
- Planning for other routes as determined by the Board of Directors

The Consulting Engineers relies on the Program Management Office (PMO) to provide scopes of work and estimates of construction costs. The PMO utilizes several methods for verifying the various types of estimates, and the Consulting Engineers believes that the cost-tracking and estimating practices presently used by the PMO for Move Illinois are appropriate.

It should be noted that under the Consulting Engineers contract, cost-estimating services are provided to the Illinois Tollway and are directed by the PMO. The Consulting Engineers provided the PMO with annual costs associated with major maintenance for segments of the system required before reconstruction or rehabilitation projects are implemented. These costs are included in the Bridge and Ramp Repairs and other projects described within this section.

The project construction costs (for projects other than Systemwide Improvements) and durations were developed by the PMO and are predicated on the following basic assumptions:

1. Project construction will be in general conformance with past Illinois Tollway practices
2. Construction scope and schedule shall be as described below
3. Construction costs are escalated to the mid-point of construction
4. Escalation rate is 5% APR, compounded annually, unless noted otherwise
5. No unforeseen conditions / circumstances or unusual price escalation not currently identified will occur

As year five of the $12.1 billion Move Illinois Program began, the Illinois Tollway went through a process to validate corridor estimates across the program. The program estimates were adjusted to account for less than expected cost escalation since 2012. In addition, contracts completed in the early years of the program have closed out. As a result of the less than expected cost escalation, favorable construction industry market conditions and closing of projects, expenditures have been less than anticipated in some corridors, such as the Tri-State I-294/I-57 Interchange, Systemwide Maintenance Facilities, Reagan Memorial Tollway (I-88), Veterans Memorial Tollway (I-355) and Tri-State Edens Spur (I-94). This provided an opportunity to re-allocate funds into the Tri-State corridor where the funds could be better utilized as the corridor progresses through design development.

In April 2017, the Illinois Tollway Board of Directors authorized an amendment of the Move Illinois Program which increased the amount for the central portion (Balmoral Avenue – 95th Street) of the Tri-State Tollway (I-294) (the “Central Tri-State”) by approximately $2.1 billion, from $1.9 billion to $4.0 billion, increasing the total cost of the Move Illinois Program from $12.15 billion to $14.27 billion. The current cost estimate is $14.20 billion. Enhancements
included in the new Central Tri-State scope will allow the Illinois Tollway to rebuild roadway and improve bridges on the 22-mile long portion of I-294, as well as construct additional lanes to relieve congestion, improve interchanges to increase access and work to deliver solutions for stormwater, noise abatement and freight.

The table below provides the estimated annual program expenditures required to fund the current Move Illinois Program. This table is based upon information provided by: (i) the Illinois Tollway for the years 2012 through 2017; and (ii) the PMO, for the years 2018 through 2026.

Table 2: Move Illinois Program – Estimated Program Expenditures

<table>
<thead>
<tr>
<th>Year</th>
<th>Move Illinois Program Estimated Program Expenditures (Million)</th>
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<tbody>
<tr>
<td>2012</td>
<td>$108.2</td>
</tr>
<tr>
<td>2013</td>
<td>$502.2</td>
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<td>2014</td>
<td>$886.7</td>
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<tr>
<td>2015</td>
<td>$1,239.2</td>
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<td>2016</td>
<td>$985.2</td>
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<td>2017</td>
<td>$747.0</td>
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<td>2018</td>
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<td>$727.1</td>
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<td>$14,203.7</td>
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Notes: 2

From time to time, the Illinois Tollway may receive reimbursements under various intergovernmental agreements. Estimated program expenditures does not assume credit for such reimbursements with the following exceptions:

- For completed years (2012-2017) the totals are net of reimbursements received under various intergovernmental agreements
- A credit of $300 million is assumed for the Elgin O’Hare Western Access project (EOWA). The program anticipates contributions from local, federal and other sources
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valued at approximately $300 million in years 2016-2023 for interchange and access improvements, of which agreements totaling $156.0 million have been received.

2.1 Jane Addams Memorial Tollway (I-90)

2.1.1 Kennedy Expressway to Elgin Toll Plaza – Reconstruct / Add Lane

Length: 25.0 miles

Project Description: Reconstruct & widen from six to eight lanes.

Project Benefits:
- Provide congestion relief by expanding the roadway from six to eight lanes
- Provide median lane and median shoulder widening in each direction
- Improve safety and mobility throughout the corridor
- Reduce annual maintenance costs
- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Upgrade to current standards and operational requirements

Construction Period: 2013-2016

Total Cost (Escalated): $1,478.0 million

The estimated project cost was adjusted from $1,501.6 million in the 2017 Consulting Engineers Report due to the contract closeout process.

2.1.2 Elgin Toll Plaza to IL Route 47 – Reconstruct / Add Lane

Length: 7.5 miles

Project Description: Reconstruct & widen from four lanes to six lanes.

Project Benefits:
- Provide congestion relief by expanding the roadway from four to six lanes
- Provide median lane and median shoulder widening in each direction
- Improve safety and mobility throughout the corridor
- Reduce annual maintenance costs
- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Upgrade to current standards and operational requirements


Total Cost (Escalated): $202.5 million

The estimated project cost was adjusted from $202.9 million in the 2017 Consulting Engineers Report due to the contract closeout process.
2.1.3 **IL Route 47 to I-39 – Reconstruct / Add Lane**

**Length:** 29.0 miles

**Project Description:** Reconstruct & widen from four to six lanes.

**Project Benefits:**
- Provide congestion relief by expanding the roadway from four to six lanes
- Provide median lane and median shoulder widening in each direction
- Improve safety and mobility throughout the corridor
- Reduce annual maintenance costs
- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Upgrade to current standards and operational requirements

**Construction Period:** 2013-2015

**Total Cost (Escalated):** $482.0 million

No adjustments in cost from the 2017 Consulting Engineers Report.

2.1.4 **Kennedy Expressway to I-39 – Transit Accommodation**

**Length:** 61.5 miles

**Project Description:** Miscellaneous improvements to allow future transit accommodation that are contracted as part of the roadway and bridge reconstruction and widening projects. The costs of median lane widening and median shoulder widening to accommodate transit are included in the section costs above. This widened cross section could be used for future operational improvements. SMART technology initiatives are also included within the main roadway sections above.

**Project Benefits:**
- Allow operation of a Bus Rapid Transit (BRT) system (by others)
- Allow for accommodation of rail transit in the future (by others)
- Provide basic infrastructure for lane management of transit and Illinois Tollway system users

**Construction Period:** 2013-2015 (Note: Transit Accommodation construction timeline includes those forecasted in main roadway sections above)

**Total Cost (Escalated):** $0.9 million

No adjustments in cost from the 2017 Consulting Engineers Report.

2.1.5 **Kennedy Expressway to I-39 – ROW Acquisition**

**Length:** 61.5 miles

**Project Description:** Acquire right-of-way (ROW) and easements necessary for roadway and bridge reconstruction and widening.
Project Benefits:
- Allow projects to move forward with optimal design elements

**Construction Period:** 2012-2016

**Total Cost (Escalated):** $13.0 million

The estimated project cost was adjusted from $13.5 million in the 2017 Consulting Engineers Report.

### 2.1.6 Kennedy Expressway to I-39 – Utility and Fiber Optic Relocation

**Length:** 61.5 miles

**Project Description:** Relocate Illinois Tollway-owned fiber optic and private utilities to accommodate roadway and bridge reconstruction and widening.

**Project Benefits:**
- Allows projects to move forward with optimal design elements
- Maintains Illinois Tollway fiber optic continuity
- Modernize utilities crossing Illinois Tollway right-of-way as necessary

**Construction Period:** 2012-2016

**Total Cost (Escalated):** $159.1 million

The estimated project cost was adjusted from $155.4 million in the 2017 Consulting Engineers Report due to refinement in scope and to account for work completed to date for the various utility projects, fiber optic relocations and NSMJAWA water main relocation.

### 2.1.7 Kennedy Expressway to I-39 – Bridge and Ramp Repairs

**Length:** 61.5 miles

**Project Description:** Reconstruct or rehabilitate crossroad bridges and ramps.

**Project Benefits:**
- Upgrade to current standards and operational requirements
- Preserve and maintain the crossroad structures and ramps
- Reduce maintenance costs

**Construction Period:** 2013-2026

**Total Cost (Escalated):** $24.1 million

The estimated project cost was adjusted from $19.7 million in the 2017 Consulting Engineers Report due to updated cost estimates for the remaining projected repairs.
2.2 Tri-State Tollway (I-94/I-294/I-80)

2.2.1 95th Street to Balmoral Avenue – Reconstruct

**Length:** 22.3 miles

**Project Description:** Reconstruction of existing eight lanes and capacity enhancement from widening.

**Project Benefits:**

- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Better accommodate current and future traffic demand with the addition of a Flex Lane
- Improved operations at the I-290 Interchange
- Improvements at I-55 to reduce mainline congestion
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

**Construction Period:** 2018-2025

**Total Cost (Escalated):** $3,624.2 million

No adjustments in cost from the 2017 Consulting Engineers Report.

2.2.2 Edens Spur – Reconstruct

**Length:** 5.0 miles

**Project Description:** Reconstruct existing four lanes of pavement.

**Project Benefits:**

- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

**Construction Period:** 2018-2020

**Total Cost (Escalated):** $105.0 million

The estimated project cost was adjusted from $102.2 million in the 2017 Consulting Engineers Report due to updated cost estimates.

2.2.3 Bishop Ford Expressway to Russell Road – Bridge and Ramp Repairs

**Length:** 78.0 miles

**Project Description:** Reconstruct or rehabilitate crossroad bridges and ramps.

**Project Benefits:**

- Upgrade to current standards and operational requirements
- Preserve and maintain the crossroad structures and ramps
• Reduce maintenance costs

**Construction Period:** 2012-2026

**Total Cost (Escalated):** $ 285.7 million

The estimated project cost was adjusted from $379.7 million in the 2017 Consulting Engineers Report due to updated design cost estimates, now based on 2018 base costs and reallocation of scope for maintenance repairs in 2020-2026 in order to maintain clarity between current repairs and the future maintenance repair work. The schedule for the Edens Spur was adjusted from completing the repairs in 2021-2022 to completing the repairs in 2018-2020 in order to take advantage of the current competitive bidding environment and provide operational benefits of the project to the public earlier.

### 2.2.4 Bishop Ford Expressway to Russell Road – ROW Acquisition

**Length:** 78.0 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide right-of-way and easements for improvements.

**Project Benefits:**

- Allows projects to move forward with optimal design elements

**Construction Period:** 2017-2021

**Total Cost (Escalated):** $184.0 million

No adjustments in cost from 2017 Consulting Engineers Report.

### 2.2.5 Bishop Ford Expressway to Russell Road – Utility and Fiber Optic Relocation

**Length:** 78.0 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide relocation of fiber optic and private utilities for improvements.

**Project Benefits:**

- Allows projects to move forward with optimal design elements
- Maintains Illinois Tollway fiber optic continuity
- Modernizes utilities crossing Illinois Tollway right-of-way as necessary

**Construction Period:** 2017-2021

**Total Cost (Escalated):** $149.0 million

The estimated project cost was adjusted from $147.3 million in the 2017 Consulting Engineers Report primarily due to updated cost estimates on Edens Spur Reconstruction.
2.3 Veterans Memorial Tollway (I-355)

2.3.1 I-55 to Boughton Road, Collector-Distributor Roads, North Avenue to Army Trail Road – Mill, Patch and Overlay

CONSTRUCTION COMPLETE

Length: 17.5 miles

Project Description: Rehabilitate remaining original (1992) I-355 pavement between I-55 and Army Trail Road. Add safety improvements throughout.

Project Benefits:

- Preserve and maintain the existing pavement
- Improve ride quality and traffic flow
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

Construction Period: 2013

Total Cost (Escalated): $19.8 million

No adjustments in cost from the 2017 Consulting Engineers Report.

2.3.2 I-55 to Army Trail Road – Mill, Patch and Overlay

Length: 17.5 miles

Project Description: Second rehabilitation of the original I-355 pavement between I-55 and Army Trail Road.

Project Benefits:

- Preserve and maintain the existing pavement
- Improve ride quality and traffic flow
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

Construction Period: 2018-2019

Total Cost (Escalated): $133.3 million

The cost was adjusted from $260.6 million from the 2017 Consulting Engineers Report due to refined cost estimates and the competitive bidding process in a favorable market.

2.3.3 I-80 to Army Trail Road – Bridge and Ramp Repairs

Length: 30.0 miles

Project Description: Reconstruct or rehabilitate crossroad bridges and ramps.

Project Benefits:
• Upgrade to current standards and operational requirements
• Preserve and maintain the crossroad structures and ramps
• Reduce maintenance costs

**Construction Period:** 2018-2026

**Total Cost (Escalated):** $108.4 million

The estimated project cost was adjusted from $84.6 million in the 2017 Consulting Engineers Report due to updated cost estimates for the remaining projected repairs and reallocation of scope for maintenance repairs in 2020-2026 to maintain clarity between current repairs and the future maintenance repair work.

### 2.3.4 I-80 to Army Trail Road – ROW Acquisition

**Length:** 30.0 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide right-of-way and easements for improvements.

**Project Benefits:**
• Allows projects to move forward with optimal design elements

**Construction Period:** 2019

**Total Cost (Escalated):** $0.5 million

No adjustments in cost from 2017 Consulting Engineers Report.

### 2.3.5 I-80 to Army Trail Road – Utility and Fiber Optic Relocation

**Length:** 30.0 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide relocation of fiber optic and private utilities for improvements.

**Project Benefits:**
• Allows projects to move forward with optimal design elements
• Maintains Illinois Tollway fiber optic continuity
• Modernizes utilities crossing Illinois Tollway right-of-way as necessary

**Construction Period:** 2018-2019

**Total Cost (Escalated):** $1.3 million

The estimated cost was adjusted from $1.0 million in the 2017 Consulting Engineers Report due to updated cost estimates.
2.4  Reagan Memorial Tollway (I-88)

2.4.1  York Road to I-290 - Reconstruct

Length: 1.5 miles

Project Description: Reconstruct existing four and six lanes of pavement.

Project Benefits:
- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

Construction Period: 2018-2019

Total Cost (Escalated): $58.4 million

The estimated cost was adjusted from $61.5 million in the 2017 Consulting Engineers Report due to updated contract projections from the competitive bidding process.

2.4.2  East-West Connector Road Between I-294 and I-88 – Reconstruct

Length: 3.7 miles

Project Description: Reconstruct existing four lanes of pavement.

Project Benefits:
- Improve ride quality and traffic flow by replacing 50+ year-old pavement
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

Construction Period: 2019

Total Cost (Escalated): $27.9 million

This estimated project cost was adjusted from $19.8 million in the 2017 Consulting Engineers Report due to refined design, cost estimates and the addition of Windsor Road Bridge reconstruction and widening. The construction period was changed to 2019 due to impacts on the bidding process.

2.4.3  IL Route 251 to IL Route 56 – Mill, Patch and Overlay

Length: 38.1 miles

Project Description: Rehabilitate existing four lanes of pavement.

Project Benefits:
- Preserve and maintain existing pavement
- Improve ride quality and traffic flow
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

**Construction Period:** 2018-2019

**Total Cost (Escalated):** $173.1 million

The estimated project cost was adjusted from $199.1 million in the 2017 Consulting Engineers Report due to updated cost estimates and the competitive bidding process.

### 2.4.4 Aurora Toll Plaza to IL Route 59 – Mill, Patch and Overlay

**Length:** 5.5 miles

**Project Description:** Rehabilitate existing six lanes of pavement.

**Project Benefits:**
- Preserve and maintain existing pavement
- Improve ride quality and traffic flow
- Reduce annual maintenance costs
- Upgrade to current standards and operational requirements

**Construction Period:** 2014, 2020-2021

**Total Cost (Escalated):** $41.8 million

The estimated project cost was adjusted from $44.6 million in the 2017 Consulting Engineers Report due to updated cost estimates.

### 2.4.5 U.S. Route 30 to I-290 – Bridge and Ramp Repairs

**Length:** 96.5 miles

**Project Description:** Reconstruct or rehabilitate crossroad bridges and ramps.

**Project Benefits:**
- Upgrade to current standards and operational requirements
- Preserve and maintain the crossroad structures and ramps
- Reduce maintenance costs

**Construction Period:** 2013, 2019 and 2021-2026

**Total Cost (Escalated):** $54.4 million

The estimated project cost was adjusted from $51.6 million in the 2017 Consulting Engineers Report due to updated cost estimates for the remaining projected repairs.

### 2.4.6 U.S. Route 30 to I-290 – ROW Acquisition

**Length:** 96.5 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide right-of-way and easements for improvements.

**Project Benefits:**
- Allows projects to move forward with optimal design elements

**Construction Period:** 2016-2020

**Total Cost (Escalated):** $1.2 million

No adjustments in cost from 2017 Consulting Engineers Report.

### 2.4.7 U.S. Route 30 to I-290 – Utility and Fiber Optic Relocation

**Length:** 96.5 miles

**Project Description:** As necessary during reconstruction or repair projects, will provide relocation of fiber optic and private utilities for improvements.

**Project Benefits:**
- Allows projects to move forward with optimal design elements
- Maintains Illinois Tollway fiber optic continuity
- Modernizes utilities crossing Illinois Tollway right-of-way as necessary

**Construction Period:** 2018-2020

**Total Cost (Escalated):** $0.6 million

No adjustments in cost from 2017 Consulting Engineers Report.
2.5  I-294 / I-57 Interchange

2.5.1  Ramps to/from Memphis & 147th Street Ramps

Length: N/A

Project Description: Construct the new system interchange at I-294 and I-57, as well as the 147th Street ramps.

Project Benefits:

- Provide economic benefit to the region
- Add access between two major interstates

Construction Period: 2012-2014

Total Cost (Escalated): $113.1 million (Illinois Tollway Commitment)

The estimated project cost was adjusted from $115.0 million in the 2017 Consulting Engineers Report due to the contract closeout process.

2.5.2  Tri-State Tollway (I-294) / I-57 Interchange – New Ramps and Structures

Length: N/A

Project Description: Construct new ramps to complete system interchange at I-294 and I-57.

Project Benefits:

- Provide economic benefit to the region
- Add access between two major interstates

Construction Period: 2019-2024

Total Cost (Escalated, 4% APR): $205.4 million (Illinois Tollway Commitment)

The estimated project cost was adjusted from $181.6 million in the 2017 Consulting Engineers Report due to updated design cost estimates, now based on 2018 base costs. The construction period was changed from 2024-2026 to 2019-2024 to take advantage of the current competitive bidding environment and provide operational benefits of the project to the public earlier.
2.5.3 **Tri-State Tollway (I-294) / I-57 Interchange – ROW Acquisition**

**Length:** N/A

**Project Description:** Acquire right-of-way and easements necessary for roadway and bridge reconstruction and widening.

**Project Benefits:**
- Allows project to move forward with optimal design elements

**Construction Period:** 2013-2017 and 2020-2021

**Total Cost (Escalated):** $12.0 million

No adjustments in cost from 2017 Consulting Engineers Report.

2.5.4 **Tri-State Tollway (I-294) / I-57 Interchange – Utility and Fiber Optic Relocation**

**Length:** N/A

**Project Description:** Relocate Illinois Tollway-owned fiber optic and private utilities to accommodate roadway and bridge reconstruction and widening.

**Project Benefits:**
- Allows projects to move forward with optimal design elements
- Maintains Illinois Tollway fiber optic continuity
- Modernizes utilities crossing Illinois Tollway right-of-way as necessary

**Construction Period:** 2013-2015 and 2020-2021

**Total Cost (Escalated):** $3.3 million

The estimated project cost was adjusted from $25.3 million in the 2017 Consulting Engineers Report due to updated cost estimates. The original estimate was established as a percentage of the overall contract value.
2.6 Elgin O’Hare Western Access Project, IL 390 and I-490

2.6.1 EOWA: IL 390 From US 20 to IL 83 – Roadway and Bridge Construction

Length: 10 miles

Project Description: Repairs to existing IL 390 (formerly Elgin O'Hare Expressway) from US 20 to IL 53; Widening of the existing IL 390 between IL 19 and IL 53; Construction of new four-lane (with auxiliary lanes) facility from west of IL 53 to IL 83.

Project Benefits:
- Provide economic benefit to the region
- Improve travel efficiency – reduce congestion on the local street network
- Provide access to the west side of O'Hare Airport
- Facilitate multimodal opportunities

Construction Period: 2013-2017

IL 390 Cost (Escalated): $950.0 million

The estimated cost for the IL 390 project was $971.0 million for the purpose of the 2017 Consulting Engineers Report. Minor decreases are due to closeout reconciliation (credits and quantity adjustments) and do not change the overall EOWA cost.

2.6.2 I-490 South Leg From I-294 to Western Access Interchange – New Roadway Construction

Length: 7.7 miles

Project Description: Construction of a new four-lane facility from the extension of IL 390 to I-294 to the south, including O'Hare ramp connections.

Project Benefits:
- Provide economic benefit to the region
- Improve travel efficiency – reduce congestion on the local street network
- Provide access to the west side of O'Hare Airport
- Facilitate multimodal opportunities

Construction Period: 2016-2026

I-490 South Leg Cost (Escalated): $1,838.0 million

No adjustments in cost from the 2017 Consulting Engineers Report.
2.6.3 I-490 North Leg from Western Access Interchange to I-90 – New Roadway Construction

Length: 3.1 miles

Project Description: Construction of a new four-lane facility from north of the Western Access Interchange to I-90, including collector-distributor roadways along I-90.

Project Benefits:
- Provide economic benefit to the region
- Improve travel efficiency – reduce congestion on the local street network
- Provide access to the west side of O’Hare Airport
- Facilitate multimodal opportunities

Construction Period: 2016-2025

I-490 North Leg Cost (Escalated): $811.0 million

The estimated cost for the I-490 project was $790.0 million for purpose of the 2017 Consulting Engineers Report. The resulting 2.7% increase to this segment does not change the overall EOWA cost.

EOWA Funding by Others – The assumed EOWA corridor funding sources consist of $3.299 billion of funding by the Illinois Tollway and $300 million of funding by other sources. Funding by other sources is expected to include local government contributions in the form of grants and in-kind contributions including land and right-of-way (ROW), design, utility and materials. Commitments for approximately half of the assumed funding from other sources has been obtained.

2.7 Tri-County Access and Other Emerging Projects

2.7.1 Tri-County Access and Other Emerging Projects

Length: N/A

Project Description: Planning studies for the extension of IL Route 53 from Lake Cook Road north into Lake County and for other routes as determined by the Board of Directors.

Project Benefits:
- Study and preparation of planning studies, including Environmental Impact Statements.

Construction Period: N/A

Total Cost (Escalated): $121.1 million

No adjustments in cost from the 2017 Consulting Engineers Report.
3 Systemwide Improvements and Initiatives

3.1 Systemwide Maintenance Facilities

Maintenance Facilities – Reconstruct / Relocate / Rehabilitate

Locations:

- M-1 (Alsip) – Reconstruct
- M-3 (Park Ridge) – Reconstruct
- M-5 (Schaumburg) – Reconstruct
- M-6 (Marengo) – Reconstruct
- M-7 (Rockford) – Reconstruct
- M-8 (Naperville) – Reconstruct / Relocate
- M-11 (DeKalb) – Rehabilitate
- M-12 (Dixon) - Rehabilitate

Project Description: Reconstruct, relocate or rehabilitate aging maintenance facilities.

Project Benefits:

- Optimize maintenance operations to meet expanded system needs
- Reduce annual facilities maintenance costs

Construction Period: 2013-2025

Total Cost (Escalated): $340.7 million

The cost was adjusted from $329.0 million in the 2017 Consulting Engineers Report due to the addition of the I-PASS Customer Service Center, Central Warehouse facility and a storage building at M-4 (Gurnee), as well as refined cost estimates.
3.2 **Systemwide Improvements**

3.2.1 **Infrastructure Renewal – Bridge, Pavement, Drainage and Safety Appurtenance Repairs**

**Length:** N/A

**Project Description:** Annual bridge, pavement, drainage and safety appurtenance repairs and upgrades which are not included in the major corridor improvements.

**Project Benefits:**
- Preserve and maintain existing infrastructure
- Upgrade to current standards and operational requirements

**Construction Period:** 2012-2026

**Total Cost (Escalated):** $710.4 million

The estimated project cost was adjusted from $730.5 million in the 2017 Consulting Engineers Report to reflect updated cost estimates for the remaining projected repairs in conjunction with the adjustments mentioned from corridors previously discussed.

3.2.2 **Infrastructure Enhancements – Business Systems and Toll Collection Upgrades**

**Length:** N/A

**Project Description:** Business Systems and Information Technology upgrades, including toll collection systems and related software to keep pace with and incorporate best practices

**Project Benefits:**
- Optimize all toll collection operations

**Construction Period:** 2013-2026

**Total Cost (Escalated):** $112.1 million

The estimated project cost was adjusted from $110.2 million in the 2017 Consulting Engineers Report.
3.2.3 Infrastructure Enhancements – Information Technology and Intelligent Transportation System Upgrades

Length: N/A

Project Description: Intelligent Transportation System (ITS) upgrades, including communications tower replacements and related software to keep pace with and incorporate best practices

Project Benefits:
- Ensure reliability of communication network
- Improve traffic and incident management

Construction Period: 2012-2026

Total Cost (Escalated): $167.9 million

No adjustments in cost from 2017 Consulting Engineers Report.

3.2.4 Non-Roadway Projects

Length: N/A

Project Description: Annual miscellaneous capital expenditures, including transponders, vehicles, computers and other items that are critical to the Illinois Tollway’s day-to-day operations.

Project Benefits:
- Maintain the state-of-good-repair
- Modernize the current systems

Construction Period: 2017-2026

Total Cost (Escalated): $895.8 million

The estimated project cost was adjusted from $885.4 million in the 2017 Consulting Engineers Report.

3.2.5 Access Expansion – Service Interchanges

Length: N/A

Project Description: Source of matching funds for construction of two service interchanges in accordance with the Illinois Tollway Interchange Policy.

Project Benefits:
- Construct interchanges on the existing system
- Provide economic benefit to the region

Construction Period: 2012-2019

Total Cost (Escalated): $133.1 million (Illinois Tollway Commitment)

The estimated project cost was adjusted from $111.5 million in the 2017 Consulting Engineers Report.
Report due to revisions to estimated costs on the I-90 at IL 23 Interchange improvement.

3.2.6 Toll Collection Upgrades – Plaza Modifications for Electronic Tolling Upgrades

Length: N/A

Project Description: Implement mainline and ramp plaza modifications to accommodate electronic toll collection upgrades.

Project Benefits:
- Reduce operational and maintenance costs
- Reduce environmental impacts
- Improve operational efficiency

Construction Period: 2016-2026

Total Cost (Escalated): $274.9 million

The estimated project cost was adjusted from $276.8 million in the 2017 Consulting Engineers Report.

3.2.7 Program Support

Length: N/A

Project Description: Program management, project management, technical and administrative service contracts.

Project Benefits:
- Program management to execute projects efficiently and to manage budget and schedule

Construction Period: 2012-2026

Total Cost (Escalated): $513.3 million

The estimated project cost was adjusted from $339.4 million in the 2017 Consulting Engineers Report due to an updated estimate of support (i.e. dedicated Army Corp staff, Independent Assurance Contract, Program Management Office, etc.) required for the remainder of the program.
3.2.8 Utility and Fiber Optic Relocation

Length: 0.0 miles

Project Description: As necessary during reconstruction or repair projects, will provide relocation of fiber optic and private utilities for improvements.

Project Benefits:
  - Allows projects to move forward with optimal design elements
  - Maintains Illinois Tollway fiber optic continuity
  - Modernizes utilities crossing Illinois Tollway right-of-way as necessary

Construction Period: 2014-2018

Total Cost (Escalated): $9.7 million

No adjustments in cost from the 2017 Consulting Engineers Report.

3.2.9 Systemwide Right-of-Way

Length: 0.0 miles

Project Description: Acquire right-of-way and easements necessary for interchange improvements, maintenance facilities.

Project Benefits:
  - Allows project to move forward with optimal design elements

Construction Period: 2018-2019

Total Cost (Escalated): $32.9 million

A systemwide ROW account was established in 2018 to purchase right-of-way and easements necessary for interchange improvements at I-90 and IL 23, as well as right-of-way needed for M-5 and M-8 reconstruction and the acquisition of a central warehouse.
3.3 Intelligent Transportation System

Deployment of Intelligent Transportation System (ITS) on the Illinois Tollway began in the late 1980s with installation of Road Weather Information Systems (RWIS) for monitoring atmospheric and pavement conditions during inclement weather. The system was further expanded with the construction of a systemwide fiber optic communications network and the I-PASS electronic tolling initiative in the late 1990s.

The Illinois Tollway's first traffic operations center (TOC) opened in 2003. The TOC employs a Traffic Incident Management System (TIMS) software package, which is monitored and controlled from the TOC at the Central Administration (CA) building. The TIMS software package is a management platform that allows operators to monitor traffic conditions in real-time, manage response and clearance of incidents, monitor construction zones and communicate with a variety of stakeholders, including Illinois Tollway staff, other Traffic Management Centers, the media and directly to the motorist. The TOC was integrated (two-way) with the computer-aided dispatch (CAD) system a year later. An early review of the impact of the CAD-TIMS integration resulted in a 24% reduction in incident response times.

In 2005, the Illinois Tollway launched the CRP to rebuild and widen major segments of the Illinois Tollway system, implement open road tolling and add a 12-mile extension to one of four interstate routes that comprise the Illinois Tollway system. The CRP contained funding to advance ITS as part of the capital program. ITS deployments continued, and the integration of incident management was further developed early in the CRP implementation process.

Since then, the Illinois Tollway ITS system has been expanded and enhanced to reduce the incident timeline (the time from once an incident is detected, to the time the incident is cleared, and the roadway is returned to normal conditions) to include a systemwide network of communications, monitoring and traveler information tools. This system has enhanced the Illinois Tollway’s ability to meet the overarching traffic and incident management goals and objectives of improving the mobility, efficiency and safety of the Illinois Tollway roads.

To date, the Illinois Tollway ITS system includes the following primary components that are integrated into TIMS:

- Systemwide fiber optics and communications equipment
- Closed Circuit Television (CCTV) camera surveillance— for detecting, verifying and monitoring congestion and incidents
- Dynamic Message Signs (DMS) – for providing traveler information such as travel time, roadway conditions and incidents to motorists ahead of major decision points on the roadway
- Vehicle Detection Systems (VDS) – both microwave and in-pavement sensors for measuring volume, vehicle speed and roadway occupancy on both the mainline and ramps. The data from this detection system provides the basis for the Illinois Tollway’s posted travel times
- Portable Changeable Message Signs (PCMS) – for providing traveler information to motorists on a short-term basis or within construction zones
- Weigh-in-Motion (WIM) – to assist overweight vehicle enforcement measuring the weight of vehicles moving at highway speeds
• Road Weather Information Systems (RWIS) – to assist roadway operations to prepare and respond to snow and ice events by measuring atmospheric and pavement conditions
• Wireless Queue/Count Stations – for automatic queue detection, wrong way driver detection and traffic counting
• Bluetooth detection devices – to allow for ease of traffic monitoring, particularly in construction zones

Since 2010, the Illinois Tollway's focus has shifted from significant expansion of the ITS system, which coincided with the broader CRP, to filling in gaps in the system with devices to better manage traffic operations while maintaining and improving the existing assets. While additional deployment has scaled down compared to years past, the system has continued to expand as part of both standalone ITS projects and the "mainstreaming" of the ITS system within larger roadway rehabilitation projects.

The first corridor-wide solar-powered / wireless communications CCTV & Roadway Sensor project was undertaken in 2013. Since then, 28 elements have been implemented and fully utilized. By 2015, these 28 elements have been converted to AC power with fiber optic communications (FOC). Additionally, during 2014, units were installed to maintain Jane Addams Memorial Tollway (I-90) corridor ITS operations east of the Fox River. These units were upgraded with the Jane Addams Memorial Tollway (I-90) corridor reconstruction/widening. Intermediate Power Distribution & Communication (IPDC) facilities were installed along the I-90 corridor west of the Fox River.

Continued ITS rehabilitation and replacement occur through small systemwide and capital contracts that include Microwave Vehicle Detection Systems (MVDS) replacement (end of lifecycle), Type 2 DMS installations near ramp queue locations, new CCTV installations not originally scoped as part of the Move Illinois Program, systemwide ramp queue detectors and a permanent truck scale at Maintenance Facility M-2 (Hillside)

New CCTV and MVDS equipment support poles have been designed and implemented that provide less deflection during windy conditions, allowing for better observation of the roadway at the TOC. The ITS guide drawings and specifications were developed in 2015 and have since been implemented in construction contracts.

In 2017, the Illinois Tollway opened the first "smart corridor" in the system. The Jane Addams Memorial Tollway (I-90) is funded under the current Program. This corridor includes a combination of traditional Illinois Tollway ITS devices, including CCTV and MVDS, and provides enhanced full color/full matrix DMS capable of illustrating color and graphic messages and new ITS devices, including a Lane Control System (LCS) over each lane. The LCS can indicate if a specific lane or lanes are open (green arrow), closed (red "X") or merging (yellow diagonal arrow), alerting drivers to change lanes and avoid incidents. The goal is to increase roadway safety and efficiency through this implementation.
Major deployments in 2018 include the following:

- Improved maintenance and management systems with the goals of reducing system downtime, including a pilot preventative maintenance contract for 200 ITS devices.
- Commenced design activities for CCTV gap analysis, queue detection, communication upgrade and continued DMS upgrades within the system. Under the ITS Design Upon Request (DUR) contracts, two ITS standalone contracts were designed and bid for construction. These contracts used a new design scheme using “typical” site design plans to reduce the cost of design and construction. Over 300 ITS devices were included in these contracts.

Major initiatives planned for 2019 include the following:

- Continued design activities for CCTV gap analysis, queue detection, communication upgrade and continued DMS upgrades within the system.
- Testing third-party data – This would involve the procurement and testing of a variety of private sector crowdsourced data. The congestion points and travel times will be compared against existing sources. An analysis of the cost effectiveness, accuracy and level of granularity will help determine if the approach should be used systemwide.
- Wrong-Way Driver Detection and Warning System Pilot testing.
- Lane-by-lane detection – The current microwave detection does not provide sufficient level of accuracy required for certain specific new functions. To address this, more robust and accurate lane-by-lane detection is required in selected locations. Options will need to be studied and a new technology chosen.
- Implement Time-of-Day Shoulder Running.
- The largest continuing efforts will continue to be the ongoing operation and maintenance of the TIMS and CAD systems. These two systems are critical to the management of incidents and traffic across the system. Components of each are discussed later in this document.
3.4 Environmental Initiatives

The Illinois Tollway is committed to protecting the environment and implementing numerous green initiatives throughout the Illinois Tollway system and its construction projects. During the 2018 calendar year, environmental initiatives throughout the Illinois Tollway included both the continuation of previous commitments along with innovative programs. The following is a summary.

3.4.1 Wetland and Waters Mitigation

Fox River Country Day School Forested Fen:

The Illinois Tollway partnered with the City of Elgin and the Forest Preserve District of Kane County for the purchase of a high-quality forested fen wetland, one of two in the state, located at IL Route 25 off of the Jane Addams Memorial Highway (I-90), just north of Trout Park. The site was designated as an Illinois nature preserve in 2014. This marked the first time an Illinois Tollway mitigation site gained this designation. Maintenance on the site, by the Forest Preserve District of Kane County in 2017 consisted of herbicide treatment of invasive species re-sprouts and other undesirable plant species.

Orland Grassland South:

The Illinois Tollway developed, advertised and let a construction contract for the restoration of a 162-acre site near Orland Park known as Orland Grassland South. Restoration activities include native planting and seeding, invasive species control, removal of drain tiles, creation of a snake hibernaculum and the restoration of a section of tributary to Marley Creek. Public access was provided with the construction of a new entrance road, parking lot and a path system. The work began in the fall of 2014 and was completed in 2018. Vegetative and hydrological maintenance and monitoring is ongoing through February of 2020.

Formerly farmland, the property is owned by the Forest Preserve District of Cook County and is adjacent to the 960-acre Orland Grassland Preserve, which provides important breeding habitat for grassland birds. The restoration of Orland Grassland South provides an expansion of the important Orland Grassland Preserve INAI site. Approximately 58 acres of wetlands were restored to offset impacts from the reconstruction/widening of Jane Addams Memorial Tollway (I-90).

St. James Farm Stream Restoration:

The Illinois Tollway provided funds to the Forest Preserve District of DuPage County to restore Spring Brook No. 1 Creek within the St. James Farm Forest Preserve in Warrenville. This was to offset IL 390 corridor construction water impacts. Restoration activities included remeandering the creek back to its pre-settlement configuration, which has reduced flooding and improved water quality. Restoration also provided aesthetic improvements to enhance the natural setting of the popular recreational site. The Forest Preserve District of DuPage County awarded the construction contract for the stream restoration effort in early 2015. Maintenance and monitoring of the site took place throughout 2017.

Pine Dunes Wetland Mitigation:

The Illinois Tollway partnered with the Lake County Forest Preserves beginning in 2014 to restore a 315-acre parcel known as Pine Dunes Forest Preserve. Approximately 52 acres of
wetland restoration and 33 acres of wetland enhancement were established for mitigation of impacts from the I-390 corridor construction. Additionally, 158 acres of upland agricultural land has been restored to native grassland, and 6,800 linear feet of surface water was restored. The project also included a parking lot, restroom, drinking water and nearly 3 miles of bike path.

This addition to the Lake County Forest Preserves has added to a large ecological complex consisting of over 5,300 acres of natural habitat that is protected as open space in northern Lake County. Substantial completion of the work on the site was reached in late fall of 2015. A large-scale planting was completed in 2017, with 2,400 trees and 2,400 shrubs planted in 2017 along with continued maintenance activities. Moving forward, vegetative and hydrological maintenance and monitoring of the site is planned to continue through 2020.

Pollinator Habitat Program

With the rusty patched bumble bee and the monarch butterfly being evaluated for listing as endangered under the Endangered Species Act, the Illinois Tollway has initiated a Pollinator Habitat Program and is establishing pollinator habitat within its ROW. In order to promote the establishment of pollinator habitat within these areas, the Illinois Tollway has developed specific seed mixes that include native flowers that are important to pollinators in this region. To date, the Illinois Tollway has incorporated 923 acres of pollinator habitat as part of the Illinois Tollway’s Best Management Practices and construction of wetland mitigation sites. Approximately 300 more acres of habitat are anticipated to be planted over the remaining years of the Move Illinois Program.

3.4.2 Landscape and Tree Planting Initiative

The Systemwide Landscape Master Plan was finalized in December 2017 with the goal of establishing and maintaining healthy tree communities throughout the Illinois Tollway’s 294 miles, 5 corridors and 12 counties. In partnership with The Morton Arboretum, the Master Plan leverages existing efforts in creating and nurturing current and future tree communities in the region focused on increasing the region’s tree canopy. The initial planting efforts commenced in the Spring of 2018 as part of the 58,000 trees that the Illinois Tollway has committed to planting in support of the program, and to date, over 30% of this goal has been achieved with the planting of over 18,400 trees. The Master Plan also includes functional planting of shrubs at strategic locations to help reduce snow drifting on pavement while complementing Illinois Tollway environmental programs and initiatives.

3.4.2.1 Experimental Tree Planting Areas

Planning efforts for experimental tree planting was completed in 2017 in collaboration with The Morton Arboretum. Implementation of this program has commenced in 2018 along I-355 and once complete, will be monitored to assess the impact of soil preparation, tree species composition and soil moisture on overall tree health and growth along the Illinois Tollway. Researchers will rigorously examine the effects of different tree species mixtures, soil treatments, maintenance and pruning practices. The results from this work will be used to drive a cost-benefit analysis that will help inform the Illinois Tollway of optimal tree planting strategies throughout the Illinois Tollway system. These analyses will be used as a guide for future Illinois Tollway landscape projects, and knowledge gained can be shared with other transportation agencies to promote successful planting strategies throughout Illinois, the
Midwest region and beyond.

3.4.3 NPDES MS4 Inspection and Annual Reporting

The Illinois Tollway maintains compliance with the Illinois Environmental Protection Agency’s (EPA) Storm Water Management Program ILR40 Permit conditions (ILR40 Permit) under the Small Municipal Separate Storm Sewer System (MS4), permit number ILR400494. An inspection of the entire system is completed annually and includes outfall inspections, illicit discharge detection and visual dry weather screening.

The Illinois EPA issued a new ILR40 Permit that became effective March 1, 2016. The Illinois Tollway Environmental Unit is currently studying procedures and policies to identify the most efficient means for complying with other new permit requirements.

3.4.4 INVEST Program

The Illinois Tollway continues to utilize the Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) process developed by the Federal Highway Administration (FHWA) that enables transportation agencies to assess the sustainability of their projects and systems as a whole. The Illinois Tollway customized the FHWA’s INVEST program by incorporating supplements to existing FHWA criteria and creating new criteria. In 2017, the INVEST team assessed the Illinois Tollway using the System Planning and Operations and Maintenance modules to determine system scores. The 2017 System Planning and Operations and Maintenance scores continue to maintain the highest level of achievement, platinum.

In 2017, the Illinois Tollway also used the INVEST Project Development module to evaluate in-progress design and construction contracts with a construction cost exceeding $10 million. Projects that reached construction substantial completion in 2013 and 2014 averaged a silver rating, while projects in 2015, 2016 and 2017 averaged a gold rating. When comparing 2017 projects to baseline projects (1998-2012), the INVEST team found that scores in 19 of the INVEST Project Development criteria increased by 30 percentage points or more. In 2017, the Illinois Tollway Move Illinois projects scored all possible points in the following INVEST Project Development criteria:

- Context-Sensitive Project Development
- Educational Outreach
- Habitat Restoration
- Ecological Connectivity
- Pedestrian Access
- ITS for System Operations
- Site Vegetation
- Reduced Energy and Emissions in Pavement Materials
- Construction Equipment Emission Reduction
- Construction Quality Control Plan

Planners, designers (including engineers of various disciplines), construction managers, contractors and Illinois Tollway employees have been participating in a rigorous sustainability
process, including project scoring and workshops that involve brainstorming sustainability practices. The Illinois Tollway’s INVEST Program not only improves Illinois Tollway sustainability, which directly benefits its customers and the community, it also provides exposure to sustainable principles and practices to many industry professionals. These professionals can in turn incorporate sustainable principles and practices into other jobs they are involved with throughout the region and country.

3.4.5 Stormwater Management

Several storm events have occurred throughout the Illinois Tollway’s history resulting in pavement flooding. The Consulting Engineers have listed known flooding issues with the potential to impact the traveling public. Until mitigation measures are completed in each of these locations, the Consulting Engineers monitor them during, or following, severe rain events to evaluate the public impacts and provide recommendations to the Illinois Tollway. All of the listed flooding concerns are in locations where mitigation efforts may be incorporated into the current Capital Programs.

Table 3: Flooding Locations and Mitigation

<table>
<thead>
<tr>
<th>Location</th>
<th>Mitigation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-294 &amp; Cermak Ave</td>
<td>In design (I-17-4299)</td>
</tr>
<tr>
<td>I-294 &amp; Archer Ave</td>
<td>In design (I-17-4296)</td>
</tr>
<tr>
<td>I-294 &amp; St. Charles</td>
<td>In design (I-17-4301)</td>
</tr>
<tr>
<td>I-294 &amp; 95th Street</td>
<td>In design (I-17-4296)</td>
</tr>
<tr>
<td>SB Balmoral Ramp to I-294</td>
<td>In design (I-17-4303)</td>
</tr>
<tr>
<td>NB I-294 to Hinsdale Oasis</td>
<td>In design (I-17-4298)</td>
</tr>
<tr>
<td>WB I-88 near Watson Road</td>
<td>Under construction (RR-16-4254)</td>
</tr>
<tr>
<td>SB I-355 near Boughton Road</td>
<td>Under construction (RR-16-4255)</td>
</tr>
<tr>
<td>I-94 near Lake Forest Oasis</td>
<td>Under construction (RR-17-4341)</td>
</tr>
</tbody>
</table>
3.5 System Growth

The following table depicts how the Illinois Tollway system will grow throughout the implementation of the Move Illinois Program. All lanes (mainline, auxiliary, ramps and toll plaza manual lanes) are included. The basis of these values was determined by mapping all of the Illinois Tollway’s lanes individually and categorizing them appropriately. As improvement projects add new lanes, such as IL 390, I-490 and I-294, the total lane mile values may be revised accordingly in future versions of this and/or other reports, based on the evolution of those designs.

The system growth projections from 2018 to 2026 are based on calculations provided by the Design Corridor Managers (DCM) of the respective improvement projects, current as of the date of this report. Based upon the proposed project scopes, specifically those that increase capacity on the mainline, add interchange ramps and add mainline elements, the overall system lane-mile total is expected to grow by 17.85% from 2012 through 2026.

Table 4: Growth of the Illinois Tollway System per Corridor (By Lane Miles)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tri-State (I-294 &amp; I-94)</td>
<td>781.0</td>
<td>781.0</td>
<td>793.1</td>
<td>795.7</td>
<td>794.9</td>
<td>794.9</td>
<td>794.9</td>
<td>781.0</td>
<td>800.2</td>
<td>811.9</td>
<td>811.9</td>
<td>814.9</td>
<td>823.9</td>
<td>847.1</td>
<td>847.1</td>
</tr>
<tr>
<td>Jane Addams (I-90)</td>
<td>473.2</td>
<td>476.9</td>
<td>543.8</td>
<td>545.4</td>
<td>615.6</td>
<td>615.6</td>
<td>616.1</td>
<td>473.2</td>
<td>476.9</td>
<td>543.8</td>
<td>545.4</td>
<td>615.6</td>
<td>615.6</td>
<td>616.1</td>
<td>616.1</td>
</tr>
<tr>
<td>Ronald Reagan (I-88)</td>
<td>527.7</td>
<td>527.7</td>
<td>528.5</td>
<td>530.1</td>
<td>530.1</td>
<td>530.1</td>
<td>530.1</td>
<td>527.7</td>
<td>527.7</td>
<td>528.5</td>
<td>530.1</td>
<td>530.1</td>
<td>530.1</td>
<td>530.1</td>
<td>530.1</td>
</tr>
<tr>
<td>Veterans (I-355)</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>263.1</td>
<td>263.1</td>
<td>263.1</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
<td>262.3</td>
</tr>
<tr>
<td>EOWA (IL 390 and I-490)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>51.4</td>
<td>73.3</td>
<td>73.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>51.4</td>
<td>73.3</td>
<td>73.3</td>
</tr>
<tr>
<td>Total Lane Miles</td>
<td>2,044.2</td>
<td>2,047.9</td>
<td>2,127.7</td>
<td>2,133.5</td>
<td>2,255.1</td>
<td>2,277.0</td>
<td>2,277.5</td>
<td>2,044.2</td>
<td>2,047.9</td>
<td>2,127.7</td>
<td>2,133.5</td>
<td>2,255.1</td>
<td>2,277.0</td>
<td>2,277.5</td>
<td></td>
</tr>
</tbody>
</table>

% Increase - Annual: 0.18% 0.26% 1.97% 0.27% 5.70% 0.97% 0.02%

% Increase - Aggregate: 0.2% 4.1% 4.4% 10.3% 11.4% 11.4%
4 Condition of the Illinois Tollway System

The Illinois Tollway continues to function as an essential component of the transportation network in Northern Illinois. As part of the current Move Illinois Program to date:

- Approximately 21.5% of the system mainline pavement existing prior to the commencement of the Move Illinois Program was reconstructed and widened
- Reconstruction and widening of the Jane Addams Memorial Tollway (I-90) east of Mill Road to the Eastern Terminus has been completed
- Construction of a new interchange for the Tri-State Tollway (I-294) with Interstate 57 has commenced with the initial phase ramps opened in 2014
- Rehabilitation and widening of the Illinois Route 390 Tollway west of Rohlwing Road was completed
- Construction of the Illinois Route 390 Tollway extension to Illinois Route 83 was completed.

As part of the previous, substantially complete CRP Capital Program, the following was completed:

- Approximately 43% of the system mainline pavement existing prior to the commencement of the CRP Capital Program was reconstructed or reconstructed/widened
- Approximately 32.3% of the system mainline pavement existing prior to the commencement of the CRP Capital Program was rehabilitated
- Open road tolling was implemented at all mainline toll plazas systemwide
- Construction of the Veterans Memorial Tollway (I-355) South Extension to I-80 was completed

The current Capital Programs are effectively managing the infrastructure condition of the system. It is recommended that programmed capital maintenance continue to occur as programmed and that issues identified during annual inspections be addressed as part of this programmed work.

Most of the system mainline pavement which has not been reconstructed or reconstructed/widened as part of the CRP or the Move Illinois Programs to date (approximately 10.2% of the system mainline pavement existing prior to the commencement of the Move Illinois Program) is programmed for reconstruction or reconstruction and widening as part of the Move Illinois Program through 2026. Additionally, sections of pavement constructed, reconstructed, reconstructed and widened or rehabilitated as part of the CRP (approximately 21.2% of the system mainline pavement existing prior to the commencement of the Move Illinois Program) are programmed for rehabilitation required by the pavement preservation program as part of the Move Illinois Program through 2026.
Once complete, the *Move Illinois* Program will have:

- Reconstructed or reconstructed/widened approximately 90.0 centerline miles or 31.7% of the system mainline pavement existing prior to the commencement of the *Move Illinois* Program
- Rehabilitated approximately 60.1 centerline miles or 21.2% of the system mainline pavement existing prior to the commencement of the *Move Illinois* Program
- Constructed approximately 17.1 centerline miles of new routes and route extensions
- Increased the systemwide lane mileage by approximately 15.7% through various widening projects, construction of route extensions and new interchanges, and the inclusion of the Elgin O'Hare Western Access corridor

**NOTE:** The above percentages are based upon the approximately 284.1 centerline miles of mainline pavement existing prior to the commencement of the *Move Illinois* program and may not include new construction/expansion of interchange ramps, auxiliary or plaza pavements.

### 4.1 Transportation Asset Management System

Inspections are performed annually throughout the entire Illinois Tollway system (Annual Inspections) pursuant to requirements of the Trust Indenture. The purpose of these inspections is to evaluate Illinois Tollway assets, which include but are not limited to pavement, bridges, overhead sign structures, structural walls, drainage structures, slopes, ditches, safety appurtenances, facilities and ITS devices. Certain Illinois Tollway assets, including bridges, structural walls, overhead sign structures and facilities, are inspected on multi-year cycles which are described in further detail later in this report.

Deficiencies are logged in the Illinois Tollway’s Asset Management System. Any deficiencies that are appropriate for Illinois Tollway Maintenance to repair are instantaneously transmitted to the appropriate Maintenance Division for repair. All other deficiencies requiring repair by a contractor are transmitted to the Illinois Tollway Engineering Department for incorporation into a current or future contract, based on the severity of the deficiency.

### 4.2 Pavement

The Illinois Tollway roadway pavement is inspected annually. The inspection includes a structural evaluation, a pavement surface evaluation and a visual inspection that detail areas for repair by means as appropriate determined by the severity of the deficiency.

#### 4.2.1 Visual Inspection

Visual inspection of the Illinois Tollway roadway system is performed annually. This inspection consists of documenting the condition of the mainline and ramp pavements from the edge-of-shoulder and from a vehicle outfitted with cameras that capture continuously. This visual pavement inspection includes all bridge decks, approaches, shoulders and gutters.

#### 4.2.2 Pavement Structural Evaluation

The structural evaluation of the Illinois Tollway roadway system pavement is performed annually by the Illinois Tollway’s Pavement Consultant during the spring and summer months.
This evaluation consists of Falling Weight Deflectometer (FWD) testing and a pavement coring program, from which the data is used to analyze and assess the structural integrity of the mainline pavements and assist in identifying deficiencies.

FWD testing is completed by measuring the deflections caused by an impulse deflection device that applies a dynamic load by dropping a weight onto a circular load plate placed on the pavement surface. The results of the FWD testing are utilized to determine pavement layer and subgrade structural parameters, to evaluate load transfer characteristics at pavement joints and to detect the presence of subsurface voids.

The pavement coring program consists of six-inch diameter full depth cores taken through bound pavement layers at strategically identified locations throughout the Illinois Tollway system. Pavement cores are used to verify pavement layer thickness, inspect material and bonding conditions and assess the condition of pavement layers below the surface.

4.2.3 Surface Evaluation

The pavement surface evaluation of the Illinois Tollway roadway system is performed annually during the summer and fall months. This evaluation utilizes electronic and visual surveillance of the pavement surface to determine the extent of pavement distress.

The Illinois Tollway utilizes a pavement inspection and evaluation system similar to that developed by the Illinois Department of Transportation (IDOT) which categorizes pavement conditions using Condition Rating System (CRS) values. A CRS rating of 4.5 is considered to be “poor.” Although this may be tolerable on a rural route, a CRS of 5.5 or less is used as an indication of a riding surface that is uncomfortable and inconsistent with Illinois Tollway operational standards and user expectations. Therefore, pavement sections with a CRS of 5.5 or less on the Illinois Tollway system are candidates for repairs or rehabilitation. Furthermore, a pavement with a CRS value between 6.0 and 6.5 may be considered “transitional” by the Consulting Engineers, based upon the pavement’s maintenance and repair history and age, for which repairs in the subsequent two to seven years are anticipated due to repeated repair cycles diminishing pavement life span.

The CRS ratings utilized for the Illinois Tollway pavement surface evaluation are provided in the following table:

<table>
<thead>
<tr>
<th>CRS Rating</th>
<th>General Pavement Surface Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7.4</td>
<td>Excellent</td>
</tr>
<tr>
<td>6.5 to 7.4</td>
<td>Good</td>
</tr>
<tr>
<td>6.0 – 6.4</td>
<td>Transitional</td>
</tr>
<tr>
<td>4.5 – 5.9</td>
<td>Fair</td>
</tr>
<tr>
<td>&lt; 4.5</td>
<td>Poor</td>
</tr>
</tbody>
</table>
It should be noted that while the riding surface may reflect a high CRS rating, the aging pavement substructure, drainage problems or other unknown conditions that may exist below the pavement surface is not reflected by the CRS rating.

CRS values are determined by digitally recording surface conditions and measuring certain types of surface distress and rideability of pavements through the collection of electronic sensor data. This data is collected by a semi-automatic survey process which utilizes a survey vehicle outfitted with cameras that capture continuous images of the pavement surface and panoramic images of the roadway. The images and sensor data are processed by experienced CRS rating personnel who assign CRS values. A summary of the most recent systemwide CRS ratings is included in the following table:

**Table 6: Summary of Mainline Pavement CRS Ratings from the 2017 Evaluation (Lane Miles)**

<table>
<thead>
<tr>
<th>Tollway</th>
<th>Excellent &gt;7.5</th>
<th>Good 6.6-7.4</th>
<th>Transitional 6.0-6.5</th>
<th>Fair 4.5-5.9</th>
<th>Poor 0-4.4</th>
<th><strong>Not Rated</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tri-State (I-294)</td>
<td>185.0</td>
<td>138.4</td>
<td>78.8</td>
<td>8.0</td>
<td>0.0</td>
<td>13.2</td>
</tr>
<tr>
<td>Tri-State (I-94)</td>
<td>66.2</td>
<td>98.1</td>
<td>16.1</td>
<td>16.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Edens Spur (I-94)</td>
<td>0.9</td>
<td>2.7</td>
<td>7.1</td>
<td>3.8</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Jane Addams (I-90)</td>
<td>487.0</td>
<td>13.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Reagan (I-88)</td>
<td>283.4</td>
<td>135.8</td>
<td>14.6</td>
<td>0.6</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Veterans (I-355)</td>
<td>59.1</td>
<td>115.3</td>
<td>6.1</td>
<td>0.0</td>
<td>0.0</td>
<td>7.7</td>
</tr>
<tr>
<td>EOWA (IL 390)</td>
<td>26.7</td>
<td>1.1</td>
<td>2.6</td>
<td>2.4</td>
<td>0.0</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1108.33</strong></td>
<td><strong>504.5</strong></td>
<td><strong>125.3</strong></td>
<td><strong>31.2</strong></td>
<td><strong>0.0</strong></td>
<td><strong>37.3</strong></td>
</tr>
<tr>
<td><strong>% of Total</strong></td>
<td><strong>61.4%</strong></td>
<td><strong>27.9%</strong></td>
<td><strong>6.9%</strong></td>
<td><strong>1.7%</strong></td>
<td><strong>0.0%</strong></td>
<td><strong>2.1%</strong></td>
</tr>
</tbody>
</table>

* Lane Miles Surveyed does not equal total actual system lane mileage due to approximate beginning and ending points of the field survey, construction activity and the exclusion of auxiliary lanes and other lane types.

** Sections that contained construction and the long bridges were excluded from the survey and listed as “Not Rated”.

Note: This evaluation does not include auxiliary or ramp lanes that are required for entering and exiting the Illinois Tollway. Due to this, route and system totals may not match information in other sections of the report. Percentages may not total to 100% due to rounding.
Ramp lanes are evaluated on a three-year basis due to the reduced traffic and anticipated improved condition compared to the mainline, though the Illinois Tollway may begin to monitor the ramps more closely since the current programs are not expected to address many of the system’s ramps. Auxiliary lanes are generally in better condition than the adjacent mainline lanes due to reduced traffic and are generally maintained in conjunction with the mainline lanes.

CRS ratings are only one indicator of overall pavement condition and, if used alone, can be misleading. A newly rehabilitated roadway will likely receive an “excellent” CRS rating even though the underlying concrete pavement and base could be largely deteriorated. In such a case, the “excellent” CRS rating is expected to rapidly deteriorate to a “transitional” or “poor” CRS rating, and the pavement will likely require additional work in a relatively short period of time. It is anticipated that Illinois Tollway pavement sections not reconstructed as part of recent Capital Program projects which received a CRS rating of “good” to “excellent” will rapidly deteriorate to a “transitional” or lower rating due to the condition of the underlying concrete base pavement.

Considering this, the Remaining Service Life (RSL) categories were developed. The RSL categories take into account current CRS ratings, traffic volumes and pavement thickness information. This data is projected to determine how many theoretical years are remaining before a condition level is reached where major repairs are required. The RSL categories are developed using specific pavement performance models, historical condition data for a specific pavement type and assumed rehabilitation treatments. The RSL categories have been found to be a reliable indicator of pavement performance. However, if there is any deviation from the future rehabilitation treatments assumed in developing the performance model, then the model will no longer accurately predict pavement performance and the RSL category may be incorrect.

The Illinois Tollway RSL categories included 0 years, 1-2 years, 3-4 years, 5-8 years, 9-12 years, 13-19 years and 20 or more years. An RSL category of 20 or more years was created to allow for better programming of future rehabilitation projects. New pavement with an expected life of 30 or more years would typically be categorized with an RSL of 20 or more years. In contrast, pavement categorized with an RSL of 0 years will require extensive intermittent pavement repairs to maintain the pavement integrity.

The Illinois Tollway has generally been successful in maintaining consistent pavement conditions to date. This has been accomplished through activities performed by the Maintenance Division and programmed major repair work through the Capital Programs.

The system mainline pavement sections which have been constructed, reconstructed, or reconstructed and widened as part of the Capital Programs to date addressed the concern of failing base pavement on those portions of the system. However, there still exist areas of concern where the pavement has not been reconstructed. In addition to intermittent repairs systemwide, other short-term repairs in these areas include asphalt resurfacing on the Edens Spur (I-94) completed in 2010, on the Reagan Memorial Tollway (I-88) completed in 2012 and on the Tri-State Tollway (I-294) completed in 2012. These short-term repairs serve to improve pavement surface conditions and ride quality; however, they do not adequately address the deterioration of the underlying concrete base pavement. Based on pavement age and repair histories, reconstruction of these pavements is likely the most cost-effective long-term repair
strategy.

Currently, a majority of the system mainline pavement not reconstructed or reconstructed and widened to date is programmed for reconstruction or reconstruction and widening as part of the Capital Programs through 2026. Additionally, sections of pavement constructed, reconstructed, reconstructed and widened, or rehabilitated as part of the CRP are programmed for rehabilitation through 2026 per the Move Illinois Program pavement preservation program.

While the Illinois Tollway’s annual maintenance efforts have focused on maintaining pavement basic integrity through projects such as emergency patching and intermittent pavement repairs, the original pavement infrastructure continues to deteriorate due to load-related (vehicle loading) and non-load related (environmental) impacts. In the past, this resulted in a repair cycle that continued to accelerate until the implementation of the CRP when more substantial improvements were made. The strategy of maintaining pavement through small-scale maintenance projects became infeasible due to increasing construction costs, repair quantities, traffic disruptions and reduced pavement life. The current Capital Programs focus on rehabilitating or reconstructing the aging infrastructure through the reconstruction or reconstruction and widening of approximately 31.7% of the mainline system by the end of the Move Illinois Program in 2026, with approximately 21.5% of the system mainline pavement having been completed thus far.

Long-term pavement repairs began to be addressed in 2005, the first year of the CRP. As part of this, the underlying concrete base pavement deterioration issues along the Tri-State Tollway (I-294/I-94) and the Reagan Memorial Tollway (I-88) have been or are programmed to be addressed. As is shown in the following table, approximately 22.4% of systemwide pavement surveyed in 2017 was categorized with an RSL of eight years or less. The pavement within these categories will require repairs within the next eight years to maintain pavement integrity. This is a major improvement over the 85.1% of pavement systemwide that was within these categories in 2004 before the CRP began. Additionally, 51.7% of pavement surveyed in 2017 was categorized with an RSL of greater than 20 years compared to 2.2% in 2004.

NOTE: The above percentages are based upon the approximately 284.1 centerline miles of mainline pavement existing prior to the commencement of the Move Illinois Program and may not include new construction/expansion of interchange ramps, auxiliary or plaza pavements.
### Table 7: Summary of Mainline Pavement RSL Values from the 2017 Evaluation (Lane Miles)

<table>
<thead>
<tr>
<th>Tollway</th>
<th>20+ Years</th>
<th>13-19 Years</th>
<th>9–12 Years</th>
<th>5–8 Years</th>
<th>3–4 Years</th>
<th>1–2 Years*</th>
<th>0 Years*</th>
<th>***Not Rated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tri-State (I-294)</td>
<td>189.0</td>
<td>46.9</td>
<td>18.0</td>
<td>75.8</td>
<td>46.1</td>
<td>16.4</td>
<td>18.2</td>
<td>13.1</td>
</tr>
<tr>
<td>Tri-State (I-94)</td>
<td>156.7</td>
<td>4.0</td>
<td>4.0</td>
<td>2.5</td>
<td>2.5</td>
<td>11.1</td>
<td>16.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Edens Spur (I-94)</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>0.0</td>
<td>6.3</td>
<td>6.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Jane Addams (I-90)</td>
<td>391.5</td>
<td>32.1</td>
<td>56.3</td>
<td>3.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Reagan (I-88)</td>
<td>127.4</td>
<td>144.4</td>
<td>38.3</td>
<td>116.0</td>
<td>27.9</td>
<td>7.6</td>
<td>3.1</td>
<td>0.3</td>
</tr>
<tr>
<td>Veterans (I-355)</td>
<td>60.9</td>
<td>16.6</td>
<td>65.7</td>
<td>37.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>7.7</td>
</tr>
<tr>
<td>EOWA (IL 390)</td>
<td>7.1</td>
<td>19.0</td>
<td>0.0</td>
<td>6.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>932.7</strong></td>
<td><strong>263.0</strong></td>
<td><strong>182.3</strong></td>
<td><strong>243.1</strong></td>
<td><strong>76.5</strong></td>
<td><strong>41.3</strong></td>
<td><strong>43.8</strong></td>
<td><strong>21.1</strong></td>
</tr>
<tr>
<td>% of Total</td>
<td>51.7%</td>
<td>14.6%</td>
<td>10.1%</td>
<td>13.5%</td>
<td>4.2%</td>
<td>2.3%</td>
<td>2.4%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

* Critical areas in need of attention. Reagan Memorial Tollway (I-88) – programmed for rehabilitation and reconstruction in various years, the Tri-State Tollway (I-294) from 95th Street to Balmoral Avenue – programmed for reconstruction in 2024 to 2025 and the Edens Spur (I-94) – programmed for reconstruction in 2018 to 2020.

** Lane Miles Surveyed does not equal total actual system lane mileage due to approximate beginning and ending points of the field survey and the exclusion of auxiliary lanes and other lane types.

*** Sections that contained construction and the long bridges (such as the Mile Long and Bensenville bridges on I-294) were excluded from the survey and listed as “Not Rated”.
4.2.4 Summary of Mainline Pavement Condition

4.2.4.1 Tri-State Tollway (I-294/I-94)

The 77.6-mile Tri-State Tollway (I-94/I-294/I-80) was constructed in 1958 as part of the original pavement network and consisted of either two or three lanes in each direction. The two-lane portions of this route were widened to three lanes in each direction in 1966 and at various times throughout the 1970s. As part of these widening projects, a Hot Mix Asphalt (HMA) overlay was also typically added to the original lanes. A portion of the route from approximately 95th Street to Balmoral Avenue, commonly referred to as the Central Tri-State, was widened to four lanes in each direction and either reconstructed or partially reconstructed in 1992 and 1993. A rehabilitation of the Central Tri-State was completed in 2012 which included full-depth concrete patches, removal of the existing HMA overlay and the placement of a thicker Stone Matrix Asphalt (SMA) overlay. The Central Tri-State mainline pavement is scheduled for reconstruction in 2018 to 2025, as part of the Move Illinois Program. The majority of the mainline pavement along this route outside the limits of the Central Tri-State was reconstructed, or reconstructed and widened, from 2006 to 2009 as part of the CRP.

For the purposes of this report, the Tri-State Tollway is separated into the following three sections:

South Tri-State Tollway (Bishop Ford Freeway to 95th Street)

The majority of this pavement was rated in “excellent” condition (CRS) with an RSL rating of 13 to 20 years or more. The pavement from the Bishop Ford Freeway (I-94) to 163rd Street has undergone reconstruction and widening, completed in 2007. The pavement from 163rd Street to 95th Street has undergone reconstruction and widening, completed in 2009. Pavement preservation within this section was completed in 2017.

Central Tri-State Tollway (95th Street to Balmoral Avenue)

The majority of this pavement was rated in “good” to “transitional” condition (CRS) with an RSL rating of 1 to 8 years. The pavement from 95th Street to Balmoral Avenue/O'Hare Interchange was widened and either reconstructed or partially reconstructed in 1992 and 1993. The partial reconstruction and widening included the reconstruction of the outside (third) lane in each direction on the existing six-lane facility and the addition of a new fourth lane in each direction. The remaining two inside lanes in each direction were left in place, rehabilitated and resurfaced. The reconstruction and widening areas included jointed plain concrete pavement throughout. A rehabilitation of this section was completed in 2012 which included full-depth concrete patches, removal of the existing HMA overlay and the placement of a thicker SMA overlay. Reconstruction of this section is programmed to occur in 2018 to 2025, as part of the Move Illinois Program.

North Tri-State Tollway (Balmoral Avenue to Russell Road)

The majority of this pavement was rated in “excellent” to “good” condition (CRS) with an RSL rating of 20 years or more. The pavement from Balmoral Avenue/O'Hare Interchange to the Deerfield/Edens Spur improvement limits and from Half-Day Road to the Russell Road has undergone reconstruction and widening, completed in 2009.

The Deerfield/Edens Spur improvement was a project completed in 2000 which included the removal of the original Toll Plaza 25 (Deerfield), widening and reconstruction of the Tri-State
Tollway in the vicinity of Deerfield Road, reconstruction of the west end of the Edens Spur, construction of the new mainline Toll Plaza 24 on the Edens Spur and reconfiguration of the Deerfield Road interchange ramps. Pavement preservation within this section is under construction in 2018.

Edens Spur (I-94)

The 4.8-mile Edens Spur (I-94) was constructed in 1958 as part of the original pavement network and consisted of two lanes in each direction. An HMA overlay was added to this pavement in 1976 and was subsequently resurfaced in 1995. Rehabilitation of this section was completed in 2010 and included removal of the existing HMA overlay and the placement of an SMA overlay. As part of the Deerfield/Edens Spur improvement project, the west end pavement was reconstructed in 1997, and Toll Plaza 24 (Edens Spur) was constructed in 1998. Toll Plaza 24 (Edens Spur) was subsequently converted to open road tolling in 2006.

The majority of this pavement was rated in "good" to "fair" condition (CRS) with an RSL rating of 0 to 2 years. The CRS and RSL ratings have rapidly deteriorated to a point where the majority of the pavement is anticipated to require work in the near future. Reconstruction of this route is programmed to occur in 2018 to 2020, as part of the Move Illinois Program.

4.2.4.2 Jane Addams Memorial Tollway (I-90)

The 75.9-mile Jane Addams Memorial Tollway (I-90), originally referred to as the Northwest Tollway until 2008, was constructed in 1957 as part of the original pavement network and consisted of two lanes in each direction. The pavement from East River Road to Barrington Road was widened to three lanes in each direction in 1967. The pavement from Barrington Road to US Route 20 (Marengo-Hampshire) was widened to three lanes in each direction in 1992 and 1998. The majority of pavement from Mill Road to Rockton Road was reconstructed and widened to three lanes in each direction in 2009.

The pavement from Mill Road to Elgin Toll Plaza 9 was reconstructed and widened to three lanes in 2013 to 2014 as part of the Jane Addams Memorial Tollway (I-90) corridor reconstruction/widening projects. The pavement from Elgin Plaza 9 to the Eastern Terminus was reconstructed and widened to four lanes in each direction in 2014 to 2016.

For the purposes of this report, the Jane Addams Memorial Tollway (I-90) is separated into the following sections:

Western Corridor (Rockton Road to Mill Road)

The majority of the pavement in this section was reconstructed and widened in 2009 and is rated in "excellent" condition (CRS) with an RSL rating of 9 to 19 years. Since this pavement is a mix of rubblized and reconstructed pavement, the RSL rating is slightly lower due to the future surface rehabilitations required on the rubblized sections.

Central Corridor (Mill Road to Elgin Plaza 9)

The majority of the pavement in this section was reconstructed and widened in 2013 to 2014 as part of the Move Illinois Program and is rated in "excellent" condition (CRS) with an RSL rating of 20 years or more.

Eastern Corridor (Elgin Plaza 9 to Des Plaines River)

The pavement within this section was reconstructed and widened in 2015 and 2016 as part
of the Move Illinois Program and is rated in “excellent” condition (CRS) with an RSL rating of 20 years or more.

4.2.4.3 Reagan Memorial Tollway (I-88)

The 26.7-mile Reagan Memorial Tollway (I-88) east of Illinois Route 56, originally referred to as the East-West Tollway until 2006, was constructed in 1957 as part of the original pavement network and consisted of two lanes in each direction. The pavement from the Eisenhower Expressway to Naperville Road was widened to three lanes and resurfaced in each direction in 1977. The pavement from Naperville Road to Prairie Path was reconstructed and widened to three lanes in each direction in 1987. The pavement from Prairie Path to Toll Plaza 61 (Aurora) and from Toll Plaza 61 (Aurora) to Orchard Road was reconstructed and widened to three lanes in each direction in 2000 and 2008 respectively.

The pavement from York Road to Naperville Road and from Naperville Road to Illinois Route 59 was reconstructed and widened to four lanes in each direction in 2008-2009 and 2004-2005 respectively. Subsequently, the pavement from the Eisenhower Expressway to York Road was resurfaced in 2008-2009. The pavement from Illinois Route 56 to Orchard Road was reconstructed and widened to three lanes in each direction in 2012 as part of the CRP.

The majority of the pavement along this route was rated in “excellent” to “good” condition (CRS) with an RSL rating that varies widely between 9 to 20 or more years. Reconstruction and widening of this route from Orchard Road to Illinois Route 56 was completed in 2012 as part of the CRP. The section of the pavement from the Eisenhower Expressway to York Road was rated with a lower RSL of 0 to 2 years and is programmed for reconstruction to occur in 2018 to 2019 as part of the Move Illinois Program.

Reagan Memorial Extension (I-88)

The 69.5-mile Reagan Memorial Tollway (I-88) Extension west of Illinois Route 56 was constructed in 1974 as a western extension to the original Reagan Memorial Tollway (I-88) and consisted of two lanes in each direction. The pavement received an HMA overlay in 1993. This HMA overlay was placed to a nominal 2¼ inch thickness, thinner than the typical 3-inch HMA overlay. The thinner overlay was originally intended to act as a bond breaker for a future concrete overlay. However, due to the poor performance of a similar concrete overlay installation on a section of the original Reagan Memorial Tollway (I-88), the concrete overlay was never placed. Instead, the HMA overlay remained as the riding surface. This thinner overlay did not perform well and required constant repairs by the Maintenance Division.

Illinois Route 56 to Illinois Route 251

In January 2001, the HMA overlay between Illinois Route 56 and Illinois Route 251 failed and the Illinois Tollway initiated immediate emergency repairs. Adverse weather conditions during the course of these emergency repairs limited their effectiveness and life expectancy, thus requiring subsequent full-width, shoulder-to-shoulder resurfacing during the summer of 2001. The pavement from Illinois Route 56 to Illinois Route 251 was rehabilitated including the application of a thicker SMA overlay in 2012.

The majority of the pavement between Illinois Route 56 and Illinois Route 251 was rated in “excellent” to “good” condition (CRS) with an RSL rating of 3 to 12 years (71% rated with an RSL of 5 to 8 years). The rehabilitation of this pavement completed in 2012 has served to
increase the remaining service life of this pavement. However, these projects were intended to rehabilitate the pavement surface and did not include rehabilitation of the deteriorating original concrete pavement and base. As a result, the ratings of this pavement have deteriorated from the 2013 ratings (“excellent” condition (CRS) with approximately 90% with an RSL of 9 to 19 years). It is expected that this original concrete pavement and base will continue to rapidly deteriorate, will result in a rapid depreciation in the current ratings and may require a more frequent rehabilitation cycle.

Illinois Route 251 to Rock Falls/US Route 30

The 2004 Annual Inspections and preliminary development of intermittent HMA repair quantities in 2005 revealed severe deterioration of the pavement west of Illinois Route 251. It was decided to accelerate the reconstruction of this pavement that was originally programmed in 2006. The reconstruction included the removal of the original HMA overlay, the rubblization of the original concrete base pavement and the application of a 6-inch HMA overlay. The rubblization consisted of breaking the original concrete pavement into baseball-size and smaller pieces. The intent of this reconstruction is the eventual removal of 2 inches of HMA overlay and the application of an additional 6-inch HMA overlay for a total HMA thickness of 10 inches. Work to complete the “perpetual pavement” commenced in 2016 and was completed in 2017. The pavement at culverts and along bridge decks which was not rubblized was also included in the reconstruction along this section.

The pavement west of Illinois Route 251 to Chicago Avenue was reconstructed with work completed in 2015. This work addressed all previously noted deficiencies within this section. The pavement from Chicago Avenue to the Western Terminus was rehabilitated in 2016. This rehabilitation included the placement of an additional 6-inch thick asphalt layer, reconstruction of pavements which were not previously rubblized and reconstruction of the shoulder pavement. Most of the pavement west of Illinois Route 251 was rated in “excellent” condition (CRS) with an RSL rating of 13 to 19 years.

4.2.4.4 Veterans Memorial Tollway (I-355)

The 17.5-mile Veterans Memorial Tollway (I-355) north of Interstate 55, originally referred to as the North-South Tollway until 2007, was constructed in 1988 and consisted of two lanes in each direction except between Maple Avenue and Butterfield Road, which consisted of three lanes in each direction. The pavement from Plaza 89 (Boughton) to Maple Avenue and from Butterfield Road to North Avenue was widened to three lanes in each direction in 1994 and 1996, respectively. The pavement from Boughton Road to Interstate 55 was widened to three lanes in each direction in 2007 as part of the Veterans Memorial Extension project discussed later in this report. The pavement from Interstate 88 to 75th Street was widened to four lanes in each direction in 2008 and 2009. As part of these 2008 and 2009 widening projects, an HMA overlay was also added to the original three lanes. Rehabilitation of the pavement outside the limits of the aforementioned widening projects from North Avenue to Interstate 88 and from 75th Street to Boughton Road was completed in 2010 and included the placement of an SMA overlay to all lanes in each direction.
The majority of this pavement was rated in “excellent” to “good” condition (CRS) with an RSL rating of 5 to 19 years. The areas north of the Interstate 55 Interchange were rehabilitated in 2010 and 2013, which has served to extend the remaining service life and improve the CRS ratings. A subsequent rehabilitation of this pavement, including resurfacing and base pavement patching, is programmed for 2018 through 2020.

Veterans Memorial Tollway (I-355) South Extension

The 12.3-mile Veterans Memorial Tollway (I-355) South Extension was constructed in 2007 as a southern extension to the original Veterans Memorial Tollway (I-355) south of Interstate 55 to Interstate 80 and consists of three lanes in each direction. Upon completion of the extension construction, the entire route was memorialized as the Veterans Memorial Tollway. This extension serves 13 municipalities/townships in three counties and provides a regional connection that improves north-south mobility between Interstate 55 and Interstate 80.

The majority of this pavement was rated in “excellent” to “good” condition (CRS) with an RSL rating of 20 or more years.

4.2.4.5 Illinois Route 390 Tollway

The existing 6.1-mile Illinois Route 390, originally referred to as the Elgin O’Hare Expressway until 2013, was constructed by IDOT in 1993 and consisted of two lanes in each direction between US Route 20/Lake Street and US Route 53/Rohlwing Road. The pavement from Illinois Route 19/Irving Park Road to Meacham Road was rehabilitated and widened to three lanes in each direction in 2014-2016 as part of the Move Illinois Program. Tolling of this section commenced in July of 2016, designating this route under the jurisdiction of the Illinois Tollway. IL 390, consisting of three lanes in each direction from Meacham Road to IL 83/Busse Road, including an interchange with I-290, was completed in 2017. The Move Illinois Program includes extension of the route east to an interchange with the future I-490, with work expected to occur between 2018 and 2025.

Annual inspections along the completed IL 390 corridor commenced in 2017. The majority of the pavement west of Illinois Route 53 was rated in “excellent” to “transitional” condition (CRS) with an RSL rating of 13-20 years. While not included in the rehabilitation or reconstruction work that occurred between 2014 and 2017, the pavement between US Route 20/Lake Street and Illinois Route 19/Irving Park Road, was rated in “excellent” to “fair” condition (CRS) (over 70% in “transitional” to “fair”) with an RSL rating of 5 to 8 years.

4.2.4.6 I-490 Tollway

The Move Illinois Program includes the anticipated construction of I-490, which will connect the Jane Addams Memorial Tollway (I-90) to the Tri-State Tollway (I-294) along the western border of O’Hare International Airport with construction to occur between 2016 and 2026.
4.3 Roadway Appurtenances

The Illinois Tollway roadway appurtenances are visually inspected annually by the Illinois Tollway Engineering Department’s Division of Maintenance and Traffic as well as the Consulting Engineer. These inspections consist of the recording of visible deficiencies from right-of-way fence to right-of-way fence, including the drainage systems and all safety appurtenances.

4.3.1 Drainage Systems

Visual inspection of the Illinois Tollway roadway drainage systems is performed annually. This inspection consists of recording visible deficiencies of the drainage structures, crossing culverts, slopes, ditches and vegetation.

The drainage systems throughout the Illinois Tollway are generally in good to fair condition, and the majority of the embankment slopes are stable. Typical deficiencies noted during the inspections included concrete headwall deficiencies, drainage structures requiring cleaning or repair, gutter heaving or sinking, rill erosion, washouts, sinkholes and ditch restoration due to erosion.

Closed drainage systems are typical throughout the urban areas systemwide. Only limited inspections can be performed on closed drainage systems due to limited access; therefore, it is recommended to have these cleaned and televised to obtain better inspection data and to determine the general condition of these systems. Televising of the closed drainage systems has been programmed to occur prior to the design development stage of subsequent roadway rehabilitation to identify areas of concern so that they may be addressed as part of the programmed roadway construction.

Crossing culverts are inspected for functionality, obstructions and conveyance. The crossing culverts throughout the Illinois Tollway system are generally structurally sound. However, some have exposed reinforcement bars, misaligned wingwalls, honeycombing of the concrete surface, open joints or deterioration of the metal pipe (metal pipe culverts), or require cleaning. The crossing culverts not replaced during recent reconstruction or rehabilitation projects may in some cases be over 50 years old.

The deterioration of Corrugated Metal Pipe (CMP) continues to be a concern in sections not recently reconstructed. CMP deterioration typically occurs along the flow line or at the joints of the pipe. This causes backfill material and soil to erode through the pipe during rain events, creating voids beneath the roadway. As the volume of these voids increases, the probability of roadway pavement slab settlement or failure also increases. In many cases, these pipes may have been extended due to roadway widening or other construction. Although the ends of these pipes may appear in excellent condition, further examination reveals deterioration of the original pipe and separation of the joints where the original pipe joins the new.

Due to the collapse of several CMP crossing culverts, the Consulting Engineers completed a detailed systemwide inspection of all culverts that cross beneath Illinois Tollway pavement with a diameter of three feet or greater in 2007. The purpose of this inspection was to identify CMP culverts that require lining, repair or replacement. Culverts classified as bridges by the Federal Highway Administration (FHWA) were not included in the inspection and are included with the bridge inspections.
To date, many CMP have been replaced as part of reconstruction or rehabilitation contracts. Additionally, two repair/lining contracts were completed in 2010 to repair or line CMP with a diameter of three feet or greater that cross beneath pavement. These contracts have addressed some concerns with crossing CMP. However, smaller diameter and non-mainline-crossing CMP still require repair or replacement in future projects.

Due to the large quantity of CMPs located throughout the Illinois Tollway system and the more than 50 years of changing roadways, not all CMPs may have been identified for repair or replacement. It is recommended that replacement or lining of CMPs continue in future contracts, as they are identified.

4.3.2 Safety Appurtenances

A passive visual inspection of the Illinois Tollway roadway safety appurtenances is performed annually. This inspection consisted of logging the visible deficiencies of the concrete barriers, guardrails/terminals, cable median barriers and impact attenuators.

Concrete barriers, guardrails, cable median barrier systems and impact attenuators throughout the Illinois Tollway system are generally in excellent to good condition. Any deficiencies are instantaneously transmitted to the Illinois Tollway Division of Maintenance and Traffic for repair.

The guardrail/terminals within the limits of Capital Program reconstruction or rehabilitation projects have been upgraded to the current Illinois Tollway standards, which adhere to the National Cooperative Highway Research Program (NCHRP) Report 350 or Manual for Assessing Safety Hardware (MASH), as appropriate. Illinois Tollway policy requires that any guardrail/terminal safety concerns or damage resulting from vehicular accidents be addressed within 24 hours, though procurement limitations for materials in some cases prohibit achieving this policy.

Guardrail standards are regularly updated to reflect current crash test data and new technologies. The current Illinois Tollway guardrail standards were developed in conformance with the requirements of NCHRP Report 350. The NCHRP, which conducts research in areas of highway planning, design, construction, operation and maintenance nationwide, published Report 350 in 1993. NCHRP Report 350 presents uniform guidelines for the crash testing of highway safety features, recommends evaluation criteria for the assessment of the crash test results and presents guidelines for the in-service evaluation of safety features. These guidelines are developed utilizing current technology and the collective judgment and expertise of experts in the field of roadside safety design.

MASH is an update to NCHRP Report 350, for the purposes of evaluating new safety hardware devices based primarily on changes in the vehicle fleet. Any new or revised highway safety hardware under development as of the October 15, 2009 publication of MASH may continue to be tested using the criteria in NCHRP Report 350. However, FHWA stopped accepting or reviewing requests for new or revised highway safety hardware tested using NCHRP 350 criteria after January 1, 2011. In the summer of 2015, the American Association of State Highway and Transportation Officials (AASHTO) established sunset dates for NCHRP Report devices. The Illinois Tollway is scheduled to meet or exceed the dates outlined by AASHTO.
The FHWA does not require that the safety appurtenances be upgraded when not meeting the current standard. However, the Illinois Tollway Risk Management Division works in conjunction with other departments to maintain loss control and to protect the interests of the Illinois Tollway. It is recommended that all guardrail installations which have not been successfully tested under NCHRP Report 350 requirements be replaced to the current Illinois Tollway standard as currently programmed.

The current Capital Programs include funds for drainage and safety improvements systemwide which should include the replacement of non-NCHRP Report 350 compliant guardrail installations. Additionally, areas of programmed reconstruction/rehabilitation are anticipated to include the replacement of non-NCHRP Report 350 compliant guardrail installations within the limits of construction.

Cable median barrier systems are installed west of Deerpath Road on the Reagan Memorial Tollway (I-88), along the Edens Spur (I-94), at the Southern Terminus of the Veterans Memorial Tollway (I-355) and along the Reagan Memorial Tollway (I-88) connector ramps with the Tri-State Tollway (I-294). Median cable barrier systems consist of tensioned cables extending between bridges and emergency turnarounds in grassy median locations to minimize the occurrence of vehicles crossing into oncoming traffic. There are few federal standards for median cable barrier systems; however, all installations are inspected to confirm that they meet the current industry practices.

4.3.3 Delineators and Reflectors

The delineators and reflectors throughout the Illinois Tollway system are generally in good to fair condition. Damage to these is typically caused by traffic accidents or snowplows. As these inspections typically occur at the end of the winter season, it is common to note large quantities of missing or damaged reflectors. The Illinois Tollway Division of Maintenance and Traffic performs regularly scheduled maintenance on these items systemwide at least twice annually.

4.3.4 Pavement Markings

The pavement markings throughout the Illinois Tollway system are generally in excellent to fair condition. Typical deficiencies noted were missing or damaged sections of pavement markings. The specific deficiencies identified during the inspections are documented in the Annual Field Inspection Reports prepared for each Maintenance Section.

The Illinois Tollway Pavement Management Consultant maintains a Pavement Marking Database (available upon request) which contains historical installation data and retroreflectivity values. These values are updated as new information becomes available. The retroreflectivity values, in conjunction with visual inspection and age of the markings, is utilized by the Illinois Tollway to determine areas for inclusion in the annual systemwide pavement marking contract and the scheduling of future contracts.

The ongoing annual pavement marking renewal program continues to improve the pavement marking visibility throughout the Illinois Tollway system. As part of this annual program, pavement markings are upgraded and maintained through the use of epoxy paint.

Since pavement marking replacement is typically beyond the capabilities of the Maintenance
Division, it is recommended that areas of deficient pavement markings as identified in the visual inspection and areas which exhibit low retroreflectivity be included within the annual systemwide pavement marking contract.

4.3.5 Raised Pavement Markers

The raised pavement markers (RPMs) throughout the Illinois Tollway system are generally in excellent to fair condition. Areas of missing reflectors or castings were noted during the inspections. As these inspections typically occur at the end of the winter season, it is common to note large quantities of missing or damaged reflectors. The Illinois Tollway performs regularly scheduled maintenance on these items systemwide on a three-year cycle within each individual maintenance section. During this regularly scheduled work, they replace damaged or missing reflectors and remove any castings that are damaged or appear as if they may become loose.

It should be noted that reconstruction projects occurring from 2007 to 2009 did not include the installation of RPMs while a study was conducted to review their use. In 2012, it was decided to include RPMs as part of all contracts systemwide. In 2013, the contract work commenced for the installation of RPMs in sections of pavement in which they were not originally included. In addition, repair/replacement of RPMs is typically included with the annual systemwide pavement marking contracts.

4.3.6 Roadway Lighting System

The roadway lighting systems throughout the Illinois Tollway system are generally in excellent to fair condition. The majority of the light poles appeared to be plumb with no noticeable movement or tilt. The typical deficiencies noted during the inspections were concrete or helix foundations which have been installed too high (over four inches from finished grade) or installations with improper breakaway devices. These locations are generally replaced to ensure the effectiveness of the breakaway devices. Additionally, instances of missing light pole handholes with exposed pole wiring are reported.

4.3.7 Right-of-Way Fence

The right-of-way fence throughout the Illinois Tollway system is generally in excellent to good condition. Recent reconstruction projects have included the replacement of four-foot high field right-of-way fence with the current Illinois Tollway standard six-foot high chain-link fence. This type of fence is more compatible with the continued development of properties adjacent to the roadway and serves as a better barrier to pedestrians and animals from entering the Illinois Tollway property.

4.3.8 Ground Mounted Traffic Signs

The ground-mounted traffic signs throughout the Illinois Tollway system are generally in good to fair condition. Damage to these signs is typically caused by traffic accidents or snowplows. The Illinois Tollway Sign Shop repairs or replaces these signs as damage occurs. Additionally, instances were noted at which wooden ground-mounted traffic sign posts are either installed with incorrectly placed or missing breakaway holes.

Please note: The ground-mounted traffic sign inspection does not include overhead sign
structures which are discussed elsewhere within this report. In addition, traffic signs are only rated based upon visual inspection of the physical condition. Retroreflectivity measurements are not taken as part of these inspections and are not accounted for in the ratings assigned.

4.4 Structural Elements

The structural elements inspected throughout the Illinois Tollway system consist of bridges, large culverts, retaining walls, noise abatement walls, sight screen walls and overhead sign structures.

4.4.1 Bridges and Large Culverts

In accordance with FHWA guidelines, bridges throughout the Illinois Tollway system must receive a routine inspection at least every two years. A routine inspection consists of, at a minimum, a complete visual inspection of all major components of the bridge. Routine inspections determine the physical and functional condition of the bridge and identify any changes from “Initial” or previously recorded conditions. Underwater inspections are performed every five years. During routine inspections, inspection of submerged portions of the substructure is limited to observations during low-flow periods. The Illinois Tollway conducted routine bridge inspections each year, and the resultant “Structure Inspection Field Reports” were reviewed by the Consulting Engineer.

As part of the inspections, condition ratings are assigned to the deck, superstructure and substructure components for each bridge inspected. The bridge deck consists of the wearing surface, joints and parapets. The superstructure consists of beams, diaphragms and stiffeners. The substructure consists of piers, abutments, bearings, foundations, slope and crash walls and piling.

It should be noted that many of the bridge decks which pass over the Illinois Tollway are not under the Illinois Tollway’s jurisdiction. However, these bridge decks are included with the inspection as an informational courtesy to the responsible agency.

The FHWA classifies culverts as bridges if the span of the culvert is at least 20 feet when measured along the centerline of the roadway. Therefore, all Illinois Tollway culverts that meet this criterion are also inspected at a minimum of every two years as part of the bridge inspections and are assigned a condition rating similar to that of the bridges. A Health Index, as described below, is then determined from this condition rating. The Health Index for culverts is directly related to the condition ratings used for the annual bridge inspections. This rating is an all-encompassing review of the culvert elements and only recorded as a single rating value.

In 2009, the Health Index calculation for culverts was changed to follow the same description as bridges.

As of the date of this report, there are 684 structures classified as bridges throughout the Illinois Tollway system. Of these, there are 609 vehicular bridges, six railroad bridges, 61 culvert bridges, one land bridge, two pedestrian bridges and five over-the-road oasis structures. Of these structures, 338 were inspected by the Illinois Tollway in 2017.

The bridge inventory is revised on an as-needed basis to account for new construction, demolition and/or ownership transfers to other agencies.

There are bridges located within the jurisdiction limits of the Illinois Tollway that are entirely
under the jurisdiction of another agency. As of the date of this report, these bridges have been omitted from the Illinois Tollway bridge inventory. Since these bridges cross over Illinois Tollway roadways, they are informally inspected along with the structures for which the Illinois Tollway is responsible. Formal inspections are conducted and submitted to the FHWA by the responsible agency. The following fourteen bridges are entirely under the jurisdiction of and maintained by another agency:

**Illinois Department of Transportation**

- Bridge 197C: Tri-State (I-294/I-80) over Calumet Union Drainage Ditch
- Bridge 198: EB I-80 Ramp A over Tri-State Tollway (I-294/I-80)
- Bridge 521: I-290/IL Route 53 over Jane Addams Memorial Tollway (I-90)
- Bridge 1146: NB I-39 over Reagan Memorial Tollway (I-88)
- Bridge 1146A: SB I-39 over Reagan Memorial Tollway (I-88)
- Bridge 1621: I-290 SE Ramp G1 over IL 390
- Bridge 1625: I-290 NW Ramp G5 over IL 390
- Bridge 1628: SE I-290 Ramp G1 over WS IL 390 Ramp G7

**Chicago Transit Authority (CTA)**

- Bridge 366A: EB CTA O’Hare Rapid Transit over Tri-State Tollway (I-294)
- Bridge 366B: WB CTA O’Hare Rapid Transit over Tri-State Tollway (I-294)
- Bridge 366C: CTA O’Hare Rapid Transit over NW I-90 Ramps M & P

**DuPage County Division of Transportation**

- Bridge 1408: Great Western Trail pedestrian bridge over Veterans Memorial Tollway (I-355)

**Illinois Department of Conservation**

- Bridge 702: Rock Cut State Park road over Jane Addams Memorial Tollway (I-90)

**Village of Oakbrook**

- Bridge 280: Salt Creek Greenway Trail over Reagan Memorial Tollway (I-88)

The FHWA guidelines do not include bridge deck ratings in the determination of the overall Sufficiency Rating. Therefore, the deck is not typically the driving force behind replacement. However, the deck is important in the programming of repair work based on general aesthetics and rideability. The deck is also the most visible bridge component to the traveling motorist/patron. Since the Illinois Tollway is patron-oriented and bridge deck repairs, other than minor deterioration, are typically beyond the capabilities of the Illinois Tollway Maintenance Division, the deck should be accounted for in the overall bridge condition rating.

Considering this, the Consulting Engineers created a Health Index to more appropriately quantify the condition of the bridges throughout the Illinois Tollway system. The Health Index is a weighted representation of the deck, superstructure and substructure ratings based on field inspections and is intended to give an overall indication of the condition of a bridge. A
higher weight is placed on the deck rating because the deck tends to deteriorate faster than the other components of the bridge.

The Health Index is a number on a scale from 0 to 100 with 100 being the best. It does not consider the individual ratings of components such as joints, diaphragms or bearings, though these ratings are generally used to develop future repair contracts. The Health Index replaces the “Overall Condition” rating that had been used prior to 2005 to classify the bridges. The following table provides descriptions of the bridge Health Index numbers.

<table>
<thead>
<tr>
<th>H.I.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥90</td>
<td>No problems or some minor problems noted. No action required.</td>
</tr>
<tr>
<td>89 – 80</td>
<td>Some areas of minor deterioration. Minor repair by Maintenance or Contract would prevent additional deterioration.</td>
</tr>
<tr>
<td>79 – 70</td>
<td>Structural elements are sound but exhibit minor section loss or deterioration. Repair Contract likely needed within 5 years.</td>
</tr>
<tr>
<td>69 – 60</td>
<td>Advanced section loss. Repair Contract should be initiated within 2 years.</td>
</tr>
<tr>
<td>&lt; 60</td>
<td>Advanced loss of section and deterioration. Local failures possible. Immediate attention needed.</td>
</tr>
</tbody>
</table>
The following table illustrates the bridge inspection Health Index summary. Since the bridges are on a two-year inspection cycle, the table illustrates the health index rating for all bridges inspected in 2016 and 2017. The discrepancy between the total number of bridges and bridges inspected is due to the addition of new bridges to the system within the last two years. The new bridges added in 2017 & 2018, will be inspected in 2019 & 2020 respectively.

### Table 9: Bridge Inspection Summary

<table>
<thead>
<tr>
<th>Health Index</th>
<th>2016</th>
<th>2017</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥90</td>
<td>262 (78.9%)</td>
<td>306 (90.5%)</td>
<td>568 (84.8%)</td>
</tr>
<tr>
<td>80-89</td>
<td>50 (15.1%)</td>
<td>24 (7.1%)</td>
<td>74 (11.0%)</td>
</tr>
<tr>
<td>70-79</td>
<td>19 (5.7%)</td>
<td>8 (2.4%)</td>
<td>27 (4.0%)</td>
</tr>
<tr>
<td>60-69</td>
<td>1 (0.3%)</td>
<td>-</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>&lt;60</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>332</strong></td>
<td><strong>338</strong></td>
<td><strong>670</strong></td>
</tr>
</tbody>
</table>

One bridge has a Health Index indicating repairs are necessary within two years. Bridge 125 carries 159th Street over the Tri-State Tollway (I-294). The deck is maintained by IDOT and is in poor condition. This bridge is scheduled for reconstruction in 2018 within construction contract RR-17-4349.

Of the 27 bridges with a Health Index of 70-79, the majority are programmed for repair within the next five years. However, a number of these bridges are located within the Central Tri-State (I-294) corridor, which is programmed for reconstruction in 2020 to 2023. Depending on the nature of the deficiencies noted, some of the bridge structures may be included with these contracts. These structures will continue to be monitored, and if required, will be included for repair in advance of this programmed reconstruction.

In 2015, the Consulting Engineers performed an in-depth inspection of 52 bridges throughout the Illinois Tollway system. In-depth inspections are performed at those bridges most in need of repair as identified in the previous year’s biennial inspection by the Illinois Tollway and which are not already programmed into a repair contract or were identified for monitoring. The in-depth inspection is conducted in addition to the biennial inspection. If an Illinois Tollway bridge spans over the railroad, the adjacent twin bridge was also inspected while permission for railroad site access was available. The Illinois Tollway has requested that the Consulting Engineers also separately inspect Fracture Critical bridges carrying highway traffic. In-depth inspections are generally not performed for bridges included in current design or construction contracts. The intent of the in-depth inspection is to gather defect repair quantities in order to develop anticipated costs and contract scopes for future bridge repair projects. The Consulting Engineers have provided the Illinois Tollway with repair recommendations resulting from the in-depth inspections in 2017 and a grouping of the bridges into recommended contracts for design and construction.
Bridge deck age is also an indicator of the amount of bridge work that may be required in the future. The typical expected service life of a bridge deck is between 40 to 50 years. It is recommended that bridge decks aged over 40 years be replaced during the next repair cycle to reduce the need and frequency of interim repairs. The following table provides the number and percentage of bridge decks throughout the Illinois Tollway system within various age categories. To date, the bridge decks aged over 40 years are programmed for reconstruction as part of the multi-year systemwide budget or the Capital Program.

Table 10: Bridge Deck Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of Decks</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 40 Years</td>
<td>109</td>
<td>17.7%</td>
</tr>
<tr>
<td>25 to 40 Years</td>
<td>64</td>
<td>10.4%</td>
</tr>
<tr>
<td>1 to 25 Years</td>
<td>367</td>
<td>59.5%</td>
</tr>
<tr>
<td>Under 1 Year</td>
<td>77</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>617</strong>*</td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

* This bridge deck age summary does not include bridge culverts
4.4.2 Structural Walls

Structural walls include retaining walls, noise abatement walls and sight screen walls. Visual inspections of the structural walls located throughout the Illinois Tollway system are performed annually. Due to the number of structures to be inspected, the effort is scheduled as a multi-year task. The structural walls throughout the Illinois Tollway system are generally inspected on a four-year cycle. However, newly constructed structures or those last rated in excellent condition may be inspected on a slightly extended cycle due to the expectation of their remaining in excellent condition for several years. Approximately one quarter of Illinois Tollway structural walls are inspected each year.

An overall condition rating is assigned for each structural wall inspected. In order to improve objectivity and uniformity between maintenance sections and inspectors, a condition rating system was developed for the structural wall inspections. The condition ratings utilized for the structural wall inspections are included in the following table:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>There are no problems noted.</td>
</tr>
<tr>
<td>Good</td>
<td>Good condition exists with only minor problems noted.</td>
</tr>
<tr>
<td>Fair</td>
<td>Fair condition exists with minor section loss, cracking or spalling observed.</td>
</tr>
<tr>
<td>Poor</td>
<td>Poor condition exists with signs of advanced deterioration, section loss, wide cracks, water seepage and out of plumb but stable condition. Wall requires close monitoring.</td>
</tr>
<tr>
<td>Critical</td>
<td>Critical condition exists with major defects, significant deterioration and section loss, obvious vertical or horizontal movement affecting wall stability exists. Wall requires replacement or immediate attention.</td>
</tr>
</tbody>
</table>

Deficiencies noted at structural walls assigned a condition rating of excellent to fair are typically minor and do not require immediate attention. These deficiencies are typically addressed by the Maintenance Division or are included in a future contract. Therefore, recommendations are only provided for structural walls assigned a condition rating of poor to critical since those deficiencies typically require either monitoring or immediate attention.

The following table lists the number of structural walls inspected during the previous four-year cycle. In addition, the table accounts for any special inspections conducted in interim years to ensure the severity of noted defects has not increased.

<table>
<thead>
<tr>
<th>Inspection Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Walls Inspected</td>
<td>198</td>
<td>125</td>
<td>135</td>
<td>211</td>
</tr>
</tbody>
</table>
As part of the current Capital Programs, there are a number of projects ongoing or recently completed systemwide which include the reconstruction of existing or the construction of new structural walls. Many of these structures are not accounted for in the Structural Wall Inspection Summary over the previous four years because they have not been phased into the inspection schedule. It is expected that these structural walls are and will remain in excellent condition for several years. These structural walls will be accounted for and phased into the inspection schedule over the next four-year inspection cycle.

4.4.3 Overhead Sign Structures

Visual inspections of the overhead sign structures located throughout the Illinois Tollway system are performed annually. Due to the number of structures to be inspected, the effort is scheduled as a multi-year task. Overhead sign structures are generally inspected on a four-year cycle. However, newly constructed structures or those last rated in excellent condition may be inspected on a slightly extended cycle due to the expectation of their remaining in excellent condition for several years. Approximately one quarter of Illinois Tollway overhead sign structures are inspected each year.

An overall rating is assigned for each overhead sign structure inspected. In order to improve objectivity and uniformity between maintenance sections and inspectors, a condition rating system was developed for the overhead sign structure inspections. The condition ratings utilized for the overhead sign structure visual inspections are included in the following table.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>There are no problems noted.</td>
</tr>
<tr>
<td>Good</td>
<td>Good condition exists with only minor problems noted, such as: minor rust or foundation cracking, loose bolts, missing safety chains, damaged lighting, sign legend/background problems, etc.</td>
</tr>
<tr>
<td>Fair</td>
<td>Fair condition exists with the following: moderate corrosion or foundation cracking/spalling, several loose bolts or loose pillow blocks/saddles, etc.</td>
</tr>
<tr>
<td>Poor</td>
<td>Poor condition exists with signs of moderate structural cracking, section loss, heavy foundation cracking/spalling or collision damage. Sign structure requires monitoring.</td>
</tr>
<tr>
<td>Critical</td>
<td>Critical condition exists with major structural defects or loose components that could fall on roadway. Overhead sign requires immediate attention.</td>
</tr>
</tbody>
</table>

Deficiencies noted at overhead sign structures assigned a condition rating of excellent to fair are typically minor and do not require immediate attention. These deficiencies are typically addressed by the Maintenance Division or are included in a future contract. Therefore, recommendations are only provided for overhead sign structures assigned a condition rating.
of poor to critical since those deficiencies typically require either monitoring or immediate attention.

The following table lists the number of overhead sign structures inspected from 2014 to 2017. In addition, the table accounts for special inspections conducted in interim years to confirm that the severity of noted defects has not increased.

Table 14: Overhead Sign Structure Inspection Summary

<table>
<thead>
<tr>
<th>Inspection Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sign Structures Inspected</td>
<td>163</td>
<td>173</td>
<td>185</td>
<td>188</td>
</tr>
</tbody>
</table>

As part of the current Capital Programs, there are a number of projects ongoing or recently completed systemwide which include the reconstruction of existing or the construction of new overhead sign structures. Many of these structures are not accounted for in the Overhead Sign Structure Inspection Summary over the previous four years provided herein because they have not been phased into the inspection schedule. Most notably, a more than 20% increase of inventory has occurred as part of the Jane Adams Memorial Tollway (I-90) corridor reconstruction and the ongoing reconstruction and expansion of the Illinois Route 390 Tollway corridor. It is expected that these overhead sign structures are and will remain in excellent condition for several years. These structural walls will be accounted for and phased into the inspection schedule over the next four-year inspection cycle.

4.5 Facilities

Visual inspections of the facilities located throughout the Illinois Tollway system are performed annually by the Illinois Tollway’s Consulting Engineer. The inspection consists of the recording of visible deficiencies of all facility elements, including but not limited to buildings, tunnels, canopies and sites with associated appurtenances. Facilities that are inspected include maintenance facilities, toll plazas, telecommunications buildings, oases and miscellaneous facilities.

Due to the number of Illinois Tollway facilities of various complexities to be inspected, the effort is scheduled as a multi-year task. The facilities throughout the Illinois Tollway system are generally inspected on a four-year cycle. However, newly constructed facilities or facilities last rated in excellent condition may be inspected on a slightly extended cycle due to the expectation of these facilities remaining in excellent condition for several years. Approximately one quarter of Illinois Tollway facilities are inspected each year.

The objective of these inspections is to assess the general condition of Illinois Tollway facilities and associated site elements, identify elements requiring remedial work, make repair or replacement recommendations and evaluate the remaining useful life. The data provided by these inspections is utilized by the Illinois Tollway to program repairs and replacements of various facility components and to aid the Illinois Tollway Building Maintenance Division in planning and estimating maintenance repairs. The evaluations and recommendations are based upon visual observations, discussions with Illinois Tollway Building Maintenance Division personnel and the reviews of available reports. Emphasis is given to the identification of specific issues identified by on-site personnel experienced with the actual operating
conditions of the facility. No destructive or non-destructive testing is performed, and no physical samples are collected as part of these inspections.

An overall condition rating is assigned for each facility inspected. A separate condition rating is also typically assigned to each associated facility element. A rating system was developed to improve objectivity and uniformity between facilities inspected and inspectors. Based upon the assigned condition rating, the future inspection schedule for each facility may either remain on a four-year cycle or be recommended for more near-term inspections. The overall condition ratings utilized for the visual inspections are provided in the following table.

**Table 15: Facilities Inspection Ratings Summary**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
</table>
| Excellent | All four conditions must be exhibited:  
- New Facility or component  
- No repair required  
- Condition like new  
- Component performing as intended |
| Good | All three conditions must be exhibited:  
- Facility is performing essentially as intended  
- Minor repair required (i.e., paint, clean, patching, etc.)  
- Less than 25% of the replacement cost of the facility or component is required to return the component to intended condition. |
| Poor | Any condition exhibited may be cause for rating:  
- Facility is approaching end of useful life  
- Major components need extensive repair / replacement work  
- 25% - 50% of the replacement cost of the system or component is required to return the component to intended condition. |
| Critical | Any condition exhibited may be cause for rating:  
- System or component is non-functioning  
- Safety or environmental concerns are prevalent (If component exhibits safety or environmental concerns, entire system will be graded as critical)  
- More than 50% of the replacement cost of the facility or component is required to return the component to intended condition. |

Many of the facilities located throughout the Illinois Tollway system are over fifty years old and are candidates for rehabilitation or replacement of their component systems. Renovation work performed at these facilities has enabled them to continue to function. Architectural and site improvements have been made to maintenance facilities on an “as needed” basis through capital improvement projects. In addition, the I-PASS implementation program has enabled many upgrades, renovations and replacement of toll plazas. To date, all mainline toll plazas have been reconstructed or rehabilitated to accommodate open road tolling. Although the inspected facilities are functional, the condition of the major systems (mechanical, electrical, HVAC, plumbing, roofing, etc.) continues to deteriorate, resulting in inefficiencies and higher operational costs.

Illinois Tollway Building Maintenance Division forces provide necessary day-to-day repairs of facilities to the extent possible. More intensive repair and rehabilitation work is performed as
4.5.1 Maintenance Facilities and Miscellaneous Facilities

The maintenance facilities typically consist of garages, offices, salt domes, gas pumping facilities, storage buildings, telecommunication towers and other components.

The Consulting Engineers completed an assessment for each maintenance facility throughout the system in 2006 and 2007. These assessments reviewed the functionality, efficiency and condition of the sites, buildings and all associated components located within and made recommendations for improvement or replacement. Details of these assessments are available in the respective Assessment and Recommendation Report for each maintenance facility.

Utilizing the Assessment and Recommendation Report, a major Facilities’ Capital Program to repair or replace a number of maintenance facility buildings began in late 2008. The initial emphasis of this program was the repair of existing systems and the improvement of the working environment for Illinois Tollway employees. These improvements have been and continue to be consistent with the Illinois Tollway’s desire for sustainable facilities. A scope and schedule for this 10-year program has been approved. However, due to funding restrictions, the budget is approved annually, thus requiring annual review of the program and prioritization of the repairs.

Due to the adoption of the Move Illinois Program, a number of maintenance facilities are programmed for relocation, reconstruction or rehabilitation. Due to this, the emphasis at these facilities has shifted to keep them functional until the programmed reconstruction or rehabilitation. As a result, Professional Service Bulletin No. 12-5 was issued in October 2012 which included contract RR-12-4079 (Maintenance Facilities) that began in 2013. The purpose of this contract is to provide Phase I and II engineering services for the development of a master plan and design/architectural plans for the maintenance facilities. The scope of work includes the following:

- Development of a short-term maintenance repair plan to keep the existing facilities functional until reconstruction or rehabilitation.
- Development of master plans for reconstructed or relocated maintenance facilities.
- Development of the plats of survey for the Maintenance Facility M-4 (Gurnee), M-8 (Naperville) and Elgin O’Hare Western Access maintenance facilities.
- Development of contract documents for the construction of the maintenance buildings including the finalization of two prototype designs for the reconstructed and relocated maintenance facilities.
- Development of a strategy to maintain facilities and maintenance operations during construction.
- Site investigations and potential remediation.

The improvements completed to date and those anticipated as part of contract RR-12-4079 have been and will continue to be consistent with the Illinois Tollway’s desire for sustainable facilities. It is anticipated that the improvements that were not completed as part of the original
Facilities’ Capital Program will be addressed as part of contract RR-12-4079 as budget permits.

The prototype master plan developed for the reconstruction of maintenance facilities has been implemented at Maintenance Facility M-1 (Alsip). Work was completed in 2015. Construction commenced at Maintenance Facilities M-6 (Marengo) and M-7 (Rockford) and is scheduled to be completed in 2018.

In 2001, it was first recommended to program the replacement of deteriorated salt dome roofs throughout the system into a systemwide contract and to replace the vehicle storage building at Maintenance Facility M-1 by 2006. That work has been completed, and to date, salt dome repair/replacement has been completed at Maintenance Facilities M-1, M-2, M-3, M-4, M-7, M-8, M-11 and M-12 and at the Illinois Route 251 salt dome.

The majority of maintenance and miscellaneous facilities throughout the Illinois Tollway System have generally been assigned a condition rating of good over the previous four-year inspection cycle. These facilities typically only require minor repairs and continued routine maintenance. There were four facilities assigned a condition rating of poor during this period.

- Maintenance Facility M-3 (Park Ridge)
- Maintenance Facility M-4 (Gurnee)
- Maintenance Facility M-5 (Arlington Heights)
- Maintenance Facility M-6 (Marengo) – Currently under Construction

4.5.2 Toll Plazas

The majority of Toll Plazas throughout the Illinois Tollway System have generally been assigned a condition rating of good over the previous four-year inspection cycle. These facilities typically only require minor repairs and continued routine maintenance. There were three Toll Plazas systemwide last rated in poor condition.

- Plaza 31 (O’Hare West)
- Plaza 38 (95th Street)
- Plaza 47 (Halsted Street/Illinois Route 1)

4.5.3 Communication Facilities

All communication facilities throughout the Illinois Tollway System have been assigned a condition rating of good over the previous four-year inspection cycle. These facilities typically only require minor repairs and continued routine maintenance.

4.5.4 Oases

All oases throughout the Illinois Tollway System have been assigned a condition rating of good over the previous four-year inspection cycle. These facilities typically only require minor repairs and continued routine maintenance. Rehabilitation or reconstruction of the parking areas at the oasis facilities commenced in 2014 and was completed in 2015. The Des Plaines oasis along I-90 was removed as part of the I-90 widening and to make way for the planned interchange with I-490. The O’Hare Oasis along I-294 is being taken out of service and
demolished in 2018.

4.6 ITS Devices

Historically, the inspection of ITS devices on the Illinois Tollway system consisted of a visual inspection as part of the annual general visual inspection of the right-of-way. In 2016, due to the increased deployment of ITS devices throughout the system, the Consulting Engineers performed a field inventory of the ITS devices systemwide. The purpose of this inventory was to verify the deployed devices and to confirm that they are functional. This information will allow the Illinois Tollway to accurately account for the number of ITS devices under its jurisdiction and to enable the Consulting Engineers to develop a more detailed ITS device inspection and preventive maintenance program.

There are several types of ITS devices deployed throughout the system. These include CCTV, DMS, VDS, RWIS, WIM and Bluetooth Vehicle Detection sites. Each inventoried device was also given a basic inspection to gain an understanding of the process and required data fields.

As of 2018, the Illinois Tollway has the following ITS devices deployed in its system:

<table>
<thead>
<tr>
<th>Table 16: ITS Device Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td><strong>Quantity</strong></td>
</tr>
</tbody>
</table>

* CCTV devices consist of ITS, toll plazas and shared use cameras.

** DMS devices consist of Type 1, Type 2 and lane control use signs.

*** BT (Bluetooth) devices are deployed in areas, usually construction zones, where VDS devices are not able to function efficiently.

The inspection consists of a ground-level visual inspection of the device and control components, verification that the device is communicating with TIMS and inventory and operational verification of the device and control components. These inspections occur on an annual basis.
4.7 Electronic Tolling System

The electronic tolling system encompasses technologies related to automatic vehicle detection, automatic vehicle classification and violation enforcement systems that support traffic and revenue monitoring and collections. These technologies are deployed at all Illinois Tollway toll plazas at 580 lanes throughout the Illinois Tollway system. Back-office hardware and software along telecommunications and networking facilities support toll collection, I-PASS customer service and violations processing. These back-office operations are located at multiple and redundant facilities, including the Central Administration data center, the Call Center located at the University of Illinois Chicago campus and a Disaster Recovery site located in DeKalb. These systems are generally in good condition.

The primary objective of the Illinois Tollway Department of Business Systems (DBS) is revenue assurance. As such, policies and contractual relationships have been enacted that focus on enhancing and optimizing revenue capture and completeness. While the technology assets are an integral component to this objective, the focus is on the bottom-line results and the ability of the systems to capture revenue accurately rather than focus on the condition of the equipment itself.

Historically, internal and external personnel are responsible for preventive, routine and corrective maintenance of the various technologies. The lifecycle of electronic tolling system equipment varies by sub-system components, while the average age and predicted replacement of critical components and parts are tracked and managed by DBS. Replacement and upgrade of components has followed a planned and budgeted process. Moving forward, DBS has engaged an asset management consultant which shall perform routine inspections to verify the health and reliability of these technologies. Specific deficiencies identified during these inspections will be documented in the DBS Asset Management System and preventative maintenance activities shall be deployed to mitigate identified concerns.

Inspections by the Consulting Engineers of electronic tolling system devices has been limited to a visual inspection as part of the annual inspection of the right-of-way and facilities, discussed elsewhere within this report. Due to the increased deployment of electronic tolling system devices throughout the system, the Consulting Engineers shall review the inspection results from the DBS asset management consultant to ensure the Illinois Tollway’s assets remain in a state of good repair, as it pertains to this report.
5 Estimated Renewal and Replacement Deposits

Section 204(1)(4) of the Trust Indenture details that the Consulting Engineers shall provide estimates of Renewal and Replacement Deposits. The Renewal and Replacement Deposit is the “amount budgeted for deposit to or projected for deposit to the Renewal and Replacement Account for Renewal and Replacement Expenses, other than such budgeted or projected amounts which the Illinois Tollway has determined will be available for Renewal and Replacement Expenses from the System Reserve Fund, the Improvement Fund, or from the proceeds of authorized borrowings or from installment purchases or leases.”

The table below provides estimates of Renewal and Replacement Deposits for each of the fiscal years 2018 through 2031. The Renewal and Replacement Deposits are based upon the following information provided to the Consulting Engineers prior to the issuance of this report:

- Estimated capital expenditures of $6.3 million for the execution of the remainder of the CRP in 2018 as described in Section 1
- Estimated capital expenditures of $14.2 billion for the execution of Move Illinois Program as described in Sections 2 and 3 with approximately $4.5 billion spent through 2017
- The finance plan provided to the Consulting Engineers by the Illinois Tollway, which currently anticipates that the Move Illinois Program will be paid for with approximately $5.8 billion of bond proceeds and approximately $8.4 billion of Illinois Tollway revenue
- The below deposits consist of revenue funds to be used for Renewal and Replacement expenditures

The Consulting Engineers utilize and rely upon information provided by the Illinois Tollway and PMO for the development of the Renewal and Replacement Deposit estimates. The estimates are developed based upon the independent review of information provided prior to the issuance of this report. The Consulting Engineers provide an annual letter to the Illinois Tollway indicating the recommended deposit amount for the following year, pursuant to the requirements of Section 710.1 of the Trust Indenture. The Consulting Engineers provide concurrence to the amount of the recommended deposit based upon projected balances, budgeted expenditures, projected future expenditures and other pertinent considerations or information at the time of the letter issuance.
Estimated Renewal and Replacement Deposits will fund the Move Illinois Program. The Trust Indenture requires projections for five years beyond the projected “in-service” date of the project.

Table 17: Estimated Annual Renewal and Replacement Deposits

<table>
<thead>
<tr>
<th>Year</th>
<th>Renewal and Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$420,000,000</td>
</tr>
<tr>
<td>2019</td>
<td>$420,000,000</td>
</tr>
<tr>
<td>2020</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2021</td>
<td>$270,000,000</td>
</tr>
<tr>
<td>2022</td>
<td>$240,000,000</td>
</tr>
<tr>
<td>2023</td>
<td>$240,000,000</td>
</tr>
<tr>
<td>2024</td>
<td>$330,000,000</td>
</tr>
<tr>
<td>2025</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2026</td>
<td>$420,000,000</td>
</tr>
<tr>
<td>2027</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2028</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2029</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2030</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>2031</td>
<td>$300,000,000</td>
</tr>
</tbody>
</table>
6 Operating Expenses

Operating Expenses are the expenses that the Illinois Tollway incurs due to the normal course of business for operation, maintenance and repairs of the Illinois Tollway system. Operating expenses do not include debt services; the Illinois Tollway’s debt service obligations are not discussed in this report. The summary, review and future projections of the Illinois Tollway Operating expenses provided in this section rely upon budget and actual expenditure data provided by the Illinois Tollway.

6.1 Historic Expenses

The Illinois Tollway’s organizational structure consisted of 14 primary functions, including: Administration, Business Systems, Communications, Diversity & Strategic Development, Engineering, Planning, Executive/Board of Directors, Finance and Procurement, Information Technology, Inspector General (Investigations), Internal Audit, Legal, Illinois State Police and Toll Operations. The following table identifies, by primary function, the budgeted and actual Operating Expenses for the Illinois Tollway in 2017 and the budgeted Operating Expenses for 2018. The 2018 overall budget represents a 4.9% increase compared to the 2017 budgeted expenses. However, compared to the 2017 actual expenses, the 2018 budget represents an overall 10.3% increase due to 2017 actual expenditures coming in at 4.8% lower than budgeted.
Table 18: Operating Expenses by Illinois Tollway Primary Function

<table>
<thead>
<tr>
<th>Department</th>
<th>2017 Budgeted Expenditures</th>
<th>2017 Actual Expenditures</th>
<th>2018 Budgeted Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>$4,701,385</td>
<td>$3,998,043</td>
<td>$4,080,588</td>
</tr>
<tr>
<td>Business Systems</td>
<td>$75,690,490</td>
<td>$81,537,787</td>
<td>$85,854,395</td>
</tr>
<tr>
<td>Communications</td>
<td>$1,669,681</td>
<td>$1,574,365</td>
<td>$1,669,684</td>
</tr>
<tr>
<td>Diversity and Strategic Development</td>
<td>$4,144,964</td>
<td>$2,592,451</td>
<td>$5,845,709</td>
</tr>
<tr>
<td>Engineering</td>
<td>$74,371,275</td>
<td>$72,678,503</td>
<td>$76,018,307</td>
</tr>
<tr>
<td>Planning</td>
<td>$2,264,285</td>
<td>$2,184,158</td>
<td>$2,375,141</td>
</tr>
<tr>
<td>Executive Office and Directors</td>
<td>$1,835,499</td>
<td>$1,667,016</td>
<td>$2,283,274</td>
</tr>
<tr>
<td>Office of Finance¹</td>
<td></td>
<td>$46,867,476</td>
<td>$61,579,009</td>
</tr>
<tr>
<td>Finance</td>
<td>$55,398,532</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement</td>
<td>$4,879,542</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td>$15,786,425</td>
<td>$14,530,295</td>
<td>$18,682,034</td>
</tr>
<tr>
<td>Inspector General</td>
<td>$953,909</td>
<td>$719,503</td>
<td>$953,909</td>
</tr>
<tr>
<td>Internal Audit</td>
<td>$827,525</td>
<td>$679,256</td>
<td>$924,163</td>
</tr>
<tr>
<td>Legal</td>
<td>$1,854,333</td>
<td>$1,428,549</td>
<td>$1,854,268</td>
</tr>
<tr>
<td>State Police</td>
<td>$33,714,925</td>
<td>$30,692,046</td>
<td>$33,693,909</td>
</tr>
<tr>
<td>Toll Operations</td>
<td>$58,168,280</td>
<td>$58,249,043</td>
<td>$56,935,688</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$336,261,050</strong></td>
<td><strong>$319,398,491</strong></td>
<td><strong>$352,750,078</strong></td>
</tr>
</tbody>
</table>

The existing Illinois Tollway system to be maintained and operated includes 294 miles of limited access highways featuring a toll collection system consisting of mainline plazas and ramp plazas with I-PASS, automatic coin collection, manual lanes and automated toll payment machines (ATPM). Since the implementation of the CRP, the system has been expanded to include the 12.5-mile extension of the Veterans Memorial Tollway, the widening of existing routes and the construction of additional interchanges. Additional improvements under the Move Illinois Program will add new capacity on existing routes, create new routes within the Illinois Tollway system and will introduce additional locations of all electronic tolling, where no cash or coins are collected.

¹ Finance and Procurement were combined to Office of Finance in 2018
6.2 Illinois Tollway Operating Expenses by Department

Each department has a defined operating budget that is prepared by both the specific department and the Illinois Tollway’s Finance Department. Quarterly expenditures are carefully monitored to verify compliance with the budget and to identify revisions that need to be made either in the current calendar year, or for the following year budget preparation.

Department expenses are fairly static and are generally influenced by the budgeted and actual headcounts within the department, as well as some minor annual fluctuations of material, utility or contract costs. The Illinois Tollway strives to manage their overall and department budgets. Salary and wage adjustments, required retirement contributions and inflationary factors are the main variables on a year-over-year basis. Individual department budgets and overall budget line items may vary from one year to the next due to equipment refresh or operational changes. Four departments are influenced by dynamic factors that change from year to year that warrant special analysis: Toll Operations, Business Systems, Engineering and Finance.

6.2.1 Toll Operations

The Illinois Tollway’s Toll Operations Department is responsible for manual toll collection, which includes the collection and counting of all manually collected toll revenue along with cash handling. Maintenance of Illinois Tollway buildings is also managed within Toll Operations. The headcount for Toll Operations decreased substantially as the open road tolling projects opened and the total number of manned toll lanes were reduced. The number of budgeted positions within the department dropped nearly 32% between 2009 and 2018, from 824 to 563. The need for lane walkers was eliminated, and staffing has been reduced to become more flexible (part-time and seasonal workers) as open road tolling and I-PASS usage matures with changes to toll rates, transponder penetration, transponder usage from other states and other factors. In addition, the Illinois Tollway has begun adjusting staffing levels so that there may not be any collectors at low-usage time periods (most notably during overnight hours on the rural plazas on the Jane Addams and Reagan Memorial Tollways). The Illinois Tollway is also implementing ATPM at targeted locations to accommodate non-transponder customers to reduce the dependence on manual toll collection staff.

Expenses related to Toll Operations are variable, primarily based upon the active number of employees there are within the department, which is influenced by the number of annual manual toll transactions. Employee costs make up 87% of the total department cost in the 2018 budget. As staffing levels have adjusted downward, the salary and wage costs are reduced, even considering wage adjustments. Retirement costs have increased, which have negated salary and wage cost reductions. Since 2009, the salary and wage costs for Toll Operations have declined nearly 17%. However, retirement costs, as a percentage of salary and wage costs, have increased by 57% since 2009. The overall result is that the combined cost of salary, wages and retirement have remained relatively flat with only a 1.3% increase between the 2009 costs and the 2018 budget. In the 2018 budget, retirement costs represent 18% of Operating Expenses.

The Illinois Tollway has opened three interchanges that are fully electronic, and additional interchanges are planned. The planned Elgin O’Hare Western Access roadways are expected to be exclusively electronic. Although the trend continues that a larger volume of transactions
are and will be electronic, the Illinois Tollway has not identified a time when eliminating cash collection will be viable or appropriate. Other toll agencies have shifted to 100% electronic collection, but the Illinois Tollway currently believes that negatives may outweigh the positives. Reduced revenues due to persistent violators and issues with license plate recognition may not allow the eliminated costs of cash collection to be recouped. The Illinois Tollway will continue to study industry trends to evaluate options in the future.

6.2.2 Business Systems

The Business Systems Department is responsible for the operation and maintenance of the electronic tolling system hardware and software, which also includes collecting toll revenue from toll violators and assessing fines and imposing sanctions. The department monitors the contracts and performance of the structure surrounding the Electronic Tolling System known as open road tolling. Additionally, Business Systems provides support through the Customer Call Center which acts as a single point of contact for all customer calls that relate to I-PASS, violations processing and missed toll services.

Business Systems expenses are primarily variable with respect to the number of transactions and amount of revenue collected from customers. Due to the toll rate increases effective January 1, 2012 and January 1, 2015-2018, the overall department budget has increased by more than 84% between 2011 and the budget year 2018.

As discussed above regarding Toll Operations, no timetable has been set for eliminating cash collection. There should be the expectation that I-PASS usage increases, especially with cash rates continuing to be double the I-PASS rate. Increased I-PASS transactions; traffic and revenue enhancement due to natural growth; increased capacity due to roadway widening; and substantial increase in vehicles due to roadway openings will all contribute to driving up costs within the Business Systems Department. Factoring in these elements, Business Systems’ expenditures are anticipated to experience an average annual increase of 4.3% as projected over the duration of the Move Illinois Program.
6.2.3 Engineering

The Engineering Department is responsible for the planning, design, construction, operation and maintenance of the Illinois Tollway system. Additionally, Engineering works closely with the Planning Department in coordinating with community groups, government agencies and planning organizations on transportation and land-use policy. This department oversees annual inspections of the pavement, bridges and drainage systems, as well as the overall day-to-day maintenance of the Illinois Tollway’s fleet and roadway system.

The Engineering Department oversees three areas of operation:

- Design – Project plans and specifications are prepared for various construction and maintenance activities according to the capital improvement program schedule.

- Construction – Implements the construction phase of projects; monitoring construction quality, schedule and budget.

- Maintenance / Traffic – Maintains the roadway system by keeping roads clean, properly lit and serviceable in all weather conditions; managing incidents; and informing motorists of traffic and travel concerns.

As of December 2017, the Engineering Department had an actual headcount of 589 employees, with approximately 88% of the employees within the Maintenance / Traffic unit. The Engineering Department headcount also includes the Planning Department, which had 22 staff as of the end of 2017. The planning department is anticipating an 18% staff level increase in 2018 to support ongoing and future planning efforts with respect to evaluating and identifying potential future system expansion projects.

The improvements made as part of the CRP and the Move Illinois Program affect the Engineering Department two major ways.

- Additional engineers within design and construction units are required to administer the design and construction phases of the projects. The majority of this work has and will be performed by consulting engineers under contract with the Illinois Tollway, including the PMO and other firms serving as Design Section Engineers (DSE) and Construction Managers (CM). These costs are included within the CRP and Move Illinois Program budgets.

- Maintenance and Traffic units staffing will increase as the system length and number of lane miles grow. Staff will be augmented within the majority of the groups due to additional traffic and the system growth.
Table 19: Growth in Illinois Tollway System

<table>
<thead>
<tr>
<th>Year</th>
<th>Centerline Miles</th>
<th>Total Lane-Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>284.1</td>
<td>2044.2</td>
</tr>
<tr>
<td>2013</td>
<td>284.1</td>
<td>2047.9</td>
</tr>
<tr>
<td>2014</td>
<td>284.1</td>
<td>2127.7</td>
</tr>
<tr>
<td>2015</td>
<td>284.1</td>
<td>2133.5</td>
</tr>
<tr>
<td>2016</td>
<td>290.6</td>
<td>2255.1</td>
</tr>
<tr>
<td>2017</td>
<td>294.0</td>
<td>2277.0</td>
</tr>
<tr>
<td>2018</td>
<td>294.0</td>
<td>2277.5</td>
</tr>
<tr>
<td>2019</td>
<td>294.0</td>
<td>2281.6</td>
</tr>
<tr>
<td>2020</td>
<td>294.0</td>
<td>2287.5</td>
</tr>
<tr>
<td>2021</td>
<td>297.2</td>
<td>2332.6</td>
</tr>
<tr>
<td>2022</td>
<td>297.5</td>
<td>2338.8</td>
</tr>
<tr>
<td>2023</td>
<td>300.1</td>
<td>2366.5</td>
</tr>
<tr>
<td>2024</td>
<td>300.1</td>
<td>2375.5</td>
</tr>
<tr>
<td>2025</td>
<td>301.3</td>
<td>2409.5</td>
</tr>
<tr>
<td>2026</td>
<td>301.3</td>
<td>2409.5</td>
</tr>
</tbody>
</table>

The Maintenance / Traffic unit is subdivided into the following groups (staffing levels as of December 2017):

- Roadway Maintenance had 376 staffed positions working from the 12 maintenance facilities. They are responsible for activities such as roadway sweeping; litter collection; snow and ice control; minor pavement, guardrail, fence and bridge work; drainage system upkeep; roadside landscaping; traffic channelization; and motorist aid.

- Fleet Maintenance had 67 staffed positions and is responsible for the maintenance of all Illinois Tollway vehicles.

- Sign Shop had 19 staffed positions.

- Roadway Electric had 15 staffed positions.

- Traffic Operations had 13 staffed positions in the traffic operations center.

- Dispatch had 31 staffed positions and is responsible for dispatching services in response to calls for motorist aid.
Maintenance / Traffic uses a database called the Maintenance Management System (MMS) to track costs associated with the Roadway Maintenance group and the Roadway Signage and Lighting activities of the Traffic Operations group. The Illinois Tollway provides the Consulting Engineers with year-end reports derived from the Maintenance Management System. On a percentage basis, the leading major activities in 2017 were snow and ice control (28%), roadside litter control (18%) and general maintenance (16%).

Staffing levels at maintenance facilities have been closely tied to the snow and ice control program because of the high level of service goals established by the Illinois Tollway. Although snow and ice control are a seasonal activity, staff are hired on a permanent basis rather than as temporary or seasonal help. Snow and ice control staff members are prohibited from using vacation time during winter. Historically, the staffing level needed for snow and ice control has been relatively equal to the needs for maintenance work throughout the year. In addition, other staff, including a portion of the building maintenance employees in the Toll Operations Department, are trained to be available for snow and ice control functions. Although a 5.8% increase in new lane miles is planned as part of the Move Illinois program, only a 3% increase in Maintenance staff is assumed by the conclusion of the Move Illinois program.

6.2.4 Finance

The Finance Department covers a variety of internal and external roles within the Illinois Tollway. The majority of the cost items that are included within the department are fairly consistent. Risk Management is a small division within Finance that funds the costs for Worker’s Compensation Insurance and Employee Group Insurance for the Illinois Tollway. These two insurance items totaled $44.4 million in the 2018 budget, which represents a 72% share of the Finance Department expenses and more than 12% of the total Illinois Tollway expenditures. Insurance costs may vary in the future due to changes in premiums and staffing levels, self-insurance requirements and other factors.
6.3 **Estimated Illinois Tollway Operating Expenses**

From current expenditure and budget information provided by the Illinois Tollway, overall, salary and wage costs are projected to escalate to account for annual wage adjustments required by collective bargaining. The staffing level for the Engineering Department is projected to increase slightly year over year as additional lane mileage is added as part of the *Move Illinois* Program, then remain static after 2025. Overall, Engineering Department staff is anticipated to increase by approximately 5% by year 2025. Operational services staffing levels are projected to remain flat. Business Systems costs are expected to increase at a relatively higher rate than other departments over the study period due to transponder usage, increased toll rates (including the 2015-2018 toll rate increases for commercial vehicles) and increases in traffic. The Business Systems costs include both the transaction processing and the bank charges for account replenishment, video tolling charges and violation payments. The inflation rate utilized for non-labor expenditures is 3.0%.

Retirement and pension contributions, as a percentage of salary and wages, has risen significantly in recent years. From the State fiscal years 2013 – 2020, the employer contribution rates published by the State Employees’ Retirement System (SERS) are as follows:

<table>
<thead>
<tr>
<th>State Fiscal Year</th>
<th>Beginning Date</th>
<th>Ending Date</th>
<th>Total Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>7/1/2012</td>
<td>6/30/2013</td>
<td>37.987%</td>
</tr>
<tr>
<td>2014</td>
<td>7/1/2013</td>
<td>6/30/2014</td>
<td>40.312%</td>
</tr>
<tr>
<td>2015</td>
<td>7/1/2014</td>
<td>6/30/2015</td>
<td>42.339%</td>
</tr>
<tr>
<td>2016</td>
<td>7/1/2015</td>
<td>6/30/2016</td>
<td>45.598%</td>
</tr>
<tr>
<td>2017</td>
<td>7/1/2016</td>
<td>6/30/2017</td>
<td>44.568%</td>
</tr>
<tr>
<td>2018</td>
<td>7/1/2017</td>
<td>6/30/2018</td>
<td>47.342%</td>
</tr>
<tr>
<td>2019</td>
<td>7/1/2018</td>
<td>6/30/2019</td>
<td>51.614%</td>
</tr>
<tr>
<td>2020</td>
<td>7/1/2019</td>
<td>6/30/2020</td>
<td>54.292%*</td>
</tr>
</tbody>
</table>

* Preliminary Rate

The employer contribution rate of 57% has been used for the purposes of projecting future operating costs, beyond 2020. This is based on the draft actuarial report prepared for SERS forecasting an increase in the employer contribution rate to approximately 57%.

The Trust Indenture requires projections for five years beyond the projected “in-service” date of the project. Based on the information above, the Consulting Engineers have projected Operating Expenses, as defined in the Trust Indenture, for each of the fiscal years 2018 through 2031 as provided in the table below.
Table 21: Estimated Operating Expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Operating Expenses (Millions)</th>
<th>Annual Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$352.8</td>
<td>-</td>
</tr>
<tr>
<td>2019</td>
<td>$365.4</td>
<td>3.6%</td>
</tr>
<tr>
<td>2020</td>
<td>$383.6</td>
<td>5.0%</td>
</tr>
<tr>
<td>2021</td>
<td>$397.6</td>
<td>3.6%</td>
</tr>
<tr>
<td>2022</td>
<td>$412.5</td>
<td>3.7%</td>
</tr>
<tr>
<td>2023</td>
<td>$430.5</td>
<td>4.4%</td>
</tr>
<tr>
<td>2024</td>
<td>$447.8</td>
<td>4.0%</td>
</tr>
<tr>
<td>2025</td>
<td>$464.8</td>
<td>3.8%</td>
</tr>
<tr>
<td>2026</td>
<td>$486.7</td>
<td>4.7%</td>
</tr>
<tr>
<td>2027</td>
<td>$504.8</td>
<td>3.7%</td>
</tr>
<tr>
<td>2028</td>
<td>$524.1</td>
<td>3.8%</td>
</tr>
<tr>
<td>2029</td>
<td>$542.9</td>
<td>3.6%</td>
</tr>
<tr>
<td>2030</td>
<td>$562.4</td>
<td>3.6%</td>
</tr>
<tr>
<td>2031</td>
<td>$583.2</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

The estimates for Operating Expenses prepared by the Consulting Engineers and included in this report have an average growth per year of approximately 3.9% between 2019 and 2031. There are many factors that will dictate what the actual Operating Expenses experienced by the Illinois Tollway will be and the Consulting Engineers cannot predict the outcome of these factors. The Consulting Engineers have reviewed the data and forecasts provided by the Illinois Tollway with respect to proposed system expansion and operational changes and find them to be reasonable. Thus, these forecasts and assumptions have been included in the Consulting Engineers analysis. However, the Consulting Engineers cannot predict unforeseen circumstances or unusual price escalations that are not currently identified and known; thus, the estimates above may vary from actual future expenses.
7 Conclusion

This report complies with Section 204.1.(4) of the Amended and Restated Trust Indenture Effective March 31, 1999. It provides the estimates for Operating Expenses and Renewal & Replacement Deposits for five years beyond the projected in-service date (through 2031). It also provides the estimated cost of construction and the schedule of completion for the projects (as developed by the Illinois Tollway’s PMO and reviewed for reasonableness by the Consulting Engineer) included in the Illinois Tollway’s Move Illinois Program that may be partly or wholly funded from bond proceeds. Current professional practices and procedures commensurate with the scope and schedule of the Consulting Engineers work were used in the development of this report. In that regard, in preparing this report, the Consulting Engineers is compelled to rely on information from, and the work of, others. Although that information and work product is examined for reasonableness, no extensive or exhaustive effort is undertaken by the Consulting Engineers to confirm the accuracy of such information and work product.

The Illinois Tollway has had remarkable success in delivering the Congestion Relief Program in a timely fashion and under budget. This success is continuing as the Illinois Tollway proceeds with major construction of Move Illinois Program projects in 2018, the seventh year of the Move Illinois Program. The cost estimates utilized for the compilation of costs for the program follow standard industry practices and contain appropriate contingency factors based upon level of completeness of the design. All project costs are escalated appropriately to the estimated mid-point of construction. Currently, the overall estimate of the cost of the Move Illinois Program at $14,203.7 billion appears reasonable.

This report is intended for the use of the Illinois Tollway for inclusion in the Preliminary Official Statements and Official Statement for the Illinois Tollway’s issuances of (i) Toll Highway Senior Revenue Bonds, 2018 Series A (Refunding), state sale of which is expected in November or December 2018, and (ii) Toll Highway Senior Revenue Bonds with sale expected in December 2018 or January 2019. This report is subject to the limitations described within the Official Statements, such as those with respect to forward-looking statements, which are incorporated within this report. The Consulting Engineers are not, and have not been, a municipal advisor as defined in Federal law (such as the Dodd-Frank Wall Street Reform and Consumer Protection Act) to the Illinois Tollway and does not owe a fiduciary duty pursuant to Section 15B of the Securities Exchange Act of 1934 to the Illinois Tollway with respect to the information and material contained in this report. The Consulting Engineers are not recommending and has not recommended any action to the Illinois Tollway.

Market conditions and unforeseen events beyond the control of the Consulting Engineers, the PMO, or the Illinois Tollway may affect the implementation and cost of the Move Illinois Program and the future Operating Expenses of the Illinois Tollway as detailed herein. The Consulting Engineers presumes that the PMO will continually monitor the Move Illinois Program and will adjust the scopes and schedules of projects in order to control the cost of the overall program. On an annual basis, the Consulting Engineers recommendation for the Renewal and Replacement deposit will reflect consideration of adjustments to the Move Illinois Program by the PMO.
Finally, no one should use or rely on this report for any purpose without giving due consideration to the impact that the above-described circumstances and factors might have on the estimates and findings contained herein.
ABOUT WSP

WSP USA is the U.S. operating company of one of the world’s leading engineering and professional services firms—WSP. Dedicated to serving local communities, we are engineers, planners, technical experts, strategic advisors and construction management professionals. WSP USA designs lasting solutions in the buildings, transportation, energy, water and environment sectors. With nearly 7,000 people in 100 offices across the U.S., we partner with our clients to help communities prosper.