CONSULTING ENGINEERS REPORT

Toll Highway Senior Revenue Bonds 2020 Series A

November 20, 2020

Illinois Tollway

WSP
ILLINOIS TOLLWAY GEC

CONSULTING ENGINEERS REPORT [1]

List of Tables

[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 portion from I-57 to I-80 has not moved forward. The following projects authorized in July 1993 have also not moved forward: a north extension of Illinois Route 53 from Lake-Cook Road to Illinois Route 120 in Grayslake and east to I-94, and a 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 expenditures are generally categorized into two categories, Improvement (I) and Renewal and Replacement (RR). Expenditures classified as improvements are typically those that add capacity/lane miles and/or improve operations of the existing system. Expenditures classified as 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 to 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.

The CRP was closed out in 2018 having achieved all program goals.

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.

1.2.3 Illinois Tollway and the COVID Pandemic

In response to the unprecedented pandemic emergency event, the Illinois Tollway acted quickly to ensure the safety of its staff and customers and to continue to deliver on its commitment to operate and maintain its facilities to the highest standards. Through deliberate and effective actions of its Leadership, the Illinois Tollway rapidly and successfully deployed an action plan to transition its office-based staff to a sustainable telework environment, and in coordination with state health and emergency management officials, instituted appropriate steps to protect its maintenance and operations staff who are essential to providing service to its customers. These actions, supported through the strong commitment of staff at all levels, ensures that the Illinois Tollway will continue maintain the highest levels of service during this global health situation and beyond.

The Illinois Tollway is positioned to continue to deliver projects for its capital program known as the Move Illinois Program, including major contracts related to the Central Tri-State (I-294) and Elgin O'Hare Western Access projects, along with renewal and replacement projects planned as part of its Systemwide Program.

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. Current projections are for the Program to be completed by 2027.

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, including an amendment of the program that increased its budget from $12.15 billion to $14.27 billion, which such cost is currently estimated at $14.107 billion.

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:

- Reconstruct, and widen for significant portions, 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 rehabilitation and widening of the existing IL 390, construction of an extension of IL 390, and construction of I-490 between I-90 and I-294
- Implementing features to accommodate transit and provide increased flexibility for passenger vehicles on the Jane Addams Memorial Tollway (I-90)
- Planning for other routes as determined by the Board of Directors

The Consulting Engineers rely 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 while the Consulting Engineers have not independently verified the PMO's methods, the review conducted shows that the cost-tracking and estimating practices presently used by the PMO for *Move Illinois* appear to be 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 budget of the *Move Illinois* Program from $12.15 billion to $14.27 billion. The current cost estimate at completion is $14.107 billion.

Enhancements included in the new Central Tri-State scope are allowing 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 2019; and (ii) the PMO, for the years 2020 through 2027.

Table 1: Move Illinois Program – Estimated Program Expenditures

Year	Move Illinois Program Estimated Program Expenditures [1] (Millions)
2012	$108.2
2013	$502.2
2014	$886.7
2015	$1,239.2
2016	$985.2
2017	$747.0
2018	$919.5
2019	$941.6
2020	$1,094.4
2021	$1,534.1
2022	$1,209.4
2023	$1,017.1
2024	$943.7
2025	$759.7
2026	$527.5
2027	$691.9
Total	**$14,107.4**

Notes: [1]

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

- For completed period (2012 – June 2020), the totals are net of reimbursements received under various intergovernmental agreements totaling $147.6 million.
- 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 valued at approximately $300 million in years 2017-2024 for interchange and access improvements, of which agreements totaling $171.7 million have been received.
- Includes $67.4 million in potential budgetary reserve, a projected net surplus of bid savings, reduced management reserve against escalated costs.

The following Sections 2, 3.1 and 3.2 provide descriptions of major projects within the Move Illinois Program, including cost and timing estimates. The total budget is $14.255 billion. The difference between that total and the total shown in the table above is the $147.6 million received under various intergovernmental agreements referenced in the second footnote above.

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): $1,477.0 million

The project cost is reduced from $1,479.0 in the December 2019 Consulting Engineers Report due to the contract closeout process. The project cost includes $8.0 million in 2027 for grading and drainage improvements.

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

Construction Period: 2013-2015

Total Cost (Escalated): $202.1 million

The project cost is reduced slightly from $202.2 million in the December 2019 Consulting Engineers Report.

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 or schedule from the December 2019 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 or schedule from the December 2019 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): $13.3 million

No adjustments in cost or schedule from the December 2019 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): $157.8 million

The estimated project cost was reduced slightly from $158.0 million in the December 2019 Consulting Engineers Report due to updated estimates for utility projects and fiber optic relocations.

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): $23.8 million

The estimated project cost was adjusted from $24.0 million in the December 2019 Consulting Engineers Report due to updated project cost estimates.

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: 2018-2027

Total Cost (Escalated, 4%): $3,553.7 million

The estimated project cost was adjusted from $3,639.7 million in the December 2019 Consulting Engineers Report due to revised timing of projects within the corridor.

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: 2018-2021

Total Cost (Escalated): $111.8 million

The estimated project cost was adjusted from $109.1 million in the December 2019 Consulting Engineers Report due to updated cost estimates and timing.

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: 2012-2027

Total Cost (Escalated, 4%): $293.2 million

The estimated project cost was adjusted from $272.4 million in the December 2019 Consulting Engineers Report due to the timing of bridge and ramp repairs and associated escalated costs.

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: 2017-2027

Total Cost (Escalated): $147.6 million

The estimated project cost was adjusted from $178.8 million in the December 2019 Consulting Engineers Report due to reduced parcel acquisition costs. Central Tri-State (CTS) truck parking has been moved to 2027.

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: 2017-2023

Total Cost (Escalated): $161.5 million

The estimated project cost was adjusted from $162.3 million in the December 2019 Consulting Engineers Report due to updated estimates for utility projects and fiber optic relocations.

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 or schedule from the December 2019 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: 2018-2020

Total Cost (Escalated): $141.0 million

The estimated project cost was adjusted from $135.6 million in the December 2019 Consulting Engineers Report due to updated contract projections.

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: 2018-2027

Total Cost (Escalated): $102.7 million

The estimated project cost was adjusted from $108.4 million in the December 2019 Consulting Engineers Report due to updated cost estimates.

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: 2019-2026

Total Cost (Escalated): $0.5 million

No adjustments in cost but a revised schedule from December 2019 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: 2018-2023

Total Cost (Escalated): $1.3 million

No adjustments in cost but a revised schedule from December 2019 Consulting Engineers Report.

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: 2018-2020

Total Cost (Escalated): $62.2 million

The estimated project cost was updated from $60.5 million in the December 2019 Consulting Engineers Report due to updated contract projections.

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: 2019-2022

Total Cost (Escalated): $29.5 million

The estimated project cost was adjusted from $30.6 million in the December 2019 Consulting Engineers Report due to updated contract projections.

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: 2018-2020

Total Cost (Escalated): $167.9 million

The estimated project cost was adjusted from $169.1 million in the December 2019 Consulting Engineers Report due to updated contract projections.

2.4.4 Aurora Toll Plaza (61) 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, 2020-2022

Total Cost (Escalated): $52.6 million

The estimated project cost was adjusted from $48.6 million in the December 2019 Consulting Engineers Report due to updated contract projections. The project cost includes $7.0 million in 2027 for roadside improvements.

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 2021-2022, 2024, 2026-2027

Total Cost (Escalated): $52.8 million

The estimated project cost was adjusted from $50.6 million in the December 2019 Consulting Engineers Report due to updated timing of projects and associated cost estimates.

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: 2016-2023

Total Cost (Escalated): $0.4 million

No adjustments in cost or schedule from the December 2019 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: 2018-2021

Total Cost (Escalated): $0.6 million

No adjustments in cost and a schedule adjustment from December 2019 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, 2020
- **Total Cost (Escalated):** $ 115.1 million (Illinois Tollway Commitment)
- No material adjustments in cost or schedule from the December 2019 Consulting Engineers Report.

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):** $194.9 million (Illinois Tollway Commitment)
- The estimated project cost was adjusted from $201.4 million in the December 2019 Consulting Engineers Report due to updated project estimates. Schedule adjusted.

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, 2020 and 2022-2023

Total Cost (Escalated): $12.0 million

No adjustments in cost and a schedule adjustment from the December 2019 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 2022-2026

Total Cost (Escalated): $3.3 million

No adjustments in cost and a schedule adjustment from December 2019 Consulting Engineers Report.

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, ROW acquisitions.

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: $947.0 million

Overall segment cost reduced from prior $953.0 million shown in the December 2019 Consulting Engineers Report due to ongoing budget reconciliations for project closeouts and applied CMAQ funding for the I-290 Flyover. Physical construction of this segment was completed as noted above.

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, ROW acquisitions.

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): $1,416.0 million

Cost adjustment from the previous amount of $1,412 million shown in the December 2019 Consulting Engineers Report aligns with ROW settlements and the latest construction schedule and cost estimate updates. The construction period remains unchanged for this 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, ROW acquisitions.

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: 2016-2024

I-490 North Leg Cost (Escalated): $903.0 million

Cost adjusted from the previous estimate of $901 million shown in the December 2019 Consulting Engineers Report, aligns with ROW settlements, construction schedule and cost estimate updates. The construction schedule remains unchanged for this report.

EOWA Funding by Others – The assumed EOWA corridor funding sources consist of $3.266 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 Planning for Other Projects

2.7.1 Planning for Other Projects

Length: N/A

Project Description: Planning studies 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 or schedule from the December 2019 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: 2013-2027

Total Cost (Escalated): $401.9 million

The estimated project cost was adjusted from $370.0 million in the December 2019 Consulting Engineers Report due to updated timing and contract projections. Several facilities were moved to the latter years of the program such as the Central Warehouse construction, the M-2 (Hillside) Truck Wash, M-3 (Park Ridge), M-5 (Schaumburg), M-12 (Dixon) Annex A and M-14 (Downers Grove).

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: 2012-2027

Total Cost (Escalated): $689.9 million

The estimated project cost was adjusted from 682.0 million in the December 2019 Consulting Engineers Report due to updated contract projections.

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): $109.9 million

No adjustments in cost or schedule from the December 2019 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): $170.1 million

No adjustments in cost or schedule from the December 2019 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): $895.0 million

The estimated project cost was adjusted from $895.8 million in the December 2019 Consulting Engineers Report due to updated contract projections.

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: 2012-2022, 2027

Total Cost (Escalated): $130.8 million (Illinois Tollway Commitment)

The estimated project cost was adjusted from $125.8 million in the December 2019 Consulting Engineers Report due to updated project timing and contract projections. The Lee Street Eastbound Exit Ramp was moved to 2027.

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

No adjustments in cost or schedule from December 2019 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): $514.2 million

No adjustments in cost or schedule from the December 2019 Consulting Engineers Report.

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, 2020, 2022-2026

Total Cost (Escalated): $9.7 million

No adjustments in cost and a schedule adjustment from the December 2019 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: 2018-2021

Total Cost (Escalated): $36.0 million

No adjustments in cost and a schedule adjustment from the December 2019 Consulting Engineers Report.

3.3 Intelligent Transportation System

Deployment of Intelligent Transportation System (ITS) on the Illinois Tollway began in the late 1980s with the 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, deployment of roadway CCTV cameras for monitoring traffic, Microwave Vehicle Detection System (MVDS), deployment of Digital Messaging Signs (DMS) and 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 Congestion Relief Program (CRP) to rebuild and widen major segments of the Illinois Tollway system, implement open road tolling and add a 12-mile extension to I-355 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 systems 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
- Vehicle Detection Systems (VDS) – both microwave, Bluetooth 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. Bluetooth solar powered detection devices allow for ease of traffic monitoring, particularly for temporary use in construction zones.
- 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
- Weigh-in-Motion (WIM) – to assist overweight vehicle enforcement measuring the weight of vehicles moving at highway speeds, equipped with a tire anomaly classification system detecting flat tires or missing tires and equipped with an over-height vehicle detection system (virtual gantry) that monitors over height vehicles.
- Road Weather Information Systems (RWIS) – to assist roadway operations to prepare and respond to snow and ice events by measuring atmospheric and pavement conditions, they are located at major bridge and overpass
- Wireless Queue/Count Stations – for automatic queue detection, wrong way driver detection and traffic counting
- Portable Changeable Message Signs (PCMS) – for providing traveler information to motorists on a short-term basis or within 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. 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, temporary solar-powered / wireless units were installed to maintain Jane Addams Memorial Tollway (I-90) corridor ITS operations. These units were replaced with permanent devices during the Jane Addams Memorial Tollway (I-90) corridor reconstruction/widening. Intermediate Power Distribution & Communication (IPDC) facilities were also installed along the I-90 corridor.

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 vibration during windy conditions, allowing for better camera video quality of the roadway at the TOC. First issue of the ITS guide drawings, special provisions and ITS Deployment Guide were developed in 2015 and have been revised yearly based on construction lessons learned and product improvements. The ITS base drawings, guides and special provisions are used by the designers for every ITS construction contract at the Tollway.

In 2017, the Illinois Tollway opened the first "smart corridor" in the system. The Jane Addams Memorial Tollway (I-90) was funded under the current Program. This corridor included a combination of traditional Illinois Tollway ITS devices, including CCTV, MVDS, RWIS at the Fox River Bridge. A virtual weigh-in-motion system was also installed at Beverly Road. The corridor also provided enhanced full color/full matrix DMS capable of illustrating color and graphic messages. Also included were IPDC's 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 2019 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
- Development of the 5 year ITS Strategic Plan
- 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, three ITS standalone contracts were designed and bid for construction. Under the ITS Refurbishment and Replacement program, more than 250 ITS devices have been replaced due to parts that reached end of their service life. Priorities are given to ITS components that have exceed their service life and become too costly to maintain and repair.

Major initiatives planned for 2020 include the following:

- Continued design activities for CCTV gap analysis, ramp queue detection, communication upgrade, replacement of out of service weigh-in-motion (WIM) so they can be used by the Illinois State Police for weight enforcement thus reducing the flow of overweight vehicles on Tollway roads and also 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 and expanded deployment. Additional signage, flashing beacons and detections systems are being evaluated for deployment to reduce the number of wrong way driving incidents.
- Ramp queue detection – The current microwave detection does not provide sufficient level of accuracy required for certain specific new functions. As example, for ramp

vehicle detection a MVDS will fail giving accurate date for traffic speed less than 20 MPH. To address this, more robust and accurate lane-by-lane detection is required in selected locations. New deployment of in-pavement sensors will be used for ramp queue detection.

- ITS device modernization planning and ITS inventory management system – Development of guidelines and reasons to modernize ITS devices beyond just age. Utilizing asset management software to document ITS device life cycle from concept to end of life.
- ITS test lab and site – Install ITS test lab at M-14 and three poles to test and validate ITS products prior to specification and widespread deployment. This will ensure products are compatible with the Tollway ITS system and verify desired performance.
- Implement Time-of-Day Shoulder Running
- Connected and Automated Vehicle research and development of strategic plan.
- 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. Environmental initiatives throughout the Illinois Tollway include both the continuation of previous commitments along with innovative programs. The following is a summary.

3.4.1 Expanded Use of Brine for Roadway De-icing

The Tollway continues to make firm investments into expanding its use of brine across its system. Salt brine is produced by dissolving dry salt into a solution which can then be directly sprayed on the pavement or used to 'wet' dry salt before it is applied, depending on the conditions.

Use of brine has benefits for the Tollway, Tollway customers and the environment. Traditionally, dry salt crystals have been used primarily to de-ice roadway pavement. When dry salt is released from plow truck spreaders, it tends to bounce and scatter, with a substantial amount of salt, approximately 30%, being lost on the shoulders, in the median or beyond, where it is not effective. Thus, salt spread rates need to be set high enough to ensure an adequate amount salt remains on the pavement for safe roadway operations.

When dry salt is pre-wetted with brine before it is applied to the pavement, it reduces the tendency for salt to bounce and scatter and enhances its ability remain on the pavement; when pre-wetted, only 4% of salt is lost beyond the road surface. The implications are that pre-wetting the salt can allow application rates to be reduced up to approximately 25% and achieve the desired deicing effect.

From a safety and operations perspective, Pre-wetting immediately activates the salt, jump starting the deicing process, resulting in more rapid improvement of roadway driving conditions during icing events.

From an environmental perspective, reducing the amount of salt applied to the system subsequently results in less salt (chlorides) entering and affecting our rivers, streams and lakes.

Increased use of brine will decrease the Tollway's dependency on salt, which can save costs, particularly during winter seasons when salt supplies are low and demand is high.

The Tollway has been testing brine for several years, having procured two mobile brine makers, with limited production capacity and outfitting its fleet for increased brine applications.

In 2020, the Tollway will have substantially completed construction of its first permanent, high production brine maker on its system which will be installed at the new M-8 maintenance yard that began construction in early 2020. This pilot program will inform installations of future permanent brine makers across the system in its effort to reduce its impact on the environment while maintain the high level of safety that its customers enjoy.

3.4.2 Enhanced Environmental Inspections

In 2019, the Illinois Tollway enhanced its physical inspection program of detention basins, bioswales, and storm water outfalls. Ensuring that these assets are operating as intended is imperative to protecting surface water resources which are conveyed through and received by the Illinois Tollway's drainage system.

The enhanced inspection program incorporates additional assessment criteria as part of an improved asset management rating system that better addresses individual components and conditions that may have changed since the initial construction or since the previous inspection. The assessment criteria for storm water outfalls now includes nine physical and sensory indicators of illicit discharges as defined per U.S. Environmental Protection Agency guidance. Furthermore, assessment of basin inlet and outlet structures has been expanded to include criteria that more specifically evaluate the function and safety of the basins including nuisance issues (e.g. animal dens and burrows), vegetation components (e.g. invasive, woody, inhibited or dead), cleanliness (e.g. litter and debris accumulations), and erosion (e.g. unstable or eroding banks, damaged erosion controls). In addition to assessment of physical conditions, criteria related to bioswale function and vegetation have been incorporated to enhance the assessment of effectiveness and overall health.

This enhanced inspection program and rating system was implemented to improve tracking and identification of maintenance issues, aid in planning preventative maintenance to avoid costlier drainage repairs, and more effectively identify and eliminate potential illicit storm water discharges to maintain compliance with Illinois EPA permit requirements.

3.4.3 Invasives to Energy Research Program

In 2019, the Illinois Tollway began working with University of Connecticut to evaluate the water quality benefits of, and energy production potential from invasive vegetation, such as cattails harvested from Tollway drainage ditches and ponds. In particular, the Illinois Tollway is looking to cattail harvesting as a way of removing environmentally detrimental chlorides (salt from winter de-icing activities) from the environment while also improving the function of the drainage system.

Cattails, among some other common reeds, are considered invasive plants and are adapted

to thrive in environmentally degraded habitats that frequently occur along highway drainage systems. Cattails are generally considered to be a nuisance as they quickly overtake drainage features and over time cause reduced storm water storage capacity, reduced water flow, excess nutrients after decay and can clog drainage appurtenances. These large plants are difficult to manage due to fast growth and rapid reproduction that results in the crowding out of deep-rooted native species resulting in the degradation of aquatic ecosystems and reduced biodiversity.

However, these plants are effective in taking up and storing water pollutants such as chlorides and excess nutrients within their stalks. Cutting them at the right time can remove these pollutants from the environment. Typically, cattails have been managed by clear cutting and leaving the cut stalks in place and as the cattails decompose, any captured pollutants move back into the soil and are then released back into the environment.

This three-year research program will evaluate the costs and benefits of harvesting and removing cattail biomass annually (along with the chlorides it has accumulated) and identifying ways to utilize the harvested material for other useful purposes. Potential benefits include:

- Removal of chlorides and other pollutants from the system,
- Water quality improvement within the Illinois Tollway's drainage system as well as downstream,
- Reduce drainage system waste and creation of a sustainable maintenance program
- Determination of whether this harvested material can be used as an energy source in wastewater treatment processes or as compost.

3.4.4 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 Illinois Tollway's goal of planting 58,000 trees in support of the program, and to date, over 61% of this goal has been achieved with the planting of more than 35,300 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.

3.4.5 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.

3.4.6 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 2019, the INVEST team assessed the Illinois Tollway's system using the INVEST System Planning and Operations and Maintenance modules to determine system scores. The 2019 System Planning and Operations and Maintenance scores continue to reflect the highest level of achievement, platinum.

In 2019, the Illinois Tollway also used the INVEST Project Development module to evaluate in-progress design and construction contracts with an estimated construction cost exceeding $10 million. Projects that reached construction substantial completion in 2013 and 2014 averaged a silver rating, while projects in 2015, 2016, 2017 and 2018 averaged a gold rating. In 2019, Illinois Tollway projects earned regional employment points for the first time due to the ConstructionWorks program.

Innovations implemented in 2019 also included use of precast panels and rapid setting concrete on a bridge pavement rehabilitation contract, and the use of LIDAR to analyze the existing pavement surface.

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, but 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 projects they are involved with throughout the region and country.

3.4.7 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. In 2019, no new flooding issues were identified, four issues were corrected as part of capital improvements and five remaining issues, all located along the Central Tri-State (I-294) corridor, will be remediated as part of future reconstruction.

Table 2: Flooding Locations and Mitigation

Location	Mitigation Status
I-94 near Lake Forest Oasis	Monitor and planned for future construction
I-294 & Cermak Ave	In design (RR-16-4265)
I-294 & Archer Ave	In construction (I-20-4518)
I-294 & St. Charles	In construction (I-20-4533)
I-294 & 95th Street	In construction (I-20-4517)
NB I-294 to Hinsdale Oasis	In design (I-17-4298)

3.5 System Growth

The following table depicts how the Illinois Tollway system has grown and 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 on 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 2020 to 2027 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 18.3% from 2012 through 2027.

Table 3: Growth of the Illinois Tollway System per Corridor (By Lane Miles)

Tollway	2012	2013	2014	2015	2016	2017	2018	2019
Tri-State (I-294 & I-94)	781.0	781.0	793.1	795.7	794.9	794.9	794.9	799.7
Jane Addams (I-90)	473.2	476.9	543.8	545.4	615.6	615.6	616.1	619.2
Ronald Reagan (I-88)	527.7	527.7	528.5	530.1	530.1	530.1	530.1	534.0
Veterans (I-355)	262.3	262.3	262.3	262.3	263.1	263.1	263.1	264.5
EOWA (IL 390 and I-490)	0.0	0.0	0.0	0.0	51.4	73.3	73.3	73.3
Total Lane Miles	2,044.2	2,047.9	2,127.7	2,133.5	2,255.1	2,277.0	2,277.5	2,290.7
% Increase - Annual		0.18%	3.90%	0.27%	5.70%	0.97%	0.02%	0.37%
% Increase - Aggregate		0.2%	4.1%	4.4%	10.3%	11.4%	11.4%	11.8%

Tollway	2020	2021	2022	2023	2024	2025	2026	2027
Tri-State (I-294 & I-94)	800.2	802.5	802.5	809.9	827.8	827.8	838.1	847.1
Jane Addams (I-90)	619.2	619.2	619.2	619.2	619.2	619.2	619.2	619.2
Ronald Reagan (I-88)	534.0	534.0	534.0	534.0	534.0	534.0	534.0	534.0
Veterans (I-355)	264.5	264.5	264.5	264.5	264.5	264.5	264.5	264.5
EOWA (IL 390 and I-490)	78.0	111.4	117.6	142.3	142.3	153.1	153.1	153.1
Total Lane Miles	2,295.9	2,331.6	2337.8	2,369.9	2,387.8	2,398.6	2,408.9	2,417.9
% Increase - Annual	0.23%	1.55%	0.27%	1.37%	0.76%	0.45%	0.43%	0.37%
% Increase - Aggregate	12.3%	14.1%	14.4%	15.9%	16.8%	17.3%	17.8%	18.3%

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, completed 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 throughout the system.
- Construction of the Veterans Memorial Tollway (I-355) South Extension to I-80 was completed

The current capital program is 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 2027. 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 2027.

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 system-wide 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.

Repair activities 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 4: CRS Rating System

CRS Rating	General Pavement Surface Condition
>7.5	Excellent
6.5 to 7.4	Good
6.0 – 6.4	Transitional
4.5 – 5.9	Fair
< 4.4	Poor

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 are not reflected by the CRS rating. Structural evaluations as described above, projected traffic loading and analysis of the pavement’s history can also factor into the pavement’s overall condition rating and Remaining Service Life (RSL), as described below.

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 system-wide CRS ratings is included in the following table:

Table 5: Summary of Mainline Pavement CRS Ratings from the 2019 Evaluation (Lane Miles)

Tollway	Excellent >7.5	Good 6.5-7.4	Transi-tional 6.0-6.4	Fair 4.5-5.9	Poor 0-4.4	**Not Rated
Tri-State (I-294)	177.4	105.6	100.2	26.4	0.0	12.8
Tri-State (I-94)	82.1	85.0	0.0	1.6	0.0	37.7
Edens Spur (I-94)	0.0	0.0	0.0	0.0	0.0	5.1
Jane Addams (I-90)	476.0	24.5	0.0	0.0	0.0	0.0
Reagan (I-88)	367.2	68.8	11.9	0.6	0.0	16.7
Veterans (I-355)	159.7	16.5	3.5	0.0	0.0	7.7
EOWA (IL 390)	42.5	1.7	2.6	2.0	0.0	6.0
Total*	**1305.0**	**302.1**	**118.2**	**30.6**	**0.0**	**85.9**
% of Total	**70.9%**	**16.4%**	**6.4%**	**1.7%**	**0.0%**	**4.7%**

* *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+ 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 system-wide, 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 2027. Additionally, sections of pavement constructed, reconstructed, reconstructed and widened, or rehabilitated as part of the CRP are programmed for rehabilitation through 2027 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 2027. Approximately 21.5% of the system mainline pavement has 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 11.4% of system-wide pavement surveyed in 2019 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 system-wide that was within these categories in 2004 before the CRP began. Additionally, 39.9% of pavement surveyed in 2019 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 6: Summary of Mainline Pavement RSL Values from the 2019 Evaluation (Lane Miles)

Tollway	≥ 20 Years	13-19 Years	9-12 Years	5-8 Years	3-4 Years	1–2 Years*	0 Years *	***Not Rated
Tri-State (I-294)	131.2	109.8	11.5	45.6	40.0	40.6	31.0	12.8
Tri-State (I-94)	76.7	79.5	10.9	0.0	0.0	0.0	1.6	37.7
Edens Spur (I-94)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1
Jane Addams (I-90)	403.2	5.3	84.0	8.1	0.0	0.0	0.0	0.0
Reagan (I-88)	105.5	129.5	179.9	25.2	7.8	0.0	0.6	16.7
Veterans (I-355)	0.8	173.3	2.1	3.5	0.0	0.0	0.0	16.7
EOWA (IL 390)	23.3	0.0	19.3	0.6	3.6	0.0	2.0	6.0
Total**	**740.7**	**497.4**	**307.7**	**83.0**	**51.4**	**40.6**	**35.2**	**85.9**
% of Total	**40.2%**	**27.0%**	**16.7%**	**4.5%**	**2.8%**	**2.2%**	**1.9%**	**4.7%**

* *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 2020 to 2027 and the Edens Spur (I-94) – programmed for reconstruction in 2018 to 2021.*

** *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 2020 to 2027, 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.

I-294 has some of the oldest pavement on the Tollway system, with portions along the central Tri-State nearing 60 years in age. In 2019, 69% of this corridor, including the Edens Spur, was rated in "excellent" to "good" condition. However, 28% of the corridor is estimated to have an RSL of under 12 years.

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. In 2019, 73% of this section was rated in "excellent" condition with an average RSL rating of 19.9 years.

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

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. In 2019, only approximately 0.5% of the section was rated in "excellent" condition with an average RSL estimated as 5.2 years. Approximately 23% of the section has an RSL of greater than 6 years.

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

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. In 2019, 55% of this section was rated in "excellent" condition with an average RSL estimated at 19.6 years.

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. 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. Toll Plaza 24 (Edens Spur) was subsequently converted to open road tolling in 2006.

The majority of this pavement was previously rated in "good" to "fair" condition (CRS) with an RSL rating of 0 to 2 years. The CRS and RSL ratings had rapidly deteriorated to a point where the majority of the pavement was recommended for work in the near future. Reconstruction and pavement preservation along this route began in 2018 with anticipated completion in 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.

In 2019, 95% of this corridor was rated in "excellent" condition with an average RSL along the corridor of 23.7 years.

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 89% is rated in "excellent" condition. This pavement is a mix of rubblized and reconstructed pavement. This will slightly reduce the RSL due to the anticipated need for future surface rehabilitations required on the rubblized sections. In 2019, an average RSL value of 10.9 years was estimated for this section.

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 96% is rated in "excellent" condition (CRS) with an average estimated RSL rating of 24.0 years.

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. In 2019, 96% was rated in "excellent" condition with an average RSL rating of 26.7 years.

4.2.4.3 Reagan Memorial Tollway (I-88)

The Reagan Tollway is in excellent condition with over 75% of the pavement having a CRS

greater than 7.5. During the 2019 survey period, about 95% of the I-88 corridor was rated in "excellent" and "good" condition. The average RSL for the corridor is estimated as 14.0 years with 29% of the corridor above 16.0 years.

I-290 to Illinois Route 56 (East)

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.

In 2019, about 55% of this section was in "excellent" condition with approximately 5.1 miles along the section scheduled for surface overlay in 2021.

Illinois Route 56 to Illinois Route 251 (Central)

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 2.25-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.

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 central portion of the Reagan Memorial received an additional 2.5-inch WMA overlay in 2018.

The rehabilitation of this pavement completed in 2012 and 2018 has served to increase the RSL 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. It is expected that this original concrete pavement and base will continue to deteriorate, resulting in depreciation in the current ratings, and may require a more frequent rehabilitation cycle.

The 2019 ratings saw 99% of the section in “excellent” to “good” condition.

Illinois Route 251 to Rock Falls/US Route 30 (West)

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 (MP 76.1). It was decided to accelerate the reconstruction of this pavement 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. In 2019, 98% of the pavement west of Illinois Route 251 was rated in “excellent” condition.

4.2.4.4 Veterans Memorial Tollway (I-355)

The original 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 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, commenced in 2018 with work extending through 2020. In 2019 85% of the I-355 corridor was rated in “excellent” condition. Sections, north of I-55, rated in 2019, indicated an average RSL along the corridor of 15.9 years.

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 a 2019 RSL rating of 19 years.

4.2.4.5 Illinois Route 390 Tollway

The existing 6.1-mile Illinois Route 390 Tollway, 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. In 2019, pavement condition between Lake Street to Illinois Route 83 showed 77% in “excellent” condition.

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 the edge-of-shoulder to the right-of-way fence, including the drainage systems and all safety appurtenances. Needed repairs are prioritized based on the level of severity and then quantified. These quantities may be included in the scheduling of tasks for the Tollway Roadway Maintenance Division or, depending on the severity and scope of the deficiency, added to future contracts.

4.3.1 Drainage Systems

Generally, visual inspection of the Illinois Tollway roadway drainage systems is performed annually, however some drainage assets are inspected on a four-year cycle. This inspection consists of visibly identifying any required repair activities of drainage structures, crossing culverts, slopes, ditches, detention basins, bioswales, and storm water outfalls.

The drainage systems throughout the Illinois Tollway are generally in good condition, and most of the embankment slopes are stable. Typical repair activities noted during the inspections included concrete headwall repair activities, 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 where curb and gutter is used along the roadway to control pavement drainage. These systems typically consist of storm sewers installed under the roadway pavement and shoulders that receive rainfall runoff via storm sewer catch basins. Only limited inspections can be performed on closed drainage systems due to access constraints; therefore, it is recommended that these systems be cleaned and televised to better determine their condition. Televising of closed drainage systems to identify areas of concern is programmed to occur prior to the development of designs for programmed roadway rehabilitation so that issues are addressed as part of the programmed roadway construction. As of 2019, there are 24,413 existing storm sewers, system-wide.

Crossing culverts are pipes that generally cross perpendicularly under the roadway to allow water to continue to flow from one side of the roadway to the other. Culverts are inspected for functionality, physical damage, 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. Crossing culverts not replaced during recent reconstruction or rehabilitation projects may in some cases be over 50 years old.

Deterioration of older Corrugated Metal Pipes (CMP) that were installed as part of the original construction of the Illinois Tollway continues to be a concern in those roadway sections not recently reconstructed. CMP deterioration typically occurs along the flow line or at the joints of the pipe. This deterioration may lead to perforation of the pipe that results in the erosion of the supporting soil and backfill material during rain events creating voids beneath the roadway.

As the volume of the voids increase, the probability of roadway pavement slab settlement or failure 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 may reveal deterioration of the original pipe and separation at the joints where the original pipe joins the new.

Due to the collapse of several CMPs, in 2007, the Illinois Tollway completed a detailed system-wide inspection of CMPs with a diameter of three feet or greater. 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.

Over time, most of the older CMPs have been replaced with reinforced concrete pipe as part of reconstruction or rehabilitation contracts. Currently, there are 569 CMP storm sewers and seven CMP culverts known to exist system-wide. Two maintenance contracts completed in 2010 repaired and/or lined existing CMPs with a diameter of three feet or greater that cross beneath the pavement. Although these contracts addressed many concerns with CMPs, smaller diameter and some non-mainline-crossing CMPs 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

Roadway safety appurtenance inspections are performed annually, or on an annual rotation cycle as appropriate. Safety appurtenances include positive protection devices (such as concrete barriers, guardrail, impact attenuators, and cable median barrier systems), as well as pavement markings, delineators, lighting, right-of-way fencing, and ground mounted signs. Evaluations include a passive visual inspection of the Illinois Tollway roadway safety appurtenances along with logging of visible deficiencies in the concrete barriers, guardrails/terminals, cable median barriers and impact attenuators.

Concrete barriers, guardrails, cable median barrier systems and impact attenuators throughout the system are generally in good to excellent condition. Any repair activities are promptly transmitted to the Division of Maintenance and Traffic for repair. 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 prohibits achieving this policy in some cases.

The guardrail, terminals, and impact attenuators included in projects as part of the *Move Illinois* and recently completed *Congestion Relief* capital programs have been upgraded to meet Illinois Tollway standards in place at that time in adherence with the National Cooperative Highway Research Program (NCHRP) *Report 350* or *Manual for Assessing Safety Hardware* (MASH), as appropriate. Guardrail standards used by the Illinois Tollway are regularly updated to reflect current crash test data and new technologies, in conformance with the requirements of NCHRP *Report 350* and *MASH*.

The *Manual for Assessing Safety Hardware* (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 NCHRP *Report 350* criteria. 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 construction sunset dates for NCHRP Report 350 devices, whereas new roadway safety products must comply with the new MASH requirements.

The Illinois Tollway has directed that all existing guardrail installations which have not been successfully tested under NCHRP *Report 350* requirements, be programmed to be upgraded to MASH-tested devices over the next several years. As such, the Illinois Tollway is scheduled to meet or exceed the dates outlined by AASHTO for the installation of safety appurtenances.

The current capital programs include funds for drainage and safety improvements system-wide 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.

In 2019, a detailed audit and inspection of existing guardrail, cable median barrier and impact attenuator installations was performed to provide a more comprehensive condition assessment of this infrastructure. The audit and inspections were performed in the office by reviewing high definition geo-located 360-degree video footage of the system. This method allows for a thorough and safe inspection of each asset. Per this audit there are 2,627 of these assets system-wide, with 78 required repairs addressed in 2019. Any repair activities deemed as beyond the capability of Tollway Maintenance have been recommended for repair or replacement in future contracts.

4.3.2.1 Guardrail

AASHTO's Strategic Highway Safety Plan lists objectives and strategies for keeping vehicles on the roadway and for minimizing the consequences when a vehicle does encroach on the roadside. Additionally, the National Cooperative Highway Research Program (NCHRP) also has published a series of guides to assist state and local agencies in their efforts to reduce injuries and fatalities along the nation's roadways. The current Manual for Assessing Safety Hardware (MASH) contains the current recommendations for testing and evaluating the safety performance of highway features and hardware, including longitudinal barriers, terminals, crash cushions, work zone elements, and breakaway structures.

The Midwest Guardrail System (MGS), is a non-proprietary steel post, W-beam guardrail system that has been successfully crash tested per MASH TL-3 criteria and is the current guardrail installed on the Illinois Tollway system. Guardrail and terminals along the Illinois Tollway system are considered to be in generally Excellent condition.

4.3.2.2 Impact Attenuator

Impact attenuators are protective systems that prevent vehicles from impacting rigid obstacles by a controlled deceleration. Impact attenuators are adaptable to many roadside locations where guardrail cannot practically be used. Impact attenuators along the Illinois Tollway system are currently rated in Excellent to Good condition.

4.3.2.3 Cable Median Barrier

Cable median 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 cable median barrier systems; however, all installations are inspected to confirm that they meet the current industry practices. Cable median barrier systems are in excellent condition due most these assets being replaced or newly installed as of 2016. Currently they are installed:

- West of Deerpath Road on the Reagan Memorial Tollway (I-88)
- At the southern terminus of the Veterans Memorial Tollway (I-355)
- Along the Elgin O'Hare Western Access (IL 390)

4.3.2.4 Delineators and Reflectors

Delineators and reflectors are installed throughout the Illinois Tollway system, typically affixed to guardrail or on sticks mounted in the ground. In general, these assets were found to be in fair condition. Inspections of these devices are performed by close review of high definition 360-degree camera footage typically captured at the end of each winter season. The Illinois Tollway performs regularly scheduled maintenance on these items system-wide at least twice per year.

4.3.3 Pavement Markings and Raised Pavement Markers

Pavement markings generally refer to lane striping and other demarcations designed to be in place under active traffic conditions. These pavement markings consist of durable thermoplastic material that is affixed directly to the pavement and is utilized throughout the Illinois Tollway system.

The Illinois Tollway maintains a Pavement Marking Database which contains historical installation data and retroreflectivity values. These values are updated as new information becomes available, typically through field measurement of reflectivity by the Pavement Management Consultant. The retroreflectivity values, in conjunction with visual inspections and historical records indicating the age of the markings, is utilized to determine locations for inclusion in the annual system-wide pavement marking contract and the scheduling of future contracts.

In 2019, 1,227.5-line miles of pavement marking were field inspected, and any repair activities communicated to the Illinois Tollway. Overall, lane markings varied from fair to excellent condition. Typical defects noted were missing or damaged sections of pavement markings.

The ongoing annual system-wide pavement marking renewal program provides upgrades to pavement marking visibility throughout the system. As part of this annual program, pavement markings are maintained and upgraded as indicated by age or the observation of defects. Pavement marking replacement is typically beyond the capabilities of Tollway Maintenance. It is most often recommended that areas exhibiting observed deficiencies as identified in the visual inspection and areas which exhibit low retro reflectivity be included for improvement in the annual system-wide pavement marking contract.

Raised pavement markers (RPMs) are low-profile reflectors affixed to the pavement that are typically used in conjunction with pavement markings to help delineate lanes at night or in

other reduced visibility conditions. Areas of missing reflectors typically are noted at the end of the winter season due to winter plowing. The Illinois Tollway performs regularly scheduled maintenance on these items system-wide on a three-year cycle within each individual Maintenance division. During regularly scheduled work, damaged or missing reflectors and castings are removed and replaced. RPMs throughout the Illinois Tollway system vary in condition from excellent to fair depending on when areas have been inspected and most recently repaired.

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 system-wide. In 2014, the contract work commenced for the installation of RPMs in sections of pavement in which they were not originally included. However as of 2019, the Illinois Tollway halted the installation of RPMs as part of any construction contracts pending the conclusion of further study, initiated in 2019, regarding their safety and effectiveness.

4.3.4 Roadway Lighting System

As of 2019 there were 12,945 light poles system-wide. 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. Corrective repairs are recommended to the Illinois Tollway Maintenance Division or, depending on the severity and extent of required repairs, forwarded for inclusion in future contracts.

The Illinois Tollway has implemented a plan to retrofit all roadway lighting luminaires from High Pressure Sodium (HPS) to less energy intensive LED luminaires. All future contracts will specify LED luminaires as part of new or replacement installations. As of 2019, LED lighting technology has been implemented along the following Tollway sections:

- Reagan Memorial (I-88)
- Tri-State (I-94) from northern terminus to Duffy Lane
- Jane Addams Memorial (I-90) from east of Mill Road to the eastern terminus
- Tri-State (I-294) from Balmoral Avenue to Lake-Cook Road
- Tri-State (I-294) Bensenville Bridge
- Tri-State (I-294) from southern terminus to 95th Street
- Veterans Memorial (I-355) from southern terminus to Butterfield Rd
- IL 390 Elgin-O'Hare Expressway

It is anticipated that LED lighting will be implemented along the following sections by the end of 2020:

- Jane Addams Memorial (I-90) from western terminus to I-39
- Edens Spur (I-94) from eastern terminus Duffy Lane
- Tri-State (I-294) from Bensenville Bridge to Balmoral Ave

- Veterans Memorial (I-355) from I-55 to Army Trail Road

4.3.5 Right-of-Way Fence

Right-of-Way fence inspections are conducted in the office by reviewing high definition, 360-degree drone video footage. The right-of-way fence throughout the Illinois Tollway system is generally in excellent to good condition. Deficiencies or required repairs identified during inspections are referred to the Illinois Tollway Maintenance Division or recommended for inclusion in future contracts.

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. Most right-of-way fence along the Tri-State Tollway (I-94/I-294/I-80) and the Reagan Memorial Tollway (I-88), all the Veterans Memorial Tollway (I-355) and over half of the Jane Addams Memorial Tollway (I-90) have been upgraded to the current Illinois Tollway standard chain-link fence.

4.3.6 Ground-Mounted Traffic Signs

Ground-mounted traffic signs are rated based upon visual inspection of their physical condition. Retroreflectivity measurements are not taken as part of these inspections. In 2019 there were 38,774 ground-mounted traffic signs throughout the Illinois Tollway system. The ground mounted signs are generally in fair to good condition. Damage to these signs is typically caused by traffic accidents or snowplows. The Illinois Tollway Sign Shop repairs or replaces these signs when damage is reported.

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 submersed 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.

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 610 vehicular bridges, six railroad bridges, 61 culvert bridges, one land bridge, two pedestrian bridges and four over-the-road oasis structures. Bridges and large culverts, classified as bridges in this category are inspected as part of a mandated bridge inspection schedule along with supplemental maintenance, fracture critical, damage and deficiency inspections. In 2019, the Tollway performed a total of 771 bridge inspections, including 353 scheduled routine inspections on bridges under Illinois Tollway jurisdiction.

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

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.

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 14 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 an Overall Condition Index (OCI) to more appropriately quantify the condition of the bridges throughout the Illinois Tollway system. The OCI 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 Overall Condition 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 following table provides descriptions of the bridge Overall Condition Index ratings.

Table 7: Overall Condition Index Rating Descriptions

H.I.	Description
≥90	No problems or some minor problems noted. No action required.
89 – 80	Some areas of minor deterioration. Minor repair by Maintenance or Contract would prevent additional deterioration.
79 – 70	Structural elements are sound but exhibit minor section loss or deterioration. Repair Contract likely needed within 5 years.
69 – 60	Advanced section loss. Repair Contract should be initiated within 2 years.
< 60	Advanced loss of section and deterioration. Local failures possible. Immediate attention needed.

The following table illustrates the bridge inspection Overall Condition Index summary. Since the bridges are on a two-year inspection cycle, the table illustrates the condition index rating for all bridges inspected in 2018 and 2019.

Table 8: Bridge Inspection Summary

Condition Index	2018	2019	Total
≥90	282	304	586 (85.8%)
80-89	36	23	59 (8.6%)
70-79	21	12	33 (4.8%)
60-69	4	1	5 (0.8%)
<60	0	0	0 (0.00%)
Total	343	340	683*

*Does not include the land bridge because an OCI rating is not assigned for this structure.

Five of the bridges inspected during the current two-year cycle had an OCI rating of Poor; however, one of these bridges has been replaced as noted:

Bridge 125: 159th Street (US 6) over I-294/I-80 MP 6.36

This bridge was replaced in 2019 under Contract RR-17-4349. The OCI Rating is now Excellent (100).

Bridge 223: SE I-290 Ramp H over I-290, I-294 MP 31.8

The bridge deck has an NBIS rating of Poor, the superstructure has an NBIS rating of Fair and the substructure has an NBIS rating of Fair. The bridge is currently planned for complete removal as part of ongoing design Contract I-17-4300. Interim bridge deck repairs were completed in 2019 under Contract RR-18-4439. The next scheduled inspection is in 2020.

Bridge 279: I-294 Ramp M & N under York Road, I-88 MP 136.68

The bridge deck and superstructure have NBIS ratings of Poor and the substructure has an NBIS rating of Satisfactory. The superstructure was analyzed and the load rating determined that the bridge has no reduction in load carrying capacity. The bridge deck and wearing surface are under the jurisdiction of the Village of Oak Brook. The remainder of the structure is under the Illinois Tollway's jurisdiction. Bridge repairs are in progress under Contract RR-13-4117R in coordination with the Village of Oak Brook.

Bridge 299: I-294 Ramps M & N under Windsor Road, I-88 MP 138.45

The bridge deck has a NBIS rating of Poor and the superstructure and substructure have NBIS ratings of Satisfactory. The bridge deck and wearing surface are under the jurisdiction of the Village of Oak Brook. The remainder of the structure is under the Illinois Tollway's jurisdiction. Currently, the bridge is planned for complete replacement in 2021 under Design Contract I-18-4352 in coordination with the Village of Oak Brook.

Bridge 341: I-294 / I-94 over Lake-Cook Road, I-94 Milepost 25.28:

The bridge deck has a NBIS Rating of Satisfactory, the superstructure has a rating of Poor and the Substructure has a rating of Fair. The bridge deck is under the jurisdiction of Cook County. The remainder of the structure is under the Illinois Tollway's jurisdiction. Bridge repairs are currently ongoing under Contract RR-16-4277R.

Of the 33 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 2026. 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.

Supplemental Inspections are performed as a proactive effort towards continuous improvement. These inspections differ from FHWA and IDOT Special Inspections which are intended to monitor a specific structural feature, repair activity or condition that must be monitored more frequently than required by other inspection types. Supplemental Inspections are generally performed on bridge identified during the previous year's scheduled inspection as having a small number of outstanding repair activities that do not affect the structural load-carrying capacity of the bridge. Supplemental Inspections typically are scheduled to provide repair recommendations and monitor those activities. Bridges selected for Supplemental Inspection had one of more bridge components and/or elements rated 6 (Satisfactory) or worse in the 2018 and 2017 Biennial Inspections.

Supplemental Inspections are conducted to determine an initial or updated scope of work and timeframe for required repairs. All bridges will still receive scheduled Biennial Inspections. In 2019, Supplemental Inspections were performed on 72 bridges throughout the Tollway system. Of these 72 bridges, several bridges exhibited structural or safety repair activities over traffic including spalling of the underside of the bridge deck or vertical face of parapet wall. The Illinois Tollway Maintenance Division completed repairs at 19 bridges to eliminate those conditions. Supplemental Inspections performed in 2019 identified no bridges that required immediate structural repairs due to a concern over the load-carrying capacity of the bridge.

4.4.2 Structural Walls

Structural walls include retaining walls, noise abatement walls and sight screen walls. In total, the Illinois Tollway has 943 walls under its jurisdiction.

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 25% 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 overall condition of the structural wall is assigned based on the extent and severity of all individual repair activities observed during the inspection. The condition ratings utilized for the structural wall inspections are included in the following table:

Table 9: Structural Wall Inspection Condition Rating Summary

Rating	Description
Excellent	There are no problems noted.
Good	Good condition exists with only minor problems noted.
Fair	Fair condition exists with minor section loss, cracking or spalling observed.
Poor	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.
Critical	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.

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. Recommendations provided for structural walls assigned a condition rating of poor to critical require monitoring or immediate attention.

The following table lists the number of structural walls inspected during the past four-year cycle. A majority (78.1%) of the structural walls inspected in the time period 2016-2019, were rated in excellent to good condition.

Table 10: Structural Wall Inspection Summary

Inspection Year	2016	2017	2018	2019
Total Walls Inspected	134	193	285	236
Excellent	27	48	96	79
Good	51	102	119	108
Fair	34	33	44	27
Poor	19	9	24	19
Critical	3	1	2	3

As part of the current capital programs, there are a number of projects ongoing or recently completed throughout the system which include the reconstruction of existing walls or the construction of new structural walls. Many of these structures are not accounted for in the Structural Wall Inspection Summary for the past 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 phased into the inspection schedule during the next four-year inspection cycle.

4.4.3 Overhead Sign Structures

Illinois Tollway overhead sign structures include cantilever (one support), span (two supports) and bridge mounted (above and attached to the bridge). Sign structures may support static signs, digital message signs, tolling, lighting and Intelligent Transportation System (ITS) equipment. The Illinois Tollway has 900 overhead sign structures under its jurisdiction.

Overhead sign structures along 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 25% 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 11: Overhead Sign Structures Inspection Condition Rating Summary

Rating	Description
Excellent	There are no problems noted.
Good	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.
Fair	Fair condition exists with the following: moderate corrosion or foundation cracking/spalling, several loose bolts or loose pillow blocks/saddles, etc.
Poor	Poor condition exists with signs of moderate structural cracking, section loss, heavy foundation cracking/spalling or collision damage. Sign structure requires monitoring.
Critical	Critical condition exists with major structural defects or loose components that could fall on roadway. Overhead sign requires immediate attention.

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 2016 to 2019. In addition, the table accounts for special inspections conducted in interim years to confirm that the severity of noted defects has not increased. Based on the 2016-2019 inspection cycle, 84% of the 900 Illinois Tollway overhead sign structures rate in excellent to good condition.

Table 12: Overhead Sign Structure Inspection Summary

Inspection Year	2016	2017	2018	2019
Total Sign Structures Inspected	188	188	226	225
Excellent	28	96	29	80
Good	139	82	159	115
Fair	18	7	30	21
Poor	3	3	8	9
Critical	0	0	0	0

As part of the current capital programs, there are a number of projects ongoing or recently completed throughout the system 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 sign structures will be phased into the inspection schedule over the next four-year inspection cycle.

4.5 Facilities

There are several types of facilities throughout the Illinois Tollway system, including operations and administration, maintenance, toll plazas, power and communications buildings, oases and pump stations. Each may also contain multiple facility assets such as buildings, fuel stations etc. The current Illinois Tollway inventory contains 185 facilities. Through 2019, 71.7% of the facilities inspected over the most recent inspection cycle rated a condition of excellent to good, 38 facilities were assigned a condition of fair and 11 facilities were rated poor. No facility was given a rating of critical. 12 facilities were new and not included in most recent inspection cycle. These facilities can be categorized as being in excellent. Inspection of these facilities will be incorporated into the next four-year inspection cycle.

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, mechanical and electrical, tunnels, canopies and sites with associated appurtenances. Facilities that are inspected include maintenance facilities, toll plazas, telecommunications buildings, oases and miscellaneous facilities. Facilities 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 25% 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. Starting in 2018, the inspection process included the use of Unmanned Aerial Vehicles to assess the conditions of canopies and roofs, making these inspections easier and safer.

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 13: Facilities Inspection Ratings Summary

Rating	Description
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

Due to recent major capital program construction, there are 70 newly constructed or reconstructed Illinois Tollway facilities throughout the system. Facilities rated as fair to poor have seen renovation work performed to enable these facilities to continue to function although costs to maintain and repair ancillary systems including plumbing, heating and cooling, mechanical and electrical will continue to increase. 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.

Illinois Tollway Building Maintenance Division forces provide necessary day-to-day repairs of facilities to the greatest extent possible. More intensive repair and rehabilitation work is performed as part of the capital programs.

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.

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 a 10-year program has been approved. However, due to funding restrictions, the budget is approved annually, thus requiring annual review of the program schedule and prioritization of needed repairs and facility upgrades.

Due to the adoption of the *Move Illinois* Program, a number of maintenance facilities are programmed for relocation, reconstruction or rehabilitation. Thus, 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 Contracts RR-12-4079 and RR-12-4267 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 a future design contract with budget to be determined.

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 at Maintenance Facilities M-6 (Marengo) and M-7 (Rockford) was completed in 2018. The Construction of the M-7 Truck Wash was completed in 2019. The reconstruction of the M-8 Facility is scheduled to begin in 2020 with completion in 2021.

In 2001, it was first recommended to program the replacement of deteriorated salt dome roofs throughout the system into a system-wide 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 five 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)
- Maintenance Facility M-8 (Naperville) - Construction beginning in 2020

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. System-wide, there were seven Toll Plazas last rated in poor condition.

- Plaza 14 (Route 59)
- Plaza 15 (IL Route 53)
- Plaza 18 (Arlington Heights Road)
- Plaza 31 (O'Hare West)
- Plaza 37 (I-55/Joliet Road)
- Plaza 38 (38th Street)
- Plaza 47 (Halsted Street/IL 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 over I-294 was taken out of service and demolished in 2018. Some activities remain at this location including gas stations and convenience stores operated by others.

The Hinsdale Oasis is scheduled for demolition starting in 2020 and to be completed in 2021.

4.6 ITS Devices

In 2016, due to the increased deployment of Intelligent Transportation System (ITS) devices throughout the Illinois Tollway system, the Consulting Engineers performed a field inventory of the ITS devices system-wide. This inventory was done to verify the location, condition and functionality of deployed devices. This information allows 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 devices are closed-circuit television (CCTV) cameras, vehicle detection systems (VDS), dynamic message signs (DMS), roadway weather information systems (RWIS), weigh-in-motion (WIM) stations, advanced warning flashing beacons, and active traffic management systems (ATMS). The ITS infrastructure consists of cabinet enclosures, pole mounting structures, and site foundations that are associated with each device.

As of 2019, the Illinois Tollway has the following ITS devices deployed in its system.

Table 14: ITS Device Summary

Type	CCTV[1]	VDS	Flash Beacon	DMS[2]	RWIS	WIM	ATMS[3]	**Total**
Quantity	1309	433	4	77	19	7	376	2,225

[1]CCTV devices consist of ITS, toll plazas and shared use cameras.

[2]DMS devices consist of Type 1, and Type 2.

[3]ATMS consist of lane control use sign and 3ftx9ft full-matrix display signs.

Inspections consist of 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. ITS assets located within an active construction zone are generally not inspected. 100% of all remaining ITS assets were inspected in 2019.

As a means to ensure that all ITS assets are kept in a satisfactory condition and inspectors, designers and maintainers have a consistent and objective standard for determining the status of ITS assets, the Illinois Tollway has developed the following Overall Condition Index (OCI) to measure asset condition.

Table 15: ITS Rating System

Rating	Description
Excellent **100 to 90**	New device, element or component Device, element or component is performing as intended No repair required Condition like new
Good **89 to 70**	Device, element or component is performing as intended Only minor repair (i.e. paint, clean etc.) required to return the device, element or component to intended condition.
Fair **69 to 50**	Device, element or component is performing essentially as intended Substantial repair (i.e. component/system required replacement) required to return the device, element or component to intended condition.
Poor **49 to 30**	Device, element or component has reached predicted end of useful life, but is functioning. Major components requiring extensive repair/replacement work to return the device, element or component to intended condition.
Critical **29 to 0**	Device, element or component is non-functioning. Safety or environmental concerns are prevalent.

The 2019 annual inspection of ITS assets reported that 94.8% of all the Illinois Tollway's ITS devices are operating within their intended lifecycle, and their infrastructures are estimated to be in "Good Condition" with an average Overall Condition Index (OCI) of 87.21.

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. The electronic tolling system is operated by the Illinois Tollway's Department of Business Systems (DBS) whose primary objective is revenue collection and assurance. Due to the business-critical nature of this system, it is compartmentalized, firewalled, and operated independently from any other Illinois Tollway system, including ITS.

The Illinois Tollway's electronic tolling system consists of technology deployed at its 93 toll plazas across 580 lanes that includes cameras, vehicle detection equipment, and point of sale equipment, as well as robust back-office hardware and software systems, telecommunications and networking facilities, violations processing, and an IPASS customer service center. Back-office operations are located across 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.

Tollway Staff and external personnel are responsible for preventive, routine and corrective maintenance of tolling system 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. DBS utilizes an independent asset management consultant who performs routine inspections to ensure the health and reliability of these technologies. Specific repair activities identified during these inspections will be documented and tracked in the DBS Asset Management System and preventative maintenance activities are deployed as needed to mitigate identified concerns. These systems are maintained in good condition.

Due to the increased deployment of, and reliance on electronic tolling system devices, it is recommended that the Illinois Tollway's independent inspectors continue to perform inspections, report findings to the DBS asset management consultant, and perform maintenance activities as directed to ensure the Illinois Tollway's assets remain in a state of good repair.

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 2020 through 2032. 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 $14.1 billion for the execution of *Move Illinois* Program as described in Sections 2 and 3 with approximately $6.3 billion spent through 2019
- 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 $8.3 billion of Illinois Tollway revenue.
- The below deposits consist of revenues to be used for Renewal and Replacement expenditures.
- Minimal proceeds from Bond Issuances in the years of 2027-2032.

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 16: Estimated Annual Renewal and Replacement Deposits

Year	Renewal and Replacement
2020	$120,000,000
2021	$228,000,000
2022	$228,000,000
2023	$216,000,000
2024	$216,000,000
2025	$216,000,000
2026	$216,000,000
2027	$552,000,000
2028	$500,000,000
2029	$500,000,000
2030	$500,000,000
2031	$500,000,000
2032	$500,000,000

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 currently consists of 16 primary functions, including: Administration, Business Systems, Communications, Directors/Executive, Diversity and Strategic Development, Engineering, Facilities and Fleet, Finance, Illinois State Police, Information Technology, Inspector General (Investigations), Internal Audit, Legal, Planning, Procurement, and Toll Operations. The following table identifies, by primary function, the budgeted and actual Operating Expenses for the Illinois Tollway in 2019, the budgeted Operating Expenses for 2020, and the tentatively budgeted Operating Expenses for 2021. Below are comparisons, followed by the table.

- The 2020 budget represented a 4.1% increase compared to the 2019 budget (not shown in the following table) and an 8.6% increase compared to 2019 actual expenses.
- The 2021 tentative budget represents a 0.2% decrease compared to the 2020 budget and a 6.6% increase compared to 2020 estimated actual expenses.

NOTE: Due to certain departmental organizational changes implemented in 2020 and effect for the "2020 Estimates" and "2021 Tentative Budget" shown below, the columns "2019 Actual" and "2020 Budget" have been restated to conform to such departmental organizational changes.

Table 17: 2020 Budgeted Expenditures

Department	2019 Actual	% of Total	2020 Budget	% of Total	2020 Estimate	% of Total	2021 Tentative Budget	% of Total
Administration	$4,618,724	1.3%	$4,028,545	1.1%	$4,101,000	1.1%	$5,473,982	1.4%
Business Systems	$19,508,860	5.6%	$24,298,388	6.4%	$25,080,000	6.9%	$24,033,003	6.3%
Communications	$1,502,051	0.4%	$1,627,127	0.4%	$1,597,000	0.4%	$1,571,104	0.4%
Diversity and Strategic Development	$4,640,734	1.3%	$5,825,200	1.5%	$4,886,000	1.3%	$6,355,368	1.7%
Engineering	$66,984,734	19.1%	$65,122,712	17.1%	$75,425,000	20.7%	$64,477,353	17.0%
Facilities and Fleet	$33,760,684	9.6%	$37,486,466	9.9%	$35,792,000	9.8%	$38,669,070	10.2%
Planning	$3,281,851	0.9%	$4,100,547	1.1%	$2,540,000	0.7%	$3,967,154	1.0%
Executive Office and Directors	$2,128,038	0.6%	$2,633,610	0.7%	$2,612,000	0.7%	$3,875,475	1.0%
Finance	$77,732,886	22.2%	$86,292,960	22.7%	$78,011,000	21.4%	$81,194,720	21.4%
Procurement	$13,031,867	3.7%	$23,567,202	6.2%	$21,444,000	5.9%	$26,827,033	7.1%
Information Technology	$833,926	0.2%	$1,155,956	0.3%	$757,000	0.2%	$1,143,658	0.3%
Inspector General	$662,890	0.2%	$1,048,037	0.3%	$652,000	0.2%	$1,168,165	0.3%
Internal Audit	$1,594,687	0.5%	$1,925,584	0.5%	$1,590,000	0.4%	$1,991,434	0.5%
Legal	$5,060,404	1.4%	$3,318,289	0.9%	$2,939,000	0.8%	$3,200,942	0.8%
State Police (Illinois)	$34,896,890	10.0%	$34,790,437	9.1%	$37,355,000	10.2%	$35,641,241	9.4%
Toll Operations	$79,967,467	22.8%	$83,026,478	21.8%	$70,219,000	19.2%	$79,926,740	21.1%
Total	**$350,206,694**	**100%**	**$380,247,536**	**100%**	**$365,000,000**	**100%**	**$379,516,443**	**100%**

The existing Illinois Tollway system to be maintained and operated includes 294 centerline 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). Improvements in progress as part of 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.

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. Five departments are influenced by dynamic factors that may change from year to year: Toll Operations, Business Systems, Engineering, Facilities and Fleet, and Finance. These five departments account for 78% of the Illinois Tollway's 2020 operating expense budget, and 76% of its 2021 tentative operating expense budget.

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 has continued to decrease over the past 10 years as the Illinois Tollway makes investments in electronic toll collection and as percentage of transponder transactions increase. The number of budgeted toll collector positions has decreased over 50% from 2009 to 2020. This trend continues in the 2021 tentative budget which reflects a 17% reduction in the number of budgeted toll collector positions compared to 2020, decreasing from 308 to 257. Toll collection staffing is expected to decline further over time as the percentage of manual transactions decrease due to market penetration of transponders and an expectation of an increased portion of the System that is all-electronic-tolling Expenses related to Toll Operations comprise approximately 21% of the 2021 tentative budget and are variable, impacted by 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 45% of the total department cost in the 2021 tentative budget. As staffing levels have adjusted downward, the salary and wage costs are reduced, even considering wage adjustments. The combined budgeted cost of salary, wages and benefits declined over 9% from approximately $39.4 million in the 2020 budget to approximately $35.7 million in the 2021 tentative budget.

All new facilities that the Illinois Tollway opens, such as the Elgin O'Hare Western Access roadways, have been and will be exclusively electronic. Additionally, the Illinois Tollway continues to evaluate options to increase the portion of its current system that is all-electronic, including the possibility of making permanent the system's current status as exclusively electronic, a status implemented effective March 14, 2020 in response to the COVID-19 pandemic and which remains in place as of the date of this report. The Tollway has not yet formally determined to eliminate cash tolling, but continues to study industry trends and evaluate options, and considers it unlikely that pre-pandemic levels of cash tolling will return.

6.2.2 Business Systems

The Business Systems Department expenses represent 26% of the Illinois Tollway's 2020 budget and is responsible for overseeing the electronic tolling system, collecting toll revenue, customer service, and assessing and collecting unpaid tolls.

Beginning in June 2020, the Illinois Tollway enacted a new invoicing process for unpaid tolls. Customers are still granted a 14 day period for to pay any unpaid tolls on-line at no additional cost, however after the 14 day period, rather than receiving a $20 violation fine for each unpaid toll, owners across all vehicle classes will receive an invoice for the unpaid tolls with an initial fee nearer the toll rates for each class of vehicles. Initial notice fees begin at $3.00 for standard passenger vehicles, to be followed by an additional $5.00 fee if nonpayment continues, eventually followed by the aforementioned $20.00 fine if nonpayment continues.

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 increasing number of electronic transactions year over year, and toll rate increases effective January 1, 2012 and January 1, 2015-2021, the overall department budget has increased by 120% between 2011 and the budget year 2021.

As discussed above regarding Toll Operations, while the Tollway is evaluating options to permanently increase the portion of its system that is exclusively electronic, including making permanent the current exclusively electronic status of the entire system, as implemented in March 2020 in response to the COVID-19 pandemic, 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 that of 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 new growth in system lane miles will all contribute to driving up costs within the Business Systems Department. Business Systems' expenditures are anticipated to experience an average annual increase of 4.9% 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 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.

The improvements made as part of the *Move Illinois* Program affect the Engineering Department in two significant ways:

- There is an increased need for additional engineers within design and construction units 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 *Move Illinois* Program budgets.
- Maintenance and Traffic units staffing needs are anticipated to increase as the system length and number of lane miles grow. Staff needs in most of the Engineering groups are also anticipated to increase due to additional traffic and the system growth.

Table 18: Growth in Illinois Tollway System

Year	Centerline Miles	Total Lane-Miles
2012	284.1	2044.2
2013	284.1	2047.9
2014	284.1	2127.7
2015	284.1	2133.5
2016	290.6	2255.1
2017	294.0	2277.0
2018	294.0	2277.5
2019	294.0	2290.7
2020	294.0	2295.9
2021	297.2	2331.6
2022	297.5	2337.8
2023	300.1	2369.9
2024	300.1	2387.8
2025	301.3	2398.6
2026	301.3	2408.9
2027	301.3	2417.9

For the 2021 Tentative Budget, the Engineering Department has budgeted for a headcount of 604 employees, with approximately 91% of the employees within the Maintenance / Traffic unit. The Maintenance / Traffic unit is subdivided into the following groups (staffing levels projected in the 2020 Budget):

- Roadway Maintenance has budgeted for 394 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 has budgeted for 68 staffed positions and is responsible for the maintenance of all Illinois Tollway vehicles.
- Sign Shop has budgeted for 20 staffed positions.
- Roadway Electric has budgeted for 17 staffed positions.
- Traffic Operations has budgeted for 17 staffed positions in the traffic operations center.
- Dispatch has budgeted for 36 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 2019 were snow and ice control (41%), roadside litter control (15%) and Motorist Aid (Aid Patrols & H.E.L.P. (9%).

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. A 5.8% increase in new lane miles is planned as part of the *Move Illinois* program, and a 4% 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, Employee Group Insurance, and Property Insurance for the Illinois Tollway. These three insurance items totaled $43.6 million in the 2020 budget and $40.1 million in the 2021 tentative budget, which represents a 49% of Finance Department expenses and 10.6% of total Illinois Tollway operating expenses. Insurance costs may vary in the future due to changes in premiums and staffing levels, self-insurance requirements and other factors. The Finance Department also includes bank charges for account replenishment, which totaled $30.2 million in the 2021 tentative budget, representing a 37% share of Finance Department expenses.

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 4% 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 annual CPI-based 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 – 2021, the employer contribution rates published by the State Employees' Retirement System (SERS) are as follows. A preliminary rate for State fiscal year 2022 is also included.

Table 19: State Employees' Retirement System – Employer Contribution Rate

State Fiscal Year	Beginning Date	Ending Date	Total Employer Contribution Rate
2013	7/1/2012	6/30/2013	37.987%
2014	7/1/2013	6/30/2014	40.312%
2015	7/1/2014	6/30/2015	42.339%
2016	7/1/2015	6/30/2016	45.598%
2017	7/1/2016	6/30/2017	44.568%
2018	7/1/2017	6/30/2018	47.342%
2019	7/1/2018	6/30/2019	51.614%
2020	7/1/2019	6/30/2020	54.290%
2021	7/1/2020	6/30/2021	54.831%
2022 (projected)	7/1/2021	6/30/2022	56.169%*

* *Released at SERS Board meeting dated October 27, 2020.*

Factoring 7.65% FICA contribution, an overall employer contribution rate of 56.4% has been used for the purposes of projecting future operating costs beyond 2022.

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 2020 through 2032 as provided in the table below.

Table 20: Estimated Operating Expenses

Year	Operating Expenses (Millions)	Annual Increase
2020	$365.0	
2021	$379.5	4.0%
2022	$395.5	4.2%
2023	$409.4	3.5%
2024	$424.0	3.6%
2025	$439.0	3.5%
2026	$455.3	3.7%
2027	$471.8	3.6%
2028	$488.2	3.5%
2029	$505.0	3.4%
2030	$522.4	3.4%
2031	$540.4	3.4%
2032	$559.2	3.5%

The estimates for Operating Expenses prepared by the Consulting Engineers and included in this report have an average growth per year of approximately 3.61% between 2021 and 2032. 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, so 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 2032). 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 is being partly 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 are 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 2020, the ninth 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 estimated cost of the *Move Illinois* Program at $14.107 billion appears reasonable.

This report is intended for the use of the Illinois Tollway for inclusion in the Preliminary Official Statement and Official Statement for the Illinois Tollway's issuances of Toll Highway Senior Revenue Bonds, 2020 Series A and 2020 Series B, the sales and issuances of which are expected in the fourth quarter 2020. This report is subject to the limitations described within each Official Statement, 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, such as the COVID-19 pandemic, are 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 presume 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.