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OHIO TURNPIKE AND INFRASTRUCTURE COMMISSION 64th ANNUAL CONSULTING ENGINEER INSPECTION REPORT



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TABLE OF CONTENTS

1.0	Introduction.....	1
2.0	Report of Findings and Recommendation for Maintenance and Repair.....	4
2.1	Pavement and Shoulders	4
2.2	Landscaping.....	6
2.3	Bridges	7
2.4	Culverts.....	14
2.5	Fence and Guardrail	17
2.6	Interchanges	18
2.7	Technology.....	20
2.8	Buildings	26
2.9	Maintenance Organization and Equipment	32
2.10	Safety and Signs.....	33
2.11	State Highway Patrol.....	38
2.12	Traffic, Revenues and Expenses	40
3.0	Estimate of Current Expenses.....	41
4.0	Schedule of Insurance	42
5.0	Renewal, Replacement and System Project Funds	43

Appendices

Appendix A:	Ohio Turnpike Straight Line Diagram (Strip Map).....	44
Appendix B:	Pavement Resurfacing and Replacement	46
Appendix C:	Bridge Deck Replacement and Rehabilitation.....	53
Appendix D:	Current Bridge Repairs, Rehabilitations and Replacements.....	69
Appendix E:	Crash Statistics	73
Appendix F:	Schedule of Insurance	77

1.0 INTRODUCTION

This report is a general summary of the 2019 routine field inspection findings of Ohio Turnpike and Infrastructure Commission (OTIC) assets; specifically, the bridges, culverts, pavement, signs and buildings including a summary of observations pertaining to new construction, maintenance, revenues, traffic and safety. Detailed 2019 field inspection notes were delivered to the OTIC staff in July and September of 2019 for their use in the early planning of maintenance and repair programs for 2019 and beyond. In addition, the Ohio Department of Transportation (ODOT) and Federal Highway Administration (FHWA) bridge inspection reports were completed and submitted to the OTIC in July 2019 to meet federal and state reporting requirements.

Pavement and Bridge Conditions

During the 2019 calendar year, capital improvements were made totaling over \$127 million. Continued improvements on OTIC bridges resulted in the repainting of nine (9) structures and significant work to twenty-six (26) others. To minimize future maintenance expenses, five (5) mainline bridges are in the process of being removed and replaced with embankment or a culvert with three (3) to be completed in 2019 and two (2) in 2020. Deck replacements were performed on eight (8) bridges, one (1) bridge received a deck overlay and one (1) bridge was replaced. Bridge widening and existing deck replacement was also performed on nine (9) bridges. Additionally, ten (10) bridges throughout the Turnpike received various repairs including fence, parapet and bearing replacements / rehabilitations.

Following the 2014 completion of the OTIC Third Lane Program project between MP 59.52 and MP 64.13 in Lucas County, the OTIC now boasts three continuous lanes in both the eastbound and westbound directions from MP 59.52 to MP 218.70. There are currently no further scheduled OTIC Third Lane Program projects. As a part of the Toll Collection System Modernization project, additional lanes will be added in the future to accommodate these upgrades.

In 2009, the OTIC completed a study to evaluate the condition of the original concrete pavement for the entire 241 miles of the Turnpike. The purpose and goal of the study was to assess the life expectancy of the pavement and make a recommendation for the sequential reconstruction along the entire length of the Turnpike. The study has shown that the pavement and roadway

elements are in relatively good condition for its age, however, the base pavement is in differing states of deterioration. The report has aided in the creation of a 50-year capital plan including replacement, rehabilitation and maintenance of the pavement and bridges on the Turnpike. In 2011, the OTIC began replacement of the original concrete pavement from MP 95.9 to MP 101.2 to be used as a guideline for future original concrete pavement replacement projects. The OTIC continued the program in 2019, resulting in 23.38 lane-miles being replaced as well as 47.8 lane-miles of mainline pavement resurfacing. To date including 2019 projects, 237.42 lane-miles of original roadway have been replaced as a part of this program. Also, in 2019, 8.38 lane miles of contracted mainline pavement repairs were performed in addition to the routine repairs performed by the OTIC's maintenance staff. Added toll plaza lanes were constructed at Exit 180 to facilitate easier access to and from the Ohio Turnpike.

Facilities

Over a 15-year period (1998 to 2013), fourteen (14) of the original sixteen (16) service plazas were replaced. Since then, the OTIC service plaza program has been focused on maintaining high standards of service and excellent facility conditions. In 2019 roof upgrades were completed at two (2) plazas. Additionally paved areas in two (2) service plazas were repaired and sealed. Currently three (3) of the seven (7) pairs of service plazas constructed during the early phases of the replacement program have been updated. The service plazas are modern, state-of-the-art facilities with improved energy efficiency, designed to accommodate the ever-increasing number of Turnpike travelers. Amenities for the service plazas include a food court arrangement with a sit-down restaurant and multiple fast food vendors, electronic travel and weather information centers, and retail outlets. Special truck driver areas have been incorporated into the facilities which include a lounge, laundry and shower facilities. Also in 2019 Electric Vehicle Charging stations were added at four (4) service plazas. In 2017 OTIC entered into a contract with a consultant to develop a more in-depth strategic plan for all facilities including maintenance buildings, service plazas, toll plazas and the administration building. This strategic plan is still under development.

Highway Safety

The OTIC highway safety record continues to compare favorably with other similar interstate type facilities. The accident rate per one hundred million vehicle-miles increased from 73.0 in 2017 to 78.3 in 2018 (2238 total accidents in 2017 compared to 2397 in 2018). The rate of accidents resulting in fatalities increased from 0.2 in 2017 to 0.3 in 2018. For the first eight months of 2019, total accidents have increased slightly compared to the same time period in 2018. Total accidents for this time period was 1411 in 2018 compared to 1456 in 2019. The accident rate resulting in fatalities for the first eight (8) months of 2019 increased slightly to 0.5 compared to the same time period from 2018.

Revenue

Total revenues for the OTIC from all sources in 2018 were approximately \$353,534,000, up 7.1% compared to 2017. Meanwhile, total expenses decreased 10.8% including interest expense and ODOT Infrastructure Project Expense. The increase in revenue can, in large part, be attributed to an increase in commercial vehicle traffic as well as a 2.7% toll rate increase on January 1, 2018. The total miles traveled per passenger vehicle decreased by 2.3% while commercial vehicle total miles traveled increased by 4.3%. The increases in total vehicles and average vehicle mileage resulted in an approximate 3.5% increase in 2018 toll revenue. The revenue data for the first eight months of 2019 shows that, when compared to the same period in 2018, toll revenues from passenger cars was down 0.9 percent and toll revenues from commercial vehicles was up 1.4 percent. Total toll revenues were up 0.5 percent for the first eight months of 2019 and investment income up 28.2 percent. Total revenues for the first eight months of 2019 were up 1.8 percent compared to January-August, 2018. The total number of vehicles using the Turnpike during January-August, 2019 was 3.8 percent lower than for this same period in 2018. Based on current trends to date, total revenues from all sources for 2019 are estimated at approximately \$362,000,000.

2.0 REPORT OF FINDINGS AND RECOMMENDATION FOR MAINTENANCE AND REPAIR

2.1 Pavement and Shoulders

In 2009, the OTIC completed the evaluation of the condition of the original concrete pavement for the entire 241 miles of the Turnpike. The comprehensive pavement evaluation and analysis identified the factors contributing to the current condition of both the pavement and the subbase. The purpose and goal of the study was to assess the remaining life expectancy of the original base pavement and make a recommendation for the sequential reconstruction along the entire length of the Turnpike. Based upon the 2009 report and continuing annual pavement assessments, the OTIC is continuing the reconstruction of the original base pavement through the Pavement Replacement Program as detailed below:

Pavement Replacement project Started in 2018 and to be completed in fall of 2019

MP 149.24 to MP 154.10

Pavement Replacement project Started in 2018 and to be completed in fall of 2020

MP 169.74 to MP 176.34(EB) and MP 176.59(WB)

The final project of the Third Lane Expansion Program was completed in 2014 between MP 59.52 and MP 64.13. The OTIC now boasts a continuous three-lane roadway spanning 159.18 miles from MP 59.52 near Toledo to MP 218.70 near Youngstown.

In 2019 the OTIC performed several mainline resurfacings totaling approximately 47.8 lane-miles spread throughout the Turnpike. In addition, 41.02 lane-miles were reconstructed as part of the 2019 Pavement Replacement Program projects. The overall Resurfacing Program continues to be closely coordinated with the Pavement Replacement Program and prioritized based on the annual pavement assessments. In 2019 8.38 lanes miles of pavement received contract repairs in addition to the routine repairs performed by OTIC Maintenance staff. See **Appendix B** for additional information on pavement resurfacing.

A visual inspection of the roadway, shoulders, embankments and median barrier are performed annually, and a report of these findings are provided to OTIC to assist in the planning of roadway maintenance projects. Overall, the mainline travel lanes on the Turnpike continue to be very well maintained, earning an average Pavement Condition Rating (PCR) score of 83.53/100 in 2019 up slightly from 83.10/100 in 2018. AECOM expects the ODOT PCR ratings will remain similar and or increase resulting from the continued OTC investment in the traveled pavement. The shoulders are also well maintained with an average rating of “GOOD” per the ODOT pavement condition rating criteria from AECOM’s inspection. Deductions in the shoulder score were primarily due to rough pavement, spalling and shifting of pavement and scattered areas of erosion. The current Resurfacing and Pavement Replacement Programs continue to prove effective, providing a consistent and reliable driving experience throughout the full length of the Turnpike. Therefore, AECOM recommends that the OTIC continue the Resurfacing and Pavement Replacement Programs as detailed in the current 50-year Capital Master Plan. **Figure 2.1.1** shows the changes in these scores by percentage over time beginning in 2013 when ODOT PCR scoring criteria was utilized.

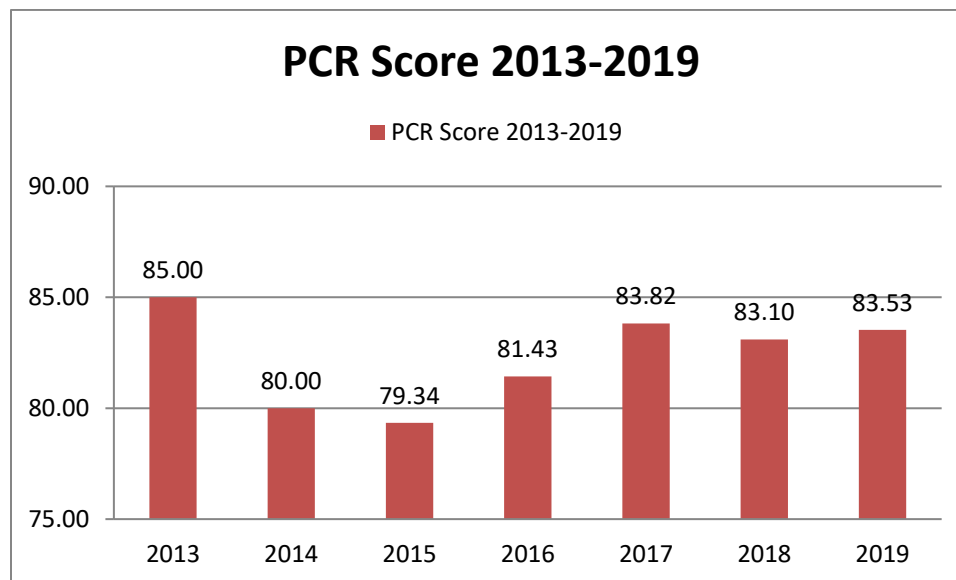


Figure 2.1.1 – Graph showing distribution of Pavement Condition Ratings over time (PCR scoring criteria from ODOT)

2.2 Landscaping

The OTIC landscape personnel continue to supervise the contract herbicide spray program along the mainline and at interchanges, and perform minor herbicide and pesticide spraying at interchanges and service plazas. Landscape personnel maintain landscaping along the right-of-way and also construct and maintain the landscaping and plantings at the interchanges, service plazas, maintenance buildings and administration building. The OTIC's landscape personnel developed and implemented the landscaping plans for the seven pairs of newer service plazas. In addition, landscaping plans were developed for exits and interchanges. In partnership with Keep Ohio Beautiful and Davey Resource Group, pollinator gardens, incorporating native Ohio plant species, were installed at the Middle Ridge and Vermilion Valley Service Plazas in 2016 and at the Mahoning Valley and Glacier Hills Service Plazas in 2017. The landscaping beds and lawn areas were upgraded around the service plazas at Indian Meadow and Tiffin River in 2018. The landscaping beds and lawn areas were upgraded around the service plazas at Blue Heron, Wyandot, Erie Islands, and Commodore Perry in 2019. Additionally, in 2018 and 2019, as part of the pavement replacement projects and individual maintenance contracts, clearcutting and large-scale tree removal was performed at various locations along the mainline and ramp interchanges to improve sight distance and maintain clear zone areas.

Condition of the landscaping was considered during bridge, culvert, roadway and facilities inspections. The right-of-way continues to be well maintained, with no notable issues. AECOM recommends that landscaping continue to be performed as planned throughout 2019.

2.3 Bridges

Based on the bridge condition inspections performed in 2019, the large majority of bridges maintained by the OTIC are in Satisfactory to Excellent Condition (NBIS Scores 6-9) according to National Bridge Inspection Standards (NBIS). Per ODOT and OTIC policy the total number of bridges maintained by OTIC is 544. Out of a total of 544 bridges, only 4.9% of the structures (27 total) rate below Satisfactory Condition (**Figure 2.3.1**) and the majority of deficiencies at these structures is related to substructure (piers and abutments) concrete deterioration. While this number is up 1% from 2018 the overall average general appraisal score has increased 0.5% illustrating the OTIC's continued investment in caring for its aging infrastructure. Of the substructure deficiencies, the most downgraded element impacting the overall structure rating was found to be the piers. The piers rating below Satisfactory do not currently pose a safety hazard to the public; however, continued deterioration has the potential to increase maintenance and repair costs as well as decrease the overall service life of the structures. Rehabilitation should be performed at these structures in the near future and the deficient elements should be monitored closely until repairs can be made. **Figure 2.3.2** shows the changes in these scores by percentage of inventory over time.

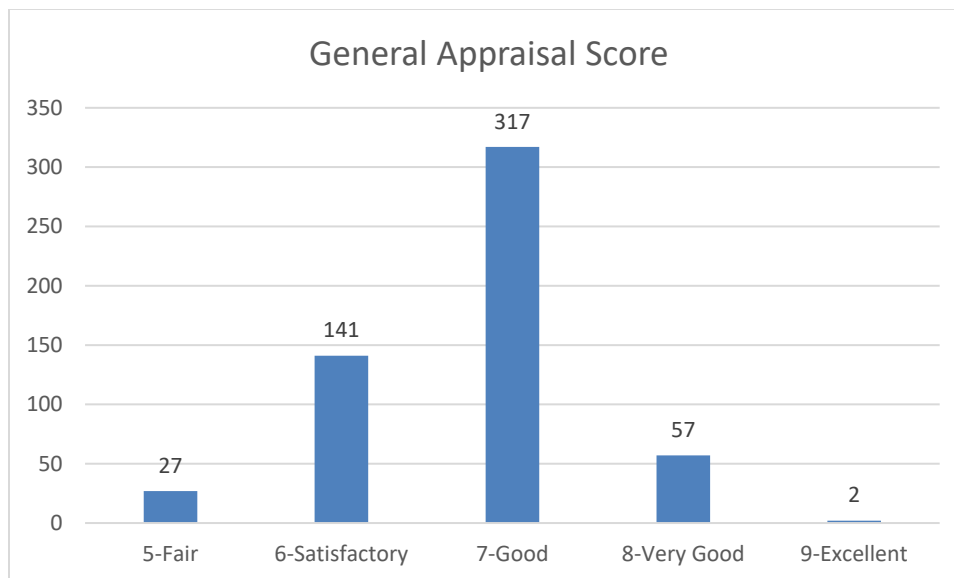


Figure 2.3.1 – Graph showing distribution of overall NBIS Condition Ratings for bridges maintained by the OTIC. NBIS Scoring criteria based on 1-9 evaluation with 1 being Imminent Failure and 9 being Excellent. Ratings of 5 or greater indicate structural elements may or may not show deterioration but remain sound with no significant affects to the main load path. For additional information see ODOT MBI 2014 Table 34.

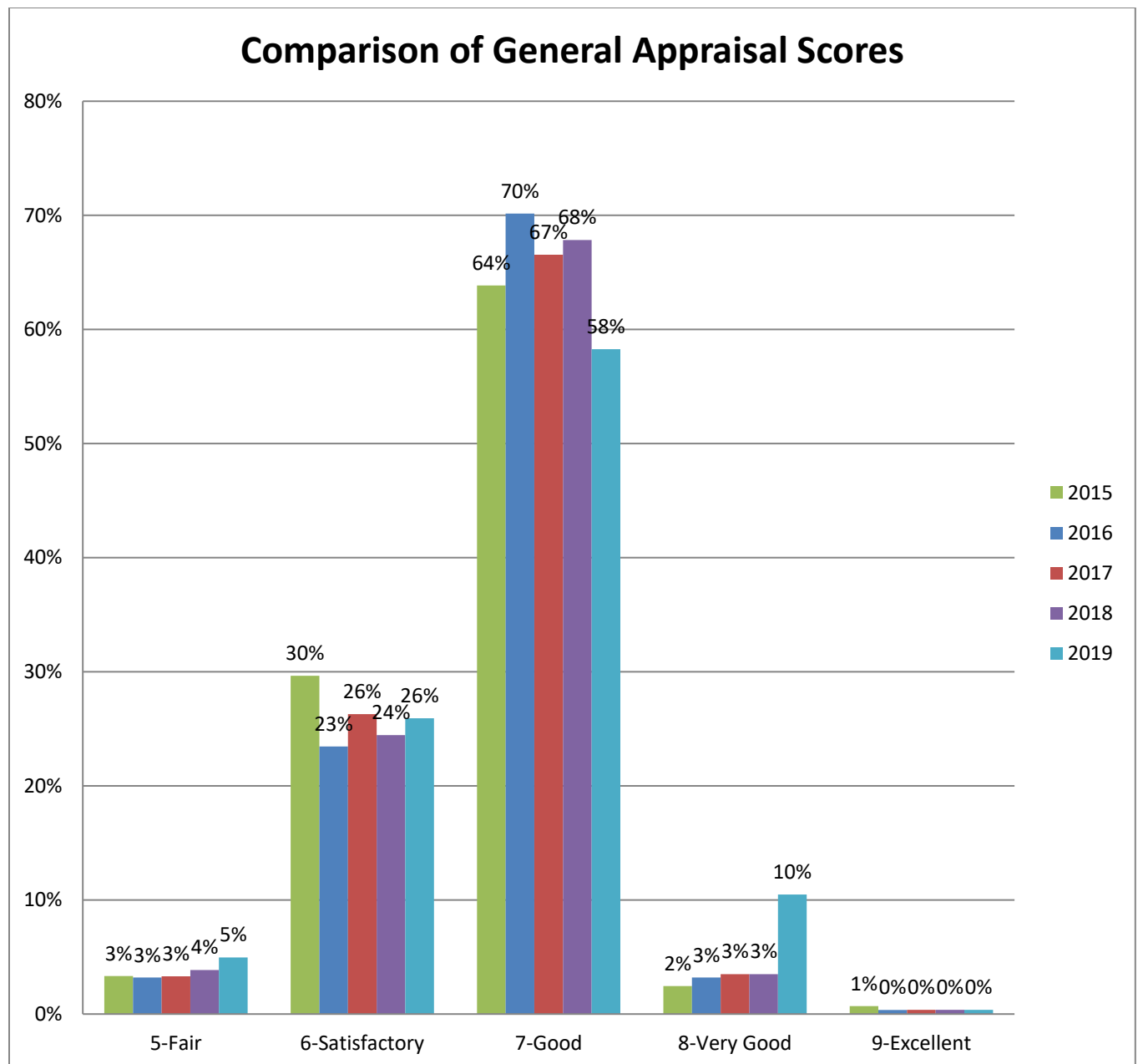


Figure 2.3.2 – Graph showing distribution of General Appraisal ratings for bridges maintained by the OTIC as viewed on the SMS inspection form from 2015-2019. (Note due to rounding and for clarity total may not equal 100% in some years)

Major and/or Fracture Critical Bridges

In depth Major Bridge Inspections of the Ohio Turnpike Bridges over the Maumee River and the Ohio Turnpike Bridges over the Sandusky River were performed in July of 2019. As a part of the inspections underwater diving and channel profiling was completed at all substructure locations to check for any scour related issues that would affect the bridges. These inspections were completed in accordance with FHWA and ODOT guidelines with the inspection reports submitted to OTIC under separate covers. No critical findings as defined by the ODOT MBI 2014 were found in any of these inspections.

An arms-length fracture critical inspection was performed on the Ohio Turnpike Ramp over US 250 bridge, the State Route 88 Bridge over the Ohio Turnpike, and the Olde Eight Road Bridge over the Ohio Turnpike in accordance with FHWA and ODOT guidelines with the inspection reports submitted to OTIC under separate covers. No critical findings as defined by the ODOT MBI 2014 were found in any of these inspections.

2019 Structure Improvements

The OTIC 2019 Capital Program includes minor to major repairs and rehabilitations to several structures along the Turnpike (**Appendix D**). One (1) emergency repair contract was let in 2019, and four (4) additional bridges were struck by over-height vehicles requiring repair. These repair plans are under development with lettings anticipated in 2020. During 2019, a total of ten (10) bridges were rehabilitated with various repairs to elements such as decks, fencing, parapets, bearings and joints. Various rehabilitation repairs were completed on ten (10) bridges (this includes four (4) overhead and six (6) mainline bridges within Pavement Replacement projects). Also nine (9) bridges will be repainted in 2019 to minimize future deterioration of the steel superstructures.

A total of twenty-six (26) bridges are receiving significant work in 2019. This includes eight (8) bridges receiving deck replacements, one (1) receiving a deck overlay, an additional nine (9) being widened, and receiving existing deck replacements. Following the widening, eight (8) of the bridges will be reclassified as four (4) bridges under ODOT's inventory and coding guidelines. One (1) bridge is scheduled to be replaced completely in 2019. Additionally, to reduce current and future maintenance costs three (3) bridges are being eliminated in 2019 with two (2) more scheduled to be eliminated in 2020 with work beginning in 2019.

Maintenance and Repair Recommendations

The “General Appraisal and Operational Status” rating given to each structure describes its overall condition. Based on a scale of 1 thru 9, this rating is determined, in essence, by the Substructure or Superstructure (beams) conditions. Review of the summary ratings produced from the findings of the 2019 bridge safety inspections shows that substructure elements remain the predominant controlling factor in the overall General Appraisal ratings. Overall Ratings continue to increase in 2019 due to a significant number of focused rehabilitations. However, for the first time since element level data was recorded in 2014, bridges rated as fair have increased. The baseline for comparison is 2014 as this was the first year Element Level Scoring Criteria was utilized in the bridge safety inspections. Element level scoring criteria assigns the score based on percentage deficient rather than a score based on the lowest deficient item controlling the entire score. For example, under the previous scoring system, a bridge where 90% of the superstructure is good and 5 % is satisfactory and 5 % is fair, then the entire structure would be rated as fair. Under the new element level scoring the superstructure would be rated as good. **Figure 2.3.3** shows that only 4% of OTIC substructure summaries (19 structures) receive below a satisfactory rating (NBIS-6), while 1% (6 structures) of the superstructure summaries receives a rating below satisfactory (NBIS-6). **Figure 2.3.4** and **Figure 2.3.5** show the changes over time between superstructure and substructure ratings for the last five (5) years where element level scoring was utilized.

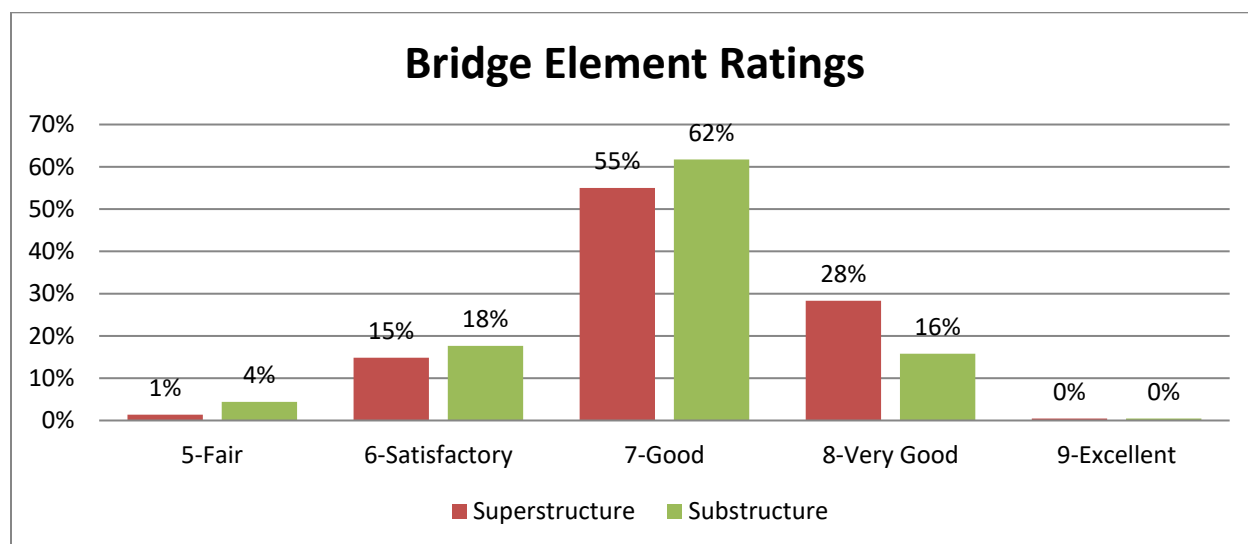


Figure 2.3.3 – Graph showing distribution of Superstructure and Substructure summary ratings for bridges maintained by the OTIC as viewed on the SMS inspection form. (Note due to rounding for clarity total may not equal 100%)

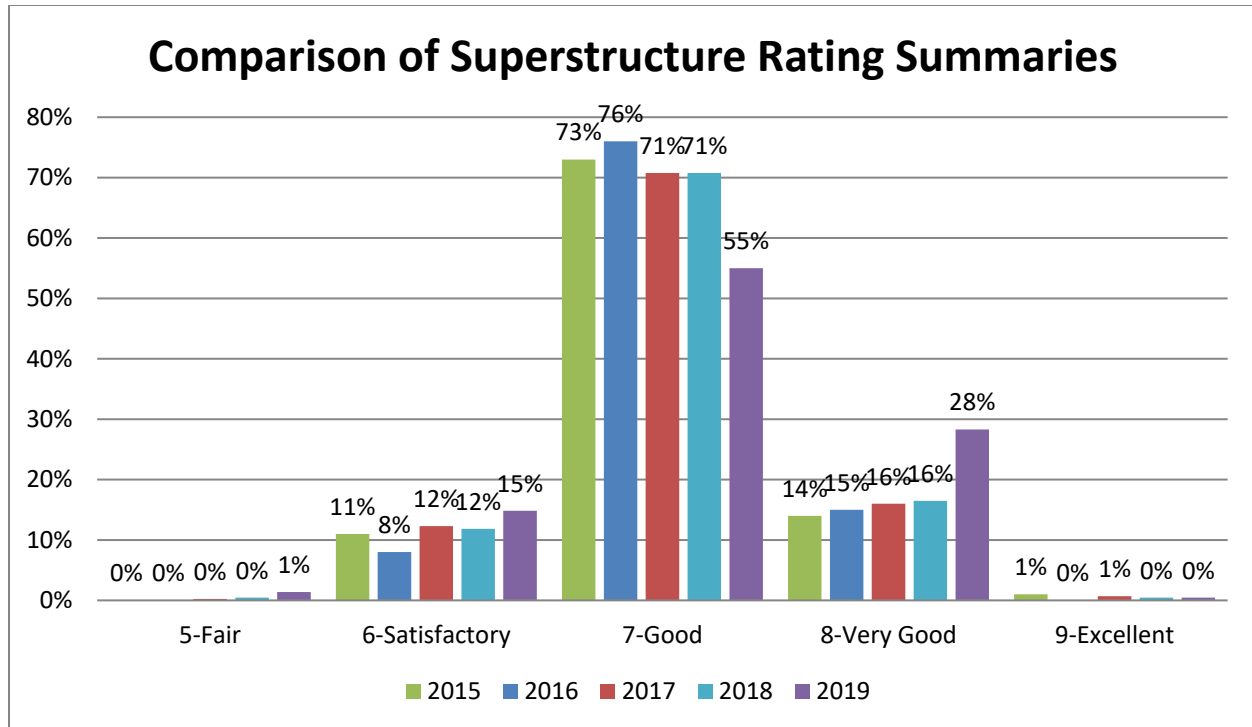


Figure 2.3.4 – Graph showing distribution of Superstructure summary ratings for bridges maintained by the OTIC as viewed on the SMS inspection form from 2014-2018. (Note due to rounding for clarity total may not equal 100% in some years)

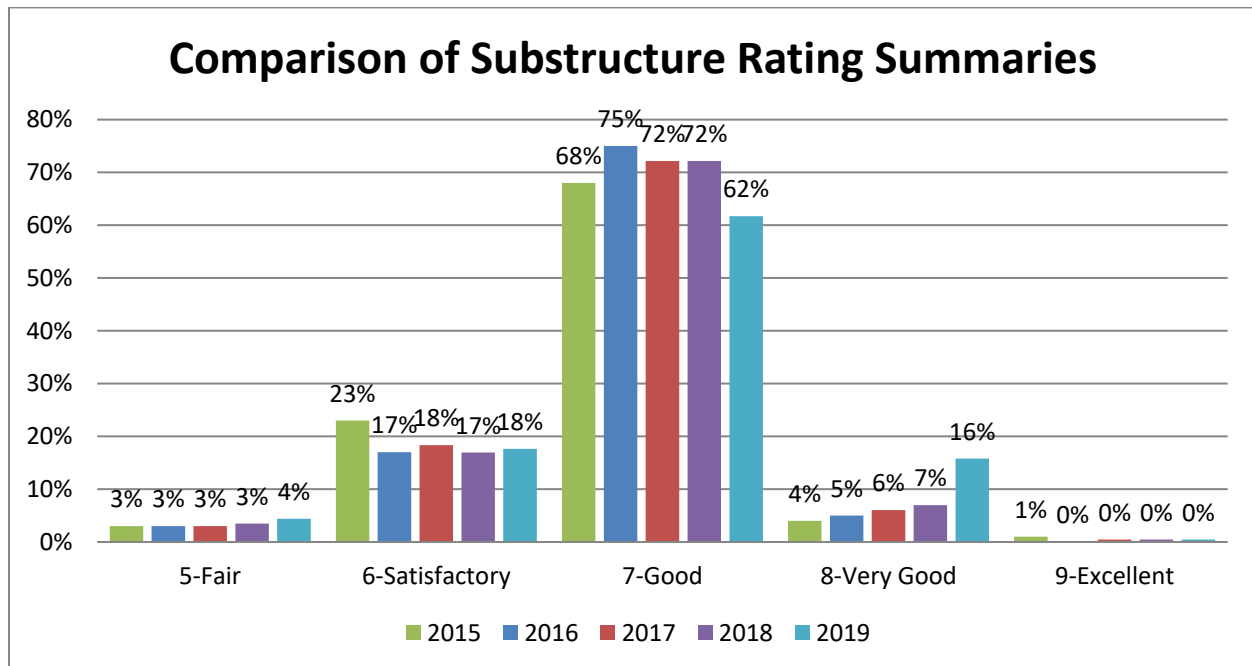


Figure 2.3.5 – Graph showing distribution of Substructure summary ratings for bridges maintained by the OTIC as viewed on the SMS inspection form from 2014-2018. (Note due to rounding for clarity total may not equal 100% in some years)

In general, a below satisfactory summary rating does not indicate a condition that is unsafe for either of these elements. However, based on the distribution of ratings, the OTIC should consider developing a substructure preventative maintenance and repair plan aimed to extend the usable life of these critical infrastructure elements as well.

Superstructure ratings for steel structures (the predominant type of superstructure on the Turnpike) are typically controlled by the amount of steel section loss and cracking in secondary diaphragm members and connection plates. The condition of the steel structures is generally good (NBIS-7) with regard to section loss. This can in large part be attributed to the OTIC on-going bridge painting program.

Some structures were noted to have diaphragm and weld cracks forming as well as loosening connectors, and the OTIC should consider a long-term maintenance and repair plan to mitigate these effects and extend the useable life of the structures. As of 2019 this continues to occur in approximately fifty (50) structures and, while not being a safety issue, it should continue to be closely monitored. Additionally, as a part of the next inspection cycle, the OTIC should consider provisions for up-close, hands-on inspection of a random sample of bridges with this condition in order to better evaluate the extent of these deficiencies.

The impacts of steel corrosion at the original expansion bearings beneath expansion joints in the bridge decks throughout the Turnpike are pronounced. The development of large quantities of pack rust between the bearing components has created significant problems in regards to bearing alignment and function in some locations. Bearing issues of this nature not only reduce the functionality of the bearing itself, but create significant problems in adjacent members including floating bearings, vertical misalignment of the expansion joints (leading to snow plow blade impact damage), and out of plane bending cracks at beam ends and stiffeners/diaphragms. Under past bridge repair contracts and continuing with 2018 projects, the OTIC rehabilitated as well as replaced many of these deficient bearings with an elastomeric type. Elastomeric bearings by nature are less prone to this type of deterioration and should alleviate many of these issues in the future. Despite the bearing work already completed, many original and or rehabilitated bearings that were not replaced with elastomeric bearings still exhibit significant issues and the OTIC should consider developing an aggressive bearing rehabilitation and/or replacement program to improve long term serviceability and performance.

Over the past several years, many bridges on the Turnpike have been exhibiting delaminating parapet concrete over the mainline roadways. The potential for falling concrete poses a significant threat to the traveling public and, when discovered, is immediately addressed by both bridge inspectors and OTIC maintenance crews. The bridge safety inspections occur only one time a year and reveal many of these issues; however, these problems develop year-round and, as such, the OTIC should consider implementing a parapet monitoring program in order to minimize these public safety hazards. It has been noted that these parapet deficiencies typically stem at the vandal fence anchor locations.

Documentation

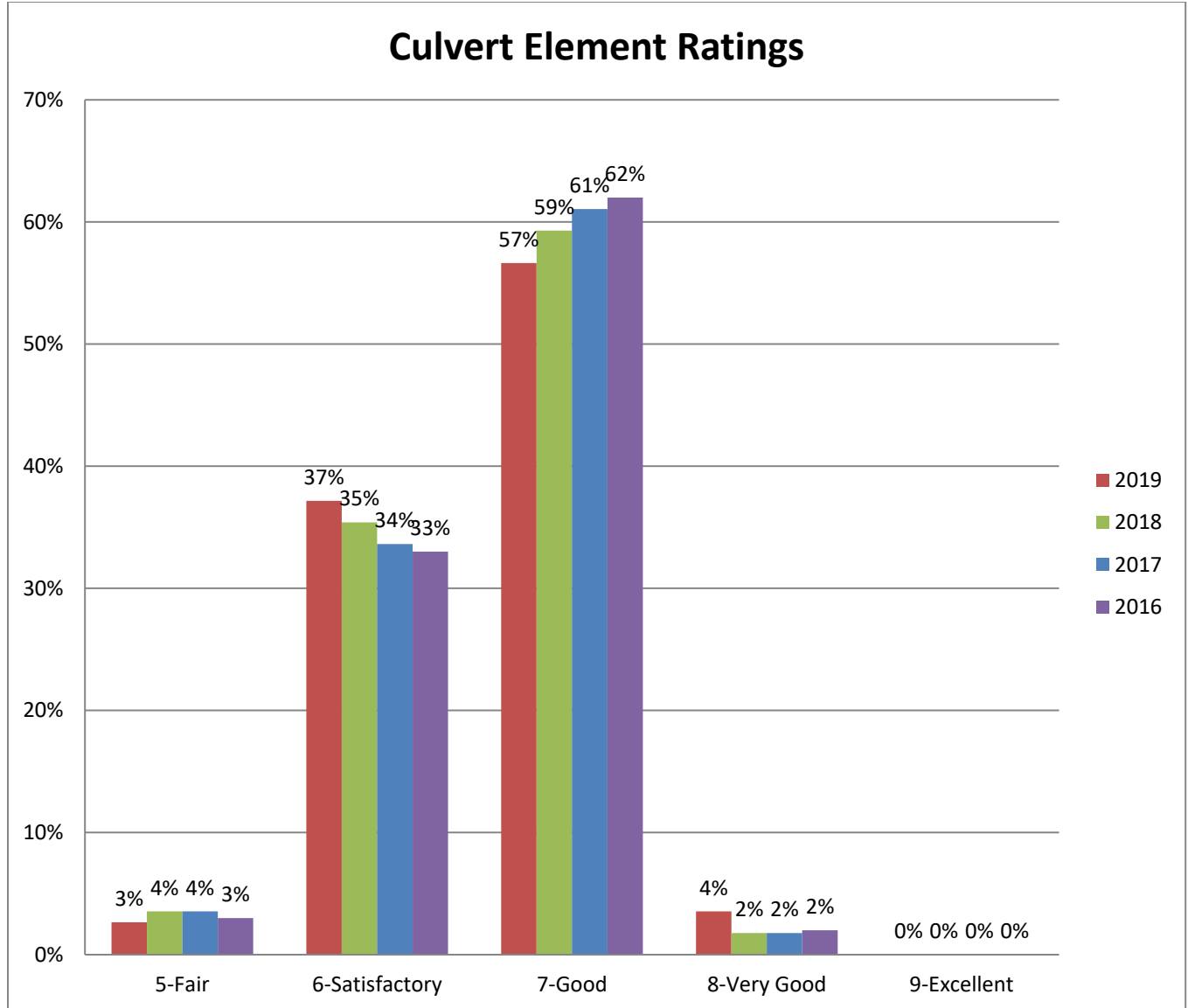
As required by the Federal Highway Administration and the Ohio Department of Transportation, inspection reports for 2019 have been prepared by AECOM for the OTIC on all Turnpike bridges. A database containing the 2019 field inspection notes for all Turnpike structures, including photos, were submitted to the OTIC staff on August 2, 2019 to use in planning future maintenance and repair programs.

2.4 Culverts

Culverts Classified as Bridges

Structures having a clear span of ten (10) feet or greater are inspected and reported as bridges per Ohio Revised Code Section 5501.74 however when spans are less than twenty (20) feet they do not meet the Federal definition of a bridge. There are currently 109 structures out of the 544 bridges noted in Section 2.3 that are owned and maintained by the OTIC which fall into the category of spans ten (10) feet and greater, but less than twenty (20) feet. The majority of these culverts are cast-in-place reinforced concrete box shapes with single or multiple cells. The most common deficiencies include deteriorated headwalls and wingwalls and obstruction and scour of the waterways. Three (3) culverts with a span over ten (10) feet but less than twenty (20) feet are in Poor Condition. These culverts do not currently pose a safety hazard to the traveling public, but if left unrepaired could lead to costly erosion and/or settlement damage along the Turnpike. Figure 2.4.1 shows a summary of the element level ratings for culverts maintained by the OTIC for 2016 through 2019. Due to changes in ODOT's SMS data reporting this information was not readily available prior to 2016.

Figure 2.4.1 – Graph showing element ratings for culverts maintained by the OTIC as viewed on the SMS inspection form for 2016-2018 (Note due to rounding for clarity total may not equal 100% in some years)



Culverts Not Classified as Bridges

Structures with a clear span of less than ten (10) feet are not classified as bridges; however, their proper function is tied to the long term performance of the OTIC assets. The inventoried and inspected culverts range in size from 30" to 108" and are typically constructed of corrugated steel and reinforced concrete pipes. Culvert barrels are inspected closely to ensure early detection of deterioration which could merit repair or replacement. The deficiencies found in small culverts typically consist of broken channel and ditch protection, headwall deterioration, erosion, and obstruction and scour of the waterways. There are currently 467 culverts identified and inventoried by AECOM inspectors that are inspected annually as of the 2019 inspection. This number changes as drainage patterns are modified and structures are removed and added to accommodate new drainage requirements resulting from the pavement replacement and interchange modification projects.

Culvert Construction and Rehabilitation

Over the past twenty-five years in conjunction with the Third Lane Program (MP 59.52 to 218.70) all culverts within a design contract section were inspected by the design consultants and required repairs were included in the Third Lane construction plans in addition to the annual inspections. These repairs typically included recoating of bituminous pipes, realigning if required, wingwall and headwall repairs and/or reconstruction with new flared end sections. Required ditch improvements were also included in these construction contracts. In order to maintain the culverts outside the limits of the Third Lane Program where many culverts are 60 plus years old, a similar repair program should be implemented.

In 2019 three (3) locations received mainline slope and drainage repairs including culvert rehabilitations. These improvements are located at MP 222.1 EB, 222.65 EB, and 228.50 WB

2.5 Fence and Guardrail

The entire right-of-way of the Turnpike is fenced to deter the entrance of animals and pedestrians onto the roadways. The fence also serves as a demarcation of the right-of-way. The majority of this fence is the welded wire type farm fence. In 1987, a program was implemented to replace this fence in its entirety by the OTIC maintenance forces. As of 2019, approximately 95% of the fence was completed by this program. Portions of the fence have been difficult to replace due to rugged terrain or swampy areas. Currently, a combination of pavement replacement projects and OTIC maintenance forces continue to replace fence where necessary. In some areas, primarily where development has occurred adjacent to the Turnpike, a chain-link fence has replaced the welded wire fence. The chain-link fence is in generally good condition. Minor areas of damage have been noted where the fence terminates at the bridges. Comments and details pertaining to this damage have been included in the 2019 bridge inspection report.

The guardrail replacement program has continued and includes the replacement of deteriorated Type 5 guardrail, posts, block and hardware with the new guardrail standard, Midwest Guardrail System (MGS). The major portion of this work is performed with the Pavement Replacement Program. OTIC maintenance forces also replace portions of the outdated guardrail as part of an annual guardrail upgrade program, and where required, runs of guardrail are replaced in resurfacing projects.

In areas where Third Lane construction is complete, the 56 foot grass median strip has been replaced by two traffic lanes, paved shoulders and a 50-inch concrete median barrier. The concrete median barrier is currently in place for approximately 159 miles of the Turnpike, eliminating the need for interior guardrail in those areas.

2.6 Interchanges

The number of interchanges on the Turnpike is currently at thirty-one (31). Despite the age of the facility infrastructure, the interchanges and toll plazas are serving their intended function. The pavement resurfacing program for the Turnpike ramps is required to continue to keep the ramp pavement safe and smooth. Some of the tolling equipment, such as the toll booths frame and siding, toll booth HVAC, server room HVAC, and the utility building HVAC system, are in need of dedicated maintenance/replacement. Capital funds have been appropriated to fund the replacement of the aforementioned items on an as-needed basis.

The OTIC has been operating with *E-ZPass*® for ten (10) years and continues to benefit from the electronic tolling system. Enhancements continue to be made to further streamline this service for the patrons of the Ohio Turnpike, including an upgrade to the credit card processing system which decreased processing times significantly. To enhance toll operation efficiencies, a total of fourteen (14) ATPMs were installed at Toll Plazas TP-59, TP-64, TP-110, TP-118, TP-142, TP-180 and TP-209 in 2018. Construction of two (2) additional toll lanes for Toll Plaza 180 were completed in 2019. Furthermore, the Commission initiated a Toll Collection System and Customer Service Center Strategic Plan in 2016 to evaluate the current systems and plan for their upgrade in the near future.

The Ohio Turnpike's Toll Collection System and Customer Service Center Modernization Plan is expected to provide operational efficiency and meet the needs of customers into the foreseeable future. The plan, adopted by the Commission on December 18, 2017, includes the implementation of highway speed E-ZPass lanes at four (4) mainline locations, Westgate, MP 49, MP 211, and Eastgate. This plan also includes the removal of nine (9) existing Toll Plazas (Toll Plazas 13 to 39, and Toll Plazas 215 to 234) after the operationalizing of the modernized toll collection system which is expected to be complete in late 2022. In addition, the plan calls for the installation of an additional twenty-eight (28) ATPMs and the removal of nearly all toll lane gates from all Ohio Turnpike Toll Plaza entrance lanes and in E-ZPass-Only Exit lanes. For toll enforcement, license plate image capture cameras are planned for installation to prevent revenue loss.

Construction work began on extending the acceleration and deceleration ramps to meet current design standards at Interchanges 152 and 173 as part of the Pavement Reconstruction projects. Interchange resurfacing continued in 2019 at the Toll Plaza 173 ramps that were not resurfaced in 2018. Additionally, the Commission upgraded the roadway lighting at Interchanges 187 with high-efficiency LED luminaires that significantly decrease maintenance and energy costs.

An overview of the toll plaza utility buildings and toll booths inspection findings as well as the Facility Plans is included in Section 2.8 Buildings.

2.7 Technology

The OTIC Technology Department operations are managed and supported by a team of fourteen (14) individuals.

Construction of the OTIC's Technology Building (formerly Telecommunications Building) was completed in 1999. The Technology Building is located adjacent to the Administration Building and continues to serve as the hub site for all OTIC technology systems. Prior to 1999, all telecommunications and data system equipment was installed in various rooms throughout the Administration Building. Installation of the new digital microwave equipment and fiber-optic equipment was completed in late 1999 and installation of the CRT touch-screen dispatch console system was completed in January 2000. The Technology Building became fully equipped and operational in February 2000, initially housing communications centers for both the OTIC and Ohio State Highway Patrol - Turnpike Operations as well as the offices of the Telecommunications Department and Ohio State Highway Patrol staff. In mid-2003, the OTIC Information Systems Department and Data Center were relocated to the Technology Building. In May, 2012 the OTIC combined its Telecommunications and Information Systems departments to form the new Technology Department. In February, 2015 the Ohio State Highway Patrol relocated its Communications Center to Post 18 in Brook Park, Ohio. Today, the Technology Building provides office space for the Technology Department operations, Communication Center operations, and Ohio State High Patrol staff and office personnel.

In 2015, the OTIC made the decision to migrate from its VHF high-band system to the State of Ohio's MARCS system. As part of the first phase of the project, the OTIC procured three (3) Motorola dispatch consoles and three (3) Motorola control points for its Communications Center. Additional control points were procured for each of its eight (8) maintenance facilities. Installation and training was completed in September, 2016. The Ohio State Highway Patrol (OSHP) replaced its entire fleet of portable radios and donated approximately four hundred (400) of the former portable radios to the OTIC, which are installed in OTIC vehicles, contracted disabled service vehicles and construction contractor's zone vehicles. The OTIC plans to replace portable radios mounted in vehicles with mobile radios over the next three (3) years, which included the replacement of 147 radios in 2017.

The OTIC's SONET fiber optic system provides voice and data transport to the Berea Administration Building, thirty-one (31) toll plazas, eight (8) maintenance buildings, and fourteen (14) service plazas along the 241 miles of the Ohio Turnpike. In 1984, the OTIC approved a right-of-way agreement allowing CenturyLink (formerly Qwest Comm, LCI, Litel) to install fiber-optic cable along the Turnpike right-of-way between MP 40 and MP 228. As part of that agreement, CenturyLink reserved twenty-four (24) fiber strands for the OTIC to utilize for its private telecommunications network. In 1998, the OTIC awarded contracts to install its own fiber optic cable from MP 40 to the Westgate terminal and from MP 228 to the Eastgate terminal to provide complete paths to all fifty-five (55) facilities. The contract for the design and installation of the OTIC's fiber optic system was also awarded in 1998, which was accepted by the OTIC when all data transport was successfully transferred in December of 1999. In the event of catastrophic failure at the primary hub, the system is designed to automatically switch all SONET traffic to the disaster recovery site. The installation of a secondary 24-strand fiber optic cable between the Technology Building and the disaster recovery site was completed in 2006.

In 2005, the OTIC awarded a contract for the development of a strategic plan for the implementation of intelligent transportation systems (ITS) components. As part of that study, it was determined that the OTIC existing fiber optic communication equipment would need to be replaced with higher capacity hardware components to provide the additional bandwidth required for future ITS components. As a result, the OTIC awarded a contract in June, 2007 to replace its existing SONET system with new switchgear to provide OC-192 bandwidth capacity for the west leg of the system and OC-48 for the east leg. Installation was completed in September, 2008.

The ITS study also resulted in the implementation of a geographic information system (GIS) designed to organize the OTIC's facility and structure data for which installation was completed in 2008. Upgrades to the GIS system were performed in 2014, which include new software versions and remote-access capability. Other ITS components recommended by the study include mainline variable message signs, an all facility messaging and alarm system, pavement weather monitoring system and an integrated video monitoring system. The video monitoring system would allow the OTIC to monitor and record activity at each of the OTIC toll plazas, service plazas, maintenance facilities and key locations along the Turnpike mainline to provide

safety for the OTIC's employees and its customers, and would be designed with remote viewing capability to allow staff to view all cameras from the Administration Complex in Berea.

In 2016 a new contract was awarded to AECOM to re-evaluate the current ITS components as well as develop a new strategic plan to update and implement the ITS components. This study is complete and a number of the recommendations are being implemented with the planned new customer service center, toll system, and other technology initiatives underway and planned for in the future.

The OTIC utilizes a voice logging recorder to record all radio calls processed by the OTIC communications center, which features network capability and Blue Ray storage. In spring of 2012, the digital voice logging recorder was upgraded with new hardware and operating system to support the latest software version.

In 2015, the OTIC reviewed options for replacement of its PBX, voicemail and call accounting systems as the existing systems are obsolete and no longer supported by the manufacturers. In November, 2015, the OTIC chose to participate in a State of Ohio offering and contracted with Cincinnati Bell Technology Solutions (CBTS) to subscribe to its Next Generation Telephony System (NGTS). The CBTS NGTS is a subscriber-based Voice over IP (VoIP) phone system that utilizes primarily Cisco Systems hardware. Migration to CBTS was completed in April of 2017.

In mid-2012 the OTIC launched its new Employee Extranet which allows employees to access, forms, newsletters, etc. A project for replacement of the OTIC www.ohioturnpike.org website was awarded in April, 2013. Phase I of the project focused primarily on content and was completed in July, 2013. Phase II of the project, which includes replacement of the content management system and integration of the OTIC's Permitting website, was completed in late 2015. The final phase of the project, which provides for vendor registration and management, was completed in August of 2017.

In 2014, the OTIC replaced its network attached storage (NAS) system and obsolete data servers with a converged network infrastructure (CNI). The new virtualized system provides for greater data storage capacity and full redundancy for the disaster recovery site. All outdated core and edge data switches were replaced in the Spring of 2016 with new Cisco layer 2 and

layer 3 switches that feature power over Ethernet (PoE), which was needed to support the new VoIP phone system. The project also provided for the purchase and installation of an intrusion detection and prevention system (IDS/IPS), a new wireless controller, and Wi-Fi access points for all maintenance facilities, toll plazas and service plazas to provide connectivity for wireless VoIP phones as well as future mobile data needs.

Contracts were awarded in 2014 for upgrades to the OTIC's enterprise resource planning (ERP) system and for the replacement of the OTIC's document imaging/management system. Migration to the new ERP version was successfully completed in February, 2015 and deployment of new ERP tools including enhancements to the OTIC's purchasing card process was completed in 2016. The pilot phase of the new document management system was completed in September, 2015; subsequent phases are currently undergoing design. In lieu of hosting its own email system, the OTIC determined it was more efficient and cost effective to subscribe to Microsoft Office 365 via the State of Ohio's Microsoft Enterprise Agreement. All existing email accounts were migrated in October, 2015. Immediately thereafter, new email accounts were established for OTIC employees that did not previously have an account to provide a direct method of sharing information.

The OTIC selected a Managed Print Services (MPS) solution for the Administration Complex in 2016 when console-type multifunction units were installed in strategic locations throughout the two (2) buildings. The current individual desktop printers will be eliminated as they fail. An assessment of the HR/payroll system conducted in the Spring of 2016 resulted in the addition of an Employee Self-Service (ESS) module, which provides employees online access to pay stub information and leave balances as well as the ability to self-perform open enrollment and contact changes. ESS was implemented in November of 2016. A contract was also awarded for the implementation of Kronos workforce management software and terminals to provide for an efficient system of timekeeping, leave tracking and scheduling. This implementation was completed by the end of 2018.

In 2018, the OTIC implemented the Motorola Premier Computer-Aided Dispatch solution through a hosted agreement with the State of Ohio Multi—Agency Radio Communication System (MARCS) in the OTIC Communications Center. Device (pc/tablet/notebook) life-cycle replacements replacing the Windows 7 operating system with the Windows 10 operating system

were rolled out to both maintenance facilities and the technology department. As part of adding fourteen (14) ATPMs (Automatic Toll Payment Machines) to various toll plaza lanes, remote monitoring personal computer and large monitors were installed in designated toll plazas to enhance remote monitoring capabilities of toll plazas during un-staffed hours. The Technology Department launched a new maintenance and prevention program for batteries and UPS systems utilized in communication rooms in facilities across the Turnpike and completed a project to better automate the Technology HelpDesk for improved customer service. A vulnerability penetration test was completed on the OTIC network by the Ohio National Guard Cyber Unit to identify cybersecurity strengths and weaknesses across the OTIC network. The OTIC implemented TowBook, a disabled vehicle response system to better manage incident response across the Ohio Turnpike. The DVTEL/FLIR video system utilized to monitor lanes at toll plazas was updated and expanded. Finally, the OTIC integrated the OTIC incident notification system with WAZE to provide real-time incident traffic alerts to travelers utilizing the WAZE app.

Technology projects planned for 2019-2020 include the following:

- Completion of a fleet modernization and safety notification a system utilizing DSRC connected vehicle and edge computing technology. This project will involve a sixty (60) mile test road on the Ohio Turnpike with fifteen (15) roadside units communicating with thirty-eight (38) OTIC vehicles. The system will allow snow & ice removal operational data and vehicle operational data to be transmitted real-time to an operational management dashboard and allow for safety messages to be transmitted to a human interface installed in these vehicles. The overall goal of the project is to demonstrate how connected vehicle technology can be leveraged to better manage maintenance operations associated with snow and ice removal and improve safety during operations;
- Replacement of the antiquated intercom system leveraging the MARCS Radio System for communication between OTIC facilities;
- Implementation of the VEEAM Backup System for business continuity and disaster recovery;
- Rollout of the Agile Fiber Redundancy and Wi-Fi Project. This project will include the build-out of a redundant network to the existing fiber network and provide public W-Fi access at all service plazas;

- Upgrade of the fiber network equipment to improve the overall capacity of the existing fiber network;
- Implementation of the Cornerstone learning content management system for online training and curriculum for OTIC employees;
- Desktop, tablet and notebook refreshes with migration to the Windows 10 operating system;
- Replacement of and expansion of the facility access control system;
- Upgrade of the existing primary and secondary data center virtual servers and storage environment;
- Implementation of the KnowBe4 cybersecurity program for employee cybersecurity training and awareness;
- Implementation of a enterprise-wide self-password solution utilizing multi-factor authentication;
- Strengthen PCI security, implement a cyber security framework, and other cybersecurity-related initiatives;
- New presentation and video conferencing systems for three conference rooms;
- Launch of focused work groups on external technology and internal processes to identify projects to enhance operational efficiencies and safety; and

2.8 Buildings

Inspection

A visual inspection of all buildings maintained by the OTIC is performed annually. The inspection includes, but is not limited to, interior and exterior conditions of all structures and storage facilities, potential health and safety risks due to structure conditions and the condition and performance of roofing, electrical, plumbing and HVAC systems. A database and printed copy of the field inspection notes have been provided to the OTIC by the Consulting Engineer (AECOM) to aid in the future construction planning and maintenance of the OTIC. Please see **Table 2.8.1** for a list of all buildings located on the Turnpike.

In 2017, Prime AE of Akron, Ohio was selected to develop a Facilities Strategic Plan for the Ohio Turnpike Commission's Maintenance Buildings, Administration Buildings, Service and Toll Plazas. This plan and the subsequent implementation of it is ongoing.

When completed, the Facilities Strategic Plan will identify, quantify and prioritize capital and facility maintenance activities.

**Table 2.8.1 Total number of buildings on the Turnpike*

Building	Qty
Administration Building	1
Technology Building / Vehicle Maintenance Garage	1
Maintenance Buildings	8
Sign Shop	1
Ohio State Highway Patrol Buildings	1
Toll Plaza/Interchanges	31
Service Plaza Buildings	14
Total	57

*The total does not include ancillary buildings, such as vehicle storage garages, salt domes, equipment storage buildings, toll booths and sewage and water treatment plant buildings.

Administration Building Complex

The Administration Building, located adjacent to the Turnpike in the City of Berea, houses the following administrative departments; Executive, Legal, CFO/Comptroller, Human Resources, Accounting, Procurement, Contract Administration, Audit, Marketing & Communications, Payroll, Office Services, Safety Services, Service Plaza Operations, Toll Operations, Customer Service Center, Maintenance and Engineering. A vehicle maintenance garage and contiguous Technology Building are located east of the Administration Building and houses technology staff, computer center, Turnpike radio communications center and Ohio State Highway Patrol Turnpike operations center. Starting in 2002, there were a series of interior Administration Building renovations to improve the restrooms, use of office space, interior finishes, computer/phone cabling, HVAC and lighting. Renovations completed in 2009 made accommodations for E-ZPass transponder processing and the Customer Service Center. In 2013 and 2014 the Administration Building and Technology Building received upgrades to their aging HVAC systems. In 2017, the north wing boiler at the Administration Building was replaced with a high efficiency boiler and improvements were made to the second floor of the Technology Building. These included a reconfiguration of the office space to allow for eleven (11) work stations. In 2018, additional second floor improvements were made to the Technology Building with the addition of a conference room, storage room and new HVAC units for the Communications Equipment Room.

In 2019 the boiler in the Technology Building was replaced with a high efficiency boiler and the upgrades to the Administration and Technology building HVAC controls are in progress with completion planned for before year end.

The Administration Building, vehicle maintenance garage, and Technology Building have been maintained in generally good condition. However, the Administration Building does have some deficiencies in the building envelope such as leaking at the skylight and window systems during heavy rains and some water infiltration through the exterior sandstone system.

Maintenance Buildings

The maintenance buildings consist of eight (8) steel and masonry structures housing a central main bay with adjacent offices, restrooms, break room, mechanic bays, inventory and storage areas. Additionally, every maintenance facility includes a salt dome of concrete and wood construction and other storage buildings constructed of metal, wood or a combination. The maintenance buildings were found to be in generally good condition, with deficiencies noted below.

Typical deficiencies include minor scattered damage to the brick façade, minor surface rust to interior and exterior metal surfaces and cracking to the concrete floor throughout the main bay areas. Additionally, the roof system on nearly all maintenance buildings was found to be in a deteriorated state, allowing water infiltration in several locations. The OTIC has begun the replacement of the roofing systems on all maintenance facilities. Prior to May of 2019 the Hiram and Canfield maintenance buildings had roofing replacement completed. Swanton, Castalia, and Amherst maintenance buildings have roof replacements scheduled to be completed prior to November 1st 2019.

The additional buildings located at the maintenance facilities were also found to be in generally good condition. Typical deficiencies noted include minor damage to exterior of structures due to impact. Several older storage garages throughout the Turnpike are reaching levels of moderate to significant deterioration. These facilities were included in the Facilities Strategic plan noted previously.

In 2019, the FuelMaster fuel management system was installed at all eight (8) maintenance buildings. FuelMaster automates the management of fuel inventory by controlling access to the fuel pumps and recording the employee, vehicle/equipment, mileage, and amount of fuel dispensed for each transaction.

Highway Patrol Facilities

All Ohio State Highway Patrol facilities are in generally good condition and have been well maintained. The parking lot at the Milan Patrol Post 90 (MP 118.5) was resurfaced in 2016.

Toll Plaza Buildings

With limited exception, the overall appearance of the toll plazas, including toll booths, canopies and utility buildings, as well as additional buildings or storage areas where applicable were found to be in satisfactory condition.

Many toll booths are nearing a point of moderate deterioration with areas of complete section loss along the lower portions, requiring consideration for repair or replacement. Newly renovated and newly constructed toll plazas are in good condition and have been generally well maintained.

The mechanical systems that serve the Toll Booths and Utility Buildings require some improvements. The HVAC technology is antiquated with constant volume AHU's and pumps, and inefficient control schemes. Numerous comfort and energy efficient upgrades could be made to the buildings. In 2017, upgrades were made to Toll Plaza 180 air handlers and controls, providing more comfort to the booths and improving efficiency. Communication rooms at Toll Plazas 161 & 209 have had air conditions systems replaced with ductless units, with Toll Plazas 140 & 239 scheduled to have ductless units installed prior to the end of 2019.

In 2017, Jacobs Engineering Group made general recommendations regarding the Commission's aging toll collection system and the associated toll plaza facilities. The implementation of this plan is ongoing with changes to the toll plaza facilities and associated infrastructure scheduled for construction beginning in 2020.

Service Plaza Buildings

Currently there are fourteen (14) Service Plazas in operation on the Turnpike. See **Table 2.8.2** for a list of the Service Plazas.

As of 2013, all the original service plaza facilities dating to the early 1950's have been demolished and/or replaced. The new service plazas are designed to accommodate the

Turnpike travelers and professional drivers with amenities including a food court arrangement with a sit-down restaurant and multiple fast food vendors, electronic travel and weather information centers, and retail outlets. Special trucker areas have been incorporated including a lounge, laundry and shower facilities.

Currently, one (1) set of service plazas (Oak Openings and Fallen Timbers at MP 49.0) has not been reconstructed.

Table 2.8.2 Service Plazas in Operation on the Turnpike

<u>EASTBOUND SERVICE PLAZAS</u>	<u>WESTBOUND SERVICE PLAZAS</u>
Tiffin River (MP 20.8)	Glacier Hills (MP 237.3)
Wyandot (MP 76.9)	Portage (MP 197.0)
Commodore Perry (MP 100.0)	Great Lakes (MP 170.1)
Vermilion Valley (MP 139.5)	Middle Ridge (MP 139.5)
Towpath (MP 170.1)	Erie Islands (MP 100.0)
Brady's Leap (MP 197.0)	Blue Heron (MP 76.9)
Mahoning Valley (MP 237.2)	Indian Meadow (MP 20.8)

Updates to the service plazas continued in 2015, with approximately \$3,400,000 in total renovations being performed at the Great Lakes and Towpath Service Plazas (MP 170.1) and Portage and Brady's Leap Service Plazas (MP 197). Also, in 2014 a program was initiated to upgrade underground gasoline and diesel fuel lines to fiberglass, starting with the Erie Island and Commodore Perry Service Plazas. Fuel system upgrades were completed at the Great Lakes and Towpath Service Plazas in 2016, the Portage and Brady's Leap Service Plazas in 2017, and the Middle Ridge and Vermilion Valley Service Plazas in 2018. In addition, the truck parking areas at Erie Island (MP 100.0) and Vermilion Valley (MP 139.5) were repaired and resurfaced in 2016. Also, improvements to the lights, ceilings, walls, doors and floors in the vendor hallways at Middle Ridge (MP 139.5), Vermilion Valley (MP 139.5), Towpath (MP 170.1), Great Lakes (MP 170.1), Brady's Leap (MP 197.0) and Portage (MP 197.0) Service Plazas were completed.

Commodore Perry and Erie Islands roof membrane replacements were completed in 2019 as well as pavement sealing in the parking areas.

The Service Plazas were found to be in generally good condition. The Service Plazas are served by multiple air handling units (AHU's) with air cooled chillers and/or condensing units. Each has hot water heating with two (2) 80% efficient Bryan boilers serving hot water radiators in the rotunda and coils in the AHU's. The cooling at the AHU's is accomplished with refrigerant split systems or chilled water coils. The air-cooled chiller or condensing unit is located outside on grade. As a majority of the service plazas are relatively new, the HVAC system is in good condition.

The wastewater treatment plant at Erie Islands Service Plaza (MP 100.0) is in generally good condition, with no significant defects. The Lift Station study has been completed and the Turnpike is currently in discussions with the City of Clyde to develop the path forward on sewer treatment options.

The Portage Service Plaza (MP 197.0) sanitary pump station experienced operational issues in 2019 and AECOM was contracted to provide repair and or replacement options for the failed pumps. Pump replacement plans are underway with replacement scheduled for 2020.

General

OTIC purchased and began implementing Asset Essentials software to improve the overall facility management process. This software creates a tracking system for maintenance requests, preventative maintenance work, comprehensive compliance management and insight into asset costs. Key performance indicators will be more visible, enabling the Turnpike to operate with higher efficiency in facility management.

2.9 Maintenance Organization and Equipment

Eight (8) maintenance buildings are located at approximately 30-mile intervals along the Turnpike. Each of these buildings serves as headquarters for a maintenance section and is headed by a section foreman. Maintenance equipment and supplies are stored in these buildings and in the adjacent yards. The OTIC maintenance organization is divided into two (2) divisions, each under the direction of a division superintendent. Each division consists of four (4) maintenance sections. The western division personnel and equipment is housed in the Elmore Maintenance building, and the eastern division is housed in the Hiram Maintenance building.

The maintenance section personnel perform work such as snow removal, mowing, pavement and minor bridge repairs and maintenance, joint sealing of roadways, right-of-way fence repair and replacement, guardrail repair and replacement, storm water and sanitary sewer repairs and replacements, policing the right-of-way and maintenance and repair of vehicles and equipment. The division personnel consist of various tradesmen and mechanics that perform such duties as mechanical and electrical work, equipment repair, operation and maintenance of utilities, and perform major (non-routine) work items, with the assistance of the maintenance section, not performed under contract. Mobile equipment such as trucks, excavators, backhoes and rollers, front-end and skid steer loaders, conveyors, and other construction/maintenance equipment continues to be well maintained by the maintenance personnel and replaced at the end of its service life cycle.

2.10 Safety and Signs

The Ohio State Highway Patrol (OSHP) developed an electronic OH-1 crash reporting system that was instituted on the Turnpike in March of 2008. To accommodate the changes, the OTIC developed a file transfer system in cooperation with the OSHP. The combination of these changes significantly reduces the amount of time between the actual crash and the OTIC's ability to process crash data. This new electronic system allows for a greater level of accuracy in the OTIC reporting system.

The OTIC safety record continues to compare favorably with other similar highways. The accident rate per one hundred million vehicle miles decreased from 78.3 in 2018 to 71.9 in 2019, and the fatality rate increased from 0.3 to 0.5. **Appendix E** contains crash statistics including traffic accidents and fatalities and annual accident rates and fatality rates per one hundred million vehicle miles of travel. **Table 2.10.1** indicates the causes to which accidents have been attributed for the past ten (10) years.

Table 2.10.1 Ohio Turnpike Accident Causation Factors

CAUSE OF ACCIDENT	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	*2019
Tire Condition	43	55	59	59	49	48	44	27	23	14	---
Mechanical Failure	3	2	2	1	2	1	2	---	1	6	---
Exceeding Speed Limit	2	2	4	4	4	1	2	5	2	---	2
High Wind	8	6	1	4	3	54	12	---	1	---	---
Poor Visibility (Fog/Smoke, Rain, Snow)	397	604	813	735	1253	808	614	---	300	357	260
Other Reasons	65	---	1	2	2	3	2	---	54	1	---
Improper Parking/Backing/Starting	109	144	179	818	725	881	777	724	690	563	239
Fire	40	45	46	44	40	47	57	38	36	29	9
Improper Passing/ Fail. to Yield	8	5	12	9	19	10	15	7	13	3	5
Driver Asleep/Sleepy	68	68	82	60	53	54	61	56	62	31	112
Driver Ill	10	1	8	8	10	3	15	13	4	6	4
Driver Drinking/ Intoxicated	27	38	37	24	25	31	38	35	36	21	21
Driver Inattention/ Carelessness	74	94	89	84	119	182	47	36	38	20	1
Driver/Other	4	4	6	7	20	20	15	19	17	8	72
Person Fell from Vehicle	---	1	---	2	1	1	---	---	1	---	---
Object on Roadway/ Thrown	157	182	251	9	62	65	82	99	76	74	46
Object Dropped off Overpass	2	---	---	---	---	---	---	---	---	---	---
Deer on Roadway	419	402	361	324	318	319	307	292	279	135	136
Other Animal on Roadway	13	12	14	15	16	15	14	15	14	7	9
Vehicle Stopped/Slowed	2	2	---	12	17	9	11	6	10	4	50
Unsecure Load	14	18	18	25	15	19	21	15	18	12	---
Pedestrian/Passenger Action	4	4	1	4	3	1	3	1	---	4	---
Illegal Use of Crossover	11	19	27	19	9	2	6	8	5	8	---
Following Too Closely/ A.C.D.A	67	59	81	---	---	---	---	1	---	---	79
Unsafe Vehicle	62	62	51	100	56	52	51	37	23	13	---
Side-Swiped	24	39	40	---	1	---	---	---	144	57	---
Rear-Ended	74	65	78	---	95	106	109	118	115	45	---
Swerving to Avoid	39	44	36	5	4	3	11	8	4	5	---
Failure to Control	61	66	68	61	47	36	34	31	36	19	16
Other Improper Action	7	13	17	101	32	35	50	51	19	15	1
Operation Vehicle in Erratic	4	7	---	---	1	---	1	1	---	1	7
Defective Lights	---	---	---	1	1	---	1	1	---	---	---
Not at fault	310	384	435	743	637	701	685	723	716	374	387
TOTAL	2125	2268	2583	2598	2380	2642	2459	2367	2238	2397	1456

*Eight month span ending in August 2019

A visual inspection of all overhead sign structures is performed every other year. The most recent inspections were performed in 2018. With noted exceptions, the sign structures were found to be in generally good condition. Common deficiencies include minor damage to the lettering and sign panels and minor surface corrosion. A detailed inspection report was provided to the OTIC in 2018 to aid in planning for future repairs. In addition to the visual inspection of signs a visual inspection of light tower poles and foundations was performed in 2015 in accordance with OTIC and ODOT procedures for inspection. With noted exceptions, the light towers were found to be in generally good condition. A detailed inspection report was provided in 2018 to OTIC to aid in future repairs.

The OTIC has a staffed Sign Shop that routinely performs the removal, fabrication and replacement of missing, obsolete, damaged and/or non-reflective traffic signs and parking area pavement markings. Additionally, the Sign Shop fabricates the necessary guide, warning and regulatory signs for the mainline roadway, ramps and plaza areas.

The Sign Shop furnishes all the permanent signs needed for the Pavement Replacement Program, mainline resurfacing contracts, toll plaza ramp resurfacing, bridge construction, as well as toll and service plaza renovation projects.

In 2016 the OTIC began an overhead sign structure repair and replacement program, which includes replacing all the overhead sign structures and signs within the two-lane sections of the Turnpike over a ten (10) year period. The first project, performed in 2016, included eleven (11) sign structures between MP 0.0 and MP 65.0. During 2017 another ten (10) sign structures were replaced near MP 3.75, 53.0, and several between MP 237.2 and MP 240.65. In 2018, thirteen (13) sign structures were replaced primarily in the MP 230.75 to MP 236.25 area. In 2019, eight (8) sign structures are being replaced. Two (2) at Toll Plaza 142 and the remaining six (6) are located between MP 214.35 and MP 220.40.

The OTIC is currently on an annual cycle for updating the pavement markings located on the mainline, the interchange ramps, and service plaza acceleration and deceleration ramps. Each year, by contract, the pavement markings are painted using a high quality, waterborne acrylic paint system and glass beads. The glass beads are designed to enhance the retro-reflectivity of the markings during wet pavement and/or nighttime conditions.

Maintenance personnel routinely repair the roadside delineation and replace damaged raised pavement marker reflectors.

Traffic Incident Management (TIM) is the coordinated detection, response to and removal of traffic incidents and the restoration of traffic capacity as quickly and safely as possible. TIM is a coordinated effort both internally and externally.

TIM depends on communication among responsible personnel (e.g., in incident reporting, response dispatch, and traffic management). Experience gained from each incident provides opportunities to improve our TIM performance. Both communication and learning from experience are being enhanced by new technology and management practices, such as Google Maps Traffic, geo-located device inventory (GIS), communication procedures (e.g., standardization of terminology and adoption of shared radio frequencies), and channels for communicating with travelers (Facebook, Twitter, Instagram etc.).

The OTIC is committed to the efficient operation of the Ohio Turnpike. While various police and fire agencies have the statutory authority to close travel lanes, the Commission works to minimize the disruption to the traveling public by assisting with traffic control, developing pre-planned route diversions and advocating quick clearance of major traffic crashes.

To this end, the OTIC continues to refine their Incident Management Playbook. The Playbook can be downloaded at: <https://www.ohioturnpike.org/ohio-turnpike-and-infrastructure-commission-incident-management-playbook>

As a means of decreasing the likelihood and severity of crashes and reducing queuing and delay, OTIC Permitted Lane Closure Schedule (PLC) provides pre-approved lane closure schedules for each segment of the Turnpike.

Some segments are deemed to be so sensitive that even a single lane can be closed only when authorized by the OTIC's upper management. For other segments, a lane or multiple lanes may not be closed except during certain times of the day and/or days of the week. Such segments require an approved waiver to extend lane closures outside the specified times. Other segments have enough surplus capacity that single lane closures are allowed at any time without special approval.

While OTIC strives to eliminate queuing in work zones, the pre-approved closure schedules are based on threshold queuing values which were chosen realizing that this is not always possible to achieve. Special Provision 104 Section H6 stipulates "Approval of any Lane Closure is conditional that the zone must be removed anytime traffic backups extend one half (1/2) mile beyond the first transitional arrow board."

Variations from the pre-approved closure schedules are only allowed when it is shown there are no viable alternatives to performing the work or that the other alternatives are distinctly inferior. As traffic demand changes over time the PLC will be updated accordingly.

The Commission has completed a proof-of-concept project by installing a Dedicated Short-Range Communications (DSRC) connected vehicle communication system. The project was commissioned to take full advantage of existing fiber optic cable within Turnpike right-of-way and 160 miles of three-lane roadway to improve safety and mobility. The Commission has installed fifteen (15) roadside units (RSUs) on a 52-mile stretch of the Turnpike between Toll Plaza 135 (Amherst, Ohio) and Toll Plaza 187 (Streetsboro, Ohio). The Commission has equipped thirty-eight (38) Commission vehicles with onboard units (OBUs). All OBUs have the functionality to broadcast Basic Safety Messages. The vehicles include a human-machine interface (HMI) to share alerts and advisories to drivers.

Meanwhile, self-driving leaders have already used the Ohio Turnpike as a site for testing autonomous commercial vehicle technology in real-life traffic conditions and the roadway is well positioned for additional testing with six (6) contiguous lanes through 160 of its 241 miles of well-maintained roadway.

2.11 State Highway Patrol

The Ohio State Highway Patrol (OSHP) continues to patrol the Turnpike under an agreement between the OTIC and the Director of the Department of Public Safety of Ohio. The OTIC, under this agreement, reimburses the State for all costs of the Turnpike patrol. **Table 2.11.1** shows the contingent of officers designated to the Ohio Turnpike. Turnpike Posts presently have eleven (11) trooper vacancies in this contingent designation.

Table 2.11.1 Officers designated to the Ohio Turnpike

Officer Ranking	Qty
Captain / Staff Lieutenant	1
Lieutenants	3
Sergeants	12
Communications Technicians	10
Troopers	58
Total Personnel	84

The OSHP now utilizes sixty-six (66) patrol vehicles and aircraft from Columbus to accomplish their duties on the Turnpike. Along with traffic enforcement, some of the duties they perform include apprehending those persons involved in drug trafficking on the Turnpike, providing additional assistance at the Service Plazas to vehicles and drivers having difficulties along the Turnpike. In response to the events of September 11, 2001, Motor Carrier Enforcement officers continue to monitor hazardous material transport that could be used as weapons. These inspections also ascertain if the drivers are authorized by the company to transport that particular load. All shipping papers are also checked for authenticity. In addition, all officers are diligent in looking for any unusual circumstances or suspicious persons that may be potentially involved in terrorist activities.

Table 2.11.2 Activities of the Patrol, 2007-2018

ACTIVITY	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Arrests for All Offenses	46,095	41,165	41,903	44,479	45,112	44,575	44,027	41,004	41,131	33,631	39,152	42,639
Accidents Investigated	2,534	2,668	2,133	2,276	2,584	2,535	2,356	2,611	2,648	2,444	2,168	2,346
Assistance to Vehicles Having Difficulties	50,008	40,787	41,185	31,890	31,663	28,345	26,719	23,848	20,737	19,029	19,217	17,641
Stolen Vehicles Recovered	57	39	40	24	16	18	22	10	24	29	22	13
Culprits of Stolen Vehicles Apprehended	31	31	25	18	16	16	9	9	15	20	34	10
Abandoned Cars Removed from Turnpike	**463	**373	**474	**410	**450	**449	**226	**466	**380	**331	**407	**425
Driving Under the Influence of Alcohol	340	283	307	290	266	389	322	361	421	278	408	317

** Due to the changes in reporting using the CAD system, this figure includes vehicles towed due to enforcement and abandonment.

2.12 Traffic, Revenues and Expenses

Total revenues for the OTIC from all sources in 2018 were \$353,534,000, which is a 7.1 percent increase compared to 2017. This revenue increase was primarily the result of increased investment revenue, an increase in commercial vehicle miles traveled and a 2.7% toll rate increase on January 1, 2018.

Table 2.12.1 Comparison of the Records of 2018 with 2017

Passenger Vehicle-Miles of Travel	Decreased	2.3%
Commercial Vehicle-Miles of Travel	Increased	4.3%
Toll Revenues	Increased	3.5%
Total All Revenue	Increased	7.1%
Operating Expense	Increased	0.1%
Total Expenses, Including Interest Expense and ODOT Infrastructure Project Expense	Decreased	10.8%

The revenue data for the first eight (8) months of 2019 shows that, when compared to the same period in 2018, toll revenues from passenger cars were down 0.9 percent and toll revenues from commercial vehicles were up 1.4 percent. Total toll revenues were up 0.5 percent for the first eight (8) months of 2019 and investment income was up 28.2 percent. Total revenues for the first eight (8) months of 2019 were up 1.8 percent compared to January-August, 2018. The total number of vehicles using the Turnpike during January-August, 2019 was 3.8 percent lower than for this same period in 2018. Based on current trends to date, total revenues from all sources for 2019 are estimated at approximately \$362,000,000.

3.0 ESTIMATE OF CURRENT EXPENSES

The OTIC fiscal year is based on a January-December time period. Summarized below is an estimate of the amount of money required to maintain and operate the Ohio Turnpike during the calendar year 2019.

Summary

Administration and Insurance	\$ 12,000,000
Maintenance and Operations Expense	\$ 109,000,000
Bond Interest and Principal	\$ 115,000,000

Estimate of Current Expenses

Fiscal Year 2019	\$241,000,000
------------------------	---------------

AECOM has reviewed historical data of the OTIC pledged revenues, expenses and debt service payments. Pursuant to Article IV, Section 4.08 (b)(ii) of the Amended and Restated Master Trust Agreement dated April 08, 2013 between the Ohio Turnpike and Infrastructure Commission and The Huntington National Bank, AECOM expresses its agreement with the Commission's past practice of maintaining the Expense Reserve Account in an amount equal to one-twelfth (1/12) of the annual operating, maintenance and administrative expenses to be paid from pledged revenues, as set forth in the Commission's annual budget for such Fiscal Year. AECOM recommends that the OTIC continue this practice for 2020.

4.0 SCHEDULE OF INSURANCE

The Schedule of Insurance currently in force is shown in **Appendix F**.

The Ohio Turnpike and Infrastructure Commission is required to maintain comprehensive property and casualty insurance coverage in accordance with Article 5, Sections 5.05, 5.06 and 5.07 of the Amended and Restated Master Trust Agreement dated April 8, 2013, as amended by the Twentieth Supplemental Trust Agreement dated as of August 21, 2017, as well as the Junior Lien Master Trust Agreement dated August 1, 2013 (collectively, the “Trust Agreements”). These consist of policies on Major Bridges, Use and Occupancy, and Commercial Liability. In addition to the required policies, a number of other insurance policies are carried in accordance with prudent business practices.

As Consulting Engineer, AECOM has reviewed the current insurance policies held by OTIC and confirmed that they meet and, in several cases, exceed the minimum insurance requirements stated in Article V, Section 5.05 of the Amended and Restated Master Trust Agreement Dated April 08, 2013.

5.0 RENEWAL, REPLACEMENT AND SYSTEM PROJECT FUNDS

Pledged revenues exceeding those required for operations, maintenance, and administration, bond interest and principal, and the required deposit to the expense reserve account, are deposited into the Renewal and Replacement and System Projects Funds. The revenues in the Renewal and Replacement Fund are used for the purchase of replacement vehicles and equipment and routine annual maintenance operations, while the System Projects Fund is used for the rehabilitation and upgrading of the Turnpike bridges, roadways, buildings, and for construction of new interchanges and other facilities.

It is estimated that total pledged revenues in 2020 will amount to approximately \$351,000,000, of which approximately \$133,000,000 will be needed for the operations, maintenance, and administration of the Turnpike and \$114,000,000 will be required for bond interest and principal expense. Of the remaining amount, approximately \$10,000,000 will likely be deposited into the Renewal and Replacement Fund, leaving a total of approximately \$94,000,000 to be deposited into the System Projects Fund.

Appendix A

Ohio Turnpike Straight Line Diagram
(Strip Map)

TOLL PLAZAS

- FULL INTERCHANGE
- PARTIAL INTERCHANGE

SERVICE PLAZAS

- SERVICE PLAZA (OPEN)
- SERVICE PLAZA (CLOSED)

MAINTENANCE ZONES

- MAINTENANCE BUILDING
- 3 LANES
- 2 LANES

SNOW AND ICE LIMITS

- SALT STORAGE
- MAINTENANCE BUILDING
- 3 LANES
- 2 LANES

COUNTY LINES

- MAJOR BRIDGE/ RIVER CROSSING

DISABLED VEHICLE SERVICE ZONES

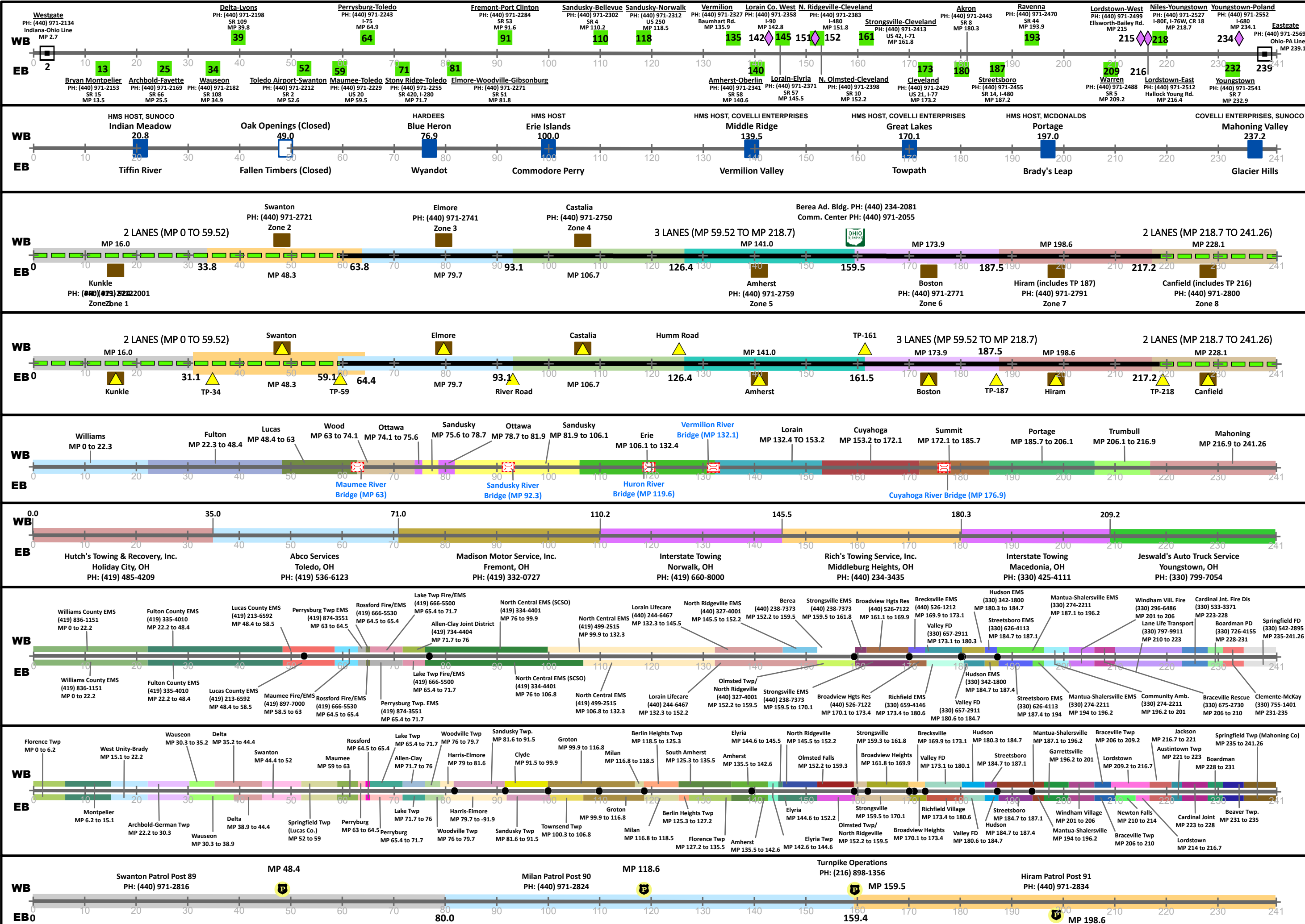
EMERGENCY MEDICAL SERVICE ZONES

- OTHER COVERAGE AREA (contact Comm. Center for more information)

FIRE DEPARTMENT SERVICE ZONES

- OTHER COVERAGE AREA (contact Comm. Center for more information)

STATE HIGHWAY PATROL ZONES



Appendix B

Pavement Resurfacing and Replacement

Table 1: Third Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
1980	144.0 to 153.5	9.5	20.1
	230.6 to 241.2	10.6	
1981	132.3 to 144.0	11.7	11.7
1983	92.4 to 101.4	9	25.7
	186.9 to 196.3	9.4	
	223.3 to 230.6	7.3	
1985	153.5 to 161.6	8.1	19.4
	161.6 to 172.9	11.3	
1986	214.2 to 223.3	9.1	9.1
1987	71.0 to 80.7	9.7	19.5
	111.7 to 118.7	7	
	177.4 to 180.2	2.8	
1988	27.5 to 38.9	11.4	18.3
	180.1 to 187.0	6.9	
1989	205.4 to 214.3	8.9	8.9
1990	39.0 to 48.6	9.6	14.0
	173.0 to 177.4	4.4	
1991	118.8 to 132.3	13.5	13.5
1992	62.5 to 71.1	8.6	18.9
	101.4 to 111.7	10.3	
1993	0.0 to 5.7	5.7	5.7
1994	5.7 to 14.8	9.1	20.7
	80.8 to 92.4	11.6	
1996	14.8 to 27.5	12.7	19.7
	55.5 to 62.5	7	
1998	48.6 to 55.5	6.9	6.9
2006	196.3 to 205.4(*)	9.1	9.1
2007	196.3 to 205.4 (**)	9.1	
Total to Date			241.2

(*) – Eastbound lanes only.

(**) – Westbound Lanes only.

Table 2: Fourth Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
1989	144.0 to 153.0	9	9
1990	230.6 to 234.9	4.3	4.3
1991	234.9 to 241.2	6.3	6.3
1992	132.0 to 144.0	12	12
1993	91.2 to 101.4	10.2	20.6
	161.6 to 172.0	10.4	
1994	214.2 to 223.3	9.1	9.1
1995	111.7 to 118.8	7.1	23.8
	186.9 to 196.3	9.4	
	223.3 to 230.6	7.3	
1996	153.5 to 160.0	6.5	6.5
1997	71.1 to 80.8	9.7	14
	160.0 to 161.6	1.6	
	177.4 to 180.1	2.7	
1998	27.5 to 38.9	11.4	11.4
1999	38.9 to 48.6	9.7	16.5
	180.1 to 186.9	6.8	
2000	101.4 to 111.7	10.3	21.3
	172.9 to 177.0	4.1	
	207.4 to 214.3	6.9	
2001	118.8 to 127.23	8.4	8.4
2002	0.0 to 5.7	5.7	5.7
2003	62.5 to 69.3	6.8	6.8
2004	55.5 to 63.8	8.3	8.3
2007	80.9 to 91.2	10.3	10.3
2008	5.7 to 14.8	9.1	9.1
2011	14.8 to 27.5	12.75	12.75
2012	69.3 to 71.1	1.8	1.8
2013	127.3 to 132.1	4.8	4.8
2014	48.6 to 55.45	6.85	6.85
2018	196.3 to 205.2	8.9	11.7
	172.0 to 172.8	2.8	
Total to Date			241.3

Table 3: Fifth Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
1997	144.0 to 153.5	9.5	9.5
2001	230.6 to 241.3	10.7	10.7
2002	92.4 to 101.4	9	12.2
	161.6 to 164.8	3.2	
2003	132.1 to 144.4	12.3	12.3
2004	168.6 to 172.0	3.4	11.9
	214.8 to 223.3	8.5	
2006	111.2 to 111.7	0.5	0.5
2006	186.9 to 196.3(*)	9.4	9.4
2007	186.9 to 196.3 (**)	9.4	
2008	111.7 to 118.8	7.1	7.1
2010	223.3 to 230.6	7.3	7.3
2011	205 to 210	3	10
	153 to 160	7	
2012	101.2 to 109.2	8	8
2012	118.8 to 127.3	8.5	8.5
2012	209.6 to 214.4	4.8	4.8
2013	27.5 to 38.9	11.4	21.22
	127.2 to 127.3	.10	
	176.3 to 186.02	9.72	
2014	43.3 to 48.6	5.3	5.3
2015	0.0 to 5.7	5.7	12.1
	74.1 to 80.5	6.4	
2016	38.9 to 43.3	4.4	18.25
	55.45 to 69.3	13.85	
2017	69.3 to 74.1	4.8	4.8
2018	127.2 to 132.1	4.9	4.9
2019	8.20 to 14.80	6.6	6.6
Total to Date			185.37

(*) – Eastbound lanes only.

(**) – Westbound lanes only.

Table 4: Sixth Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
2006	144.4 to 153.5	9.1	9.1
2010	91.2 to 101.5	10.3	14.4
	132.1 to 136.2	4.1	
2011	160 to 161.6	1.6	1.6
2012	172 to 176.3	4.3	4.3
2013	136.2 to 144.4	8.2	13.85
	230.35 to 236.0	5.65	
2014	217.3 to 218.3 (*)	1.0	6.26
	236.0 to 241.26	5.26	
2015	221 to 223 (**)	2.0	4.0
	214 to 216 (**)	2.0	
2016	221 to 223 (*)	2.0	2.0
2018	191.39 to 196.3	4.91	4.91
Total to Date			60.42

(*) – Eastbound lanes only.

(**) – Westbound lanes only.

Table 5: Seventh Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
2011	152 to 153.5	1.5	1.5
2013	132.1 to 132.2	.1	.1
2017	136.0 to 144.1	8.1	8.1
2018	132.1 to 136.2	4.1	4.1
Total to Date			13.8

(*) – Eastbound lanes only.

(**) – Westbound lanes only.

Table 6: Third Lane - First Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
2003	193.4 to 199.0	5.6	5.6
2005	145.0 to 152.0	7	7
2006	199.0 to 205.4(*)	6.4	6.4
2007	199.05 to 205.4(**)	6.4	6.4
2015	141.1 to 145.4	4.3	7.3
2015	215.0 to 218.0	3.0	
2017	160.1 to 169.1	9.0	9.0
2018	149.2 to 154.1	4.9	12.14
2018	169.1 to 176.34 (*)	7.24	
2019	205.2 to 215.9	10.7	10.7
Total to Date			64.54

(*) – Eastbound lanes only.

(**) – Westbound lanes only.

Table 7: Third Lane - Second Resurfacing

Year	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
2018	199.0 to 205.2	6.2	6.2
Total to Date			6.2

Table 8: Full Depth Replacement

Year	Direction	Milepost Limits	Length (Miles)	Total Length for Year (Miles)
2011	WB	95.90 – 101.20	5.30	5.3
2012	EB	95.90 to 101.20	5.30	10.22
	WB	164.82 to 169.74	4.92	
2013	WB	90.00 to 95.90	5.90	10.82
	EB	164.82 to 169.74	4.92	
2014	EB	159.80 to 164.82	5.02	11.12
	EB	101.20 to 107.30	6.10	
2015	WB	159.80 to 164.82	5.02	21.42
	WB	101.20 to 107.30	6.10	
	EB	144.10 to 149.24	5.14	
	WB	216.10 to 221.26	5.16	
2016	EB	107.30 to 112.50	5.20	20.54
	WB	144.10 to 149.24	5.14	
	EB	186.35 to 191.39	5.04	
	EB	216.10 to 221.26	5.16	
2017	EB	90.00 to 95.90	5.90	16.14
	WB	107.30 to 112.50	5.20	
	WB	186.35 to 191.39	5.04	
2018	EB	149.24 to 154.10	4.86	11.46
	EB	169.74 to 176.34	6.60	
2019	WB	149.24 to 154.10	4.86	11.69
	WB	169.74 to 176.57	6.83	
Total to Date				118.71

Right two lanes and shoulder only included in full depth replacement limits shown in Table 8

Appendix C

Bridge Deck
Replacement and Rehabilitation
Including
Third Lane
Construction and Expansion

Mainline Bridge Deck Replacements

*Bridges replaced or rehabilitated as part of Third Lane Construction are shown in *italics*
(Typical for all of Appendix C)

Year	Bridge	Milepost
1983	Maumee River - EBL	63.0
1983	Cuyahoga River - WBL	176.9
1984	S.R. 109	40.3
1984	D T & I Railroad	40.5
1984	Bad Creek	41.3
1984	Maumee River - WBL	63.0
1984	S.R. 53	92.0
1984	Sandusky River	92.3
1984	N & S Railroad	98.9
1984	S.R. 510	99.1
1984	S.R. 412	99.7
1984	S.R. 99	111.2
1984	Vermilion River	132.1
1984	Quarry Road	138.0
1984	Penn Central Railroad	138.2
1984	Black River	145.9
1984	S.R. 301	147.3
1984	Chestnut Ridge Road	152.0
1984	Over Ramp at Exit 152	152.2
1984	Lorain Road	152.3
1984	Conrail Railroad	152.6
1984	S.R. 82 (Royalton Road)	165.4
1984	York Road	165.5
1984	Bennett Road	166.2
1984	Cuyahoga River - EBL	176.9
1984	Tinkers Creek	185.6
1984	S.R. 45	217.3
1984	Penn Central Railroad	217.3
1984	Meander Reservoir	221.3
1984	Evans Lake-Yellow Creek	234.4
1984	Poland-Unity Road	237.8
1984	Columbiana Road	238.1
1984	Garfield Road	240.8

Mainline Bridge Deck Replacements (continued)

Year	Bridge	Milepost
1985	S.R. 49	2.1
1985	Swan Creek	47.4
1985	S.R. 64	47.5
1985	Little Muddy Creek	90.2
1985	S.R. 19	90.3
1985	N & W Railroad	90.7
1985	Green Creek	96.2
1985	Branch of South Creek	96.7
1985	Erlin Road and South Creek	97.1
1985	Raccoon Creek	97.9
1985	S.R. 58 (Oberlin N. Road)	140.2
1985	N & W Railroad	140.6
1985	Penn Central Railroad	141.7
1985	Cuyahoga River	191.4
1985	Bryant Road	202.8
1985	Tumor Road	222.7
1985	Kirk Road	222.8
1985	Erie Lackwanna Railroad	223.0
1986	Sugar Creek	81.3
1986	Wolf Creek	82.0
1986	Wagoner Road	83.3
1986	Penn Central Railroad	83.3
1986	Berlin Road	124.0
1986	S.R. 61 & Ceylon-Norwalk Rd.	124.5
1986	Humm Road	125.3
1986	Ditch	126.6
1986	Baumhart Road	136.2
1986	Lake Avenue	144.4
1986	B & O Railroad	144.6
1986	S.R. 57	145.1
1986	Penn Central Railroad	147.9
1986	U.S. 20	148.0
1986	W. Branch of Rocky River	157.4
1986	Lindbergh Blvd.	157.5
1986	N. Royalton-Brecksville Pkwy.	168.6
1986	Western Reserve Road	230.7
1986	Sharott Road	232.0
1986	S.R. 7	232.0

Mainline Bridge Deck Replacements (continued)

Year	Bridge	Milepost
1987	Grand Trunk Western Railroad	34.2
1987	S.R. 108	34.5
1987	S.R. 295	51.4
1987	Penn Central Railroad	52.3
1987	Albion Road	56.1
1987	Penn Central Railroad	56.3
1987	Swan Creek	58.5
1987	S.R. 65	63.3
1987	B & O Railroad	63.5
1987	White Road	63.6
1987	Simmons Road	63.9
1987	East Branch Grassy Creek	64.2
1987	Nine Mile Creek	85.3
1987	Muddy Creek	87.3
1987	Fuller Creek	101.5
1987	Dirt Access Road	103.4
1987	Pickel Street	103.5
1987	Mills Creek	108.3
1987	Penn Central Railroad	109.1
1987	Portland Road	109.2
1987	Hudson Aurora Road	184.2
1987	Norfolk and Western Railroad	186.0
1987	Erie Lackawanna and Penn Central Railroads	208.1
1987	Penn Central Railroad	208.7
1987	Newton Falls - Braceville Road	208.9
1987	Newton Falls - Bailey Road	211.5
1987	B & O and Penn Central Railroads	211.7
1987	Branch of Duck Creek	212.6
1987	Carson - Salt Springs Road	213.6
1987	Tippecanoe Road	228.4
1987	Indian Run	228.6
1987	Mill Creek	230.4

Mainline Bridge Deck Replacements (continued)

Year	Bridge	Milepost
1988	Nettle Creek	10.6
1988	St. Joseph River	11.3
1988	Conrail	19.6
1988	U.S. 127	20.1
1988	U.S. 20	59.8
1988	Eastgate Road	61.1
1988	Norfolk & Western Railroad & Stengel Avenue	61.5
1988	Glenwood Road	66.0
1988	Conrail Railroad	66.2
1988	Cedar Creek	68.0
1988	Conrail Railroad & C.R. 10	68.8
1988	S.R. 163	73.0
1988	Conrail Railroad	74.0
1988	County Line Road	74.1
1988	Trapp Road	77.4
1988	Toussaint Creek	77.5
1988	Lime Road	77.6
1988	Bark Creek	94.2
1988	U.S. 6	95.4
1988	N & W Railroad - Kelley Road	117.3
1988	U.S. 250	118.1
1988	Huron River - N & W Railroad	119.6
1988	Infirmity Road	193.1
1988	Parkman Road	203.7
1988	South Fork Eagle Creek	205.2
1988	Ohio Turnpike over Interchange 16 Ramps	232.9
1989	St. Joseph Beaver Road	14.1
1989	N & W Railroad	14.2
1989	Tiffin River	24.7
1989	C & O Railroad	70.2
1989	Cummins Road	70.3
1989	S.R. 420 & I-280	71.4
1989	S.R. 43	188.2
1989	Mahoning Avenue	219.8

Mainline Bridge Deck Replacements (continued)

Year	Bridge	Milepost
1990	Portage River	80.5
1990	B & O Railroad	113.7
1990	Ransom Road	114
1990	S.R. 5	209.6
1990	Mahoning River	209.9
1990	Ravenna-Warren Road	210.1
1990	B & O Railroad	210.3
1991	Eastland Road	160.4
1991	East Branch of Rocky River	160.7
1991	Rocky River Road	160.7
2002	Turnpike over I-76	219
2006	Turnpike over Meander Reservoir	221.3
2017	Garfield Road - CR8 (WB)	240.8
2018	Garfield Road - CR8 (EB)	240.8
2018	Wheeling & Lake Erie RR	186.0
2019	State Route 108	34.5
2019	Al Creek	47.4
2019	State Route 64	47.5
2019	W & LE	186.0
2019	Poland-Unity Road	237.8
2019	Columbiana-New Castle	238.1
	Total to Date	155 Pairs

Overhead and Ramp Deck Replacements

Year	Bridge	Milepost
1980	Gulf Road	146.4
1983	<i>Bagley Road</i>	152.9
1983	<i>Sprague Road</i>	159.0
1983	U.S. 42 (Pearl Road)	161.1
1983	S.R. 91	183.2
1984	Holland Road	59.0
1984	Ramp over Chestnut Ridge Road at Exit 152	152.0
1984	Usher Road	156.1
1984	Webster Road	162.9
1984	<i>Abbey Road</i>	164.4
1984	Ramp over S.R. 21 at Exit 173	172.9
1984	S.R. 303	207.3
1985	Ramp over Turnpike at Exit 13	13.4
1985	Ramp over Turnpike at Exit 173	173.2
1985	S.R. 21	172.9
1986	Ramp over Turnpike at Exit 34	34.9
1986	Ramp over S.R. 57 at Exit 145	145.1
1986	<i>Jennings Road over Turnpike</i>	154.0
1986	<i>W. 130th Street over Turnpike</i>	163.8
1986	Turnpike Ramp over S.R. 8	180.0
1987	Ramp over US 250 at Exit 118	118.1
1987	<i>Ramp over Turnpike at Exit 118</i>	118.6
1987	West Ridge Road	142.6
1987	<i>Ramp over Turnpike at Exit 145</i>	145.5
1987	S.R. 83	150.5
1987	S.R. 252	156.9
1987	<i>Edgerton Road</i>	169.6
1987	Highland Road	171.1
1987	Barr Road	171.6
1987	Raccoon Road	226.7
1988	Race Road	149.2
1988	Maddock Road	149.8
1988	Ramp over C.R. 12 at Exit 152	152.3
1988	Old Exit 161 Ramp over Turnpike	161.5
1988	S.R. 3	166.8
1988	Ramp over S.R. 7 at Exit 232	232.6
1988	S.R. 164	233.8

Overhead and Ramp Deck Replacements (continued)

Year	Bridge	Milepost
1989	S.R. 66	26.3
1989	Wilkens Road	50.4
1989	S.R. 2	52.9
1989	Eber Road	53.5
1989	Crissey Road	54.8
1989	Manley Road	58.6
1989	S.R. 590	85.5
1989	Fought Road	86.6
1989	Four Mile House Road	88.1
1989	Fangbonner Road	91.1
1989	Ramp over Turnpike at Exit 91	91.6
1989	Ramp over S.R. 53 at Exit 91	92.0
1989	Shannon Road	93.0
1989	Carley Road	94.7
1989	Northwest Road	106.1
1989	S.R. 269	106.8
1989	Deyo Road	107.5
1989	<i>Billings Road</i>	<i>108.7</i>
1989	<i>Patten-Tract Road</i>	<i>112.5</i>
1989	<i>Thomas Road</i>	<i>115.1</i>
1989	S.R. 13	119.3
1989	Gore-Orphanage Road	133.1
1989	<i>Vermilion Road</i>	<i>135.0</i>
1989	South Amherst Road	138.7
1989	Oberlin Road	141.3
1989	Stearns Road	154.6
1989	Big Creek Parkway	161.0
1989	<i>Black Road over EB Turnpike</i>	<i>174.1</i>
1989	<i>Black Road over WB Turnpike</i>	<i>174.1</i>
1989	Boston Mills Road	178.0
1989	S.R. 8 Northbound	180.0
1989	S.R. 8 Southbound	180.0
1989	Ramp over Turnpike at Exit 180	180.3
1989	Stow Road	184.7
1989	U.S. 224	227.6
1989	New Springfield Road	235.6
1989	Beard Road	236.7
1989	S.R. 170	240.4

Overhead and Ramp Deck Replacements (continued)

Year	Bridge	Milepost
1990	Nettle Creek Road	6.2
1990	Farmer Center Road	9.0
1990	S.R. 576	10.2
1990	Townline Road	12.1
1990	S.R. 15 over Exit 13 Ramp	13.2
1990	S.R. 15	13.2
1990	Pleasant Hill Road	15.1
1990	Holloway Road	57.3
1990	<i>Camper Road</i>	75.6
1990	Gibbs Road	97.6
1990	Karbler Road	98.1
1990	Yorktown Road	100.2
1990	Vickery Road	101.2
1990	Mugg Road	102.3
1990	<i>Albion Road</i>	162.2
1990	S.R. 94	167.3
1990	<i>S.R. 176</i>	169.5
1990	Old S.R. 8	179.5
1991	Exit 59 Ramp over US 20	59.8
1991	Portage River-South Road	80.6
1991	Murray Ridge Road	143.4
1991	West River Road	145.8
1991	Page Road	189.2
1991	Diagonal Road	191.2
1992	<i>Harrison Road</i>	130.8
1992	Prospect Road	182.1
1992	Exit 187 Ramp over Turnpike	187.2
1992	Exit 187 Ramp over S.R. 14	187.2
1992	Peck Road	195.2
1993	<i>S.R. 105</i>	79.5
1993	Joppa Road	128.5
1993	<i>S.R. 60</i>	131.6
1993	Coit Road	192.4
1993	Limeridge Road	196.7
1993	S.R. 534	207.6
1993	Exit 209 Ramp over Turnpike	209.2
1993	Exit 209 Ramp over S.R. 5	209.6

Overhead and Ramp Deck Replacements (continued)

Year	Bridge	Milepost
1994	Township Line Road	94.1
1994	S.R. 101	104.2
1994	Exit 161 over Turnpike	161.8
1994	S.R. 88	199.5
1994	S.R. 4 over Turnpike	110.7
1994	S.R. 44 over Turnpike	194.2
1995	River Road	62.8
1996	EB I-480 over Turnpike	186.8
1996	WB I-480 over Turnpike	186.8
1999	Gibson Road	223.9
1999	US 62/S.R. 46	225.2
2000	Shiets Road	96.1
2000	Jacobs Road	96.5
2000	Vickery Road	101.2
2000	Dirt Access Road	103.4
2000	S.R. 101 Bridge	104.2
2000	EB I-90 over West Ridge Road	142.6
2000	EB I-90 over Turnpike	142.8
2001	Stanley Road	201.8
2001	Lintz Road	214.5
2002	<i>Pemberville Road</i>	<i>72.0</i>
2002	Prospect Street	159.5
2002	Ramp over I-71	161.5
2002	Lipkey Road	220.3
2003	Slagle Road	200.2
2003	Horn Road	204.7
2004	Shiloh-Whiteville Road	44.4
2004	Scott Road	49.4
2004	Ramp over Turnpike at Exit 234	234.1
2004	Ramp over Yellow Creek at Exit 234	234.1
2005	Fulton-Lucas County Road	48.4
2005	Cass Road	60.3
2005	Ramp Over Turnpike at Exit 71	71.7
2007	Reighard-Whiteville	43.9
2007	Utah Road	45.4
2012	Gulf Road	146.4
2014	Fish Creek Road	0.9
2014	Stryker-Lockport Road	22.0
2014	Werth Road	93.5

Overhead and Ramp Deck Replacements (continued)

Year	Bridge	Milepost
2015	Old SR596 - CR 17	16.1
2015	Clay's Church Road - TR 19	18.1
2015	Liberty-Adrian Road - CR 8-1	41.1
2015	Key Street - CR 101	60.8
2015	Gibson Road - TR118	223.9
2016	Eberly-Home Road	17.1
2016	Alvordton Road	19.1
2016	Clifton-Gunn Road	21.4
2016	Rueger-Shetler Road	23.9
2016	Fulton-Williams Road	24.4
2016	Spies-Handy Corners Road	27.3
2016	Raker-Barden Road	41.9
2016	Delta-Santee Road	42.4
2016	Brigham-Fraker Road	42.9
2016	SR 83	150.5
2016	Asbury Road	197.8
2016	SR 700	198.5
2017	Arlington Road - TR 130	122.3
2017	Joppa Road - CR 140	128.5
2017	Dean Road - TR 66 (County Line)	132.4
2017	West River Road	145.8
2017	State Route 252 - Columbia Road	156.9
2017	Boston Mills Road - CR 32	178.0
2017	Olde Eight Road	179.5
2017	Nichols Road - CR 225	199.2
2018	USR 42 - Pearl Road	161.1
2018	I-480 EB - Exit 187	186.8
2019	Ramp over State Route 420	71.4
2019	South Billman Road	75.2
2019	Hessville Road	84.4
2019	River Road	120.0
2019	Wikel Road	121.9
2019	Chapin Road	123.1
2019	State Route 60	131.6
2019	Gifford Road	135.4
	Total to Date	167

Bridge Deck Overlay Projects

Year	Bridge	Type	Milepost
1982	Prospect Street (S.R. 237)	Latex	159.5
1983	Key Street	Latex	60.8
1983	Ramp over I-71 at Exit 161	Latex	161.5
1983	Ramp over Turnpike at Exit 161	Latex	161.5
1984	S.R. 101	Latex	104.2
1984	U.S. 62 - S.R. 46	Latex	225.2
1985	EB Turnpike over I-77	Latex	172.5
1985	WB Turnpike over I-77	Latex	172.5
1985	EB Turnpike over I-271	Latex	175.3
1985	<i>Ramp over Turnpike at Exit 218</i>	Latex	219.0
1985	EB Turnpike over I-76	Latex	219.0
1985	WB Turnpike over I-76	Latex	219.0
1988	<i>Root Road over Turnpike</i>	Latex	151.1
1989	Heller Lyon Road over Turnpike	Latex	39.3
1989	Liberty-Adrian Road over Turnpike	Latex	41.1
1989	Raker-Barden Road over Turnpike	Latex	41.9
1989	Delta-Santee Road over Turnpike	Latex	42.4
1989	<i>Lime City Road over Turnpike</i>	Latex	65.4
1989	<i>Oregon Road</i>	Latex	67.2
1989	Ramp under Toll Plaza, Exit 161	Latex	162.0
1990	Pettisville-Morenci Road	Latex	30.3
1990	Tedrow-Morenci Road	Latex	31.4
1990	Hartman-Inlet Road	Latex	32.5
1990	Lena-Morenci Road	Latex	33.2
1990	Exit 71 Ramp over S.R. 420	Latex	71.4
1990	Pemberville Road	Latex	72.0
1990	<i>Billman Road</i>	Latex	75.2
1991	Fish Creek Road	Latex	0.9
1991	Malcolm Church Road	Latex	3.1
1991	Ricketts Bridge Road	Latex	4.1
1991	West Eagle Church Road	Latex	5.1
1991	White Bridge Road	Latex	6.9
1991	Champion Road	Latex	7.6
1991	Cummins Road	Latex	11.6
1991	Old State Route 259	Latex	16.1
1991	Eberly Home Road	Latex	17.1
1991	Clays Church Road	Latex	18.1
1991	Alvordton Road	Latex	19.1

Bridge Deck Overlay Projects (continued)

Year	Bridge	Type	Milepost
1991	Clifton Gunn Road	Latex	21.4
1991	Zone-Southern Road	Latex	25.3
1991	Spies Handy Corners Road	Latex	27.3
1991	Lauber Hill-Ritter Road	Latex	28.3
1991	Eckley-Powers Road	Latex	29.3
1991	Reighard-Whiteville Road	Latex	43.9
1991	Shiloh-Whiteville Road	Latex	44.4
1991	Utah Road	Latex	45.4
1991	Brailey Road	Latex	46.6
1991	Fulton-Lucas Road	Latex	48.4
1991	Scott Road	Latex	49.4
1991	Exit 59 Ramp	Latex	59.5
1991	Cass Road	Latex	60.3
1991	<i>Crystal Street</i>	Latex	62.0
1991	US 24 - SR 25	Latex	62.3
1991	<i>Swartzman Road</i>	Latex	82.2
1991	Hessville Road	Latex	84.4
1991	Dean Road	Latex	132.4
1991	Gifford Road	Latex	135.4
1991	Exit 142 Eastbound Ramp over West Ridge Road	Latex	142.6
1991	Lipkey Road	Latex	220.3
1991	Herbert Road	Latex	225.0
1991	Exit 234 Eastbound Ramp over Turnpike	Latex	234.1
1991	Exit 234 SB Ramp over the Yellow Creek	Latex	234.4
1992	Asbury Road	Latex	197.8
1992	Nichols Road	Latex	199.2
1992	Jewel-North Road	Latex	206.3
1993	Stryker-Lockport Road	Latex	22.0
1993	Shilling-Ely Road	Latex	22.7
1993	Ruegar Shelter Road	Latex	23.9
1993	Fulton-Williams Road	Latex	24.4
1993	Wauseon-Ottokee Road	Latex	35.2
1993	W. Barre-Advance Road	Latex	36.3
1993	Biddle Scott Road	Latex	37.1
1993	Winnemeg-Lyons Road	Latex	38.3
1993	Brigham-Fraker Road	Latex	42.9
1993	<i>Dutch Road</i>	Latex	76.3
1993	<i>Martin- Williston Road</i>	Latex	78.7

Bridge Deck Overlay Projects (continued)

Year	Bridge		Milepost
1993	Dishinger Road	Latex	81.5
1993	River Road	Latex	120.1
1993	Wikel Road	Latex	121.9
1993	Arlington Road	Latex	122.3
1993	Chapin Road	Latex	123.1
1993	Frailey Main Road	Latex	126.3
1993	Angling Road	Latex	129.0
1993	S.R. 700	Latex	198.5
1995	Copp Road	Latex	104.3
2012	Royalton Road	Micro-Silica	165.4
2012	York Road	Micro-Silica	165.5
2012	Bennet Road	Micro-Silica	166.2
2013	Turnpike Ramp over Turnpike	Micro-Silica	161.5
2013	Turnpike Ramp over Turnpike	Micro-Silica	161.8
2013	Turnpike Ramp over Turnpike	Micro-Silica	173.2
2014	Maddock Road	Type K	149.8
2014	State Route 3	Type K	166.8
2015	Turnpike Ramp over Turnpike	Type K	34.9
2015	NS RR (Conrail) (NYC RR) (EB)	Type K	147.9
2015	Turnpike Ramp over Turnpike	Type K	218.7
2016	EB & WB Turnpike over Kelly Road	Micro-Silica	117.3
2016	EB & WB Turnpike over SR 250	Micro-Silica	118.1
2016	NS RR (Conrail) (NYC RR) (WB)	Micro-Silica	147.9
2018	Turnpike Ramp over Turnpike	Micro-Silica	218.7
2019	Quarry Road	Micro-Silica	138.0
Total to Date			101

Third Lane Construction Program Overhead Bridge Replacement or Reconstruction

Year	Bridge	Milepost
1996	Dishinger Road	81.5
1996	Billings Road	108.7
1996	Root Road	151.2
1996	S.R. 88	199.5
1997	Lime City Road	65.4
1997	Tracy Road	67.7
1997	Lemoyne Road	70.8
1997	Billman Road	75.2
1997	Dutch Road	76.3
1997	Martin-Williston Road	78.7
1997	Swartzman Road	82.2
1997	Kingsway Road	89.4
1997	Patten-Tract Road	112.5
1997	Thomas Road	115.1
1997	Gate 7 Ramp	118.6
1997	Gate 8 Ramp	145.5
1997	West 130th Street	163.8
1997	S.R. 176	169.5
1997	Black Road	174.1
1997	Metroparks Bikeway	179.2
1997	Selkirk-Bush Road	212.5
1998	Crystal Avenue	62.0
1998	Detroit Avenue	62.3
1998	Vermilion Road	135.0
1998	Albion Road	162.2
1999	Camper Road	75.6
1999	S.R. 105	79.5
1999	Angling Road	129.0
1999	S.R. 60	131.6
1999	Abbey road	164.4
1999	Edgerton Road	169.6
2000	Oregon Road	67.2
2000	Luckey Road	69.7
2000	Harrison Road	130.8
2000	Berea-Bagley Road	152.9
2000	Sprague Road	159.0
2000	Elsworth Bailey NB	215.4
2000	Elsworth Bailey SB	215.4

Third Lane Construction Program (continued)
Overhead Bridge Replacement or Reconstruction

Year	Bridge	Milepost
2000	Exit 218 Ramp Over Turnpike	219.0
2002	S.R. 795 Over Turnpike	65.1
2002	Pemberville Road	72.0
2003	Ramp over Turnpike	59.5
2003	CSX Railroad	157.2
2006	Norfolk Southern Railroad	182.0
	Total to Date	44

Appendix D

Current Bridge Repairs,
Rehabilitations,
And Replacements

Table 1: Embankment Rehabilitation

Milepost	Intersecting Roadway	Status
N/A	N/A	NONE UNDER CONTRACT

Table 2: Various Repairs Including Fence, Parapet, Bearings, Joints etc.

Milepost	Intersecting Roadway	Status
149.8	Maddock Road over OT	Completion Scheduled 10/2019
151.1	Root Road over OT	Completion Scheduled 10/2019
152.0	OT over Chestnut Ridge Road	Completion Scheduled 10/2019
152.1	OT over OT Ramp	Completion Scheduled 10/2019
152.3	OT over Lorain Road	Completion Scheduled 10/2019
152.6	OT over NS RR	Completion Scheduled 10/2019
152.9	Bagley Road over OT	Completion Scheduled 10/2019
153.9	Jennings Road over OT	Completion Scheduled 10/2019
172.3	OT over Ramp	Completion Scheduled 10/2019
172.5	OT over I-77	Completion Scheduled 10/2019

Table 3: Bridge Painting

Milepost	Intersecting Roadway	Status
60.8	Key Street over OT	Completion Scheduled 10/2019
66.0	OT over Glenwood Road	Completion Scheduled 10/2019
68.0	OT over Cedar Creek	Completion Scheduled 10/2019
70.3	OT over Cummings Road	Completion Scheduled 10/2019
71.4	OT Ramp over SR 420	Completion Scheduled 10/2019
73.0	OT over SR 163	Completion Scheduled 10/2019
195.2	Peck Road over OT	Completion Scheduled 10/2019
198.5	State Route 700 over OT	Completion Scheduled 10/2019
199.2	Nichols Road over OT	Completion Scheduled 10/2019

Table 4: Emergency Repairs

Milepost	Intersecting Roadway	Status
95.4	U.S. 6	Completion Scheduled 10/2019

Table 5: Bridge Deck Overlays

Milepost	Intersecting Roadway	Status
138.0	Quarry Road (EB/WB)	Completion Scheduled 6/2019

Table 6: Bridge Deck Replacements

Milepost	Intersecting Roadway	Status
34.5	State Route 108	Completion Scheduled 10/2019
47.4	Al Creek	Completion Scheduled 10/2019
47.5	State Route 64	Completion Scheduled 10/2019
186.0	W & LE RR	Completion Scheduled 10/2019
237.8	Poland-Unity Road	Completion Scheduled 10/2019
238.1	Columbiana-New Castle	Completion Scheduled 10/2019

Table 7: Bridge Removals

Milepost	Intersecting Roadway	Status
34.2	DT & I RR	Completion Scheduled 2020
138.2	Abandoned Railroad	Completion Scheduled 10/2019
223.0	Mill Creek Bikeway	Completion Scheduled 10/2019

Table 8: Bridge Replacements

Milepost	Intersecting Roadway	Status
59.0	Perrysburg-Holland Road	Completion Scheduled 10/2019

Appendix E

Crash Statistics

Crash Statistics (1955 to 2019 Year to Date)

Year	Accidents	Accident Rate	No. of Fatalities	Fatality Rate
1955	233	147	4	2.5
1956	806	102.5	16	2.0
1957	775	85	28	3.1
1958	666	72.5	29	3.1
1959	763	77.7	18	1.8
1960	756	73.2	20	1.9
1961	735	72.3	23	2.3
1962	773	72.6	13	1.2
1963	778	71.6	16	1.5
1964	966	83.3	35	3.0
1965	1,039	86.3	32	2.6
1966	1,193	93.4	40	3.1
1967	1,268	98.7	27	2.1
1968	1,485	108.4	35	2.6
1969	1,502	104.1	40	2.8
1970	1,478	100.2	24	1.6
1971	1,542	101.3	34	2.2
1972	1,832	114.9	26	1.6
1973	1,902	115.4	28	1.7
1974	1,491	98.1	10	0.7
1975	1,366	88.5	24	1.6
1976	1,496	90.7	21	1.3
1977	1,770	103.4	26	1.5
1978	1,726	98.4	19	1.1
1979	1,543	95.5	38	2.4
1980	1,393	88.4	26	1.7
1981	1,583	94.6	20	1.2
1982	1,552	98.3	12	0.8
1983	1,625	98.6	13	0.8
1984	1,821	107.8	11	0.7

Crash Statistics (1955 to 2019 Year to Date)

Year	Accidents	Accident Rate	No. of Fatalities	Fatality Rate
1985	1,814	104.8	19	1.1
1986	1,698	93	8	0.4
1987	1,944	101.7	12	0.6
1988	1,874	93	18	0.9
1989	1,944	92.7	21	1.0
1990	1,847	84.6	13	0.6
1991	1,759	81.5	13	0.6
1992	1,755	78.5	21	0.9
1993	1,846	80	12	0.5
1994	1,978	81.8	19	0.8
1995	2,019	80.3	12	0.5
1996	2,248	90.5	13	0.5
1997	2,035	82.9	10	0.4
1998	1,889	73.5	8	0.3
1999	2,303	86.7	8	0.3
2000	2,443	90.4	12	0.4
2001	2092	77	14	0.5
2002	2373	84.5	10	0.4
2003	2433	85.9	11	0.4
2004	2609	89.6	17	0.6
2005	2858	95.6	14	0.5
2006	2342	77.0	8	0.3
2007	2532	85.0	11	0.5
2008	2689	95.0	5	0.2
2009	2125	81.6	8	0.3
2010	2268	80.9	7	0.2
2011	2583	92.7	6	0.2
2012	2598	92.7	7	0.2
2013	2380	83.5	8	0.3

Crash Statistics (1955 to 2019 Year to Date)

Year	Accidents	Accident Rate	No. of Fatalities	Fatality Rate
2014	2642	91.1	9	0.4
2015	2459	90.2	11	0.4
2016	2367	91.7	12	0.5
2017	2238	73.0	5	0.2
2018	2397	78.3	9	0.3
*2019	1456	71.9	10	0.5

* 8 months

Appendix F

Schedule of Insurance

OHIO TURNPIKE AND INFRASTRUCTURE COMMISSION

Resolution Authorizing the Renewal of Insurance Policies for the Commission's Property and Casualty Insurance Program for the 2019/2020 Policy Year in the Aggregate Amount of \$847,977.00

WHEREAS, the Ohio Turnpike and Infrastructure Commission ("Commission") is required to maintain comprehensive property and casualty insurance coverage in accordance with Article 5, Sections 5.05, 5.06 and 5.07 of the Master Trust Agreement dated April 8, 2013, as amended, as well as the Junior Lien Master Trust Agreement dated August 1, 2013 (collectively, the "Trust Agreements"); and

WHEREAS, the Commission has received proposals for the renewal of the Property and Casualty Insurance Program for the 2019/2020 policy year as described below whereby the Commission will continue to maintain coverage for Commercial General Liability, Automobile Liability, Public Officials Liability, Employment Practices Liability, Employers Liability, Employee Benefits Liability, Bridge and Use & Occupancy, Multi-Peril Property, Data Processing, Maintenance/Contractor's Equipment, Boiler & Machinery, Money and Securities/Crime Insurance, Umbrella/Excess Liability, Pollution Liability and Cyber Liability Insurance coverage, which will result in an overall 7% increase in premium as compared to the cost paid for the same insurance coverage during the 2018/2019 policy year; and

WHEREAS, the General Counsel/Director of Risk Management, and the Commission's independent insurance consultant, Crain Langner & Co. have recommended that the Commission accept the proposals received for the purchase of said insurance policies offered by the following agent/brokerage firms on behalf of insurance carriers at the corresponding premium quotes:

1. Commercial General Liability including terrorism coverage, Automobile Liability, Public Officials Liability, Employment Practices Liability, Employers Liability, Employee Benefits Liability, Umbrella Liability Insurance coverage, and agency fee proposed by Jackson, Dieken & Associates on behalf of the U.S. Specialty Insurance Company for an annual premium of \$308,479.00 beginning on September 1, 2019;
2. Multi-Peril/Property Insurance, including terrorism coverage and engineering fees, proposed by Arthur J. Gallagher Risk Management Services, Inc. on behalf of Travelers Indemnity Company for an annual premium of \$212,548.00 beginning on September 1, 2019;
3. Bridge and Use & Occupancy Insurance, including terrorism coverage, proposed by Arthur J. Gallagher Risk Management Services, Inc. on behalf of the Continental Casualty Company for an annual premium of \$150,386.00 beginning on September 1, 2019;
4. Broad Form Money and Securities/Crime Insurance proposed by Arthur J. Gallagher Risk Management Services, Inc. on behalf of Travelers Casualty & Surety Co. of America for an annual premium of \$38,866.00 beginning on September 1, 2019;
5. Excess Liability Insurance Coverage, including terrorism coverage, proposed by Arthur J. Gallagher Risk Management Services, Inc. on behalf of The North River Insurance Company and Great American Insurance Co. of New York for a total annual premium of \$106,874.00 beginning on September 1, 2019;
6. Note, Pollution Liability Insurance, including terrorism was purchased last year under a two-year policy term starting September 1, 2018, for a two-year premium of \$29,772.00 that was paid in 2018. This coverage is provided by Ironshore Specialty Insurance Company through Arthur J. Gallagher Risk Management Services, Inc.; and
7. Cyber Liability Insurance, including terrorism coverage, proposed by Arthur J. Gallagher Risk Management Services, Inc. on behalf of Ironshore Specialty

Insurance Company, for an annual premium of \$30,824.00 beginning September 1, 2019.

WHEREAS, the Executive Director has reviewed the recommendations submitted by the General Counsel/Director of Risk Management and concurs with their recommendations; and

WHEREAS, the Commission has duly considered such recommendations,

NOW, THEREFORE, BE IT

RESOLVED, that the Commission, in accordance with the Trust Agreements, which require it to maintain comprehensive property and casualty insurance coverage, has duly considered the recommendations of its independent insurance consultant and General Counsel/Director of Risk Management; and

FURTHER RESOLVED that the Commission hereby authorizes the Executive Director and the General Counsel/Director of Risk Management, each alone or together, to purchase the above-specified insurance policies for the aggregate premium amount of \$847,977.00 from the following brokers:

- 1) Jackson, Dieken & Associates., for Commercial General Liability Insurance, Employee Benefits Liability Insurance, Employers Liability Insurance, Automobile Liability Insurance, Public Officials Liability Insurance, Employment Practices Liability Insurance, and Umbrella Liability Insurance; and
- 2) Arthur J. Gallagher Risk Management Services, Inc., for second and third layers of Excess Liability Insurance, Bridge and Use & Occupancy Insurance, Multi-Peril Property Insurance, Broad Form Money and Securities/Crime Insurance and Cyber Liability Insurance.

FURTHER RESOLVED that the Commission hereby authorizes the Executive Director or the General Counsel/Director of Risk Management, together or individually, to execute such additional documentation or certificates and to take any and all further action that may be necessary or appropriate in the opinion of the General Counsel/Director of Risk Management to the Commission, in order to effect the purchase of the above-described insurance policies and the intent of this Resolution; and

FURTHER RESOLVED that a certified copy of this Resolution shall be transmitted to the Trustee for the bondholders in accordance with the requirements of our Trust Agreements.

(Resolution No. 41-2019 adopted August 19, 2019)

OHIO TURNPIKE AND INFRASTRUCTURE COMMISSION

