



E-470 Public Highway Authority
2021 Annual Certification



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2021 E-470 Annual Certification Report

Prepared for E-470 by Short Elliott Hendrickson Inc. (SEH)

1 Introduction

1.1 Purpose of Report

The E-470 Public Highway Authority's (the Authority) bond covenants require an Annual Certification, which consists of an independent consultant inspecting the Authority's assets and providing a written report summarizing the inspection results. The completion of this process keeps the Authority in compliance with the applicable requirements of the bond documents and allows for a "fresh" set of eyes to look at the Authority's assets and identify areas of concern or items needing specific attention.

Each asset evaluated receives a numerical score from 0-100 as defined in the Authority's Numerical Scoring System (NSS). This scoring system provides a repeatable method to measure asset conditions and provides a scientific method for measurement of quality and the Authority's performance of maintenance of their assets. With such a system, results can be compared to previous years and over time the scores can be tracked.

The report, as outlined by the Authority, will include the following:

- 1) Inspection results identifying if completed portions of the highway have been maintained appropriately as outlined in the NSS.
- 2) Review of the Authority's annual budget to assess the estimated cost of maintenance and improvements needed for the upcoming fiscal year.
- 3) Discussion of upcoming safety initiatives for improvement of the highway.

1.2 Budget

The Authority's annual budget addresses road maintenance and improvements in both the Operating and Capital portions of the budget. Furthermore, the Authority maintains a Capital Improvement Fund as a sub-account within the General Surplus Fund. The Capital Improvement Fund had a balance of \$214,639,122 to fully fund the 2021 capital budget of the \$38,625,200. See Section 3 for Roadway and Maintenance Budget details.

1.3 Overview

The E-470 Public Highway, described further in Section 1.4, has been, and continues to be, maintained in good working order and safe operating condition. The Authority has an established Asset Management System, which in part is used to monitor assets by conducting specific scheduled inspections to identify deficiencies before potential failure of the asset occurs or the deficiencies increase in severity. This proactive approach has greatly aided the Authority in correcting minor problems and performing preventative maintenance, thus preventing larger

problems in the future, and prolonging the life of their assets. This approach has proven to be cost-effective as well, since preventative measures mitigate the chance of failure of an asset, which could pose a danger to the public with potential liability issues.

Capital Improvement Projects have been completed or are scheduled, which address both current and future maintenance and operation issues. The improvement projects will be finished before traffic increases impact the level of service to the tollway customers. This approach has enabled maintaining excellent levels of service, such that the customers are always provided safe and reliable method of travel.

The findings noted in this report are based on the Authority's NSS to assess and identify the level of maintenance being achieved. The corridor continues to receive ongoing, outstanding maintenance. The capacity, safety upgrades, and operational enhancements are on a scale that exceeds other roads in Colorado. The safety features on the corridor have been, and continue to be, upgraded to provide the customer a safer and quicker option for a travel route than either the Interstate or State Highway System.

The Authority continues to reinvest in their corridor with several improvements that were completed in recent years or are ongoing, as well as setting the stage for future projects.

1.4 E-470 Public Highway Description

E-470 was originally constructed as a 47-mile long 4-lane toll road and was designed and constructed to Interstate Highway standards. The first portion of the toll road opened in 1991 and the final portion opened in 2003 and traverses the eastern limits of the Denver metro area as shown in Figure 1-1. Since the highway's original construction, an additional through lane has been added in each direction to create a 6-lane highway between the south I-25 interchange and the I-70 interchange.

Lane Miles: The highway consists of 299 lane miles of roadway, which includes through lanes, climbing lanes, ramps and interchanges, and auxiliary lanes. The Authority completed an additional 16 lane miles through roadway widening between Quincy Ave and I-70 in 2020, widening this length to 3 lanes in each travel direction (see section 1.5 below).

Interchanges: There are a total of 24 interchanges with 5 freeway-to-freeway interchanges located at north I-25, I-76, Pena Boulevard, I-70, and south I-25. The remainder of the interchanges are with arterial streets and are mostly standard interstate diamond interchanges. Six of the interchanges are non-tolled and located at north I-25, I-76, Pena Boulevard, I-70, Parker Road, and south I-25.

Tolling: The tollway was designed and constructed as a "closed" system in that every vehicle that uses the highway pays a toll, either at an entry point, an exit point, or through one of the five mainline toll plazas. On July 4th, 2009, the highway was converted to an all-electronic tolling facility. Tolls are now collected using ExpressToll accounts with transponders or through license plate tolling. On January 1st, 2020, toll rates were frozen for the third time for ExpressToll customers, and the first time for LicensePlateToll customers on E-470. Even during the current pandemic downturn and recovery period, the Authority's Board of Directors approved an extension of current 2020 toll rates through 2021.

Facilities: There are five mainline toll plazas along the highway located at Milepoints 2.5, (Plaza A), 15.5 (Plaza B), 22.5 (Plaza C), 30.0 (Plaza D), and 40.0 (Plaza E). These plazas consist of an overhead canopy structure to house the license plate cameras and electronic toll collection system hardware, along with administrative buildings.

Near Plazas A, C, D, and E, the Authority also maintains maintenance facilities (“support sites”), which provide areas for storage and distribution of snow removal chemicals, granular materials, and plow truck deployment for winter weather. The support site near Plaza C also houses a Central Maintenance Facility (CMF), which provides garage space, wash bays, and additional garage storage space for plow truck maintenance and repair.

The Authority Headquarters Facility (AHF), located near the midpoint of the corridor at the Stephen D. Hogan/6th Parkway Interchange, provides office space for Authority and toll operations contractor staff. This facility houses the heart of all electronic Toll Collection System hardware and software. The AHF includes a communications center with 24-hour surveillance of all activities on the highway, including traffic flow, road conditions, toll collection system monitoring, and accident/incident response.

Toll Plaza C and the CMF properties have been sold to a private developer. The Authority will remain in the CMF until 2024, when a new CMF will be opened adjacent to the AHF.

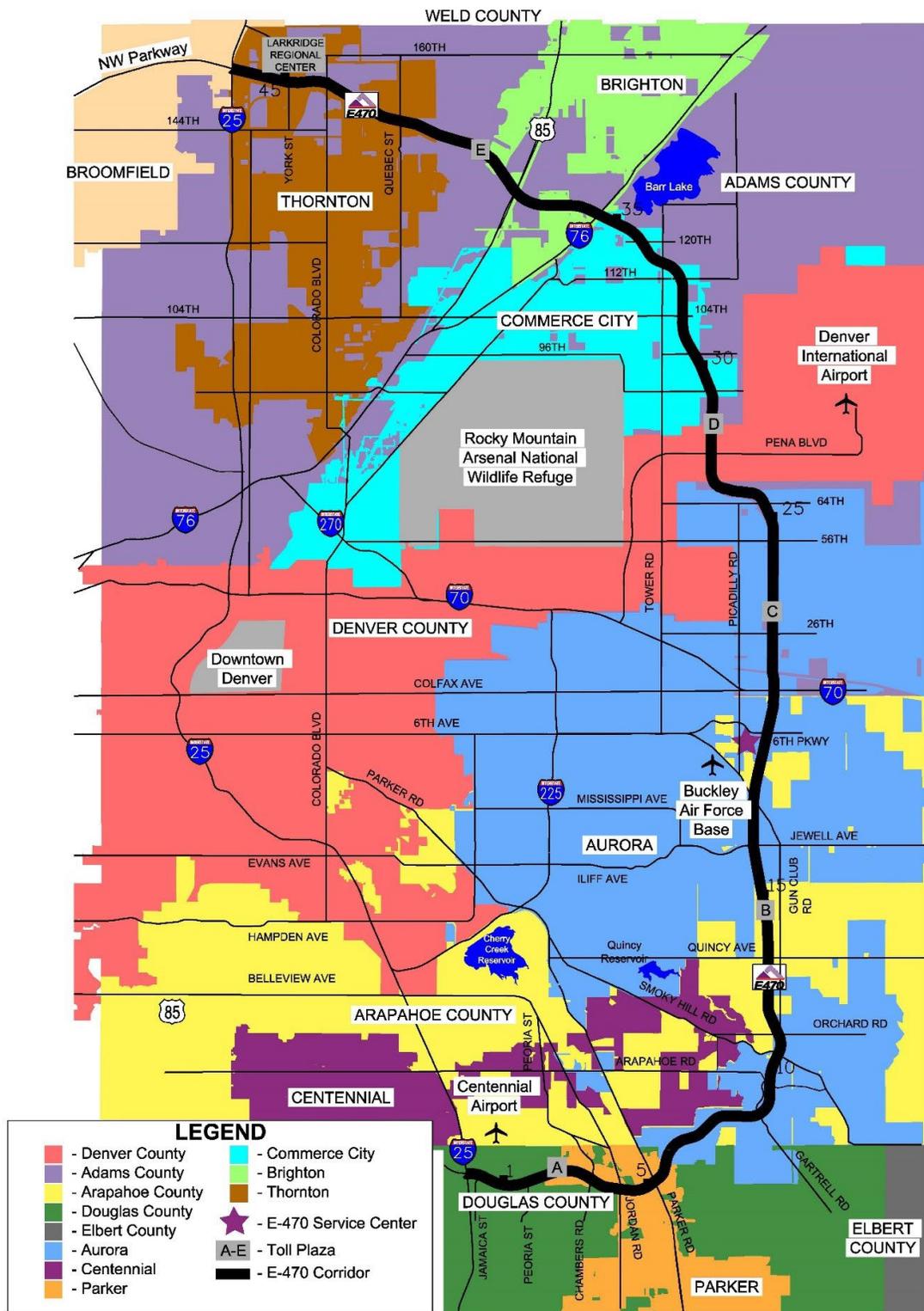


Figure 1-1 – E-470 Mainline Map

1.5 Improving the Tollway

The Authority has continued to be proactive in responding to traffic and revenue studies that have predicted low values for future Level of Service (LOS) ratings. The Authority has set a standard of LOS C or better for its facility. This is a high LOS standard that is maintained to ensure that customers are provided reliable service with minimal delays all hours of the day throughout the year. The 2020 E-470 Master Plan contains a table that summarizes the proposed timeline of mainline segments that will need to be widened in order to maintain the desired LOS throughout the corridor through 2040.

In March of 2021, the Authority completed a roadway widening project adding a third travel lane between Quincy Avenue and I-70. These eight miles now feature expanded bridge structures, upgraded interchange signals, improved drainage assets, fresh pavement, and expansion to the High Plains Trail. Through partnership with Arapahoe County and the City of Aurora, the northbound Quincy Ave. ramps were relocated to support the Quincy Avenue/Gun Club Rd. intersection improvements. In addition, major drainage improvements, signal and signage upgrades, railing enhancements, and many other advances were made. Looking forward into 2022, the next section of highway to be widened is approximately 11 miles from I-70 to 104th Avenue. This phase will also include various interchange improvements, moving Toll Plaza C, reconfiguring Toll Plaza D, and additional multi-use trail extensions.

In early 2018, the Authority partnered with the City of Aurora and Arapahoe County to address increasing traffic congestion and safety concerns in the Quincy Avenue area due to the proximity of the E-470 ramp intersections and the adjacent Gun Club Road intersection. The solution agreed upon between the three agencies required two concurrent construction projects: one to convert the Quincy Avenue/Gun Club Road intersection into a partial continuous flow layout and the other to relocate the northbound Quincy Avenue off and on ramps to connect to Gun Club Road via a buttonhook layout. The combination of these projects would reduce congestion, travel times and safety concerns. The ramp relocation of Quincy Avenue was included with the Quincy Avenue to I-70 Road Widening Project to achieve economies of scale. The completed Quincy Avenue/Gun Club Road ramp relocation, including land acquisition, was \$6.4M compared to the initial \$9M estimate. These interchange improvements were completed earlier this year.

The 2020 Master Plan also outlines future interchange improvement needs. These improvements include signaling ramp terminal intersections, widening cross streets/bridges, and the construction of new full-access interchanges along the corridor. Signal warrant studies were conducted in 2018 for the 120th Avenue and Quincy Avenue ramp terminals to determine if signal control was warranted at either interchange. Design of traffic signals for the 120th Avenue interchange accounts for future widening of 120th Avenue through the E-470 interchange, and signal installation was completed in late 2020. Signalization of the southbound Quincy ramp terminals was completed with the widening project discussed above.

The locations of potential new interchanges are at 38th Avenue, 48th Avenue, 88th Avenue, 112th Avenue and Potomac Street/Sable Boulevard. Conceptual layouts for design were being evaluated at both Potomac Street and Sable Boulevard locations. After further discussion with the City of Brighton, Adams County, and finalization of feasibility studies for both, the Authority

confirmed that Sable Boulevard is the preferred location for a new proposed interchange. In July of 2021, the Authority began a feasibility study to review the possible accelerated construction of the future 48th Avenue interchange.

On May 21st, 2020 the Authority signed a multi-million dollar long term contract with Electronic Transaction Consultants (ETC), one of the United States' leading intelligent transportation system and service providers. Within this contract, ETC will deliver and operate its next generation roadside tolling system, RiteSuite™. Some features of this advanced software include enhanced vehicle detection, separation, and classification; redundant toll collection equipment; and upgraded digital video audit system. Implementing this state-of-the-art system will help E-470 continue to grow and expand services to their customers; and efficiently monitor the health and performance of toll collecting equipment.

The Authority executed an agreement with the Aerotropolis Regional Transportation Authority to jointly fund the construction of a new diamond interchange at 38th Avenue. The new interchange will provide access to and from Aurora Highlands, a 3,150-acre master planned development that will add a projected 32,000 residents.

The Authority also executed an agreement with the 64th Avenue Aurora Regional Improvement Authority to jointly fund the expansion of the 64th Avenue to accommodate rapid development in that area.

A Hazardous Materials Route Data and Analysis report was prepared for the E-470 Public Highway Authority so they can determine whether the E-470 corridor is a feasible route for the transportation of hazardous materials. In August 2020, the Authority's Board of Directors approved proceeding with the petition process based on a HAZMAT Route Analysis. The HAZMAT petition is scheduled to be submitted to the Colorado State Patrol in fall 2021. This study compares E-470 to neighboring HAZMAT routes and analyzes environmental, safety, traffic, physical roadway characteristics, and social environmental data. The Colorado State Patrol will assess the data presented in the HAZMAT petition and, after public meetings and stakeholder outreach, present a recommendation to the Colorado State Transportation Commission.

1.6 Public Communications

The Authority uses social media as a tool to educate and communicate with its customers. Videos are created quarterly in an effort to provide updated and timely information to the public. In addition, the Authority uses this communication channel to inform the traveling public of current and future construction projects on or near E-470 that may impact the customer's travel. The following is the E-470 Facebook link which shows many of the videos created by the E-470 Communications Team aimed at keeping the customers informed: <https://www.facebook.com/E47OPHA>.

The E-470 website (<https://www.e-470.com>) also has vast amounts of information available to the public including general information about the highway, toll calculator, maps, current widening projects updates, a history of the highway, road advisories, safety tips, contests and promotions, and customer feedback. The Authority sends out a Quarterly Newsletter via email to its customers and is also active on Twitter (@e470RoadUpdates).

1.7 Safety Initiatives

The Authority continues to focus on safety initiatives to address known and potential problem areas throughout the corridor. The Authority conducts a quarterly review of all accidents and incidents occurring on the corridor in an effort to determine if future safety initiatives may have an impact on accident reduction. Ongoing initiatives include:

- The Authority's safety consultant DiExSys, LLC completed a Road Safety Study Report in early 2019 with recommendations for safety improvements. From one of these recommendations, the Authority is working with Colorado State Patrol to add two troopers to the Authority's detail to enhance needed enforcement.
- In August 2019, the Authority Board of Directors unanimously approved the Colorado State Patrol 5-year (2019-2024) Patrol Services and Safety Enforcement contract. The Authority has been contracting law enforcement services with the Colorado State Patrol for the past 28 years.
- CDOT frequently updates their standards for W-beam guardrail. As large portions of the existing guardrail are damaged, it is being replaced with the newest CDOT-compliant W-beam guardrail. New construction projects will also upgrade the guardrail to the newest standards.
- To protect drivers and wildlife, E-470 utilizes deer fencing on long stretches of the corridor. Between Parker Road and Smoky Hill Road, deer vs. vehicle incidents were reduced from 15 to 5 per year after the installation of deer fence. As future road widening projects occur, deer fence will continue to be installed in an effort to reduce vehicle-wildlife accidents.
- The program "Alive at 25" provides drivers ages 15 to 24 a half-day driver education course to prevent traffic violations, collisions, and fatalities.
- The E-470 Transportation Safety Foundation, a non-profit organization that raises its own funds, awards transportation safety grants to support teen driving education, seat belt safety, transportation services, safety for seniors and youth, and car seat safety programs.

In 2020 the Authority implemented the following safety initiatives:

- Speed radar signs just north of 64th Avenue to address a higher-than-average number of accidents at an approaching horizontal curve.
- Started to use 6" wide lane markings for all new construction and restriping projects in lieu of 4" to increase visibility. All mainline striping is now 6" wide.

1.8 Independent Engineer Statement

This report was prepared by Short Elliott Hendrickson Inc., which is an independently owned professional engineering firm licensed to provide engineering services in Colorado.

2 Annual Maintenance Inspection

2.1 Overview of Annual Maintenance Inspection

The consultant responsible for preparing this report is also responsible for the inspection of most of the assets listed in Section 2.1.1, unless the asset is inspected by a third party to ensure compliance with industry standards. The inspections consist primarily of visual inspection, with others utilizing non-destructive testing techniques. The Authority has provided a Numerical Scoring System (NSS) to standardize the results, which can be used in future years to provide a trend analysis. Using the NSS, the inspections for each major and minor asset are categorized as follows:

- 90 to 100 – Excellent Condition
- 80 to 89.9 – Good Condition
- 70 to 79.9 – Average Condition
- 60 to 69.9 – Below Average Condition
- 0 to 59.9 – Poor Condition

2.1.1 Inspection Categories

- Major Assets
 - Roadway Pavement
 - Bridges
 - Lighting
 - Drainage
 - Guardrail, Cable Rail and Barrier
 - Buildings
 - Walls
- Secondary Assets
 - Signing
 - Striping
 - Delineators
 - Native Seeded Areas
 - Fencing
 - Embankment Protectors
- Additional Assets
 - Variable Message Signs
 - Overhead Sign Structures
 - Irrigation and Plant Maintenance
- Traffic Services
 - Safety

- Litter Control
- Snow and Ice Removal

2.1.2 Evaluation Criteria

Each inspection category was scored according to the Authority's NSS. Any areas of concern were classified under three levels of evaluation. The criteria for the levels of evaluation are:

Level One – Immediate Requirements

Level One items require immediate attention and should be addressed as quickly as possible. Immediate notification of Level One findings are provided to the Authority. Items in this category include posing potential safety hazards, creating excessive maintenance, or possessing the potential to be a liability. They also include items with a NSS value below the minimum requirements established for each major and secondary asset.

Level Two – Short-Term Requirements

Level Two items are not in need of immediate attention, but are not up to standards and should be included in the upcoming maintenance program to be addressed within a year of discovery.

Level Three – Long-Term Requirements

Level Three items are items in current good condition and do not require any major maintenance within the next year, but should be monitored for deterioration in the next two to four years.

2.2 Major Assets

2.2.1 Roadway Pavement

The Authority contracts with a third-party to conduct a pavement condition assessment in accordance with ASTM 6433-99 for smoothness and pavement distress. Two types of pavement are used on E-470, Hot Mix Asphalt (HMA) on the mainline and ramp gore areas and Portland Cement Concrete Pavement (PCCP) on the ramps and approaches to the toll plazas. Projected traffic, revenue studies, and data from the International Roughness Index (IRI) and the Pavement Condition Index (PCI) are used to plan five to eight years of renewal and replacement projects on E-470. Hot Mix Asphalt

The pavement analysis conducted in the summer of 2021 provided an **overall IRI of 66 in/mi**. Based on a 2019 Federal Highway Administration (FHWA) report, roughly 60% of Colorado's interstate miles had an IRI rating below 95 in/mi (a lower number constitutes a smoother ride). The PCI assesses visible signs of deterioration in the roadway and provides a number from 0 to 100, with 100 representing pavement in excellent condition. **The 2021 pavement analysis resulted in a PCI of 83.7, which is considered to be in good condition.** From extensive driving of the corridor and visual assessment of the pavement at each individual asset inspection, the Consultant agrees that pavement remains in good condition with no substantial damage found.

Portland Cement Concrete Pavement

The Portland Cement Concrete Pavement (PCCP) is located on the ramps and toll plaza approaches and therefore does not get assessed in the pavement analysis report. The Authority strives to repair or replace portions of PCCP before it has failed; however, PCCP that has failed is quickly reconstructed. For repairs, such as longitudinal cracks, the Authority uses cross-stitching as an effective repair method. No substantial deterioration or damage was observed during the 2020 inspections.

2.2.2 Bridges

Each year, the Authority contracts with an independent consultant for the bridge inspections in accordance with the Federal Highway Administration’s National Bridge Inspection Standards (NBIS). The Authority maintains 102 bridges, approximately half of which are inspected one year, and the remaining bridges are inspected the following year, providing the required two-year cycle for bridge inspections per the NBIS. The NBIS defines a bridge as any structure that has a clear span or opening of at least 20 feet along the centerline of the roadway, including culverts that meet these criteria. Thus, some concrete box culverts are considered “bridges” per this definition.

Forty-four (44) bridges located in Segments I-III were inspected in July and August 2021 and only minor preventative repair or maintenance items recommended, and no major structural concerns were identified. Numerous bridges were reconstructed and/or widened, or in the process of being widened, through the construction zone and no issues were seen with these bridges.

A Sufficiency Rating is automatically calculated through the inspection database for each bridge, which rates the overall structural adequacy of the bridge on a 0-100 scale. **The inspected bridges were found to be in an overall excellent condition with an average sufficiency rating of 95.3.** Table 2-1 summarizes the individual sufficiency ratings for the bridges inspected in 2021.

Table 2-6 – 2021 Structure Sufficiency Rating

Structure Number	Facility Carried	Feature Intersected	Sufficiency Rating
E-470-34.08A	E-470 NB	120th Avenue	90.4
E-470-34.08B	E-470 SB	120th Avenue	91.6
E-470-34.42A	E-470 NB	O’Brian Canal	96.0
E-470-34.42B	E-470 SB	O’Brian Canal	94.9
E-470-34.42D	E-470 Ramp D	O’Brian Canal	99.4
E-470-34.63A	E-470 NB	Buckley Road	97.3
E-470-34.63B	E-470 SB	Buckley Road	97.3
E-470-34.79A	E-470 NB	Burlington Ditch	98.4
E-470-34.79B	E-470 SB	Burlington Ditch	97.3
E-470-35.28D	E-470 Ramp C	Relocated Third Creek	99.8
E-470-35.34D	E-470 Ramp C	BNSFRR, Cameron Drive	98.8
E-470-35.44A	E-470 NB	I-76, BNSFRR	96.8

E-470-35.44B	E-470 SB	I-76, BNSFRR	96.0
E-470-35.46D	E-470 Ramp G	Relocated Third Creek	99.8
E-470-36.27C	Sable Road/SH 2	E-470	94.7
E-470-37.07A	E-470 NB	Second Creek	94.9
E-470-37.07B	E-470 SB	Second Creek	94.4
E-470-37.30CBC	E-470	Local Drainage	81.3
E-470-37.72C	E-470 Connector	US 85 Mainline	99.9
E-470-37.83A	E-470 NB	US 85, UPRR, Fulton Ditch	94.1
E-470-37.83B	E-470 SB	US 85, UPRR, Fulton Ditch	91.3
E-470-38.38C	US 85 Connector	E-470	95.9
E-470-38.47C	Brighton Boulevard	E-470	95.8
E-470-38.97A	E-470 NB	South Platte River	91.5
E-470-38.97B	E-470 SB	South Platte River	91.5
E-470-39.51A	E-470 NB	Riverdale Road and Ditch	97.6
E-470-39.51B	E-470 SB	Riverdale Road and Ditch	97.6
E-470-41.57C	Quebec Street	E-470 Mainline	98.9
E-470-42.45CBC	E-470 Mainline	Local Drainage	81.6
E-470-42.61A	E-470 NB	Holly Street	96.6
E-470-42.61B	E-470 SB	Holly Street	85.5
E-470-43.04C	Signal Ditch	E-470 Mainline	-
E-470-43.66C	Colorado Boulevard	E-470 Mainline	96.7
E-470-44.11C	Union Pacific Railroad	E-470 Mainline	-
E-470-44.62CBC	E-470 Mainline	Local Drainage	81.6
E-470-44.83A	E-470 NB	York Street	97.6
E-470-44.83B	E-470 SB	York Street	97.6
E-470-44.98A	E-470 NB	Big Dry Creek	97.6
E-470-44.98B	E-470 SB	Big Dry Creek	97.6
E-470-44.98C	E-470 On Ramp B	Big Dry Creek	100.0
E-470-44.98E	E-470 Off Ramp D	Big Dry Creek	100.0
E-470-45.87C	Washington Street	E-470 Mainline	97.1
E-470-46.36D	I-25 Ramp D	I-25, E-470 Mainline, Ramps	99.9
E-470-46.39D	E-470 Ramp F	I-25, Northwest Parkway	99.5

2.2.3 Lighting

The Authority maintains approximately 1,450 lights and strives to keep 95% of the lights working at all times. The Authority conducts a lighting inspection no less than once a month with its own

personnel and keeps records as to how many high mast lights are working or not working, but this does not assess the structural components of the lights. A complete structural verification of the high mast lighting is completed by a third party and separate report is provided for the findings.

A random selection of 145 lights (10%) were inspected for bolt tightness, weld conditions, rust, cracks, flaking paint, and erosion around the poles. **The detailed light inspection proved the lights are in excellent physical condition with each individual light achieving a score of 100.** No loose anchor bolts were found during inspection. Only six rust, weld, or paint issues were present on light poles at the time of inspection. It was noted for information that four electrical plates housing wiring on the pole were loose or missing.

A nighttime driving inspection was conducted to inspect the working conditions of all 1,450 lights and one point, out of 100, was deducted for every 14, or portion thereof, lights not working. **This inspection found 122 lights with at least one bulb burnt out, resulting in a score of 92.0.** Based on the NSS, a total numerical score from 0-100 is calculated for the average score of working lights and the average score of the randomly inspected poles and bases. **The overall condition of the lights was found to be in excellent condition with an average score of 96.**

2.2.4 Drainage

The Authority maintains 59 box culverts, which are inspected every two to four years for structural concerns. The frequency is determined by the culvert's clear opening as described in Section 2.2.2. The Authority also maintains 160 reinforced concrete pipe culverts. For the Annual Certification, a random sample of 10 concrete box culverts and 15 reinforced concrete pipe culverts are inspected for sediment, trash, tumbleweeds, and capacity. Only two culverts were found to have sediment greater than 4", and eight culverts were found to have tumbleweeds impacting the water flow. Trash was found in only three of the pipes. See Figure 2-1 below for an example of minor tumbleweed and trash blockage at the end of a reinforced concrete pipe (northbound 6th Parkway on-ramp). Overall, the culverts are in excellent condition with an overall score of 98.3.



Figure 2-1 – Reinforced Concrete Pipe Flared End with Tumbleweed and Trash Build-Up

2.2.5 Guardrail, Cable Rail and Barrier

The Authority maintains three types of barriers, 217,500 feet of median cable rail, 108,500 feet of W-beam guardrail, and 4,000 feet of concrete Jersey barrier.

Since a small percentage of the barrier total is concrete Jersey barrier, and the concrete can be damaged and still perform to its full capacity, no score will be associated with the concrete barriers. However, a visual inspection of the concrete barrier was conducted and no substantial damage that would require replacement was noted.

Guardrail

An initial driving inspection of all the W-beam guardrail was conducted to note any areas of visual damage to the systems. The Authority strives to repair any significant damage to W-beam within one week. A second visual inspection of all the barriers was conducted within three weeks to provide the Authority a sufficient period of repair. Three of the four locations of damage noted during the first driving inspection were repaired at the time of the second driving inspection. Based on these inspections, the Authority has an overall score of 75 for this aspect of the guardrail inspections.

Twenty random locations of W-beam guardrail were selected for a detailed visual inspection in accordance with the NSS, where thorough inspection of the posts and W-beam for missing or broken bolts, posts out of plumb, and areas exhibiting significant distress was performed. The results of the detailed inspection found the guardrail to be in excellent condition with an average score of 99.7. **The overall average score of the guardrail driving and field inspections is good with a score of 87.4.**

Cable Rail

Although cable rail can be damaged and still be functional, the Authority strives to repair cable rail as soon as possible after any significant damage occurs to minimize accident severity in the case of a secondary accident at the same location. There was one location where damage was noted during the first inspection but not repaired at the time of the second inspection. This results in a score of 100 for the driving portion of the cable rail inspection.

In addition to repairing any loose cables, the Authority's roadway contractor provides tension tests for the cable rail throughout the corridor. The tension tests provided by the Authority show that most of the sections tested met or exceeded the required tension design loads.

Twenty 200-foot sections of cable rail were randomly selected for a detailed visual inspection deducting points for any significant damage, posts out-of-plumb by more than two inches, and rust. The overall condition found in the detailed inspection is excellent with an average score of 100. **The overall average score of the cable rail driving and field inspections is excellent with a score of 100.**

2.2.6 Buildings

Two types of buildings are maintained by the Authority according to the NSS – large buildings and ramp buildings. There are 11 large buildings which include four Toll Plazas (A, B, D, and E), three Maintenance Support Sites (MSSA, MSSD, and MSSE), and the Authority Headquarters Facility (AHF). All the large buildings are inspected annually and 10 of the 32 ramp buildings, different

than those inspected the previous year, were selected at random for the Annual Certification inspection. Toll Plaza C and the Central Maintenance Facility (CMF) were not inspected, as they were sold in 2020 and are being leased to the Authority. These properties are no longer under the Authority's control.

To quantify the overall state of the buildings, a balanced score card is used that summarizes the score for each building's major components. Each component of the buildings was scored on a 100 point scale and the average of the applicable components were used for the overall building health score. The average building scores are shown in the following table.

Table 2-7 – Buildings Balanced Scorecard – Buildings Summary

Component	TPA	TPB	TPD	TPE
Exterior	90	90	99	98
Interiors	80	77	84	56
Tunnels	96	97	96	96
Mechanical Equipment	98	99	99	99
Average	91.00	90.75	94.50	87.25

Component	MSSA	MSSD	MSSE
Exterior	100	100	100
Interiors	92	100	99
Barns	90	90	96
Mechanical Equipment	98	96	98
Average	95.00	96.50	98.25

Component	AHF	Ramps
Exterior	91	98
Interiors	80	98
Mechanical Equipment	99	100
Average	90.00	98.80

Large Buildings

The major components of the large buildings include: building exterior, building interior, HVAC systems, mechanical components within the buildings, and the underground tunnels at the Toll Plazas. Buildings were inspected for, but not limited to, cracks larger than ¼", visible leaks, water damage, voids larger than ½" in masonry walls, structural damage, vandalism, and mold/mildew. Inspections of the HVAC equipment is supplied by a specialized independent HVAC contractor to generate a condition assessment to be used in the Annual Certification.

The following summarizes the findings and scoring of the large buildings:

- MSSA: The building is in excellent condition with an overall rating of 95.00. The noted Level Three findings were water damages and discoloration to ceiling tiles, mildew in the fire sprinkler control room, damage to an interior door frame, peeling and cracking damage to plywood paneling/sheeting on the exterior of the building, and water damage and cracking near an interior door.
- Toll Plaza A: The building is in excellent condition with an overall rating of 91.00. There were no Level One or Two findings. The following items noted are Level Three findings: 1) voids larger than ½ inch in brick mortar on the building exterior, 2) chipping of bricks on exterior of structure, 3) chip at corner of structural foundation on exterior of building, 4) soffit peeling on exterior of building, 5) water damages and discoloration to ceiling tiles throughout building interior, 6) crack in drywall and evidence of slab settlement, 7) unrepaired cracks in concrete wider than ¼ inch in tunnel, and 8) visible water damage on wall of tunnel (at least 12 inches in height). Evidence of water in the tunnel is shown in Figure 2-2.



Figure 2-2 – Evidence of Water on Tunnel Wall in Toll Plaza A

- Toll Plaza B: The building is in excellent condition with an overall rating of 90.75. No Level One findings occurred. The only Level Two finding was water damages and discoloration to ceiling tiles and floor throughout the building interior. At the time of inspection, a total of 22 separate locations exhibited water damages and discoloration. The Level Three findings were voids larger than ½ inch in brick mortar on the building exterior, holes larger than ½ inch and deeper than 1 inch on the exterior of the building, exterior structural damage of bricks, soffit peeling on exterior of building, crack in drywall, and unrepaired cracks in concrete wider than ¼ inch in the tunnel.
- Authority Headquarters Facility (AHF): The AHF is in excellent condition with an overall rating of 90.00. Only four Level Three findings were discovered. These items are cracks in concrete larger than ¼ inch on building exterior near window, structural damage of concrete columns (chunks missing) on building exterior, water damages and discoloration

to ceiling tiles and floor, and visible structural damage including vertical cracking in drywall and at multiple door headers inside building.

- Toll Plaza D: The building is in excellent condition with an overall rating of 94.50. No Level One or Two findings were noted. The Level Three findings were: 1) soffit peeling on exterior of building, 2) cracks in concrete larger than ¼ inch inside buildings, 3) water damages and discoloration to ceiling tiles, and 4) unrepaired cracks in concrete wider than ¼ inch in tunnel.
- MSS D: The building is in excellent condition with an overall rating of 96.50 with the Level Three findings being damage and discoloration to plywood paneling/sheeting on building exterior and visible structural damage (cracking) of interior building drywall. Figure 2-3 is an area of damaged plywood paneling/sheeting on the building exterior.



Figure 2-3 – Damage to Plywood Paneling/Sheeting on MSS D Exterior

- Toll Plaza E: The building is in good condition with an overall rating of 87.25. There were two Level Two findings. There was water damage and discoloration to ceiling tiles and floor through the interior of the building. A total of 44 ceiling tiles were stained at the time of inspection. Also, there was at least ¼ inch of standing water at the end of the tunnel (Figure 2-4). There were four Level Three findings. These findings include 1) exterior structural damage of bricks, 2) soffit peeling on exterior of building, 3) unrepaired cracks in concrete wider than ¼ inch in tunnel, and 4) visible water damage on the walls of the tunnel.



Figure 2-4 – Standing Water at End of Tunnel in Toll Plaza E

- **MSS E:** The building is in excellent condition with an overall rating of 98.25. Level Three findings being water damage and discoloration to the wall in the fire sprinkler control room and damage and discoloration to plywood paneling/sheeting on building exterior.

For the mechanical components within the buildings, Haynes Mechanical Systems prepared an Asset Condition Report in September 2021 for their annual review. HVAC Equipment was rated as Good, Fair, Critical or Not Rated. Some of the different items rated throughout the buildings include air conditioning units, exhaust fans, pumps, rooftop units, and water heaters. A review of the complete report revealed that 144 pieces of equipment were inspected and 88.9% of the equipment was rated as Good, 10.4% was rated as Fair, and 0.0% was rated as Critical. The remaining 0.7% was Not Rated. For additional details see the Haynes Mechanical Systems Report.

The Authority also contracts with independent contractors to inspect and maintain other mechanical systems. Building maintenance is scheduled and the previous year's records are provided to the consultant. The following table shows the necessary mechanical components and the status of the certification.

Table 2-8 – Mechanical Components/HVAC Certifications

P.M. Type	Frequency	Certifying Entity	Month Completed	Certification Status
Fire Extinguishers	Annually	Siemens	June 2021	Current
Fire Suppression (sprinklers)	Annually	Siemens	June 2021	Current
Smoke Detectors	Annually	Siemens	June 2021	Current
Fire Control Panel	Annually	Siemens	June 2021	Current
Backflows	Annually	Victory Fire Protection	June 2021	Current
HVAC	Twice a Year	Haynes Mechanical Systems	Sept. 2021	Current

Elevators	Annually	State of Colorado	May 2020	Current
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Elevators at multiple Authority facilities are currently receiving repairs at the time of this report.

Ramp Buildings

Ten ramp buildings were randomly selected from the 32 total buildings provided they were not inspected in the previous year’s assessment. The numerical score for the ramp buildings were compiled as the average of the 10 ramp buildings inspected. **The ramp buildings are in excellent condition with an overall score of 98.8.** There were 13 Level Three findings discovered during the ramp building inspections. Seven (7) out of the 10 buildings exhibited cracked bricks on the exterior, three (3) out of the 10 buildings had interior damages (cracking bricks), two (2) out of the 10 buildings had voids in the mortar, and one building had loose bolts on the ceiling. Table 2-9 summarizes the ramp buildings inspected and the Level Three findings at each.

Table 2-9 – Ramp Building Level Three Findings

Ramp Building	Damage to Exterior Bricks	Damage to Interior Bricks	Voids in Mortar	Loose Bolts on Ceiling
Peoria Street NB Off-Ramp	X	X		
Jordan Road NB On-Ramp	X	X		
6 th Parkway NB On-Ramp	X	X		
64 th Avenue NB On-Ramp	X			
120 th Avenue NB On-Ramp	X		X	
York Street SB Off-Ramp				
Colorado Boulevard SB Off-Ramp	X			X
96 th Avenue SB Off-Ramp				
Jewell Avenue SB Off-Ramp			X	
Jordan Road SB Off-Ramp	X			

Overall Buildings Summary

The following table summarizes the average scores of the large and ramp buildings, as well as the comparison to last year’s scores:

Table 2-10 – Building Scores Summary

Building	2021 Average Score	2020 Average Score
Toll Plaza A	91.00	97.50
MSS A	95.00	98.75
Toll Plaza B	90.75	98.25
Authority Headquarters Facility (AHF)	90.00	94.67

MSS D	96.50	97.50
Toll Plaza D	94.50	97.50
Toll Plaza E	87.50	96.75
MSS E	98.25	97.25
Ramps	98.80	100.0

2.3 Secondary Assets

2.3.1 Signing

The Authority maintains approximately 4,000 signs and targets for 95% to be in good condition with no damage, and that they are secure, straight, and have good retro-reflectivity during both the day and at night. Forty signs were chosen randomly for inspection. Each sign was assessed for secureness to post, if the sign was bent, cleanliness, if the sign or posts were out-of-plumb by more than 1 inch per 4 feet of height, and whether the sign was unreadable during daytime or nighttime conditions. One sign, while visible during both daytime and nighttime inspections, did exhibit worn retro-reflective sheeting. Figure 2-5 shows the “chipping” of retro-reflective sheeting on an Exit Ramp sign (W13-2) on the northbound 64th Avenue off ramp. The average retro-reflective reading for this sign is 66 cd/lx/m², very low in comparison to the other signs with yellow backgrounds selected for the 2021 inspection (next lowest average reading is 202 cd/lx/m²).



Figure 2-5 – Retro-reflective Sheeting Damage on Exit Ramp Sign

The majority of the signs were clean, plumb, secure, and had sufficient retro-reflectivity readings. All signs were readable during the day and night. **The overall condition of the signs is excellent with an average score of 99.4.**

2.3.2 Striping

Approximately 1,350,000 linear feet of roadway striping is maintained by the Authority. For the inspection, five separate, random, one-mile mainline sections of roadway in each direction were visually inspected for nighttime visibility. The Authority contracts with an outside consultant to measure the retro-reflectivity of all of the striping using a Laserlux retroreflectometer. The recorded measurements will be compared to the visual spot check. If the retro-reflectivity is measured less than 100 cd/lx/m², 50 points will be deducted from that mile section score. It is also recommended that striping stretches with a reading less than 100 cd/lx/m² mandate restriping. **Visually, the striping is in excellent condition with an overall score for pavement markings of 100.**

Retroreflectivity testing was performed in the fall of 2021, resulting in an overall value of 287 cd/lx/m² for the entire highway (165 cd/lx/m² in 2020).

2.3.3 Delineators

The Authority maintains approximately 6,000 delineators, with approximately 20 delineators per mile section of road, and targets for 80% to be in good condition. Five separate, random, one-mile mainline sections of delineators in each direction were visually inspected for straightness (measuring out-of-plumb by more than four inches), nighttime visibility of yellow and white reflective squares, and number of delineators knocked down or missing. **Based on the random sections inspected the overall condition of the delineators is excellent with a score of 91.6.**

2.3.4 Native Seeded Areas

Ten randomly selected 100-foot x 100-foot areas were inspected out of the approximately 1,200 acres of native seeded area maintained by the Authority. The areas were inspected for bare spots larger than two square feet and erosion greater than two inches deep. **The overall condition is excellent with an average score of 97.7.**

One portion at the NB Jordan Rd Off-Ramp presents a large bare patch and over one foot of erosion, likely caused by stormwater runoff, see Figure 2-6 and 2-7.



Figure 2-6 & 2-7 – Bare Spot and Erosion at Jordan Road Off-Ramp (Northbound)

2.3.5 Fencing

Three main types of fencing are maintained by the Authority, Right of Way (ROW) fence, snow fence, and deer fence. Twenty-five locations of ROW fencing, twenty locations of snow fencing, and five locations of deer fence were randomly selected for inspection. Fences were inspected for structural soundness, no openings or breaks in the fabric, plumbness of posts, secure attachments of fence to the posts, and fabric being intact to the required height. **The overall condition of the fencing is excellent with an average score of 98.6.**

2.3.6 Embankment Protectors

Similar to culvert inspections, embankment protectors are inspected for debris and depth of erosion at the discharge location. Fifteen (15) embankment protectors out of the seventy maintained by the Authority were randomly selected for inspection. Nine (9) out of the 15 embankment protectors inspected had restricted openings. It was also noted that those nine had significant plant overgrowth near one or both openings. There was no erosion found at any of the inspected embankment protectors. **The overall condition is excellent with an average score of 92.4.**

The bottom opening of the embankment protector on the northeast corner of the 104th Ave bridge has significant blockage (about 45%) due to sediment. The top opening has moderate blockage due to sediment but the asphalt pavement surrounding the top opening is severely damaged. The blockage and damages of the bottom and top openings are shown below in Figures 2-8 and 2-9.



Figure 2-8 & 2-9 – Bottom and Top of Embankment Protector near 104th Avenue

Additional Assets

2.3.7 Variable Message Signs

At the time of inspection, all of the 12 Variable Message Signs (VMS) signs along the E-470 corridor were operational and providing drivers with informative and necessary information for safe travel. VMS are used to warn of accidents, closed lanes and of adverse road conditions resulting from inclement weather.

2.3.8 Overhead Sign Structures

The Authority has an independent consultant inspect overhead signs every five years. In addition, the Authority Roadway Maintenance staff inspects each overhead sign structure for loose or missing anchor bolt nuts and checks the welds at the base of overhead sign structure yearly as part of an Asset Management Program. The 5-year inspections are performed in accordance with the “Colorado Signs, Signals, and High-Mast Lights Inventory and Inspection Manual” published by CDOT. The sign structures in Segments I, II, and III will be inspected in 2021, and those in Segment IV in 2022.

2.3.9 Irrigation and Plant Maintenance

The Authority has multiple water sources for irrigation and plant maintenance along the tollway. Irrigation is used at the Toll Plazas, Maintenance Support Sites and the Authority Headquarters Facility. From Milepoints 0.0 to 5.0, the Authority works with Meridian Metropolitan District for its irrigation water needs. From Milepoint 5.0 to 34.0, the Authority has agreements with public and private agencies as well as the use of an Authority-owned well near Toll Plaza D. From Milepoint 34.0 to 46.0, water from the Todd Creek Farms Metro District is utilized.

The Authority has a dead plant removal inspection twice a year: during spring and fall. Plant maintenance is an ongoing activity.

2.4 Traffic Services

2.4.1 Safety

The Authority provides free 24/7 roadside assistance to motorists on E-470. Services include, but are not limited to, aid with flat tires, gas, oil and radiator refills, and battery jumps. E-470's Communications Center has full camera coverage and continually monitors the highway for incidents or distressed vehicles sending out the closest Roadside Assistance vehicle.

Road advisories are posted on social media, such as Facebook and Twitter, for current conditions. The Authority also provides access to view the live cameras on E-470 on their website to allow customers to see the current conditions.

The Transportation Safety Foundation was launched in 2001 to promote public safety, transportation safety, and driver education. "Alive at 25" is a program provided by the Foundation one Saturday a month as an early driving intervention course for drivers aged 15-24 to help prevent traffic violations, collisions, and fatalities. Another portion of the Foundation is the grant program, which awards up to eight \$2,500 grants to nonprofits and tax-exempt government entities in Colorado. The funds for the Transportation Safety Foundation are raised separately from the E-470 toll revenue.

Previously mentioned in the Safety Initiatives section: In 2020, the Authority started using 6" wide lane markings in lieu of 4". In the summer of 2020, the Authority performed restriping of the main lanes in the SB direction between I-25 and Quincy Ave, and in the NB direction from 120th to I-25. With the completion of this project, the entire E-470 mainline limits now feature 6" striping. This modification has increased visibility for drivers traveling at night. Furthermore, the on and off ramps at Jamaica, Peoria, Chambers, Jordan and Smoky Hill having been upgraded to 6" striping.

2.4.2 Litter Control

Road debris and litter is removed daily by the Authority's maintenance crew and Roadside Assistance crew in between calls. Cleanup of the road was witnessed regularly during the inspections for the Annual Certification. E-470 is well maintained and has an excellent appearance.

2.4.3 Snow and Ice Removal

The Authority monitors E-470 for weather conditions and uses strategically placed weather stations and pavement sensors to be proactive for inclement weather. Two outside professional forecasting firms are also utilized to provide advanced notifications of storm systems. One proactive measure is the Authority's use of liquid magnesium chloride prior to snow or ice conditions. When conditions require, the Authority will also use dry road salt as necessary. Snow plowing efforts are contracted and organized and coordinated by the Authority's maintenance staff. Plowing is prompt and E-470 is normally cleared before the adjoining highways.

2.5 Findings

The overall findings are summarized in Table 2-6 and the overall NSS condition scores are summarized in Table 2-7. The definitions of the three levels of findings are repeated below for reference:

Level One – Immediate Requirements

Level One items require immediate attention and should be addressed as quickly as possible. The Authority is immediately notified of Level One findings. Items in this category include posing potential safety hazards, creating excessive maintenance, or possessing the potential to be a liability. They also include items with a NSS value below the minimum requirements established for each major and secondary asset.

Level Two – Short-Term Requirements

Level Two items are not in need of immediate attention, but are not up to standards and should be included in the upcoming maintenance program to be addressed within a year of discovery.

Level Three – Long-Term Requirements

Level Three items are items currently in good condition and do not require any major maintenance within the next year, but should be monitored for deterioration in the next two to four years.

Table 2-6 – Summary of 2021 Findings

Level	Location	Description of Finding
One	Embankment Protector at 104th Ave. (northwest)	Bottom opening significantly restricted (~45%), severely cracked asphalt pavement at top opening
Two	Exit Ramp Sign at NB 64th Ave. Off-Ramp	Low retro-reflectivity reading of Yellow background, retro-reflective sheeting "chipping" off
Two	Native Seeding Area near NB Jordan Rd Off-Ramp	Large bare spot and erosion greater than 12" in depth
Two	Snow Fence along NB Colorado Blvd. On-Ramp	Fabric deficiencies throughout stretch, evidence of vehicle driving through fence
Two	Toll Plaza B	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior)
Two	Toll Plaza E	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior)
Two	Toll Plaza E	Standing water at end of tunnel (¼" in depth)
Three	RCP south of Colorado Blvd. bridge	Opening blocked 25% by trash, and 36" of tumbleweeds for length of 10'
Three	MSS A	Water damages and discoloration to ceiling tiles (building interior)
Three	MSS A	Mildew in fire sprinkler control room (building interior)
Three	MSS A	Damage to door frame at (building interior)

Three	MSS A	Peeling and cracking damage to plywood paneling/sheeting on building exterior
Three	MSS A	Water damage and cracking at door (building interior)
Three	Toll Plaza A	Voids larger than ½" in brick mortar on building exterior
Three	Toll Plaza A	Exterior structural damage of bricks (chipping)
Three	Toll Plaza A	Structural foundation problem (chip at corner) on building exterior
Three	Toll Plaza A	Soffit peeling on building exterior
Three	Toll Plaza A	Water damages and discoloration to ceiling tiles throughout building interior
Three	Toll Plaza A	Crack in drywall and evidence of slab settlement (building interior)
Three	Toll Plaza A	Unrepaired cracks in concrete wider than ¼" in tunnel
Three	Toll Plaza A	Visible water damage on tunnel wall (at least 12" in height)
Three	Toll Plaza B	Voids larger than ½" in brick mortar on building exterior
Three	Toll Plaza B	Holes larger than ½" and deeper than 1" on building exterior
Three	Toll Plaza B	Exterior structural damage of bricks
Three	Toll Plaza B	Soffit peeling on building exterior
Three	Toll Plaza B	Crack in drywall (building interior)
Three	Toll Plaza B	Unrepaired cracks in concrete wider than ¼" in tunnel
Three	AHF	Cracks in concrete larger than ¼" under window on building exterior
Three	AHF	Structural damage of concrete columns (chunks missing) on building exterior
Three	AHF	Water damages and discoloration to ceiling tiles and floor (building interior)
Three	AHF	Visible structural damage, vertical cracking in drywall and multiple door headers (building interior)
Three	Toll Plaza D	Soffit peeling on building exterior
Three	Toll Plaza D	Cracks in concrete larger than ¼" (building interior)
Three	Toll Plaza D	Water damages and discoloration to ceiling tiles (extensive throughout interior)
Three	Toll Plaza D	Unrepaired cracks in concrete wider than ¼" in tunnel
Three	MSS D	Damage and discoloration to plywood paneling/sheeting on building exterior
Three	MSS D	Visible structural damage of interior drywall (cracking)

Three	Toll Plaza E	Exterior structural damage of bricks
Three	Toll Plaza E	Soffit peeling on building exterior
Three	Toll Plaza E	Unrepaired cracks in concrete wider than ¼" in tunnel
Three	Toll Plaza E	Visible water damage on tunnel wall (at least 12" in height)
Three	MSS E	Water damages and discoloration on wall in fire sprinkler control room
Three	MSS E	Damage and discoloration to plywood paneling/sheeting on building exterior
Three	Ramp Building (Off Ramp, NB E-470 to Peoria St.)	Damage to exterior (bricks cracking), interior cracks
Three	Ramp Building (On Ramp, Jordan Rd. to NB E-470)	Damage to exterior (bricks cracking), interior cracks
Three	Ramp Building (On Ramp, 6th Pkwy. to NB E-470)	Damage to exterior (bricks cracking), interior bricks damaged
Three	Ramp Building (On Ramp, 64th Ave. to NB E-470)	Damage to exterior (bricks cracking)
Three	Ramp Building (On Ramp, 120th Ave. to NB E-470)	Damage to exterior (bricks cracking), voids in mortar (building interior)
Three	Ramp Building (Off Ramp, SB E-470 to Co. Blvd.)	Damage to exterior (bricks cracking), bolts appear loose on ceiling
Three	Ramp Building (Off Ramp, SB-E470 to Jewell Ave.)	Voids in mortar (building interior)
Three	Ramp Building (Off Ramp, SB E-470 to Jordan Rd.)	Damage to exterior (bricks cracking)

Table 2-7 – Numerical Scoring System Summary

	Inspection Category	2020	2021	Asset Condition
Major Assets	Roadway Pavement (PCI)	81.7	83.7	Good
	Bridges	95.0	95.3	Excellent
	Lighting	97.0	96.0	Excellent
	Drainage	98.1	98.3	Excellent
	Guardrail and Cable Rail			
	-Guardrail	99.3	87.4	Good
	-Cable Rail	99.9	100	Excellent
	Buildings	97.3	93.6	Excellent
Secondary Assets	Signing	99.4	99.4	Excellent
	Striping	98.0	100	Excellent
	Delineators	90.8	91.6	Excellent
	Native Seeded Areas	93.6	97.7	Excellent
	Fencing	99.1	98.6	Excellent
	Embankment Protectors	94.3	92.4	Excellent

3 Roadway and Maintenance Budget

3.5 Roadway and Maintenance Budget

The Authority continues to allocate funds appropriately for the maintenance of the corridor. The Engineering and Roadway Maintenance Department’s 2021 Budget Summary for Roadway Specific Expenses is included in the following table:

Table 3-1 – 2021 Roadway and Maintenance Expenses

Roadway and Maintenance Expenses	2021 Budget
Facility Maintenance	\$669,900
Vehicle Expenses - Fuel	\$115,000
Utilities	\$690,000
Electrical Repairs	\$90,000
General Landscape Maintenance	\$55,000
Mowing & Irrigation	\$40,000
Drainage Maintenance	\$50,000
Shouldering	\$40,000
Pavement Maintenance	\$100,000

Structure Maintenance	\$40,000
Roadway Maintenance	\$637,000
Snow Removal	\$4,062,000
Roadway & Engineering Support	\$591,000
Land Management Support	\$172,600
Total Roadway Specific Expenses	\$7,352,500

3.6 Fiscal Year Roadway and Maintenance Budget

The 2021 budget for the proper maintenance and repair appears to be adequate based on the required historical expenditures and the very good condition of the tollway.

When additional repairs become necessary, the Authority has a Capital Improvement Fund, which is available for unusual or immediate maintenance needs as well as future capital improvements.

The Authority also maintains a Five-Year Capital Projects Budget, as shown in Table 3-2. This includes interchange improvements, pavement resurfacing, and future construction projects such as widening to 6 lanes from Quincy Ave to I-70, I-70 to 104th Avenue, and 104th Avenue to I-76.

Table 3-2 – Five-Year Capital Projects Budget Summary

Project Category	2021 Budget	2022 Estimate	2023 Estimate	2024 Estimate	2025 Estimate
Renewal and Replacement	\$26,503,200	\$24,570,000	\$11,625,000	\$9,450,000	\$9,730,000
Construction Projects	\$11,622,000	\$83,963,000	\$79,418,000	\$125,464,000	\$26,779,500
Other Capital Requirements	\$500,000	-	-	-	-
Total Capital Expenditures	\$38,625,200	\$108,533,000	\$91,043,000	\$134,914,000	\$36,509,500

4 Summary

The Authority continues to maintain and improve the tollway at a very high standard. Out of the 12 major and secondary assets, **10 are rated in Excellent condition**. The Authority has addressed any immediate concerns in a timely manner and continues to be responsive when concerns are brought to their attention. The Authority has proved themselves to appropriately allocate the resources and funding required to maintain their assets in an overall excellent condition.

The Authority has maintained operations during ever-changing circumstances surrounding workplace commuters and travelers. The Authority continues to show prudent financial management of the roadway asset in this continued period of economic and national uncertainty.



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