



E-470 Public Highway Authority

2022 Annual Certification



Building a Better World
for All of Us®

Engineers | Architects | Planners | Scientists



Building a Better World
for All of Us®

Table of Contents

1	Introduction	1
1.1	Purpose of Report	1
1.2	Budget	1
1.3	Overview	1
1.4	E-470 Public Highway Description	2
1.5	Improving the Tollway	5
1.6	Public Communications	6
1.7	Safety Initiatives	6
1.8	Independent Engineer Statement	7
2	Annual Maintenance Inspection.....	7
2.1	Overview of Annual Maintenance Inspection	7
2.1.1	Inspection Categories	8
2.1.2	Evaluation Criteria	8
2.2	Major Assets.....	9
2.2.1	Roadway Pavement.....	9
2.2.2	Bridges.....	9
2.2.3	Lighting.....	13
2.2.4	Drainage	13
2.2.5	Guardrail, Cable Rail and Barrier	14
2.2.6	Buildings	15
2.3	Secondary Assets.....	20
2.3.1	Signing	20
2.3.2	Striping	20
2.3.3	Delineators	21
2.3.4	Native Seeded Areas.....	21
2.3.5	Fencing	22
2.3.6	Embankment Protectors.....	22
	Additional Assets.....	22
2.3.7	Variable Message Signs	22
2.3.8	Overhead Sign Structures	22
2.3.9	Irrigation and Plant Maintenance.....	23

SEH is a registered trademark of Short Elliott Hendrickson Inc.

Table of Contents (continued)

- 2.4 Traffic Services23
 - 2.4.1 Safety.....23
 - 2.4.2 Litter Control23
 - 2.4.3 Snow and Ice Removal.....23
- 2.5 Findings24
- 3 Roadway and Maintenance Budget.....27
 - 3.5 Roadway and Maintenance Budget27
 - 3.6 Fiscal Year Roadway and Maintenance Budget.....28
- 4 Summary29

2022 E-470 Annual Certification Report

Prepared for the E-470 Public Highway Authority 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 tollway 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 tollway.

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 2022 capital budget of \$108,533,000. 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 highways 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 tollway'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 tollway 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. Similarly, The Authority will begin a mainline widening project between I-70 and 104th Ave beginning in the early fall of 2022.

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 tollway 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 tollway 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 COVID-19 pandemic downturn and recovery period, the Authority's Board of Directors approved an extension of current 2020 toll rates through 2021. In November 2021, the Board of Directors unanimously approved yearly toll reductions starting on January 1, 2022. The toll rates and future

toll rate reductions will be subject to annual E-470 Board of Director approval due to the recent economic uncertainty.

Facilities: There are five mainline toll plazas along the tollway located at Mile points 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 {MSS}”), 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 Traffic Management Center with 24-hour surveillance of all activities on the tollway, including traffic flow, road conditions, toll collection system monitoring, and accident/incident response.

Toll Plaza C and the CMF properties have in the past several years been sold to private developers. Toll Plaza C is no longer under the control of The Authority, while The Authority will remain in the CMF until 2024 when a new CMF will be opened adjacent to the AHF.

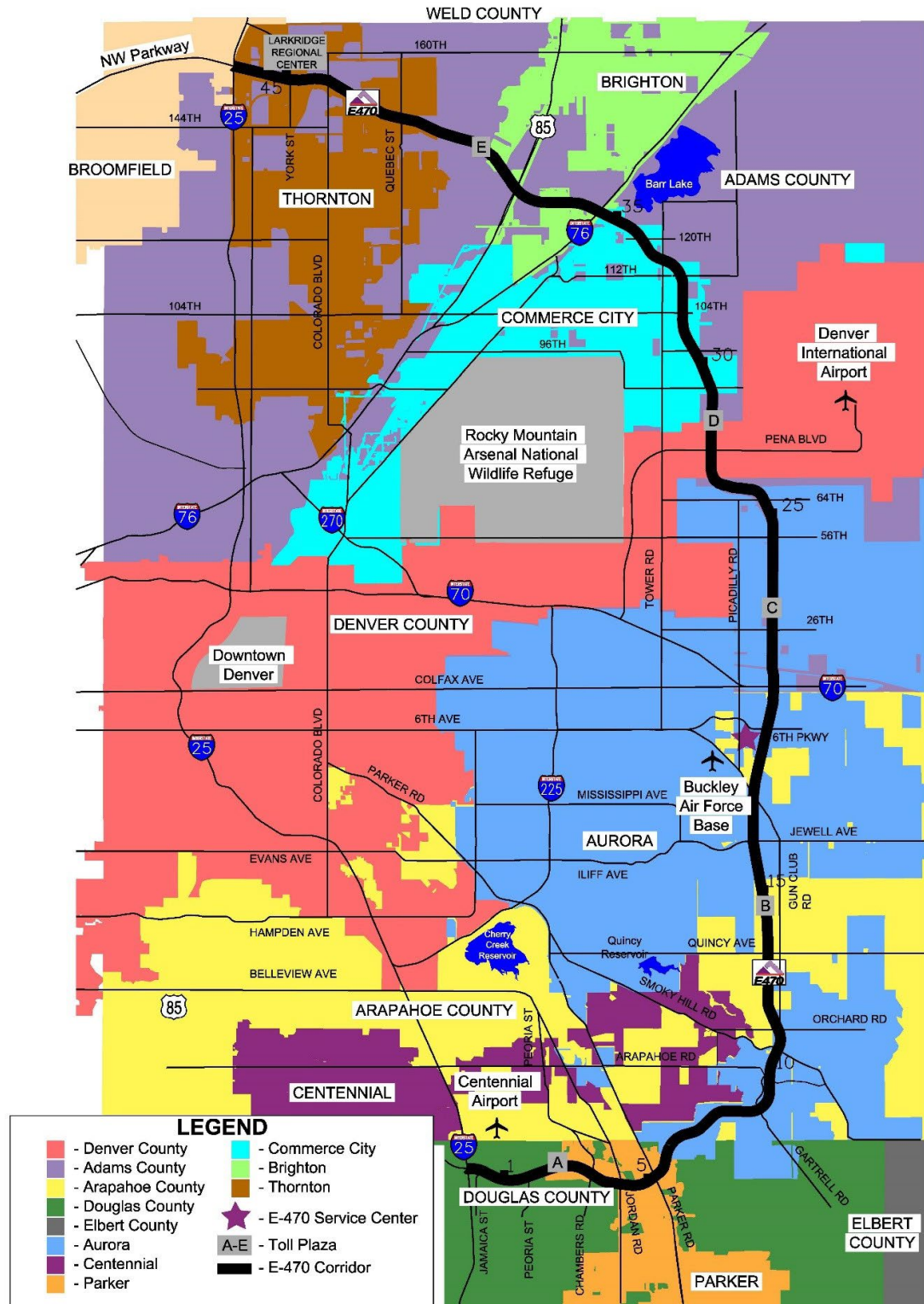


Figure 1-1 – E-470 Mainline Map

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.

The 2020 Master Plan also outlines future interchange improvement needs. These improvements include signalizing 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 described above.

The Authority continues to pursue agreements and work with local municipalities to strengthen system connectivity between E-470 and surrounding roadways. A Structure Selection Report was recently completed for the new Aurora Parkway bridge over E470. The bridge will carry the proposed extension of Aurora Parkway over E-470 in Douglas and Arapahoe Counties. Additionally, the City of Aurora is working on the widening of the Gartrell Bridge over E470.

There are several interchange improvement projects planned in the near future. The widening project from I-70 to 104th Avenue will include new interchanges at 38th Avenue and 48th Avenue. In addition, the Authority has executed an Intergovernmental Agreement (IGA) with the City of Brighton and Adams County to construct a new interchange at Sable Boulevard. This planned Sable interchange is tentatively forecast to open in 2025/2026.

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. Toll Plaza E is currently being used as a test site for this technology, which is planned to be formally installed in 2023.

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. This study compared E-470 to neighboring HAZMAT routes and analyzes environmental, safety, traffic, physical roadway characteristics, and social environmental data. E-470 officially became a hazmat route on April 1st, 2022.

1.6 Public Communications

The Authority uses social media as a tool to educate and communicate with its customers. Videos are created quarterly 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/E470PHA>.

The E-470 website (<https://www.e-470.com>) also has vast amounts of information available to the public including general information about the tollway, toll calculator, maps, current widening projects updates, a history of the tollway, 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. 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 W-beam guardrail standards. As large portions of the existing guardrail are damaged, it is replaced with the newest CDOT-compliant W-beam guardrail. New construction projects will also upgrade the guardrail to the newest standards.
- Similarly, The Authority performs Cable Rail repairs and upgrades annually. Beginning in July of 2022, The Authority will be installing new cable barrier at selected locations

along the corridor as part of performed safety studies conducted prioritizing safety projects based on cost/benefit basis. The selected locations include various on and off ramps of interchanges along E-470, as well as in the median to protect a large overhead sign monotube foundation.

- 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 installation of deer fence. As future road widening projects occur, deer fence continues to be installed 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 is an affiliated non-profit organization that raises its own funds, awarding 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, speed radar signs just north of 64th Avenue were installed to address a higher-than-average number of accidents at an approaching horizontal curve.
- The Authority installed high visibility “WRONG WAY” signs at select locations to enhance deterrence of wrong way drivers.
- The Authority started to use 6” wide lane markings for all new construction and restriping projects in 2020. This is 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
- 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 is 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 pavements 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.**

No further pavement testing was performed in 2022. The Authority acknowledges this gap in testing, but for this report scoring defaults to the total identified last year. From extensively driving the corridor and visually assessing the pavement, the Consultant agrees that pavement remains in good condition with no substantial deterioration 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 latest provided 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. Some culverts are part of the inspections and are inspected on a 4-year cycle. 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.

Ninety-one (91) bridges and culverts located in Segments I-III were inspected in July and August 2022. Only minor preventative repair or maintenance items were recommended. No major structural or safety concerns were identified. Numerous bridges were reconstructed and/or widened between 2020 and 2021 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 and functional 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 90.93.** Table 2-1 summarizes the individual sufficiency ratings for the bridges inspected in 2022.

Table 2-1 – 2022 Structures Inspected and Sufficiency Rating

Structure Number	Facility Carried	Feature Intersected	Sufficiency Rating
E-470-0.47A	E-470 EB	Cottonwood Ck & Jamaica	98.1
E-470-0.47B	E-470 WB	Cottonwood Ck & Jamaica	98.0
E-470-0.47C	E-470 On-Ramp	Cottonwood Creek	97.9
E-470-0.47D	E-470 Off-Ramp	Cottonwood Creek	99.9
E-470-1.31CBC	E-470	Local Drainage	80.2
E-470-1.71A	E-470 EB	Peoria Street	91.6
E-470-1.71B	E-470 WB	Peoria Street	94.3
E-470-2.69CBC	E-470	Toll Plaza A Tunnel	96.1
E-470-2.80CBC	E-470	Local Drainage	80.2
E-470-3.26A	E-470 EB	Happy Canyon Creek	89.3
E-470-3.26B	E-470 WB	Happy Canyon Creek	98.0
E-470-3.54C	Chambers Road NB	E-470	91.8
E-470-3.54D	Chambers Road SB	E-470	88.3
E-470-4.23CBC	E-470	Local Drainage	80.4
E-470-4.33A	E-470 EB	Jordan Road	98.1
E-470-4.33B	E-470 WB	Jordan Road	98.0
E-470-05.13A	E-470 NB	Cherry Creek	98.2
E-470-5.13B	E-470 SB	Cherry Creek	98.0
E-470-5.13D	Ramp A	Cherry Creek	92.3
E-470-05.25A	E-470 EB	Parker Road	98.2
E-470-05.25B	E-470 WB	Parker Road	98.0
E-470-05.76A	E-470 NB	Cottonwood Drive	96.1
E-470-05.76B	E-470 SB	Cottonwood Drive	96.0
E-470-7.38CBC	E-470	Local Drainage	68.5
E-470-7.41CBC	E-470	Local Drainage	68.6

Structure Number	Facility Carried	Feature Intersected	Sufficiency Rating
E-470-07.78C	Ireland Way	E-470	84.0
E-470-8.19CBC	E-470	Local Drainage	77.6
E-470-8.74CBC	E-470 and Ramps	Local Drainage	77.6
E-470-08.90C	Gartrell Road	E-470	85.0
E-470-09.57A	E-470 NB	Piney Creek	98.3
E-470-09.57B	E-470 SB	Piney Creek	98.2
E-470-9.73CBC	E-470	Local Drainage	80.7
E-470-09.83A	E-470 NB	Arapahoe Road	98.3
E-470-09.83B	E-470 SB	Arapahoe Road	96.1
E-470-9.94CBC	E-470	Local Drainage	80.7
E-470-10.66C	Smoky Hill Road	E-470	87.3
E-470-13.25CBC	E-470 Ramp B and D	Local Drainage	67.0
E-470-13.31A	E-470 NB	Quincy Avenue	98.3
E-470-13.31B	E-470 SB	Quincy Avenue	94.2
E-470-14.32C	Hampden Avenue	E-470	99.3
E-470-15.45CBC	E-470	Toll Plaza B Tunnel	96.7
E-470-16.35C	Jewell Avenue	E-470	98.6
E-470-17.58C	State Highway 30	E-470	98.5
E-470-17.78CBC	E-470	Murphy Creek	81.3
E-470-18.44A	E-470 NB	Coal Creek	98.5
E-470-18.44B	E-470 SB	Coal Creek	98.5
E-470-18.71CBC	E-470	Coal Creek Trib.	81.4
E-470-18.91C	6th Parkway	E-470	94.3
E-470-19.29CBC	E-470	Local Drainage	78.5
E-470-19THCBC	19th Ave	First Creek	83.9
E-470-VALDAICBC	Valdai Road	Local Drainage	96.9
E-470-20.13A	E-470 NB	Ramp B	98.6
E-470-20.13B	E-470 SB	Ramp B	98.6
E-470-20.13C	E-470 Ramp H	E-470 Ramp B	98.6
E-470-20.32A	E-470 NB	Colfax Avenue	98.6
E-470-20.32B	E-470 SB	Colfax Avenue	98.6
E-470-20.46A	E-470 Ramp H	I-70, Colfax, E470 ML	95.7
E-470-20.50A	E-470 NB	I-70	92.3
E-470-20.50B	E-470 SB	I-70	91.8

Structure Number	Facility Carried	Feature Intersected	Sufficiency Rating
E-470-RAMPGCBC (aka E-470-20.67CBC)	E-470 Ramp G	First Creek	84.8
E-470-20.70A	E-470 NB	19th Avenue	97.6
E-470-20.70B	E-470 SB	19th Avenue	97.6
E-470-20.81CBC	E-470	First Creek	81.7
E-470-20.88A	E-470 NB	Ramp E	98.6
E-470-20.88B	E-470 SB	Ramp E	98.6
E-470-21.01A	E-470 NB	Smith Road & UPRR	97.0
E-470-21.01B	E-470 SB	Smith Road & UPRR	90.8
E-470-21.01C	Ramp E	Smith Road & UPRR	94.5
E-470-21.43C	26th Avenue	E-470	99.9
E-470-22.35CBC	E-470	Local Drainage	81.9
E-470-22.59CBC	E-470	Toll Plaza C Tunnel	81.9
E-470-23.38CBC	E-470	Local Drainage	78.7
E-470-23.43C	48th Avenue-Future	E-470	91.3
E-470-24.44C	56th Avenue	E-470	98.5
E-470-25.00CBC	E-470	Local Drainage	78.4
E-470-25.48C	64th Avenue	E-470	98.5
E-470-25.90CBC	E-470	Local Drainage	90.7
E-470-27.86A	E-470 NB	Pena Boulevard	87.0
E-470-27.86B	E-470 SB	Pena Boulevard	94.1
E-470-28.49CBC	E-470	Local Drainage	80.6
E-470-28.54CBC	E-470	Future Bike Path	77.6
E-470-29.39C	88th Avenue	E-470	89.2
E-470-29.79CBC	E-470	Toll Plaza D Tunnel	96.1
E-470-30.46C	96th Avenue	E-470	93.5
E-470-31.57C	104th Avenue	E-470	99.7
E-470-32.53CBC	E-470	Local Drainage	77.7
E-470-32.57C	112th Avenue	E-470	99.4
E-470-112THCBC	112th Avenue	Local Drainage	99.0
E-470-33.22C	Tower Road	E-470	95.9
E-470-33.36CBC	E-470	Local Drainage	85.0
E-470-33.55CBC	E-470	Local Drainage	70.0

2.2.3 Lighting

The Authority maintains approximately 1,450 lights and strives to keep 95% of the lights working at any given time. 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 eighty-one (81) high mast lights was completed at the interchange of I-25 (South), at Plazas A, B, C, D, E, and at the interchange of Peña Boulevard in 2022. These high mast lights will be inspected again in 2027.

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 99.94.** We found 2 loose anchor bolts during inspection. Only seven rust, weld, or paint issues were present on light poles at the time of inspection. It was noted for information that eleven of the electrical access panel doors or plates had missing or loose pieces.

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 95.97.**

2.2.4 Drainage

The Authority maintains 59 box culverts, which are inspected every two to four years depending on their structural condition. 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 seven culverts were found to have sediment greater than 4", and nine culverts were found to have tumbleweeds impacting the water flow. Trash was present in only four of the pipes. See Figure 2-1 on the following page for an example of minor tumbleweed and trash blockage at the end of a reinforced concrete pipe. **Overall, the culverts are in excellent condition with an overall score of 96.07.**



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. One location of damage was noted during the first driving inspection, which was repaired at the time of the second driving inspection. Based on these, inspections, the authority has an overall score of 100 for this aspect of 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 100. **The overall average score of the guardrail driving and field inspections is excellent with a score of 100.**

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 no location where damage was noted during the first inspection for cable rail. 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 8 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 2-2 – Buildings Balanced Scorecard – Buildings Summary

Component	TPA	TPB	TPD	TPE
Exterior	93	92	98	98
Interiors	85	77	84	100
Tunnels	100	100	100	100
Mechanical Equipment	100	98	100	97
Average	94.50	91.75	95.50	98.75

Component	MSSA	MSSD	MSSE
Exterior	97	97	98
Interiors	95	100	95
Barns	87	90	90
Mechanical Equipment	98	96	98
Average	94.25	95.75	95.25

Component	AHF	Ramps
Exterior	98	99
Interiors	91	94
Mechanical Equipment	93	100
Average	94.00	97.67

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 94.25. The only Level Two finding was significant peeling and cracking damage to the plywood paneling on the exterior of the building at 10 separate locations. The noted Level Three findings were rust forming at the timber base plate connections on the exterior of the building, water damages and discoloration to ceiling tiles, ¾ inch deep by 1-inch-wide concrete voids in storage shed retaining walls, and water damage and cracking near an interior door.
- Toll Plaza A: The building is in excellent condition with an overall rating of 94.50. The only Level Two finding was significant water damages and discoloration to ceiling tiles and floor throughout the building interior. The following items noted are Level Three findings: 1) voids larger than ½ inch in brick mortar on the building exterior near the entryway, 2) broken bricks on exterior of structure at garage, 3) chip in structural foundation stem wall on exterior of building, and 4) soffit peeling on exterior of building. Evidence of floor and ceiling stains shown in Figure 2-2.

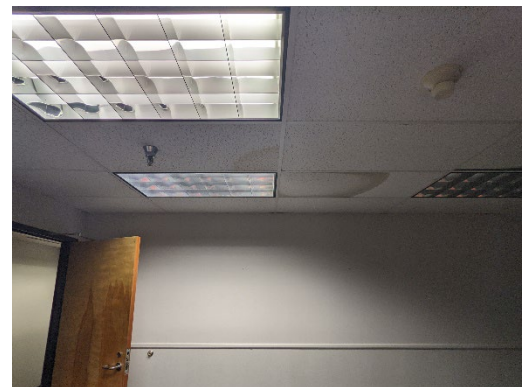


Figure 2-2 – Water Stain on Floor and Ceiling in Toll Plaza A

- Toll Plaza B: The building is in excellent condition with an overall rating of 91.75. No Level One findings were noted. The only Level Two finding was water damage and discoloration to ceiling tiles throughout the building interior. At the time of inspection, a total of 15 separate locations exhibited water damages and discoloration. The Level Three findings were cracks in concrete larger than ¼ inch on building exterior, voids larger than ½ inch in brick mortar on the building exterior, soffit peeling on exterior of building, peeling wallpaper at exterior windows (possible moisture damage), and cracks and swelling in drywall.
- Authority Headquarters Facility (AHF): The AHF is in excellent condition with an overall rating of 94.00. Only four Level Three findings were discovered. These items were structural damage and spalling of concrete columns on building exterior, water damage and discoloration to ceiling tiles and floor in the break room. Various other small cracks were observed in drywall and at multiple door headers and windows inside the building.
- Toll Plaza D: The building is in excellent condition with an overall rating of 95.50. No Level One findings were noted and the only Level Two finding was water damages and discoloration to ceiling tiles and wall. Only two Level Three findings were discovered. These items were soffit peeling on the exterior of the building and visible leaks in the ceiling contributing to the damage and discoloration of some ceiling tiles. Figure 2-4 shows significant staining on the basement wall.



Figure 2-3 – Stain on Basement Wall in Toll Plaza D

- MSS D: The building is in excellent condition with an overall rating of 95.75 with the following Level Three findings: base connections at the timber columns beginning to rust and damaged plywood paneling on the building exterior. Figure 2-3 is an area of damaged plywood paneling/sheeting on the building exterior with cladding missing in one location.



Figure 2-4 – Damage to Plywood Paneling/Sheeting and Missing Cladding on MSS D Exterior

- Toll Plaza E: The building is in excellent condition with an overall rating of 98.75. There were no Level One or Two findings. The only Level Three finding was soffit peeling on the exterior of the building.
- MSS E: The building is in excellent condition with an overall rating of 95.25. Level Three findings being missing brick on the building exterior at the entryway, voids larger than ½ inch in the brick mortar, water damage and discoloration to ceiling tiles, and damage and discoloration to plywood paneling/sheeting on building exterior.

For the mechanical HVAC components within the buildings, an Asset Condition Report is typically prepared summarizing equipment into the rating categories of 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. SEH has not received this report at this time and will incorporate said report when received.

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 these mechanical component categories and the status of the certification as delivered to SEH.

Table 2-3 – Mechanical Components/HVAC Certifications

P.M. Type	Frequency	Certifying Entity	Month Completed	Certification Status
Fire Extinguishers	Annually	Siemens	March 2022	Current
Fire Suppression (sprinklers)	Annually	ETG Fire	July 2022	Current
Smoke Detectors	Annually	ETG Fire	July 2022	Current
Fire Control Panel	Annually	ETG Fire	July 2022	Current
Backflows	Annually	Victory Fire Protection	June 2022	Current
HVAC	Twice a Year	Haynes Mechanical	Monthly	Current
Elevators	Annually	A to Z Elevator Inspections Inc.	May 2022	Current

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 97.67.** There were 12 Level Three findings discovered during the ramp building inspections. Three (6) out of 10 buildings exhibited cracked bricks on the exterior, three (5) out of the 10 buildings had damaged bricks on the interior and one building had missing pieces of mortar. Table 2-9 summarizes the ramp buildings inspected and the Level Three findings at each.

Table 2-4 – Ramp Building Level Three Findings

Ramp Building	Damage to Exterior Bricks	Damage to Interior Bricks	Voids in Mortar	Loose Bolts on Ceiling
On-ramp from E Quincy Ave. to SB E-470	X	X		
On- ramp from S Peoria St. to SB E-470	X		X	
On-ramp from Chambers Rd. to NB E-470				
Off-ramp from NB E-470 to Gartrell Rd.	X			
Off-ramp from NB E-470 to E Smoky Hill Rd.	X	X		
On-ramp from E 104 th Ave. to NB E-470		X		
On-ramp from Quebec St. to NB E-470				
On-ramp from York St. to NB E-470	X	X		
Off-ramp from SB E-470 to E 64 th Ave.		X		
Off-ramp from SB E-470 to E 56 th Ave.	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 2-5 – Building Scores Summary

Building	2022 Average Score	2021 Average Score
Toll Plaza A	94.50	91.00
MSS A	94.25	95.00
Toll Plaza B	91.75	90.75
Authority Headquarters Facility (AHF)	94.00	90.00
MSS D	95.75	96.50
Toll Plaza D	95.50	94.50
Toll Plaza E	98.75	87.50
MSS E	95.25	98.25

Building	2022 Average Score	2021 Average Score
Ramps	97.67	98.80

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 was visible during the daytime but was not clearly visible at night. The sign is rotated towards mainline traffic and almost completely away from vehicles traveling the On Ramp. Figure 2-5 shows the orientation of the W4-1 “Merge” sign located between northbound E-470 and the northbound On Ramp at Peoria St.



Figure 2-5 – Chipped and Fading Sign SB Before Quincy Ave Off Ramp

The majority of inspected 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 98.05.**

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 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 last performed in the fall of 2022, resulting in an overall value of 249 cd/lx/m² for the entire tollway (236 cd/lx/m² in spring of 2022).

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 98.9.**

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 average with an average score of 79.50.**

One portion north of Gartrell Road between the Off Ramp and mainline has many large bare patches, see Figure 2-6. This area also showed evidence of erosion between 2 and 12 inches in depth. Another area where large bare stretches were observed was near the Gun Club Road interchange along the right main lane shoulder, shown in Figure 2-7.



Figure 2-6 – Bare Spot Northeast of Gartrell Road between Off-Ramp and Mainline



Figure 2-7 – Bare Seeding Area Between Right Shoulder and Gun Club Rd. Near Interchange

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 locations of ROW fencing, fifteen locations of snow fencing, and fifteen 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 98.05.**

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. Two (2) out of the 15 embankment protectors inspected had restricted openings and three (3) showed signs of erosion at either the inlet or outlet end. **The overall condition is excellent with an average score of 98.87.**

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 4-year inspections are performed in accordance with the “Colorado Signs, Signals, and High-Mast Lights Inventory and Inspection Manual” published by CDOT. Thirty-four (34) overhead sign structures in Segment IV were inspected in 2022 and

those in Segments I, II, and III were inspected in 2021. These signs will be inspected again in 2026 and 2025, respectively.

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 tollway 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.

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 2022 Findings

Level	Location	Description of Finding
Two	RCP between Parker Road and Ireland Way	Plywood board at inlet is reducing capacity by 40% (may be intentional). Counted as “trash”.
Two	MSS A	Peeling and cracking damage to plywood paneling/sheeting on exterior of building (extensive throughout).
Two	Toll Plaza A	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior).
Two	Toll Plaza B	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior).
Two	Toll Plaza D	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior).
Two	Merge Arrow sign at Peoria St. On Ramp traveling NB	Sign rotated and is not clearly visible at night.

Level	Location	Description of Finding
Two	Native Seeding Area south of Gartrell Rd, between Off Ramp and Mainline	Various bare spots and erosion between 2-12 inches in depth, and in one case, greater than 10 feet in length.
Two	Native Seeding Area inside Gun Club Rd. Interchange, right shoulder	Many bare spots and erosion between 2-12 inches in depth and greater than 10 feet in length.
Two	Native Seeding Area north of Gartrell Rd., between Off Ramp and Mainline	Various bare spots and erosion between 2-12 inches in depth.
Two	Snow Fence north of Cottonwood Rd. traveling SB	Fabric height deficiencies throughout stretch, erosion hole approximately 3 feet deep.
Three	MSS A	Rust forming at timber base plate connections (building exterior).
Three	MSS A	Water damages and discoloration to ceiling tiles (building interior).
Three	MSS A	3/4" deep x 1" wide concrete voids in storage shed retaining walls.
Three	MSS A	Water damage and cracking at door (building interior).
Three	Toll Plaza A	Voids larger than 1/2 inch in brick mortar on exterior of building near entryway.
Three	Toll Plaza A	Exterior structural damage of bricks (broken brick at garage).
Three	Toll Plaza A	Structural foundation problem (chipped foundation stem wall) on exterior of building.
Three	Toll Plaza A	Soffit peeling on exterior of building at window and entryway.
Three	Toll Plaza B	Cracks in concrete larger than 1/4 inch (building exterior).
Three	Toll Plaza B	Voids larger than 1/2 inch in brick mortar on exterior of building (cracked mortar joints).
Three	Toll Plaza B	Soffit peeling on exterior of building.
Three	Toll Plaza B	Peeling wallpaper at exterior windows, possible moisture damage.
Three	Toll Plaza B	Cracked and swelling drywall at soffit.
Three	AHF	Cracks in concrete larger than 1/4" under window on building exterior

Level	Location	Description of Finding
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	Visible leaks in the ceiling (building interior).
Three	MSS D	Rusting column base connection to foundations.
Three	MSS D	Damaged plywood paneling and missing exterior cladding in one location.
Three	Toll Plaza E	Soffit peeling on exterior of building.
Three	MSS E	Missing brick at entryway (building exterior).
Three	MSS E	Voids larger than 1/2 inch in the brick mortar (building exterior).
Three	MSS E	Water damages and discoloration to ceiling tiles and floor (extensive throughout interior).
Three	MSS E	Damaged plywood paneling.
Three	Ramp Building (On Ramp, Quincy Ave. to SB E-470))	Rust staining on building exterior.
Three	Ramp Building (On Ramp, Quincy Ave. to SB E-470))	Hole larger than 1/2-inch diameter and 1 inch deep around pipes leading to exterior.
Three	Ramp Building (On Ramp, Peoria St. to SB E-470)	Cracked brick, missing pieces of mortar and rust staining.
Three	Ramp Building (Off Ramp, NB E-270 to Gartrell Rd.)	1/4" wide by 12" tall crack in exterior brick and large horizontal crack on building exterior.
Three	Ramp Building (Off Ramp, NB E-470 to Smoky Hill Rd.)	Large horizontal crack on building exterior.
Three	Ramp Building (Off Ramp, NB E-470 to Smoky Hill Rd.)	Light coming through the hole on the underside of the steel lintel.
Three	Ramp Building (On Ramp, 104th Ave to NB E-470)	Smell upon entry indicates possible mold/mildew (building interior).
Three	Ramp Building (On Ramp, 104th Ave to NB E-470)	Brick cracks at bearing ends of lintel.

Level	Location	Description of Finding
Three	Ramp Building (On Ramp, York St. to NB E-470)	Rust staining on building exterior.
Three	Ramp Building (On Ramp, York St. to NB E-470)	Brick cracks at bearing ends of lintel.
Three	Ramp Building (Off Ramp, SB E-470 to 64th Ave.)	Brick cracks at bearing ends of lintel.
Three	Ramp Building (Off Ramp, SB E-470 to 56th Ave.)	2" deep by 10" wide portion of damaged brick at exterior.

Table 2-7 – Numerical Scoring System Summary

	Inspection Category	2022	2021	Asset Condition
Major Assets	Roadway Pavement (PCI)	83.7	83.7	Good
	Bridges	90.9	95.3	Excellent
	Lighting	96.0	96.0	Excellent
	Drainage	96.1	98.3	Excellent
	Guardrail and Cable Rail			
	-Guardrail	100	87.4	Excellent
	-Cable Rail	100	100	Excellent
	Buildings	95.3	93.6	Excellent
Secondary Assets	Signing	98.1	99.4	Excellent
	Striping	100	100	Excellent
	Delineators	98.9	91.6	Excellent
	Native Seeded Areas	79.5	97.7	Average
	Fencing	98.1	98.6	Excellent
	Embankment Protectors	98.9	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 2022 Budget Summary for Roadway Specific Expenses is shown in Table 3-1.

Table 3-1 – 2022 Roadway and Maintenance Expenses

Roadway and Maintenance Expenses	2022 Budget
Vehicle Expenses - Fuel	\$120,000
Electrical Repairs	\$95,000
General Landscape Maintenance	\$60,000
Mowing & Irrigation	\$45,000
Drainage Maintenance	\$55,000
Shouldering	\$80,000
Pavement Maintenance	\$120,000
Structure Maintenance	\$45,000
Roadway Maintenance	\$612,000
Snow Removal	\$4,367,000
Roadway & Engineering Support	\$629,000
Land Management Support	\$172,600
Legal Support	\$135,000
Total Roadway Specific Expenses	\$6,535,600

3.6 Fiscal Year Roadway and Maintenance Budget

The 2022 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 I-70 to 104th Avenue, and 104th Avenue to I-76.

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

Project Category	2022 Budget	2023 Estimate	2024 Estimate	2025 Estimate	2026 Estimate
Renewal and Replacement	\$36,527,600	\$18,271,800	\$13,895,000	\$11,875,000	\$10,070,000
Construction Projects	\$91,184,000	\$140,219,000	\$100,597,000	\$48,545,000	\$17,192,500
Other Capital Requirements	\$500,000	\$300,000	-	-	-
Total Capital Expenditures	\$128,211,600	\$158,790,000	\$60,420,000	\$60,420,000	\$27,262,500

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 while pushing forward towards rider quality and connectivity improvements .



Building a Better World for All of Us[®]

Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy and a balanced environment. Building a Better World for All of Us communicates a company-wide commitment to act in the best interests of our clients and the world around us.

We're confident in our ability to balance these requirements.

[Join Our Social Communities](#)

