



E-470 Public Highway Authority

# 2020 Annual Certification



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# 2020 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 \$214,481,801 to fully fund the 2020 capital budget of the \$94,541,100. See Section 3 for Roadway and Maintenance Budget details.

### 1.3 Overview

The E-470 Public Highway, as described in Section 1.4, has been, and is continuing 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 Quincy Avenue.

**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 (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 1<sup>st</sup>, 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 and downturn period, the Authority 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.

Near Plazas A, C, D, and E, the Authority also maintains maintenance facilities, 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 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.

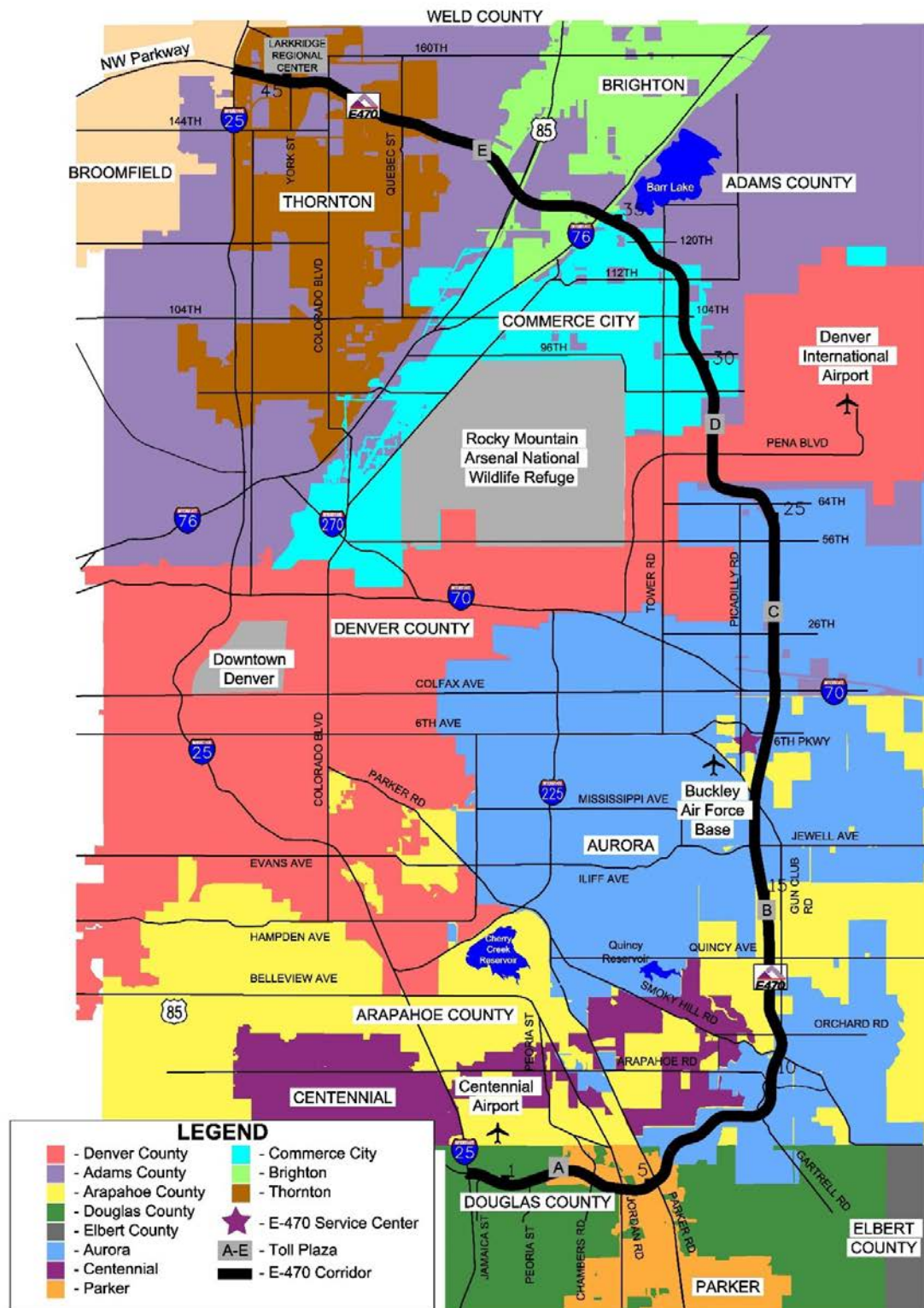


Figure 1-1 – E-470 Mainline Map

## 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. For example, this forecasting has initiated the current widening project from Quincy Avenue to I-70 with a completion timeframe of late 2020.

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 requires two concurrent construction projects. The County will convert the Quincy Avenue/Gun Club Road intersection to a partial continuous flow layout that will significantly increase capacity and traffic flow. Simultaneously, the Authority will relocate its northbound Quincy Avenue ramp to connect to Gun Club Road via a buttonhook layout. This ramp relocation will remove one of the intersections from the Quincy Avenue corridor, thereby reducing congestion, travel times and safety concerns. The Authority's ramp relocation is included in the Quincy Avenue to I-70 Road Widening Project to achieve economies of scale with construction mobilization. The Quincy Avenue/Gun Club Road intersection improvements are scheduled to be completed early 2021.

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 120<sup>th</sup> Avenue and Quincy Avenue ramp terminals to determine if signal control was warranted at either interchange. Design of traffic signals for the 120<sup>th</sup> Avenue interchange accounts for future widening of 120<sup>th</sup> Avenue through the E-470 interchange, and signal installation is scheduled to be completed in late 2020. The locations of potential new interchanges are at 38<sup>th</sup> Avenue, 48<sup>th</sup> Avenue, 88<sup>th</sup> Avenue, 112<sup>th</sup> Avenue and Potomac St./Sable Blvd. Conceptual layouts for design were being evaluated at both Potomac St. and Sable Blvd. locations, but after further discussion with the City of Brighton and Adams County, Sable Blvd. is the preferred location for the proposed interchange. The Authority is finalizing a feasibility study in late 2020 to confirm this assessment.

On May 21<sup>st</sup>, 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 provider. 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 City of Aurora completed construction on the Stephen D. Hogan Parkway, which connects East 6th Avenue to East 6th Parkway at E-470. This will provide direct access to E-470 from Tower



Road and improve access to residential communities east of E-470, as well as provide access from E-470 to Buckley Air Force Base.

The Authority executed an agreement with the Aerotropolis Regional Transportation Authority to jointly fund the construction of a new diamond interchange at 38<sup>th</sup> 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 64<sup>th</sup> Avenue Aurora Regional Improvement Authority to jointly fund the expansion of the 64<sup>th</sup> 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 compares E-470 to neighboring HAZMAT routes and analyzes environmental, safety, traffic, physical roadway characteristics, and social environmental data. The Colorado State Patrol assess the data presented in the HAZMAT petition and, after public meetings and stakeholder outreach, will 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/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 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.
- 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 64<sup>th</sup> Avenue to address a higher than average number of accidents at a horizontal curve.
- Started to use 6” wide lane markings in lieu of 4” to increase visibility.

## 1.8 COVID-19 Pandemic

On March 13<sup>th</sup>, 2020, the President of the United States declared a national emergency as a result of the COVID-19 pandemic and put social distancing guidelines in place for the United States. In response, Mayor Hancock ordered a stay-at home directive for residents in the City and County of Denver going into effect on March 23<sup>rd</sup>. Following that, on March 25<sup>th</sup>, Governor Polis of Colorado issued a statewide stay-at home order to last through April 11<sup>th</sup> unless withdrawn or modified. The pandemic has had, and is likely to continue to have, an adverse effect on travel and traffic volumes on Colorado roads. The decreased traffic volumes have impacted the E-470 toll road traffic levels, use of the toll road by drivers to avoid congestion on alternative roads, and of course toll revenue.

As a result of these developments and creating an inability to predict the magnitude and duration of the impact, the Authority has continued to monitor traffic levels on the E-470 toll road. While the Authority’s operating expenses and budgeted capital spending have been reduced, the Authority has unrestricted funds with the General Surplus Account which could be valuable when debt service is due. It is difficult to be certain in these times, but the Authority believes that with such unrestricted funds combined with future net toll revenues, there will be sufficient funds to pay debt service when due.

In order to meet the goals of lowering and leveling future debt, the Authority closed on a significant transaction in June of this year that restructured bonds in order to take advantage of lower rates in the bond market. Tim Stewart, Executive Director of E-470, stated, “This action gives us better long-term stability and still maintains more than sufficient liquidity for current and future planned capital improvement project in the region.”

Shortly after the state of national emergency was declared, E-470 sent a newsletter to customers with updates on Express Service Center operations. After several months of remote operations, the walk-in service center was re-opened in August. Due to the modified operations of the service center, the newsletter also listed some additional information and links to assist customers that need to make a payment.

Under the Road Widening Projects section of the website, there is a section dedicated to construction precautions that E-470 is taking to help slow and prevent the spread of the virus. A task force has been created to ensure that project teams are adhering to the latest guidelines set by public health officials. Some of these guidelines include holding previously scheduled indoor meetings virtually, crews practicing social distancing throughout the workday, and maintaining social distancing at small group meetings taking place. E-470 and its sub-contractors will continue to follow these procedures and are ready to adjust to any new safety measures.

## 1.9 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 the majority 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 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. This year, due to reduced traffic and budget, the Authority made the decision to forego an independent pavement analysis. Since the tollway was driven a significant amount while performing the other asset inspections, the pavement was assessed qualitatively and was found to be in good condition. The 2019 results are summarized below along with commentary from visual inspection from this year.

### Hot Mix Asphalt

The pavement analysis conducted in the summer of 2019 provided an **overall IRI of 68.1 in/mi**. Based on a 2014 Federal Highway Administration (FHWA) report, most of Colorado's interstate miles had an IRI rating of 60 to 120 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 2019 pavement analysis resulted in a PCI of 81.7, 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 the 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, half of which are inspected one year and the other half of the 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 this criteria. Thus, some concrete box culverts are considered "bridges" per this definition.

Sixty-six (66) bridges located in Segments I-III were inspected in July and August 2020 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 95.0.** Table 2-1 summarizes the individual sufficiency ratings for the bridges inspected in 2020.

Table 2-1 – 2020 Structure 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-470-05.13A	E-470 NB	Cherry Creek	98.2
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-470-07.78C	Ireland Way	E-470	99.8
E-470-08.90C	Gartrell Road	E-470	97.7
E-470-09.57A	E-470 NB	Piney Creek	98.3
E-470-09.57B	E-470 SB	Piney Creek	98.2
E-470-09.83A	E-470 NB	Arapahoe Road	98.3
E-470-09.83B	E-470 SB	Arapahoe Road	96.1
E-470-1.71A	E-470 EB	Peoria Street	91.6
E-470-1.71B	E-470 WB	Peoria Street	94.3
E-470-10.66C	Smoky Hill Road	E-470	88.7
E-470-13.31A	E-470 NB	Quincy Avenue	94.2
E-470-13.31B	E-470 SB	Quincy Avenue	94.2
E-470-14.32C	Hampden Avenue	E-470	99.3
E-470-16.35C	Jewell Avenue	E-470	99.9
E-470-17.58C	State Highway 30	E-470	98.8
E-470-17.78CBC	E-470	Murphy Creek	81.3
E-470-18.44A	E-470 NB	Coal Creek	79.1
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	100.0
E-470-19thCBC	19 <sup>th</sup> Avenue	First Creek	84.2
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 RMP B	98.6
E-470-20.32A	E-470 NB	Colfax Avenue	98.6

<b>E-470-20.32B</b>	E-470 SB	Colfax Avenue	98.6
<b>E-470-20.46A</b>	E-470 Ramp H	I-70, Colfax, E470 ML	97.6
<b>E-470-20.50A</b>	E-470 NB	I-70	92.3
<b>E-470-20.50B</b>	E-470 SB	I-70	91.8
<b>E-470-20.70A</b>	E-470 NB	19th Avenue	96.6
<b>E-470-20.70B</b>	E-470 SB	19th Avenue	97.6
<b>E-470-20.81CBC</b>	E-470	First Creek	81.7
<b>E-470-20.88A</b>	E-470 NB	Ramp E	98.6
<b>E-470-20.88B</b>	E-470 SB	Ramp E	98.6
<b>E-470-21.01A</b>	E-470 NB	Smith Road & UPRR	94.2
<b>E-470-21.01B</b>	E-470 SB	Smith Road & UPRR	94.8
<b>E-470-21.01C</b>	Ramp E	Smith Road & UPRR	94.5
<b>E-470-21.43C</b>	26th Avenue	E-470	96.0
<b>E-470-23.38CBC</b>	E-470	Local Drainage	78.7
<b>E-470-23.43C</b>	48th Avenue-Future	E-470	92.5
<b>E-470-24.44C</b>	56th Avenue	E-470	100.0
<b>E-470-25.48C</b>	64th Avenue	E-470	100.0
<b>E-470-27.86A</b>	E-470 NB	Pena Boulevard	87.0
<b>E-470-27.86B</b>	E-470 SB	Pena Boulevard	94.1
<b>E-470-29.39C</b>	88th Avenue	E-470	96.0
<b>E-470-3.26A</b>	E-470 EB	Happy Canyon Creek	89.3
<b>E-470-3.26B</b>	E-470 WB	Happy Canyon Creek	98.0
<b>E-470-3.54C</b>	Chambers Road NB	E-470	91.8
<b>E-470-3.54D</b>	Chambers Road SB	E-470	88.3
<b>E-470-30.46C</b>	96th Avenue	E-470	99.9
<b>E-470-31.57C</b>	104th Avenue	E-470	100.0
<b>E-470-32.57C</b>	112th Avenue	E-470	100.0
<b>E-470-33.22C</b>	Tower Road	E-470	98.6
<b>E-470-4.33A</b>	E-470 EB	Jordan Road	98.1
<b>E-470-4.33B</b>	E-470 WB	Jordan Road	98.0
<b>E-470-5.13B</b>	E-470 SB	Cherry Creek	98.0
<b>E-470-5.13D</b>	Ramp A	Cherry Creek	98.4
<b>E-470-RAMPGCBC</b>	E-470 Ramp G	First Creek	84.8

### 2.2.3 Lighting

The Authority maintains approximately 1,450 lights and strives to maintain 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 and no rust, weld, or paint issues were found during inspection. It was noted for information only that 34 bolt covers were missing or damaged, and 20 electrical plates that house 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 93 lights with at least one bulb burnt out, resulting in a score of 94.0.** 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 97.00.**

### 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. Seven culverts were found to have sediment greater than 4" and three were found to have tumbleweeds impacting the water flow. Trash was only found in three of the culverts. See Figure 2-1 below for an example view of moderate tumbleweed blockage at the end of a reinforced concrete pipe (south of Toll Plaza C). **The culverts are in excellent condition with an overall score of 98.1.**





Figure 2-1 – Reinforced Concrete Pipe Flared End with Tumbleweed 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. There were no locations of damage noted during either driving inspection. Based on these inspections, the Authority has an overall score of 100 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 98.7. **The overall average score of the guardrail driving and field inspections is excellent with a score of 99.3.**

### Cable Rail

Although cable rail can be damaged and still 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 were two locations where damage was noted

during the first inspection and both were repaired at the time of the second inspection. This results in a score of 100 for the driving portion of the cable rail inspection.

Additionally 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 all sections of cable 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 99.9. **The overall average score of the cable rail driving and field inspections is excellent with a score of 99.9**

## 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 five Toll Plazas (A, B, C, D, and E), four Maintenance Support Sites (MSSA, MSSC, MSSD, and MSSE), the Central Maintenance Facility (CMF), 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.

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	TPC	TPD	TPE
Exterior	98	100	100	99	100
Interiors	95	94	89	94	88
Tunnels	99	100	100	98	100
Mechanical Equipment	98	99	99	99	99
<b>Average</b>	<b>97.50</b>	<b>98.25</b>	<b>97.00</b>	<b>97.50</b>	<b>96.75</b>

Component	MSSA	MSSC	MSSD	MSSE
Exterior	100	98	100	99
Interiors	99	94	100	99
Barns	98	90	94	93
Mechanical Equipment	98	99	96	98
<b>Average</b>	<b>98.75</b>	<b>95.25</b>	<b>97.50</b>	<b>97.25</b>

Component	AHF	CMF	Ramps
Exterior	96	98	100
Interiors	89	94	100
Mechanical Equipment	99	99	100
<b>Average</b>	<b>94.67</b>	<b>97.00</b>	<b>100.00</b>

## 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:

- MSS A: The building is in excellent condition with an overall rating of 98.75. The only noted Level Three findings were damage and discoloration to ceiling, floors, or walls and damages or discoloration to plywood paneling/sheeting. It was also noted that there was warping in the fascia board.
- Toll Plaza A: The building is in excellent condition with an overall rating of 97.50. There were no Level One or Two findings. The following items noted are Level Three findings: 1) voids larger than ½ inch in the brick mortar, 2) water damage and discoloration to ceiling, 3) drywall cracks at roof or building interior, and 4) unrepaired crack in tunnel in concrete wider than ¼ inch.
- Toll Plaza B: The building is in excellent condition with an overall rating of 98.25. No Level One or Two findings occurred. The Level Three findings are water damages or discoloration to ceiling, floors, or walls and a hole larger than ¼ inch in drywall.
- Authority Headquarters Facility (AHF): The AHF is in excellent condition with an overall rating of 94.67. Only three Level Three findings were discovered. These items are clogged or inoperative gutters, seven separate areas of water damage and discoloration to ceiling throughout the building's interior, and holes larger than ¼ inch in the drywall.
- Toll Plaza C: The building is in excellent condition with an overall rating of 97.00. The only Level Three finding was eleven separate areas of water damage and discoloration to ceiling, and walls.
- MSS C: The building was in excellent condition with a rating of 95.30. The only Level Two item was damages and discoloration to plywood paneling/sheeting. The exterior wood was described as being in bad shape at the time of inspection. There were two Level Three findings found in the buildings. These findings include voids larger than ½ inch in the brick mortar and water damages or discoloration to ceiling, floors, or walls.

- Central Maintenance Facility: The building was in excellent condition with a rating of 97.00. The only Level Two item was damages and discoloration to plywood paneling/sheeting. The exterior wood was described as being in bad shape at the time of inspection (Figure 2-2). There were two Level Three findings found in the buildings. These findings include voids larger than ½ inch in the brick mortar and water damages or discoloration to ceiling, floors, or walls.



Figure 2-2 – Damages to Exterior Wood

- Toll Plaza D: The building is in excellent condition with an overall rating of 97.50. No Level One or Two findings were noted. The Level Three findings are: 1) voids larger than ½ inch in the brick mortar on the building exterior, 2) water damage and discoloration to ceiling tiles, 3) mold/mildew in any of the rooms, and 4) unrepaired cracks in the tunnel concrete wider than ¼ inch.
- MSS D: The building is in excellent condition with an overall rating of 97.50 with the Level Three findings being 1) damage and discoloration to plywood paneling/sheeting, 2) mold/mildew on the floor of the utility room, and 3) netting, flashing missing, and down flashing.
- Toll Plaza E: The building is in excellent condition with an overall rating of 96.75. There was only one Level Two finding. It was noted that there was water damage and discoloration to ceiling tiles throughout the interior of the building (Figure 2-3).



Figure 2-3 - Water Damages and Discoloration to Ceiling

- MSS E: The building is in excellent condition with an overall rating of 97.25. There were three Level Three findings. These findings include 1) void larger than ½ inch in the brick mortar, 2) water damage or discoloration to ceiling, floors, or walls, and 3) damages or discoloration to plywood paneling/sheeting.

For the mechanical components within the buildings, Haynes Mechanical Systems prepared an Asset Condition Report in July 2020 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 138 pieces of equipment were inspected and 88.4% of the equipment was rated as Good, 10.9% 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 is provided to the consultant. The following table shows the necessary mechanical components and the status of the certification.

Table 2-3 – Mechanical Components/HVAC Certifications

P.M. Type	Frequency	Certifying Entity	Month Completed	Certification Status
Fire Extinguishers	Annually	Siemens	May 2020	Current
Fire Suppression (sprinklers)	Annually	Siemens	May 2020	Current
Smoke Detectors	Annually	Siemens	May 2020	Current
Fire Control Panel	Annually	Siemens	May 2020	Current
Backflows	Annually	Victory Fire Protection	May 2020	Current
HVAC	Twice a Year	Haynes Mechanical Systems	July 2020	Current
Elevator	Annually	State of Colorado	May 2020	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 100.** There were two Level Three findings discovered during the ramp building inspections. The ramp building on the northbound on-ramp on Chambers Road displayed mortar cracks and the ramp building on the northbound on-ramp on Colorado Boulevard had mold/mildew inside with visible efflorescence.

### 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 2-4 – Building Scores Summary

Building	2020 Average Score	2019 Average Score
Toll Plaza A	<b>97.50</b>	97.75
MSS A	<b>98.75</b>	99.75
Toll Plaza B	<b>98.25</b>	98.75
Authority Headquarters Facility (AHF)	<b>94.67</b>	99.33
Toll Plaza C	<b>97.00</b>	98.25
Central Maintenance Facility (CMF)	<b>97.00</b>	98.67
MSS C	<b>95.25</b>	100.00
MSS D	<b>97.50</b>	99.25
Toll Plaza D	<b>97.50</b>	98.25
Toll Plaza E	<b>96.75</b>	98.25
MSS E	<b>97.25</b>	99.25
Ramps	<b>100.0</b>	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 or not the sign was unreadable during daytime or nighttime conditions.

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/m<sup>2</sup>, 50 points will be deducted from that mile section score. It is also recommended that striping with a reading less than 100 cd/lx/m<sup>2</sup> be mandatory restriped. **Visually, the striping is in excellent condition with an overall score for pavement markings of 98.0.**

Retroreflectivity testing was performed in the spring of 2020, resulting in an overall value of 165 cd/lx/m<sup>2</sup> for the entire highway (182 cd/lx/m<sup>2</sup> in 2019).

### 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 90.8.**

### 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 93.6.**

One portion between Quincy Ave. and Smoky Hill Road, at Milepoint 12.0 traveling south, had four bare spots, three areas with erosion greater than 10 feet in length, along with two other areas of erosion less than 10 feet in length, see Figure 2-4.



Figure 2-4 – Erosion and Bare Spots at Milepoint 12.0 (Southbound)

### 2.3.5 Fencing

Three main types of fence 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 99.1.**

### 2.3.6 Embankment Protectors

Similar to the culvert inspection, embankment protectors are inspected for debris and depth of erosion at the discharge location. Fifteen embankment protectors out of the seventy maintained by the Authority were randomly selected for inspection. Nine out of the fifteen embankment protectors inspected had restricted openings. It was also noted that those nine had significant plant overgrowth near one or both of the openings. There was no erosion found at any of the inspected embankment protectors. **The overall condition is excellent with an average score of 94.33.**

The top opening of the embankment protector northwest of 88<sup>th</sup> Ave. has significant plant overgrowth (see Figure 2-5). The bottom opening is also overgrown with plants and blocked approximately 15% with tumbleweeds and sediment.





Figure 2-5 – Top of Embankment Protector near 88<sup>th</sup> Ave.

## Additional Assets

### 2.3.7 Variable Message Signs

At the time of inspection, all but one 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. Repairs to the VMS that was damaged by a passing motorist are being procured and scheduled.

### 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, 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 age 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.

In 2020, the Authority started using 6" wide lane markings in lieu of 4" to increase visibility for driver's traveling at night.

### 2.4.2 Litter Control

Road debris and litter is removed on a daily basis 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 2-5 and the overall NSS condition scores are summarized in Table 2-6. 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. 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.

Table 2-5 – Summary of 2020 Findings

Level	Location	Description of Finding
Two	CMF	Damages or discoloration to plywood paneling/sheeting (exterior wood in bad shape)
Two	Toll Plaza E	Water damages or discoloration to ceiling, floors, or walls (extensive throughout interior)
Three	MSS A	Water damage or discoloration to ceiling, floors, or walls (in Women's Room)
Three	MSS A	Damages or discoloration to plywood paneling/sheeting (warping in fascia board)
Three	Toll Plaza A	Voids larger than ½ inch in the brick mortar
Three	Toll Plaza A	Water damage or discoloration to ceiling, floors, or walls
Three	Toll Plaza A	Drywall cracks at roof of building interior
Three	Toll Plaza A	Unrepaired crack in tunnel in concrete wider than ¼ inch
Three	Toll Plaza B	Water damages or discoloration to ceiling, floors, or walls
Three	Toll Plaza B	Hole larger than ¼ inch in drywall
Three	AHF	Clogged or inoperative gutters or downspouts
Three	AHF	Water damages or discoloration to ceiling, floors, or walls
Three	AHF	Holes larger than ¼ inch in drywall
Three	Toll Plaza C	Water damages or discoloration to ceiling, floors, or walls
Three	CMF	Voids larger than ½ inch in the brick mortar
Three	CMF	Water damages or discoloration to ceiling, floors, or walls

Three	Toll Plaza D	Void larger than ½ inch in the brick mortar
Three	Toll Plaza D	Water damages or discoloration to ceiling, floors, or walls
Three	Toll Plaza D	Mold/mildew in any room
Three	Toll Plaza D	Unrepaired cracks in tunnel in concrete wider than ¼ inch
Three	MSS D	Damages or discoloration to plywood paneling/sheeting
Three	MSS D	Mold/mildew in any room
Three	MSS D	Netting, flashing missing, and down flashing
Three	MSS E	Void larger than ½ inch in the brick mortar
Three	MSS E	Water damage or discoloration to ceiling, floors, or walls
Three	MSS E	Damages or discoloration to plywood paneling/sheeting
Three	Ramp Building (On Ramp, Chambers Rd. to NB E-470)	Mortar cracks
Three	Ramp Building (On Ramp, Colorado Blvd. to NB E-470)	Mold/mildew in interior (efflorescence visible)

Table 2-6 – Numerical Scoring System Summary

	Inspection Category	2019	2020	Asset Condition
Major Assets	Roadway Pavement (PCI)*	81.7	<b>81.7</b>	<b>Good</b>
	Bridges	95.0	<b>95.0</b>	<b>Excellent</b>
	Lighting	93.9	<b>97.0</b>	<b>Excellent</b>
	Drainage	98.9	<b>98.1</b>	<b>Excellent</b>
	Guardrail and Cable Rail			
	-Guardrail	99.9	<b>99.3</b>	<b>Excellent</b>
	-Cable Rail	100.0	<b>99.9</b>	<b>Excellent</b>
	Buildings	99.0	<b>97.3</b>	<b>Excellent</b>
Secondary Assets	Signing	99.2	<b>99.4</b>	<b>Excellent</b>
	Striping	99.0	<b>98.0</b>	<b>Excellent</b>
	Delineators	96.5	<b>90.8</b>	<b>Excellent</b>
	Native Seeded Areas	93.0	<b>93.6</b>	<b>Excellent</b>
	Fencing	99.0	<b>99.1</b>	<b>Excellent</b>
	Embankment Protectors	87.1	<b>94.3</b>	<b>Excellent</b>

\*No pavement assessment conducted this year.

## 3 Roadway and Maintenance Budget

### 3.1 Roadway and Maintenance Budget

The Authority continues to allocate funds appropriately for the maintenance of the corridor. The Engineering and Roadway Maintenance Department's 2020 Budget Summary for Roadway Specific Expenses is included in the following table:

Table 3-1 – 2020 Roadway and Maintenance Expenses

Roadway and Maintenance Expenses	2020 Budget
Facility Maintenance	\$788,900
Vehicle Expenses	\$130,000
Utilities	\$760,000
Electrical Repairs	\$110,000
General Landscape Maintenance	\$70,000
Mowing & Irrigation	\$135,000
Drainage Maintenance	\$55,000
Shouldering	\$85,000
Pavement Maintenance	\$140,000
Structure Maintenance	\$45,000
Roadway Maintenance	\$627,000
Snow Removal	\$4,280,000
Roadway & Engineering Support	\$615,000
Land Management Support	\$222,600
<b>Total Roadway Specific Expenses</b>	<b>\$8,063,500</b>

Due to the effects of COVID and the associated reduction in traffic on the toll road, the Authority reduced its 2020 Operating budget in May. The revised 2020 budget is \$6.2M with proportional reductions in most of the line items listed above.

### 3.2 Fiscal Year Roadway and Maintenance Budget

The 2020 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.

In case additional repairs become necessary, the Authority has a Capital Improvement Fund, which is available for any 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 104<sup>th</sup> Avenue, and 104<sup>th</sup> Avenue to US-85.

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

Project Category	2020 Budget	2021 Estimate	2022 Estimate	2023 Estimate	2024 Estimate
Renewal and Replacement	\$25,650,300	\$37,416,400	\$31,005,000	\$15,260,000	\$14,480,000
Construction Projects	\$68,150,000	\$30,675,000	\$71,850,000	\$51,550,000	\$33,503,000
Other Capital Requirements	\$740,800	\$10,000	-	-	-
<b>Total Capital Expenditures</b>	<b>\$94,541,100</b>	<b>\$68,101,400</b>	<b>\$102,855,000</b>	<b>\$66,810,000</b>	<b>\$47,983,000</b>

## 4 Summary

The Authority continues to maintain and improve the tollway at a very high standard. Out of the 12 major and secondary assets, **11 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 responded to the COVID pandemic related traffic and revenue impacts by reducing their operating and capital budgets accordingly. The Authority has continued maintained operations as well as could be expected under the current circumstances. The Authority continues to show prudent financial management of the roadway asset in this period of economic and national uncertainty.



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