Description

- CTDOT inspects 5,440 roadway bridges, 1,823 of which are National Bridge Inventory (NBI) structures on the National Highway System (NHS).
- 4,054 of these bridges are state maintained; the remaining 1,386 are maintained locally or under another jurisdiction
- CTDOT defines a bridge as a crossing of at least six feet in length, including culverts. The Federal Highway Administration (FHWA) defines an NBI bridge as a structure measuring more than 20 feet in length.
- CTDOT has a distinct Major Bridge Program for large or expensive-to-replace bridges. 60 structures are currently categorized as Major Bridges.

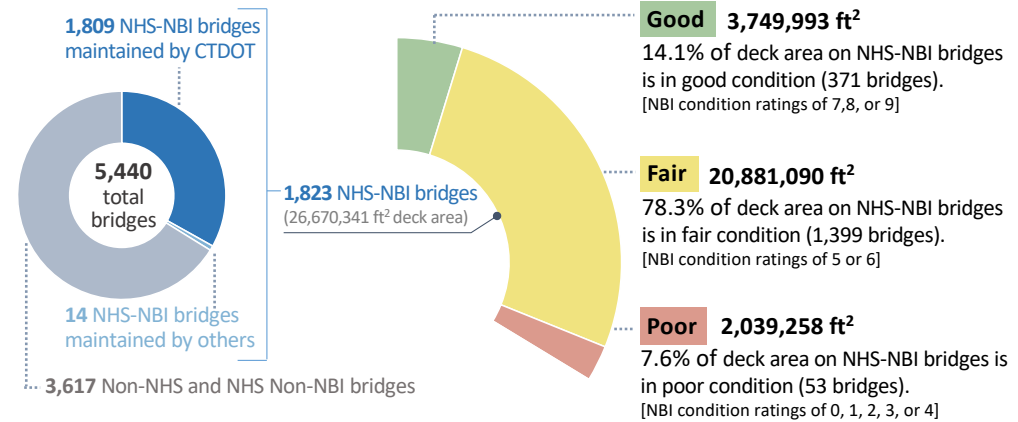## State of Good Repair (SOGR)

A bridge for which the condition rating for each of the three major components for a span bridge (Substructure, Deck, and Superstructure) or the structural condition of a culvert is rated at least a 5 on a 0-9 condition scale is classified as being in a SOGR.

Bridge Age

The average NHS-NBI bridge in Connecticut is 56 years old, which is 9 years older than the national average of 47 years. The state has a higher percentage of Poor bridges (by deck area) compared to the national average.

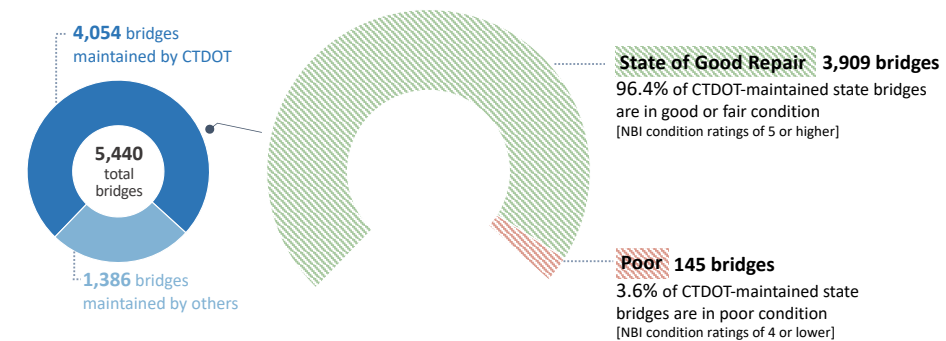## NHS-NBI Inventory and Condition
Federal Requirements

1,809 NHS-NBI bridges maintained by CTDOT

5,440 total bridges

1,823 NHS-NBI bridges (26,670,341 ft² deck area)

14 NHS-NBI bridges maintained by others

3,617 Non-NHS and NHS Non-NBI bridges

Good **3,749,993 ft²**
14.1% of deck area on NHS-NBI bridges is in good condition (371 bridges).
[NBI condition ratings of 7,8, or 9]

Fair **20,881,090 ft²**
78.3% of deck area on NHS-NBI bridges is in fair condition (1,399 bridges).
[NBI condition ratings of 5 or 6]

Poor **2,039,258 ft²**
7.6% of deck area on NHS-NBI bridges is in poor condition (53 bridges).
[NBI condition ratings of 0, 1, 2, 3, or 4]

Based on CTDOT 3/15/22 NBI Submittal

Good-Fair-Poor defined by MAP-21/FAST Act

CTDOT-Maintained Inventory and Condition
State Goals

4,054 bridges maintained by CTDOT

5,440 total bridges

1,386 bridges maintained by others

State of Good Repair **3,909 bridges**
96.4% of CTDOT-maintained state bridges are in good or fair condition
[NBI condition ratings of 5 or higher]

Poor **145 bridges**
3.6% of CTDOT-maintained state bridges are in poor condition
[NBI condition ratings of 4 or lower]

SOGR defined by CTDOT

History

Distribution of NHS Bridges By Decade Built

% Poor NHS Bridges By Deck Area
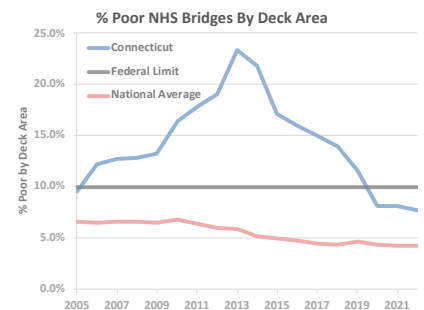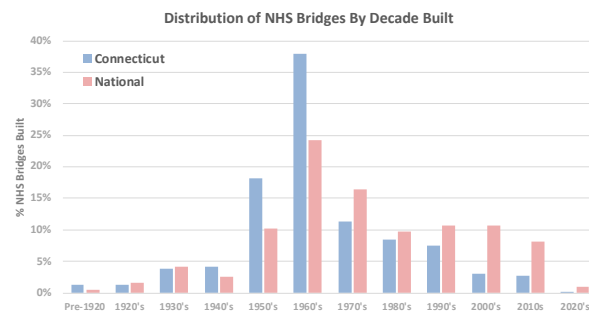
Based on National Data available from FHWA LTBP InfoBridge as of 2/9/23

NHS-NBI Bridge Performance Projections

Federal Requirements for deck area for 1,823 NHS-NBI bridges
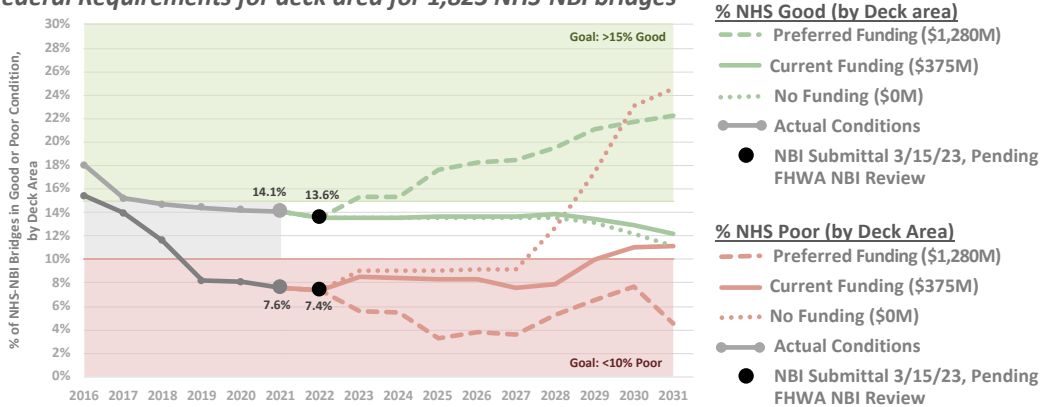
% NHS Good (by Deck area)
- – – Preferred Funding ($1,280M)
- —— Current Funding ($375M)
- ····· No Funding ($0M)
- —●— Actual Conditions
- ● NBI Submittal 3/15/23, Pending FHWA NBI Review

% NHS Poor (by Deck Area)
- – – Preferred Funding ($1,280M)
- —— Current Funding ($375M)
- ····· No Funding ($0M)
- —●— Actual Conditions
- ● NBI Submittal 3/15/23, Pending FHWA NBI Review

'No Funding' scenario assumes routine bridge maintenance continues, but all capital work is canceled

Performance Projections at Current Funding Level ($375M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
NHS Good (by deck area)	13.6%	13.6%	13.6%	13.6%	13.6%	>15.0%
NHS Poor (by deck area)	8.5%	8.4%	8.3%	8.3%	7.5%	<10.0%

CTDOT-Maintained Bridge Performance Projections

State Goals by number of bridges for 4,054 CTDOT-maintained bridges
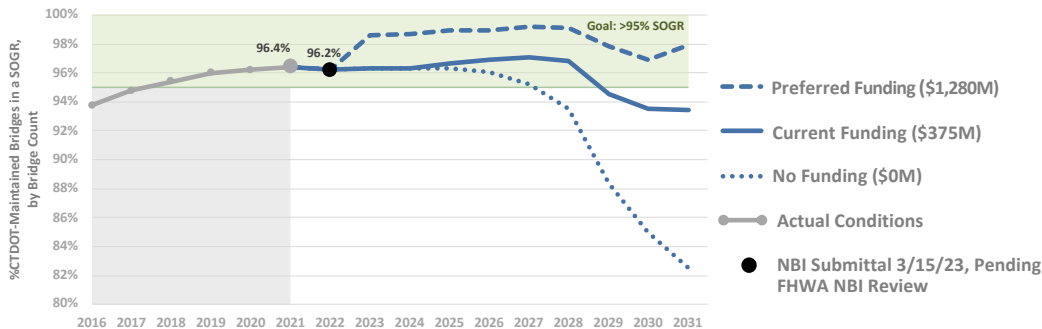
- – – Preferred Funding ($1,280M)
- —— Current Funding ($375M)
- ····· No Funding ($0M)
- —●— Actual Conditions
- ● NBI Submittal 3/15/23, Pending FHWA NBI Review

'No Funding' scenario assumes routine bridge maintenance continues, but all capital work is canceled

Performance Projections at Current Funding Level ($375M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	96.3%	96.3%	96.7%	96.9%	97.1%	95.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

The chart on the left depicts bridge condition for various funding scenarios. These were developed through an analysis program using CTDOT bridge condition data, as of March 2022.

Asset Valuation

$18,477,194,000

Asset value is estimated using the replacement value. For bridges, replacement value is the product of deck area and unit construction cost. For 4,054 bridges: 36,954,388 sqft * $500/sqft = $18.5 billion.

Measures and Goals

CTDOT has set the following bridge condition goals:

Federal Requirements:
- 10% or less Poor by deck area on NHS-NBI bridges (Federal minimum is less than 10% Poor)
- 15% or more Good by deck area on NHS-NBI bridges. (Percent Good is established by each state; no Federal minimum for this goal)

State Goal:
- 95% or more of State-Maintained bridges in a SOGR (State target)

Description

- There are 3,715 centerline miles of state-maintained routes and roads in Connecticut, 1,406 of which are on the National Highway System (NHS), including 346 Interstate miles.
- There are another 17,466 centerline miles of town maintained roads, 56 of which are on the NHS.
- 70.7% of CTDOT maintained centerline miles are flexible (asphalt) pavements, 29.0% are composite pavements (asphalt over concrete), and 0.3% are rigid (concrete) pavements.
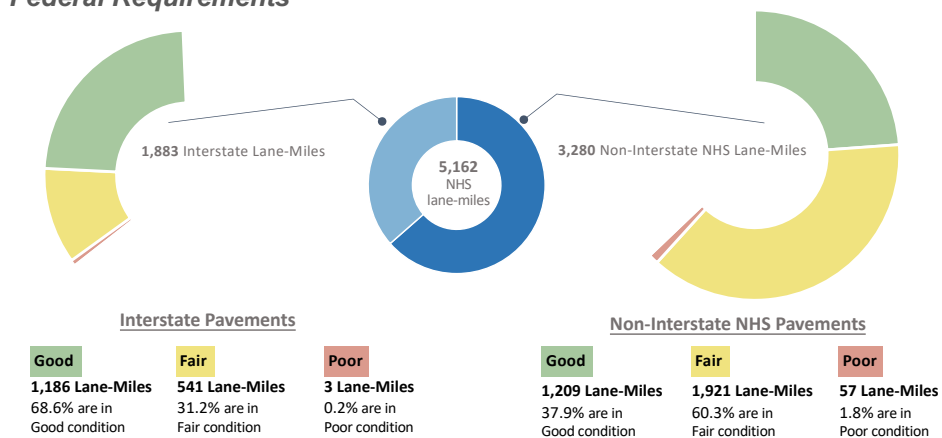
State of Good Repair (SOGR)

A pavement section for which the Pavement Condition Index (PCI) is 6 or greater is classified as being in a State of Good Repair (SOGR). The PCI is based on cracking, rutting, drainage disintegration, and ride. FHWA uses different condition measures for NHS pavements.

Pavement Age

The average Connecticut NHS pavement structure was constructed 48.6 years ago, and the average surface age is 7.5 years old, based on lane miles.

NHS Roadways Inventory and Condition
Federal Requirements

Good-Fair-Poor defined by MAP-21/FAST Act

1,883 Interstate Lane-Miles

5,162 NHS lane-miles

3,280 Non-Interstate NHS Lane-Miles

Interstate Pavements

Good	Fair	Poor
1,186 Lane-Miles	**541 Lane-Miles**	**3 Lane-Miles**
68.6% are in Good condition	31.2% are in Fair condition	0.2% are in Poor condition

Non-Interstate NHS Pavements

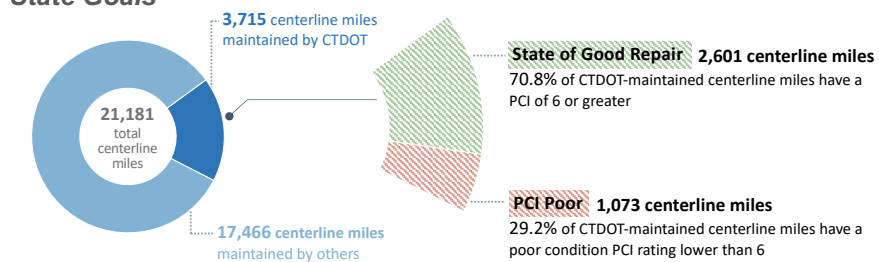| Good	Fair	Poor
1,209 Lane-Miles	**1,921 Lane-Miles**	**57 Lane-Miles**
37.9% are in Good condition	60.3% are in Fair condition	1.8% are in Poor condition

Note on Interstate: Total condition lane miles of 1,730 excludes 131 lane miles coded as bridge and 22 lane miles missing/invalid.
Note on Non-Interstate NHS: Total condition lane miles of 3,187 excludes 80 lane miles coded as bridge and 13 lane mile missing/invalid. Totals include 148 NHS lane miles which are locally maintained, 3.4% in good condition, 92.6% in fair condition and 4.0% in poor condition.

Based on 2021 HPMS pavement condition data submitted to FHWA June 14, 2022

CTDOT-Maintained Roadways Inventory and Condition
State Goals

SOGR defined by CTDOT

3,715 centerline miles maintained by CTDOT

21,181 total centerline miles

17,466 centerline miles maintained by others

State of Good Repair **2,601 centerline miles**
70.8% of CTDOT-maintained centerline miles have a PCI of 6 or greater

PCI Poor **1,073 centerline miles**
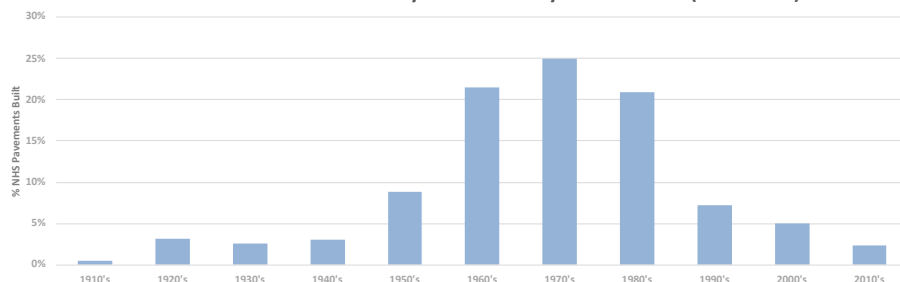29.2% of CTDOT-maintained centerline miles have a poor condition PCI rating lower than 6

Note: Total condition centerline miles of 3,674 excludes 41 centerline miles missing/invalid.

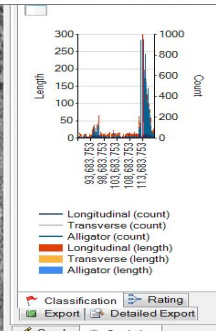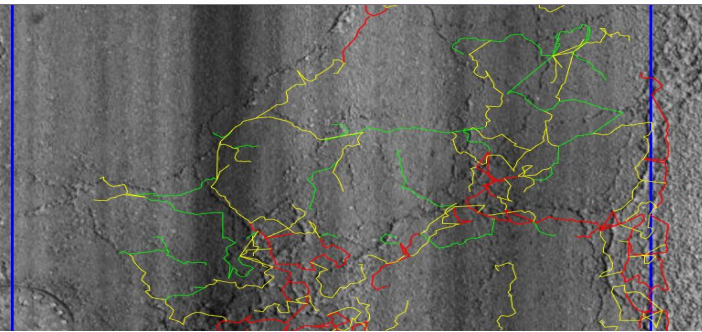*Based on CTDOT 1/11/23 Snapshot*

History

Distribution of CT NHS Roadway Pavements By Decade Built (lane miles)

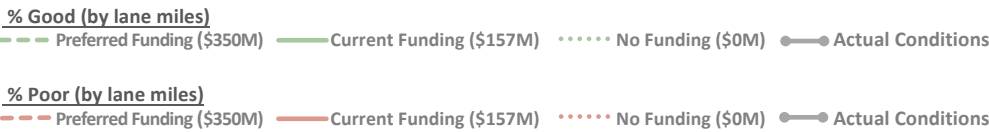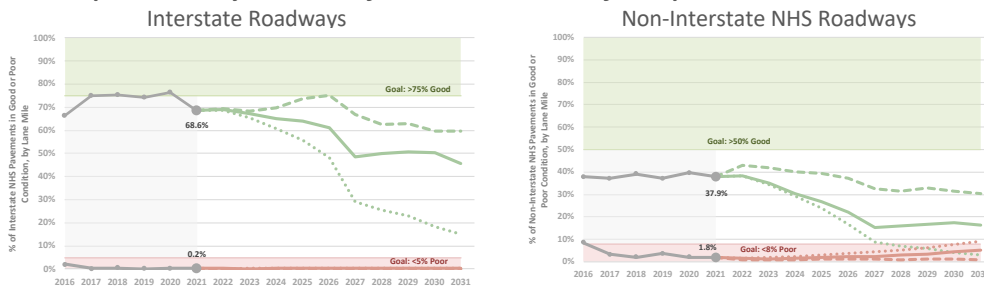# NHS Pavement Performance Projections

Federal Requirements by lane miles for 4,917 lane miles of NHS pavement

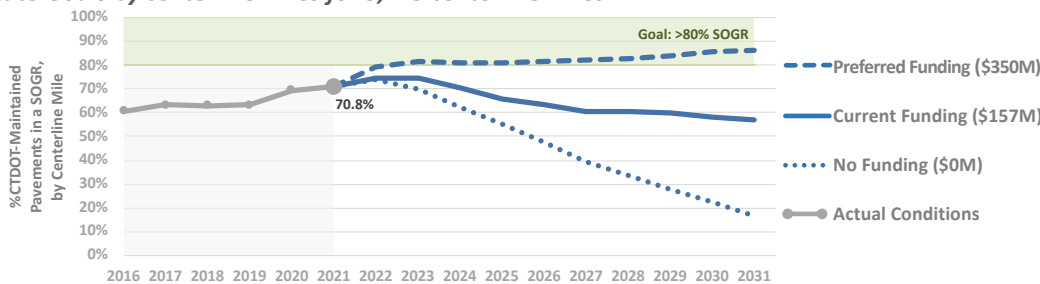Interstate Roadways — Goal: >75% Good — 68.6% — 0.2% — Goal: <5% Poor

Non-Interstate NHS Roadways — Goal: >50% Good — 37.9% — 1.8% — Goal: <8% Poor

% Good (by lane miles)
- – – Preferred Funding ($350M)
- —— Current Funding ($157M)
- ⋯⋯ No Funding ($0M)
- —●— Actual Conditions

% Poor (by lane miles)
- – – Preferred Funding ($350M)
- —— Current Funding ($157M)
- ⋯⋯ No Funding ($0M)
- —●— Actual Conditions

Based on funding as of 12/31/22

Performance Projections at Current Funding Level ($157M Budget)

End of Year	2022	2023	2024	2025	2026	Goal
Interstate Good	69.0%	67.1%	64.9%	63.9%	61.2%	75.0%
Interstate Poor	0.2%	0.1%	0.2%	0.2%	0.2%	<5.0%
Non-Int NHS Good	38.5%	35.3%	30.5%	26.7%	22.3%	50.0%
Non-Int NHS Poor	1.6%	1.4%	1.5%	1.9%	2.2%	<8.0%

CTDOT-Maintained Pavement Performance Projections

State Goals by centerline miles for 3,715 centerline miles

Goal: >80% SOGR — 70.8%
- – – Preferred Funding ($350M)
- —— Current Funding ($157M)
- ⋯⋯ No Funding ($0M)
- —●— Actual Conditions

Based on funding as of 12/31/22

Performance Projections at Current Funding Level ($157M Budget)

End of Year	2022	2023	2024	2025	2026	Goal
SOGR	74.4%	74.3%	70.6%	65.9%	63.5%	80.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

The charts on the left depicts pavement condition for various funding scenarios developed through an analysis program using CTDOT pavement deterioration curves projected from 2021 pavement condition data.

Asset Valuation

$11,732,885,502

Asset value is estimated using the replacement value. For pavements, replacement value is the product of pavement area (SY) and unit construction cost. For 3,715 centerline miles of pavement: 99 million SY * $119/SY = $11.7 Billion

Measures and Goals

CTDOT has set the following pavement condition goals:
Federal Requirements:
- Interstate: 75% good condition and less than 5% poor condition (Federal minimum is less than 5% poor)
- Non-Interstate: 50% good condition and less than 8% poor condition
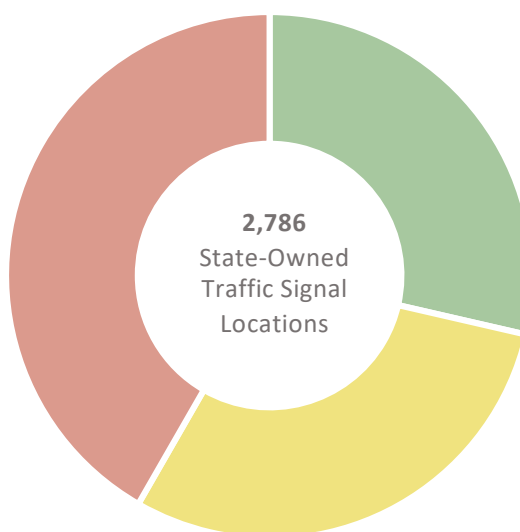
State Goal:
- 80% or more of State-maintained pavements in a SOGR (State)

Description

- CTDOT is currently responsible for maintaining 2,786 State owned traffic signals:
    - 2,560 Traditional Traffic signals
    - 226 Overhead flashing beacons
- Of the 2,560 traditional traffic signals, 966 are part of 111 computerized traffic signal systems
- CTDOT defines a traffic signal unit as all traffic control equipment at a given intersection or location
- There are an additional 279 independent signs with flashers that are managed as part of the sign asset

State of Good Repair (SOGR)

The State of Good Repair for traffic signals is determined to be 25 years of life based on expectations of controller and signal head life. Major component upgrades improve operation and safety of traffic signals but are not reflected in SOGR calculations.

Traffic Signal Age

- 41.7% of traffic signals are older than 25 years
- 1.3% of traffic signals are older than 53 years

Traffic Signal Inventory and Condition

2,786 State-Owned Traffic Signal Locations

Good
798 Locations
28.6% are in Good condition (0-15 years old)

Fair
827 Locations
29.7% are in Fair condition (16-25 years old)

Poor
1161 Locations
41.7% are in Poor condition (26+ years old)

Good-Fair-Poor and SOGR defined by CTDOT

Based on CTDOT 1/19/23 Snapshot

History

Distribution of Traffic Signal Locations by Year Installed or Replaced
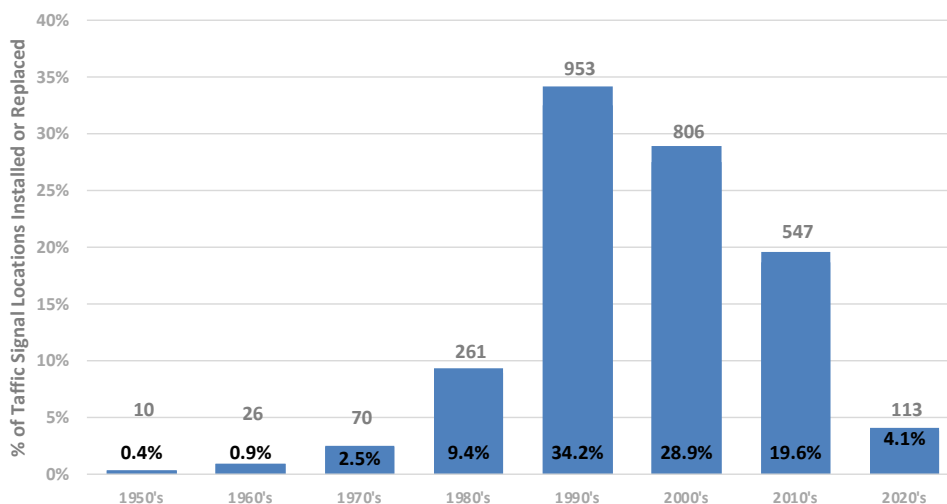
% of Traffic Signal Locations Installed or Replaced

Decade	Count	Percent
1950's	10	0.4%
1960's	26	0.9%
1970's	70	2.5%
1980's	261	9.4%
1990's	953	34.2%
2000's	806	28.9%
2010's	547	19.6%
2020's	113	4.1%

Based on CTDOT 1/19/23 Snapshot

Traffic Signals Performance Projections

State Goals by traffic signal for 2,786 traffic signals

Goal: >80% SOGR

58.3%

- - - Preferred Funding ($74M)

—— Current Funding ($49M)

······ No Funding ($0M)

—●— Actual Conditions
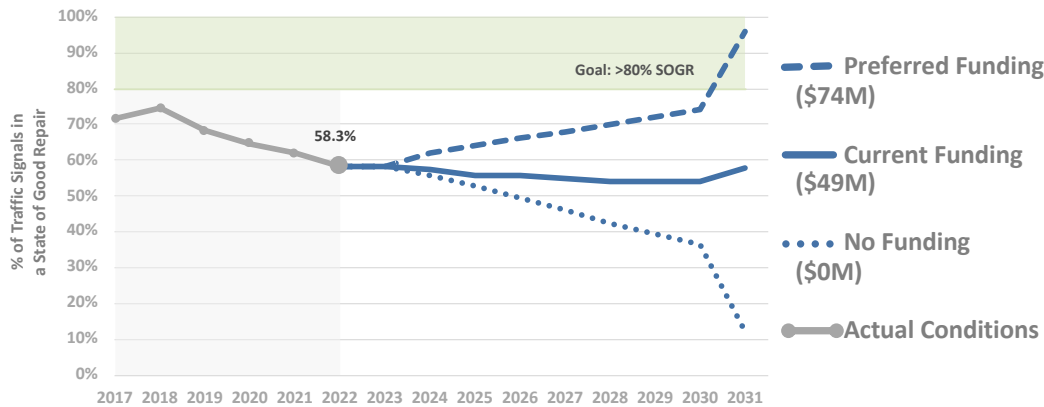
Based on funding as of 12/31/22

Projected Performance at Current Funding Level ($49M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	58.3%	57.6%	55.8%	55.6%	55.0%	80.0%

Note: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

In order to maintain a State of Good Repair, roughly 120 traffic signals need replacement each year. Currently, approximately 50-60 traffic signals are replaced each year. Of those, 45-55 signals are programmed under the signal replacement program and 5-10 signals are replaced under other state projects annually.

Asset Valuation

$830,500,000

Asset value is estimated using the replacement value. For traffic signals, replacement value is the product of traffic signal and unit construction cost.
For 2,560 traffic signals :
2,560 * $320,000 = $819,200,000
For 226 Overhead flashing beacons: 226 * $50,000 = $11,300,000

Measures and Goals

There are no Federal requirements at this time. CTDOT has set the following traffic signal condition goal:

State Goal:
- 80% or more of state owned traffic signals in a SOGR

Description

- CTDOT is responsible for maintaining 202,564 signs (regulatory, warning, and guide) that are located on State owned and maintained roadways. Sign inventory is also represented as 1,853,075 square feet of sign area.
- CTDOT defines a sign as a panel attached to a post(s) or sign structure and a sign assembly as the combination of sign panel(s) and their post(s), support, or sign structure at a single location.
- Overhead sign supports and foundations are managed as a separate asset
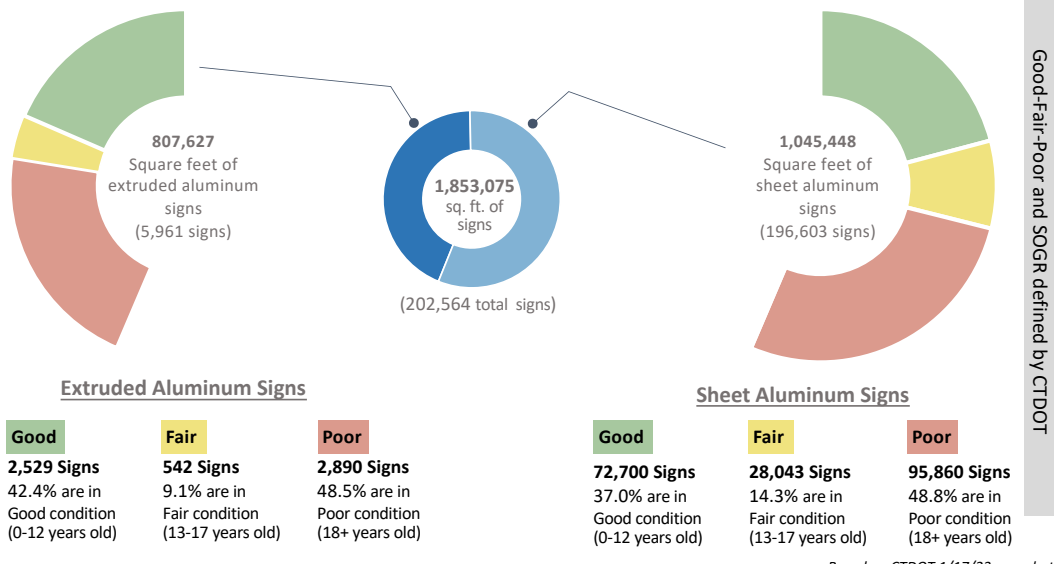
State of Good Repair (SOGR)

A sign installed within 17 years is classified as being in a State of Good Repair. This is based on expectations of retroreflectivity life. Retroreflectivity is a measure of the amount of light reflected by a surface back to the source of the light.

Sign Age

- More than 51% of all signs have are within their expected sign life or effective service life
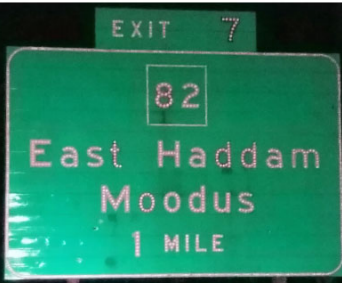- More than 51% of extruded aluminum signs are less than 25 years old.

Sign Inventory and Condition

807,627 Square feet of extruded aluminum signs (5,961 signs)

1,853,075 sq. ft. of signs

(202,564 total signs)

1,045,448 Square feet of sheet aluminum signs (196,603 signs)

Good-Fair-Poor and SOGR defined by CTDOT

Extruded Aluminum Signs

Good	**Fair**	**Poor**
2,529 Signs	**542 Signs**	**2,890 Signs**
42.4% are in Good condition (0-12 years old)	9.1% are in Fair condition (13-17 years old)	48.5% are in Poor condition (18+ years old)

Sheet Aluminum Signs

Good	**Fair**	**Poor**
72,700 Signs	**28,043 Signs**	**95,860 Signs**
37.0% are in Good condition (0-12 years old)	14.3% are in Fair condition (13-17 years old)	48.8% are in Poor condition (18+ years old)

Based on CTDOT 1/17/23 snapshot

History

Distribution of Signs by Year Built

Period	Extruded (#)	Sheet (#)
1985-1989	361	13,531
1990-1994	1,626	37,916
1995-1999	903	33,859
2000-2004	0	27,109
2005-2009	542	22,807
2010-2014	361	19,283
2015-2019	1,264	24,354
2020-2024	903	17,731

Based on CTDOT 1/17/23 snapshot

Extruded Aluminum Signs Performance Projections

State Goals by extruded aluminum sign for 5,961 signs
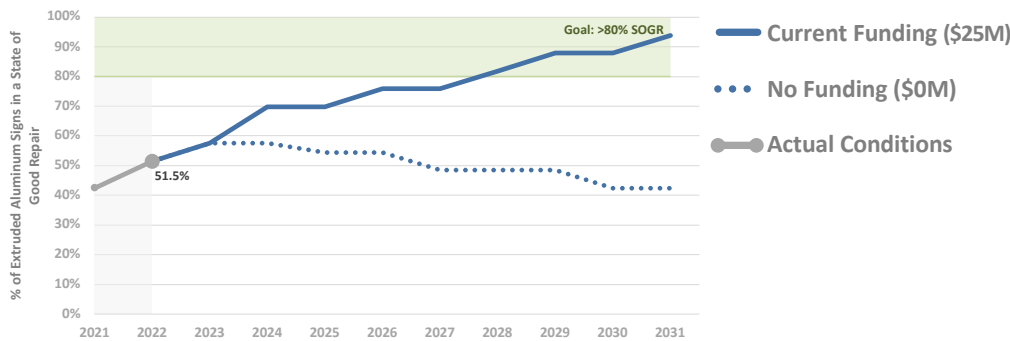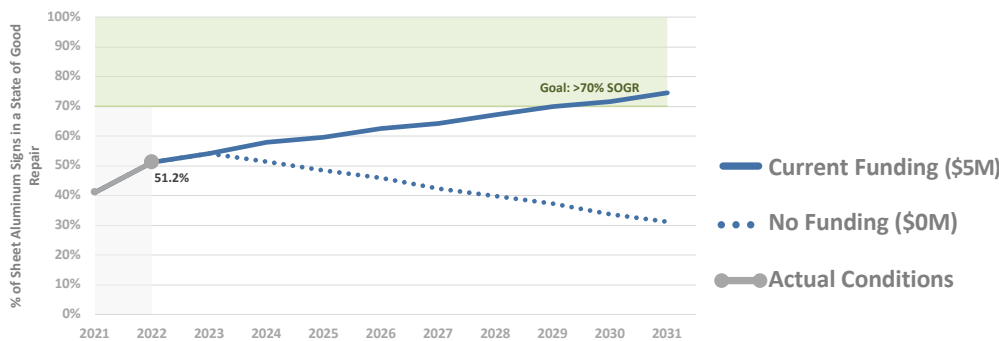

Based on funding as of 12/31/22

Projected Performance at Current Funding Level ($25M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	57.6%	69.7%	69.7%	75.8%	75.8%	80.0%

Sheet Aluminum Signs Performance Projections

State Goals by sheet aluminum sign for 196,603 signs

Based on funding as of 12/31/22

Projected Performance at Current Funding Level ($5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	54.1%	57.9%	59.7%	62.5%	64.3%	70.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

In order to maintain a State of Good Repair, nearly 500 extruded and 14,000 sheet signs need replacement each year. Currently, approximately 5,000 signs are replaced each year.

Asset Valuation

$160,018,776

Asset value is estimated using the replacement value. For signs, replacement value is the product of square footage and unit construction cost.

Note: This value does not include the cost of overhead sign supports and foundations.

Measures and Goals

There are no Federal requirements at this time. CTDOT has set the following sign condition goals:

State Goals:
- 80% or more of extruded aluminum signs in a SOGR
- 70% or more of sheet aluminum signs in a SOGR

Description

- CTDOT is responsible for maintaining approximately 1,651 overhead sign supports on state maintained roadways
- Sign supports are made up of three categories:
  - 685 Cantilevers
  - 615 Full-Span
  - 351 Bridge Mounted
- CTDOT defines a sign support as the structure (horizontal member(s), post(s) and foundation) carrying sign panels or variable message boards at a single location
- Sign panels attached to the sign support are managed as a separate asset

State of Good Repair (SOGR)

Condition ratings are determined via inspection of sign supports on a predetermined cycle. Sign supports with an overall rating of at least a 5 on a 0-9 condition scale are classified as being in a State of Good Repair.

Support Age

- Overhead sign supports are assigned a 34-year service life based on a 17-year sign replacement cycle
- 26.0% (431) of sign supports are 34 years or older.
- 229 sign supports with unknown age were assigned to 1980's based on available imagery from DigitalHIWAY or Google Earth.

Sign Support Inventory and Condition

1,651 Overhead Sign Supports
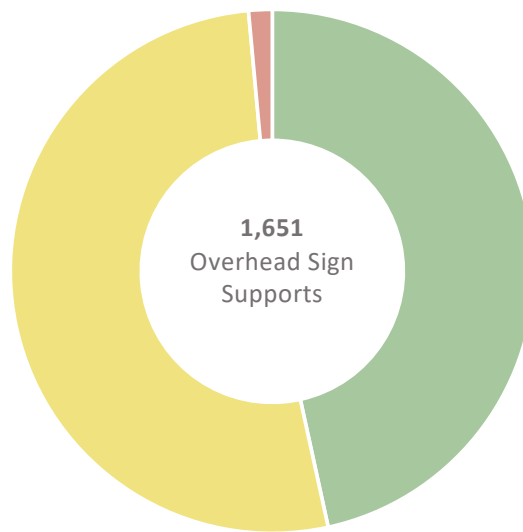
Good
769 Sign Supports
46.6% are in Good condition
[Condition ratings of 7,8, or 9]

Fair
858 Sign Supports
51.9% are in Fair condition
[Condition ratings of 5 or 6]

Poor
24 Sign Supports
1.5% are in Poor condition
[Condition ratings of 0,1,2,3, or 4]

Good-Fair-Poor and SOGR defined by CTDOT

Based on CTDOT 1/1/23 Snapshot

History

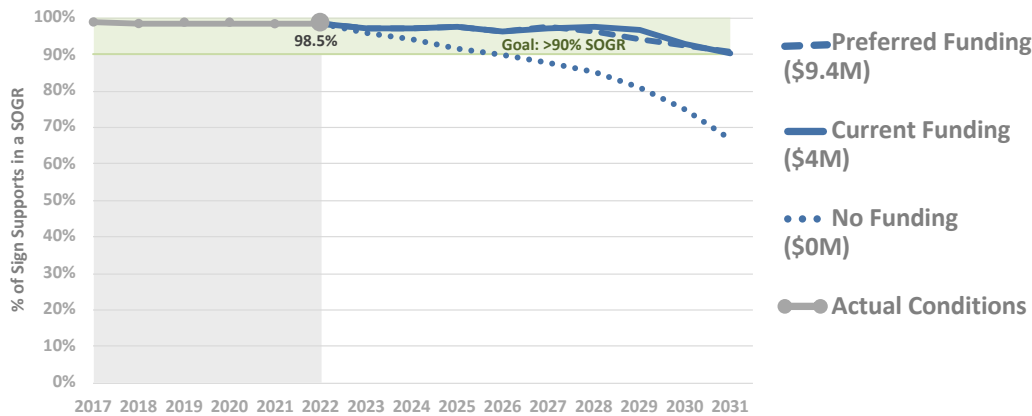Distribution of Sign Supports By Decade Built
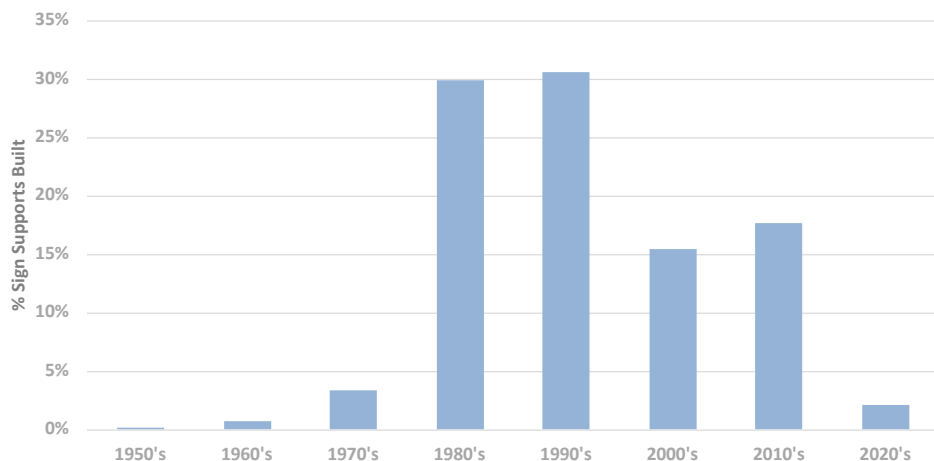
Based on CTDOT 1/1/23 Snapshot

Sign Support Performance Projections

State Goals by sign support for 1,651 sign supports

Preferred Funding ($9.4M)

Current Funding ($4M)

No Funding ($0M)

Actual Conditions

Projected Performance at Current Funding Level ($4M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	97.1%	97.0%	97.7%	96.4%	97.2%	90.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

Sign support projections use deterioration curves for the overall structure condition rating. These curves are based on the assigned 34-year service life of sign supports.

Asset Valuation

$293,820,000

Asset value is estimated using the replacement value. For sign supports, replacement value is based on the average unit construction cost by type:
Cantilever $150,000 * 685 = $102,750,000
Full Span $285,000 * 615 = $172,275,000
Bridge Mount $45,000 * 351 = $15,795,000

Note: This value does not include the cost of the sign panels.

Measures and Goals

There are no Federal requirements at this time. CTDOT has set the following sign support condition goal:

State Goal:
• 90% or more of sign supports in a SOGR

Description

- CTDOT is responsible for maintaining pavement markings on approximately 3,715 centerline miles of State maintained roadways
- Pavement Markings include:
  - Line Striping
  - Symbols & Legends (arrows, crosswalks, etc.)
- CTDOT pavement marking applications are either water-based by State forces and Epoxy by Contractor
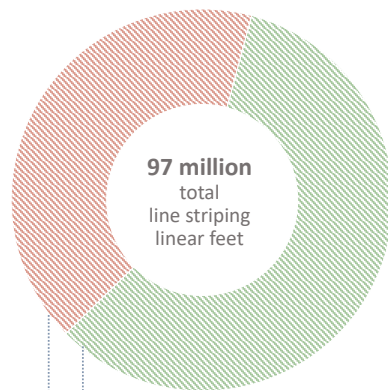
State of Good Repair (SOGR)

In-laid epoxy pavement markings installed within 6 years, epoxy pavement markings installed within the past 3 years and water-based pavement markings installed within 1 year are classified as being in a SOGR. This is based on expectations of retroreflectivity life and wear. Retroreflectivity is a measure of the amount of light reflected by a surface back to the source of the light.

Marking Age

- More than 41% of all line striping and nearly 66% of all symbol and legend pavement markings have exceeded their expected service life.

Pavement Markings Inventory and Condition:
Line Striping and Symbols & Legends

97 million total line striping linear feet

State of Good Repair   **56.7 million linear feet**
58.5% of line striping is in a state of good repair

Poor   **40.3 million linear feet**
41.5% of line striping is in poor condition

3.4 million total symbols & legends square feet
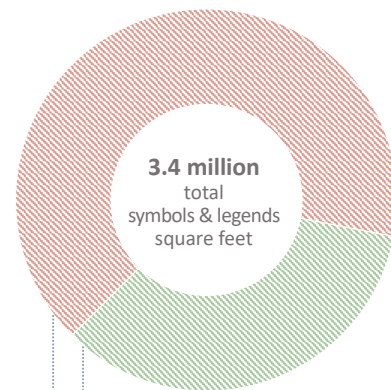
State of Good Repair   **1.2 million square feet**
34.4% of symbols & legends are in a state of good repair
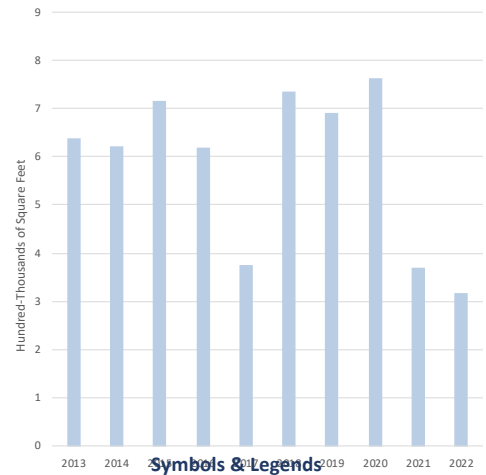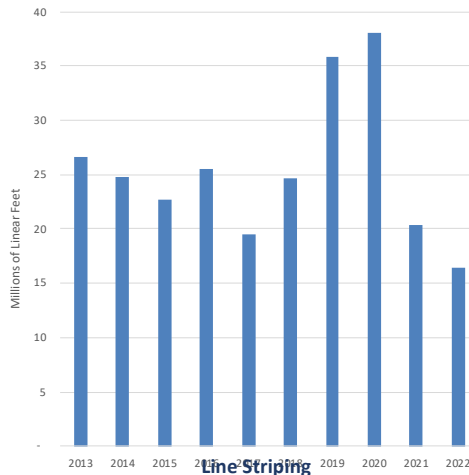
Poor   **2.2 million square feet**
65.6% of symbols & legends are in poor condition

SOGR defined by CTDOT

Based on CTDOT 12/31/22 Snapshot

History

Line Striping and Symbols & Legends Painted Annually
2013 – 2022

Line Striping

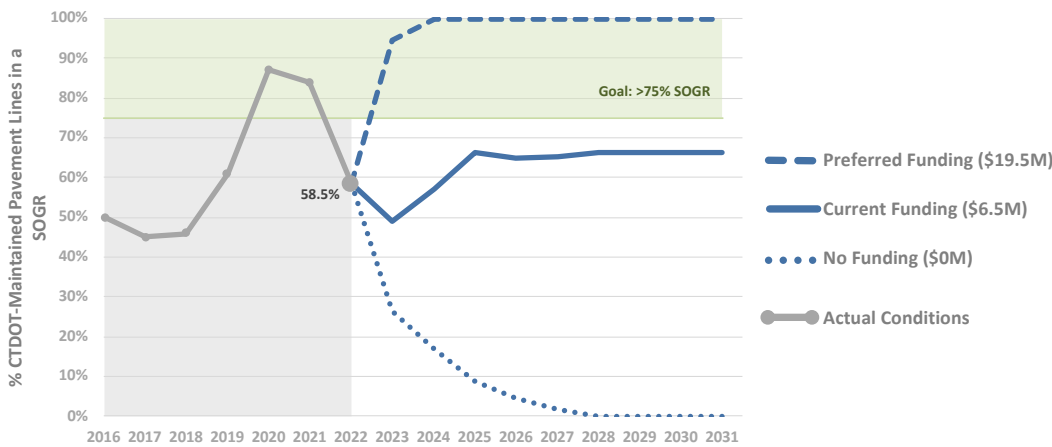Symbols & Legends

Based on CTDOT 12/31/22 Snapshot

Pavement Markings Performance Projections

State Goals by pavement lines for 97 million linear feet of line striping

Goal: >75% SOGR

58.5%

- - - Preferred Funding ($19.5M)
—— Current Funding ($6.5M)
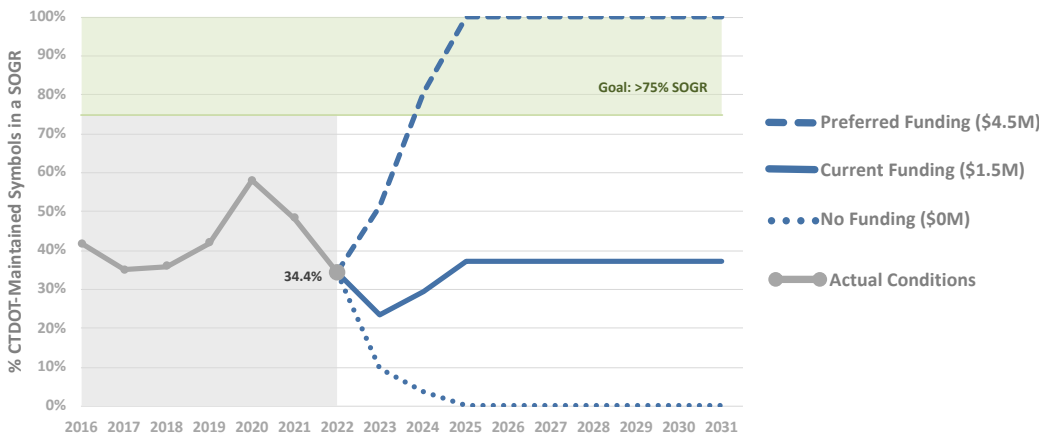······ No Funding ($0M)
—— Actual Conditions

Based on funding as of 12/31/22

Performance Projections at Current Funding Level ($6.5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	49.0%	57.1%	66.5%	64.9%	65.1%	75.0%

State Goals by pavement symbols for 3.4 million square feet of symbols & legends

Goal: >75% SOGR

34.4%

- - - Preferred Funding ($4.5M)
—— Current Funding ($1.5M)
······ No Funding ($0M)
—— Actual Conditions

Based on funding as of 12/31/22

Performance Projections at Current Funding Level ($1.5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	23.6%	29.5%	37.3%	37.3%	37.3%	75.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

In order to maintain a State of Good Repair, about 32 million linear feet of line striping and 1.1 million square feet of symbols & legends epoxy pavement markings need to be remarked each year. Currently, approximately 30 million linear feet and 640,000 square feet are remarked each year.

Asset Valuation

$127,410,000

Asset value is estimated using the replacement value method. For pavement markings, replacement value is the product of square footage and unit construction cost considering epoxy only.
Line striping: 97 million LF * $1.1/LF = $110,580,000
Symbols: 3.4 million SF * $5.0/SF = $16,830,000

Measures and Goals

There are no Federal requirements at this time. CTDOT has set the following pavement marking condition goals:

State Goals:
- 75% or more of line striping pavement markings in a SOGR
- 75% or more of symbols & legends pavement markings in a SOGR

Description

- CTDOT defines a highway building as a relatively permanent structure to house persons or property
- CTDOT owns 506 highway buildings classified into four Tiers:
  - Tier 1: significant structures normally occupied by employees or the public
  - Tier 2: salt sheds
  - Tier 3: specialty, storage, and portable office type structures
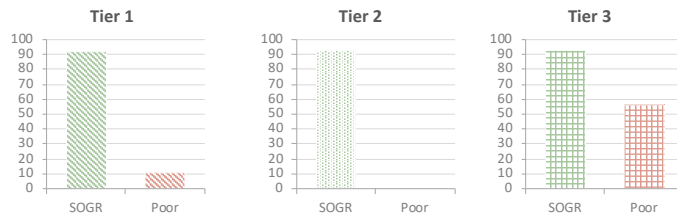 - Tier 4: no asset management plan; portable storage containers, buildings managed by other entities or programmed for demolition or sale
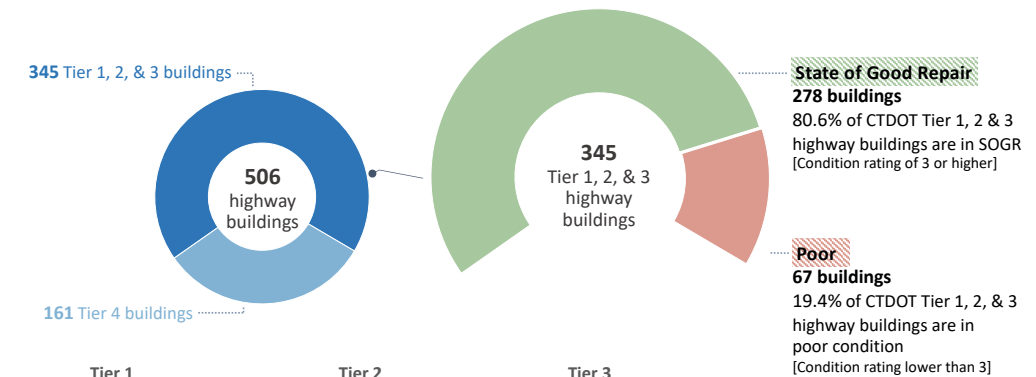
State of Good Repair (SOGR)

- Buildings with an overall rating of 3 or better on a scale of 1-5 are classified as being in a SOGR
- Building ratings are a combination of age-based and condition-based component ratings

Building Age

- Building age is based on the date CTDOT acquired the asset or the date of the last (like new) renovation
- Tier 1 buildings have a 60-year life cycle with a 30-year mid-life SOGR upgrade
- Life cycles and the need for mid-life SOGR upgrades vary for Tier 2 & 3 buildings

CTDOT-Maintained Inventory and Condition

345 Tier 1, 2, & 3 buildings

506 highway buildings

161 Tier 4 buildings

345 Tier 1, 2, & 3 highway buildings

State of Good Repair
278 buildings
80.6% of CTDOT Tier 1, 2 & 3 highway buildings are in SOGR
[Condition rating of 3 or higher]

Poor
67 buildings
19.4% of CTDOT Tier 1, 2, & 3 highway buildings are in poor condition
[Condition rating lower than 3]

Tier 1

Tier 2

Tier 3

103 Tier 1 buildings
State of Good Repair : 89.3%
- 73 Maintenance & Repair Facilities
- 17 Rest Area / Weigh Station Facilities
- 13 Administrative Facilities

93 Tier 2 buildings
State of Good Repair : 100.0%
- 93 Salt Sheds

149 Tier 3 buildings
State of Good Repair : 62.4%
- 96 Storage Structures
- 51 Portable Office Structures
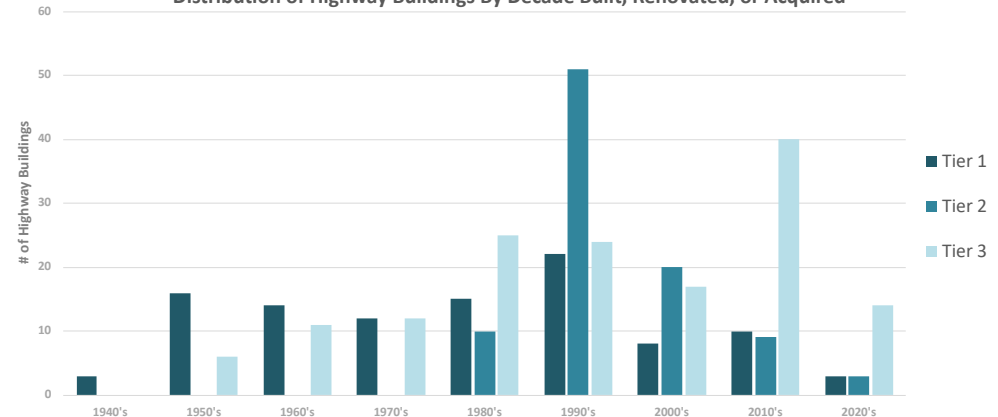- 2 Specialty Facilities

161 Tier 4 buildings
State of Good Repair : *Not tracked*
- 91 Portable Storage Containers
- 57 Buildings Managed by Others
- 13 Vacant Buildings Programmed for Demolition or Sale

Based on CTDOT 12/31/22 Snapshot

History

Distribution of Highway Buildings By Decade Built, Renovated, or Acquired
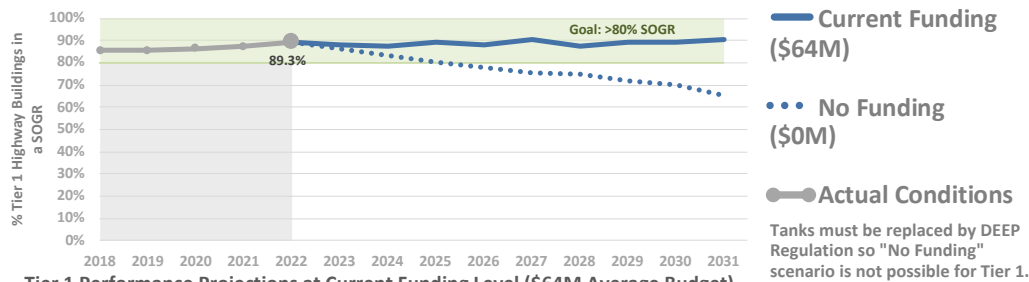

Based on CTDOT 12/31/22 Snapshot

Highway Buildings Performance Projections

State Goals by Tier 1 highway building for 103 highway buildings

Goal: >80% SOGR

89.3%

— Current Funding ($64M)

··· No Funding ($0M)

—●— Actual Conditions

Tanks must be replaced by DEEP Regulation so "No Funding" scenario is not possible for Tier 1.

Tier 1 Performance Projections at Current Funding Level ($64M Average Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	88.3%	87.4%	89.3%	88.3%	90.3%	80.0%

State Goals by Tier 2 highway building for 93 highway buildings

100.0%

Goal: >80% SOGR

— Current Funding ($400K)

··· No Funding ($0M)

—●— Actual Conditions

Tanks must be replaced by DEEP Regulation so "No Funding" scenario is not possible for Tier 2.

Tier 2 Performance Projections at Current Funding Level ($400K Average Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	98.9%	97.8%	98.9%	98.9%	98.9%	80.0%

State Goals by Tier 3 highway building for 149 highway buildings

62.4%

Goal: >50% SOGR

— Current Funding ($75K)

··· No Funding ($0K)

—●— Actual Conditions

Tier 3 Performance Projections at Current Funding Level ($75K Average Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	62.6%	65.1%	71.9%	73.0%	68.6%	50.0%

Tier 1, 2, and 3 projections based on funding as of 12/31/22

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

Performance projection funding levels are based on the replacement value and include a 1.6 factor to account for non-building related project administration costs for engineering, rights-of-way, and construction incidentals and contingencies.
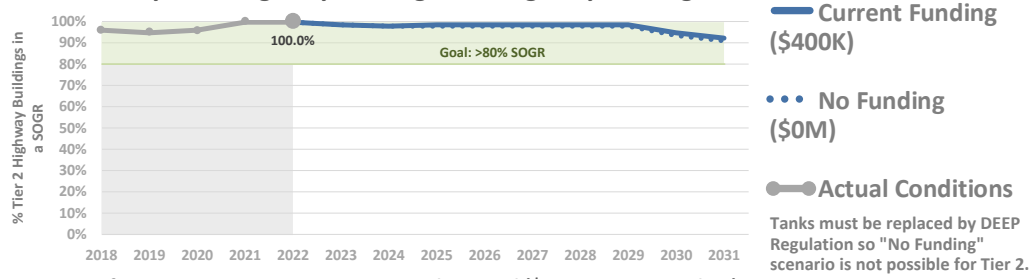
Asset Valuation

$1,009,000,000
- Tier 1 buildings: $821M
- Tier 2 buildings: $173M
- Tier 3 buildings: $15M

Asset valuation is the replacement cost of the asset in current year dollars. For buildings, the replacement costs includes any site work necessary for the building to function such as water and sewer systems, generators, and fuel stations as applicable.
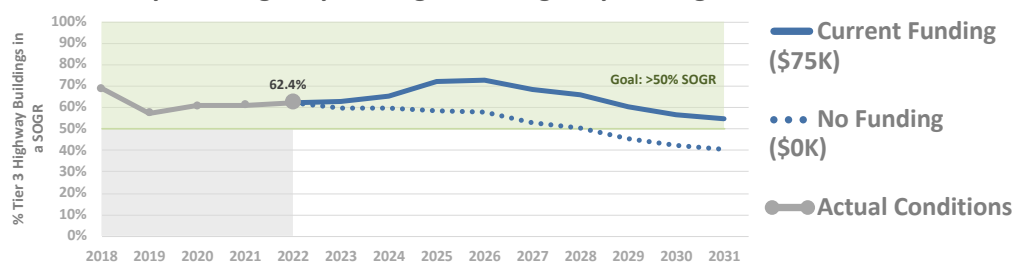
Measures and Goals

Federal targets for buildings have not yet been established. The following State Goals have been set:
- Tier 1 buildings: maintain 80% in a SOGR
- Tier 2 buildings: maintain 80% in a SOGR
- Tier 3 buildings: maintain 50% in a SOGR

Description

- CTDOT owns and maintains a total of 208 lighting systems that include 23,870 light fixtures.
- The majority of lighting systems are located along the roadway network.
- A typical lighting system includes a control cabinet, conduit, conductors, cabinet and light pole foundations, handholes, transformer bases, light poles, light fixture brackets and light fixtures.
- Specialized lighting systems exist for underpasses, tunnels, commuter lots and decorative lighting.

State of Good Repair (SOGR)

- Lighting systems installed within the last 40 years are classified as being in a SOGR.

Asset Age

- Lighting systems and components have an average projected useful life (PUL) of 40 years.
- 14.3% of light fixtures are beyond the end of their PUL.

CTDOT-Maintained Inventory and Condition

23,870 State-Owned Light Fixtures
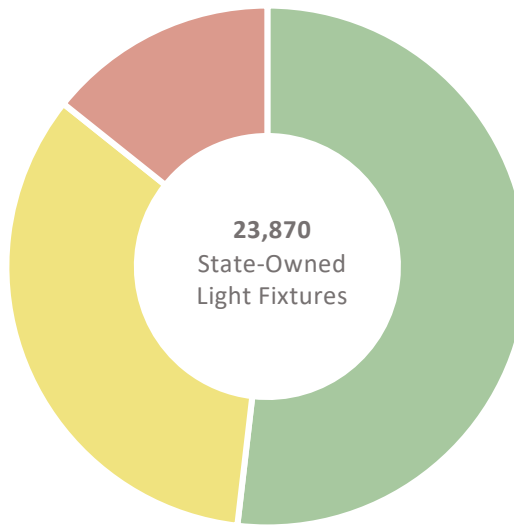
Good
12,374 Light Fixtures
51.8% are in Good condition (0-30 years old)

Fair
8,088 Light Fixtures
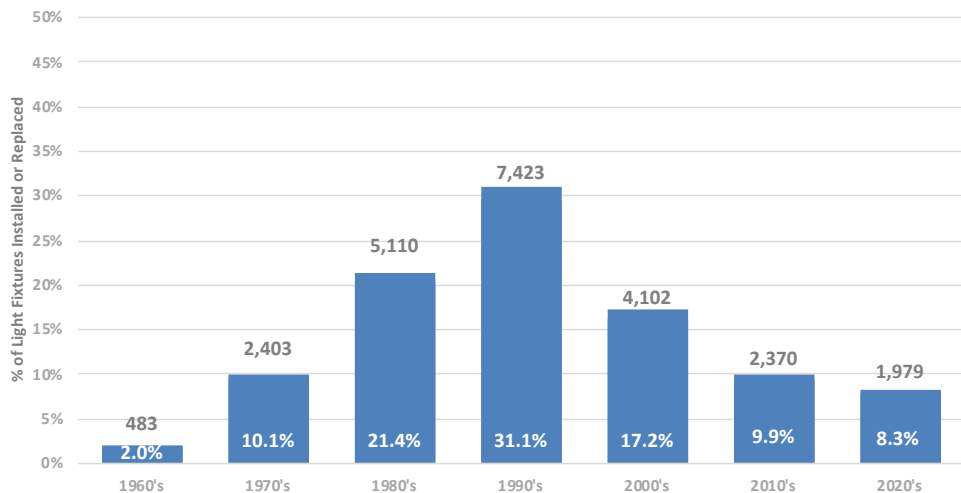33.9% are in Fair condition (31-40 years old)

Poor
3,408 Light Fixtures
14.3% are in Poor condition (41+ years old)

Based on CTDOT 12/31/22 Snapshot

History

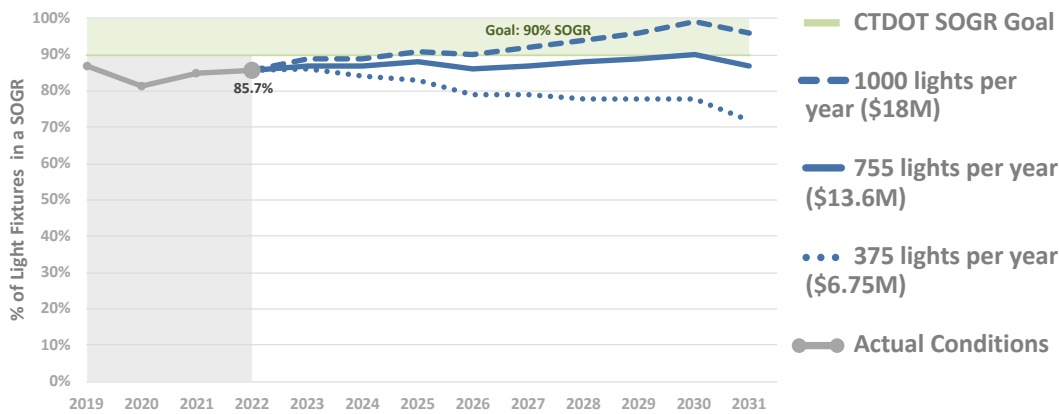**Distribution of Light Fixtures by Year Installed or Replaced**

Decade	Count	% of Light Fixtures Installed or Replaced
1960's	483	2.0%
1970's	2,403	10.1%
1980's	5,110	21.4%
1990's	7,423	31.1%
2000's	4,102	17.2%
2010's	2,370	9.9%
2020's	1,979	8.3%

Based on CTDOT 12/31/22 Snapshot

Light Fixture Performance Projections

State Goals by Light Fixture for 23,870 Light Fixtures

Legend:
- **CTDOT SOGR Goal**
- **1000 lights per year ($18M)**
- **755 lights per year ($13.6M)**
- **375 lights per year ($6.75M)**
- **Actual Conditions**

Performance Projections at Current Funding Level ($13.6M Average Budget)

Year	2023	2024	2025	2026	2027	Goal
SOGR	87.0%	87.0%	88.0%	86.0%	87.0%	90.0%

Projections based on funding as of 12/31/22

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

In order to achieve a SOGR an average of 755 light fixtures need to be replaced each year for approximately 10 years; replacements then drop to an average of 400 lighting fixtures per year to maintain a SOGR. Highway Safety Improvement Projects currently replace an average of 250 light fixtures per year, leaving the remainder to be installed by roadway lighting replacement projects.

The preferred scenario includes approximately 755 signals replaced through illumination specific projects and 250 signals replaced through safety improvement projects.

Asset Valuation

$461,760,000

Asset value is estimated using an average replacement value per lighting system.

208 lighting systems * $2.22M each = $461.8million

Measures and Goals

There are no Federal requirements for illumination at this time. CTDOT has set the following State goal:
- 90% of lighting systems in a SOGR

Description

- CTDOT defines a retaining wall as a structure that provides a grade separation by retaining earth and/or rock.
- CTDOT has currently identified and incorporated 897 retaining walls into its asset database. Plans to capture and rate the remaining wall population are ongoing.
- There are 12 different retaining wall categories.
- Bridge abutments, wingwalls, culvert headwalls and barrier curbs shorter than 4 feet tall are considered separate assets.

State of Good Repair (SOGR)

Retaining walls with a total rating of at least a 3 on a 0-6 condition scale are classified as being in a State of Good Repair.

Retaining Wall Age

While there is limited data available on life expectancy of retaining walls, empirical evidence indicate life expectancy ranging from 50 years (for Metal Bin walls and Concrete Crib walls) to well over 100 years (for Masonry walls).

CTDOT-Maintained Inventory and Condition

1,497
total
retaining walls
(estimated)
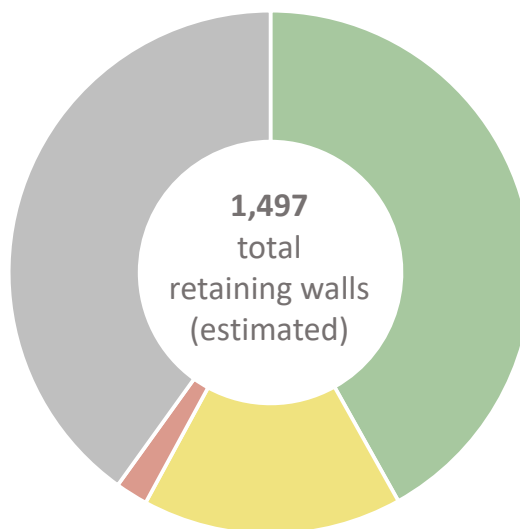
Good

627 Retaining walls
69.9% are in Good condition
[Condition ratings of 5 or 6]

Fair

240 Retaining walls
26.8% are in Fair condition
[Condition ratings of 3 or 4]

Poor

30 Retaining walls
3.3% are in Poor condition
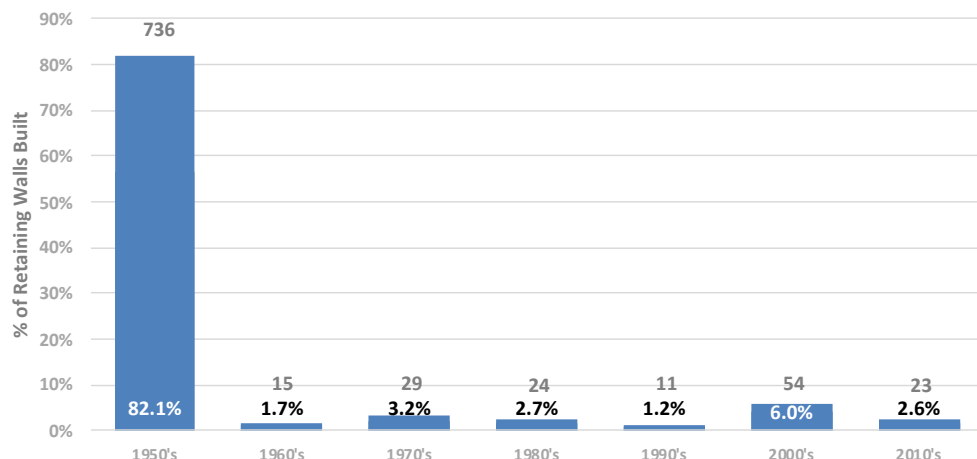[Condition ratings of 0, 1, or 2]

Unknown

600+ Retaining walls

Good-Fair-Poor and SOGR defined by CTDOT

Based on CTDOT 2010 inventory, with 2022 updates

History

Distribution of Retaining Walls by Decade Built

Decade	Count	% of Retaining Walls Built
1950's	736	82.1%
1960's	15	1.7%
1970's	29	3.2%
1980's	24	2.7%
1990's	11	1.2%
2000's	54	6.0%
2010's	23	2.6%

Based on CTDOT 2010 inventory, with 2022 updates

Retaining Walls Performance Projections

State Goals by retaining wall for 897 retaining walls

% of Retaining Walls in a SOGR

96.7%

Goal: >90% SOGR

- **Preferred Funding ($7.5 - $20M)**
- **Current Funding ($7.5M)**
- **No Funding ($0M)**
- **Actual Conditions**
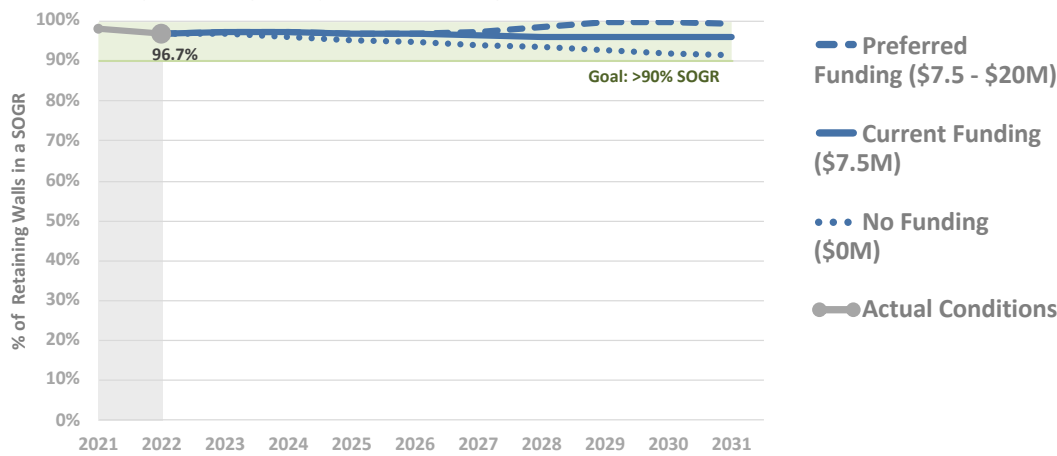
Based on CTDOT 2010 inventory, with 2022 updates

Projected Performance at Current Funding Level ($7.5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	97.2%	97.2%	97.0%	96.9%	96.3%	90.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.
Preferred funding assumes $7.5 million in annual funding until 2026, followed by $20m in annual funding through 2031.

Performance Projections

The projections assume the CTDOT retaining wall fund invests in improvements to walls 60+ yrs old. Current data shows that concrete (cantilever & gravity) and masonry walls are in better condition compared to concrete crib and metal bin walls.

Asset Valuation

$340,475,636

Asset value is estimated using an average replacement cost per retaining wall unit area. For retaining walls, the average unit cost to replace a wall is estimated to be $110/sf. For 897 retaining walls with 3,095,233 sq ft (total average area) x $110/sq ft = $340,475,636

Measures and Goals

There are no Federal requirements at this time. CTDOT has set the following retaining wall condition goal:

State Goal:
- 90% or more of retaining walls in a SOGR

Drainage Culverts

Data Confidence
Low

Description

- CTDOT is responsible for a complex drainage system including storm drains, manholes, closed conveyance pipes, culverts, headwalls, and endwalls.
- Culverts convey watercourses or stormwater runoff underneath state roads. In Connecticut, the majority of culverts are reinforced concrete pipes (RCPs) or corrugated metal pipes (CMPs). CMPs can have asphalt coating.
- Culverts with a diameter of 6' and larger are considered bridge structures and are inspected and tracked as bridges. Culverts smaller than 6' in diameter (<72" horizontal dimension for box culverts) are considered drainage culverts.
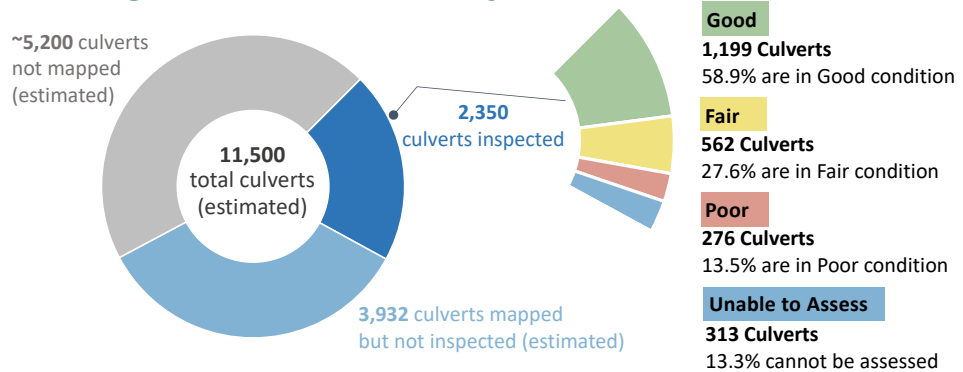
State of Good Repair (SOGR)

A culvert which has been rated Fair or Good is classified as being in a State of Good Repair (SOGR). This rating is based on the Culvert Condition Rating Assessment developed by the CTDOT Office of Environmental Planning.
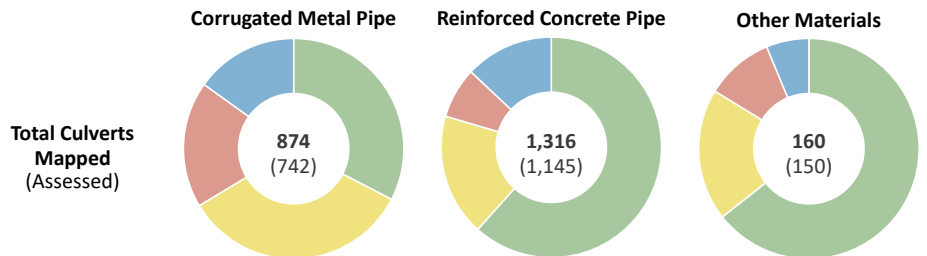
Drainage Culvert Age

The average drainage culvert in the CTDOT network is 68 years old. The average drainage CMP in the CTDOT network is 61 years old.

Drainage Culvert Inventory and Condition

~5,200 culverts not mapped (estimated)

11,500 total culverts (estimated)

2,350 culverts inspected

3,932 culverts mapped but not inspected (estimated)

Good
1,199 Culverts
58.9% are in Good condition

Fair
562 Culverts
27.6% are in Fair condition

Poor
276 Culverts
13.5% are in Poor condition

Unable to Assess
313 Culverts
13.3% cannot be assessed

Inspected Culvert Inventory and Condition by Material

	Corrugated Metal Pipe	Reinforced Concrete Pipe	Other Materials
Total Culverts Mapped (Assessed)	874 (742)	1,316 (1,145)	160 (150)
Good	285 (38.4%)	811 (70.8%)	103 (68.7%)
Fair	295 (39.8%)	236 (20.6%)	31 (20.6%)
Poor	162 (21.8%)	98 (8.6%)	16 (10.7%)
Unable to Assess	132 (15.1%)	171 (13.0%)	10 (6.3%)

Note: Percentages of culverts in Good/Fair/Poor condition are based on the number of assessed culverts

Based on CTDOT 1/10/23 Snapshot

History

Distribution of Culverts By Decade Built
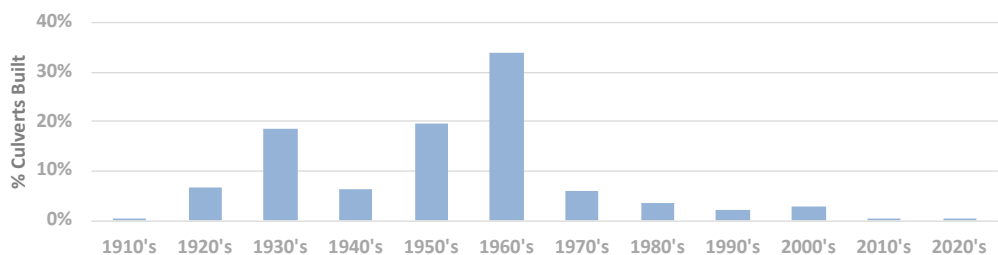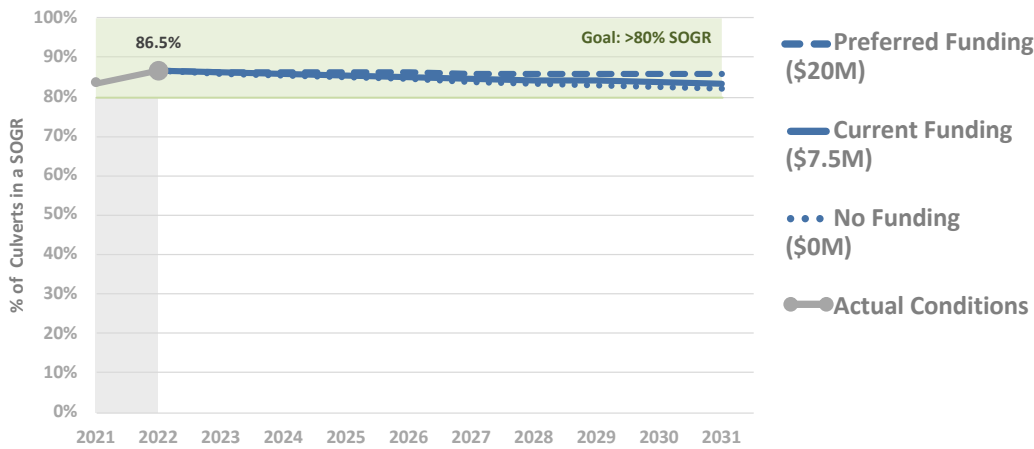

Based on CTDOT 1/10/23 Snapshot

Drainage Culvert Performance Projections
State Goals by drainage culvert for 2,350 culverts

Based on funding as of 12/31/22

Projected Performance at Current Funding Level ($7.5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	86.1%	85.8%	85.4%	85.1%	84.7%	80.0%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

Culvert performance projections were created using very limited data from culverts that had both age and condition data associated with them.
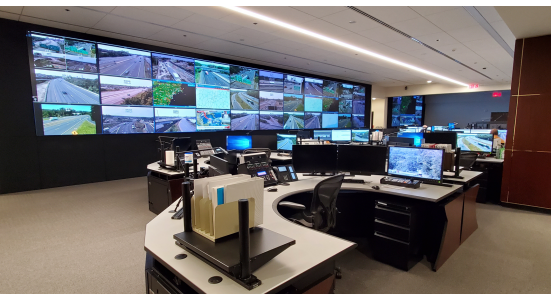
Asset Valuation

$1,597,886,820

Asset value is estimated using the replacement value. For 11,500 estimated culverts, replacement value is 11,500 * 276 sq ft of pipe * $503 per sq ft of pipe = $1,597,886,820

Measures and Goals

CTDOT has not determined measures and targets for culverts at this point.

Description

- CTDOT currently owns and maintains a total of 548 Advanced Traffic Management System (ATMS) field devices.
- ATMS field devices are comprised of 363 Closed Circuit Television Cameras (CCTV), 145 Variable Message Signs (VMS), and 40 Roadway Weather Information Systems (RWIS)
- ATMS field devices relies on Operation Centers, Fiber Hubs, and Video Data Transport that are tracked as part of the Highways Buildings Asset.
- ATMS field devices also relies on servers, software, central equipment, and 244 miles of fiber optic cable trunkline to communicate to ATMS field devices. These assets are being evaluated and will be considered for future updates.
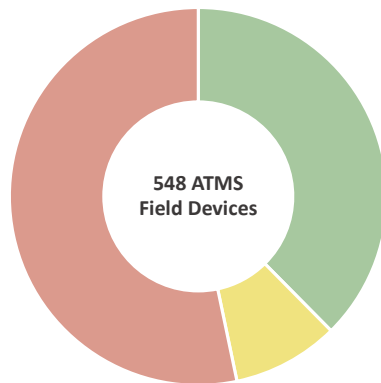
State of Good Repair (SOGR)

- ATMS field devices installed within the last 10 years are classified as being in a SOGR.
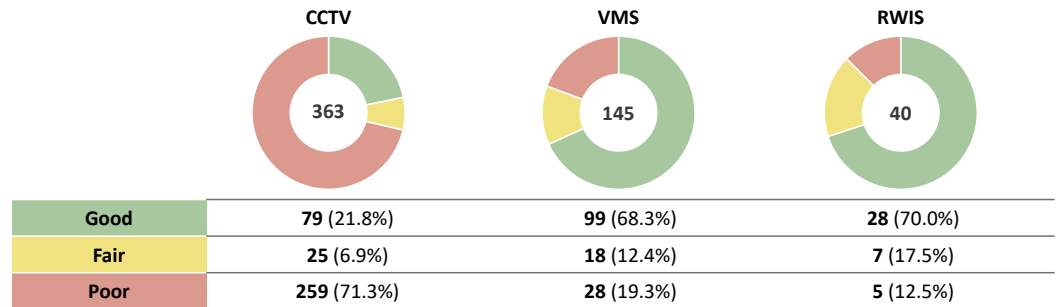
Asset Age

- ATMS field devices have an average projected useful life (PUL) of 15 years.
- 53% of ATMS field devices have aged beyond their PUL.

CTDOT-Maintained Inventory and Condition

548 ATMS Field Devices

Good
206 ATMS Field Devices
37.6% are in Good condition (0-10 years old)

Fair
50 ATMS Field Devices
9.1% are in Fair condition (11-15 years old)

Poor
292 ATMS Field Devices
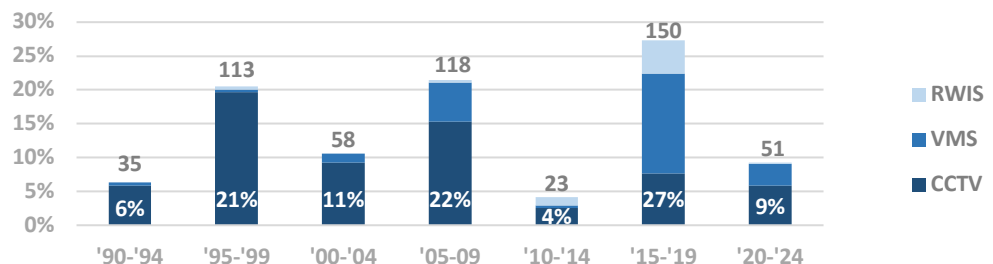53.3% are in Poor condition (16+ years old)

ATMS Inventory and Condition by Type

	CCTV (363)	VMS (145)	RWIS (40)
Good	79 (21.8%)	99 (68.3%)	28 (70.0%)
Fair	25 (6.9%)	18 (12.4%)	7 (17.5%)
Poor	259 (71.3%)	28 (19.3%)	5 (12.5%)

Based on CTDOT 1/4/23 Snapshot

History

Distribution of ATMS Field Devices by Year Installed

Year	Total	CCTV %
'90-'94	35	6%
'95-'99	113	21%
'00-'04	58	11%
'05-09	118	22%
'10-'14	23	4%
'15-'19	150	27%
'20-'24	51	9%

Legend: RWIS, VMS, CCTV

Based on CTDOT 1/4/23 Snapshot
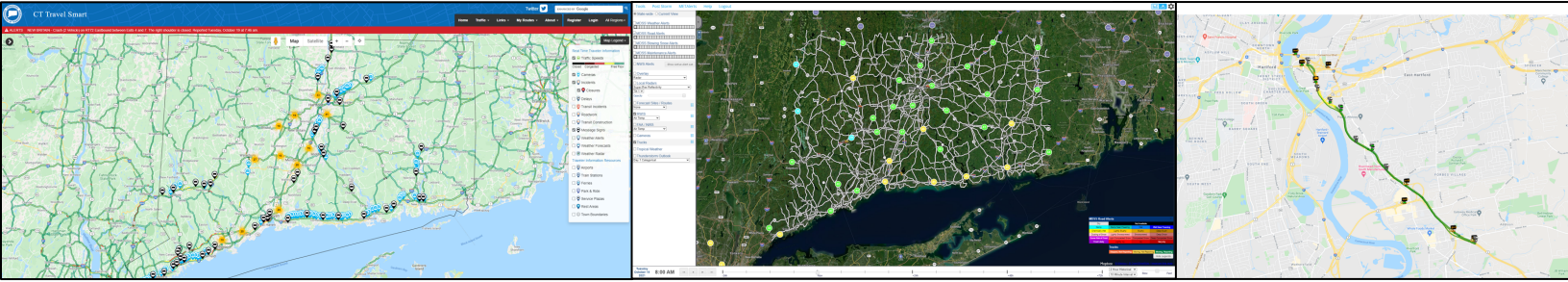
ITS: ATMS Performance Projections

State Goals by ATMS field device for 548 ATMS field devices
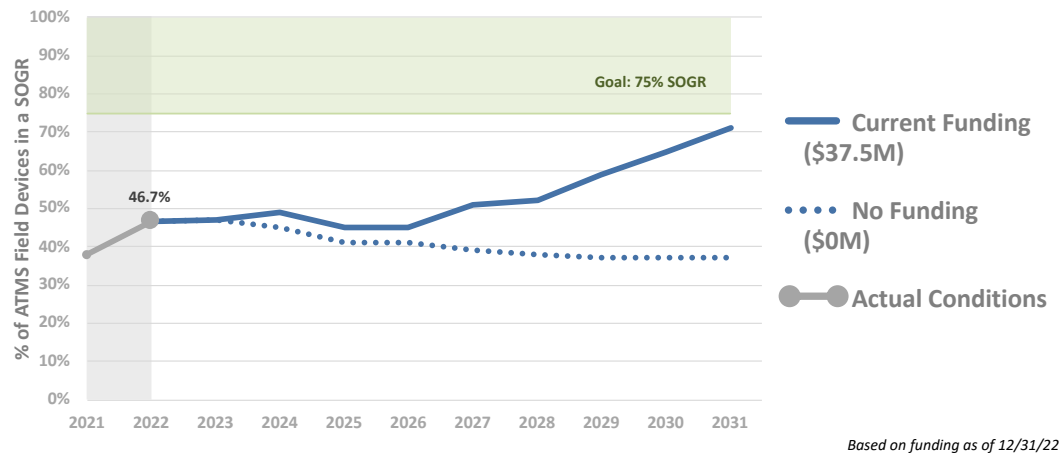
Based on funding as of 12/31/22

Projected Performance at Current Funding Level ($37.5M Budget)

End of Year	2023	2024	2025	2026	2027	Goal
SOGR	47.0%	49.0%	45.0%	45.0%	51.0%	75%

NOTE: "Current Funding" shown in the graphs is limited to funding programed to address State of Good Repair. Projected performance is expected to be greater due to asset improvements funded through CTDOT's Capital Program which are not captured. The Department will soon be able to capture this funding through a project asset data system in development.

Performance Projections

In order to achieve a SOGR of above 75% within 10 years, Highway Operations has been approved for 9 projects that will replace an average of 25 ATMS field devices per project and install new 12 ATMS field devices per project.

Highway Operations projects currently replace an average of 20 ATMS field devices per year, leaving the remainder to be installed by other various projects.

Asset Valuation

$169,250,000

Asset value is estimated using an average replacement value per ATMS field device. Asset value does not include the cost for communication network, hardware, software, or portable ATMS field devices.

363 CCTV* $0.25M each
145 VMS* $0.5M each
40 RWIS* $0.15M each
Total = $169.25 M

Measures and Goals

There are no Federal requirements for ATMS field devices at this time. CTDOT has set the following state goal:
- 75% of ATMS in a SOGR