



### Description

- CTDOT inspects 5,429 roadway bridges, 1,821 of which are National Bridge Inventory (NBI) structures on the National Highway System (NHS).
- 4,044 of these bridges are state maintained; the remaining 1,385 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)

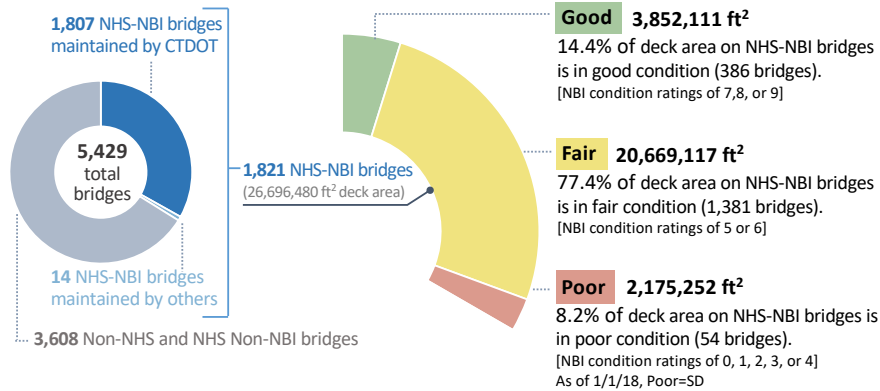
A bridge for which the condition rating for each of the three major components for a span bridge (Substructure, Deck, and Superstructure) or the structural condition of a culvert is rated at least a 5 on a 0-9 condition scale is classified as being in a SOGR.

### Bridge Age

The average NHS-NBI bridge in Connecticut is 53 years old, which is 9 years older than the national average of 44 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

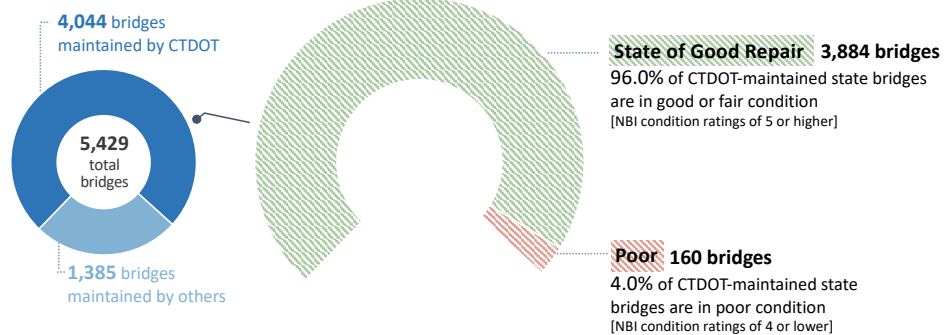


Based on CTDOT 3/13/20 NBI Submittal

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

### CTDOT-Maintained Inventory and Condition

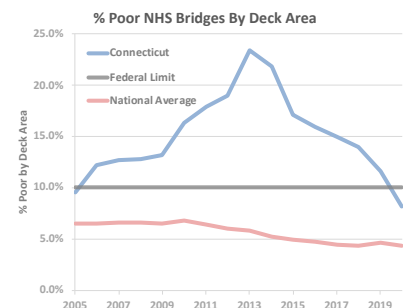
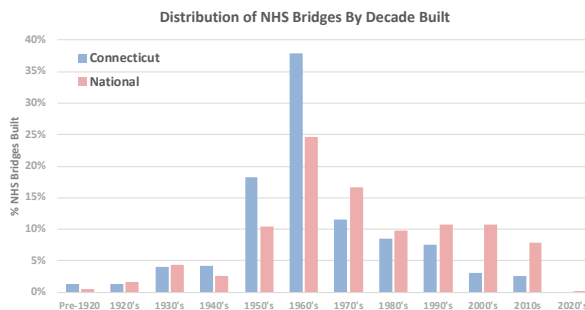
#### State Goals



Based on CTDOT 3/13/20 Snapshot

SOGR defined by CTDOT

### History



Based on National Data available from FHWA LTBP InfoBridge

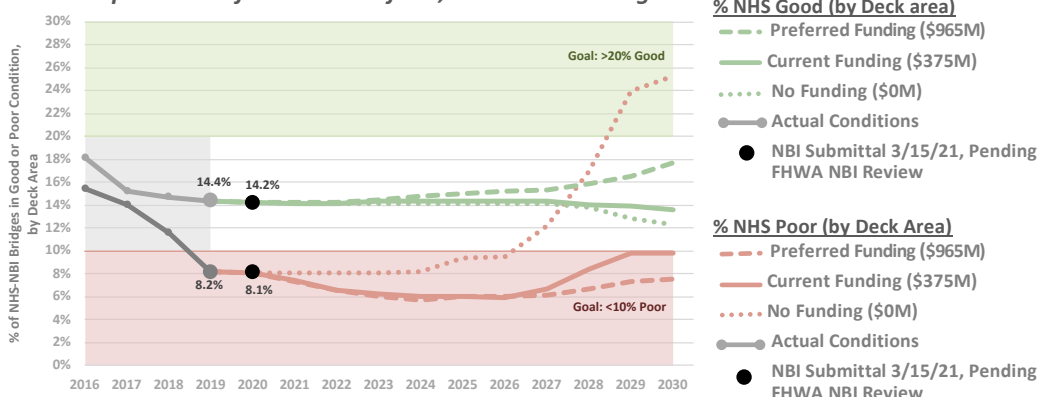


# Connecticut Transportation Asset Management Plan Bridge



## NHS-NBI Bridge Performance Projections

Federal Requirements for deck area for 1,821 NHS-NBI bridges



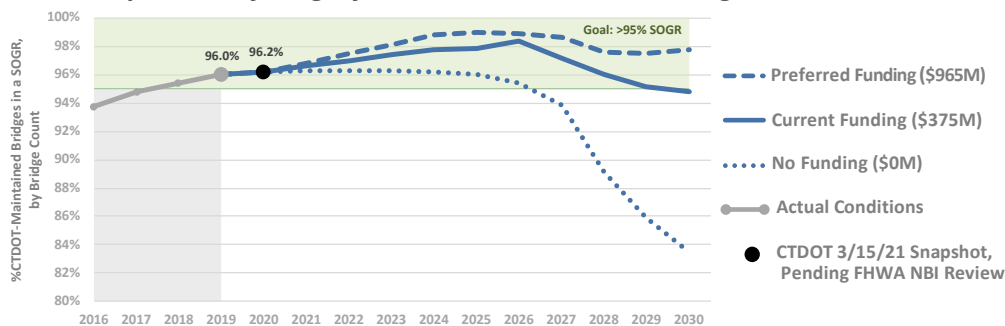
*'No Funding' scenario assumes routine bridge maintenance continues, but all capital work is canceled*

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

End of Year	2021	2022	2023	2024	2025	Goal
NHS Good (by deck area)	14.2%	14.2%	14.3%	14.3%	14.3%	>20.0%
NHS Poor (by deck area)	7.5%	6.6%	6.3%	6.1%	6.1%	<10.0%

## CTDOT-Maintained Bridge Performance Projections

State Goals by number of bridges for 4,044 CTDOT-maintained bridges



*'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	2021	2022	2023	2024	2025	Goal
SOGR	96.6%	97.0%	97.4%	97.8%	97.9%	95.0%

## 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 February 2021.

## Asset Valuation

**\$17,060,710,730**

Asset value is estimated using the replacement value. For bridges, replacement value is the product of deck area and unit construction cost. For 4,044 bridges: 34,817,777 sqft \* \$490/sqft = \$17.0 billion.

## Measures and Targets

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)
- 20% 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)

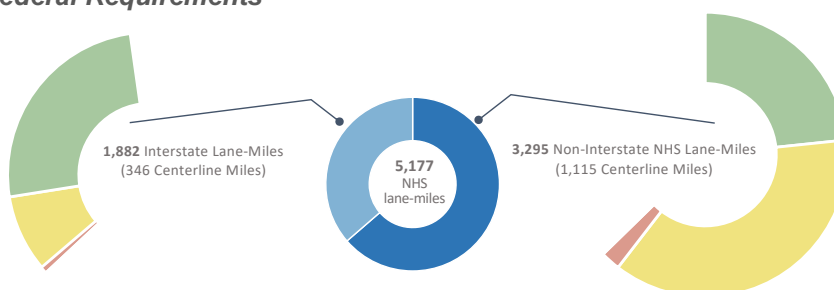


## Description

- There are 3,716 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 17,446 centerline miles of town maintained roads, 56 of which are on the NHS.
- 70.5% of CTDOT maintained centerline miles are flexible (asphalt) pavements, 29.2% are composite pavements (asphalt over concrete), and 0.3% are rigid (concrete) pavements.

## NHS Roadways Inventory and Condition

### Federal Requirements



#### Interstate Pavements

Good	Fair	Poor
1,275 Lane-Miles	441 Lane-Miles	2 Lane-Miles
74.2% are in Good condition	25.7% are in Fair condition	0.1% are in Poor condition

#### Non-Interstate NHS Pavements

Good	Fair	Poor
1,177 Lane-Miles	1,872 Lane-Miles	113 Lane-Miles
37.2% are in Good condition	59.2% are in Fair condition	3.6% are in Poor condition

Note on Interstate: Total condition lane miles of 1,718 excludes 131 lane miles coded as bridge and 32 lane miles missing/invalid.  
 Note on Non-Interstate NHS: Total condition lane miles of 3,163 excludes 81 lane miles coded as bridge and 51 lane mile missing/invalid. Totals include 130 NHS lane miles which are locally maintained, 3.1% in good condition, 87.7% in fair condition and 9.2% in poor condition.

Based on 2019 HPMS pavement condition data submitted to FHWA June 2020

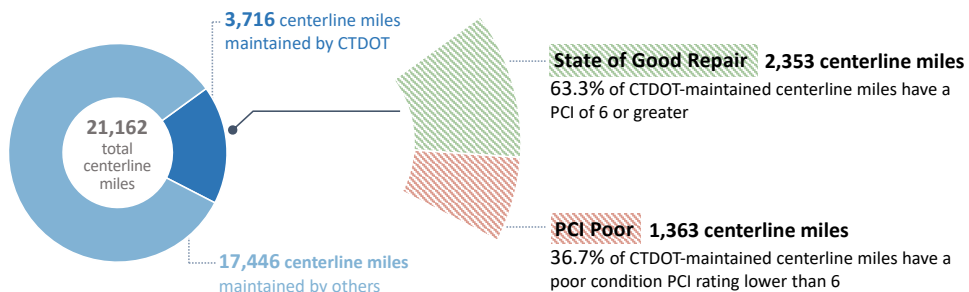
Good-Fair-Poor defined by MAP-21/FAST Act

## 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.

## CTDOT-Maintained Roadways Inventory and Condition

### State Goals

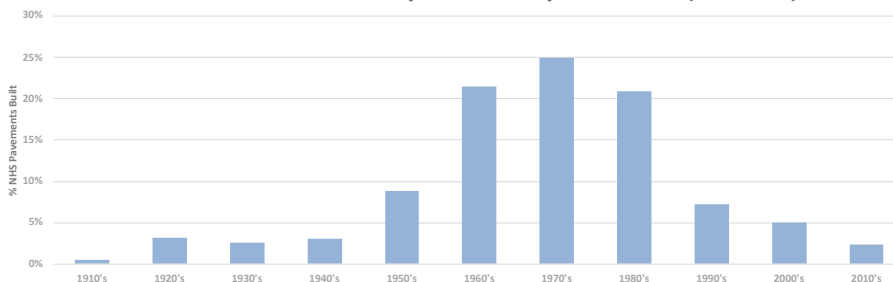


Based on CTDOT 12/31/19 Snapshot

SOGR defined by CTDOT

## History

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



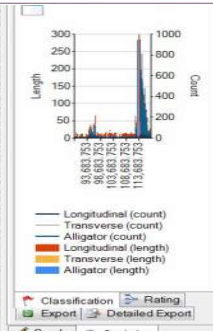
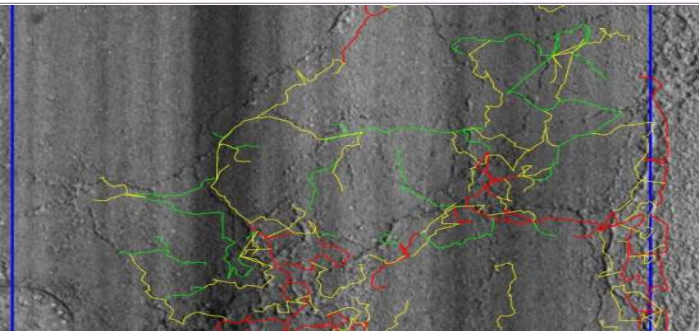
## Pavement Age

The average Connecticut NHS pavement structure was constructed 47.6 years ago, and the average surface age is 7.7 years old, based on lane miles.



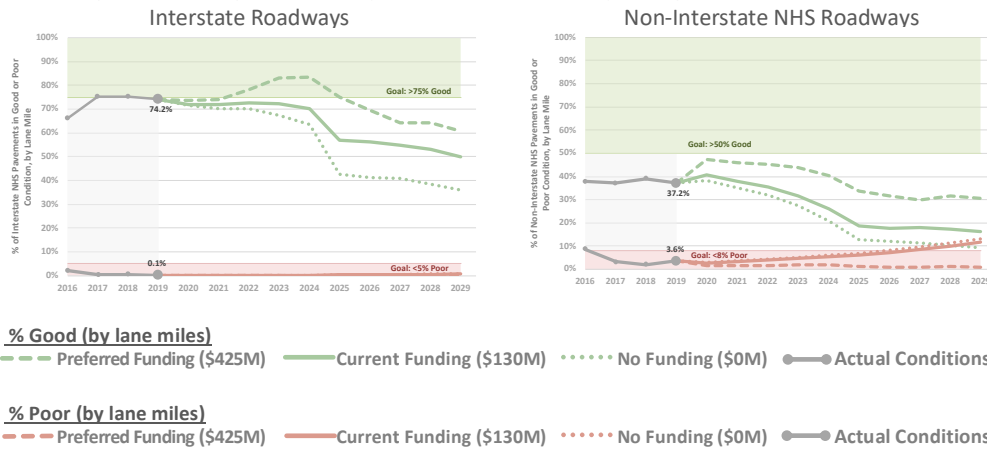


# Connecticut Transportation Asset Management Plan Pavement



## NHS Pavement Performance Projections

Federal Requirements by lane miles for 4,882 lane miles of NHS pavement

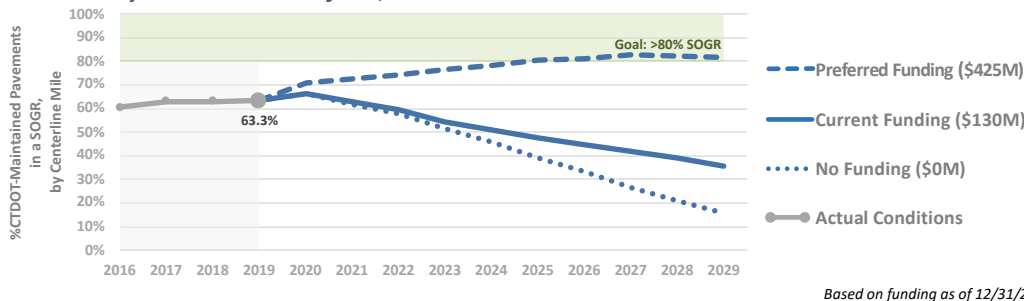


### Performance Projections at Current Funding Level (\$130M Budget)

End of Year	2020	2021	2022	2023	2024	Goal
Interstate Good	72.1%	71.9%	72.8%	72.2%	70.3%	75.0%
Interstate Poor	0.2%	0.2%	0.2%	0.2%	0.2%	<5.0%
Non-Int NHS Good	40.6%	37.9%	35.3%	31.5%	26.2%	50.0%
Non-Int NHS Poor	2.7%	3.4%	4.0%	4.7%	5.5%	<8.0%

## CTDOT-Maintained Pavement Performance Projections

State Goals by centerline miles for 3,716 centerline miles



### Performance Projections at Current Funding Level (\$130M Budget)

End of Year	2020	2021	2022	2023	2024	Goal
SOGR	66.6%	62.9%	59.5%	54.6%	51.2%	80.0%

## Performance Projections

The charts on the left depicts pavement condition for various funding scenarios. These were developed through an analysis program using CTDOT pavement deterioration curves projected from 2019 pavement condition data.

## Asset Valuation

**\$10,931,647,881**

Asset value is estimated using the replacement value. For pavements, replacement value is the product of pavement area (SY) and unit construction cost. For 3,716 centerline miles of pavement: 104.1 million SY \* \$105/SY = \$10.93 Billion

## Measures and Targets

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)

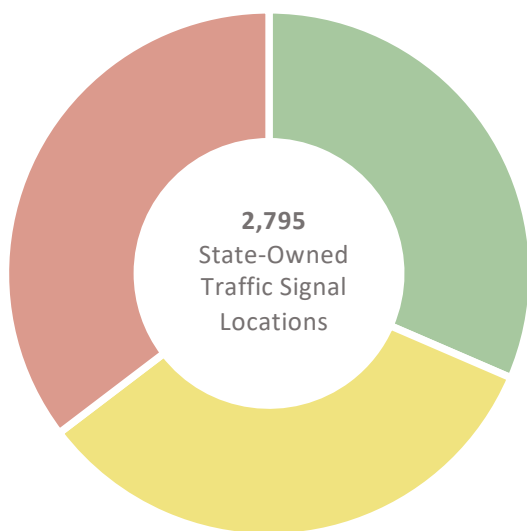


## Description

- CTDOT is currently responsible for maintaining 2,795 State owned traffic signals:
  - 2,567 Traditional Traffic signals
  - 228 Overhead flashing beacons
- Of the 2,567 traditional traffic signals, 961 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

## Traffic Signal Inventory and Condition

State Goals



**Good**

**880 Locations**

31.5% are in Good condition (0-15 years old)

**Fair**

**927 Locations**

33.2% are in Fair condition (16-25 years old)

**Poor**

**988 Locations**

35.3% are in Poor condition (26+ years old)

Good-Fair-Poor and SOGR defined by CTDOT

Based on CTDOT 2/8/21 Snapshot

## State of Good Repair (SOGR)

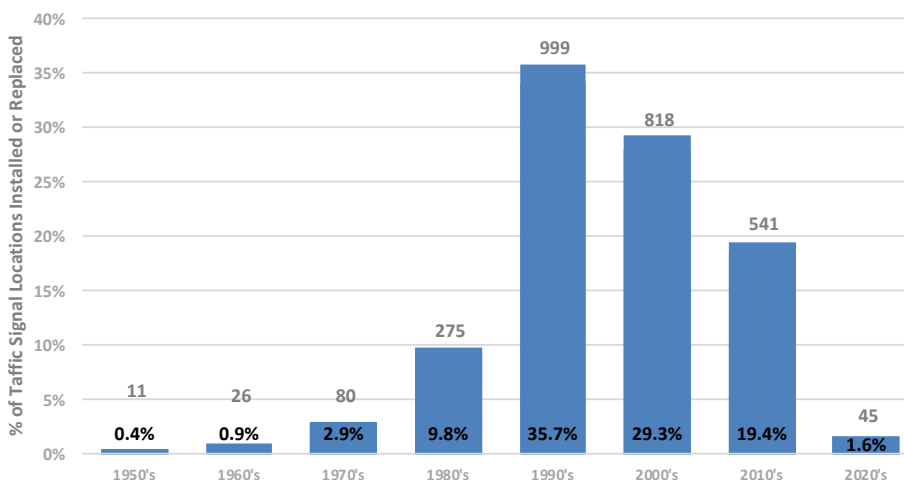
The State of Good Repair for traffic signals is determined to be 25 years of life based on expectations of controller and signal head life. Major component upgrades improve operation and safety of traffic signals but are not reflected in SOGR calculations.

## Traffic Signal Age

- 35.3% of traffic signals are older than 25 years
- 1.4% of traffic signals are older than 50 years

## History

Distribution of Traffic Signal Locations by Year Installed or Replaced



\*Note that numbers do not include major upgrades such as 98 accessible pedestrian signals added in the 2010's

Based on CTDOT 2021 Snapshot



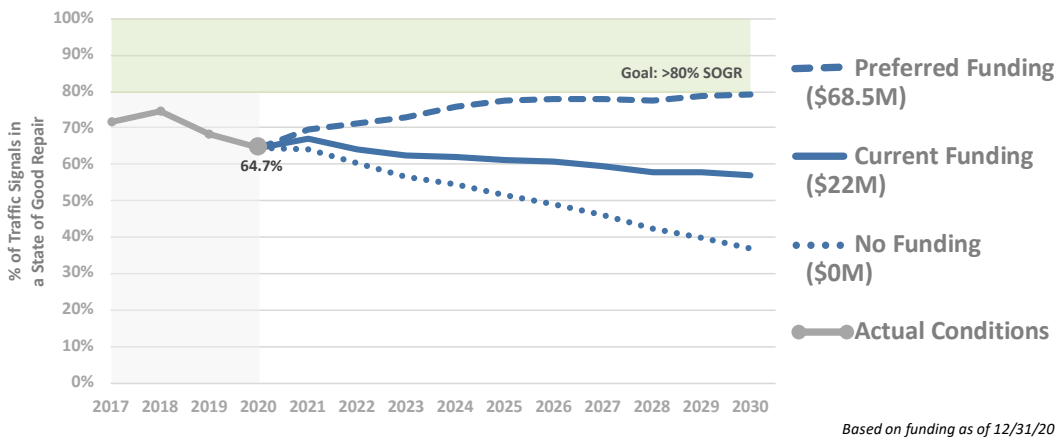
# Connecticut Transportation Asset Management Plan

## Traffic Signals



### Traffic Signals Performance Projections

State Goals by traffic signal for 2,795 traffic signals



Based on funding as of 12/31/20

#### Projected Performance at Current Funding Level (\$22M Budget)

End of Year	2021	2022	2023	2024	2025	Goal
<b>SOGR</b>	<b>67.0%</b>	<b>63.9%</b>	<b>62.3%</b>	<b>61.9%</b>	<b>61.2%</b>	<b>80.0%</b>

Note: \$7M of budget in 2022, 2023, and 2024 is designated for safety upgrades to existing equipment that do not affect SOGR rating.

### Performance Projections

In order to maintain a State of Good Repair, roughly 150 traffic signals need replacement each year. Currently, approximately 50-60 traffic signals are replaced each year. Of those, 42-50 signals are programmed under the signal replacement program and 8-10 signals are replaced under other state projects annually.

### Asset Valuation

**\$702,578,700**

Asset value is estimated using the replacement value. For traffic signals, replacement value is the product of traffic signal and unit construction cost.

For 2,567 traffic signals :  
 $2,567 * \$269,100 = \$690,779,700$

For 228 Overhead flashing beacons:  $226 * \$51,750 = \$11,799,000$

### Measures and Targets

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

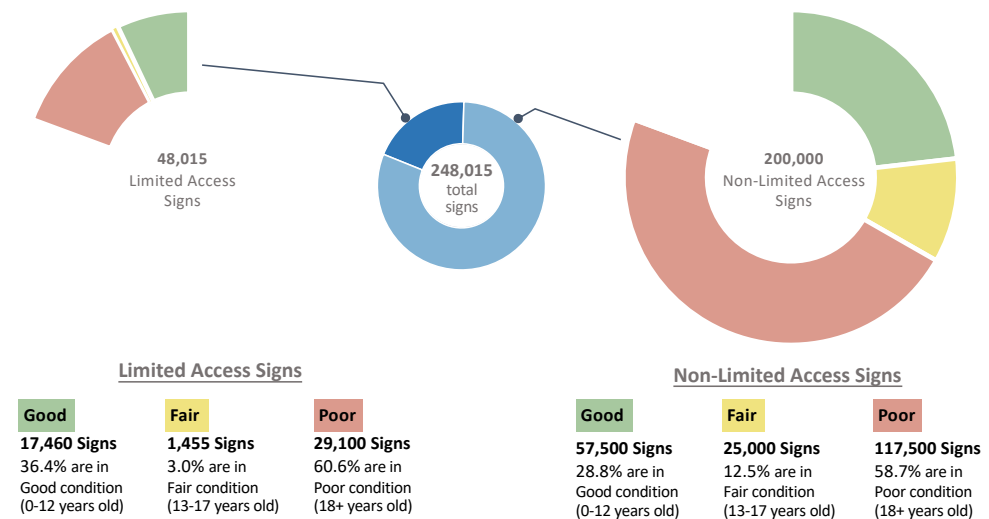


### Description

- CTDOT is responsible for maintaining approximately 248,015 signs (regulatory, warning, and guide) that are located on State owned and maintained roadways
- 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

### Sign Inventory and Condition

State Goals



Good-Fair-Poor and SOGR defined by CTDOT

Note: revised inventory to remove duplicates from route overlaps – inventory validation still in progress.

Based on CTDOT 2013 inventory, with 2020 updates

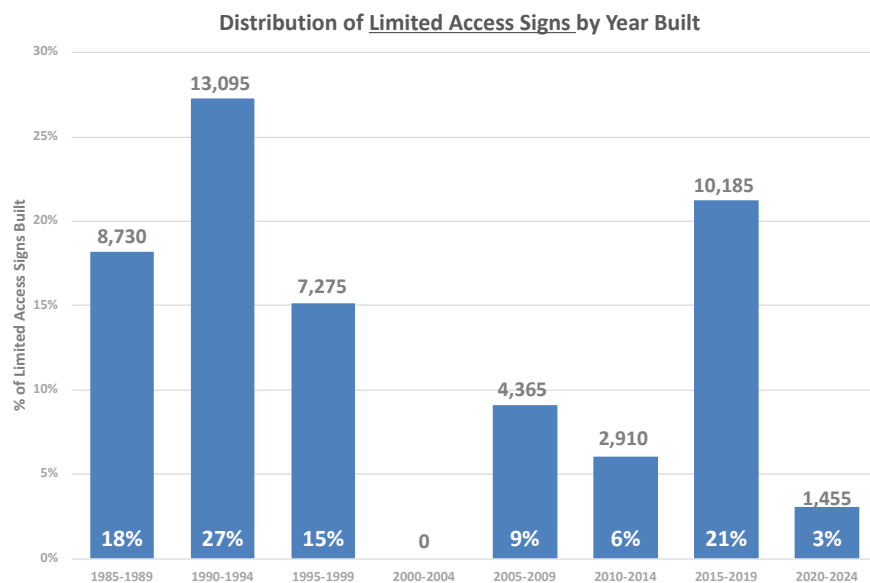
### State of Good Repair (SOGR)

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

- Nearly 60% of all signs have exceeded their expected sign life or effective service life
- 45% of signs on limited access roadways are older than 25 years

### History



Based on CTDOT 2020 Snapshot





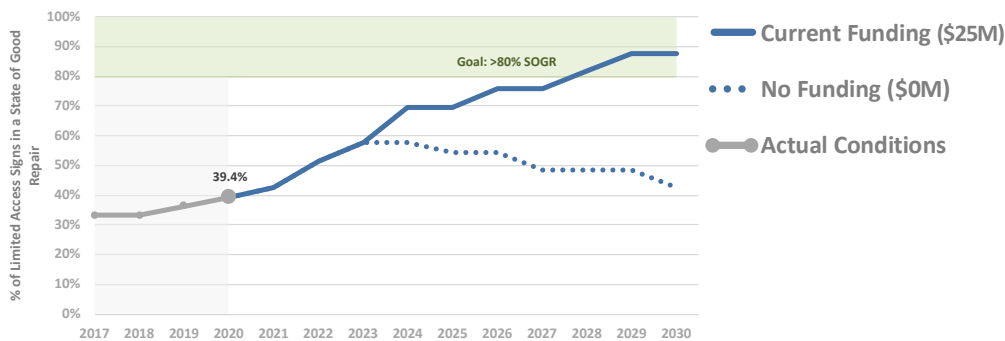
# Connecticut Transportation Asset Management Plan

## Signs



### Limited Access Signs Performance Projections

State Goals by limited access roadway sign for 48,015 signs



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

Based on funding as of 12/31/20

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	42.4%	51.5%	57.6%	69.7%	69.7%	80.0%

### Performance Projections

In order to maintain a State of Good Repair, nearly 14,600 signs need replacement each year. Currently, approximately 5,000 signs are replaced each year.

### Asset Valuation

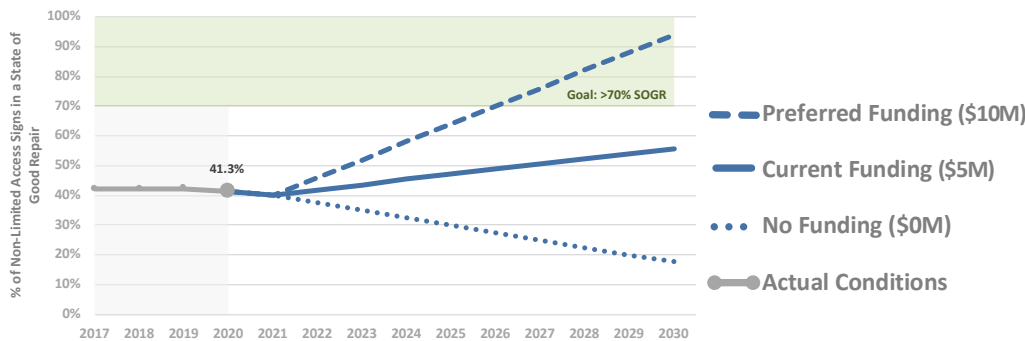
**\$178,328,760**

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.

### Non-Limited Access Signs Performance Projections

State Goals by non-limited access roadway sign for 200,000 signs



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

Based on funding as of 12/31/20

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	40.0%	41.8%	43.5%	45.3%	47.0%	70.0%

### Measures and Targets

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

#### State Goals:

- 80% or more of signs on limited access roadways in a SOGR
- 70% or more of signs on non-limited access roadways in a SOGR





## Description

- CTDOT is responsible for maintaining about 1,660 overhead sign supports on state maintained roadways
- Sign supports are made up of three categories:
  - 676 Cantilevers
  - 623 Full-Span
  - 361 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)

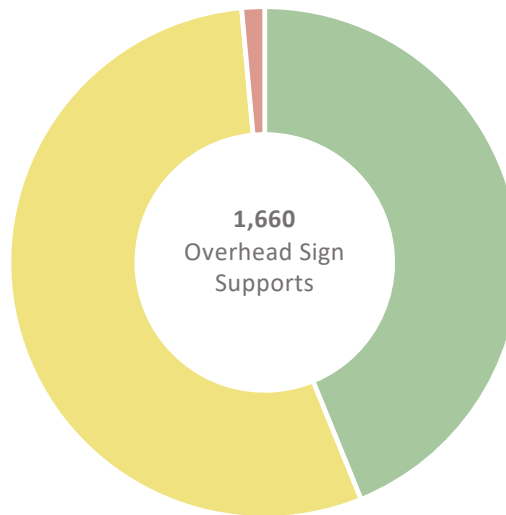
Condition ratings are determined via inspection of sign supports on a predetermined cycle. Sign supports with an overall rating of at least a 5 on a 0-9 condition scale are classified as being in a State of Good Repair.

## Support Age

- Overhead sign supports are assigned a 34-year service life based on a 17-year sign replacement cycle
- 26.0% of sign supports are older than 34 years

## Sign Support Inventory and Condition

State Goals



### Good

**728 Sign Supports**

43.9% are in Good condition  
[Condition ratings of 7,8, or 9]

### Fair

**908 Sign Supports**

54.7% are in Fair condition  
[Condition ratings of 5 or 6]

### Poor

**24 Sign Supports**

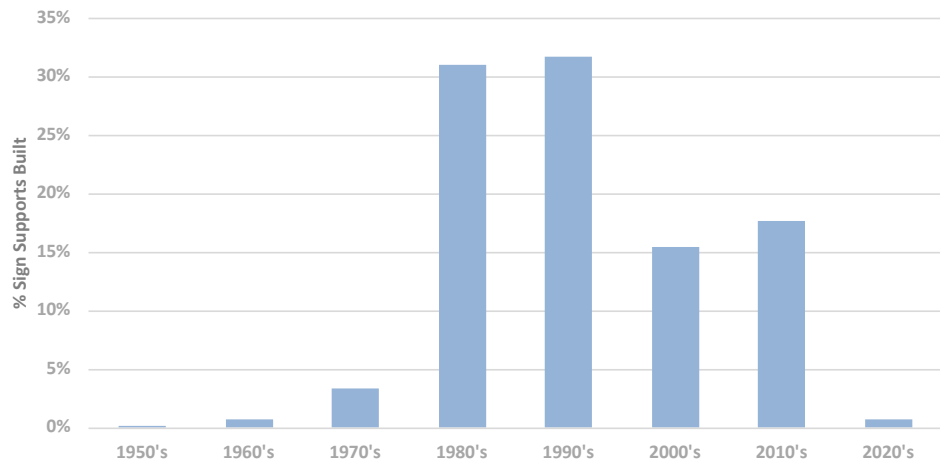
1.4% are in Poor condition  
[Condition ratings of 0,1,2,3, or 4]

Based on CTDOT 3/3/21 Snapshot

Good-Fair-Poor and SOGR defined by CTDOT

## History

Distribution of Sign Supports By Decade Built



Based on CTDOT 3/3/21 Snapshot

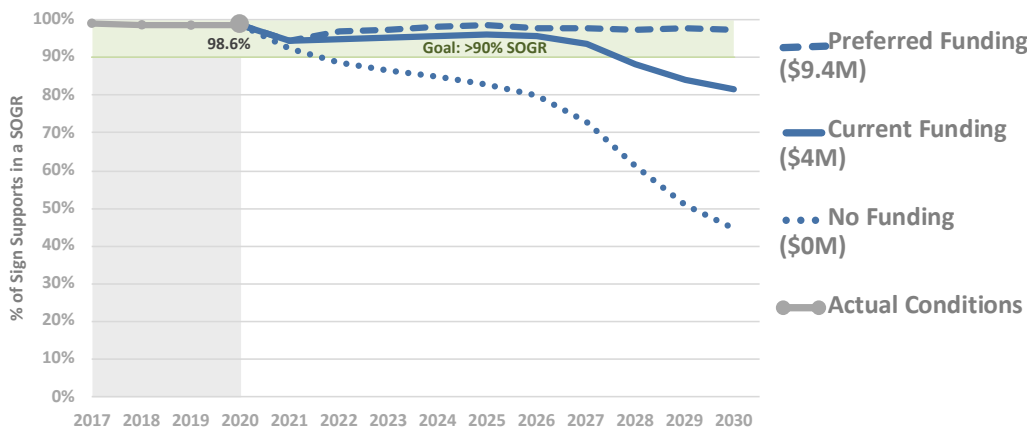


# Sign Supports



## Sign Support Performance Projections

State Goals by sign support for 1,660 sign supports



The projections assume an additional \$2.6 million of sign supports are replaced under other types of projects.

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

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	94.5%	94.9%	95.3%	95.6%	96.1%	90.0%

## 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

**\$268,440,000**

Asset value is estimated using the replacement value. For sign supports, replacement value is based on the average unit construction cost by type:  
 Cantilever \$140,000 \* 676 = \$94,640,000  
 Full Span \$250,000 \* 623 = \$155,750,000  
 Bridge Mount \$50,000 \* 361 = \$18,050,000

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

## Measures and Targets

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 3,716 centerline miles of on 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)

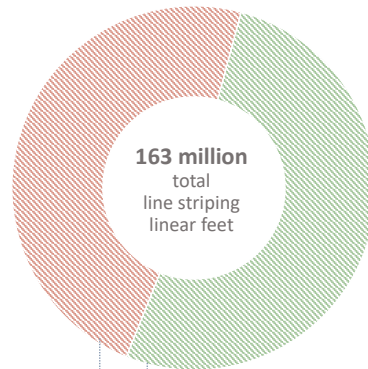
In-laid epoxy pavement markings installed within 6 years, epoxy pavement markings installed within the past 3 years and water-based pavement markings installed within 1 year are classified as being in a SOGR. This is based on expectations of retroreflectivity life and wear. Retroreflectivity is a measure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

## Marking Age

- More than 48% of all line striping and nearly 16% of all symbol and legend pavement markings have exceeded their expected service life.

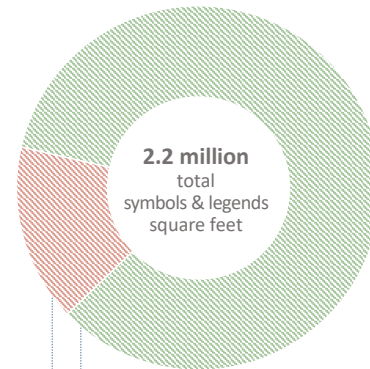
## Pavement Markings Inventory and Condition: Line Striping and Symbols & Legends

### State Goals



**State of Good Repair 84.5 million linear feet**  
51.9% of line striping is in a state of good repair

**Poor 78.5 million linear feet**  
48.1% of line striping is in poor condition



**State of Good Repair 1.9 million square feet**  
84.2% of symbols & legends are in a state of good repair

**Poor 0.3 million square feet**  
15.8% of symbols & legends are in poor condition

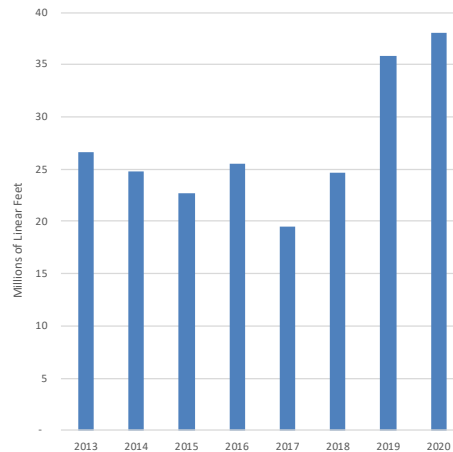
SOGR defined by CTDOT

Based on CTDOT 3/19/21 Snapshot

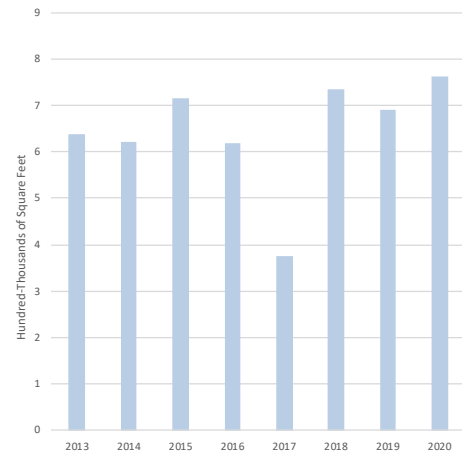
## History

Line Striping and Symbols & Legends Installed Annually

2013 – 2020



Line Striping



Symbols & Legends

Based on CTDOT 3/19/21 Snapshot



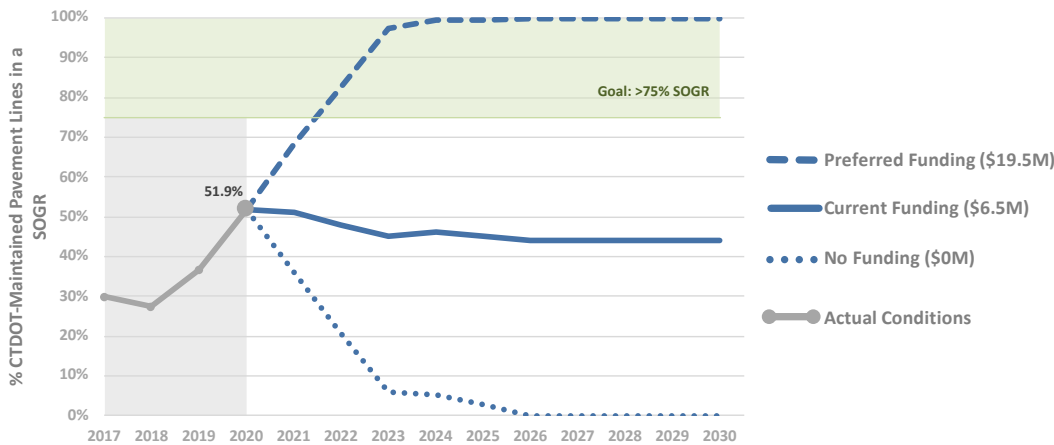


# Connecticut Transportation Asset Management Plan Pavement Markings



## Pavement Markings Performance Projections

State Goals by pavement lines for 163 million linear feet of line striping

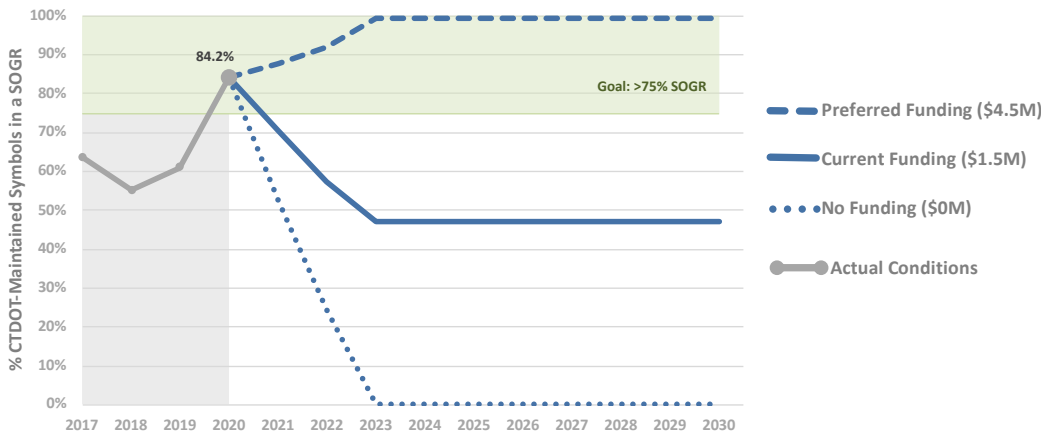


Based on funding as of 12/31/20

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

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	51.0%	48.0%	45.2%	46.1%	45.0%	75.0%

## State Goals by pavement symbols for 2.2 million square feet of symbols & legends



Based on funding as of 12/31/20

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

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	70.6%	57.3%	47.2%	47.2%	47.2%	75.0%

## Performance Projections

In order to maintain a State of Good Repair, nearly 54 million linear feet of line striping and 735,000 square feet of symbols & legends epoxy pavement markings need to be remarked each year. Currently, approximately 35 million linear feet and 700,000 square feet are remarked each year.

## Asset Valuation

**\$90,828,000**

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: 163 million LF \* \$0.50/LF = \$81,500,000  
 Symbols: 2.2 million SF \* \$4.24/SF = \$9,328,000

## Measures and Targets

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

### State Goals:

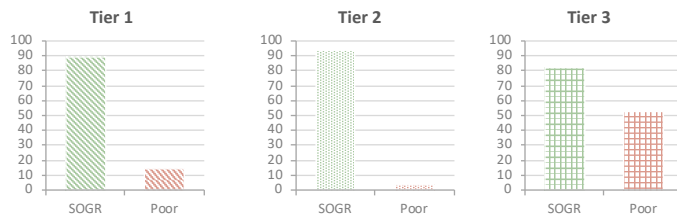
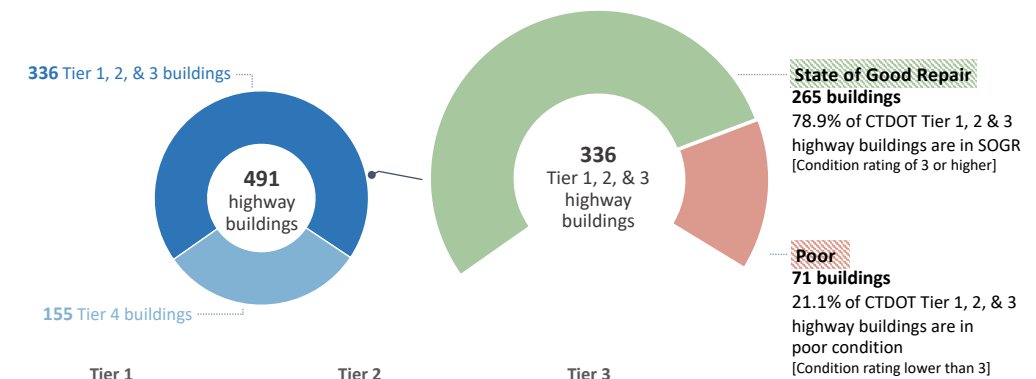
- 75% or more of line striping pavement markings in a SOGR
- 75% or more of symbols & legends pavement markings in a SOGR



## Description

- CTDOT defines a highway building as a relatively permanent structure to house persons or property
- CTDOT owns 491 highway buildings classified into four Tiers:
  - Tier 1: significant structures normally occupied by employees or the public
  - Tier 2: significant structures not normally occupied by employees or the public
  - Tier 3: storage and portable office type structures
  - Tier 4: no asset management plan; portable storage containers, buildings managed by other entities or scheduled for demolition or sale

## CTDOT-Maintained Inventory and Condition



- 103 Tier 1 buildings**  
State of Good Repair : 86.4%
  - 73 Maintenance & Repair Facilities
  - 17 Rest Area / Weigh Station Facilities
  - 13 Administrative Facilities
- 98 Tier 2 buildings**  
State of Good Repair : 95.9%
  - 94 Salt Sheds
  - 4 Specialty Facilities
- 135 Tier 3 buildings**  
State of Good Repair : 60.7%
  - 90 Storage Structures
  - 45 Portable Office Structures
- 155 Tier 4 buildings**  
State of Good Repair : Not tracked
  - 83 Portable Storage Containers
  - 61 Buildings Managed by Others
  - 11 Vacant Buildings Scheduled for Demolition or Sale

Based on CTDOT 5/1/21 Snapshot

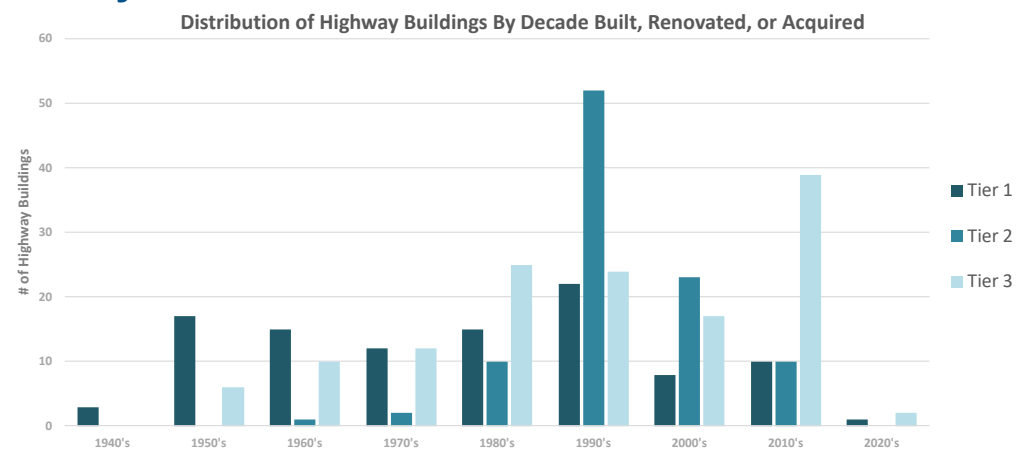
## State of Good Repair (SOGR)

- 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

## History



Based on CTDOT 5/1/21 Snapshot

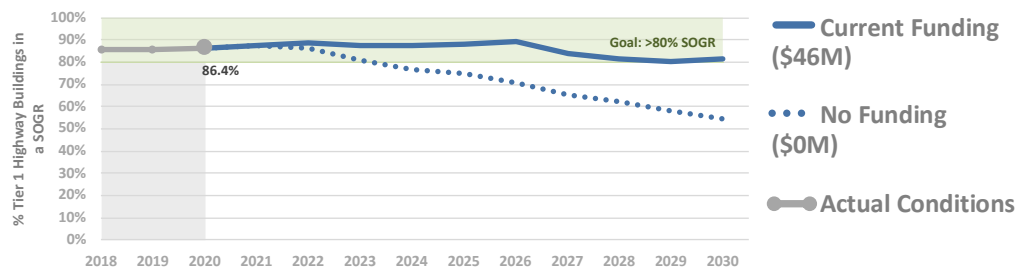


# Connecticut Transportation Asset Management Plan Highway Buildings



## Highway Buildings Performance Projections

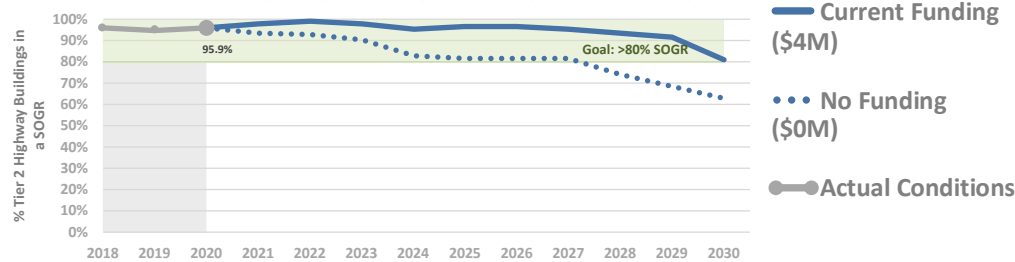
State Goals by Tier 1 highway building for 103 highway buildings



Tier 1 Performance Projections at Current Funding Level (\$46M Average Budget)

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	87.4%	88.5%	87.5%	87.5%	88.1%	80.0%

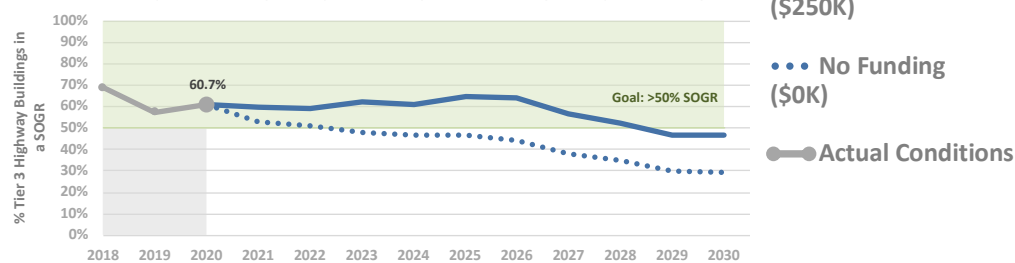
State Goals by Tier 2 highway building for 98 highway buildings



Tier 2 Performance Projections at Current Funding Level (\$4M Average Budget)

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	97.9%	99.0%	97.9%	95.8%	96.9%	80.0%

State Goals by Tier 3 highway building for 135 highway buildings



Tier 3 Performance Projections at Current Funding Level (\$250K Average Budget)

End of Year	2021	2022	2023	2024	2025	Goal
SOGR	59.8%	59.2%	62.3%	60.7%	64.9%	50.0%

Tier 1, 2, and 3 projections based on funding as of 12/31/19

## 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

**\$852,000,000**

- Tier 1 buildings: \$675M
- Tier 2 buildings: \$165M
- Tier 3 buildings: \$12M

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 Targets

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