# Transportation Performance Management

# State Biennial Performance Report for Performance Period 2018-2021 (PROGRESS)

## 2022

# FULL PERFORMANCE PERIOD PROGRESS REPORT (FPP)

# Connecticut

Report Due: 12/16/2022 Report Status: Submitted Report Updated On: Report Exported on 12/16/2022

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#### **State Contact:**

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# **Summary of Performance Measures and Targets**

Performance Measures	Baseline	2-Year Condition/ Performan ce	2-Year Target	4-Year Conditio n/ Perform ance	4-Year Target

# **Overview**

#### **OVERVIEW SECTION 1**

Question No	Description	Field Type
01	Please use this space to provide any general comments that may assist FHWA in its review of your submission. You can use this space to provide greater context for your targets and current condition/performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	TBD
O2	As of July 31, 2022, FHWA has not received the required significant progress additional reporting information, and it must be included in the PMF.  Did you upload the additional reporting for target(s) achievement to the PMF on the "attachment" tab?	Yes
O2a	Please explain why the additional reporting for target(s) achievement was not uploaded to the PMF as required.	

#### **OVERVIEW SECTION 2**

<b>Question No</b>	Description	Field Type
О3	Who should FHWA contact with questions?	Edgardo D. Block, PE
04	What is the phone number for this contact?  Please provide 10-digit number (area code and phone number) without formatting. (e.g., 1234567890)	8605942495
O5	What is the email address for this contact?	edgardo.block@ct.gov

# **Pavement**

#### **Pavement Performance Overview**

Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current condition, provide additional background detail or clarification, note any assumptions, or discuss complications. (Optional)  Pavement performance targets are based on the Transportation Asset Management Plan (TAMP) in terms of level of investment and investment strategy, on the pavement management system to recommend a program and a set of projects (selected through the pavement design unit and delivered through the construction program), and on the pavement condition assessment that is used by the pavement management system to project conditions over time.  The pavement performance targets are based on the Transportation Asset Management Plan (TAMP) in terms of level of investment and investment strategy, on the pavement design unit and delivered through the construction program), and on the pavement condition assessment that is used by the pavement management system to project conditions over time.  The pavement performance are based on the Transportation are based on the Transportation.
the underlying pavement condition data and the ability of the data collection systems to detect distress. This has created a complication in the target-setting process. In 2021 the crack-detection system was upgraded to a system with increased image resolution, resulting in a higher number, length, and area of cracking, one of three components in the pavement performance measure. The Data Quality Management Plan (DQMP) developed has been followed through the migration, including the relevant standards and protocols, but nevertheless this has created a discontinuity in pavement-condition-data history, with the higher detection rate and resolution presenting a drop in condition.  One of the assumptions made in developing the targets was that the data-collection protocols used,

#### **Interstate System Performance Overview**

Question No	Description	Field Type
P2	Discuss how the actual condition achieved for the statewide Interstate System [23 CFR 490.105(c)(1)] during the performance period, which indicates the near-term direction or trend, supports both the long-term national infrastructure condition performance goal of maintaining the highway infrastructure asset system in a state of good repair identified in 23 U.S.C. §150(b), and goal of	The actual condition achieved is consistent with the CTDOT Transportation Asset Management Plan and reflects significant investment in goals to maintaining the system in a state of good repair. This is reflected in

improving project and investment decision making through performance-based planning and programming [23 U.S.C. 150(a)]

Include an assessment of the effectiveness of the investment strategies documented in the State asset management plan required under 23 U.S.C. 119(e) related to pavement condition on the statewide Interstate NHS measure area. [23 CFR 490.107(b)(3)(ii)(C)]

the continued and consistent delivery of a robust pavement preservation program. As is discussed in P1, there has been a discontinuity in the condition data, so that it is difficult to utilize the actual numbers without context and as predictors of trends through time - the management systems and the TAMP provide the proper lens through which to examine these. The CTDOT has made great strides in aligning its pavement program to the TAMP over the performance period, a process that has yielded effective pavement investments over the performance period.

#### Statewide Performance Target for the Percentage of Pavements of the Interstate System in Good Condition

Question No	Description	Field Type
P3	The baseline statewide Percentage of Pavements on the Interstate System in Good Condition. For the 2018-2021 performance period only, the baseline value is the 2-year actual condition per the phase-in of new requirements for this measure. The actual 2-year condition is derived from the latest data collected through the midpoint of the performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.105(e)(7)(iii) and 23 CFR 490.107(b)(2)(ii)(A)]	74.2
P4	The 4-year statewide Percentage of Pavements on the Interstate System in Good Condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	68.6
P5	The 4-year target for the statewide Percentage of Pavements on the Interstate System in Good Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	70.0
P6	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of Pavements on the Interstate System in Good Condition, this discussion:  1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target,	The CTDOT uses a pavement management system and a Transportation Asset Management Plan (TAMP) to select targets and drive programs to achieve the selected target conditions. There is alignment between the actions taken on the road and the TAMP recommended investment levels and programs. At the same time, pavement asset life cycles are
	and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	much longer than the performance period, so the condition over the very near term

is largely determined by the pavement projects that are completed during the performance period and the size of the program delivering these projects. All projects expected to be completed within the performance period are included in projecting conditions (and performance.) 1. Comparison of actual 4-year condition to 4-year target. After review of our projects, it has been established that a change in technology in pavement data collection has impacted the extent of cracking observed, with more cracks being observed solely as a function of higher resolution and its impact on crack-detection algorithms, even as revelant protocols and the Data Quality Management Plan have been followed. The discontinuity in the data series has been larger than the improvement achieved through our interventions, and it presents as a reduction in condition when in reality what has changed has been the precision of the measurement which has fallen outside the ability of existing protocols and plans to capture the magnitude of the impact. At the same time, CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs. 2. Notwithstanding the numerical actual-performance results, which at 68.6% good do not reach the four-year target of 70.0% good, CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs, giving the Department confidence that CTDOT has continued to make significant progress in the actual pavement infrastructure condition, and that an apparent lack of progress is in reality due to a

		measurement difference and a lack of robustness in the state of the art of measurement protocols in the face of technological change resulting in higher detection rates of existing pavement defects.
P7	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Interstate System in Good Condition for the 2018-2021 Performance Period? [23 CFR 490.107(b)(3)(ii)(F)]	No
P7a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
P7b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Interstate System in Good Condition, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)	

#### Statewide Performance Target for the Percentage of Pavements of the Interstate System in Poor Condition

Question No	Description	Field Type
P8	The baseline statewide Percentage of Pavements on the Interstate System in Poor Condition. For the 2018-2021 performance period only, the baseline value is the 2-year actual condition per the phase-in of new requirements for this measure. The actual 2-year condition is derived from the latest data collected through the midpoint of the performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.105(e)(7)(iii) and 23 CFR 490.107(b)(2)(ii)(A)]	0.1
P9	The 4-year statewide Percentage of Pavements on the Interstate System in Poor condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	0.2
P10	The 4-year target for the statewide Percentage of Pavements on the Interstate System in Poor Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	2.5
P11	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of Pavements on the Interstate System in Poor	The CTDOT uses a pavement management system and a Transportation Asset Management Plan (TAMP) to

Condition, this discussion:

- 1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]
- 2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]

select targets and drive programs to achieve the selected target conditions. There is alignment between the actions taken on the road and the TAMP recommended investment levels and programs. At the same time, pavement asset life cycles are much longer than the performance period, so the condition over the very near term is largely determined by the pavement projects that are completed during the performance period and the size of the program delivering these projects. All projects expected to be completed within the performance period are included in projecting conditions (and performance.)

- 1. Comparison of actual 4-year condition to 4-year target. After review of our projects, it has been established that a change in technology in pavement data collection has impacted the extent of cracking observed, with more cracks being observed solely as a function of higher resolution and its impact on crack-detection algorithms, even as revelant protocols and the Data Quality Management Plan have been followed. The discontinuity in the data series has been larger than the improvement achieved through our interventions, and it presents as a reduction in condition when in reality what has changed has been the precision of the measurement which has fallen outside the ability of existing protocols and plans to capture the magnitude of the impact. At the same time, CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs.
- 2. Notwithstanding the numerical actual-performance results, which at 0.2% poor, meet the four-year target of 2.5% poor, care must be taken when using this number due to the complications listed under P1.

		CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs, giving the Department confidence that CTDOT has continued to make significant progress in the actual pavement infrastructure condition.
P12	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Interstate System in Poor Condition for the 2018-2021 Performance? [23 CFR 490.107(b)(3)(ii)(F)]	No
P12a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
P12b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Interstate System in Poor Condition, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)	

#### Pavement Performance on the Non-Interstate NHS Overview

Question No	Description	Field Type
P13	Discuss how the actual pavement condition achieved for the statewide Non-Interstate NHS [23 CFR 490.105(c)(2)] during the performance period, which indicates the nearterm direction or trend, supports both the long-term national infrastructure condition performance goal of maintaining the highway infrastructure asset system in a state of good repair identified in 23 U.S.C. §150(b), and goal of improving project and investment decision making through performance-based planning and programming [23 U.S.C. 150(a)]  Include an assessment of the effectiveness of the investment strategies documented in the State asset management plan required under 23 U.S.C. 119(e) related to pavement condition on the statewide Non-Interstate NHS measure area. [23 CFR 490.107(b)(3)(ii)(C)]	The actual condition achieved is consistent with the CTDOT Transportation Asset Management Plan and reflects significant investment in goals to maintaining the system in a state of good repair. This is reflected in the continued and consistent delivery of a robust pavement preservation program. As is discussed in P1, there has been a discontinuity in the condition data, so that it is difficult to utilize the actual numbers without context and as predictors of trends through time - the management systems and the TAMP provide the proper lens through which to examine these. The CTDOT has made great strides in aligning its pavement program to the TAMP over the performance period, a process

that has yielded effective
pavement investments over the
performance period.

#### Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Good Condition

Question No	Description	Field Type
P14	The baseline statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]  For the 2018-2021 performance period only, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR	42.9
P15	490.313(e)] The 2-year statewide Percentage of Pavements on the	44.3
FIS	Non-Interstate NHS in Good Condition. The actual 2-year condition is derived from the latest data collected through the midpoint of the 2018-2021 performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]	44.3
	For the 2018-2021 performance period only, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	
P16	The State DOT reported its 2-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition based on "Full Distress + IRI" data in the 2018 Baseline Performance Period Report. Thus, FHWA also calculated the actual condition using "Full Distress + IRI" data that was provided in the 2018 Mid Performance Period Progress Report. [23 CFR 490.313 (c) and (d)]	37.2
P17	The 2-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	36.0
P18	The 4-year statewide Percentage of Pavements on the Non-Interstate in Good Condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)] For the 2018-2021 performance period only, FHWA has calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	47.4
P19	The State DOT reported that its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition was based on "Full Distress + IRI" data for the 2018-2021 performance period. Thus, FHWA also calculated the actual condition using "Full Distress + IRI" data. [23 CFR 490.313 (c) and (d)]	37.9

	FHWA will use this value to determine whether the actual condition level is equal to or better than the established 4-year target as part of the 4-year significant progress determination. [23 CFR 490.109(e)(2)(ii)]	
P20	The 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	30.0
P21	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition, this discussion:  1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	The CTDOT uses a pavement management system and a Transportation Asset Management Plan (TAMP) to select targets and drive programs to achieve the selected target conditions. There is alignment between the actions taken on the road and the TAMP recommended investment levels and programs. At the same time, pavement asset life cycles are much longer than the performance period, so the condition over the very near term is largely determined by the pavement projects that are completed during the performance period and the size of the program delivering these projects. All projects expected to be completed within the performance period are included in projecting conditions (and performance.)  1. Comparison of actual 4-year condition to 4-year target. After review of our projects, it has been established that a change in technology in pavement data collection has impacted the extent of cracking observed, with more cracks being observed solely as a function of higher resolution and its impact on crack-detection algorithms, even as revelant protocols and the Data Quality Management Plan have been followed. The discontinuity in the data series has been larger than the improvement achieved through our interventions, and it presents as a reduction in condition when in reality what has changed has been the precision of the measurement which has fallen outside the ability of existing protocols and plans to capture the magnitude of the impact. At the same time, CTDOT continued to deliver a robust pavement preservation program

P22	Did any of the extenuating circumstance(s) identified in 22	and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs.  2. Notwithstanding the numerical actual-performance results, which at 37.9% good, exceed the four-year target of 30.0% good, care must be taken when using this number due to the complications listed under P1.  CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs, giving the Department confidence that CTDOT has continued to make significant progress in the actual pavement infrastructure condition.
F22	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition for the 2018-2021 Performance? [23 CFR 490.107(b)(3)(ii)(F)]	INU
P22a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
P22b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Good Condition, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]	

#### Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Poor Condition

Question No	Description	Field Type
P23	The baseline statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	17.0

	For the 2018-2021 performance period only, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph).	
P24	The 2-year statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition. The actual 2-year condition is derived from the latest data collected through the midpoint of the 2018-2021 performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]  For the 2018-2021 performance period only, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	16.9
P25	The State DOT reported its 2-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition based on "Full Distress + IRI" data in the 2018 Baseline Performance Period Report. Thus, FHWA also calculated an actual condition using "Full Distress + IRI" data that was provided in the 2020 Mid Performance Period Progress Report. [23 CFR 490.313 (c) and (d)]	3.6
P26	The 2-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	6.8
P27	The 4-year statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]  For the 2018-2021 performance period only, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	14.6
P28	The State DOT reported that its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition was based on "Full Distress + IRI" data for the 2018-2021 performance period. Thus, FHWA also calculated the actual condition using "Full Distress + IRI" data. [23 CFR 490.313 (c) and (d)]  FHWA will use this value to determine whether the actual condition level is equal to or better than the established 4-year target as part of the 4-year significant progress determination. [23 CFR 490.109(e)(2)(ii)]	1.8
P29	The 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	5.0
P30	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition, this discussion:	The CTDOT uses a pavement management system and a Transportation Asset Management Plan (TAMP) to select targets and drive programs

- 1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]
- 2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]
- to achieve the selected target conditions. There is alignment between the actions taken on the road and the TAMP recommended investment levels and programs. At the same time, pavement asset life cycles are much longer than the performance period, so the condition over the very near term is largely determined by the pavement projects that are completed during the performance period and the size of the program delivering these projects. All projects expected to be completed within the performance period are included in projecting conditions (and performance.)
- 1. Comparison of actual 4-year condition to 4-year target. After review of our projects, it has been established that a change in technology in pavement data collection has impacted the extent of cracking observed, with more cracks being observed solely as a function of higher resolution and its impact on crack-detection algorithms, even as relevant protocols and the Data Quality Management Plan have been followed. The discontinuity in the data series has been larger than the improvement achieved through our interventions, and it presents as a reduction in condition when in reality what has changed has been the precision of the measurement which has fallen outside the ability of existing protocols and plans to capture the magnitude of the impact. At the same time, CTDOT continued to deliver a robust pavement preservation program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs.
- 2. Notwithstanding the numerical actual-performance results, which at 1.8 % poor, meet the four-year target of 5.0% poor, care must be taken when using this number due to the complications listed under P1

CTDOT continued to deliver a robust pavement preservation

		program and continued to see improvements in its own, older performance measure (IRI), corroborating the alignment of the pavement program with the TAMP recommended investment levels and programs, giving the Department confidence that CTDOT has continued to make significant progress in the actual pavement infrastructure condition.
P31	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition for the 2018-2021 Performance? [23 CFR 490.107(b)(3)(ii)(F)]	No
P31a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
P31b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of Pavements on the Non-Interstate NHS in Poor Condition, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]	

# **Bridge**

#### **Bridge Performance Overview**

Question No	Description	Field Type
B1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current condition, provide additional background detail or clarification, note any assumptions, or discuss complications. (Optional)	Bridge performance targets are based on the Transportation Asset Management Plan (TAMP) in terms of level of investment and investment strategy, and on the bridge management system to recommend a program and a set of projects. Most of the deviation in performance particularly at the 2-year interval is due to reviews and improvements to the bridge management system condition projections, which were corrected for the initial TAMP, certified by FHWA, but were not completed in time for the early establishment of targets in 2018 (May.) Once this initial discontinuity is addressed, the CTDOT has both set ambitions targets to improve bridge performance, and delivered programs to achieve these.
B2	Discuss how the actual condition achieved for the statewide Bridges on the NHS [23 CFR 490.105(c)(3)] during the performance period, which indicates the nearterm direction or trend, supports both the long-term national infrastructure condition performance goal of maintaining the highway infrastructure asset system in a state of good repair identified in 23 U.S.C. §150(b), and goal of improving project and investment decision making through performance-based planning and programming [23 U.S.C. 150(a)]  Include an assessment of the effectiveness of the investment strategies documented in the State asset management plan required under 23 U.S.C. 119(e) related to the bridge condition measure area. [23 CFR 490.107(b)(3)(ii)(C)]	During this performance period the CTDOT set targets to reflect its focus on the state of good repair for its bridge assets, and has delivered on these investments. The strategy is integrated into the Transportation Asset Management Plan (TAMP), which is the vehicle for driving actions and improving outcomes.

#### Statewide Performance Target for Bridges on the NHS Classified as in Good Condition

Question No	Description	Field Type
B3	The baseline statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	15.2
B4	The 2-year statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition. The actual 2-year condition is derived from the latest data collected through the midpoint of the 2018-2021 performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR	14.4

	490.107(b)(2)(ii)(A)]	
B5	The 2-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	22.1
B6	The 4-year statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	14.1
B7	The 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	14.0
B8	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition, this discussion:  1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	CTDOT has used the TAMP to focus on this asset and has aligned bridge programs with the strategies identified therein. The achievement of the targets, in the CTDOT's view, is largely due to this strong alignment of the bridge programs with the TAMP.  1. Comparison of actual 4-year condition to the 4-year target. The 4-year target for this measure was 14.0% and it was exceeded at 14.1%. This is largely attributable to program delivery.  2. Based on these results, the State DOT expects that significant progress was made toward the 4-year target.
B9	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition for the 2018-2021 Performance? [23 CFR 490.107(b)(3)(ii)(F)]	No
В9а	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
B9b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Good Condition, and quantify the	

impacts that resulted from these circ 490.107(b)(3)(ii)(F)]	cumstances. [23 CFR	

#### Statewide Performance Target for Bridges on the NHS Classified as in Poor Condition

Question No	Description	Field Type
B10	The baseline statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	14.0
B11	The 2-year statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition. The actual 2-year condition derived from the latest data collected through the midpoint of the 2018-2021 performance period that was reported in the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]	8.2
B12	The 2-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	7.9
B13	The 4-year statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition. This value is the actual 4-year condition derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	7.7
B14	The 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	8.0
B15	Discuss the decisions and/or investments that contributed to the actual condition, and if they were effective in achieving the intended condition. For the statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition, this discussion:  1) Shall compare the actual 4-year condition to the 4-year target and document the reasons the target was or was not met, and [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	CTDOT has used the TAMP to focus on this asset and has aligned bridge programs with the strategies identified therein. The achievement of the targets, in the CTDOT's view, is largely due to this strong alignment of the bridge programs with the TAMP.  1. Comparison of actual 4-year condition to the 4-year target. The 4-year target for this measure was 8.0% and performance was better than this value, at 7.7% Poor. This is largely attributable to program delivery.

		2. Based on these results, the State DOT expects that significant progress was made toward the 4-year target.
B16	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition for the 2018-2021 Performance? [23 CFR 490.107(b)(3)(ii)(F)]	No
B16a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
B16b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percentage of deck area of Bridges on the NHS Classified as in Poor Condition, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]	

# Reliability

#### **Travel Time Reliability Performance Overview**

Question No	Description	Field Type
R1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. (Optional)	At the end of the performance period, the system reliability performance reflects ongoing changes to travel patterns caused by the COVID-19 pandemic, some of which are expected to be permanent in nature (such as reduced commuting traffic volumes due to remote work) but uncertain in magnitude, as this secular change in how we work and move plays out over time; other resulting trends have uncertain or negative effect (such as rail transit ridership, bus ridership, e-commerce trends, and shared mobility changes.) There is not an established causal relationship between these transit trends and vehicle registrations in Connecticut, but the latter have continued to increase and vehicle miles traveled on our highways have largely recovered to prepandemic levels. This generates a high degree of uncertainty in forecasts, since traditional relationships between overall volume and travel time are experiencing changes (with somewhat lower volumes measured during certain peak hours at some locations.) The CTDOT approach to considering data gathered during 2020 and 2021 has been to exclude it, since although the later periods suggest a return to previous trends to some degree, this is not a straightforward return to status quo ante.
R2	Discuss how the actual performance achieved for the statewide Travel Time Reliability [23 CFR 490.105(c)(4)] during the performance period, which indicates the nearterm direction or trend, supports both the long-term national system reliability performance goal of improving the efficiency of the surface transportation system identified in 23 U.S.C. §150(b) and the goal of improving project and investment decision making through performance-based planning and programming. [23 U.S.C. 150(a)]	Travel patterns are reflected as a component of the congestion aspects of the long-range transportation plan for both state DOTs and the relevant MPOs. These are statewide or region-wide plans and there are ongoing programs aligned with these plans that have an impact on performance. However, travel time reliability as a specific objective is not the focus of these plans of programs since the reliability perspective on mobility is newer than traditional methods

(volumes, capacity, and throughput) used to develop our investments. Nevertheless, travel time reliability is closely (though not directly or linearly) related to congestion, so there is an expectation that the projects, guided by the long-range transportation plan in general terms, will have positive impacts on travel time reliability at the locations where these improvements are made.

# Statewide Performance Target for the Percent of the Person-Miles Traveled on the Interstate That Are Reliable

Question No	Description	Field Type
R3	The baseline statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable. This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	79.6
R4	The 2-year statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable. The actual 2-year performance is derived from the latest data collected through the midpoint of the 2018-2021 performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]	79.6
R5	The 2-year target for the statewide percent of the person- miles traveled on the Interstate that are reliable for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	75.2
R6	The 4-year statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable. This value is the actual 4-year performance derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	86.2
R7	The 4-year target for the statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	79.6
R8	Discuss the decisions and/or investments that contributed to the actual Performance, and if they were effective in achieving the intended performance. For the statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable, this discussion:	Travel patterns are reflected as a component of the congestion aspects of the long-range transportation plan for both state DOTs and the relevant MPOs. These are statewide or region-

	1) Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	wide plans and there are ongoing programs aligned with these plans that have an impact on performance. However, travel time reliability as a specific objective is not the focus of these plans of programs since the reliability perspective on mobility is newer than traditional methods (volumes, capacity, and throughput) used to develop our investments. Nevertheless, travel time reliability is closely (though not directly or linearly) related to congestion, so there is an expectation that the projects, guided by the long-range transportation plan in general terms, will have positive impacts on travel time reliability at the locations where these improvements are made.  1. Comparison of actual 4-year performance to 4-year target. The actual performance, at 86.2%, exceeds the target of 79.6% adjusted at the midpoint of the performance period. The target was met because of two main reasons 1) the availability of a consistent data set (NPMRDS) on which to make target adjustments at the midpoint period, and 2) travel pattern changes due to, or accelerated by, the COVID-19 pandemic.  2) The State DOT expects that significant progress was made toward the 4-year targets. In addition to at least one project relieving a major traffic bottleneck that was completed in 2022 and which will accrue the traveling public continued benefits toward travel time reliability, the agency is taking steps to understand how to target programs to specifically address this performance measure.
R9	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable for the 2018-2021 Performance Period? [23 CFR 490.107(b)(3)(ii)(F)]	No No
R9a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	

R9b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percent of the Person-Miles Traveled on the Interstate That Are Reliable, and quantify the impacts that resulted from these circumstances, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]
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# Statewide Performance Target for the Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable

Question No	Description	Field Type
R10	The baseline Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable. For the 2018-2021 performance period only, the baseline value is the 2-year actual performance per the phase-in of new requirements for this measure. The actual 2-year performance is derived from the latest data collected through the midpoint of the performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.105(e)(7)(iii) and 23 CFR 490.107(b)(2)(ii)(A)]	85.8
R11	The 4-year statewide Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable. This value is the actual 4-year performance derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	90.0
R12	The 4-year target for the statewide Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	83.6
R13	Discuss the decisions and/or investments that contributed to the actual performance, and if they were effective in achieving the intended performance. For the statewide Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable, this discussion:  1) Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]  2) Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	Travel patterns are reflected as a component of the congestion aspects of the long-range transportation plan for both state DOTs and the relevant MPOs. These are statewide or region-wide plans and there are ongoing programs aligned with these plans that have an impact on performance. However, travel time reliability as a specific objective is not the focus of these plans of programs since the reliability perspective on mobility is newer than traditional methods (volumes, capacity, and throughput) used to develop our investments. Nevertheless, travel time reliability is closely (though not directly or linearly) related to congestion, so there is an expectation that the projects, guided by the long-range

		transportation plan in general terms, will have positive impacts on travel time reliability at the locations where these improvements are made.  1. Comparison of actual 4-year performance to 4-year target. The actual performance, at 90.0%, exceeds the target of 83.6% adjusted at the midpoint of the performance period. The target was met because of two main reasons 1) the availability of a consistent data set (NPMRDS) on which to make target adjustments at the midpoint period, and 2) travel pattern changes due to, or accelerated by, the COVID-19 pandemic.  2) The State DOT expects that significant progress was made toward the 4-year targets. The agency is taking steps to understand how to target programs to specifically address this performance measure.
R14	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable for the 2018-2021 Performance Period? [23 CFR 490.107(b)(3)(ii)(F)]	No
R14a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
R14b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]	

# **Freight**

#### Freight Reliability (Movement) Performance Overview

Question No	Description	Field Type
F1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. (Optional)	The freight movement measure is in essence a travel time reliability on the Interstate system. CTDOT joined several other agencies in trying to manage the transition in data vendor for the National Performance Management Research Data Set through a Transportation Pooled Fund, which provided adjustments to be made to the data set so that achievable targets could be set. Connecticut used these projections and conducted its own review of the projection methodology, which provided the correct general trend (this was borne out in practice) but resulted in an adjustment that could not overcome the data discontinuity from the change in data in the NPMRDS. This led to the agency missing its two-year target, though in magnitude both the change due to trends and the insufficiency of the bias adjustment paled in comparison to the actual magnitude of performance discontinuity due to the change in data set itself. This was compensated for at the mid-point of the performance period and the four-year targets were based solely on the new data set, as there was more than one year of actual performance on which to base predictive models.
F2	Discuss how the actual performance achieved for statewide freight movement on the Interstate System [23 CFR 490.105(c)(6) during the performance period, which indicates the near-term direction or trend, supports both the long-term national freight movement performance goal of improving the National Highway Freight Network, strengthening access to trade markets, and supporting economic development identified in 23 U.S.C. §150(b) and the goal of improving project and investment decision-making through performance-based planning and programming. [23 U.S.C. 150(a)]	Freight movement on the Interstate System was improved through addressing one of the most prominent traffic and freight bottlenecks in the state, but the impact of this major project (I-91 and I-84 interchange at the Charter Oak Bridge in Hartford, CT) will only be felt in the next performance period, as it was only fully completed during 2022, in a year which also has overriding reliability distortions from the pandemic and secular changes stemming for new trends in travel, such as remote work. Despite the lag between taking action and improving performance, there are projects in the capital program to

		address bottlenecks identified in the previous target-setting exercise, which are in various stages of planning, programming, design, or construction.
F3	Discuss the State DOT's efforts to address congestion at truck freight bottlenecks through comprehensive freight improvement efforts of State Freight Plan or MPO freight plans; the Statewide Transportation Improvement Program (STIP) and MPO Transportation Improvement Programs (TIP); regional or corridor level efforts; other related planning efforts; and operational and capital activities targeted to improve freight movement on the Interstate System, and the progress that these efforts have made towards addressing freight bottlenecks. [23 CFR 490.107(b)(3)(ii)(E))  If the State has prepared a State Freight Plan under 49 U.S.C. 70202, within the previous 2 years, then it may serve as the basis for addressing congestion at truck freight bottlenecks. If the State Freight Plan has not been updated since the previous State Biennial Performance Report, then an updated discussion of efforts to address congestion at truck freight bottlenecks is needed. [23 CFR 490.107(b)(3)(ii)(D) and 23 CFR 490.107(b)(3)(ii)(E)]  Please upload related document(s) in the "Attachment" tab.	The CTDOT's efforts to address congestion at truck freight bottlenecks is addressed in the attached State Freight Plan drafted in November 2022, submitted for FHWA comments, which are being incorporated and will be part of the final submittal shortly. The plan is attached to this report.

#### Statewide Performance Target for the Truck Travel Time Reliability (TTTR) Index

Question No	Description	Field Type
F4	The baseline statewide Truck Travel Time Reliability Index. This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the beginning date of the 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	1.79
F5	The 2-year statewide Truck Travel Time Reliability Index. The actual 2-year performance is derived from the latest data collected through the midpoint of the 2018-2021 performance period, and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]	1.81
F6	The 2-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	1.79
F7	The 4-year statewide Truck Travel Time Reliability Index. This value is the actual 4-year performance derived from the latest data collected through the end of the 2018-2021 performance period. [23 CFR 490.107(b)(3)(ii)(A)]	1.56

F8	The 4-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	1.84
F9	Discuss the decisions and/or investments that contributed to the actual performance, and if they were effective in achieving the intended performance. For the statewide Truck Travel Time Reliability Index, this discussion:  1.Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]  2.Shall document if the State DOT expects that significant progress was or was not made toward the 4-year target, and summarize the accomplishments achieved during the performance period that demonstrate whether significant progress is expected or not. [23 CFR 490.107(b)(3)(ii)(E)]	Freight movement on the Interstate System was improved through addressing one of the most prominent traffic and freight bottlenecks in the state, but the impact of this major project (I-91 and I-84 interchange at the Charter Oak Bridge in Hartford, CT) will only be felt in the next performance period, as it was only fully completed during 2022 (though some portions of the improvements began to impact performance in 2021), in a year which also has overriding reliability distortions from the pandemic and secular changes stemming for new trends in travel, such as remote work. Despite the lag between taking action and improving performance, there are projects in the capital program to address bottlenecks identified in the previous target-setting exercise, which are in various stages of planning, programming, design, or construction.  1. Comparison of actual performance versus targets at the 4-year mark The actual 4-year performance exceeded the 4-year targets, in part due to a minor improvement toward the end of 2021 at one particular truck bottleneck from a major project, but confounded by the outsized impact of the pandemic on travel patterns continuing into 2021. The divergence of actual performance from targets is largely due to this effect.  2. The State DOT expects that significant progress was made toward the 4-year target, based on the completion of a major project that relieved one of the highest-priority truck bottlenecks in the state, even though much of the truck travel time reliability performance can be attributed to disruptions in travel from the pandemic and the resulting potential more permanent changes in general travel patterns.

F10	Did any of the extenuating circumstance(s) identified in 23 CFR 490.109(e)(5) prevent the State DOT from making significant progress toward achieving its 4-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period? [23 CFR 490.107(b)(3)(ii)(F)]	No
F10a	Select the extenuating circumstance(s) that prevented the State DOT from making significant progress toward achieving its 4-year target. [23 CFR 490.109(e)(5)]	
F10b	Explain how the extenuating circumstance(s), listed in 23 CFR 490.109(e)(5) prevented the State DOT from making significant progress toward achieving its 4-year target for the statewide Truck Travel Time Reliability Index, and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(3)(ii)(F)]	

## **Emissions**

#### **Emissions Reduction Performance Overview**

Question No	Description	Field Type
E1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. (Optional)	The Congestion Mitigation and Air Quality (CMAQ) program was the basis for both the baseline performance and the projected trends. At CTDOT, the CMAQ program has shifted to a largely qualitative-benefits set of actions, following the findings of an FHWA program review on a cost-effectivess approach to air quality improvement actions. This led, beginning in 2016 and 2017 and continuing through this performance period, to a different set of projects than those traditionally selected. In addition, major improvements achieved through large programs spanning multiple years (in particular the Hartford Line new commuter rail service), are only accrued in the year of obligation of funds. Where targets were not met in this performance period it was due to a program funding change (because the scope of one project was substantially increased to include other work, it became not CMAQ-eligible - though it was indeed delivered and the actual emissions reductions were achieved.) Please note that the State has communicated before to FHWA that we do not agree on the PM10 and CO applicability and have communicated to FHWA in previous performance periods of this discrepancy.
E2	Discuss how the actual performance achieved for the Statewide Total Emissions Reduction [23 CFR 490.105(c)(8)] (as measured by the individual pollutants and precursors) during the performance period, which indicates the near-term direction or trend, supports both the long-term national environmental sustainability performance goal to enhance the performance of the transportation system while protecting and enhancing the natural environment identified in 23 U.S.C. §150(b), and the goal of improving project and investment decision making through performance-based planning and programming [23 U.S.C. 150(a)] *If all applicable pollutants and precursors are trending in a similar fashion you may generalize the response.	CMAQ projects deliver both quantitative as well as qualitative benefits to air quality through emissions reductions and other benefits which may not be quantified. CTDOT's CMAQ-funded projects continue to have a positive impact on the air quality and reflect a focused approach on the actual benefits that are the intent of the program.

E3	Does the State include any areas designated as nonattainment or maintenance for PM2.5?	Yes
E4	If the State includes any areas designated as nonattainment or maintenance for PM2.5, are NOx and/or VOC a significant contributor to PM2.5 emissions anywhere in the State?  A significant contributor is defined as a precursor pollutant that the State or EPA has made a finding that the precursor has a significant impact on particulate matter (PM) air quality problem in a given area; or, the State Implementation Plan establishes approved or adequate motor vehicle emissions budgets for that precursor. [40 CFR 93.102(b) and 40 CFR 93.119(f)]	Yes - NOx and VOC
E5	Does the State include any areas designated as nonattainment or maintenance for PM10?	Yes
E6	If the State includes any areas designated as nonattainment or maintenance for PM10, are NOx and/or VOC a significant contributor to PM10 emissions anywhere in the State?	No significant contributors
E7	Does the State include any areas designated as nonattainment or maintenance for CO?	No
E8	Does the State include any areas designated as nonattainment or maintenance for ozone?	Yes

#### Statewide Total Emission Reductions PM2.5 Target #1

Question No	Description	Field Type
E12	The baseline cumulative emissions reductions (total daily kilograms) of PM2.5. This value is from the 2018 Baseline Performance Period Report and is the cumulative estimated emissions reductions (total daily kilograms) as reported to the CMAQ Public Access System for the 4 Federal Fiscal Years before the start of the Federal Fiscal Year 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	12.950
E13	The 2-year cumulative emissions reductions (total daily kilograms) of PM2.5. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the Federal Fiscal Year 2018-2021 performance period and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]	0.000

	To calculate the measure, data for Federal Fiscal Years 2018-2019 was extracted from the CMAQ Public Access System on or after July 1 of 2020. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	
E14	The 2-year target for statewide Total Emissions Reduction (total daily kilograms) of PM2.5 for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	1.632
E15	The 4-year cumulative emissions reductions (total daily kilograms) of PM2.5. This value is the actual 4-year performance derived from the latest data collected through the end of the performance period. [23 CFR 490.107(b)(3)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Years 2018-2021 was extracted from the CMAQ Public Access System on or after July 1 of 2022. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a> df  ### A this provided is the actual 4-year actual 4-ye	0.000
E16	The 4-year target for statewide Total Emissions Reduction (total daily kilograms) of PM2.5 for the Federal Fiscal Years 2018-2021Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	2.674

E17	Discuss the decisions and/or investments that contributed to the actual performance, and if they were effective in achieving the intended performance. For the PM2.5, this discussion:  1) Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]	CMAQ projects deliver both quantitative as well as qualitative benefits to air quality through emissions reductions and other benefits which may not be quantified. CTDOT's CMAQ-funded projects continue to have a positive impact on the air quality and reflect a focused approach on the actual benefits that are the intent of the program.  1. Comparison of the actual 4-year performance to the target performance The target was not met. A review of targets vs. performance yielded that the scope of one project contributing the quantitative benefit being used fot the target was substantially increased to include other work and so it became not CMAQ-eligible - though it was indeed delivered and the actual emissions reductions were achieved.
		Additionally, since the measure is cumulative, field E15 should repeat the value achieved for the 2-year performance period (E14) (particularly if greater than zero.)

#### Statewide Total Emission Reductions NOx Target #2

Question No	Description	Field Type
E18	The baseline cumulative emissions reductions (total daily kilograms) of NOx. This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative estimated emissions reductions (total daily kilograms) as reported to the CMAQ Public Access System for the 4 Federal Fiscal Years before the start of the 2017-2020 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	462.490
E19	The 2-year cumulative emissions reductions (total daily kilograms) of NOx. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the Federal Fiscal Year 2018-2021 performance period and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.	0.000

	To calculate the measure, data for Federal Fiscal Year 2018-2019 was extracted from the CMAQ Public Access System on or after July 1 of 2020. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a> <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	
E20	The 2-year target for statewide Total Emissions Reduction (total daily kilograms) of NOx for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	67.690
E21	The 4-year cumulative emissions reductions (total daily kilograms) of NOx. This value is the actual 4-year performance derived from the latest data collected through the end of the performance period. [23 CFR 490.107(b)(3)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2021 was extracted from the CMAQ Public Access System on or after July 1 of 2022. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	0.000
E22	The 4-year target for statewide Total Emissions Reduction (total daily kilograms) of NOx for the Federal Fiscal Year 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	102.370

E23 Discuss the decisions and/or investments that CMAQ projects deliver both quantitative as well as qualitative contributed to the actual performance, and if they were effective in achieving the intended performance. benefits to air quality through For the NOx, this discussion: emissions reductions and other benefits which may not be quantified. CTDOT's CMAQ-1)Shall compare the actual 4-year performance to the 4-year target and document the reasons the target funded projects continue to have was or was not met. [23 CFR 490.107(b)(3)(ii)(B)] a positive impact on the air quality and reflect a focused approach on the actual benefits that are the intent of the program. 1. Comparison of the actual 4year performance to the target performance The target was not met. A review of targets vs. performance yielded that the scope of one project contributing the quantitative benefit being used fot the target was substantially increased to include other work and so it became not CMAQ-eligible though it was indeed delivered and the actual emissions reductions were achieved. Additionally, since the measure is cumulative, field E15 should repeat the value achieved for the 2-year performance period (E14) (particularly if greater than zero.)

#### Statewide Total Emission Reductions VOC Target #3

Question No	Description	Field Type
E24	The baseline cumulative emissions reductions (total daily kilograms) of VOC. This value is from the 2018 Baseline Performance Period Report and is cumulative statewide estimated emissions reductions (total daily kilograms) as reported to the CMAQ Public Access System for the 4 Federal Fiscal Years before the start of the Federal Fiscal Year 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	263.890
E25	The 2-year cumulative emissions reductions (total daily kilograms) of VOC. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the Federal Fiscal Year 2018-2021 performance period and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2019 was extracted from the CMAQ Public	0.000

E29	Discuss the decisions and/or investments that contributed to the actual performance, and if they were effective in achieving the intended performance. For the VOC, this discussion:	CMAQ projects deliver both quantitative as well as qualitative benefits to air quality through emissions reductions and other benefits which may not be
E28	The 4-year target for statewide Total Emissions Reduction (total daily kilograms) of VOC for the Federal Fiscal Year 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	30.140
	year performance derived from the latest data collected through the end of the performance period. [23 CFR 490.107(b)(3)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2021 was extracted from the CMAQ Public Access System on or after July 1 of 2022. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	
E27	2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]  The 4-year cumulative emissions reductions (total daily kilograms) of VOC. This value is the actual 4-	0.000
E26	The 2-year target for statewide Total Emissions Reduction (total daily kilograms) of VOC for the 2018- 2021 Performance Period that was reported in the	19.320
	Access System on or after July 1 of 2020. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	

1) Shall compare the actual 4-year performance to quantified. CTDOT's CMAQthe 4-year target and document the reasons the funded projects continue to have target was or was not met. [23 CFR a positive impact on the air 490.107(b)(3)(ii)(B)] quality and reflect a focused approach on the actual benefits that are the intent of the program. 1. Comparison of the actual 4year performance to the target performance The target was not met. A review of targets vs. performance yielded that the scope of one project contributing the quantitative benefit being used fot the target was substantially increased to include other work and so it became not CMAQ-eligible though it was indeed delivered and the actual emissions reductions were achieved. Additionally, since the measure is cumulative, field E15 should repeat the value achieved for the 2-year performance period (E14) (particularly if greater than zero.)

#### Statewide Total Emission Reductions PM10 Target #4

Question No	Description	Field Type
E30	The baseline cumulative emissions reductions (total daily kilograms) of PM10. This value is from the 2018 Baseline Performance Period Report and is cumulative statewide estimated emissions reductions (total daily kilograms) as reported to the CMAQ Public Access System for the 4 Federal Fiscal Years before the start of the Federal Fiscal Year 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	0.000
E31	The 2-year cumulative emissions reductions (total daily kilograms) of PM10. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the Federal Fiscal Year 2018-2021 performance period and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2019 was extracted from the CMAQ Public Access System on or after July 1 of 2020. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality	0.000

E32	Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a> The 2-year target for statewide Total Emissions Reduction (total daily kilograms) of PM10 for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	0.000
E33	The 4-year cumulative emissions reductions (total daily kilograms) of PM10. This value is the actual 4-year performance derived from the latest data collected through the end of the performance period. [23 CFR 490.107(b)(3)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2021 was extracted from the CMAQ Public Access System on or after July 1 of 2022. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	0.000
E34	The 4-year target for statewide Total Emissions Reduction (total daily kilograms) of PM10 for the Federal Fiscal Year Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	0.000
E35	Discuss the decisions and/or investments that contributed to the actual performance, and if they were effective in achieving the intended performance. For the PM10, this discussion:  1) Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]	Please see Note E1. The 4-year target set was consequently set at 0.0 and it was met.

#### **Statewide Total Emission Reductions CO Target #5**

Question No	Description	Field Type
E36	The baseline cumulative emissions reductions (total daily kilograms) of CO. This value is from the 2018 Baseline Performance Period Report and is the cumulative statewide estimated emissions reductions (total daily kilograms) as reported to the CMAQ Public Access System for the 4 Federal Fiscal Years before the start of the Federal Fiscal Year 2018-2021 performance period. [23 CFR 490.107(b)(1)(ii)(B)]	0.000
E37	The 2-year cumulative emissions reductions (total daily kilograms) of CO. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the Federal Fiscal Year 2018-2021 performance period and is the same value provided for the 2020 Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.  To calculate the measure, data for Federal Fiscal Year 2018-2019 was extracted from the CMAQ Public Access System on or after July 1 of 2020. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	
E38	The 2-year target for statewide Total Emissions Reduction (total daily kilograms) of CO for the 2018- 2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A]	0.000
E39	The 4-year cumulative emissions reductions (total daily kilograms) of CO. This value is the actual 4-year performance derived from the latest data collected through the end of the performance period. [23 CFR 490.107(b)(3)(ii)(A)]  FHWA provided the prepopulated value. If the State DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.	

	To calculate the measure, data for Federal Fiscal Year 2018-2021 was extracted from the CMAQ Public Access System on or after July 1 of 2022. [23 CFR 490.105(e)(4)(i)(B), 23 CFR 490.809(a) and 23 CFR 490.809(b)(2)] For additional information on calculating the measure, see FHWA's Computation Guidance for Congestion Mitigation and Air Quality Improvement (CMAQ) Program Total Emissions Reduction Measure: <a href="https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf" target="_blank">https://www.fhwa.dot.gov/tpm/guidance/emission_reduction_guide.pdf</a>	
E40	The 4-year target for statewide Total Emissions Reduction (total daily kilograms) of CO for the Federal Fiscal Year 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(b)(2)(ii)(E)]	0.000
E41	Discuss the decisions and/or investments that contributed to the actual perforance, and if they were effective in achieving the intended performance. For the VOC, this discussion:  1)Shall compare the actual 4-year performance to the 4-year target and document the reasons the target was or was not met. [23 CFR 490.107(b)(3)(ii)(B)]	Please see Note E1. The 4-year target set was consequently set at 0.0 and it was met.

# **Attachments**

S.No	Section	Attachment Detail
1	Freight	Filename: 2022_CT_Freight_CT Freight Plan Truck Bottleneck Analysis.pdf  Notes: Freight - Top Bottlenecks are listed on pages 12, 13 and are referenced by Route and To-From intersections (Traffic Message Channels.) TMCs are conflated with the State's Linear Referencing System (LRS) so that Route and Milepoint are available and are accurately spatially represented in the DOT's enterprise Geographic Information Systems.  Attachment Url:
2	Freight	Filename: 2022_CT_Freight_CT Freight Plan Update_Draft Final Plan_toFHWA_11-3-22.pdf  Notes: Freight - The freight plan submitted incorporates changes made during the Public Comment period and is being reviewed by FHWA for approval. Performance targets are informed from the PMF submittal for the freight movement measure.  Attachment Url: