

Transportation Performance Management  
State Biennial Performance Report  
for Performance Period 2018-2021

**2018**

**Baseline Performance Period Report**

**Iowa**

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**State Contact:**

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## Summary of Performance Measures and Targets

Performance Measures	Baseline	2-Year Target	4-Year Target
Percentage of Pavements of the Interstate System in Good Condition			49.4%
Percentage of Pavements of the Interstate System in Poor Condition			2.7%
Percentage of Pavements of the Non-Interstate NHS in Good Condition	50.9%	48.8%	46.9%
Percentage of Pavements of the Non-Interstate NHS in Poor Condition	10.6%	13.2%	14.5%
Percentage of NHS Bridges Classified as in Good Condition	48.9%	45.7%	44.6%
Percentage of NHS Bridges Classified as in Poor Condition	2.3%	3.7%	3.2%
Percent of the Person-Miles Traveled on the Interstate That Are Reliable	100.0%	99.5%	99.5%
Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable			95.0%
Truck Travel Time Reliability (TTTR) Index	1.12	1.14	1.14
Annual Hours of Peak Hour Excessive Delay Per Capita: Urbanized Area 1			
Annual Hours of Peak Hour Excessive Delay Per Capita: Urbanized Area 2			
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Urbanized Area 1			
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Urbanized Area 2			
Total Emission Reductions: PM2.5			
Total Emission Reductions: NOx			
Total Emission Reductions: VOC			
Total Emission Reductions: PM10			
Total Emission Reductions: CO			
Percent change in tailpipe CO2 emissions on the NHS compared to the calendar year 2017 level			

# Overview

## OVERVIEW SECTION 1

O1

Please provide a description of how the State DOT is coordinating with relevant MPOs in target selection. [23 CFR 490.105(e)(2)] (Optional)

Iowa DOT has a long history of coordination with the nine MPOs in the state. Coordination on performance-based planning and programming in general, and target selection specifically, has been integrated into the existing 3C planning framework. Coordination efforts have included

- Routine updates on MAP-21/FAST Act rulemakings and new requirements through standing quarterly meetings with MPOs and through regular email updates to MPO staff.

- The creation of a standalone performance and asset management webpage to house Iowa DOT targets and additional information and resources from Iowa DOT, FHWA, FTA, and others. This website can be accessed through the Iowa DOT Office of Systems Planning website.

- The integration of a performance management agreement between the State and MPOs in each MPO's unified planning work program. These agreements address the requirements of 23 CFR 450.314 (h).

Regarding the specific pavement and bridge (PM2) and system and freight reliability (PM3) targets documented in this report, MPOs were updated on the internal Iowa DOT working groups that were meeting to discuss these targets during the winter and spring of 2018. An update on the direction of those discussions and likely methodology was provided at the March 2018 quarterly meeting; this provided an opportunity for MPO questions and input. At the beginning of May, MPOs were sent memos outlining the Iowa DOT's proposed methodology and draft targets and were provided a formal opportunity to comment. No comments were received.

MPOs were notified of the targets

		<p>that were set on May 20, 2018, and Iowa DOT has continued to be in contact with them on the topic to help support MPO target-setting efforts. This has included directly providing MPO-level data for the PM2 measures, and joining the pooled fund for the MAP-21 tool developed by the Center for Advanced Transportation Technology (CATT) Lab at the University of Maryland. Iowa has committed to five years of participation in the pooled fund, which provides access to the MAP-21 tool to MPOs.</p>
<p><b>O2</b></p>	<p>Please discuss how the established targets provided in this performance report supports expectations documented in longer range plans, such as the State asset management plan required by 23 U.S.C. 119(e) and the long-range statewide transportation plan. [23 CFR 490.107(b)(1)(ii)(C)]</p>	<p>Overall, the targets documented in this report help support the implementation of the goals and strategies of several Iowa DOT plans, including the State long-range plan Iowa in Motion 2045, the Transportation Asset Management Plan (TAMP), and the State Freight Plan. Iowa in Motion 2045 sets the long-term system vision for Iowa's transportation network, and outlines key investment areas, needs, and strategies to help achieve the vision. The TAMP outlines the way the Iowa DOT manages bridges and pavements, what the desired state of good repair for these assets is, the amount of funding anticipated to be available for stewardship in the next ten years, and what gaps may exist between available funding and desired outcomes. The State Freight Plan provides long-term strategic direction for freight planning across modes, and includes system analysis, issues identification, freight improvement strategies, and a freight investment plan.</p> <p>Collectively, and combined with other system and modal plans, these documents form the framework within which Iowa DOT projects are identified, developed, and programmed. Iowa DOT primary system projects are identified and programmed as part of the Iowa Transportation Improvement Program (Five-Year Program) process. The Five-Year Program document is updated and approved annually by the Iowa Transportation Commission</p>

		<p>(Commission), and becomes part of the Statewide Transportation Improvement Program (STIP).</p> <p>The targets identified for pavement, bridge, system reliability, and freight reliability document the short-term outcomes that are anticipated from project identification and programming that is based on the goals, strategies, and direction of the long-range plan, asset management plan, freight plan, and other planning efforts. The targets help document what progress is anticipated to be made in these performance areas and what outcomes are likely based on current and anticipated investment strategies. Performance targets provide a linkage between projects that will occur in the next few years and the long-term goals and framework of performance-based plans, and provide a way to gauge whether the investments being made in the system are having the desired effect on system condition for the various measures.</p>
<p><b>O3</b></p>	<p>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 baseline condition/performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)</p>	<p>Overall, Iowa DOT has approached target-setting with a data-driven, risk-based approach. This involves analyzing available data, developing prediction intervals, focusing on the probability of achieving targets, and setting targets based on staff and management comfort with the associated level of risk. When historical data was available for a measure, trend models were developed based on available history. When adequate historical data was not available, variability within existing data was evaluated to help inform predictions. Specific methodology is discussed in more detail for each performance measure.</p> <p>Memos on these measures, Iowa DOT planning documents, and additional background information can be found on the Iowa DOT performance management and asset management website, available through the Iowa DOT Office of Systems Planning website.</p>
<p><b>OVERVIEW SECTION 2</b></p>		
<p><b>O4</b></p>	<p>Who should FHWA contact with questions?</p>	<p>Andrea White, Statewide Planning</p>

		Coordinator
<b>O5</b>	What is the phone number for this contact?  Please provide 10-digit number (area code and phone number) without formatting. (e.g., 1234567890)	5152391210
<b>O6</b>	What is the email address for this contact?	andrea.white@iowadot.us

# Pavement

Pavement Performance Overview	
<b>P1</b>	<p>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 baseline condition, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)</p> <p>A full description of Iowa DOT's pavement target methodology, including figures and tables, can be found in the attached memo, Iowa DOT Pavement and Bridge Performance Measures (PM2 memo). This memo was developed as part of the target-setting process. Much of the information in this report has been excerpted from the memo.</p> <p>Iowa DOT has a long history of collecting pavement condition data. However, there is a lack of historical data to use for forecasting condition per the new FHWA definitions, because past data collection did not include all elements now required. This has made developing a data-driven approach to target forecasting a challenge. See discussion provided for each target for more detail on the target-setting methodology.</p> <p>Targets have been set without the benefit of a long history of data to develop trends and forecasts. Additionally, targets were required to be set by May 20, 2018; the Iowa DOT's working group for these measures started meeting in late 2017 to discuss methodology and targets. The baseline data from 2017 was not initially fully available during this timeframe, meaning the data that Iowa DOT working groups were reviewing and reformatting into the FHWA-defined good, fair, and poor categories may not have been complete. This resulted in targets likely being based on incomplete baseline data, and may have impacted the intended accuracy of the target setting process in cases where the baseline used in target setting was different from the baseline FHWA has subsequently derived.</p> <p>It is important to note that pavement targets are based on FHWA definitions of good and poor, which have been nationally defined to achieve a standard</p>



		<p>measurement across States. These definitions of good and poor may not be the same as other pavement condition metrics used by the Iowa DOT to evaluate system condition, and may not be the best indicator of what a typical traveler considers to be good or poor pavement condition.</p>
<p><b>Statewide Performance Target for the Percentage of Pavements of the Interstate System in Good Condition</b></p>		
P2	<p>Please provide the 4-year target for the statewide percentage of pavements of the Interstate System in Good condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p> <p>Notes: For the first performance period only, baseline condition and 2-year targets are not required for the Pavements on the Interstate System measures. [23 CFR 490.105(e)(7)]</p>	49.4
P3	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 4-year target established for the 2018-2021 Performance Period for the statewide percentages of pavements of the Interstate System in Good condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>For the Interstate System, there are four years of data available. As shown on page 3 of the PM2 memo, the percentage good has decreased and the percentage poor has increased in that timeframe.</p> <p>Iowa DOT used a hybrid approach to target setting, given that the FHWA data requirements are different from what Iowa DOT uses to manage pavements, particularly with respect to how the pavement sections are segmented. To establish targets, Iowa DOT used output from its pavement management system to forecast the percentage of all Interstate pavements in good, fair, and poor condition annually through 2024. This forecasting model is based on pavement management data and factors in committed projects.</p> <p>This forecast was augmented with information about the observed variability in annual measures in order to account for uncertainty in future values. This results in a probabilistic prediction interval which can give some information about the likelihood of observing specific values in the future. These probabilistic targets are calculated at various levels of confidence. Since data submitted in 2022 will have been collected in 2021, the forecast for that collection year is</p>

		<p>used for the forecast baseline of the 4- year targets for Iowa DOT. The confidence level of 75 percent was used for target-setting. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.</p> <p>Associated figures and tables can be found on pages 3-4 of the PM2 memo.</p>
<b>Statewide Performance Target for the Percentage of Pavements of the Interstate System in Poor Condition</b>		
<b>P4</b>	<p>Please provide the 4-year target for the statewide percentage of pavements of the Interstate System in Poor condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p> <p>Notes: For the first performance period only, baseline condition and 2-year targets are not required for the Pavements on the Interstate System measures. [23 CFR 490.105(e)(7)]</p>	2.7
<b>P5</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 4-year target established for the 2018-2021 Performance Period for the statewide percentages of pavements of the Interstate System in Poor condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>For the Interstate System, there are four years of data available. As shown on page 3 of the PM2 memo, the percentage good has decreased and the percentage poor has increased in that timeframe.</p> <p>Iowa DOT used a hybrid approach to target setting, given that the FHWA data requirements are different from what Iowa DOT uses to manage pavements, particularly with respect to how the pavement sections are segmented. To establish targets, Iowa DOT used output from its pavement management system to forecast the percentage of all Interstate pavements in good, fair, and poor condition annually through 2024. This forecasting model is based on pavement management data and factors in committed projects.</p> <p>This forecast was augmented with information about the observed variability in annual measures in order to account for uncertainty in future values. This results in a probabilistic prediction interval which can give some information</p>

		<p>about the likelihood of observing specific values in the future. These probabilistic targets are calculated at various levels of confidence. Since data submitted in 2022 will have been collected in 2021, the forecast for that collection year is used for the forecast baseline of the 4- year targets for Iowa DOT. The confidence level of 75 percent was used for target-setting. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.</p> <p>Associated figures and tables can be found on pages 3-4 of the PM2 memo.</p>
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**Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Good Condition.**

**Note: For the first performance period only, the overall condition for all Non-Interstate NHS pavement types will use IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]**

<b>P6</b>	<p>Baseline statewide percentage of pavements of the Non-Interstate NHS in Good condition. [23 CFR 490.107(b)(1)(ii)(B)] For the first performance period, 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)]</p> <p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent.</p>	50.9
<b>P7</b>	<p>Please provide the 2-year target for the statewide percentage of pavements of the Non-Interstate NHS in Good condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p>	48.8
<b>P8</b>	<p>Please provide the 4-year target for the statewide percentage of pavements of the Non-Interstate NHS in Good condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p>	46.9
<b>P9</b>	<p>Please provide a discussion, to the maximum extent practicable, on the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the statewide percentages of pavements of the Non-Interstate NHS in Good condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>For the non-Interstate NHS, there was only one year of data available, shown on page 5 of the PM2 memo. Iowa DOT has a long history of collecting pavement condition data. However, there is a</p>

		<p>lack of historical data to use for forecasting condition per the new FHWA definitions, because past data collection did not include all elements now required. This has made developing a data-driven approach to target forecasting a challenge. Due to the restructuring of past IRI data that is necessary to compute the measure per FHWA guidelines, only one year of data was available at the time the measure was constructed.</p> <p>Iowa DOT used a hybrid approach to target setting, given that the FHWA data requirements are different from what Iowa DOT uses to manage pavements, particularly with respect to how the pavement sections are segmented. To establish targets, Iowa DOT used output from its pavement management system to forecast the IRI of all non-Interstate NHS pavements and classify each segment as good, fair, or poor condition through 2024. This forecasting model is based on pavement management data and factors in committed projects.</p> <p>Given the small sample of data to work with, this forecast was augmented with information derived from a bootstrap estimate of variance in order to estimate potential uncertainty in future values. The combined information results in a probabilistic prediction interval which can give some information about the likelihood of observing specific values in the future. These probabilistic targets are calculated at various levels of confidence. Since data submitted in 2020 will have been collected in 2019, and data submitted in 2022 will have been collected in 2021, the forecasts for those collection years are used for the forecast baseline of the 2- and 4- year targets for Iowa DOT. The confidence level of 75 percent was used for target-setting. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the</p>
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		<p>working groups and management.</p> <p>Associated figures and tables can be found on pages 5-6 of the PM2 memo.</p>
<p><b>Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Poor Condition.</b></p>		
<p><b>Note: For the first performance period only, the overall condition for all Non-Interstate NHS pavement types will use IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]</b></p>		
<b>P10</b>	<p>Baseline statewide percentage of pavements of the Non-Interstate NHS in Poor condition. [23 CFR 490.107(b)(1)(ii)(B)] For the first performance period, 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)]</p> <p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent.</p>	10.6
<b>P11</b>	<p>Please provide the 2-year target for the statewide percentage of pavements of the Non-Interstate NHS in Poor condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p>	13.2
<b>P12</b>	<p>Please provide the 4-year target for the statewide percentage of pavements of the Non-Interstate NHS in Poor condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p>	14.5
<b>P13</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the statewide percentages of pavements of the Non-Interstate NHS in Poor condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>For the non-Interstate NHS, there was only one year of data available, shown on page 5 of the PM2 memo. Iowa DOT has a long history of collecting pavement condition data. However, there is a lack of historical data to use for forecasting condition per the new FHWA definitions, because past data collection did not include all elements now required. This has made developing a data-driven approach to target forecasting a challenge. Due to the restructuring of past IRI data that is necessary to compute the measure per FHWA guidelines, only one year of data was available at the time the measure was constructed.</p> <p>Iowa DOT used a hybrid approach to target setting, given that the FHWA data requirements are different from what Iowa DOT uses</p>

		<p>to manage pavements, particularly with respect to how the pavement sections are segmented. To establish targets, Iowa DOT used output from its pavement management system to forecast the IRI of all non-Interstate NHS pavements and classify each segment as good, fair, or poor condition through 2024. This forecasting model is based on pavement management data and factors in committed projects.</p> <p>Given the small sample of data to work with, this forecast was augmented with information derived from a bootstrap estimate of variance in order to estimate potential uncertainty in future values. The combined information results in a probabilistic prediction interval which can give some information about the likelihood of observing specific values in the future. These probabilistic targets are calculated at various levels of confidence. Since data submitted in 2020 will have been collected in 2019, and data submitted in 2022 will have been collected in 2021, the forecasts for those collection years are used for the forecast baseline of the 2- and 4- year targets for Iowa DOT. The confidence level of 75 percent was used for target-setting. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.</p> <p>Associated figures and tables can be found on pages 5-6 of the PM2 memo.</p>
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**The line above marks the end of the required reporting. Everything below this line is related to optional targets.**

**Optional Additional Pavement Performance Target #1 [23 CFR 490.105(e)(3)]**

<b>P14</b>	Which measure are you establishing an optional additional target? Percentage of Pavements on the:	
<b>P15</b>	<p>Please indicate what area(s) the State DOT is establishing this additional target for (UZA stands for Urbanized Area).</p> <p>For each measure, a State DOT can only establish one additional target for the non-UZA area within their State. They can establish additional targets for any number and combination of UZAs.</p>	
<b>P16</b>	If this target is for a single UZA or group of UZAs, please indicate	

	<p>which UZA(s) are included in this target. This field is not applicable if the target is for the statewide urbanized area (all UZAs) or the non-UZA area (Statewide Rural and Small Urban Areas).</p> <p>Please enter the UZA with its official name, state abbreviation, and then the 5-digit UZA code in parentheses. For example: BIRMINGHAM, AL (07786).</p> <p>For a group of UZAs, please separate them with a semi-colon. For Example: BIRMINGHAM, AL (07786); AUBURN, AL (04033).</p>	
<b>P17</b>	<p>Please provide the current baseline condition for the selected measure in this target area. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p> <p>Notes: For the first performance period only, baseline condition and 2-year targets are not required for the Pavements on the Interstate System measures. [23 CFR 490.105(e)(7)]</p> <p>For the first performance period only, baseline condition for the all pavements on the non-Interstate NHS should be based on an overall condition using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]</p>	
<b>P18</b>	<p>Please provide the 2-year target for the selected measure in this target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p> <p>Notes: For the first performance period only, baseline condition and 2-year targets are not required for the Pavements on the Interstate System measures. [23 CFR 490.105(e)(7)]</p>	
<b>P19</b>	<p>Please provide the 4-year target for the selected measure in the target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.313(f)] Enter 86.5% as 86.5.</p>	
<b>P20</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the selected measure in the target area. [23 CFR 490.107(b)(1)(ii)(A)] Include the source of the urbanized dataset used to establish the targets. [23 CFR 490.107(b)(1)(ii)(D)]</p>	

# Bridge

## Bridge Performance Overview

**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 baseline condition, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)

A full description of Iowa DOT's bridge target methodology, including figures and tables, can be found in the attached memo, Iowa DOT Pavement and Bridge Performance Measures (PM2 memo). This memo was developed as part of the target-setting process. Much of the information in this report has been excerpted from the memo.

Iowa DOT has a long history of collecting bridge condition data. However, this data was not structured per the current FHWA definitions of good, fair, and poor, and historical data had to be reformatted to form a history and baseline for target-setting. This has made developing a data-driven approach to target forecasting a challenge. See discussion provided for each target for more detail on the target-setting methodology.

Targets were required to be set by May 20, 2018, and the Iowa DOT's working group for these measures started meeting in late 2017 to discuss methodology and targets. The baseline data from 2017 was not fully available during this timeframe, meaning the data that Iowa DOT working groups were reviewing and reformatting into the FHWA-defined good, fair, and poor categories did not have an up-to-date baseline. This resulted in targets being based on incomplete data, and may have impacted the intended accuracy of the target setting process since the baseline used in target setting was different from the baseline FHWA has subsequently derived.

It is important to note that these targets are based on FHWA definitions of good and poor, which have been nationally defined to achieve a standard measurement across States. These definitions of good and poor may not be the same as other bridge condition metrics the Iowa DOT uses to evaluate system condition, and



		may not be the best indicator of what a typical traveler considers to be good or poor bridge condition.
<b>Statewide Performance Target for Bridges on the NHS Classified as in Good Condition</b>		
<b>B2</b>	<p>Baseline statewide percentage of deck area of bridges on the NHS classified as in Good condition. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent.</p>	48.9
<b>B3</b>	<p>Please provide the 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	45.7
<b>B4</b>	<p>Please provide the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	44.6
<b>B5</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the statewide percentage of deck area of bridges on the NHS classified as in Good condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>Historical annual values for NHS bridge condition per the current FHWA condition definitions are shown on page 13 of the PM2 memo. From 2007-2017, the percent good and percent poor both declined, while the percent fair increased. This historical data was used to develop models to predict future condition. Because of the relatively short-term nature of the targets, the methodology being utilized focuses on historical information and creates a forecast based on trends. The approach relies on the use of prediction intervals around the trend model forecast to inform a “risk-based” target setting method.</p> <p>A prediction interval approach enables a focus on the acceptable risk of meeting or failing to meet a target, which allows stakeholders at all levels of the organization to understand the targets in better context. The bridge management and PM2 working groups evaluated several prediction intervals and recommended a prediction interval of 75%, meaning that there would</p>

		<p>be 75% confidence that the actual percentage of the total bridge deck area in good condition would be higher than the targets and the actual percentage of the total bridge area in poor condition would be lower than the targets.</p> <p>For each category of bridge condition, a time-series model was developed. An integrated moving average (IMA) model was used to predict the values for the next 5 years at various confidence levels for each measure. This helped illustrate the level of risk associated with various confidence levels, as well as the fact that higher confidence levels lead to more conservative targets. The IMA model output and forecast for NHS bridges' total deck area in good condition at various confidence levels is provided on page 11 of the PM2 memo.</p> <p>Targets are rounded down to the nearest tenth of a percent for percent good, and rounded up to the nearest tenth of a percent for percent poor. The targets are being set at the 75 percent confidence level. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management. Since data submitted in 2020 will have been collected in 2019, and data submitted in 2022 will have been collected in 2021, the forecasts for those years are the 2- and 4- year targets for Iowa DOT.</p> <p>Associated figures and tables can be found on pages 11-13 of the PM2 memo.</p>
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<b>Statewide Performance Target for Bridges on the NHS Classified as in Poor Condition</b>		
<b>B6</b>	<p>Baseline statewide percentage of deck area of bridges on the NHS classified as in Poor condition. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent.</p>	2.3
<b>B7</b>	Please provide the 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition that	3.7

	<p>the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	
<b>B8</b>	<p>Please provide the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	3.2
<b>B9</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>Historical annual values for NHS bridge condition per the current FHWA condition definitions are shown on page 13 of the PM2 memo. From 2007-2017, the percent good and percent poor both declined, while the percent fair increased. This historical data was used to develop models to predict future condition. Because of the relatively short-term nature of the targets, the methodology being utilized focuses on historical information and creates a forecast based on trends. The approach relies on the use of prediction intervals around the trend model forecast to inform a “risk-based” target setting method.</p> <p>A prediction interval approach enables a focus on the acceptable risk of meeting or failing to meet a target, which allows stakeholders at all levels of the organization to understand the targets in better context. The bridge management and PM2 working groups evaluated several prediction intervals and recommended a prediction interval of 75%, meaning that there would be 75% confidence that the actual percentage of the total bridge deck area in good condition would be higher than the targets and the actual percentage of the total bridge area in poor condition would be lower than the targets.</p> <p>For each category of bridge condition, a time-series model was developed. An integrated moving average (IMA) model was used to predict the values for the next 5 years at various confidence levels for each measure. This helped</p>

		<p>illustrate the level of risk associated with various confidence levels, as well as the fact that higher confidence levels lead to more conservative targets. The IMA model output and forecast for NHS bridges' total deck area in poor condition at various confidence levels is provided on page 12 of the PM2 memo.</p> <p>Targets are rounded down to the nearest tenth of a percent for percent good, and rounded up to the nearest tenth of a percent for percent poor. The targets are being set at the 75 percent confidence level. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management. Since data submitted in 2020 will have been collected in 2019, and data submitted in 2022 will have been collected in 2021, the forecasts for those years are the 2- and 4- year targets for Iowa DOT.</p> <p>Associated figures and tables can be found on pages 11-13 of the PM2 memo.</p>
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**The line above marks the end of the required reporting. Everything below this line is related to optional targets.**

**Optional Additional Bridge Performance Target #1 [23 CFR 490.105(e)(3)]**

<b>B10</b>	Which measure are you establishing an optional additional target? Percentage of deck area of Bridges on the NHS classified as in:	
<b>B11</b>	<p>Please indicate what area(s) the State DOT is establishing this additional target for (UZA stands for Urbanized Area).</p> <p>For each measure, a State DOT can only establish one additional target for the non-UZA area within their State. They can establish additional targets for any number and combination of UZAs.</p>	
<b>B12</b>	<p>If this target is for a single UZA or group of UZAs, please indicate which UZA(s) are included in this target. This field is not applicable if the target is for the statewide urbanized area (all UZAs) or the non-UZA area (Statewide Rural and Small Urban Areas).</p> <p>Please enter the UZA with its official name, state abbreviation, and then the 5-digit UZA code in parentheses. For example: BIRMINGHAM, AL (07786).</p> <p>For a group of UZAs, please separate them with a semi-colon. For Example: BIRMINGHAM, AL (07786); AUBURN, AL (04033).</p>	
<b>B13</b>	Please provide the baseline condition for the selected measure in this target area. [23 CFR 490.107(b)(1)(ii)(B)]	

	<p>The data submitted must cover the condition derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	
<b>B14</b>	<p>Please provide the 2-year target for the selected measure in this target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	
<b>B15</b>	<p>Please provide the 4-year target for the selected measure in the target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected condition by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.409(c)] Enter 86.5% as 86.5.</p>	
<b>B16</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the selected measure in the target area. [23 CFR 490.107(b)(1)(ii)(A)] Include the source of the urbanized dataset used to establish the targets. [23 CFR 490.107(b)(1)(ii)(D)]</p>	

# Reliability

## Travel Time Reliability Performance Overview

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 baseline performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)

A full description of Iowa DOT's system reliability target methodology, including figures and tables, can be found in the attached memo, Iowa DOT System Performance and Freight Measures (PM3 memo). This memo was developed as part of the target-setting process. Much of the information in this report has been excerpted from the memo.

Data for these measures is provided by FHWA through the National Performance Management Research Data Set (NPMRDS). This is a national data set of average travel times on the NHS. Since February 2017, speed and travel time data from INRIX has been used for the NPMRDS, which is hosted by the University of Maryland Center for Advanced Transportation Technology Laboratory (CATT Lab). CATT Lab has also developed a MAP-21 tool to assist States and MPOs in calculating reliability measures. This tool is available through a pooled fund effort led by the American Association of State Highway and Transportation Officials (AASHTO). Iowa DOT has joined the pooled fund for a five-year period, which provides access to the MAP-21 tool and output for the State and Iowa MPOs.

In addition to joining the pooled fund, Iowa DOT downloaded the NPMRDS data and processed it internally to calculate the reliability measures. Long-term, Iowa DOT anticipates continuing to conduct this analysis in-house to improve its understanding of the measures and the raw data. The internal analysis and CATT Lab output both evolved over the winter and spring of 2018, as clarifications were provided from FHWA on the measure calculations. Additionally, January 2017 NPMRDS data was reformatted to match the February-December 2017 NPMRDS data, to allow for a full baseline year of consistent data.

		<p>The updated CATT Lab output for the 2017 baseline for Iowa's reliability measures was downloaded on April 30, 2018, and was used for target-setting, with Iowa DOT's internal analysis being used for validation purposes. NPMRDS data has been collected for several years, but due to a change in vendor, only one full year of data is available from NPMRDS that is formatted in the manner data is currently being collected. This creates challenges in setting targets because there is not enough information to create trends or understand variability in the annual measure. As a proxy for annual variation, the monthly variance of each measure in 2017 was used in target-setting. The monthly output is assumed to follow a normal distribution. For each measure, the standard deviation of the 2017 monthly data is calculated, and the cumulative distribution properties of a normal distribution are used to derive probabilistic (risk-based) targets.</p> <p>It is important to note that these targets are based on FHWA definitions of reliability, which have been nationally defined to achieve a standard measurement across States. These metrics and definitions of reliability may not be the same as other reliability metrics the Iowa DOT uses to evaluate system performance, and may not be the best indicator of what a typical traveler considers to be a reliable transportation system.</p>
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<b>Statewide Performance Target for the Percent of the Person-Miles Traveled on the Interstate That Are Reliable</b>		
<b>R2</b>	<p>Baseline percent of person-miles traveled on the Interstate that are reliable. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the performance derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest tenth of a percent.</p>	100.0
<b>R3</b>	<p>Please provide the 2-year target for the percent of the person-miles traveled on the Interstate that are reliable that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2019.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR</p>	99.5

	490.101 (Target definition) & 23 CFR 490.513(b)] Enter 86.5% as 86.5.	
<b>R4</b>	<p>Please provide the 4-year target for the percent of the person-miles traveled on the Interstate that are reliable that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.513(b)] Enter 86.5% as 86.5.</p>	99.5
<b>R5</b>	Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the percent of the person-miles traveled on the Interstate that are reliable. [23 CFR 490.107(b)(1)(ii)(A)]	<p>To develop targets, the percentage of reliable Interstate person-miles was calculated for each month in 2017. The standard deviation of the 12 months' values was calculated and equaled 0.345. This output is assumed to follow a normal distribution. Using the cumulative distribution properties of a normal distribution helps arrive at probabilistic (risk-based) targets. For example, to be at least 75 percent confident in achieving the target, that would correspond to a multiplier of 0.67 for the standard deviation estimate (this is often known as the "z-value"). Therefore, the target at a 75 percent confidence level would be established using the 2017 annual baseline of <math>100.0 - (0.67 * 0.345) = 99.5</math> (rounded down from 99.77 to the nearest half-percent).</p> <p>Pages 2-4 of the PM3 memo provide the monthly data, possible targets at various risk levels, and statistical analysis for this performance measure. It is important to note that the relationship between monthly and annual data is not straightforward, as the level of travel time reliability (LOTTR) is recalculated based on the 80th and 50th percentile travel times for the specific timeframe being evaluated. This can result in annual values that are different than the average of monthly values.</p> <p>As discussed in the overview for this section, there is a lack of historical data for these measures to determine trends. Thus, the same targets are being established for both the 2-year 2020 target and the 4-year 2022 target. The targets are being set at the 75 percent confidence level. The Iowa DOT has had several working</p>



		groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.
<b>Statewide Performance Target for the Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable</b>		
<b>R6</b>	<p>Please provide the 4-year target for the percent of the person-miles traveled on the non-Interstate NHS that are reliable that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.513(c)] Enter 86.5% as 86.5.</p> <p>Note: For the first performance period only, baseline performance and 2-year targets are not required for the Non-Interstate NHS reliability measure. [23 CFR 490.105(e)(7)]</p>	95.0
<b>R7</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 4-year target established for the 2018-2021 Performance Period for the percent of the person-miles traveled on the non-Interstate NHS that are reliable. [23 CFR 490.107(b)(1)(ii)(A)]</p>	<p>To develop targets, the percentage of reliable non-Interstate NHS person-miles was calculated for each month in 2017. The standard deviation of the 12 months' values was calculated and equaled 0.843. This output is assumed to follow a normal distribution. Using the cumulative distribution properties of a normal distribution helps arrive at probabilistic (risk-based) targets. For example, to be at least 75 percent confident in achieving the target, that would correspond to a multiplier of 0.67 for the standard deviation estimate (this is often known as the "z-value"). Therefore, the target at a 75 percent confidence level would be established using the 2017 annual baseline of <math>95.6 - (0.67 \times 0.843) = 95.0</math> (rounded down from 95.03 to the nearest half percent).</p> <p>Pages 5-6 of the PM3 memo provide the monthly data, possible targets at various risk levels, and statistical analysis for this performance measure. It is important to note that the relationship between monthly and annual data is not straightforward, as the level of travel time reliability (LOTTR) is recalculated based on the 80th and 50th percentile travel times for the specific timeframe being evaluated. This can result in annual values that are different than the average of monthly values.</p>

		As discussed in the overview for this section, there is a lack of historical data for these measures to determine trends. The target derived based on this methodology was held constant as the 4-year target. The target is being set at the 75 percent confidence level. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.
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**The line above marks the end of the required reporting. Everything below this line is related to optional targets.**

**Optional Additional Reliability Performance Target #1 - Reliable Travel Times [23 CFR 490.105(e)(3)]**

<b>R8</b>	Which measure are you establishing optional additional targets? Percentage of person miles on the:	
<b>R9</b>	Please indicate what area(s) the State DOT is establishing this additional target for (UZA stands for Urbanized Area).  For each measure, a State DOT can only establish one additional target for the non-UZA area within their State. They can establish additional targets for any number and combination of UZAs.	
<b>R10</b>	If this target is for a single UZA or group of UZAs, please indicate which UZA(s) are included in this target. This field is not applicable if the target is for the statewide urbanized area (all UZAs) or the non-UZA area (Statewide Rural and Small Urban Areas).  Please enter the UZA with its official name, state abbreviation, and then the 5-digit UZA code in parentheses. For example: BIRMINGHAM, AL (07786).  For a group of UZAs, please separate them with a semi-colon. For Example: BIRMINGHAM, AL (07786); AUBURN, AL (04033).	
<b>R11</b>	Please provide the current baseline performance for the selected measure in this target area. [23 CFR 490.107(b)(1)(ii)(B)]  The data submitted must cover the performance derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]  The data must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) & 23 CFR 490.513] Enter 86.5% as 86.5.  Note: For the first performance period only, baseline performance and 2-year targets are not required for the Non-Interstate NHS reliability measure. [23 CFR 490.105(e)(7)]	
<b>R12</b>	Please provide the 2-year target for the selected measure in this target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2019.  Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) & 23 CFR 490.513(c)] Enter 86.5% as 86.5.	

	Note: For the first performance period only, baseline performance and 2-year targets are not required for the Non-Interstate NHS reliability measure. [23 CFR 490.105(e)(7)]	
<b>R13</b>	<p>Please provide the 4-year target for the selected measure in the target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2021.</p> <p>Target must be reported to the nearest tenth of a percent. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.513(b)] Enter 86.5% as 86.5.</p>	
<b>R14</b>	Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the selected measure in the target area. [23 CFR 490.107(b)(1)(ii)(A)] Include the source of the urbanized dataset used to establish the targets. [23 CFR 490.107(b)(1)(ii)(D)]	

# Freight

Freight Reliability (Movement) Performance Overview		
F1	<p>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 baseline performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)</p>	<p>A full description of Iowa DOT's freight reliability target methodology, including figures and tables, can be found in the attached memo, Iowa DOT System Performance and Freight Measures (PM3 memo). This memo was developed as part of the target-setting process. Much of the information in this report has been excerpted from the memo.</p> <p>Data for these measures is provided by FHWA through the National Performance Management Research Data Set (NPMRDS). This is a national data set of average travel times on the NHS. Since February 2017, speed and travel time data from INRIX has been used for the NPMRDS, which is hosted by the University of Maryland Center for Advanced Transportation Technology Laboratory (CATT Lab). CATT Lab has also developed a MAP-21 tool to assist States and MPOs in calculating reliability measures. This tool is available through a pooled fund effort led by the American Association of State Highway and Transportation Officials (AASHTO). Iowa DOT has joined the pooled fund for a five-year period, which provides access to the MAP-21 tool and output for the State and Iowa MPOs.</p> <p>In addition to joining the pooled fund, Iowa DOT downloaded the NPMRDS data and processed it internally to calculate the reliability measures. Long-term, Iowa DOT anticipates continuing to conduct this analysis in-house to improve its understanding of the measures and the raw data. The internal analysis and CATT Lab output both evolved over the winter and spring of 2018, as clarifications were provided from FHWA on the measure calculations. Additionally, January 2017 NPMRDS data was reformatted to match the February-December 2017 NPMRDS data, to allow for a full baseline year of consistent data.</p>

		<p>The updated CATT Lab output for the 2017 baseline for Iowa's reliability measures was downloaded on April 30, 2018, and was used for target-setting, with Iowa DOT's internal analysis being used for validation purposes. NPMRDS data has been collected for several years, but due to a change in vendor, only one full year of data is available from NPMRDS that is formatted in the manner data is currently being collected. This creates challenges in setting targets because there is not enough information to create trends or understand variability in the annual measure. As a proxy for annual variation, the monthly variance of each measure in 2017 was used in target-setting. The monthly output is assumed to follow a normal distribution. For each measure, the standard deviation of the 2017 monthly data is calculated, and the cumulative distribution properties of a normal distribution are used to derive probabilistic (risk-based) targets.</p> <p>It is important to note that these targets are based on the FHWA definition of freight reliability, which has been nationally defined to achieve a standard measurement across States. This metric and definition of reliability may not be the same as other freight reliability metrics the Iowa DOT uses to evaluate system performance, and may not be the best indicator of what a typical traveler or freight shipper or carrier considers to be a reliable transportation system.</p>
<b>F2</b>	Please attach a PDF document listing locations of truck freight bottlenecks within the State, including those identified in the National Freight Strategic Plan. If the State DOT has prepared a State Freight Plan under 49 U.S.C. 70202, within the last 2 years, then the State Freight Plan may serve as the basis for identifying truck freight bottlenecks. 23 CFR 490.107(b)(1)(ii)(E)	Yes, document was uploaded in the Attachment tab.
<b>F3</b>	If the required document was not included in this biennial reporting, please explain. (Optional).	
<b>Statewide Performance Target for the Truck Travel Time Reliability (TTTR) Index</b>		
<b>F4</b>	<p>Baseline statewide Truck Travel Time Reliability Index. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the performance derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p>	1.12

	The data must be reported to the nearest hundredth.	
<b>F5</b>	<p>Please provide the 2-year target for the statewide Truck Travel Time Reliability Index established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2019.</p> <p>Target must be reported to the nearest hundredth. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.613(b)] For example, enter 2.54.</p>	1.14
<b>F6</b>	<p>Please provide the 4-year target for the statewide Truck Travel Time Reliability Index established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] Target should reflect expected performance by the end of 2021.</p> <p>Target must be reported to the nearest hundredth. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.613(b)] For example, enter 2.54.</p>	1.14
<b>F7</b>	Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the statewide Truck Travel Time Reliability Index. [23 CFR 490.107(b)(1)(ii)(A)]	<p>To develop targets, the truck travel time reliability (TTTR) index was calculated for each month in 2017. The standard deviation of the 12 months' values was calculated and equaled 0.027. This output is assumed to follow a normal distribution. Using the cumulative distribution properties of a normal distribution helps arrive at probabilistic (risk-based) targets. For example, to be at least 75 percent confident in achieving the target, that would correspond to a multiplier of 0.67 for the standard deviation estimate (this is often known as the "z-value"). Therefore, the target at a 75 percent confidence level would be established using the 2017 annual baseline of <math>1.12 + (0.67 \times 0.027) = 1.14</math> (rounded up from 1.138 to the nearest hundredth).</p> <p>Pages 7-9 of the PM3 memo provide the monthly data, possible targets at various risk levels, and statistical analysis for this performance measure. It is important to note that the relationship between monthly and annual data is not straightforward, as the TTTR index is recalculated based on the 95th and 50th percentile travel times for the specific timeframe being evaluated. This can result in annual values that are different than the average of monthly values.</p> <p>As discussed in the overview for this section, there is a lack of historical data for these measures to determine trends. Thus, the same targets are being established for both the 2-year 2020 target and</p>

		<p>the 4-year 2022 target. The targets are being set at the 75 percent confidence level. The Iowa DOT has had several working groups for the various federal performance measures, and 75 percent has generally been identified as a threshold for acceptable risk for federal performance measures by the working groups and management.</p>
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**The line above marks the end of the required reporting. Everything below this line is related to optional targets.**

**Optional Additional Freight Reliability Performance Target (TTTR) #1 [23 CFR 490.105(e)(3)]**

<b>F8</b>	<p>Please indicate what area(s) the State DOT is establishing this additional target for (UZA stands for Urbanized Area).</p> <p>For each measure, a State DOT can only establish one additional target for the non-UZA area within their State. They can establish additional targets for any number and combination of UZAs.</p>	
<b>F9</b>	<p>If this target is for a single UZA or group of UZAs, please indicate which UZA(s) are included in this target. This field is not applicable if the target is for the statewide urbanized area (all UZAs) or the non-UZA area (Statewide Rural and Small Urban Areas).</p> <p>Please enter the UZA with its official name, state abbreviation, and then the 5-digit UZA code in parentheses. For example: BIRMINGHAM, AL (07786).</p> <p>For a group of UZAs, please separate them with a semi-colon. For Example: BIRMINGHAM, AL (07786); AUBURN, AL (04033).</p>	
<b>F10</b>	<p>Please provide the baseline performance for this measure in this target area. [23 CFR 490.107(b)(1)(ii)(B)]</p> <p>The data submitted must cover the performance derived from the latest data collected through the beginning date of the performance period specified in 23 CFR 490.105(e)(4)(i). [23 CFR 490.107(b)(1)(ii)]</p> <p>The data must be reported to the nearest hundredth. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.613(b)] For example, enter 2.54.</p>	
<b>F11</b>	<p>Please provide the 2-year target for the measure in this target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] The target should reflect expected performance by the end of 2019.</p> <p>Target must be reported to the nearest hundredth. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.613(b)] For example, enter 2.54.</p>	
<b>F12</b>	<p>Please provide the 4-year target for the measure in the target area that the State DOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)] The target should reflect expected performance by the end of 2021.</p> <p>Target must be reported to the nearest hundredth. [23 CFR 490.101 (Target definition) &amp; 23 CFR 490.613(b)] For example, enter 2.54.</p>	
<b>F13</b>	<p>Please provide a discussion, to the maximum extent practicable, of the basis for the 2-year and 4-year targets established for the 2018-2021 Performance Period for the selected measure in the target area. [23 CFR 490.107(b)(1)(ii)(A)] Include the source of the urbanized dataset used to establish the targets. [23 CFR</p>	

	490.107(b)(1)(ii)(D)]	
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## Attachments

S.No	Section	Attachment Name
1	Freight	2018_IA_Freight_Iowa State Freight Plan - Bottleneck Excerpt.pdf
2	Pavement	2018_IA_Pavement_Iowa DOT Pavement and Bridge Performance Measures.pdf
3	Bridge	2018_IA_Bridge_Iowa DOT Pavement and Bridge Performance Measures.pdf
4	Reliability	2018_IA_Reliability_Iowa DOT System Performance and Freight Measures.pdf
5	Freight	2018_IA_Freight_Iowa DOT System Performance and Freight Measures.pdf