# FY 2021 PERFORMANCE PLAN

# FY 2019 PERFORMANCE REPORT

## APPENDIX 1:

PERFORMANCE DATA COMPLETENESS AND RELIABILITY

U.S. Department of Transportation

# APPENDIX 1

# PERFORMANCE DATA COMPLETENESS AND RELIABILITY

## BUREAU OF TRANSPORTATION STATISTICS (BTS) REVIEW OF THE U.S. DEPARTMENT OF TRANSPORTATION'S FISCAL YEAR 2019 PERFORMANCE REPORT AND FISCAL YEAR 2021 PERFORMANCE PLAN

This appendix outlines the processes the U.S. Department of Transportation (DOT) pursues to support the general accuracy and reliability of performance information, reduce the risk of inaccurate performance data, and provide a sufficient level of confidence to the Congress and to the public that the information presented is credible as appropriate to its intended use (Office of Management and Budget (OMB) Circular A-11, section 260.9: Assessing the completeness, reliability, and quality of performance data).[1]

49 USC 6302(b)(3)(B)(ix) tasks the BTS Director to review and report to the Secretary of Transportation on the sources and reliability of the statistics used to measure outputs and outcomes as required by the Government Performance and Results Act of 1993 (GPRA). To complete this task, BTS assesses the completeness, compatibility, reliability, and quality of the performance measurements that feed into the DOT Annual Performance Report (APR) and Annual Performance Plan (APP). The review included all measures that DOT actively collects. Per 49 USC 6302(b)(3)(B)(ix), BTS judges the reliability and other statistical properties of the measures, not whether the measures are the most appropriate reflection of performance for the particular goal(s) or program(s).

Each section of this appendix includes a description of a performance measure and associated data provided by the agency(ies) in charge of the measure.

- The Scope statement provides a definition and an overview of the performance measure.
- The Sources statement identifies the data sources from which the data for each measure were taken.
- The Statistical Issues statement has comments, provided by BTS and the agency in charge of the measure, discussing variability of the measure and other issues.
- The Completeness statement indicates limitations due to missing data or availability of current measures, and provides methods used to develop projections, as appropriate.
- The Reliability statement gives the reader an indication of consistency and quality of the measure.
- The Verification and Validation (V&V) statement explains the processes agencies have in place to support the general accuracy and reliability of performance information, reduce the risk of inaccurate performance data, and provide a sufficient level of confidence to the Congress and the public that the information presented is credible, as appropriate, for its intended use (OMB Circular A-11, section 260.9: Assessing the completeness, reliability and quality of performance data).

[1] Measures not provided to the Bureau of Transportation Statistics (BTS) for verification and validation prior to the submission deadline for the fiscal year (FY) 2019 Annual Performance Report are not included.

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# ACRONYMS AND INITIALISMS

| ACRONYM OR INITIALISM | TERM |
|---|---|
| AADT | Annual Average Daily Traffic |
| AAR | Association of American Railroads |
| ACAT | Acquisition Category |
| ACQ (in OST-M) | Acquisition |
| AJR-G | Office of Performance Analysis |
| ANG | Office of NextGen |
| AP | Availability Payment |
| ASIAS | Aviation System Analysis and Sharing |
| ASPM | Aviation System Performance Metrics |
| ASQP | Airline Service Quality Performance |
| ATCSCC | Air Traffic Control System Command Center |
| ATO | Air Traffic Organization |
| ATQA | Air Traffic Quality Assurance |
| ATRs | Automated Traffic Recorders |
| AVP | Accident Investigation and Prevention |
| AVS | Aviation Safety |
| BASICs | Behavior Analysis and Safety Improvement Categories |
| BIC | Best in Class |
| BTS | Bureau of Transportation Statistics |
| BUILD | Better Utilizing Investments to Leverage Development |
| BVLOS | Beyond Visual Line-of-Sight |
| CASTLE | Consolidated Automated System for Time and Labor Entry |
| CEDAR | Comprehensive Electronic Data Analysis Reporting |
| CEO | Chief Executive Officer |
| CFR | Code of Federal Regulations |

| | |
|---|---|
| CO2 | Carbon Dioxide |
| CSAM | Cyber Security Assessment and Management |
| CY | Calendar Year |
| DoD | Department of Defense |
| DOT | Department of Transportation |
| D2D | Data to Decisions |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statements |
| EMS | Emergency Medical Services |
| FAA | Federal Aviation Administration |
| FARS | Fatality Analysis Reporting System |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FPDS | Federal Procurement Data System |
| FPDS-NG | FPDS Next Generation |
| FPPS | Federal Personnel/Payroll System |
| FRA | Federal Railroad Administration |
| FRPP | Federal Real Property Program |
| FTA | Federal Transit Administration |
| FY | Fiscal Year |
| GA | General Aviation |
| GAJSC | General Aviation Joint Steering Committee |
| GAMA | General Aviation Manufacturers Association |
| GARVEE | Grant Anticipation Revenue Vehicle |
| GPS | Global Positioning System |
| GSA | General Services Administration |
| GVWR | Gross Vehicle Weight Rating |
| HM | Hazardous Materials |

| | |
|---|---|
| HMIS | Hazardous Materials Information System |
| HPMS | Highway Performance Monitoring System |
| HQ | Headquarters |
| HR | Human Resources |
| IAB | International Advisory Board |
| IBC | Department of Interior Business Center |
| IPP | Integration Pilot Program |
| IRI | International Roughness Index |
| IT | Information Technology |
| KPI | Key Performance Indicators |
| KSN | Knowledge Services Network |
| LAANC | Low Altitude Airspace and Notification Capability |
| LOB | Line of Business |
| MADT | Monthly Average Daily Traffic |
| MARAD | Maritime Administration |
| MCMIS | Motor Carrier Management Information System |
| MSP (in MARAD) | Maritime Security Program |
| NAC | NextGen Advisory Committee |
| NAR | Non-Accident Releases |
| NAS | National Airspace System |
| NBI | National Bridge Inventory |
| NBIS | National Bridge Inspection Standards |
| NEC | Northeast Corridor |
| NEMSIS | National Emergency Medical Services Information System |
| NEPA | National Environmental Policy Act |
| NextGen | Next Generation Air Transportation System |
| NHS | National Highway System |
| NHTSA | National Highway Traffic Safety Administration |

| | |
|---|---|
| NOI | Notice of Intent |
| NPIAS | National Plan of Integrated Airport Systems |
| NPMRDS | National Performance Management Research Data Set |
| NRC | National Response Center |
| NTD | National Transit Database |
| NTL | National Transportation Library |
| NTML | National Traffic Management Log |
| NTSB | National Transportation Safety Board |
| OA | Operating Administration |
| OA (in OST-M) | Occupancy Agreements |
| OAG | Official Airline Guide |
| OCIO | Office of the Chief Information Officer |
| OHMS | Office of Hazardous Materials Safety |
| OIRA | Office of Information and Regulatory Affairs (OMB) |
| OMB | Office of Management and Budget |
| OOP | Operations Over People |
| OPM | Office of Personnel Management |
| OPSNET | Operational Network |
| OSPE | Office of the Senior Procurement Executive |
| OST-P | Office of the Secretary of Transportation - Policy |
| OST-R | Office of the Secretary of Transportation - Research |
| OTP | On-Time Performance |
| PAB | Private Activity Bond |
| PAR | Police Accident Report |
| PCR | Police Crash Reports |
| PHMSA | Pipeline and Hazardous Materials Safety Administration |
| PMT | Person-Miles Traveled |

| | |
|---|---|
| PRISM | Performance and Registration Information Systems Management |
| QA/QC | Quality Assurance/Quality Control |
| REMS | Real Estate Management System |
| R&D | Research and Development |
| ROD | Record of Decision |
| RRF | Ready Reserve Force |
| RTF | Reduce the Footprint |
| SF | Square Feet |
| SIB | State Infrastructure Bank |
| SLSDC | Saint Lawrence Seaway Development Corporation |
| SME | Subject Matter Experts |
| SPIRE | Simplified Program Information Reporting and Evaluation |
| STB | Surface Transportation Board |
| TAC | Technical Assistance Center |
| TERM | Transit Economic Requirements Model |
| TIFIA | Transportation Infrastructure Finance and Innovation Act |
| TIGER | Transportation Investment Generating Economic Recovery |
| TMI | Traffic Management Initiatives |
| TrAMS | Transit Award Management System |
| TRANSCOM | Transportation Command |
| TTTR | Truck Travel Time Reliability |
| TVT | Travel Volume Trends |
| UAS | Unmanned Aircraft Systems |
| VISA | Voluntary Intermodal Sealift Agreement |
| VMT | Vehicle Miles Traveled |
| WCF | Working Capital Fund |

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Motor Vehicle-Related Fatalities (Overall) (FHWA, NHTSA, FMCSA)

*Measure*
Motor vehicle-related roadway fatalities per 100 million vehicle miles traveled (VMT).

*Scope*
Roadway fatalities per 100 million VMT are calculated for each calendar year (CY).

The number of fatalities included in National reports is a count of deaths of a motorist or a non-motorist occurring within 30 days of a crash involving a motor vehicle traveling on a traffic-way customarily open to the public within the 50 States, the District of Columbia, and Puerto Rico.

A roadway fatality is the death of any vehicle occupant (any driver, passenger, or person riding on the exterior of a motor vehicle), including motorcycle (two- or three-wheeled motor vehicle) riders or passengers, and any non-occupants (any person not an occupant of a motor vehicle in transport, such as a pedestrian or cyclist) in a motor vehicle crash.

VMT include all vehicle miles traveled by all types of vehicles including:

- Passenger cars,
- Motorcycles,
- Buses,
- All two-axle four tire vehicles (including vans, pickup trucks, and sport/utility vehicles),
- Single unit two-axle six tires or more trucks, and
- Combination trucks.

*Sources*
Roadway fatality data are obtained from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS). The FARS database is a census of fatal traffic crashes within the 50 states, the District of Columbia, and Puerto Rico and is based on Police Crash Reports (PCRs).

Annual VMT are estimated using data from the Federal Highway Administration's (FHWA's) Highway Performance Monitoring System (HPMS). The HPMS compiles data from the States annually concerning the condition and performance of all roads in the United States. HPMS includes the annual average daily traffic (AADT) by road segment. States provide AADT on all Federal-aid highway sections. These data are based on traffic counts taken at least once every three years on the National Highway System (NHS), interstate, and principal arterials and at least once every six years on minor arterials and collectors. Traffic counts are adjusted by States to reflect day-of-week and seasonal variations, current year conditions, and axle corrections, as necessary. When these AADTs are multiplied by the length of each road segment and summed for all road segments and days of the year, they yield the annual VMT.

Monthly VMT are calculated using the annual VMT from HPMS and the monthly traffic counts states submit to FHWA from their automated traffic recorders (ATRs). These ATRs are permanent traffic counting devices such as inductive loops in the roadway. There are about 4,000 ATRs that are reported to FHWA each month. ATR data are submitted and processed using the Travel Monitoring Analysis System. Monthly average daily traffic (MADT) is computed from the ATR traffic counts. Each MADT is compared with the MADT for the same month the previous year to yield a change rate. The change rates are averaged by functional class of road. If a State does not provide traffic data in time, their change rates are estimated from the surrounding States. Monthly VMT are estimated and reported in FHWA's Traffic Volume Trends (TVT) by combining the change rates for each month with the most recent annual VMT from HPMS. The TVT report is available to the public within 60 days after the close of the month. Data that covers a minimum of 30 States and 70 percent of the VMT is required for publication.

Roadway fatality counts rates for 2017 were taken from the 2017 FARS annual report file and rates derived using FHWA's VMT, March 2019.

*Statistical Issues*
Both HPMS and TVT are based on samples of the traffic, there are associated sampling errors.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in October 2018.

VMT are complete through 2017. The final 2017 VMT estimate was available in March 2019.

*Reliability*
To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating state differences in collecting and maintaining relevant crash records.

*Verification and Validation*
FARS counts of motor vehicle crash fatalities are known to be different from fatality statistics by cause of death reported by the National Center for Health Statistics, because FARS captures fatalities from vehicle crashes only on public roadways and death within 30 days of the crash.

NHTSA is careful to ensure consistency in FARS data by establishing training, numerous quality control measures and standard data coding guidelines, thereby assuring adequate National data to facilitate accurate analyses. For example, to complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

Training for field personnel includes a new analyst training program that provides a self-directed preparatory training followed by a five-day classroom session along with an annual system-wide training consisting of all analysts. Training issues identified throughout the year and changes to the system are addressed at the annual system-wide training. Ongoing coding assistance, quality checks, and guidance to FARS analysts are available through a FARS hotline. The data itself are controlled upon entry with the FARS data entry system edit checks. These edit checks are updated annually along with a Coding and Validation Manual that provides definitions, rules, and guidance for each data element. The quality of a FARS case also is monitored for completeness, unknown values, and violations of edit check rules. Once in the database, the FARS data are also monitored through statistical quality control charts which identify deviations from expected trends in the data and indicate when an inconsistency in the data occurs.

While these activities help to ensure consistency in data acquisition, additional factors such as changes in the collection of the data in States and corresponding changes in FARS make monitoring data quality more complex. When these changes occur, it can limit the effectiveness of monitoring data using trend analysis to identify potential problems. To help address these issues, steps have been taken to develop additional means to support data quality that involves manual reviews of the case work coded by the FARS analysts—the FARS case re-coding process.

The FARS case re-coding process was developed to conduct annual case sampling and re-coding for data quality monitoring, analyst performance assessment, and training. The design combines the concepts of selected case re-coding with State-specific training. This quality assurance process uses samples from the current file year so that corrective actions to improve the quality of the data can be performed throughout the file year when inconsistencies are identified. The aim is to provide more immediate benefit from a case re-coding effort in the form of analyst training and have more tangible effects on data quality.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Motor Vehicle-Related Fatalities (by Type)—Passenger Vehicle Occupant Fatalities (FHWA, NHTSA, FMCSA)

*Measure*
Passenger vehicle occupant fatalities per 100 million VMT.

*Scope*
Passenger vehicle occupant fatalities per 100 million vehicle VMT are calculated for each CY.

The number of fatalities included in National reports is a count of passenger vehicle occupant deaths occurring within 30 days of a crash involving a motor vehicle traveling on a traffic-way customarily open to the public within the 50 states, the District of Columbia, and Puerto Rico.

An occupant is any person inside (drivers and passengers) or on the exterior of a passenger vehicle in transport.

VMT include vehicle miles traveled by all types of passenger vehicles including:

- Passenger cars,
- Vans,
- Pickup trucks, and
- Sport/utility vehicles.

*Sources*
Roadway fatality data are obtained from the NHTSA FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on PCRs.

See Reduce Motor Vehicle-Related Fatalities (Overall) for VMT source information.

Roadway fatality counts for 2017 were taken from the 2017 FARS Annual Report File and rates derived using VMT March 2019. For information on the TVT, see Reduce Motor Vehicle-Related Fatalities (Overall).

*Statistical Issues*
Both HPMS and TVT are based on samples of the traffic, there are associated sampling errors.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in October 2018.

VMT are complete through 2017. The 2018 VMT estimate will be available by March 2019.

*Reliability*
There is concern about consistency in vehicle counts across States. Further research is needed to address this concern.

To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

## Reduce Motor Vehicle-Related Fatalities (by Type)—Large Truck and Bus (FHWA, NHTSA, FMCSA)

*Measure*
Large truck and bus fatalities per 100 million VMT (all vehicle types).

*Scope*
The number of fatalities included in National reports is a count of deaths occurring within 30 days of a crash involving large trucks or buses traveling on a traffic-way customarily open to the public within the 50 States, the District of Columbia, and Puerto Rico.

VMT include all vehicle miles traveled by all types of vehicles including:

- Passenger cars,
- Motorcycles,
- Buses,
- All 2-axle four tire vehicles (including vans, pickup trucks, and sport/utility vehicles),
- Single unit 2-axle six tire or more trucks, and
- Combination trucks.

*Sources*
Roadway fatality data are obtained from the NHTSA FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on PCRs. A large truck is defined in FARS as a truck with a gross vehicle weight rating (GVWR) greater than 10,000 pounds. A bus is defined in FARS as any motor vehicle designed primarily to transport nine or more persons, including the driver.

See Reduce Motor Vehicle-Related Fatalities (Overall) for VMT source information.

*Statistical Issues*
Both HPMS and TVT are based on samples of the traffic, there are associated sampling errors.

Projections depend on the continuation of individual and market behavior regarding highway safety policies, vehicle miles traveled, seat belt use, and alcohol-related fatalities for large trucks and buses. The assumptions inherent in these projections, together with the normal levels of uncertainty inherent in statistical evaluations, may influence the accuracy of the projection.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in October 2018.

VMT are complete through 2017. The 2018 VMT estimate was available by March 2019.

*Reliability*
There is concern about consistency in vehicle counts across states. Further research is needed to address this concern.

To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Motor Vehicle-Related Fatalities (by Type)—Non-Occupant (FHWA, NHTSA, FMCSA)

*Measure*
Non-occupant fatalities (pedestrian, bicycle) per 100,000 population.

Starting in CY 2016, this measure changed to fatalities per 100,000 population to better align with the DOT strategic plan.

*Scope*
The number of fatalities included in National reports is a count of non-occupant deaths occurring within 30 days of a crash involving a motor vehicle traveling on a traffic-way customarily open to the public within the 50 States, the District of Columbia, and Puerto Rico.

A non-occupant is any person involved in a traffic crash who is not an occupant of a motor vehicle in transport and includes:

- Pedestrians,
- Bicyclists and other pedal cyclists,
- Occupants of parked motor vehicles,
- Joggers and skateboard riders, and
- People riding on animals and in animal-drawn conveyances.

*Sources*
Roadway fatality data are obtained from NHTSA FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on Police Accident Reports (PARs).

Roadway fatality counts for 2017 were taken from the 2017 FARS Annual Report File and rates derived using VMT TVT, August 2017.

Population data are obtained from the U.S. Bureau of the Census.

*Statistical Issues*
Non-occupant fatalities (pedestrian, bicycle) occur in places not covered by FARS, which is limited to public roads.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in October 2018.

*Reliability*
To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Motor Vehicle-Related Fatalities (by Type)—Motorcyclist (FHWA, NHTSA, FMCSA)

*Measure*
Motorcyclist fatalities per 100,000 motorcycle registrations.

*Scope*
Motorcyclist fatalities per 100,000 motorcycle registrations are calculated for each CY.

The number of motorcyclist fatalities included in National reports is a count of motorcyclist (rider (operator) and passenger) deaths occurring within 30 days of a crash involving a motorcycle traveling on a traffic-way customarily open to the public within the 50 States, the District of Columbia, and Puerto Rico.

A motorcycle is a two- or three-wheeled motor vehicle designed to transport one or two people, including motor scooters, minibikes, and mopeds.

*Sources*
Roadway fatality data are obtained from NHTSA FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on PCRs.

States collect motorcycle registration data and provide the data to FHWA, which then publishes the data to the public.

Fatality counts for CY 2017 were taken from the 2017 FARS Annual Report File, and rates derived using FHWA's motorcycle registration data, March 2019.

*Statistical Issues*
Motorcyclist fatalities occur in places not covered by FARS, which is limited to public roads.

The FHWA estimates of registered motorcycles may be an underestimate of the true number of motorcycles used on the roads each year. Data collected by the Motorcycle Industry Council corroborate this possibility and have noted that not all motorcyclists register their bikes (National Transportation Safety Board (NTSB)—Safety Recommendation Date: Oct 3, 2007).

The motorcycle registration date varies among States. Although many States continue to register specific vehicle types on a CY basis, all States use some form of the "staggered" system to register motor vehicles. The "staggered" system permits a distribution of the renewal workload throughout all months. Most States allow pre-registration or permit "grace periods" to better distribute the annual registration workload.

To present vehicle registration data uniformly for all States, the information is shown as nearly as possible on a calendar-year basis. Insofar as possible, the registrations reported exclude transfers and re-registrations and any other factors that could otherwise result in duplication of the vehicle counts.

*Completeness*
Annual traffic fatalities are available through CY 2017, published in October 2018.

*Reliability*
The FHWA motorcycle registration data includes all vehicles that have been registered at any time during the CY. Data include vehicles that were retired during the year and vehicles that were registered in more than one State. In some States, it is also possible that, contrary to the FHWA reporting instructions, vehicles that have been registered twice in the same State may be reported as two vehicles. The NHTSA data include only those vehicles that are published by FHWA. Therefore, they do not include vehicles registered in the last half of the CY or vehicles that may only be registered for a part of a year such as those for farm use.

To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce High Risk Motor Carriers (FMCSA)

*Measure*
Average number of days to investigate "High Risk" designated carriers.

*Scope*
The average number of days from identification until investigation is the average number of days from identification as High-Risk to when an investigation is conducted, for carriers investigated during this time.

The average number of days from identification as "High-Risk" to when an investigation is conducted. The Federal Motor Carrier Safety Administration (FMCSA) policy is to investigate identified high-risk carriers within 90 days.

This measure informs and guides the following programs for FMCSA:

- Roadway safety policy,
- Safety program planning,
- Regulatory development,
- Resource allocation, and
- Operational mission performance.

The FMCSA identifies and investigates carriers that—based on roadside performance data and investigation results—pose the greatest safety risk.

*Carrier type and high-risk criteria:*
1. Passenger Carriers—two or more of the following Behavior Analysis and Safety Improvement Categories (BASICs) at or above the 90th percentile for one month: unsafe driving, crash indicator, Hours-Of-Service compliance, and vehicle maintenance. These are the BASICs most closely correlated with crash risk, and have not received an onsite investigation in the previous 12 months.
2. Non-Passenger Carriers—two or more of the above BASICs at or above the 90th percentile for two consecutive months, and have not received an onsite investigation in the previous 18 months.

*Sources*
Investigation data are obtained from the Motor Carrier Management Information System (MCMIS). The MCMIS Crash File contains data on commercial trucks and buses in fatal, injury, and towaway crashes (crashes in which at least one vehicle is disabled as a result of the crash and transported away from the crash scene). Crash severity thresholds and vehicle type definitions in MCMIS differ slightly from those in FARS and the General Estimating System/Crash Report Sampling System, and all tables are noted accordingly.

*Statistical Issues*
The MCMIS Crash File is intended to be a census of trucks and buses involved in fatal, injury, and towaway crashes; however, some States do not report all FMCSA-eligible crashes, and some report more than those that are eligible. FMCSA continues to work with the States to improve data quality and reporting of eligible large truck and bus crashes to the MCMIS crash file.

*Completeness*
MCMIS fatal crash data used in the calculation for large trucks and buses are reported based on a subset of the Model Minimum Uniform Crash Criteria used by FARS.

Total annual fatalities are available from MCMIS through CY 2018.

Because FMCSA investigation results take time to upload, all data are considered preliminary for 22 months to allow for changes.

*Reliability*
Further research is needed.

*Verification and Validation*
FMCSA analyzes motor carrier self-reported MCMIS registration data and applies filters to identify and remove inaccurate entries to avoid over- or under-estimating values.

## Details on Safety Measures

### Goal 1/Objective 1: Systemic Safety Approach

## Reduce Motor Carrier Fatal Crashes (FMCSA)

*Measure*
Number of motor carrier incidents (number of large truck and bus fatal crashes).

*Scope*
The number of fatal crashes included in National reports includes a count of deaths occurring within 30 days of a crash involving large trucks or buses traveling on a traffic-way customarily open to the public within the 50 States, the District of Columbia, and Puerto Rico.

*Sources*
Roadway fatality data are obtained from the NHTSA FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on police accident reports (PARs). A large truck is defined in FARS as a truck with a GVWR greater than 10,000 pounds. A bus is defined in FARS as any motor vehicle designed primarily to transport nine or more persons, including the driver.

*Statistical Issues*
Further research is needed.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in August 2019.

*Reliability*
To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating State differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

## Details on Safety Measures

### Goal 1/Objective 1: Systemic Safety Approach

## Reduce Rail-Related Deaths and Injuries (FRA)

*Measures*
- Highway-rail grade crossing incident rate per million train-miles.
- Rail right-of way trespass incident rate per million train-miles.
- Train accident rate per million train-miles.

*Scope*
The railroad accident/incident reporting subsystem compiles rail-related accident and incident data from railroads subject to Federal Rail Administration (FRA) oversight. Railroads subject to oversight must have an accident and incident record-keeping system that meets or exceeds Federal standards. Requirements to report an event to FRA apply when the event's consequences exceed the annually adjusted damage threshold. The reporting threshold for CY 2016 was $10,500. A rail equipment (including train) accident is any collision, derailment, fire, explosion, act of God, or other event involving the operation of railroad on-track equipment (standing or moving) that results in damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, or roadbed. Railroads must also maintain internal records on accountable events (those that are generally less impactful than reportable events), employee on-duty injuries, and occupational illnesses that are not required to be reported to FRA. These internal records are subject to FRA review.

Railroads report train accidents on FRA form F6180.54, Rail Equipment Accident/Incident Report and operational data, including train-miles, on FRA form F6180.55, Railroad Injury and Illness Summary.

*Sources*
FRA's railroad accident/incident reporting subsystem compilation of railroad-reported data that railroads submit as required under 49 Code of Federal Regulations (CFR) Part 225. This subsystem contains approximately 40 years

of data on railroad casualties, train accidents, highway-rail grade crossing collisions, and operating statistics, including train-miles.

*Statistical Issues*
Highway-rail grade crossing incident rate is calculated in terms of train miles (operated). Adding vehicle exposure would provide a more accurate picture.

*Completeness*
Railroad systems that do not connect with the general rail system are excluded from reporting to FRA. Examples include: subway systems (e.g., Washington, D.C. Metro and New York City Subway); track existing inside an industrial compound; and insular rail (e.g., rail not connected to the general system and not intersecting a public highway-rail grade crossing or navigable waterway).

Although railroads are generally required to report accidents and incidents within 30 days after the end of the month in which the event occurred, FRA keeps its data files open for amendment for five years to capture late reports, audit findings, and other updates. Data must be updated if the costs of an accident are more than 10 percent higher or lower than the initially reported cost. Data processing requires up to 30 days to prepare the information for merging into the database. As a result, FRA measures are subject to change and might differ from previous reports. A more detailed explanation of this process is available in FRA's Guide for Preparing Accident/Incident Reports at http://safetydata.fra.dot.gov.

*Reliability*
FRA audits railroads' reporting and internal records. If railroads do not report accurately, completely, and timely, FRA can assess civil monetary penalties.

*Validation and Verification*
FRA's systems and periodic audits help validate railroad-submitted data to ensure that it is timely, complete, accurate, and reliable. Every 2 years, FRA conducts a data reporting audit of each of the seven largest carriers, known as Class I railroads, and Amtrak. FRA also audits the smaller railroads about every 5 years. The purpose of these audits is to check for properly completed reports and verify the reported data, including identifying accidents or incidents that meet thresholds, but were not reported. After verification and validation, FRA provides public access to the data through its website at http://safetydata.fra.dot.gov.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safe Rail Transport of Hazardous Materials (FRA)

*Measure*
Rate of Hazardous Materials Non-Accident Releases (NAR) per 10,000 tank-car originations.

*Scope*
NARs are the unintentional release of a hazardous material (HM) while in transportation, including loading and unloading while in railroad possession, that is not caused by a derailment, collision, or other rail related accident. NARs consist of leaks, splashes, and other releases from improperly secured or defective valves, fittings, and tank shells, and include undesired venting of non-atmospheric gases from safety relief devices. Normal safety venting of atmospheric gases such as carbon dioxide and nitrogen is not considered a NAR. Most reported NARs involve small quantities. Although 99.99 percent of all HM shipments are transported without incident, the tracking and analyzing of NAR data allows FRA to identify trends and set inspection priorities for inspection and auditing offeror (shipping/receiving) facilities and their "pre-trip" processes.

*Sources*
Pipeline and Hazardous Materials Safety Administration (PHMSA) Hazardous Material Release Reports (5800.1).

Surface Transportation Board (STB) Confidential Waybill Sample.

Association of American Railroads (AAR) Annual Hazmat Leak Reports.

*Statistical Issues*
None.

*Completeness*
This measure reflects data reported primarily by the Class I railroads with limited 5800.1 reporting from the regional and short line railroads. Initial 5800.1 reporting is required to be completed within 30 days of the discovery of a release, while a final report can take months to complete.

STB waybill data are provided to FRA on a quarterly basis.

AAR's annual leak reports are usually published in August (e.g., AAR will publish its 2018 data in August 2019).

*Reliability*
If the railroads do not report NARs timely and accurately, and FRA does not receive the waybill data from STB timely, FRA estimates specific inputs by extrapolating trends.

*Verification and Validation*
FRA does not audit or verify the data from outside sources. When subject matter experts (SME) observe inconsistencies or unexpected results, FRA works with those sources to resolve any questions. Validation of the previous CY takes place after receipt of AAR's annual leak report in August.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Transit Collisions Involving Persons (FTA)

*Measure*
Total rail transit collisions with persons.

*Scope*
Only includes rail transit systems subject to Federal Transit Administration's (FTA) State Safety Oversight Program. Excludes the Dubuque Street Elevator, Los Angeles Angel's Flight, Los Angeles Strand Beach Funicular, and the Las Vegas Monorail, all of which do not accept FTA funding and so are not subject to FTA's State Safety Oversight Program. Excludes all commuter rail systems, the Alaska Railroad, the PATH system in New York City, the Austin Capital Metro, and the Portland TriMet Westside Express system, all of which accept FTA funding, but are subject to FRA regulation. Excludes the St. Louis LOOP Trolley, which does not take FTA formula funding. Also excludes the Florida Virgin Brightline, which does not accept FTA funding and is subject to FRA regulation. Excludes all aerial tramway systems. Excludes Amtrak, including the FTA-funded Keystone Corridor and Maine Downeaster Corridor, which are grandfathered into FTA funding.

Only includes collisions between transit rail and a person that results in a reportable safety event, which in this case would be an event resulting in one or more fatalities, one or more serious injuries, or one or more people being taken away from the scene for medical treatment.

*Sources*
National Transit Database (NTD), Monthly Safety Event Reporting.

*Statistical Issues*
None, these data are collected as a complete count.

*Completeness*
Within the scope defined above, the data are complete. In some cases, a train may impact a person and the train operator may be aware of the collision. Such events are

inherently unknowable. In some cases, a transit operator may find a body in the right of way, in which case they make their best determination if a collision occurred.

*Reliability*
Transit systems must report reportable safety events to the NTD within 30 days of the event. Most reportable rail safety events must also be investigated by the State Safety Oversight Organization that has been designated in each State with rail transit. NTD safety event reports are reconciled against the list of State Safety Oversight Investigations on an annual basis. Data reports are self-certified by a designate of the transit system's Chief Executive Officer (CEO).

*Verification and Validation*
FTA employs an NTD Validation Services contractor that verifies and validates safety event reports.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Total Transit-Related Fatalities (FTA)

*Measure*
Total transit fatalities.

*Scope*
Only includes rail transit systems subject to FTA's State Safety Oversight Program. See Reduce Transit Collisions Involving Persons for systems excluded from oversight.

Additionally, fatalities are collected from all other non-rail transit systems. Excludes fatalities from rural transit systems and from small urbanized systems that receive a small system reporting waiver.

Transit fatality data include passengers, revenue facility occupants, trespassers, employees, other transit workers (e.g., contractors), pedestrians, occupants of third-party vehicles, and others. A transit fatality is a death within 30 days of an incident on transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle. Excluded are deaths due to medical conditions or natural causes occurring on public transportation systems. Also excluded are occupational safety deaths occurring inside administrative buildings.

*Sources*
NTD Monthly Safety Reports.

*Statistical Issues*
None, these data are collected as a complete count.

*Completeness*
Within the scope defined above, the fatality count data are complete.

*Reliability*
Transit systems must report reportable safety events to the NTD within 30 days of the event. Rail safety events are reconciled against State Safety Oversight Investigatory Reports. Data reports are self-certified by a designate of the transit system's CEO.

*Verification and Validation*
FTA employs an NTD Validation Services contractor that verifies and validates safety event reports.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Transit-Related Fatalities per 100 Million Miles (FTA)

*Measure*
Total transit fatalities per 100 million passenger-miles.

*Scope*
Only includes rail transit systems subject to FTA's State Safety Oversight Program. See Reduce Transit Collisions Involving Persons for systems excluded from oversight.

Additionally, fatalities are collected from all other non-rail transit systems. Excludes fatalities from rural transit systems and from small urbanized systems that receive a small system reporting waiver.

See Reduce Total Transit-Related Fatalities for transit fatalities included in the measure.

*Sources*
NTD Monthly Safety Reports.

*Statistical Issues*
Fatality rates are calculated by dividing CY fatalities by NTD report year passenger miles for those systems reporting monthly fatalities. The major source of uncertainty in the measure relates to passenger-miles traveled. Passenger-miles are an estimate typically derived from reported unlinked passenger trips and average trip length by each transit authority. Differences in measurement occur across transit authorities.

To approximate passenger-miles, total unlinked trips are multiplied by average trip length. An unlinked trip is recorded each time a passenger boards a transit vehicle, even though the rider may be transferring from one transit vehicle to another on the same journey. Transit authorities do not routinely record trip length. To obtain an average trip length for their bus routes, transit authorities use Automatic Passenger Counters with Global Positioning System (GPS) Technology or an FTA-approved sampling technique. To obtain passenger mile data on rail systems, ferry boats, and paratransit, transit authorities often use

computerized tracking systems, such as the Smart Card. In some cases, such as small fare-free systems or large free-transfer systems (e.g., the New York City subway), passenger miles are sampled directly since a 100 percent count of unlinked passenger trips is not available. Validation based on annual trend analysis is performed on the passenger mile inputs from the transit industry. The validation is performed by analysts at the NTD program.

*Completeness*
Within the scope defined above, the fatality count data are complete. Transit systems must report reportable safety events to the NTD within 30 days of the event.

*Reliability*
Rail safety events are reconciled against State Safety Oversight Investigatory Reports. Methodologies for reporting passenger miles must either follow FTA guidance, or else be approved by a qualified statistician. Data reports are self-certified by a designate of the transit system's CEO.

*Verification and Validation*
FTA employs an NTD validation services contractor that verifies and validates safety event reports. Passenger mile data are validated against the operations and financial data in the rest of the annual NTD report to ensure consistency and are validated against the prior year's reported passenger miles.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Serious Injuries from Motor Vehicle Crashes (NHTSA)

*Measure*
Occupants ejected from passenger vehicles per 100 Emergency Medical Services (EMS) motor vehicle crash dispatches.

*Scope*
EMS data from States and territories of the United States.

*Sources*
The National Emergency Medical Services Information System (NEMSIS) database. NEMSIS is a product of NHTSA's Office of EMS and in collaboration with the University of Utah Technical Assistance Center (TAC). It is a National database that is used to store EMS data from States and territories of the United States. NEMSIS is a universal standard for how patient care information resulting from an emergency 9-1-1 call for assistance is collected. NEMSIS is a collaborative system to improve patient care through the standardization, aggregation, and utilization of point of care EMS data at a local, State, and National level.

Local agencies send EMS data in the proper XML format to States, then on to the National EMS Database. The system is versatile and allows local and State agencies to customize their reports while also maintaining consistent National elements.

1. Local agency providers select elements according to their needs—keeping the National elements and State elements as part of their selected elements.
2. States select elements from the NEMSIS Dataset according to their needs—keeping the National elements as part of their selection.
3. The National elements are transmitted to the NEMSIS TAC to populate the National EMS Dataset.

*Statistical Issues*
The National EMS Database data are "event-based" and not "patient-based." That is, a single patient may

be represented in more than one record for a variety of reasons. For example, several agencies may respond to the same event (i.e., one patient) and each submit a patient care record to the National EMS Database.

*Completeness*
Data files received from contributing EMS agencies and States are checked for completeness, logical consistency, and proper formatting. Any data files not passing the NEMSIS validation and data cleaning processes are rejected or flagged; based upon the seriousness of the discovered errors. A data profile report is generated for each submitted file from a State (and/or submitting entity) allowing the opportunity to review the quality of submitted data, correct errors and resubmit their data if needed.

The proportion of missing data varies across data elements in National EMS Database. In most cases, NEMSIS data are not missing at random and analyses, therefore, are subject to bias if missing data are ignored. Excluding observations with missing values is the default for most software programs when running statistical analyses. Another option is to provide plausible values for the missing data, either by single value or multiple value imputation. A single imputation of a value may be an educated guess at the value, substitution of the mean value, or substitution based on a regression equation using other (observed) values. Most statistical software packages can do imputations without much difficulty.

*Reliability*
NEMSIS is a large convenience sample—it consists solely of data submitted by participating EMS agencies within states and it is not a population-based data set. In addition, the National EMS Database inherits the individual deficiencies originating from its contributing entities.

*Verification and Validation*
The NEMSIS TAC employs edit checks to identify invalid or out of range values for the variables included the research data set. There are currently over 300 edit checks.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safety of Fleet on United States Roadways (NHTSA)

*Measure*
Vehicle 5-Star Safety Rating.

*Scope*
Each year, NHTSA tests new cars, trucks, sport utility vehicles, and vans and rates them using the 5-Star Safety Rating system. Five stars indicate the highest safety rating and one star the lowest. The 5-Star Safety Rating evaluates how well vehicles perform in crash tests to help consumers make smart decisions about safety when purchasing a vehicle. Vehicle safety ratings are provided at the point of sale on the window sticker that is applied to new vehicles, on NHTSA's website, and other consumer information outlets. This provides consumers with a reliable, transparent, and unbiased assessment of the safety performance of passenger cars and trucks sold in America.

*Sources*
NHTSA fleet crash test program.

*Statistical Issues*
None.

*Completeness*
NHTSA conducts crash testing on approximately 85 percent of the new vehicle fleet. NHTSA categorizes vehicles by class and "curb" weight of a vehicle—standard equipment including the maximum capacity of fuel, oil, coolant, and air conditioning.

A vehicle's 5-Star Safety Rating combines the results of the frontal crash tests, side crash tests, and a rollover resistance test into one score that indicates the overall risk of injury to a vehicle occupant if the vehicle is involved in a crash. The rating also includes information about recommended advanced crash avoidance technologies:

- Forward collision warning,
- Automatic emergency braking, and
- Lane departure warning.

*Reliability*
NHTSA has developed detailed control mechanisms to ensure that the crash testing process is consistent and reliable for crash tests conducted across all brands and vehicle types. The data are carefully reviewed for any potential anomalies.

*Verification and Validation*
NHTSA's protocols for conducting crash tests has been developed, refined, and verified over the course of 50 years of the program.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Timeliness of Data (NHTSA)

*Measure*
Percentage of States that meet the quarterly timeliness benchmark for reporting motor vehicle fatalities in FARS.

*Scope*
The data collected are a count of deaths of a motorist or a non-motorist occurring within 30 days of a crash involving a motor vehicle traveling on a traffic-way open to the public within the 50 States, the District of Columbia, and Puerto Rico.

*Sources*
Roadway fatality data are obtained from NHTSA's FARS. The FARS database is a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, and is based on PCRs.

*Statistical Issues*
Further research is needed.

*Completeness*
Annual traffic fatalities are currently available through CY 2017, published in October 2018, and CY 2018 will be available in October 2019.

*Reliability*
To complete each FARS case, the analyst applies specific definitions and guidelines and inputs the appropriate element values for each data element into the data entry system. In this way, all data contained in the FARS system are uniform, eliminating state differences in collecting and maintaining relevant crash records.

*Verification and Validation*
See verification and validation for Reduce Motor Vehicle-Related Fatalities (Overall).

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Fatalities Caused by Pipelines and Hazardous Materials—Confirmed Fatalities Caused by the Release of Hazardous Materials Transported via Pipeline or Surface Transportation Conveyance (PHMSA)

*Measure*
Confirmed fatalities caused by the release of hazardous materials transported via pipeline or surface transportation conveyance.

*Scope*
Incidents on gas pipeline systems, liquefied natural gas facilities, and underground natural gas storage facilities must be reported to PHMSA under 49 CFR 191.15. Hazardous liquid and carbon dioxide (CO2) pipeline system accidents must be reported to PHMSA under 49 CFR 195.50. Both interstate and intrastate pipeline systems are subject to the reporting requirements. Additionally, any person in possession of hazardous material during air, water, rail, or highway transportation, including loading, unloading, and storage incidental to transportation, must report incidents if certain conditions are met under 49 CFR 171.15 and 171.16.

A fatality resulting from a failure in a hazardous materials transportation system in which there is a release of a hazardous liquid, CO2, or natural gas must be reported. This includes operator employees, contractors working for the operator, other workers in the right of way, emergency responders, and the public. If an injured person dies within 30 days of the incident date, it is counted as a death, not as an injury. PHMSA partners with operators, State partners, and other stakeholders to identify/confirm deaths that occurred due to a release of hazardous liquid, gas, or other hazardous materials regulated by PHMSA.

*Sources*
DOT/PHMSA incident data are used for this measure. For pipeline incidents, these data are derived from pipeline operator reports submitted on PHMSA Forms, F-7100.1, F-7100.2, F-7100.3, and F-7000-1. PHMSA regulations require incidents to be reported online through the PHMSA Portal. For incidents involving all other modes of transportation, hazardous materials transportation incident data are derived from reports submitted on Form DOT F 5800.1 and maintained in the Hazardous Materials Information System (HMIS). In addition, PHMSA's Office of Hazardous Materials Safety seeks information and data to identify potentially reportable incidents through the National Response Center (NRC), as well as the monitoring print, television, and social media daily.

*Statistical Issues*
Results in any single year should be interpreted with caution. There is some normal annual variation in the number of reported incidents each year, particularly given the small number of these fatalities, and this variation might not reflect real changes in the underlying risk.

Targets are presented as ranges to account for this variation. The target each year is set at one standard deviation from the trend line estimated based on best-fit function to account for normal variation year-to-year. This provides about 80 percent probability of achieving the target if the risk continues to follow the trend line. The trend line is evaluated and calibrated at the end of every fiscal year (FY).

The performance measure is not normalized for changes in exposure—external factors like changes in pipeline mileage, energy consumption, or U.S. population—that could affect the number of incidents with fatality.

*Completeness*
Compliance in reporting is very high and most incidents that meet reporting requirements are submitted. Operators must submit reports within 30 days of an incident or face penalties for non-compliance. There is typically a 30-day lag between the date of the pipeline incident and PHMSA receipt of the incident report. Pipeline operators can supplement incident reports at any time after original submittal. For other modes, there may be a 30- to 60-day lag in reporting, verifying, validating, and compiling information in the database for analysis, as many companies do not file incident reports on time. Filers have one year to modify their 5800.1 submission.

*Reliability*
PHMSA routinely cross-checks incident reports against

other sources of data, such as immediate notifications provided to the NRC and media outlets. PHMSA inspectors also regularly discuss accidents with operator personnel during routine inspections. PHMSA continues to work to improve the quality of the incident data.

*Verification and Validation*
All incident data are collected on OMB-approved forms online. Detailed OMB-approved instructions for incident reports are available on the PHMSA website. Validation checks are run in the online instrument prior to submittal to ensure all required data fields have been populated.

PHMSA staff are responsible for reviewing each incident report to ensure the data matches information gained during PHMSA investigation or media reports. Pipeline operators have online access to each report they have submitted. On the PHMSA website, the public can download all the incident raw data or view 20-year trend lines of pipeline incident data with views of individual report data available.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safe Delivery of Pipeline Products and Hazardous Materials—Incidents Involving Death or Major Injury Resulting from the Transport of Hazardous Materials by All Modes Including Pipelines (PHMSA)

*Measure*
Incidents involving death or major injury resulting from the transport of HM by all modes, including pipeline.

*Scope*
Incidents on gas pipeline systems, liquefied natural gas facilities, and underground natural gas storage facilities are reportable to the PHMSA under 49 CFR 191.15. Hazardous liquid and carbon dioxide (CO2) pipeline system accidents are reportable to PHMSA under 49 CFR 195.50. Both interstate and intrastate pipeline systems are subject to the reporting requirements. Additionally, any person in possession of a hazardous material during air, water, rail, or highway transportation, including loading, unloading, and storage incidental to transportation, must report incidents if certain conditions are met under 49 CFR 171.15 and 171.16.

An injury is reportable if it requires in-patient hospitalization resulting from a failure in a HM transportation system in which there is a release of a hazardous liquid, CO2, or natural gas. This includes operator employees, contractors working for the operator, other workers in the right of way, emergency responders, and the public. If the person dies within 30 days of the incident date, it is counted as a death, not as an injury. In-patient hospitalization means hospital admission and at least one overnight stay (detailed guidance is on the PHMSA website at www.phmsa.dot.gov).

*Sources*
See sources for Confirmed Fatalities Caused by the Release of Hazardous Materials Transported via Pipeline or Surface Transportation Conveyance.

*Statistical Issues*
See statistical issues for Confirmed Fatalities Caused by the Release of Hazardous Materials Transported via Pipeline or Surface Transportation Conveyance.

*Completeness*
See completeness for Confirmed Fatalities Caused by the Release of Hazardous Materials Transported via Pipeline or Surface Transportation Conveyance.

*Reliability*
PHMSA routinely cross-checks incident reports against other sources of data, such as immediate notifications provided to the NRC and media outlets. PHMSA inspectors also regularly discuss accidents with operator personnel during routine inspections. PHMSA continues to work to improve the quality of the incident data.

*Verification and Validation*
See verification and validation for Confirmed Fatalities Caused by the Release of Hazardous Materials Transported via Pipeline or Surface Transportation Conveyance.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safe Delivery of Pipeline Products and Hazardous Materials—Pipeline Hazardous Liquid Products (Gross) Spilled (Barrels) (PHMSA)

*Measure*
Pipeline hazardous liquid products (gross) spilled (barrels).

*Scope*
Hazardous liquid pipeline incidents must be reported to PHMSA under 49 CFR 195.50. PHMSA tracks both gross and net volume spilled from pipeline systems transporting crude oil, refined products, and biofuels. The gross spilled volume measure shows how effective pipeline safety standards and programs are at containing energy products moving through pipelines. Beginning in FY 2019, PHMSA included a measure of the gross volume spilled for crude oil, refined products, and biofuels from pipeline systems.

*Sources*
DOT/PHMSA Hazardous Liquid accident data are used for this measure. The data are submitted online by pipeline operators using PHMSA Form F-7000-1.

*Statistical Issues*
Results in any single year should be interpreted with caution. There is some normal annual variation in the volume spilled each year, particularly given the annual number of failures, and this variation might not reflect real changes in the underlying risk.

Targets are presented as ranges to account for year-to-year variations in gross spilled over 13-year period. The target each year is set at one standard deviation from the trendline that uses a best-fit function to account for normal variation annually.

The performance measure is not normalized for changes in exposure—external factors like changes in pipeline mileage, petroleum consumption, or ton-miles moved through pipelines—that could affect the gross volume of hazardous liquids spilled.

*Completeness*
Compliance in reporting is very high and reports are submitted for most or all incidents that meet reporting requirements. Operators must submit reports within 30 days of an incident or face penalties for non-compliance. There is typically a 30-day lag between the date of the incident and PHMSA receipt of the report.

*Reliability*
PHMSA routinely cross-checks incident reports against other sources of data, such as immediate notifications provided to the NRC and media outlets. PHMSA inspectors also regularly discuss incidents with operator personnel during routine inspections. PHMSA continues to work to improve the quality of the incident data.

*Verification and Validation*
All pipeline incident data are collected on an OMB-approved form online in the PHMSA Portal. Detailed, OMB-approved instructions are available on the PHMSA website. Validation checks are run in the Portal prior to submittal to ensure all required data fields have been populated. PHMSA staff are responsible for reviewing each incident report to ensure the data matches information gained during PHMSA investigation or media reports. Pipeline operators have online access to each report they have submitted and can supplement the report at any time after original submittal.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safe Delivery of Pipeline Products and Hazardous Materials—Pipeline Hazardous Liquid Products (Net) Spilled (Barrels) (PHMSA)

*Measure*
Pipeline hazardous liquid products (net) spilled (barrels).

*Scope*
Hazardous liquid pipeline accidents are reportable to PHMSA under 49 CFR 195.50. PHMSA tracks both gross and net volume spilled from pipeline systems transporting crude oil, refined products, and biofuels. The gross spilled volume measure shows how effective pipeline safety standards and programs are at containing energy products moving through pipelines, while the net spilled volume considers the effectiveness of remediation standards and pipeline operator actions after the spill.

While PHMSA tracks both gross and net volume spilled, PHMSA uses the net spill as the performance measure in FY 2018 since it considers both safe delivery and clean up. Beginning in FY 2019, PHMSA will include a measure of the gross volume spilled for crude oil, refined products, and biofuels.

*Sources*
DOT/PHMSA accident data are used for this measure. The data are submitted online by pipeline operators using PHMSA Form F-7000-1.

*Statistical Issues*
Results in any single year should be interpreted with caution. There is some normal annual variation in the volume spilled each year, particularly given the small number of failures, and this variation might not reflect real changes in the underlying risk.

Targets are presented as ranges to account for this variation. The target each year is set at one standard deviation from the trendline to account for normal variation annually. This provides about 80 percent probability of

achieving the target if the risk continues to follow the trendline. An exponential trendline is used to reflect the concept of diminishing returns as the numbers decline.

The performance measure is not normalized for changes in exposure—external factors like changes in pipeline mileage, petroleum consumption, or ton-miles moved through pipelines—that could affect the number of major hazardous liquid spills.

*Completeness*
Compliance in reporting is very high and most or all accidents that meet reporting requirements are submitted. Operators must submit reports within 30 days of an accident or face penalties for non-compliance. There is typically a 30-day lag between the date of the accident and PHMSA receipt of the report.

*Reliability*
PHMSA routinely cross-checks incident reports against other sources of data, such as immediate notifications provided to the NRC and media outlets. PHMSA inspectors also regularly discuss accidents with operator personnel during routine inspections. PHMSA continues to work to improve the quality of the accident data.

*Verification and Validation*
All pipeline incident data are collected on an OMB-approved form online in the PHMSA Portal. Detailed, OMB-approved instructions are available on the PHMSA website. Validation checks are run in the Portal prior to submittal to ensure all required data fields have been populated. PHMSA staff are responsible for reviewing each accident report to ensure the data matches information gained during PHMSA investigation or media reports. Pipeline operators have online access to each report they have submitted and can supplement the report at any time after original submittal.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Improve Safe Delivery of Pipeline Products and Hazardous Materials—Hazardous Materials Incidents Reported Annually (PHMSA)

*Measure*
Hazardous materials incidents reported annually.

*Scope*
Title 49 of the Code of Federal Regulations (49 CFR Parts 171-180) requires that certain types of hazmat incidents be reported to PHMSA. Any person in possession of a HM during transportation (air, water, rail, and highway), including loading, unloading, and storage incidental to transportation, must report if certain conditions are met under 49 CFR 171.15 and 171.16.

All injuries and fatalities that are a direct result of the hazmat during transportation are reportable. An individual, which includes employees, emergency responders, and members of the public, injured as a direct result of hazmat and was admitted to the hospital overnight and/or lost three days or more from work due to the injury is deemed as a major hazmat injury. An individual that was injured as a direct result of hazmat and sought onsite treatment or was seen in the emergency room and released is deemed as a minor hazmat injury.

*Sources*
HM transportation incident data are derived from reports submitted on Form DOT F 5800.1 and maintained in the HMIS. In addition, PHMSA's Office of Hazardous Materials Safety (OHMS) seeks information and data to identify potentially reportable incidents through the NRC as well as monitoring print, television, and social media daily.

*Statistical Issues*
OHMS is currently examining factors that could be used to normalize the data. Specifically, OHMS is examining economic indicators that could be used to normalize

the data as well as methods (i.e., ton miles traveled) to normalize the data when comparing different modes.

Currently, targets are presented as ranges to account for this variation. The target each year is set at one standard deviation from the trend line to account for normal variation year-to-year (which shows a decline of about 10 percent on average every eight years over the past 28 years (1988-2015)). An exponential trend line is used to reflect the concept of diminishing returns as the numbers decline.

Currently, the performance measure is not normalized for changes in exposure—external factors like changes in the amount of hazmat shipped, number of shipments, or population of the United States—that could affect the number of incidents with death or major injury.

*Completeness*
PHMSA's OHMS has instituted several actions to improve compliance regarding incident reporting. Specifically, OHMS has implemented rulemakings to increase the penalty for not reporting when required. In addition, PHMSA field operations have focused enforcement efforts on individuals who fail to comply when the incident resulted in a fatality or major hazmat injury.

Lastly, as previously mentioned, OHMS seeks information and data to identify potentially reportable incidents through the NRC as well as the monitoring print, television, and social media. 49 CFR 171.16 requires a written report for certain types of hazmat incidents within 30 days of the incident, and a follow-up written report within one year of the date of incident, based on certain circumstances. Each person in physical possession of a hazardous material at the time an incident occurs (loading, unloading, and temporary storage) during transportation must submit a Hazardous Materials Incident Report on DOT Form F 5800.1 (01-2004) within 30 days of discovery of the incident. This means that when the conditions apply for completing the report, the entity having physical control of the shipment is responsible for filling out and filing DOT Form F 5800.1. There may be a 30- to 60-day lag in reporting, verifying, validating, and compiling information in the database for analysis, as many companies do not file incident reports on time.

Projections from partial-year data include all months for which PHMSA has reliable data plus an estimated number for the missing months based on the historical fraction those months represent in the final totals over the past five years.

*Reliability*
Incidents data on deaths or major injuries are the most reliable of the available incident data. These incidents have additional verification and validation procedures to include follow-up contact with the company or individual who made the report, contact with State and local law enforcement and/or emergency response officials, and matching data with initial reports made to the NRC.

*Verification and Validation*
PHMSA routinely cross-checks incident data against other sources of data, including matching incident reports with reports made to the NRC and the use of a news clipping service to provide information on significant hazmat incidents that might not be reported. If sufficient information exists, PHMSA follows up with carriers who may need to file an incident report.

PHMSA has established several data quality initiatives. These include, but are not limited to:

- Standardizing Processes to Improve Efficiencies—Evaluating and documenting current systems requirements and implementing a standardized continuous improvement process. This process will provide performance management, identify areas for improvement, and implement processes to promote efficiencies.
- Fostering Innovation and Enhancement of Data Collection Systems—Improving Information Technology (IT) functionality and internal and external systems regarding incident reporting. This includes the development of web-based systems to improve the user experience.
- Enhancing Risk Management Principles and Encouraging the Use of Safety Management Systems —Continuing to build a risk assessment methodology based on a multidisciplinary approach, including developing better commodity flow data, and applying statistical analysis, data modeling, and predictive analytics.
- Increasing Compliance, Training, and Outreach—Educating the regulated community on incident reporting particularly what must be reported and the mechanisms available to report. This includes the

development of educational materials such as quick reference guides to the DOT 5800.1 incident reporting form.

- Enhancing Coordination with other Agencies—Working closely with other government agencies to ensure sharing of data and collaboration where appropriate.

## Details on Safety Measures

### Goal 1/Objective 1: Systemic Safety Approach

### Prevent Excavation Damage to Gas and Hazardous Liquid Pipelines—Damages per 1,000 One-Call Tickets for Gas Distribution Pipelines (National Average) (PHMSA)

*Measure*
Damages per 1,000 One-Call tickets for gas distribution pipelines (National average).

*Scope*
Damages per 1,000 One-Call tickets is an indicator that refers to the instances of excavation damages to pipelines. The desired outcome focuses on reducing the number of excavation-related incidents. Excavation damages are the number one cause of pipeline-related injuries and fatalities. Measuring likelihood of calling 811 or submitting a One-Call ticket is a direct indication of the success or failure of PHMSA's programs to influence use of the service. This measure is influenced by 811 awareness, safe digging practices, State enforcement of One-Call laws, and technology improvements.

*Sources*
The source of the data for damages per 1,000 tickets is PHMSA's gas distribution operator annual report submissions. By March 15 of each year, pipeline operators are required to submit annual reports to PHMSA and our State partners. The information is aggregated on the PHMSA website at https://opsweb.phmsa.dot.gov/primis_pdm/excavation_damage.asp.

*Statistical Issues*
Results in any single year should be interpreted with caution. The performance measure does not fully capture other damage prevention results or external factors.

*Completeness*
Compliance in reporting is very high and reports are submitted for most or all incidents that meet reporting requirements. Operators must submit reports within 30 days of an accident or face penalties for non-compliance.

There is typically a 30-day lag between the date of the accident and PHMSA's receipt of the report.

*Reliability*
Data for incidents involving death or major injury are considered the most reliable of PHMSA's incident data. These incidents have additional verification and validation procedures to include follow-up contact with the company or individual who made the report, contact with State and local law enforcement and/or emergency response officials, and data matching with initial reports made to the NRC. PHMSA continues to work to improve the quality of the incident and accident data.

*Verification and Validation*
PHMSA routinely cross-checks incident data against other sources of data, such as immediate notifications provided to the NRC and media outlets. Pipeline operators have online access to each report they have submitted and can supplement the report at any time after the original submittal. Validation checks are run in the Portal prior to submittal to ensure all required data fields have been populated. PHMSA also uses the Common Ground Alliance annual reporting to compare these damage totals to the number of One-Call tickets.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce U.S.-Owned Commercial Carrier Aviation Fatalities per 100 Million Persons on Board (FAA)

*Measure*
U.S.-owned commercial carrier fatalities per 100 million persons on board (formerly known as Commercial Air Carrier Fatality Rate).

Reduce the commercial air carrier fatalities per 100 million persons on board by 50 percent over 18-year period (2008-2025). No more than 4.4 per 100 million persons in 2025.

*Scope*
This metric includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (14 CFR Part 121) and scheduled passenger flights of commuter operators (14 CFR Part 135). It excludes on-demand (i.e., air taxi) service and general aviation. Accidents involving passengers, crew, ground personnel, and the un-involved public are all included.

*Sources*
The data on commercial fatalities come from NTSB's Aviation Accident Database. All but a small share of the data from persons on board comes from the air carriers, who submit information for all passengers on board to the Office of Airline Information within BTS. Additionally, Federal Aviation Administration (FAA) estimates crew on board based on the distribution of aircraft departures by make and model, plus an average of 3.5 persons on board per Part 121 cargo flight.

*Statistical Issues*
Both accidents and passengers on board are censuses, having no sampling error.

Crew on board is an estimate with a small range of variation for any given make and model of aircraft. Departure data and enplanements for Part 121 are from the BTS. The crew estimate is based on fleet makeup and crew requirements per number of seats. For the current fleet,

the number of crew is equal to about 7 percent of all Part 121 enplanements. The average number of cargo crew on board is 3.5 per departure, based on data from subscription services such as Air Claims (Ascend), a proprietary database used by insurers to obtain information such as fleet mix, accidents, and claims. Cargo crews typically include two flight crew members, and occasionally another pilot or company representative or two deadheading passengers. Part 135 data also comes from BTS and Air Claims databases but is not as complete. The Office of Aviation Policy and Plans verifies with the operators when it identifies gaps in the data. Based on previous accident and incident reports, the average part 135 enplanement is five per departure. Crew estimates for Part 135 are based on previous accident and incident data. Any error that might be introduced by estimating crew will be very small and will be overwhelmed by the passenger census. Importantly, the fatality rate is low and could significantly fluctuate from year to year due to a single accident.

*Completeness*
The FAA does comparison checking of the departure data collected by BTS. These data are needed for crew estimates. However, FAA has no independent data sources against which to validate the numbers submitted to BTS. FAA compares its list of carriers to the DOT list to validate completeness and places the carriers in the appropriate category (i.e., Part 121 or Part 135). The number of actual persons on board for any given period is considered preliminary for up to 18 months after the close of the reporting period. This is due to amended reports subsequently filed by the air carriers. Preliminary estimates are based on projections of the growth in departures developed by Office of Aviation Policy, Planning, and Environment. However, changes to the number of persons on board should rarely affect the annual fatality rate.

To overcome reporting delays of 60 to 90 days, FAA must rely on historical data, partial internal data sources, and Official Airline Guide (OAG) scheduling information to project at least part of the FY activity data. The FAA uses OAG data until official BTS data are available. The final result for the air carrier fatality rate is not considered reliable until BTS provides preliminary numbers. Due to reporting procedures in place, it is unlikely that calculation of future FY departure data will be markedly improved. This lack of complete historical data on a monthly basis and independent sources of verification increases the risk of error in the activity data.

NTSB and the Office of Accident Investigation and Prevention confer periodically to validate information on the number of fatalities. Accident data are considered preliminary. NTSB usually completes investigations and issues reports on accidents that occur during any FY by the end of the next FY. Results are considered final when all those accidents have been reported in the NTSB press release published early in the following year. FY 2018 results will therefore be final after the 2020 press release. In general, however, the number of fatalities is not likely to change significantly between the end of the FY and the date they are finalized.

*Reliability*
Results are considered preliminary based on projected activity data. Most accident investigations are a joint undertaking. NTSB has the statutory responsibility to determine probable cause, while FAA has separate statutory authority to investigate accidents and incidents to ensure that FAA meets its broader responsibilities. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators.

*Verification and Validation*
NTSB and the Office of Accident Investigation and Prevention confer periodically to validate information on the number of fatalities. Accident data are considered preliminary. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators. The FAA uses performance data extensively for program management, personnel evaluation, and accountability. Results are considered final when all those accidents have been reported in the NTSB press release published early in the following year. For departure data, FAA does comparison checking on the data collected by BTS. Data are reviewed by FAA senior leadership every week.

This metric is part of a core group of goals which the FAA pegs employee performance-based pay.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce General Aviation (GA) Fatal Accidents per 100,000 Flight Hours (FAA)

*Measure*
United States General Aviation (GA) fatal accidents per 100,000 flight hours (formerly known as General Aviation Fatal Accident Rate).

Reduce the GA fatal accident rate to no more than 0.89 fatal accidents per 100,000 flight hours by 2028. No more than 0.98 fatal accidents per 100,000 flight hours in FY 2018.

*Scope*
This metric includes United States registered on-demand (non-scheduled 14 CFR Part 135) and GA flights. GA comprises a diverse range of aviation activities, from single-seat homebuilt aircraft, helicopters, and balloons, single and multiple engine land and seaplanes, to highly sophisticated, extended range turbojets.

*Sources*
The data for GA fatal accidents comes from the NTSB Aviation Accident Database. Aviation accident investigators, under the auspices of the NTSB, develop the data. Annual flight hours are derived from the FAA's annual GA and Part 135 Activity Survey. The FAA's Forecast and Performance Analysis Division provides current year estimates.

*Statistical Issues*
The NTSB finalizes the actual number of GA fatal accidents. Since this is a simple count of accidents, there are no statistical issues relevant to the data.

The GA community and the General Aviation Joint Steering Committee (GAJSC), as part of the Safer Skies initiative, recommended development of a data collection program that will yield more accurate and relevant data on GA demographics and utilization. Improved GA survey and data collection methodologies have been developed. Because of these efforts, FAA, working with the General Aviation Manufacturers Association (GAMA), the NTSB, and other aviation industry associations, has made many improvements to the survey.

An improved survey was initiated in FY 2004. These annual surveys created, for the first time, a statistically valid report of activity on which the GA community could agree. First, the sample size has significantly increased. Second, a reporting form has been created to make it much easier for organizations with large fleets to report. Third, the agency worked with the Aircraft Registry to improve the accuracy of contact information. Each year, significant improvements are being made to substantially improve the accuracy of the data.

The GAJSC, the Safety Analysis Team of the GAJSC and General Aviation Data Improvement Team worked closely with the GA community and industry to develop this performance metric and target. There was unanimous support and consensus for the metric and target.

*Completeness*
The number of GA fatal accidents, even when reported as preliminary, is very accurate. NTSB and the Office of Accident Investigation and Prevention confer periodically to validate information on the number of fatalities. NTSB usually completes investigations and issues reports on accidents that occur during any FY by the end of the next FY. Results are considered final when all those accidents have been reported in the NTSB press release published early in the following year. FY 2018 results will therefore be final after the 2020 press release. In general, however, the numbers of fatalities are not likely to change significantly between the end of the FY and the date they are finalized.

Further research is needed to determine how well annual flight hours derived from the FAA's annual GA and Part 135 Activity Survey capture total GA flight hours.

GA survey calendar hours are finalized by December 31 of the following year. Hence, the fatal accident rate for FY 2018 will not be considered final/complete until December 31, 2019.

*Reliability*
Results are considered preliminary based on projected activity data. Most accident investigations are a joint

undertaking. NTSB has the statutory responsibility to determine probable cause, while FAA has separate statutory authority to investigate accidents and incidents to ensure that FAA meets its broader responsibilities. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators.

*Verification and Validation*
For the number of fatal accidents, NTSB and the Office of Accident Investigation and Prevention confer periodically to validate their information. For flight hours, GA survey data are highly accurate with a percent-standard error of less than 1 percent. The GA community and the GAJSC, as part of the Safer Skies initiative, recommended development of a data collection program that will yield more accurate and relevant data on GA demographics and utilization. Improved GA survey and data collection methodologies have been developed. Because of these efforts, FAA, working with the GAMA, the NTSB, and other aviation industry associations, has made many improvements to the survey. An improved survey was initiated in 2004.

FAA senior leadership review safety data on a weekly basis. This metric is part of a core group of goals which the FAA pegs employee performance-based pay.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Runway Incursions—Commercial Surface Safety Risk Index: Maintain the Weighted Surface Safety Risk Index per Million Operations for Commercial Aviation (FAA)

*Measure*
Maintain the weighted surface safety risk index at or below 0.35 per million operations for commercial aviation.

*Scope*
The metric measures the overall safety performance of the National Airspace System (NAS) in the runway environment. It includes all manner of operations (commercial and other types), aircraft, vehicles, and pedestrians that occur in that environment. It includes runway collision accidents, runway excursion accidents, taxiway collision accidents, runway incursion incidents, runway excursion incidents, and taxiway surface incidents. Operations are defined as total takeoffs and landings. Commercial operations are considered those operating under FAR Parts 121, 129, and 135; all other operation types are considered non-commercial.

*Sources*
The NTSB database is the primary source of runway accident data. Runway excursion data is supplemented by Accident Investigation and Prevention (AVP's) Aviation System Analysis and Sharing (ASIAS) database, which aggregates runway excursion data from multiple sources. Air traffic controllers and pilots are the primary source of runway incursion and surface incident reports. The data are recorded in the Comprehensive Electronic Data Analysis Reporting (CEDAR) system. CEDAR replaced the FAA Air Traffic Quality Assurance (ATQA) database for the Air Traffic Organization (ATO). Preliminary incident reports are evaluated when received and evaluation can take up to 90 days. Operations data used to calculate the runway incursion rate are provided via the Operational Network (OPSNET) and are downloaded directly from the FAA Operations and Performance Data database.

*Statistical Issues*
Categorization of the various accidents is performed using statistical modeling, which is prone to sampling error.

*Completeness*
The FAA conducts annual reviews of reported data and compares them with data reported from previous years. Annual runway incursion incident data are used to provide a statistical basis for research, analysis, and outreach initiatives.

The Surface Safety Metric will be recalculated if accidents or incidents are reported late, or if operations data are retroactively adjusted.

*Reliability*
A classification algorithm with approximately 95 percent accuracy is used to classify NTSB events as runway collisions, taxiway collisions, or runway excursions. Given this classification error, there is a small chance that irrelevant accidents will be included in the Surface Safety Metric calculation or relevant accidents will be excluded.

*Verification and Validation*
The FAA verifies and validates the accuracy of runway incursion and surface incident data through the initial validation process followed by quality assurance and quality control reviews. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Reduce Runway Incursions—Non-Commercial Surface Safety Risk Index: Maintain the Weighted Surface Safety Risk Index per Million Operations for Non-Commercial Aviation (FAA)

*Measure*
Maintain the weighted surface safety risk index at or below 0.60 per million operations for Non-Commercial Aviation.

*Scope*
The metric measures the overall safety performance of the NAS in the runway environment. It includes all manner of operations (commercial and other types), aircraft, vehicles, and pedestrians that occur in that environment. It includes runway collision accidents, runway excursion accidents, taxiway collision accidents, runway incursion incidents, runway excursion incidents, and taxiway surface incidents. Operations are defined as total takeoffs and landings. Commercial operations are considered those operating under FAR Parts 121, 129, and 135; all other operation types are considered non-commercial.

*Sources*
The NTSB database is the primary source of runway accident data. Runway excursion data is supplemented by AVP's ASIAS database, which aggregates runway excursion data from multiple sources. Air traffic controllers and pilots are the primary source of runway incursion and surface incident reports. The data are recorded in the CEDAR system. CEDAR replaced the FAA ATQA database for the ATO. Preliminary incident reports are evaluated when received and evaluation can take up to 90 days. Operations data used to calculate the runway incursion rate are provided via the OPSNET, and are downloaded directly from the FAA Operations and Performance Data database.

*Statistical Issues*
Categorization of the various accidents is performed using statistical modeling, which is prone to sampling error.

*Completeness*
The FAA verifies and validates the accuracy of runway incursion and surface incident data through the initial validation process followed by quality assurance and quality control reviews. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued. The FAA conducts annual reviews of reported data and compares them with data reported from previous years. Annual runway incursion incident data are used to provide a statistical basis for research, analysis, and outreach initiatives.

The Surface Safety Metric will be recalculated if accidents or incidents are reported late or if operations data are retroactively adjusted.

*Reliability*
A classification algorithm with approximately 95 percent accuracy is used to classify NTSB events as runway collisions, taxiway collisions, or runway excursions. Given this classification error, there is a small chance that irrelevant accidents will be included in the Surface Safety Metric calculation or relevant accidents will be excluded.

*Verification and Validation*
The FAA verifies and validates the accuracy of runway incursion and surface incident data through the initial validation process followed by quality assurance and quality control reviews. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued.

# Details on Safety Measures

## Goal 1/Objective 1: Systemic Safety Approach

### Exert Global Leadership at International Civil Aviation Organization—Advance U.S. Standards to Foster the Safety of U.S. Citizens Traveling Internationally and Reduce Regulatory Barriers to U.S. Aviation Firms Globally. Implement FAA's Strategy to Focus and Enhance International Engagement (FAA)

*Measure*
Advance U.S. standards to foster the safety of U.S. citizens traveling internationally and reduce regulatory barriers to U.S. aviation firms globally. Implement the FAA's International Strategy to Focus and Enhance International Engagement, and by September 30, 2019:

FY 2019 Targets
- Target 1: Establish an agency-wide approach to enterprise-level international training.
- Target 2: Provide, and have approved by the FAA Management Board, a list of priorities and programs for FY 2020.

*Scope*
- Target 1: Prepare a corporate definition of and approach to international training that transforms and expands FAA's influence and impact upon the global aviation community to create support for and implementation of U.S. approach to aviation safety.
- Target 2: Incorporate current goals and expectations with regional and global perspectives to promote U.S.-based standards and best practices.

*Sources*
At the request of agency executives, the Office of International Affairs was tasked to examine the agency's current process for program planning, including the focus and effectiveness of international training.

*Statistical Issues*
There are no statistical issues.

*Completeness*
As the integrated FAA International Strategy evolves, it may be necessary to revisit the identified data and revise the criteria on a regular basis to ensure it is valid and supports the strategy.

*Reliability*
It can be assumed that the identified data collection criteria will change on a regular basis as it is updated at the source. Although this may not affect the inclusion of this criterion in the future, it would affect the prioritization process and possibly the end product.

*Verification and Validation*
The FAA uses the International Advisory Board (IAB), a formal governance structure, for agency-wide collaboration to make decisions about how we engage globally and how we can better allocate resources. We rely on an expansive internal and external global aviation data to inform and drive the resource allocations. Further, at IAB direction, the FAA established a policy that requires the use of data to decide which foreign countries we will help through technical assistance such as training, flight inspections, equipment, spare parts and repair services, and cooperative agreements.

# Details on Infrastructure Measures

## Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Maintain Accountability for Permitting Projects—Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that Are on Schedule (OST-P)

*Measure*
Percent of DOT Environmental Impact Statements (EISs) posted on Permitting Dashboard that are on schedule.

*Scope*
The number of EISs on the Permitting Dashboard where the lead agency is a DOT Operating Administration (OA). The Permitting Dashboard tracks DOT projects that result in either an EA or EIS. In addition, the dashboard also tracks other agencies' EISs and EAs for infrastructure projects that are covered projects. EISs are projects that result in significant impacts to the environment as defined by each agency through experience. These projects are often complex and involve a number of actions with associated milestones that are tracked on the dashboard.

A project remains on schedule if the milestones have been completed or if any estimated milestone dates have not been reached.

*Sources*

- Permitting Dashboard: https://www.permits.performance.gov
- DOT Specific Projects: https://data.permits.performance.gov/Permitting-Project/DOT-Projects/4yc7-szmr
- Environmental Impact Statements: https://data.permits.performance.gov/Permitting-Project/DOT-EISs-In-Progress/sgra-wju6

*Statistical Issues*
None identified.

*Completeness*
Each mode is responsible for updating the project schedules on a quarterly basis. Some modes are better at uploading their project schedules than others. When there is a missed milestone, it may be attributed to failure to update the schedule rather than the project being delayed. OAs are creating ways to streamline the entry process so that there are not duplicative tracking processes and data are more complete and up to date.

*Reliability*
The information provided in the Federal dashboard is limited to only a few dashboard administrators having access to modifying the data. This ensures that the data being entered are reliable and accurate; however, it does result in delays of getting the information put into the system. As OAs develop ways to streamline the data entry into the Permitting Dashboard through allowing internal systems to seamlessly download to the dashboard, the OAs should do more quality assurance/quality control (QA/QC) of the data to ensure that the information is reliable and accurate.

*Verification and Validation*
DOT pulls a report of the data every quarter. DOT asks each OA to verify that they have updated their project schedules and the data in the Permitting Dashboard is up to date prior to the pull. The OAs are tasked with ensuring the verification and validation of the information within the dashboard.

# Details on Infrastructure Measures

## Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Maintain Accountability for Permitting Projects—Percentage of DOT Major Infrastructure Projects Posted on Permitting Dashboard that Are on Schedule (OST-P)

*Measure*
Percent of DOT Environmental Impact Statements posted on Permitting Dashboard that are on schedule.

The Permitting Dashboard tracks DOT projects that result in either an Environmental Assessment (EA) or EIS. In addition, the dashboard also tracks other agencies' EISs and EAs for infrastructure projects that are covered projects. EISs are projects that result in significant impacts to the environment as defined by each agency through experience. These projects are often complex and involve several actions with associated milestones that are tracked on the dashboard.

A project remains on schedule if the milestones have been completed or if any estimated milestone dates have not been reached.

*Scope*
The number of EISs on the Permitting Dashboard where the lead agency is a DOT OA.

- Permitting Dashboard: https://www.permits.performance.gov
- DOT Specific Projects: https://data.permits.performance.gov/Permitting-Project/DOT-Projects/4yc7-szmr
- Environmental Impact Statements: https://data.permits.performance.gov/Permitting-Project/DOT-EISs-In-Progress/sgra-wju6

*Statistical Issues*
None identified.

*Completeness*
See completeness for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that Are on Schedule.

*Reliability*
See reliability for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that Are on Schedule.

*Verification and Validation*
See verification and validation for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that Are on Schedule.

## Details on Infrastructure Measures

### Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

## Reduce the Time to Complete an EIS—Average Months to Complete an EIS (OST-P)

*Measure*
The average months to complete an EIS from notice of intent (NOI) to record of decision (ROD).

The Permitting Dashboard tracks DOT projects that result in either an EA or EIS. In addition, the dashboard also tracks other agencies' EISs and EAs for infrastructure projects that are covered projects. EISs are projects that result in significant impacts to the environment as defined by each agency through experience. These projects are often complex and involve several actions with associated milestones that are tracked on the dashboard including the start of an EIS (NOI) to the ROD.

A project's average months to complete an EIS is from NOI to ROD.

*Scope*
The number of EISs on the permitting dashboard where the lead agency is a DOT OA.

- Permitting Dashboard: https://www.permits.performance.gov
- DOT Specific Projects: https://data.permits.performance.gov/Permitting-Project/DOT-Projects/4yc7-szmr
- Environmental Impact Statements: https://data.permits.performance.gov/Permitting-Project/DOT-EISs-In-Progress/sgra-wju6

*Statistical Issues*
None identified.

*Completeness*
See completeness for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that are on Schedule.

*Reliability*
See reliability for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that are on Schedule.

*Verification and Validation*
See verification and validation for Percentage of DOT Environmental Impact Statements Posted on Permitting Dashboard that are on Schedule.

## Details on Infrastructure Measures

### Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Reduce the Time to Complete a Major Infrastructure Project—Average Months to Complete an Environmental Review for Major Infrastructure Projects for Which DOT is the NEPA Lead (OST-P)

*Measure*
Average months to complete an environmental review for major infrastructure projects for which DOT is the National Environmental Policy Act (NEPA) Lead.

*Scope*
Office of the Secretary of Transportation - Policy (OST-P) will begin collecting the data in 2019 with the first estimate in 2020.

*Sources*
Not applicable.

*Statistical Issues*
Not applicable.

*Completeness*
Not applicable.

*Reliability*
Not applicable.

*Verification and Validation*
Not applicable.

# Details on Infrastructure Measures

## Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Increase the Number of States and Local Agencies Using Federal Innovative Finance Methods (FHWA)

*Measure*
Number of States and local agencies that have used Federal innovative finance methods.

*Scope*
The number of States in which a public project sponsor has used one of the following finance tools in the current FY to assist a Title 23 eligible project, regardless of whether the project receives regular Federal-aid funds:

- Transportation Infrastructure Finance and Innovation Act (TIFIA) credit assistance
- Private Activity Bond (PAB) issuance
- Grant Anticipation Revenue Vehicle (GARVEE) bond issuance
- Availability Payment (AP) reimbursement agreement
- State Infrastructure Bank (SIB) credit assistance

*Sources*
Build America Bureau for TIFIA and PABs and FHWA data files for GARVEEs, APs, and SIBs submitted by Division offices.

*Statistical Issues*
Further research is needed.

*Completeness*
The Center for Innovative Finance Support has established a web-based comprehensive data collection process for GARVEEs and SIBs information. States and FHWA division offices are required to report their GARVEE and SIB data on March 1 of each year. As such, the GARVEE and SIB data are based on the most recent 12 months. It is possible that within a 12-month period the data are not reported if annual updates fall outside of this time frame.

*Reliability*
GARVEE and SIB data are collected from the 50 States and territories and are reviewed and approved by FHWA division offices. For PABs and TIFIA this information is tracked and published as the transaction closes. Thus, this information is reliable.

*Verification and Validation*
The information is verified and validated with the FHWA Financial System, SIB Biannual Audited Financial Statements, DOT Credit Council Reports and Capital Markets (Bond Buyer, and Municipal Securities Rulemaking Board). The information is reviewed annually by the Center for Innovative Finance Support and for consistency and accuracy.

# Details on Infrastructure Measures

## Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Improve Major Project Performance in FHWA Portfolio—Projects over $500 Million within 2 percent of Schedule and Costs (FHWA)

*Measure*

Percentage of FHWA-funded Major Projects over $500 million with 2 percent or less increase in schedule and costs.

For each financial plan annual update approved, the percent difference between the current performance and the previous year's performance is calculated. Then the percentage of the total number of financial plans approved with cost or schedule not exceeding 2 percent is calculated.

*Scope*

To assess the performance of each project in the portfolio of Major Projects, FHWA monitors project financial plans annually to determine the percentage that have 2 percent or less increase of the prior year cost estimate and project completion date. The goal is to maintain at least 80 percent of the financial plans approved each FY at 2 percent or less increase of the prior year cost estimate and completion date. Cost increases include items such as: utility, railroad, or right-of-way costs; in-situ field conditions unknown during the design process; changes in design criteria; construction bids higher than the engineer's estimate; and settlement claims. Schedule increases include items such as: scope changes in the project; lack of funding; design delays; and utility relocation, or right-of-way acquisition cost delays. The major causes of cost or schedule delays are tracked annually and the results are used to establish or update program improvement initiatives such as webinars, training and other outreach activities.

*Sources*

Project cost and completion date information is collected by FHWA from annual financial plans submitted by project sponsors.

*Statistical Issues*

A key concern is the sample size for Major Projects. The number of Major Projects is small and each project often take years to complete. Therefore, a completed project metric does not provide a basis to control the cost and schedule for Major Projects because it is too late. To develop an indicator that can be used to measure cost and schedule changes, the Agency uses a running one-year sample size of Financial Plan Annual Updates to monitor the changes in cost and schedule. FHWA uses this information to influence annual change to be a two percent increase or less. A one year running average essentially includes the most recent Financial Plan Annual Update for each project in the sample size.

*Completeness*

All States with active Major Projects are required by law to submit an annual financial plan with updates on project cost and schedule. As a result, the measure is expected to include 100 percent of active Major Projects. The measure is reported quarterly and is based on the most recent 12 months of financial plans submitted. It is possible that within a 12-month period all Major Projects are not reported while other Major Projects are reported twice. This is caused by the 3-month window for submittal which some States or project sponsors do not always meet the due dates for submitting a financial plan.

*Reliability*

To ensure reliability, FHWA provides guidance to States and project sponsors for the preparation of financial plans.

*Verification and Validation*

FHWA provides guidance to States and project sponsors for the preparation of financial plans. FHWA reviews all financial plans for consistency and adherence to the guidance. Cost and schedule data obtained from the financial plans are consolidated in a database maintained by FHWA with limited access rights to select users. The cost and schedule trend information are reviewed annually and compared with previously reported data for consistency and accuracy. In addition, FHWA conducts a workshop before the first financial plan is developed to establish the best estimate of project cost and schedule which is used as the baseline for tracking as the project is constructed.

# Details on Infrastructure Measures

## Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

### Improve Major Project Performance in FTA Portfolio (FTA)

*Measure*
Percentage of FTA-funded projects over $500 million within or minus 10 percent of cost.

This measure is calculated as the following percentage, subject to the scope below:

Numerator: Number of projects whose current cost estimate is 110 percent or less of the currently approved cost baseline.

Denominator: The total number of projects.

*Scope*
This measure only includes projects from FTA's Capital Investment Grant program that had a cost baseline of at least $500 million as of October 1st of the current FY.

*Sources*
FTA's Office of Capital Projects Management (TPM-20).

*Statistical Issues*
If a Full Funding Grant Agreement for a project over $500 million is signed during the current FY, it is not included in the measure until the following FY.

If FTA formally approves a new baseline for a project, the total cost of the project is measured against the original baseline. If the new baseline takes the cost estimate for the project above $500 million, it will not be included in the measure until the next year.

*Completeness*
These data are complete of all such projects.

*Reliability*
Baselines are reliable as they are based on formally-approved baselines. Current project estimates are provided to us by project sponsors. The current project estimates are subject to the normal uncertainties that would apply to any estimate made by the project sponsor.

*Verification and Validation*
FTA engages project management oversight contractors to provide some oversight over the validity of current project estimates provided by project sponsors.

## Details on Infrastructure Measures

### Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

## Increase Grants Rural and Small Urban Areas—FTA Grant Dollars Allocated to Rural Areas and Small Urban Areas (FTA)

*Measure*
FTA grant dollars allocated to rural areas and small urban areas.

The total number of grant dollars that are allocated to urbanized areas under 200,000 in population, or to rural areas (areas under 50,000 in population).

*Scope*
This measure includes both formula and discretionary grant programs.

*Sources*
FTA's full-year apportionments notice provides the allocations of formula dollars to these areas. Amounts allocated to these areas from discretionary programs are announced once the project selections are made from these discretionary grants and published in the Federal Register as being available for obligation.

*Statistical Issues*
None, this measure is a 100 percent count.

*Completeness*
None, this measure is comprehensive of all FTA grant programs. However, just because FTA makes funding available to these geographical areas does not mean that the announcement will necessarily result in an obligation.

*Reliability*
These data are reliable, as they are formal records published in the Federal Register.

*Verification and Validation*
No verification or validation of these data are needed as these are formal records published in the Federal Register.

## Details on Infrastructure Measures

### Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

## Decrease Grant Processing Time—Average Number of Days (FTA)

*Measure*
Average number of days from grant application submission to grant award.

This measure is the sum of all days from the date that each grant was formally submitted to the date that each grant was formally awarded, divided by the total number of all such grants.

*Scope*
This measure includes all grants made by FTA whose obligation date was in the current FY. It also includes Transportation Investment Generating Economic Recovery/Better Utilizing Investments to Leverage Development (TIGER/BUILD) grants for which FTA is the lead agency and whose obligation date was in the current FY.

*Sources*
FTA's Transit Award Management System (TrAMS) provides these data.

*Statistical Issues*
These data are not weighted by award amount. A large grant has as much weight in the average as a small grant.

*Completeness*
The time from formal grant application to formal award of the grant only reflects a portion of the timeline for processing and approving a grant.

*Reliability*
These data are reliable as they are directly measured from TrAMS.

*Verification and Validation*
No verification or validation is needed, as these data are directly measured from TrAMS.

## Details on Infrastructure Measures

### Goal 2/Objective 1: Project Delivery, Planning, Environment, Funding, and Finance

## Increase Percentage of Grants Identified as Inactive at the Beginning of the Fiscal Year that Are Either Closed or Returned to Active Status—Percentage of Grants Identified as Inactive at the Beginning of the Fiscal Year that Are Either Closed or Returned to Active Status (FTA)

*Measure*
Percentage of grants identified as inactive at the beginning of the FY that are either closed or returned to active status.

This percentage is calculated as follows:

Numerator: The total number of grants from the denominator for which an acceptable action was taken during the FY.

Denominator: The total number of grants identified at the beginning of the FY as potentially inactive.

*Scope*
The scope is established by FTA. FTA identifies the list of potentially inactive grants at the beginning of each FY.

*Sources*
These data are pulled from FTA's TrAMS.

*Statistical Issues*
There are no statistical issues within the scope.

*Completeness*
These data are complete within the scope.

*Reliability*
These data are reliable within the scope.

*Verification and Validation*
No verification and validation activities are conducted.

## Details on Infrastructure Measures

### Goal 2/Objective 2: Life Cycle and Preventive Maintenance

## Improve Bridge Condition in the National Highway System—Percentage of NHS Bridges in Poor Condition (FHWA)

*Measure*
Percent of deck area on NHS bridges in poor condition.

*Scope*
This measure serves as an indicator of trends in bridge conditions on the NHS. The surface area (i.e., length multiplied by width) of bridge decks is viewed as a more meaningful measure than simply a count of bridges in Poor condition. The area measure recognizes the size difference among bridges and avoids the pitfall associated with counting bridges where every bridge is treated the same regardless of size.

Since 1971, the National Bridge Inspection Standards (NBIS) have required the inspection of all highway bridges located on public roads and the submission of bridge inventory and inspection data to FHWA for inclusion in the National Bridge Inventory (NBI). FHWA maintains the NBI, which contains data on more than 615,000 highway bridges.

The information in the NBI contains 95 data items for each of the bridges as required by the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges. From the data provided, FHWA monitors the condition of the Nation's bridges, which includes identifying those bridges that are in poor condition.

*Sources*
Data used to determine if a bridge is in poor condition are contained in the NBI and are currently assembled from annual data submittals from States, Federal agencies, and Tribal governments. The deck area is calculated from length and width data also reported to the NBI.

*Statistical Issues*
Further research is needed.

*Completeness*
The NBI is the world's most comprehensive database of bridge information. States, Federal agencies, and tribal governments are required to report their data by March 15th of each year. However, updates are accepted until end of year at which time the full data set is archived and published.

*Reliability*
Because the performance measure relies on data associated with more than 143,000 NHS bridges, the impact of any differences in reporting across States is minimized in the overall National analysis.

*Verification and Validation*
The NBIS require annual submittal to FHWA of bridge inventory and inspection data collected and submitted by 50 States, the District of Columbia, and Puerto Rico in cooperation with local governments. In addition, 19 Federal agencies and a growing number of Tribes submit data for Federally and tribally owned bridges. Through the NBI Program Oversight Process, FHWA Division offices annually evaluate the quality of each State's and agency's bridge inspection program using 23 different metrics, two of which pertain to data quality and timely submission.

The inspection programs are evaluated comprehensively using statistical sampling methods, file reviews, field reviews, and data analysis. A written annual evaluation is provided to each State and agency to document problems and require corrective actions.

Upon annual submittal of the NBI data to FHWA headquarters (HQ), additional safety and reasonableness checks are performed on the data prior to acceptance, including comparisons with previously reported data. Data re-submittal is required in cases where significant or safety-related problems are identified. The accuracy and reliability of the submitted NBI information are evaluated through data checks by both HQ and division office personnel, and as part of FHWA's annual NBIS compliance reviews.

# Details on Infrastructure Measures

## Goal 2/Objective 2: Life Cycle and Preventive Maintenance

### Maintain Bridge Condition in the National Highway System—Percentage of Deck Area on NHS Bridges in Good or Fair Condition (FHWA)

*Measure*
Percentage of Deck Area on NHS Bridges in Good or Fair Condition.

*Scope*
This measure serves as an indicator of trends in bridges in Good or Fair conditions on the NHS. The surface area (i.e., length multiplied by width) of bridge decks is viewed as a more meaningful measure than simply a count of bridges. The area measure recognizes the size difference among bridges and avoids the pitfall associated with counting bridges where every bridge is treated the same regardless of size.

Since 1971, the NBIS have required the inspection of all highway bridges located on public roads and the submission of bridge inventory and inspection data to FHWA for inclusion in the NBI. FHWA maintains the NBI, which contains data on more than 616,000 highway bridges.

The information in the NBI contains 95 data items for each of the bridges as required by the *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges.* From the data provided, FHWA monitors the condition of the Nation's bridges, which includes identifying those bridges that are in Good or Fair condition.

*Sources*
Data used to determine if a bridge is in Good or Fair condition are contained in the NBI and are currently assembled from annual data submittals from States, Federal agencies, and tribal governments. The deck area is calculated from length and width data also reported to the NBI.

*Statistical Issues*
Further research is needed.

*Completeness*
The NBI is the world's most comprehensive database of bridge information. States, Federal agencies, and tribal governments are required to report their data by March 15th of each year. However, updates are accepted until end of year at which time the full data set is archived and published.

*Reliability*
Because the performance measure relies on data associated with more than 145,000 NHS bridges, the impact of any differences in reporting across States is minimized in the overall National analysis.

*Verification and Validation*
See verification and validation for Improve Bridge Condition in the National Highway System—Percentage of NHS Bridges in Poor Condition.

# Details on Infrastructure Measures

## Goal 2/Objective 2: Life Cycle and Preventive Maintenance

### Maintain Roadway Pavement Condition—Percentage of VMT on the NHS in Good Condition (FHWA)

*Measure*
Percent of travel on NHS that meets pavement performance standards for a "good" rated ride (CY).

*Scope*
Data include VMT and pavement ride quality data reported using the International Roughness Index (IRI) on the reported NHS sections in the HPMS. VMT represent the total VMT by motor vehicles on public roadways within the 50 States, Puerto Rico, and the District of Columbia. IRI is a quantitative measure of the accumulated response of a quarter-car vehicle suspension experienced while traveling over pavement. An IRI of less than 95 inches per mile is generally considered indicative of a good rated ride.

*Sources*
See Reduce Motor Vehicle-Related Fatalities (Overall) for VMT source information.

*Statistical Issues*
Both HPMS and TVT are based on samples of the traffic, there are associated sampling errors.

*Completeness*
The projections are made using the most recent trend data. Changes are expected in the way data are collected and reported beginning with data collected in 2018.

*Reliability*
There is concern about consistency in vehicle counts across States. Further research is needed to address this concern.

*Verification and Validation*
FHWA provides guidelines for data collection in the HPMS Field Manual. Adherence to these guidelines varies by State, depending on issues such as staff, resources, internal policies, and uses of the data at the data provider level. An annual review of reported data is conducted by FHWA,

both at the HQ level and in the division offices in each State. The reported data are subjected to intense editing and comparison with previously reported data and reasonability checks. A written annual evaluation is provided to each State to document potential problems and to encourage corrective actions. Data re-submittal is requested in cases where major problems are identified.

# Details on Infrastructure Measures

## Goal 2/Objective 2: Life Cycle and Preventive Maintenance

### Improve Roadway Pavement Condition—Percentage of Interstate Pavement in Good or Fair Condition (FHWA)

*Measure*
Percentage of Interstate Pavements in Good or Fair Condition.

*Scope*
This measure serves as an indicator of trends in pavements in Good or Fair conditions on the Interstate system. Effective May 2017, a DOT issued Final Rule established a new framework of National performance measures for pavement and bridge conditions. States are required to make significant progress towards achieving targets for their individual performance measures for pavements and bridges, with the State-by-State results being aggregated and reported Nationally. Per the regulation, the performance of highway pavements is reported nationally as the percentage of the Interstate system and non-Interstate NHS in Good or Fair condition.

The pavement condition measure is based on a classification system of Good, Fair, and Poor. Data used to determine the measure includes mainline lane-miles of Interstate System and full-extent IRI and distress data (i.e., cracking percent, rutting, and faulting) that is reported by State in the HPMS. The information in the HPMS contains pavement condition and inventory data items for 0.1-mile sections of the entire NHS as required by the *HPMS Field Manual.* From the data provided, FHWA monitors the condition of the Nation's pavements, which includes identifying those pavements that are in Good or Fair condition.

*Sources*
Data used to determine if pavements are in Good or Fair condition are contained in the HPMS file assembled from annual data submittals from States. The percentage is calculated from mileage and pavement condition data reported to the HPMS.

*Statistical Issues*
None.

*Completeness*
States are required to report their data by April 15 each year. However, updates are accepted until June 15 after which the data are extracted and measures are calculated and published.

*Reliability*
To ensure reliability, FHWA provides guidelines for data collection in the *HPMS Field Manual* and 23 CFR 490.309. Adherence to these guidelines varies by State; however, to help States improve data quality they are required to develop data quality management plans that define the acceptable level of data quality and describes how the data collection process will ensure this level of quality in its deliverables and processes per 23 CFR 490.319c.

*Verification and Validation*
An annual review of reported data is conducted by FHWA, both at HQ and in the Division offices in each State. The reported data are subject to comparisons with previously reported data and other reasonability checks. A written annual evaluation is provided to each State to document potential problems and to encourage corrective actions. Data resubmittal is requested in cases where major problems are identified.

# Details on Infrastructure Measures

## Goal 2/Objective 2: Life Cycle and Preventive Maintenance

### Maintain Good Runway Condition (FAA)

*Measure*
Percent of runways in FAA's National Plan of Integrated Airport Systems (NPIAS) in good condition (Formerly known as Runway Pavement).

Maintain runway pavement in excellent, good, or fair condition for 93 percent of the paved runways in the NPIAS.

*Scope*
The metric covers all open and paved runways at Federally funded NPIAS airports.

*Sources*
Data and information are collected through visual inspection of runway pavement in accordance with existing FAA guidance; including Advisory Circular 150/5320-17 Airfield Pavement Surface Evaluation and Rating Manuals provide uniformity to field observations made by individuals collecting data for the Airport Master Record (FAA Form 5010). The pavement condition is reported in the 5010 Airport Master Record database and results of the inspections are entered into FAA's National Airspace System Resource.

*Statistical Issues*
None.

*Completeness*
The inspection and reporting of conditions are conducted in accordance with existing FAA guidance. The data are publicly available and therefore can be examined and evaluated by any Federal auditor.

*Reliability*
Not applicable.

*Verification and Validation*
Runway pavement condition data are collected annually by FAA Airport Certification Safety Inspectors during their physical inspection of all certified airports in the

United States and its territories. Other public use airports are inspected by airports or airport safety data inspectors under an FAA contract ever three years. Information is collected through visual inspection of runway pavement in accordance with existing FAA guidance, resulting in a condition rating for each runway of excellent, good, fair, poor, or failed. FAA senior leadership reviews the data on a quarterly basis, with more frequent review at the line of business (LOB) level.

# Details on Infrastructure Measures

## Goal 2/Objective 2: Life Cycle and Preventive Maintenance

### Monitor Condition and Performance of Transit System (FTA)

*Measure*
State of good repair backlog (current-year dollars) (formerly known as Transit Capital Assets Backlog).

Backlog of transit capital assets in need of replacement or refurbishment (as defined by an estimated condition rating of 2.5 or lower).

*Scope*
This measure includes all capital assets of the United States transit industry and, as such, incorporates all transit systems in the country, both urban and rural. The replacement value of all United States transit assets is estimated at $847.5 billion.

*Sources*
The size of the National state of good repair backlog is estimated by the Transit Economic Requirements Model (TERM) based on capital asset data from the NTD and other ad hoc capital asset surveys.

*Statistical Issues*
An inventory of revenue vehicles is reported to the NTD annually. Data on all other capital assets are based on ad hoc surveys that are updated periodically and on estimates created by TERM.

During FY 2016, FTA took substantial steps towards implementing the National Transit Asset Management System by issuing a Final Rule. The Rule includes FTA's first-ever definition of state of good repair, requirements for each FTA grantee to establish a transit asset management plan, and a suite of state of good repair performance measures against which each of FTA's grantees are required to set targets. Concurrently, FTA also expanded the NTD to collect additional capital asset inventory information, as well as condition data towards the state of good repair performance measures in the Rule. The expanded NTD data collection will take effect in September 2018, with

the data first becoming available in fall 2019, and updated backlog estimates based on the new data available in 2020.

Data results from TERM are only available once the Conditions and Performance Report is cleared by the Office of the Secretary and OMB. This can lead to long time delays before performance measures are publicly available. For example, the 22nd edition of the Conditions and Performance Report is the most recent edition that is currently available.

FTA is planning to discontinue this measure in FY 2020 and replace it with another measure that is based on date reported directly to the NTD and that is not based on modeling.

*Completeness*
Most of the large, and many medium-sized, agencies have provided asset inventory data to the database that are used for this calculation. Assets for smaller systems are estimated by the model. FTA is in the process of expanding the capital asset data collected by the NTD, see statistical issues, above.

*Reliability*
The transit agency's CEO certifies that the vehicle data reported to the NTD are accurate. These data are reviewed by analysts and compared to trend data for the transit system and to National benchmarks. The other three quarters of transit assets are updated on an ad hoc basis, and do not require a CEO certification. However, these are the best-available data inventories that transit agencies have available, and they are generally considered to be reliable.

*Verification and Validation*
Data reported to the NTD are subject to validation for consistency with the rest of the annual report, as well as comparison with the prior year's report. Other capital asset data are collected on an ad hoc basis, and are not able to validate against other sources. The parameters of TERM were developed based in part upon independent consultant work done in the transit industry. FTA periodically seeks outside review of TERM, including a recent review conducted by the National Academies of Sciences.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

### Decrease Average Wait Time (FAA)

*Measure*
Achieve a NAS on-time arrival rate of 88 percent at core airports. NAS on-time arrival rate is the percentage of all flights with less than 15 minutes of delay with NAS assigned as the cause.

*Scope*
A flight is considered on time if it arrives no later than 15 minutes after its published, scheduled arrival time. This definition is used in both the DOT Airline Service Quality Performance (ASQP), and Aviation System Performance Metrics (ASPM) reporting systems. Air carriers, however, also file up-to-date flight plans for their services with the FAA that may differ from their published flight schedules. This metric measures on-time performance against the carrier's filed flight plan, rather than what may be a dated published schedule.

The arrival time of completed passenger flights to and from the core airports is compared to their flight plan scheduled arrival time. For delayed flights, delay minutes attributable to extreme weather, carrier caused delay, security, and a prorated share of delay minutes due to a late arriving flight at the departure airport are subtracted from the total minutes of delay. If the flight is still late, it is counted as a delayed flight attributed to the NAS and the FAA.

The core airports are those which have 1 percent or more of total U.S. enplanements (the DOT large hub airports) or 0.75 percent or more of total U.S. non-military itinerant operations.

*Sources*
The ASPM database, maintained by the FAA's Office of Performance Analysis (AJR-G), in conjunction with DOT's ASQP causation database, provides the data for this metric. By agreement with the DOT, certain major U.S. carriers file ASQP flight data for flights to and from most large and medium hubs. Flight records contained in the Traffic Flow Management System supplement the flight data.

*Statistical Issues*
Data are not reported for all carriers; at present, 26 operating carriers report monthly into the ASQP reporting system.

*Completeness*
FY data are finalized approximately 90 days after the close of the FY.

*Reliability*
Further research is needed.

*Verification and Validation*
ASPM data are verified daily by the execution of multiple audit checks, comparison to other published data metrics, and through the use of ASPM by over 1,500 active users.

Each month, FAA senior leadership reviews ASQP data under 14 CFR Part 234, Airline Service Quality Performance Reports, which separately requires reporting by major U.S. air carriers on domestic flights to and from reportable airports.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

## Maintain Airport Capacity (FAA)

*Measure*
Maintain an average daily capacity (hourly throughput that an airport's runways are able to sustain) for core airports of 59,303 or higher, arrivals and departures during reportable hours.

*Scope*
Only the core airports are included in this metric. The core airports are those which have 1 percent or more of total U.S. enplanements (the DOT large hub airports) or 0.75 percent or more of total U.S. non-military itinerant operations.

Reportable hours are based on a review of called rates and actual flight counts for each of the core airports.

- 15 Reportable Hours: DFW, IAH, LGA, MCO, PHX, SLC
- 16 Reportable Hours: ATL, BOS, CLT, DCA, DEN, FLL, IAD, LAS, MDW, MIA, MSP, ORD, PHL, SEA, SFO, TPA
- 17 Reportable Hours: BWI, DTW, EWR, HNL, LAX, SAN
- 18 Reportable Hours: JFK
- 24 Reportable Hours: MEM

Each airport facility determines the number of arrivals and departures it can handle for each hour of each day, depending on conditions, including weather. These numbers are the called arrival and departure rates of the airport for that hour. The average daily capacity is calculated on a daily, monthly, and annual basis.

*Sources*
The ASPM database, maintained by the FAA's AJR-G, provides the data for this metric. The individual air traffic facilities for the core airports provide arrival and departure rates through the use of the National Traffic Management

Log (NTML) ASPM obtains the capacity rates from the NTML system.

*Statistical Issues*
None.

*Completeness*
FY data are finalized approximately 90 days after the close of the FY.

*Reliability*
ASPM data are verified daily by the execution of multiple audit checks, comparison to other published data metrics, and through the use of ASPM by over 1,500 active users.

*Verification and Validation*
FAA leadership reviews the data each month. Data are reviewed at the LOB level on a weekly basis. This metric is part of a core group of goals which the FAA uses to establish employee performance-based pay.

## Details on Infrastructure Measures

### Goal 2/Objective 3: System Operations and Performance

### Increase the Integration of Drones into the Airspace Without Sacrificing Safety—Average Time Processing Both Manual and Automated Part 107 Unmanned Aircraft Systems (UAS) Airspace Authorizations (FAA)

*Measure*
Average time for processing Part 107 Unmanned Aircraft Systems (UAS) airspace authorizations.

*Scope*
An average of the total number of processing days for Part 107.41 authorizations completed since the beginning of FY 2018. Although now in FY 2019, FY 2018 will be used as the starting point to bring the cumulative average forward. Processing days are calculated as the number of days from when a Part 107.41 authorization is received to when it is responded to through either Low Altitude Authorization and Notification Capability (LAANC) or DroneZone.

Processing time reduction goals for FY 2019 will use the following baselines: 50 days for processing authorizations (DroneZone and LAANC combined) and 106 days for processing DroneZone authorizations. These are based on FY 2018 averages for overall processing days (all sources combined) and the processing days for manual authorizations, respectively.

*Sources*
For applications submitted through DroneZone, an application is generated through a website application process then tracked in the system to determine how long it takes to process. For applications submitted through LAANC, the request is processed through a web based application that provides expedited processing of airspace authorizations below the approved altitudes on the FAA UAS facility maps.

*Statistical Issues*
Volatility in the number of applications received over time through LAANC.

*Completeness*
The lead office (Emerging Technologies Team, AJV-115) will track Part 107.41 applications from submission to disposition through various sources discussed above. These sources are managed daily by assigned staff. The staff follows a standard operating procedure to process applications in order to ensure continuity and accuracy.

The data are collected by multiple sources and merged into one to provide the reporting metric. The data pulls from both the existing manual processes and the automated process through LAANC.

*Reliability*
This is a manual process requiring queries from two data sources merged to provide a unified response. It is subject to human error.

*Verification and Validation*
Inherent in the processes above.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

### Increase the Integration of Drones into the Airspace without Sacrificing Safety—Average Time Processing Manual Part 107 Unmanned Aircraft Systems (UAS) Airspace Authorizations (FAA)

*Measure*
ATO will improve the processing time for 107.41 authorization requests.

Reduce the time for processing manual Part 107 Airspace Authorizations by at least 10 percent, to an average of 86 days by September 30, 2019.

*Scope*
This applies only to 107.41 Authorizations.

*Sources*
For applications in the application backlog queue, through an e-mail generated by a website application process. The applications are then manually tracked in a SharePoint site to determine how long it takes to process them. For applications submitted through DroneZone, an application is generated through a website application process, then tracked in the system to determine how long it takes to process. For applications submitted through LAANC, through a web based application that provides expedited processing of airspace authorizations below the approved altitudes on the FAA UAS Facility Maps.

*Statistical Issues*
Volatility in the number of applications received over time through LAANC.

*Completeness*
The lead office (Emerging Technologies Team, AJV-115) will track Part 107.41 applications from submission to disposition through various sources discussed above. These sources are interacted with assigned staff on a daily basis. The staff follows a standard operating procedure to process applications to ensure continuity and accuracy.

The data are collected by multiple sources and merged into one to provide the reporting metric. The data pulls from both the existing manual processes and our new automated process through LAANC. The target metric was established to recognize the effect on how automation would drive down the processing time from a baseline of 96 days to 86 days representing a 10 percent decrease for FY 2019. Quarterly monitoring was established to track progress and make assessments or adjustments if necessary.

*Reliability*
This is a manual process requiring queries from three data sources merged to provide a unified response. It is subject to human error.

*Verification and Validation*
Inherent in the processes above.

## Details on Infrastructure Measures

### Goal 2/Objective 3: System Operations and Performance

### Increase the Integration of Drones into the Airspace without Sacrificing Safety—Average Time Processing UAS Part 107 Operational Waivers (FAA)

*Measure*
Maintain the average time for processing (approve or deny) part 107 waivers at 50 days for FY 2018 with a 5-day reduction each following year to FY 2022.

Part 107 UAS waiver processing time is calculated as the number of days between receipt of request and delivery of a response. The response can be either an approval or a denial.

*Scope*
Airspace Authorizations are permissions given by air traffic control to use a specific airspace in a specific time frame. If the UAS operator intends to fly in controlled airspace, the operator will need an authorization in addition to a waiver (for example, if operator wants to fly over people within 5 miles of an airport). The authorization process ensures the specific use of that aircraft in the NAS does not endanger other users of the NAS.

Part 107 waivers are requested when the operator wants to operate in a manner that is not currently allowed by regulation. The UAS operator is asking for a particular portion of a regulation to be waived (for examples, flying over people).

*Sources*
Tracking data are obtained from the operational waiver portal of FAA DroneZone. The FAA DroneZone is an enterprise IT solution to consolidate several UAS systems into a central and fully functional environment. This platform is the foundation for the next generation of UAS support applications, including those to support operational waivers.

*Statistical Issues*
Average processing time is measured in calendar days, which includes weekends and government holidays. The FAA does not process waiver applications on weekends or government holidays, which negatively skews the statistics. Additionally, on applications where the applicant includes at least 50 percent of the information required for approval, a request for information (RFI) is sent to the responsible person listed on the waiver application. An applicant is provided 30 calendar days to provide a response. The time the applicant has to respond to the RFI adds additional processing days to the processing day average but is not reflective of the team's adjudication performance.

*Completeness*
This metric includes applications submitted to the General Aviation and Commercial Division (AFS-800) Waiver Team via the on-line portal and manual (paper) submissions.

*Reliability*
FAA DroneZone provides an improved external user experience on a modernized platform and a design that is easy to understand and navigate. Although confidence is high the data are reflective of a number of applications and days in process, data are subject to human error during the application process. Scheduled user experience and functionality enhancements are in place to enhance waiver application completeness and reliability, limit erroneous waiver applications, and reduce duplicate waiver applications.

*Verification and Validation*
The FAA verifies and validates the accuracy of the data through QA/QC reviews of DroneZone waiver applications. Data are reviewed and reconciled as needed predominantly on a weekly basis. Potential errors identified in these reviews are explored and resolved.

To verify performance plan metrics are being met the waiver team posts weekly and monthly operational waiver performance reports to two distinct Knowledge Services Network (KSN) SharePoint sites. Once posted, the performance information is available for all parties with specific SharePoint access to review, validate, and address abnormalities. Staffing levels and processes are monitored as the average processing time target is reduced to ensure the appropriate level of resources are available to maintain performance.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

### Advance the Operation of Drones through the UAS Integration Pilot Program (IPP)—(FAA)

*Measure*
Issue approval for a Part 135 certificate.

Demonstrate capability for advanced UAS operations by enabling five distinct Beyond Visual Line of Sight operations (BVLOS) and three distinct Operations Over People (OOP) operations.

Issue approval for an additional Part 135 certificate.

*Scope*
Part 135 certificate: A Part 135 certificate is the operating rules for air carrier operations; air carrier refers to any operations for hire or lease that are operated across State lines or overseas, by a foreign entity, or transporting mail by aircraft.

BVLOS: When a pilot/operator of an unmanned aircraft can no longer see the aircraft with unaided vision.

OOP: Unmanned aircraft flights taking place over people.

*Sources*
There were 10 communities selected to participate in the UAS Integration Pilot Program (IPP). The selectees were tasked to test and evaluate a host of operational concepts and advanced operations. This program will run for three years and has already made strides in the testing of these operations as well as keeping the community engaged to voice their concerns regarding safety and privacy.

*Statistical Issues*
The certification process utilizes a phased gated approach and the applicant must meet the requirements of each phase prior to continuing to the next phase. The applicant must be capable of fulfilling the required responsibilities and comply with the 14 CFR. If the applicant is unable to demonstrate that they have met all the safety requirements

to conduct Part 135 Operations, no certificate will be issued.

*Completeness*
The IPP was developed as a phased integrated approach which will allow entities the opportunity to partner with the private sector. The results are data-driven and help to inform future rulemaking activities, processes, and procedures. The issuance of the Part 135 certificates is largely dependent on the applicant's ability to demonstrate that they have met all the safety requirements to conduct Part 135 Operations.

*Reliability*
As operations are being tested and evaluated, the FAA must ensure that a repeatable process is being developed. Any concerns will need to be addressed and resolved prior to the issuance of the Part 135 certificates for both BVLOS and OOP.

*Verification and Validation*
The BVLOS metrics and OOP waiver metrics are validated through DroneZone and the internal AUS/IPP KSN SharePoint. When an IPP lead participant receives a waiver approval via DroneZone, support contract personnel input the waiver number and other waiver details into the AUS IPP KSN SharePoint, which automatically tracks the number of approved waivers.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

### Alleviate Urban Congestion—Interstate (FHWA)

*Measure*
Interstate travel time reliability, as percent of person-miles traveled that are reliable.

*Scope*
The interstate travel time reliability measure examines the reliability of travel (i.e., consistency from day to day and/or hour to hour) on the interstate system from the perspective of the user as reported as the percent of person-miles traveled (PMT) that are reliable.

National targets may be adjusted further after additional data are available in 2019.

*Sources*
Data sources include average travel time data for interstates from the National Performance Management Research Data Set (NPMRDS). The data reflect actual, observed travel times on the interstates, reported as an average every 15 minutes. Data are collected by INRIX and provided by the University of Maryland CATT Lab to FHWA as the NPMRDS. The vehicle probe data can be from cell phones, in-vehicle navigation units, and/or fleet (e.g., truck, delivery vehicles, taxi) management systems. Related volume data for weighting the measure are found in HPMS.

*Statistical Issues*
PMT estimation requires information on the number of vehicle occupants that is not available in the monthly travel data. Additionally, the monthly VMT data does not distinguish between passenger and freight vehicle-miles traveled.

*Completeness*
Missing data in the NPMRDS do occur, either due to short road segment length (i.e., between interchanges in urban areas where cars pass too quickly through that they are not reporting speed and location) or where there are low volumes and no probe vehicles traveling through during a 5-minute period especially overnight and in some rural

areas. FHWA accounts for missing data, in part, by using average travel times for every 15 minutes.

*Reliability*
Reliability for these measures is excellent. All metric submissions as well as all targets and other reporting are reviewed by FHWA. Data resubmittal is requested in cases where major problems are identified. As many as 35 States have access to an analysis tool developed as part by the Transportation Performance Management Capacity Building pooled fund study, which provides consistent and reliable results.

*Verification and Validation*
NPMRDS data are validated quarterly in limited locations by comparing to ground truth travel time data. Results are within specifications of the contract. Recently available volume data from HPMS are used to calculate the results. Typically, there is a lag in data availability and of conflation to the NPMRDS location referencing network. The 2018 travel time data was conflated with 2016 HPMS data.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

### Improve Passenger Rail (On-Time) Performance—Shorter Distance Intercity Routes (FRA)

*Measure*
On-Time Performance (OTP) for Northeast Corridor (NEC) routes.

OTP for State-supported routes.

*Scope*
OTP is the percentage of total train arrivals on-time at each station, weighted by ridership. An Acela train is late when it arrives at a station more than 10 minutes after its scheduled time; a Northeast Regional or State-supported train is late when it arrives more than 15 minutes after its scheduled time.

NEC routes are those which operate predominantly on the 457-mile NEC (Connecticut, Delaware, District of Columbia, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island). State-supported routes are those which operate short-distance corridors of not more than 750 miles between endpoints—not including NEC routes. (49 U.S.C. 24102)

*Sources*
Amtrak captures the data for each service and provides reports to FRA with annual, quarterly, and monthly measures. FRA publishes the quarterly Service Quality Report for Amtrak Services each quarter using the data.

*Statistical Issues*
None.

*Completeness*
FRA and stakeholder groups, including the NEC Commission and State-Amtrak Intercity Passenger Rail Committee, monitor and evaluate Amtrak OTP closely. FRA receives adequate information from Amtrak to monitor OTP.

*Reliability*
No reliability issues in terms of OTP data integrity. Actual Amtrak performance varies depending on the degree of delays caused by Amtrak's host freight railroads, Amtrak's own causes of delay, and third-party issues, such as extreme weather and accidents.

*Verification and Validation*
FRA tracks Amtrak OTP data each month, matches it against other performance data, and conducts monthly meetings with Amtrak and host railroads to better understand the nature of Amtrak delays.

## Details on Infrastructure Measures

### Goal 2/Objective 3: System Operations and Performance

### Provide Sustainment Sealift Capacity to the United States Armed Forces (MARAD)

*Measure*
Increase the number of U.S. flag vessels.

*Scope*
The Maritime Administration (MARAD) tracks the number of large internationally trading ocean-going commercial vessels (1,600 gross tons or more) operating under U.S. flag to help ensure an adequate U.S. flag fleet, crewed by U.S. qualified Merchant Mariners, to meet Department of Defense (DoD) requirements for sealift support during National contingency operations. Most of the ships that MARAD tracks participate in the Voluntary Intermodal Sealift Agreement (VISA) program, including those participating in the Maritime Security Program (MSP).

MARAD estimates that at least 125 large, internationally trading U.S. flag commercial cargo carrying ships of 1,600 gross tons and over are required to maintain a sufficient force of unlimited credentialed mariners to meet sustainment sealift needs in a major contingency situation exceeding 4-6 months in duration.

*Sources*
MARAD relies on both commercial and private data sources to maintain an accurate list of ships. The basis for this ship list is an extract of ship data from IHS Markit, which is a commercial vendor of vessel registry data, and is the trusted and widely used source for such data across the maritime shipping industry.

MARAD also validates the data against ship information received from the United States Transportation Command (TRANSCOM) and the Military Sealift Command. Additionally, MARAD oversees the MSP, and receives data on these vessels directly from participants operating in the program. Additionally, MARAD uses the Sea Web online database provided by IHS Markit to track the actual movements of MSP vessels worldwide to ensure they are meeting program requirements.

*Statistical Issues*
The list of ships includes the population of ships meeting the vessel criteria outlined above for the measure. Accordingly, no statistical methods are used to create the list. Basic analysis is done to identify any anomalies in terms of number and/or type of ships. MARAD constructed an annual time series, going back to the year 2000, of the number of cargo carrying commercial ships 1,600 tons or more that operate exclusively in international trade. MARAD does not have records of ships lists before that time that would allow discernment between vessels in domestic and international trade.

*Completeness*
The internationally sailing vessel list produced by MARAD is the complete list of large, U.S. flag self-propelled, privately-owned merchant vessels carrying cargo from port to port that are not eligible to serve in United States domestic trade. It is relatively easy to keep a good handle on the number of such ships because of the limiting criteria. All ships of this type have an official and unique International Maritime Organization (IMO) number, which allows MARAD to identify and track them with certainty.

*Reliability*
The number of vessels MARAD tracks is highly reliable. The ships tracked are among the largest in the world fleet, all catalogued in international databases and subject to tracking via established online services. The commercial data vendor is considered the trusted source in the maritime industry.

*Verification and Validation*
MARAD can ensure validation and verification through data collected directly from vessel operators and other Federal resources. MARAD conducts monthly data assurance checks to account for and resolve any discrepancies in the data.

# Details on Infrastructure Measures

## Goal 2/Objective 3: System Operations and Performance

## Provide Sustainment Sealift Capacity to the United States Armed Forces (MARAD)

*Measure*
Percentage of DoD-required shipping capacity complete with crews available within mobilization timelines.

*Scope*
This measure is based upon the number of available ships in MARAD's Ready Reserve Force (RRF), and ships enrolled in the VISA program that can be fully crewed within the established readiness timelines. The VISA program includes 60 ships enrolled in the MSP. VISA is MARAD's emergency preparedness program for dry cargo ships and provides DoD with assured access to critical sealift capability for National security contingency requirements. Crewing of the RRF vessels is accomplished by commercial mariners employed by private sector companies under contract to the government.

*Sources*
Each month, the RRF, VISA, and MSP fleet readiness are monitored by MARAD to ensure availability of sufficient capacity and U.S. mariners. MARAD also maintains records of the sealift ships enrolled in the VISA and MSP, and their crew requirements.

*Statistical Issues*
None.

*Completeness*
MARAD's measure for shipping capacity and crew availability is to ensure that the level of both commercial and government-owned sealift is sufficient to meet current and projected DoD requirements to transport cargo to support U.S. military and during times of National emergency.

*Reliability*
The data collected are from the program offices and is considered reliable and useful in managing the readiness programs.

*Verification and Validation*
MARAD can ensure validation and verification through its direct oversight of the RRF and the activities of contracted vessel managers, as well its administration of the VISA and MSP programs and data collected from other sources. MARAD conducts monthly data assurance checks to account for and resolve any discrepancies in the data on both the Government-owned and commercial fleets.

# Details on Infrastructure Measures

## Goal 2/Objective 4: Economic Competitiveness and Workforce

### Alleviate Freight Congestion (FHWA)

*Measure*
Interstate Truck Travel Time Reliability (TTTR) Index.

*Scope*
Travel time reliability is a key indicator of transportation system performance. The TTTR index measures the reliability or consistency of truck travel times on the interstate from day to day over the course of a year. The TTTR index is the ratio of the 95th percentile truck travel time to the 50th percentile truck travel time for each roadway segment, which is then averaged for the entire interstate system to provide National TTTR Index.

The TTTR Index represents a systemwide average of extra time or cushion that needs to be added to typical or average travel time to ensure on-time arrival 95 percent of the time. The Index is reported as 1.0 or greater. The higher the value above 1.0, the less reliable is a roadway; while lower TTTR values above 1.0 indicate a more reliable roadway. This gives a system-wide indication of how much extra time, on average, a motor carrier needs to budget for freight travel on the interstate to avoid further delays that can lead to extra shipping and carrying costs.

National targets may be adjusted further after additional data are available in 2019.

*Sources*
NPMRDS provides vehicle probe-based travel time data for passenger vehicles and trucks and is used by FHWA and State DOTs to calculate the TTTR Index. Real-time probe data are collected from a variety of sources including mobile devices, connected autos, portable navigation devices, commercial fleets and sensors. NPMRDS includes historical average travel times in five-minute increments daily covering the entire NHS.

*Statistical Issues*
The key concerns are the sample size of commercial vehicle probes and frequency of the sampling time and position sampling. The reported results provide

Nationwide coverage using data from 700,000 freight vehicles operating in North America. Most of the data are from medium to large fleets that operate tractor-trailer combination trucks in every sector of the industry and every region of the U. S. and Canada.

*Completeness*
The NPMRDS provides average travel times in 5-minute increments daily covering the entire NHS. Based on the most recent review, the interstate system had 93 percent completeness for travel time date collected daily on each segment of the interstate.

*Reliability*
To provide reliable roadway performance estimates, a large enough number of freight vehicles must be equipped with GPS to provide a valid and reliable measure of roadway performance, and to provide the temporal and geographic diversity desired by the performance measurement system.

Through use of the NPMRDS, FHWA has made progress in increasing sample size and the frequency of sampling by increasing the sources of the probe data and the number of vehicles providing position information. The NPMRDS travel times are produced using path processing. In path processing, a space mean speed is calculated for each individual probe vehicle from the points along its trajectory path. This provides more accurate average vehicle speed data. Probe vehicle performance systems, such as the NPMRDS, are designed to provide travel time and speed or delay information without traditional fixed-location traffic monitoring and data collection systems. Analysis of the GPS location data allow for very accurate roadway measurements.

*Verification and Validation*
The NPMRDS includes a measurement of the density of data used to generate each average travel time. There are quarterly validations conducted that compare deployed Bluetooth sensor travel-time data to the NPMRDS data.

# Details on Infrastructure Measures

## Goal 2/Objective 4: Economic Competitiveness and Workforce

### Reduce Time to Issue Hazmat Transportation Permits (PHMSA)

*Measure*
HM special permit applications average number of days to resolution.

*Scope*
Average number of days to process and make a determination on a special permit application.

Special permits vary in both political and technical complexity. PHMSA has found that by averaging the number of days to evaluate applications, the range of complexity is accounted for and efficiency of the Special Permit evaluation processes is better reflected.

*Sources*
Data retrieved from the PHMSA Portal, Special Permits processing tool, and collated in the PHMSA Data Mart (formerly the Hazmat Information Portal).

*Statistical Issues*
When there are a particularly low number of special permit applications, the results will be skewed.

*Completeness*
Data are only available back to FY 2017 following the transition to conducting special permit evaluations on the Portal application.

*Reliability*
Issues with software, impacting the flow of data from the Portal application to the Data Mart, have impacted reliability of results in the past. In time, the situation was corrected.

*Verification and Validation*
Anecdotal review and observation of trends to determine if results fall within reasonable variation.

# Details on Infrastructure Measures

## Goal 2/Objective 4: Economic Competitiveness and Workforce

## Provide a Safe, Secure, Reliable, and Efficient United States Portion of the St. Lawrence Seaway to its Commercial Users (SLSDC)

*Measure*
Percentage of time the United States portion of the St. Lawrence Seaway is available to commercial users.

*Scope*
The reliability of the U.S. sectors of the St. Lawrence Seaway (including the two U.S. Seaway locks in Massena, New York) are critical to continuous commercial shipping during the navigation season (late March to late December).

System downtime due to any condition (weather, vessel incidents, malfunctioning equipment) causes delays to ships; affecting international trade to and from the Great Lakes region of North America.

Downtime is measured by:

- Hours/minutes of delay for weather (visibility, fog, snow, ice),
- Vessel incidents (human error, electrical and/or mechanical failure),
- Water level and rate of flow regulation, and
- Lock equipment malfunction.

*Sources*
Saint Lawrence Seaway Development Corporation (SLSDC) Office of Lock Operations and Marine Services.

*Statistical Issues*
None.

*Completeness*
The SLSDC is the Federal agency responsible for the operation and maintenance of the United States portion of the St. Lawrence Seaway. Furthermore, SLSDC's lock operations unit gathers primary data for all vessel transits through the United States Seaway sectors and locks, including any downtime in operations.
Data are collected on site, at the United States locks, as vessels are transiting or as operations are suspended. This information measuring the system's reliability is compiled and delivered to SLSDC senior staff and stakeholders each month.

*Reliability*
The SLSDC compiles annual system reliability data for comparison purposes. Since the SLSDC gathers data directly from observation, there are no limitations. The SLSDC historically reports this performance metric for its navigation season (typically late March to late December).

*Verification and Validation*
The SLSDC verifies and validates the accuracy of the data through review of 24-hour vessel traffic control computer records, radio communication between the two Seaway entities and vessel operators, and video and audiotapes of vessel incidents.

# Details on Innovation Measures

## Goal 3/Objective 1: Development of Innovation

### Increase the Development of Innovations in Transportation—Research Results and Technical Reports Made Publicly Available (OST-R)

*Measure*
Research outcomes made publicly available in Research Hub.

Technical Reports Made Publicly Available in The National Transportation Library.

*Scope*
DOT is committed to increasing the efficiency and influence of its research investments by collaborating with external stakeholders early in the research and development (R&D) process. DOT is making research results (software, data, and all other DOT-sponsored information) easy to locate to increase visibility and utility. To expand information accessibility, DOT is committed to identifying stakeholders and aligning technology transfer activities early in the process of formulating R&D agreements. This alignment may increase the impact of societal benefits attributed to DOT's R&D investment.

DOT plans to increase the visibility of its research results with stakeholders by connecting them to the National Transportation Library and Research Hub. FY 2019 is the baseline year.

*Sources*
National Transportation Library (NTL).

*Statistical Issues*
NTL provides the number of total publications made available to the public and research results through the Research Hub which were developed through DOT sponsored research. NTL has capability of producing statistical analysis of its archived items.

*Completeness*
The Office of the Secretary of Transportation—Research (OST-R) is coordinating with the modal administrations to help ensure that all DOT-sponsored reports and outcomes are made publicly available.

*Reliability*
Further research is needed.

*Verification and Validation*
None.

# Details on Innovation Measures

## Goal 3/Objective 2: Deployment of Innovation

### Integrating Space Launches into National Airspace System (NAS) By Using Time-Based Launch/Reentry Procedures to Improve NAS Efficiency (FAA)

*Measure*
Develop and implement new time-based procedures for integrating Cape Canaveral/Kennedy Space Center Launch Complex commercial space launches and reentry operations into the NAS.

*Scope*
National Traffic Management Initiatives (TMIs) in the form of Flow Constrained Area (FCA) based reroutes are used to identify aircraft affected by the launch or reentry. Procedures to communicate actual launch/reentry impact time and duration and to coordinate airspace and TMIs.

*Sources*
The Air Traffic Control System Command Center (ATCSCC) operational records, logs, and observations by the Space Operations office.

*Statistical Issues*
There are no statistical issues in the reporting of the metric.

*Completeness*
Time-based launch/reentry procedures and dynamic launch/reentry windows will be implemented once procedures and coordination for their use have been developed, outreach to affected stakeholders has been completed, and an operational demonstration of their use has been completed.

*Reliability*
The ATCSCC Space Operations office will continue to work to ensure commercial space launch/reentry operations are safely and efficiently integrated into the NAS. Opportunities to execute time based launch/reentry procedures and utilize dynamic launch/reentry windows will continue to be a priority goal.

*Verification and Validation*
Inherent in the processes above.

# Details on Innovation Measures

## Goal 3/Objective 2: Deployment of Innovation

### Increase Effectiveness of Technology Transfer—Technologies Toward Implementation and Success Stories (OST-R)

*Measure*
This measure tracks the number of times DOT-sponsored activities led to the actual use of technologies and the number of success stories. The term technology is used broadly to describe the R&D results of DOT-sponsored activities.

*Scope*
DOT will coordinate and partner with technology deployment experts within the OAs and leverage expertise and resources within and outside DOT to identify whether DOT sponsored activities led to the actual use of technologies through pilots, demonstrations, or related activities. These measures can help monitor the effectiveness of DOT's tech transfer activities, which can lead to identifying societal benefits through formal evaluations.

*Sources*
OST-R is implementing a process throughout DOT to increase the level of visibility of post R&D activities through evaluations. OST-R is monitoring implementation progress through quarterly reviews. FY 2019 is the baseline year.

*Statistical Issues*
None.

*Completeness*
OST-R is coordinating with all OAs to ensure the entire R&D portfolio is included.

*Reliability*
OST-R is leading the effort and collecting the data directly from the R&D sources.

*Verification and Validation*
OST-R is implementing a review process that collects and reviews key performance indicators (KPI) to verify and validate information on a quarterly basis.

# Details on Innovation Measures

## Goal 3/Objective 2: Deployment of Innovation

### Complete Annual NextGen Advisory Committee Recommendations for Northeast Corridor (FAA)

*Measure*
Complete 80 percent of the Next Generation Air Transportation System (NextGen) Advisory Committee (NAC) Recommendations. Achieve 80 percent of NextGen Priorities Joint Implementation Plan commitments, excluding industry-controlled milestones, within a calendar quarter of their scheduled dates and within 10 percent of the planned cost (OSI target). Due September 30, 2019.

*Scope*
This metric measures the NextGen's success in completing the identified milestones in five areas:

- Surface Operations and Data Sharing (Surface);
- Multiple Runway Operations;
- Data Communications;
- Performance-Based Navigation, and
- NAC.

*Sources*
Completion of these commitments is closely tracked, monitored, and coordinated across NextGen, Aviation Safety (AVS), and ATO LOB. The agency will continue to monitor progress by conducting internal meetings at least monthly to oversee implementation status. Senior FAA and industry leadership will provide quarterly updates to the NAC's subcommittee. Progress reports will be provided publicly through the NAC with advance notice available to the public in the Federal Register. The FAA will also report on progress against the milestones for each focus area of the NextGen Performance Snapshots website.

*Statistical Issues*
There are no statistical issues related to the NextGen Priorities.

*Completeness*
The decision to declare a commitment complete is as follows:

- Implement a functioning capability at a specific location or finish an assessment/study.
- Hold the monthly NextGen Integration Working Group meeting where SMEs share recent accomplishments with Office of NextGen (ANG), ATO, and AVS leadership.
- ANG, ATO, and AVS leadership jointly determine if the commitment is complete. If so, the commitment's status is changed from "on track" to "complete" on the public NextGen Performance Snapshot website.

*Reliability*
The metric has no reliability issue. The NAC recommended commitments are either complete or they are not.

*Verification and Validation*
Inherent in the processes above.

# Details on Innovation Measures

## Goal 3/Objective 2: Deployment of Innovation

### Mission Efficiency and Support (Major System Investments) (FAA)

*Measure*
Percentage of major system investments completed on-time and on budget.

Ninety percent of major baselined acquisition programs must be maintained within 10 percent of their current acquisition cost, schedule, and performance baseline as of the end of FY 2019.

*Scope*
Programs classified as Acquisition Category (ACAT) 1, 2, or 3 considered strategic or part of NextGen are considered "Major" programs and included in this measure. For FY 2019, 20 major acquisition programs will be tracked and monitored. This measure is consistent with Public Law 104-264, which requires the FAA Administrator to consider termination of a program if the program is breaching the cost, schedule, or technical performance baseline by more than 10 percent.

*Sources*
FAA LOBs report monthly status of their Acquisition Program Baselines using Strategic Planning, Implementation Reporting and Evaluation (SPIRE) tool, an automated database. FAA LOBs provide a monthly status of Estimated Cost at Completion, Estimated Schedule at Completion, and technical performance including an analysis of the risks in maintaining program baselines. Performance indicators and commentary are provided monthly that detail problems, issues, and corrective actions, to ensure baselines are maintained within the established acquisition baseline parameters. The performance status is reported monthly to the senior level managers via the monthly Performance Committee Meetings.

*Statistical Issues*
The programs selected each FY represent a cross section of programs within the FAA. They include Automation, Communication, Facility, NextGen, Navigation, Weather, and Surveillance programs that have an ACAT 1, 2, 3, or are of strategic importance to the agency.

*Completeness*
This measure is current with no missing data. Reporting will begin 30 days after the list of programs is finalized.

*Reliability*
Each organization having major acquisitions uses the data during periodic acquisition program reviews. The monthly status is reported through the SPIRE tool and included in monthly high-level management reviews. Detailed status is reported each month, supported by Red, Yellow, or Green measures for cost, schedule, and performance parameters. These detailed reports are reviewed with the appropriate Lines of Business and Executive levels.

*Verification and Validation*
Inherent in the processes above.

## Details on Innovation Measures

### Goal 3/Objective 2: Deployment of Innovation

#### Monitor Adoption of Self Driving Vehicles (NHTSA)

*Measure*
Deployment of Automated Driving Systems.

*Scope*
Data collection has not started for this measure.

*Sources*
Not applicable.

*Statistical Issues*
Not applicable.

*Completeness*
Not applicable.

*Reliability*
Not applicable.

*Verification and Validation*
Not applicable.

## Details on Accountability Measures

### Goal 4/Objective 1: Regulatory Reform

#### Reduce the Regulatory Burden on the Transportation Industry and Public While Still Achieving Safety Standards (DOT)—Compliance with Executive Order

*Measure*
Compliance with executive order to reduce two regulations for each new regulation (ratio).

*Scope*
This is measured as the number of DOT regulatory actions classified as "deregulatory" divided by the number of significant regulatory actions classified as "regulatory."

The "deregulatory" and "regulatory" categorizations are determined through negotiations with Office of Information and Regulatory Affairs (OIRA).

All DOT rulemakings completed within the FY.

*Sources*
Regulatory impact analyses and other economic analyses produced in support of the rulemakings. These classifications also are published in the Federal Register.

*Statistical Issues*
Not applicable as this is not a statistical data collection.

*Completeness*
Applies to 100 percent of rulemakings completed by DOT.

*Reliability*
Not applicable as this is purely an accounting exercise.

*Verification and Validation*
Review within modes and by OST. Reviewed, audited, and approved by OIRA at the end of the FY.

## Details on Accountability Measures

### Goal 4/Objective 1: Regulatory Reform

### Reduce the Regulatory Burden on the Transportation Industry and Public While Still Achieving Safety Standards—Reduce Economic Impact of Regulations (DOT)

*Measure*
Reduce the economic impact of regulations, expressed in terms of total cost savings (annualized, adjusted at a 7 percent discount rate).

*Scope*
This is calculated as the sum of regulatory costs imposed by significant DOT rules less the sum of deregulatory cost savings for all DOT deregulatory actions for the FY.

All final DOT rulemakings completed within the FY, except for nonsignificant regulatory actions.

*Sources*
Regulatory impact analyses and other economic analyses produced in support of the rulemakings.

*Statistical Issues*
To the extent that there are statistical issues, these would be raised and addressed through OST and OIRA review as well as through notice and public comment.

*Completeness*
Applies to 100 percent of rulemakings completed by DOT, which are covered by EO 13771.

*Reliability*
Not applicable as this is purely an accounting exercise.

*Verification and Validation*
Review within modes and by OST. Reviewed, audited, and approved by OIRA at the end of the FY.

## Details on Accountability Measures

### Goal 4/ Objective 2: Mission Efficiency and Support

### Increase IT Shared Service Utilization Percentage (OCIO)

*Measure*
Increase the adoption of IT shared services being funded through the DOT Working Capital Fund (WCF) as a percentage of total IT spending.

*Scope*
The Office of the Chief Information Officer (OCIO) tracks all IT spending for the Department, including whether the IT spend was used to pay for IT shared services through the WCF.

*Sources*
Data are collected in DOT's Corporate Investment Management System as part of OMB IT Investment data requirements.

*Statistical Issues*
Not applicable.

*Completeness*
Not applicable.

*Reliability*
Not applicable.

*Verification and Validation*
Not applicable.

## Details on Accountability Measures

### Goal 4/ Objective 2: Mission Efficiency and Support

### Improve DOT's Cybersecurity—Systems with Proper Security Authorizations (OCIO)

*Measure*
Percent of systems with proper security authorizations.

*Scope*
DOT systems.

*Sources*
Data collected in the Cyber Security Assessment and Management (CSAM) tool.

*Statistical Issues*
Not applicable.

*Completeness*
Further research is needed.

*Reliability*
Further research is needed.

*Verification and Validation*
Not applicable.

## Details on Accountability Measures

### Goal 4/ Objective 2: Mission Efficiency and Support

### Improve DOT's Cybersecurity—Systems Converted to an Ongoing Authorization Process (OCIO)

*Measure*
Percent of systems converted to an ongoing authorization process.

*Scope*
DOT Systems.

*Sources*
Data collected in the CSAM tool.

*Statistical Issues*
Not applicable.

*Completeness*
Not applicable.

*Reliability*
Not applicable.

*Verification and Validation*
Not applicable.

# Details on Accountability Measures

## Goal 4/ Objective 2: Mission Efficiency and Support

## Decrease Improper Payments (OST-B)

*Measure*
Improper payment percentage for Activities Identified as Susceptible.

*Scope*
Improper payment legislation defines a program as susceptible to significant improper payments when annual improper payments exceed 1.5 percent and $10 million of outlays, or $100 million of outlays regardless of the error rate. The legislation requires agencies to obtain a statistically valid estimate and report an annual amount of improper payments in programs that were identified, by risk assessment, as susceptible to significant improper payments.

As of FY 2019, one DOT program has been identified as susceptible to significant improper payments and subject to annual reporting requirements: FHWA Highway Planning and Construction.

A risk assessment, statutory law, OMB, or management may identify additional programs as susceptible to significant improper payments and require DOT to report annual estimates. For FY 2020 and beyond FY 2020, DOT expects to report additional improper payment estimates related to disaster relief funding received from the Bipartisan Budget Act of 2018.

*Sources*
The population of payment data are extracted from Delphi, DOT's financial system of record. A DOT program office or grant recipient could be the source of detailed supporting documentation on the payment requirements.

*Statistical Issues*
DOT derives improper payment estimates rates based on probability samples with estimates for sampling error in accordance with OMB Circular A-123, Appendix C, Requirements for Payment Integrity Improvement. Improper payment estimates represent the results of programs susceptible to significant improper payments and are not a statistical estimate for all of DOT's programs.

*Completeness*
The Enterprise Service Center, DOT's financial management service provider, reconciles the data extracts to the OA's financial statements to ensure completeness. Next, the statistician and DOT officials collaborate to identify the final payment populations for sampling.

*Reliability*
The results of improper payments are used to demonstrate effective stewardship of taxpayer funds. A structured approach to analyzing improper payments helps DOT identify the root cause of errors made within our internal control systems, implement targeted corrective actions, and reduce improper payments.

*Verification and Validation*
A statistician prepares and an agency official certifies that DOT's sampling and estimation plans are in accordance with OMB Circular A-123, Appendix C requirements. The statistician designs and refines the sampling plans considering the nature and distribution of payments made by our programs. For grant-related programs, DOT typically employs a multi-stage random selection methodology. The first stage involves generating a sample from DOT payments to grant recipients. At the second stage, the statistician develops a sample from the list of invoices the grant recipient applied to the DOT payment. Next, DOT samples and tests line items from the grant recipient's invoice to determine if the expenditures are proper. After DOT officials confirm improper payments within the samples, the statistician extrapolates the results to arrive at the estimate.

# Details on Accountability Measures

## Goal 4/ Objective 2: Mission Efficiency and Support

## Improve Effectiveness and Efficiency of Support Services (OST-M)

*Measure*
Percent of actions in implementation plan to consolidate similar work performed across modes (Human Resources (HR), IT, and Acquisition (ACQ)).

*Scope*
"Sharing Quality Services" is one of several KPI within the broader President's Management Agenda Cross Agency Priority Goal: Cross-Cutting Priority Areas.

Currently, DOT delivers mission support services—HR, IT, and ACQ—from each of 11 OAs including FAA (modes), resulting in duplicative, costly technology, redundant staff roles, and the proliferation of inconsistent, manual processes.

With anticipated budget cuts and an administration mandate to reorganize, DOT must find a way to improve mission support operations, cut costs, and increase accountability and oversight.

DOT has outlined management reforms including a shared services model implementation to consolidate similar work performed across the modes and ensure policies and practices are applied consistently throughout DOT.

*Sources*
As the single authoritative repository for Federal procurement award data, the Federal Procurement Data System (FPDS) is the primary data source for the IT Contract Spend. Data that are provided via General Services Administration's (GSA) Data to Decisions (D2D) dashboards are endorsed by OMB and encouraged for use by agencies in managing and overseeing their category management program implementation. The data provided in the D2D dashboards are based on contract data entered into FPDS—Next Generation (FPDS-NG).

During FY 2014, DOT began a major systems integration effort called DP2 to link the Delphi financial management system to a single instance of Performance and Registration Information Systems Management (PRISM), the Department's standard contract writing system. DP2 eliminates the individual versions of PRISM that had been in use at each OA. The integration with Delphi supports the linkage of real-time fund commitments to requisitions and the financial recording of obligations when contract records are executed in PRISM.

HR workload at DOT is measured by three indicators: the number of transactions, recruitment cases, and the staff-to-customer ratio. The final workload indicator is the staff-to-customer ratio. Per the Office of Personnel Management (OPM), the median Federal agency HR servicing ratio is 60 employees per HR staff, with a range of 46 to 100.

The HR life cycle at DOT is supported by the IT systems described in the following table. Two of these systems are owned and operated by the Department of Interior Business Center (IBC), which is one of several HR LOB organizations approved by OPM to provide services to customer agencies throughout the Federal Government.

*Statistical Issues*
Not applicable.

*Completeness*
Information collected to assess DOT's performance against this goal is based on data entered into FPDS by individual contracting officers within DOT OAs. Federal regulation and DOT acquisition policy requires contracting officers to ensure all records for contracting actions are entered and finalized in FPDS within three days of award.

*Reliability*
Not applicable.

*Verification and Validation*
There may be instances when it is not apparent to OMB and GSA when a requirement is not a common requirement, but more mission specific and should not be included in the addressable spend. Therefore, it is incumbent upon the agencies to cleanse the data prior to utilizing it for any significant decision-making.

The data are initially entered into FPDS via interface between DOT's contract writing system, PRISM, and then validated by individual contracting officers. Since there is a data validation step prior to finalization in FPDS, DOT is

IT Systems Supporting DOT's HR Life Cycle

| SYSTEM | OWNERSHIP | DESCRIPTION AND USE |
|---|---|---|
| USAJOBS | OPM | Interfaces with Federal job seekers as the government's official recruiting site. |
| Monster Government Solutions | Commercially available | Used by many Federal agencies to manage the staffing function. Used by HR specialists to rate and rank applications, build certificates of eligible candidates, share certificates and application materials with hiring managers, document selections, and maintain selection case files. |
| Federal Personnel/ Payroll System (FPPS) | IBC | Used as the official system of records for position management and employee records, as well as the pay agent for DOT. |
| Consolidated Automated System for Time and Labor Entry (CASTLE) | DOT (FAA) | Interfaces with employees, timekeepers, and FPPS to account for and process time and leave. |
| Workforce | IBC | Integrates as an overlay system with FPPS. |

satisfied that the data are primarily accurate; however, since human error is possible, there may be mistakes in minor pieces of the data pulled from FPDS.

As an additional verification of FPDS data accuracy, DOT OA contracting offices perform an annual review of FPDS data to ensure accuracy and completeness in accordance with FAR 4.604 and provide assurance statements to the Office of the Senior Procurement Executive (OSPE) as to their results. Using the OA responses, OSPE provides a consolidated report to GSA each FY on behalf of the department.

Hiring and recruitment actions are entered into Monster via the Executive Agent. Once a selection has been made, a hiring action is entered to FPPS/Workforce Transformation and Tracking System by the hiring manager or administrative support. The hiring action is validated by the Budget and HR operations offices before final approval is granted.

DOT HR offices (both the Executive Agent and the OAs follow legislative, OPM, and OMB guidance. Regarding hiring from outside the government, all OAs follow the guidance, processes, and procedures set out in the department's Personnel Manual and implemented by the EA. Each OA has its own merit promotion plan which dictates policies for filling jobs from within the government.

# Details on Accountability Measures

## Goal 4/ Objective 2: Mission Efficiency and Support

## Increase Use of Best in Class (BIC) Contracts (OST- M60)

*Measure*
Calculation of BIC is the percent of all DOT obligated contract dollars on common spend (goods and services) that are committed on a BIC contract vehicle as defined by OMB/GSA.

*Scope*
"Increasing Use of Best in Class" is one of six KPI within the broader President's Management Agenda Cross Agency Priority Goal No. 7: Category Management.

The scope of Category Management encompasses spending in 10 common categories of goods and services. The categories are: facilities and construction; professional services; IT; medical; transportation and logistics: industrial products and services; security and protection; human capital; office management; and travel.

BIC contracts have been vetted by OMB and GSA against a rigorous set of criteria and determined to meet the Category Management Principles and thus should be utilized to the maximum extent practicable.

BIC achievement to target numbers are based on actual obligation data provided with each contract action in the FPDS-NG and summarized for category management agency program officials in the GSA D2D dashboards, which are endorsed for use by the OMB.

*Sources*
As the single authoritative repository for Federal procurement award data, the FPDS-NG is the primary data source for the BIC data. The data from FPDS-NG is then populated in GSA's D2D dashboards. The dashboards are then use by agencies in managing and overseeing their category management program implementation.

*Statistical Issues*
To calculate BIC, the GSA Program Management Office needs to populate the current information from FPDS-NG into the D2D dashboard. We do not anticipate technical issues from the data transfer impacting the statistics. What will cause statistical issue is the fluctuation of spend by OAs. To accurately pinpoint progress will be challenging. Utilizing the Department's category management annual plan, we will better be able to track OAs' planned progress to actual progress.

*Completeness*
Information collected to assess DOT's performance against this goal is based on data entered into FPDS-NG by individual contracting officers within DOT OAs. Federal regulation and DOT acquisition policy requires contracting officers to ensure all records for contracting actions are entered and finalized in FPDS within three days of award.

*Reliability*
Not applicable.

*Verification and Validation*
The data are initially entered into FPDS-NG via interface between DOT's contract writing system, PRISM, and then validated by individual contracting officers. Since there is a data validation step prior to finalization in FPDS-NG, DOT is satisfied that the data are primarily accurate; however, since human error is possible, there may be mistakes in minor pieces of the data pulled from FPDS-NG.

As an additional verification of FPDS-NG data accuracy, DOT OA contracting offices perform an annual review of FPDS-NG data to ensure accuracy and completeness in accordance with FAR 4.604 and provide assurance statements to the OSPE as to their results. Using the OA responses, OSPE provides a consolidated report to GSA each FY on behalf of the Department.

# Details on Accountability Measures

## Goal 4/ Objective 2: Mission Efficiency and Support

## Facility Consolidation Measure (OST-M)

*Measure*
Square Footage Reduced year over year based on the Reduce the Footprint (RTF) base line established by GSA.

*Scope*
Nationally, DOT manages 31.3 million square feet (SF) of building space. With approximately 56,100 real property assets of which 49,800 (89 percent) are owned and 6,400 (11 percent) are leased. While, leased assets include 280 GSA leases, the majority are direct leases. Owned assets have an estimated replacement value of $13 billion. Annually the Department spends approximately $315 billion for 11.4 million SF of leased assets.

Although the DOT portfolio contains sixteen different GSA building categories, the space reductions are focused on the categories of 9.4 million SF (30.1 percent) as office and 2.8 million SF (9 percent) as warehouse. The remaining 19.0 million SF (60.8 percent), is tied to unique mission or functional requirements. These specialized facilities include:

- Schools/training (2.8 percent);
- Labs (4.2 percent);
- Navigation and traffic aids (34.8 percent); and
- Other types (18.7 percent).

*Sources*
Real Property data used to calculate reductions for owned and direct lease information is from the DOT Real Estate Management System (REMS). GSA's Federal Real Property Program (FRPP) provides information on Occupancy Agreements (OA) where GSA provides space for the Department.

*Statistical Issues*
None.

*Completeness*
To ensure accuracy of DOT's real property assets in REMS, personnel confirm information that includes: verifying lease records and land ownership documents, validating square footage, confirming against operational databases, and contacting maintenance personnel. FAA is developing a system to support a new triennial inventory process with automated cross-checks with other FAA systems and program office information to align with real property information. A major challenge to implement these features is alignment of REMS and FRPP assets with information from the operating office.

*Reliability*
DOT looks at trends based on prior FRPP submissions to ensure changes can be supported by specific real property activities, general real property strategies, or data quality improvement efforts.

FAA's Bureau Variance Report is produced from the FRPP submission and supports this review while also identifying obvious anomalies. Since DOT reports on roughly 57,000 assets, this review is completed at a portfolio level by OA and focuses on quantifiable measures such as total number of assets by type, acreage, SF, replacement value, repair needs, and operating costs.

With data from prior FRPP submissions, DOT checks the trend of major indicators going back several years. Since establishment of the RTF initiative, DOT has conducted an asset level review of office and warehouse facilities, with sensitivity to any reported changes year over year.

*Verification and Validation*
The Department is focused to ensure accurate REMS data through several processes. One method is the REMS "Invalid Data Module" that checks asset information against a set of business rules.

When data errors are identified, they are corrected immediately. Inaccuracies are reported monthly and made available for investigation.

The FAA assigns the Invalid Data report to regional personnel to validate and correct. Additionally, the Real Property Management Office performs periodic checks, such as reviewing high-level SF totals reported against a subset of facility types. While this approach may not

indicate a specific issue, it can identify inconsistencies that require further data evaluation. In some instances, comparing data may identify miscoding in one of the systems. Using this approach revealed that SF at one facility was overstated and research identified several building improvements erroneously entered as new buildings. These assets were corrected in the system.

High-level metrics are produced monthly, quarterly, and annually to identify portfolio-wide trends and verify that changes are a result of real property initiatives.

## Details on Accountability Measures

### Goal 4/ Objective 2: Mission Efficiency and Support

### Reduce the Number of Unessential Federal Advisory Committees (OST-M)

*Measure*
The number of Federal Advisory Committees terminated.

*Scope*
All Federal Advisory Committees in DOT.

*Sources*
Federal Advisory Committees Act database maintained by S-10 in DOT.

*Statistical Issues*
Not applicable as this is not a statistical data collection.

*Completeness*
Applies to 100 percent of DOT's Federal Advisory Committees.

*Reliability*
Reliability depends upon S-10 coordination with the OAs.

*Verification and Validation*
Reviewed and approved within modes and by OST.

Reviewed and approved by GSA as each committee is terminated, and at the end of each year.

**U.S. Department of Transportation**

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