

Integrating ITS/TSMO with Planning: Preliminary Decision Support Tool

Traveler Information

August 2016

Introduction

- This preliminary decision support tool has been developed to support transportation planning and operations staff with:
 - ❖ Selecting operations objectives to address regional transportation issues
 - ❖ Identifying ITS/TSMO strategies to support their selected operations objectives
- The tool currently addresses operations objectives and ITS/TSMO strategies for the Traveler Information service area only
 - ❖ Additional service areas may be developed at a later date
- Content for this tool was primarily taken from
 - ❖ Advancing Metropolitan Planning for Operations: The Building Blocks of a Model Transportation Plan Incorporating Operations – Desk Reference (<http://www.ops.fhwa.dot.gov/publications/fhwahop10027/fhwahop10027.pdf>)
 - ❖ ITS Architecture-Use in Transportation Planning (<http://www.iteris.com/itsarch/html/archuse/planning.htm>)
 - ❖ ITS Knowledge Resources (<http://www.itskrs.its.dot.gov/>)
 - ❖ ITS Applications Overview (<http://www.itsoverview.its.dot.gov/>)
 - ❖ Published results of ITS research, operational test evaluations, or other benefits documentation

What can this tool help me do?

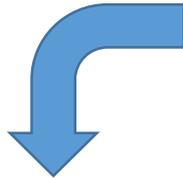
Step One

The tool helps users select a category of operations objectives appropriate for their region/agency

Operations objectives state what a region/agency plans to achieve regarding the operational performance of the transportation system. They are specific, measurable, agreed-upon statements of system performance.

What can this tool help me do?

Traveler Information



Step One

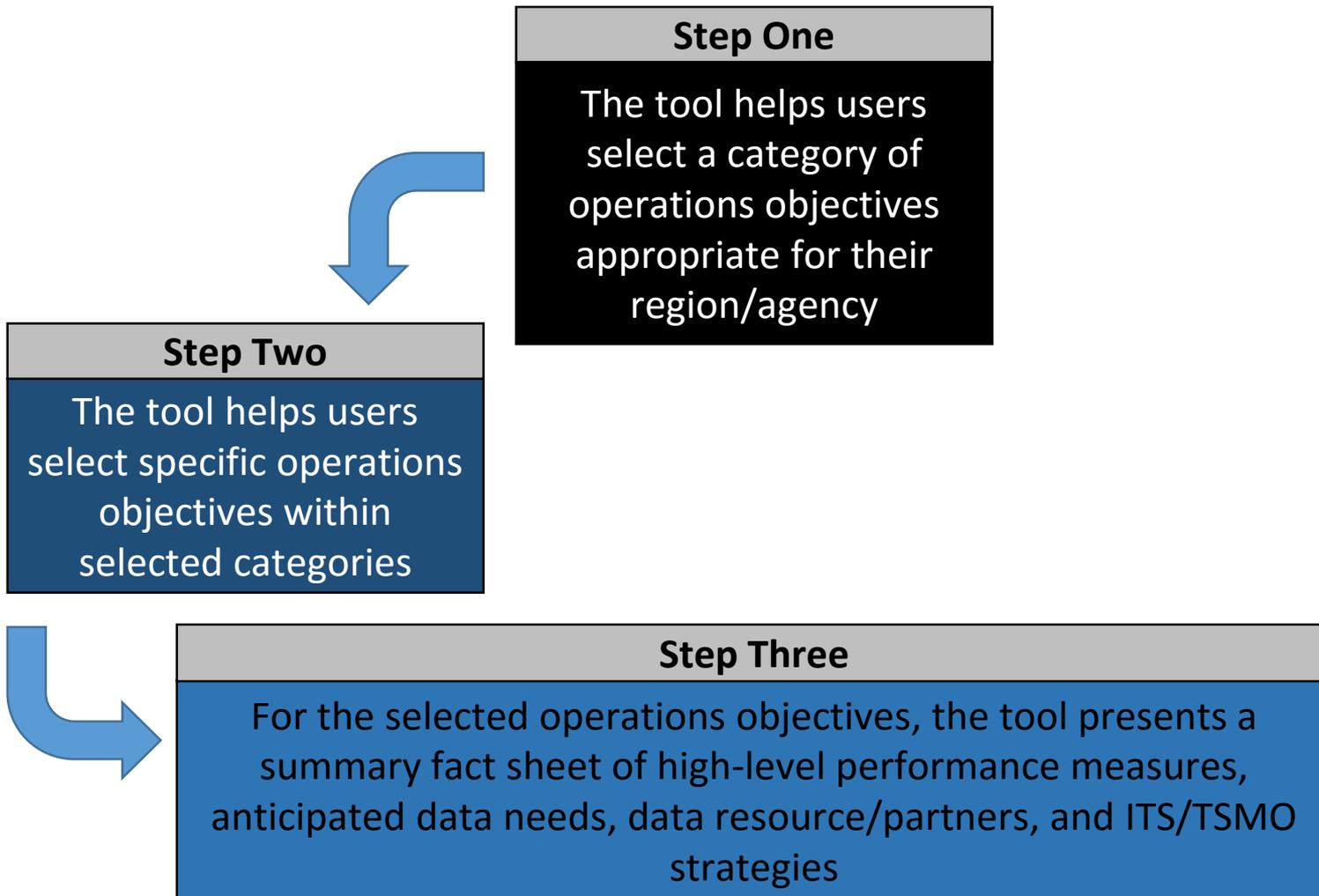
The tool helps users select a category of operations objectives appropriate for their region/agency

Step Two

The tool helps users select specific operations objectives within selected categories

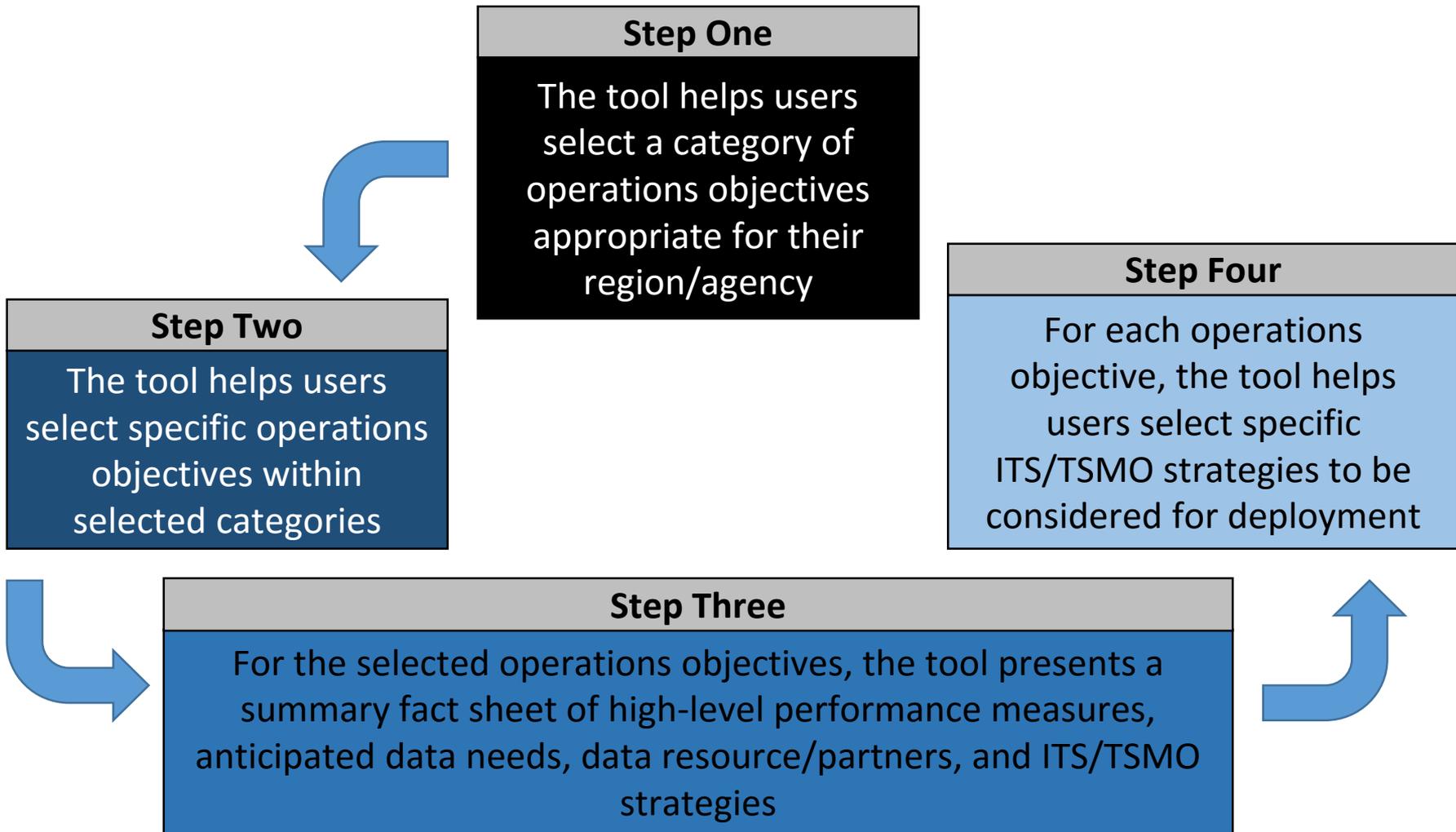
What can this tool help me do?

Traveler Information



What can this tool help me do?

Traveler Information



How is this tool used?

Step Two

The tool helps users select specific operations objectives within selected categories

2. Select Operations Objective: Data Collection and Sharing on Travel Conditions

Select specific operations objective(s) using the criteria below.

Travel Information

<p>1. If your region includes multiple modes of transportation that overlap or are adjacent to each other. AND</p> <p>2a. There is limited travel of operations data (e.g. delays, incidents, etc.) between modes. OR</p> <p>2b. There is limited sharing of the services offered to modes (e.g. transit, bus, bicycle, etc.) between modes. OR</p> <p>2c. There is a goal to increase multi-modal travel performed by travelers within the region.</p> <p>Notes:</p> <p>You should consider adopting the Operations Objective titled: Increase the percent of modes in the region that are able to provide information on multi-modal travel routes to X percent by Y year.</p>	<p>1. If your agency has not achieved compliance with the 23 CFR 511 regulation, or you are not aware of the specifics of the regulation. OR</p> <p>2a. Your agency has identified gaps in travel condition data that are required for Performance Measures Reporting performed or planned by your agency. OR</p> <p>2b. Your agency has identified gaps in the travel condition data required for performance operations, incident response, or maintenance of the transportation system. OR</p> <p>2c. Based on customer feedback or the opinions of your agency, you feel your traveler information system should include coverage of additional roads.</p> <p>Notes:</p> <p>You should consider adopting the Operations Objective titled: Increase the percent of modes in the region that are able to provide information on multi-modal travel routes to X percent by Y year.</p>	<p>1. If your region includes multiple transportation facilities (e.g. roads, parking facilities, toll roads, etc.) and you are not aware of the specifics of the regulation. OR</p> <p>2a. There is a goal to improve incident response in the region that might be addressed by cooperation between transportation modes. OR</p> <p>2b. Individual agencies of operations travel or other modes (e.g. roads, transit) need to work together to improve incident response and reporting. OR</p> <p>Notes:</p> <p>You should consider adopting the Operations Objective titled: Increase the percent of modes in the region that are able to provide information on multi-modal travel routes to X percent by Y year.</p>
--	---	---

Home

The tool presents a second layer of criteria to help user select specific operations objectives

1a. If your agency has not achieved compliance with the 23 CFR 511 regulation, or you are not aware of the specifics of the regulation. **OR**

1b. Your agency has identified gaps in travel condition data that are required for Performance Measures Reporting performed or planned by your agency. **OR**

1c. Your agency has identified gaps in the travel condition data required to perform operations, incident response, or maintenance of the transportation system. **OR**

1d. Based on customer feedback or the opinions of your agency, you feel your traveler information system should include coverage of additional roads.

THEN

You should consider adopting the Operations Objective titled: [Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.](#)

How is this tool used?

Step Three

For the selected operations objectives, the tool presents a summary fact sheet of high-level performance measures, anticipated data needs, data resource/partners, and ITS/TSMO strategies

3. Operations Objective Fact Sheet: Data Collection and Sharing on Travel Conditions

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase the percent of modes in the region that share their traveler information with other agencies in the region to 100 percent by Y year.
 - Increase the percent of transportation systems in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.
 - Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.
- Performance Measures**
- Percent of the transportation systems in which travel conditions can be detected remotely via CCTV, speed detectors, etc.
 - Percent of transportation facilities whose owners share their traveler information with other agencies in the region.
- Anticipated Data Needs**
- Number of modes in the region that share their traveler information with other modes.
 - Number of miles of roads or rails that are covered by remote detection.
 - Number of the transportation facilities in the region.
 - Count of jurisdictions sharing traveler information with other agencies in the region.
 - Count of modes in the region sharing traveler information with other modes.
- Data Resources and Partners**
- The data for these performance measures would come from querying each of the transportation facility owners/operators in the region on their detection systems and information sharing practices.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

The tool presents information from a fact sheet included in *Advancing Metropolitan Planning for Operations: The Building Blocks of a Model Transportation Plan Incorporating Operations – Desk Reference*

How is this tool used?

Step Four

For each operations objective, the tool helps users select specific ITS/TSMO strategies to be considered for deployment

The screenshot displays a web-based interface for selecting ITS/TSMO strategies. The main heading is "4. ITS/TSMO Strategies: Data Collection and Sharing on Travel Conditions". Below this, a sub-heading reads: "Review criteria below and select applicable ITS/TSMO strategies for: Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year." The interface is divided into four columns, each containing a set of criteria (1a, 1b, 1c) and a "THEN" section. A "Home" button is visible at the bottom right of the screenshot.

The tool presents an additional layer of criteria to help user select ITS/TSMO strategies, and to identify related resources

1a. If roadway or lane blocking incidents are not reported to within 20 minutes of the time the incident is verified for highways outside the metro area or within 10 minutes for locations within the metro area.² **OR**

1b. The degree of accuracy for incidents is less than 85%.⁵ **OR**

1c. Less than 90% of lane or road blocking incidents are not reported.⁶

THEN

A recommended ITS/TSMO strategy is: **Increase and automate reporting of incidents or unplanned events.**

Resources to consider:

- [Best Practices for RCRS: Automated Ingest of Law Enforcement CAD Data](#)

How is this tool used?

The tool includes a series of hyperlinks that advance the user to the appropriate pages

At various locations, a “Home” button is available to return to the start

A rectangular button with rounded corners, a thin blue border, and the word "Home" in blue text.

On the following screen the user will begin Step 1 by selecting an operations objective to consider

1. Operations Objectives Home: Traveler Information

Select a category of operations objectives below to assess for its application to your region.

[Customer Satisfaction](#)

[Data Collection and Sharing on Travel Conditions](#)

[Information Dissemination](#)

[Trip Planning Tools](#)

Traveler Information

1. Assess Operations Objective: Customer Satisfaction

Review criteria below to assess this category of operations objective and determine if it should be further reviewed.

1. If agency tracks customer satisfaction with traveler information.

AND

2a. If customer satisfaction is lower than targeted or declining.

OR

2b. If agency receives higher than acceptable amounts of feedback consistently criticizing one or more aspects of your traveler information system.

OR

2c. If agency receives suggestions from travelers for additional mechanisms for accessing traveler information (e.g. mobile apps) and has identified a goal of assessing suggestions from the public.

THEN

You should consider adopting the operations objective: [Increase customer satisfaction rating of the timeliness, accuracy, and usefulness of traveler information in the region by W, X, and Z percent, respectively, over Y years.](#)

Otherwise, return to [Operations Objectives Home: Traveler Information](#)

2. Select Operations Objective: Customer Satisfaction

Select specific operations objective(s) using the criteria below.

Because there is only one operations objective for Customer Satisfaction, this step is not needed. [Click here](#) to proceed to the next step.

3. Operations Objective Fact Sheet: Customer Satisfaction

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

Traveler Information

Operations Objectives • Increase customer satisfaction rating of the timeliness, accuracy, and usefulness of traveler information in the region by W, X, and Z percent, respectively, over Y years.

Performance Measures • Customer satisfaction ratings of timeliness, accuracy, and usefulness of traveler information.

Anticipated Data Needs • Customer ratings of traveler information per year.

Data Resources and Partners • This data would be gathered through surveys among the public and businesses that use the transportation system to move goods and deliver services.

ITS/TSMO Strategies to Consider Strategies to improve customer satisfaction with traveler information include:

- [Increasing the detection of travel conditions](#)
- [Improving multi-agency, multi-modal sharing of travel data](#)
- [Relying on convenient, accessible means of information distribution](#)

4. ITS/TSMO Strategies: Customer Satisfaction

Review criteria below and select applicable ITS/TSMO strategies for: Increase customer satisfaction rating of the timeliness, accuracy, and usefulness of traveler information in the region by W, X, and Z percent, respectively, over Y years.

1. Based on customer feedback or comments, if you feel your traveler information system is either:

- Not accurate enough; or
- Not detailed enough; or
- Not updated frequently enough/not timely.

THEN

A recommended ITS/TSMO strategy for you to consider is: [Increase the detection of travel conditions.](#)

1. Based on customer feedback or comments, if your customers are requesting:

- Traveler information about local roads not currently included in your system; or
- Additional types of information, such as travel services or events; or
- Requests for information about additional modes of travel (e.g. transit, bike).

THEN

A recommended ITS/TSMO strategy for you to consider is: [Improve multi-agency, multi-modal sharing of travel data.](#)

1. Based on customer feedback or comments, if your customers are requesting:

- More dissemination mechanisms (e.g. mobile Apps); or
- Additional functionality as they experience in other systems.

THEN

A recommended ITS/TSMO strategy for you to consider is: [Rely on convenient, accessible means of information distribution.](#)

4. ITS/TSMO Strategy Detail: Increase the Detection of Travel Conditions

Review criteria below and select additional ITS/TSMO strategy detail.

1. If your agency does not currently operate a Road Condition Reporting System (RCRS) that allows manual data entry from multiple users to describe road conditions. **AND**

2. If your agency can allocate portions of time for dispatchers or other personnel to manually enter road conditions based on field observations. **AND**

3. If your agency is willing to modify your traveler information system to display road conditions. **AND**

4. If your agency operates a road network that experiences periods of time where weather impacts the roadway driving conditions, and travelers visit your systems to view information about conditions.

THEN

A recommended ITS application for you to consider is: **Implement an RCRS.**

Resources to consider:

- [Best Practices for Road Condition Reporting Systems](#)

1. If your agency operates a Road Condition Reporting System. **AND**

2a. If you believe that the observations and manual entry of road conditions performed by personnel is not comprehensive or timely enough to meet customers needs. **OR**

2b. You believe that the geographic coverage of weather or condition reporting needs to expand.

THEN

A recommended ITS application for you to consider is: **Increase road condition reporting.**

Resources to consider:

- Best Practices for RCRS:
 - ✓ [RCRS Ingest of Weather Data](#)
 - ✓ [Citizen Reporting into RCRS](#)
- [Snowplow Tracking and Display](#)

1. If your agency operates a Road Condition Reporting System. **AND**

2a. If you believe reports of work zones impacting travel are not accurate or comprehensive enough. **OR**

2b. You would like to reduce staff workload associated with entering work zone data.

THEN

A recommended ITS application for you to consider is: **Automate reporting of road work activities.**

Resources to consider:

- [Best Practices for RCRS: Integrating Lane Closure Databases into RCRS](#)

1. If your agency operates a Road Condition Reporting System. **AND**

2a. If you would like to increase the percentage of incidents (crashes or other unplanned, non-recurring events) occurring on your road network that are included in your traveler information system. **OR**

2b. You would like to improve the timeliness of incident reports. **OR**

2c. You would like to reduce the manual workload of DOT staff entering incident reports. **OR**

2d. You would like to reduce verbal communications between law enforcement and DOT when reporting incidents.

THEN

A recommended ITS application for you to consider is: **Automate incident reporting.**

Resource to consider:

- [Best Practices for RCRS: Automated Ingest of Law Enforcement CAD Data](#)

4. ITS/TSMO Strategy Detail: Improve Multi-agency, Multi-modal Sharing of Travel Data

Review criteria below and select additional ITS/TSMO strategy detail.

Traveler Information

1. If your goal is to increase the number of transit providers included in your Trip Planning System.

AND

2. If one or more transit providers within your region do not operate transit route software capable of exporting routes in GTF format, but are interested in being included in your regional trip planning system.

THEN

A recommended ITS application for you to consider is: **Local transit agencies to develop GTF compatible transit schedules by hand (either manually or using a contractor supplied tool).**

Resources to consider:

- [Overview of GTFS](#)

1. If one or more cities or counties within your region do not share real-time travel data describing incidents, events, road work, or driving conditions on local (non State DOT) roads. **AND**

2. The state or regional traveler information system can accommodate travel information reported for local roads (e.g. website maps support presentation of icons on local roads).

THEN

A recommended ITS application for you to consider is: **Local entry tool for events on local roads.**

Resources to consider:

- [Oregon TripCheck FAQ \(Local Traffic Information\)](#)
- [Washington County \(Oregon\) Transportation System Plan 2035](#)

1. If one or more transit operators (bus, ferry, light rail) within your region operate applications that are compatible with the General Transit Feed Specification (GTFS), but are not shared with other modes in the region.

THEN

A recommended ITS application is: **Make a GTFS transit feeds publicly available.**

Resources to consider:

- [Overview of GTFS](#)

1. If one or more local law enforcement agencies operates a Computer Aided Dispatch (CAD) System.

AND

2a. If you would like to increase the percentage of incidents (crashes or other unplanned, non-recurring events) occurring on your road network that are shared with other agencies and/or other modes. **OR**

2b. You would like to reduce verbal communications between law enforcement and other agencies or other modes within your region, while maintaining or improving knowledge of current incidents and events.

THEN

A recommended ITS application for you to consider is: **Automate ingest of CAD data from law enforcement.**

Resources to consider:

- [Best Practices for RCRS: Automated Ingest of Law Enforcement CAD Data](#)

4. ITS/TSMO Strategy Detail: Rely on Convenient, Accessible Means of Information Distribution

Review criteria below and select additional ITS/TSMO strategy detail.

Traveler Information

1. If your agency or region is open to the concept of providing travel data and condition reports to third party (privately operated) traveler information service providers with established websites and mobile applications.¹ **AND**

2a. The travel data your agency assembles is owned by your agency or region without any proprietary data that you are restricted from sharing. **OR**

2b. You can isolate and remove any proprietary data from your overall dataset.

THEN

A recommended ITS Application for you to consider is: **Make as much information available to private sector information providers as possible using an Open API to support share local data.**

Resources to consider:

- [Washington State DOT Traveler Information API](#)

1. If your agency wishes to operate a full traveler information system, delivering information through multiple mediums and devices.² **AND**

2. Your agency lacks the financial or technical resources to develop and support the information delivery systems solely.²

THEN

Recommended ITS applications for you to consider is: **Shared development and operation of reporting systems and traveler information dissemination systems**

Resources to consider:

- [Best Practices for RCRS: Development and Operation Collaboration](#)

1. If your agency wishes to operate a full traveler information system, delivering information through multiple mediums and devices, but lacks the financial resources to support operations.² **AND**

2. Your agency is open to a concept of allowing private entities to own and operate some or all aspects of the traveler information systems.²

THEN

A recommended ITS application for you to consider is: **Privately operated traveler information system.**

Resources to consider:

- [NCHRP Synthesis 399: St. Louis, Missouri, Example of Privately Operated Traveler Information System](#)

1 NCHRP Synthesis 399, page 45. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_399.pdf

2 NCHRP Synthesis 399, page 44. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_399.pdf

1. Assess Operations Objective: Data Collection and Sharing on Travel Conditions

Review criteria below to assess this category of operations objective and determine if it should be further reviewed.

1. If your agency is not yet fully compliant with the [23 CFR 511 Rulemaking \(Part 511-Real-Time System Management Information Program\)](#).¹

OR

2. If you feel that transportation facility owners and operators within your region could benefit from increased information flow or coordination when responding to incidents or events.²

OR

3. If more than one transportation agency within your region is actively involved in performance management.

OR

4. If agencies within your region have identified a priority to improve: planning for operations, long-term planning, or policy and investment decision making

OR

5. If your region includes multiple modes (e.g. bus, rail, ferry, bicycle), and has identified a goal to increase the number of multi-modal trips

THEN

You should consider adopting one or more of the operations objectives in category: [Traveler Information: Data Collection and Sharing on Travel Conditions](#)

Otherwise, return to [Operations Objectives Home: Traveler Information](#)

Traveler Information

¹ 23 CFR 511: § 511.301-315 Real-Time System Management Information Program requirements. <https://www.gpo.gov/fdsys/pkg/CFR-2011-title23-vol1/xml/CFR-2011-title23-vol1-part511.xml>
² NCHRP Synthesis 460 found coordination and sharing of transportation operations data improved coordination during incidents. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_460.pdf

2. Select Operations Objective: Data Collection and Sharing on Travel Conditions

Select specific operations objective(s) using the criteria below.

Traveler Information

1. If your region includes multiple modes of transportation that overlap or are adjacent to each other. **AND**

2a. There is limited sharing of operations data (e.g. delays, incidents, etc.) between modes. **OR**

2b. There is limited sharing of the services offered by modal operations (e.g. transit, ferry, bicycle or pedestrian routes) including seasonal availability. **OR**

2c. There is a goal to increase multi-modal trips performed by travelers within the region.

THEN

You should consider adopting the Operations Objective titled: [Increase the percent of modes in the region that share their traveler information with other modes in the region to 100 percent by Y year.](#)

1a. If your agency has not achieved compliance with the 23 CFR 511 regulation, or you are not aware of the specifics of the regulation. **OR**

1b. Your agency has identified gaps in travel condition data that are required for Performance Measures Reporting performed or planned by your agency. **OR**

1c. Your agency has identified gaps in the travel condition data required to perform operations, incident response, or maintenance of the transportation system. **OR**

1d. Based on customer feedback or the opinions of your agency, you feel your traveler information system should include coverage of additional roads.

THEN

You should consider adopting the Operations Objective titled: [Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.](#)

1. If your region includes multiple transportation facility owners (e.g. roads, parking facilities, toll collection, etc.) willing to share real-time and static information about the operations of their facilities. **AND**

2a. There is a need for improved incident response in the region that might be addressed by cooperation between transportation facilities. **OR**

2b. Individual agencies disseminate traveler information (e.g. web, kiosk, DMS) and could potentially disseminate information describing neighboring facilities.

THEN

You should consider adopting the Operations Objective titled: [Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.](#)

3. Operations Objective Fact Sheet: Data Collection and Sharing on Travel Conditions

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

Traveler Information

- Operations Objectives**
- **Increase the percent of modes in the region that share their traveler information with other modes in the region to 100 percent by Y year.**
 - Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.
 - Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.

- Performance Measures**
- Percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc.
 - Percent of transportation facilities whose owners share their traveler information with other agencies in the region.
 - Percent of modes in the region that share their traveler information with other modes.

- Anticipated Data Needs**
- Number of miles of roads or rails that are covered by remote detection.
 - Number of the transportation facilities in the region.
 - Count of jurisdictions sharing traveler information with other agencies in the region.
 - Count of modes in the region sharing traveler information with other modes.

- Data Resources and Partners**
- The data for these performance measures would come from querying each of the transportation facility owners/operators in the region on their detection systems and information sharing practices.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Data Collection and Sharing on Travel Conditions

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.
 - **Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.**
 - Increase the percent of modes in the region that share their traveler information with other modes in the region to 100 percent by Y year.

- Performance Measures**
- Percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc.
 - Percent of transportation facilities whose owners share their traveler information with other agencies in the region.
 - Percent of modes in the region that share their traveler information with other modes.

- Anticipated Data Needs**
- Number of miles of roads or rails that are covered by remote detection.
 - Number of the transportation facilities in the region.
 - Count of jurisdictions sharing traveler information with other agencies in the region.
 - Count of modes in the region sharing traveler information with other modes.

- Data Resources and Partners**
- The data for these performance measures would come from querying each of the transportation facility owners/operators in the region on their detection systems and information sharing practices.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Data Collection and Sharing on Travel Conditions

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

Traveler Information

- Operations Objectives**
- Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.
 - Increase the percent of modes in the region that share their traveler information with other modes in the region to 100 percent by Y year.
 - **Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.**

- Performance Measures**
- Percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc.
 - Percent of transportation facilities whose owners share their traveler information with other agencies in the region.
 - Percent of modes in the region that share their traveler information with other modes.

- Anticipated Data Needs**
- Number of miles of roads or rails that are covered by remote detection.
 - Number of the transportation facilities in the region.
 - Count of jurisdictions sharing traveler information with other agencies in the region.
 - Count of modes in the region sharing traveler information with other modes.

- Data Resources and Partners**
- The data for these performance measures would come from querying each of the transportation facility owners/operators in the region on their detection systems and information sharing practices.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

4. ITS/TSMO Strategies: Data Collection and Sharing on Travel Conditions

Review criteria below and select applicable ITS/TSMO strategies for: Increase the percent of modes in the region that share their traveler information with other modes in the region to 100 percent by Y year.

Traveler Information

1. If one or more transit operators (bus, ferry, light rail) within your region operate applications that are compatible with the General Transit Feed Specification (GTFS), but are not shared with other modes in the region. **AND**

2. Other agencies operating transit facilities would benefit from information about current routes, schedules, or updates describing these modes.

THEN

A recommended TSMO strategy is: **To make a GTFS transit feeds publicly available.**¹

Resources to consider:

- [Overview of GTFS](#)

1. If one or more of your transit operators (bus, ferry, light rail) do not operate systems capable of generating schedules or updates compatible with the General Transit Feed Specification (GTFS). **AND**

2. These transit operators operate systems that would be beneficial to share routes and schedules with other agencies.

THEN

A recommended ITS/TSMO strategy is: **Local transit agencies to develop GTF compatible transit schedules by hand (either manually or using a contractor supplied tool).**²

Resources to consider:

- [Online Transit Trip Planner for Small Agencies Using Google Transit](#)

1 USDOT RITA Benefits Portal: Portland's TriMet and San Francisco's Muni transit agencies saved thousands of dollars in development costs and service fees through the use of Open Source Software (OSS). <http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/30EE95FBA64669CB85257B98007229CA?OpenDocument&Query=Home>

2 Caltrans: Online Transit Trip Planner for Small Agencies Using Google Transit. http://www.dot.ca.gov/newtech/researchreports/reports/2011/2011-09_task-2028_modal.pdf

4. ITS/TSMO Strategies: Data Collection and Sharing on Travel Conditions

Review criteria below and select applicable ITS/TSMO strategies for: Increase the percent of the transportation system in which travel conditions can be detected remotely via CCTV, speed detectors, etc. to X percent by Y year.

Traveler Information

1a. If full construction activities that close or open a roadway or lane are not currently reported within 20 minutes in rural areas or within 10 minutes within the metropolitan areas¹. **OR**

1b. The degree of accuracy for construction reports is less than 85 percent (i.e. error rate > 15%).⁵ **OR**

1c. The availability of construction information is less than 90%.⁶

THEN

A recommended ITS/TSMO strategy is: **Increase reporting of road work activities.**

Resources to consider:

- [Best Practices for RCRS: Integrating Lane Closure Databases into RCRS](#)

1a. If roadway or lane blocking incidents are not reported to within 20 minutes of the time the incident is verified for highways outside the metro area or within 10 minutes for locations within the metro area.² **OR**

1b. The degree of accuracy for incidents is less than 85%.⁵ **OR**

1c. Less than 90% of lane or road blocking incidents are not reported.⁶

THEN

A recommended ITS/TSMO strategy is: **Increase and automate reporting of incidents or unplanned events.**

Resources to consider:

- [Best Practices for RCRS: Automated Ingest of Law Enforcement CAD Data](#)

1a. If reports of hazardous driving conditions and roadway or lane closures because of adverse weather are not reported within 20 minutes from the time the condition is observed.³ **OR**

1b. The degree of accuracy for weather reports is less than 85%.⁵ **OR**

1c. Less than 90% of hazardous weather conditions are not reported.⁶

THEN

A recommended ITS/TSMO strategy is: **Increase road condition reporting.**

Resources to consider:

- Best Practices for RCRS:
 - ✓ [RCRS Ingest of Weather Data](#)
 - ✓ [Citizen Reporting into RCRS](#)
- [Snowplow Tracking and Display](#)

1a. If your agency is not reporting travel time reports for limited access roadways within Metropolitan Areas at a frequency of 10 minutes or less.⁴ **OR**

1b. The degree of accuracy for travel time reports is less than 85%.⁵ **OR**

1c. Travel time reports are available less than 90% of the time.⁶

THEN

A recommended ITS/TSMO strategy is: **Increase travel time reporting.**

Resources to consider:

- [Best Practices for RCRS: Integration of Third Party Data](#)

1 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (1) Construction activities. <https://www.gpo.gov/fdsys/pkg/CFR-2011-title23-vol1/xml/CFR-2011-title23-vol1-part511.xml>.

2 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (2) Roadway or lane blocking incidents. [/CFR-2011-title23-vol1-part511.xml](#).

3 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (3) Roadway weather observations. [/CFR-2011-title23-vol1-part511.xml](#).

4 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (4) Travel time information. [/CFR-2011-title23-vol1-part511.xml](#).

5 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (5) Information accuracy. [/CFR-2011-title23-vol1-part511.xml](#).

6 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting (6) Information availability. [/CFR-2011-title23-vol1-part511.xml](#).

4. ITS/TSMO Strategies: Data Collection and Sharing on Travel Conditions

Review criteria below and select applicable ITS/TSMO strategies for: Increase the percent of transportation facilities whose owners share their traveler information with other agencies in the region to X percent by Y year.

1. If your region includes one or more parking facilities that typically encounter periods when parking is full or the cost of parking is based on a variable rate. **AND**

2. If one or more agencies in your region operate traveler information or traffic management systems.

THEN

A recommended TSMO strategy is: **Publish current parking availability and pricing information.**

Resources to consider:

- [Getting There Together, King County \(Washington\) Transit Integration Report](#)

1. If one or more transportation facilities within your region operate infrastructure that vehicles or pedestrian travel on (e.g. roads, parking lots, bicycle or ped paths, ferries). **AND**

2. One or more of these facilities do not currently report and publish real-time status or conditions of the infrastructure (e.g. parking availability, path closures, road delays, incidents or capacity reductions).

THEN

A recommended TSMO strategy is: **Deploy facility specific Condition reporting Systems or expand a regional reporting system to include additional facilities.**

Resources to consider:

- [Best Practices for RCRS: Integrating Transit Data into the RCRS](#)
- [Best Practices for RCRS: Practices for Regional Integration and Interoperability](#)

1. Assess Operations Objective: Information Dissemination

Review criteria below to assess this category of operations objective and determine if it should be further reviewed.

1. If your agency provides or will provide traveler information services.
AND
- 2a. If your region is trying to manage growing travel demand. ¹
OR
- 2b. If your agency is diversifying its traveler information services.
OR
- 2c. If your agency needs to meet Federal requirements for traveler information reporting. ²

THEN

You should consider adopting one or more of the operations objectives in category:
[Traveler Information: Information Dissemination](#)

Otherwise, return to [Operations Objectives Home: Traveler Information](#)

¹ Managing Demand Through Travel Information Services. http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm

² 23 CFR 511: § 511.309 Provisions for traffic and travel conditions reporting. <https://www.gpo.gov/fdsys/pkg/CFR-2011-title23-vol1/xml/CFR-2011-title23-vol1-part511.xml>

2. Select Operations Objective: Information Dissemination

Select specific operations objective(s) using the criteria below.

Traveler Information

1. If your agency provides or will provide a 511 telephone service. **AND**

2a. Call volumes are declining. **OR**

2b. Your 511 telephone service is just beginning. **OR**

2c. Your region has limited high-speed Internet access, making web-based services challenging to offer. **OR**

2d. Demographics indicate a significant or growing elderly population with preferences for telephone service. ¹

THEN

You should consider the Operations Objective: [Increase number of 511 calls per year by X percent in Y years.](#)

1. If your agency provides or will provide a traveler information website. **AND**

2a. You wish to spread demand to other routes or times of day. ² **OR**

2b. You wish to attract more commuters to transit. ² **OR**

2c. You wish to use existing ² capacity more effectively (e.g. carpool or HOV lanes). **OR**

2d. Your agency is trying to reduce 511 telephone service costs.

THEN

You should consider the Operations Objective: [Increase number of visitors to traveler information website per year by X percent in Y years.](#)

1. If your agency provides or will provide subscription-based notifications for traveler information. **AND**

2a. Your region has specific routes that travelers would benefit from pushed notifications when conditions warrant. ² **OR**

2b. Your region would like a mechanism to inform travelers of high priority events/incidents without relying on travelers checking phone or web systems.

THEN

You should consider the Operations Objective: [Increase number of users of notifications for traveler information \(e.g. email, text message\) by X percent in Y years.](#)

1. If your agency provides or will provide social media (Web 2.0) traveler information services. **AND**

2a. Number of followers is static or declining. **OR**

2b. Customers are requesting enhanced features or information.

THEN

You should consider the Operations Objective: [Increase number of Web 2.0 \(e.g. Twitter, Facebook\) followers by X percent in Y months.](#)

1a. If there are portions of your region (geographic areas or specific routes) for which complete and accurate reports are not typically reported. **OR**

1b. If there are types of information (e.g. crashes, road work, driving conditions, etc.) that are not typically posted to information dissemination systems such as VMS/DMS, websites, or social media. **OR**

1c. If reports of traveler information disseminated to VMS/DMS, websites, or social media are not updated at a frequency that meets the goals of your agency/region.

THEN

You should consider the Operations Objective: [Increase the accuracy and completeness of traveler information posted \(on variable message signs, websites, and/or web 2.0 technologies\) by reducing the number of incomplete and inaccurate reports by X percent in Y years.](#)

1 Real-Time Traveler Information Market Assessment White Paper. http://ntl.bts.gov/lib/32000/32900/32927/rtti_wp.pdf

2 Managing demand Through Travel Information Services, USDOT. http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm

3. Operations Objective Fact Sheet: Information Dissemination

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- **Increase number of 511 calls per year by X percent in Y years.**
 - Increase number of visitors to traveler information website per year by X percent in Y years.
 - Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.
 - Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.
 - Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.

- Performance Measures**
- Number of 511 calls per year.
 - Number of visitors to traveler information website per year.
 - Number of users of notifications for traveler information (e.g., email, text message) per year.
 - Number of Web 2.0 (e.g., Twitter, Facebook) followers.
 - Number of complaints received from system users about inaccurate or missing information.

- Anticipated Data Needs**
- Data for these performance measures would be a count of users for the traveler information dissemination channels.
 - Number of customer complaints regarding incomplete or inaccurate traveler information.

- Data Resources and Partners**
- This data would be gathered through call logs, website logs, and other systems that record information on its access history or membership.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Information Dissemination

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase number of 511 calls per year by X percent in Y years.
 - **Increase number of visitors to traveler information website per year by X percent in Y years.**
 - Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.
 - Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.
 - Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.

- Performance Measures**
- Number of 511 calls per year.
 - Number of visitors to traveler information website per year.
 - Number of users of notifications for traveler information (e.g., email, text message) per year.
 - Number of Web 2.0 (e.g., Twitter, Facebook) followers.
 - Number of complaints received from system users about inaccurate or missing information.

- Anticipated Data Needs**
- Data for these performance measures would be a count of users for the traveler information dissemination channels.
 - Number of customer complaints regarding incomplete or inaccurate traveler information.

- Data Resources and Partners**
- This data would be gathered through call logs, website logs, and other systems that record information on its access history or membership.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

Traveler Information

3. Operations Objective Fact Sheet: Information Dissemination

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase number of 511 calls per year by X percent in Y years.
 - Increase number of visitors to traveler information website per year by X percent in Y years.
 - **Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.**
 - Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.
 - Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.

- Performance Measures**
- Number of 511 calls per year.
 - Number of visitors to traveler information website per year.
 - Number of users of notifications for traveler information (e.g., email, text message) per year.
 - Number of Web 2.0 (e.g., Twitter, Facebook) followers.
 - Number of complaints received from system users about inaccurate or missing information.

- Anticipated Data Needs**
- Data for these performance measures would be a count of users for the traveler information dissemination channels.
 - Number of customer complaints regarding incomplete or inaccurate traveler information.

- Data Resources and Partners**
- This data would be gathered through call logs, website logs, and other systems that record information on its access history or membership.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Information Dissemination

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase number of 511 calls per year by X percent in Y years.
 - Increase number of visitors to traveler information website per year by X percent in Y years.
 - Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.
 - **Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.**
 - Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.

- Performance Measures**
- Number of 511 calls per year.
 - Number of visitors to traveler information website per year.
 - Number of users of notifications for traveler information (e.g., email, text message) per year.
 - Number of Web 2.0 (e.g., Twitter, Facebook) followers.
 - Number of complaints received from system users about inaccurate or missing information.

- Anticipated Data Needs**
- Data for these performance measures would be a count of users for the traveler information dissemination channels.
 - Number of customer complaints regarding incomplete or inaccurate traveler information.

- Data Resources and Partners**
- This data would be gathered through call logs, website logs, and other systems that record information on its access history or membership.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

Traveler Information

3. Operations Objective Fact Sheet: Information Dissemination

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Increase number of 511 calls per year by X percent in Y years.
 - Increase number of visitors to traveler information website per year by X percent in Y years.
 - Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.
 - Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.
 - **Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.**

- Performance Measures**
- Number of 511 calls per year.
 - Number of visitors to traveler information website per year.
 - Number of users of notifications for traveler information (e.g., email, text message) per year.
 - Number of Web 2.0 (e.g., Twitter, Facebook) followers.
 - Number of complaints received from system users about inaccurate or missing information.

- Anticipated Data Needs**
- Data for these performance measures would be a count of users for the traveler information dissemination channels.
 - Number of customer complaints regarding incomplete or inaccurate traveler information.

- Data Resources and Partners**
- This data would be gathered through call logs, website logs, and other systems that record information on its access history or membership.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

4. ITS/TSMO Strategies: Information Dissemination

Review criteria below and select applicable ITS/TSMO strategies for: Increase number of 511 calls per year by X percent in Y years.

Traveler Information

1. If your agency isn't periodically promoting its 511 telephone service. **AND**

2. You believe there is one or more demographic markets that would benefit from placing 511 calls, especially those without access to web or personal communication devices (e.g. geographically located, elderly travelers, or travelers unfamiliar with the area).

THEN

A recommended TSMO strategy is: **Market traveler information services.**

Resources to consider:

- [Model Deployment of a Regional, Multi-Modal 511 Traveler Information System](#)
- [511 Deployment Costs: A Case Study](#)

1. If your agency does not yet provide a 511 telephone service. **AND**

2. Your agency has real-time information regarding traffic and travel conditions. **AND**

3. Your agency is willing to commit staff and financial resources to the long-term operation of a telephone service. ¹

THEN

A recommended TSMO strategy is: **Deploy a 511 telephone service.**

Resources to consider:

- [Implementation and Operational Guidelines for 511 Services](#)
- [Real-Time Traveler Information Services Business Models: State of the Practice Review](#)

1a. If your 511 telephone service is not being periodically reviewed. **OR**

1b. If your 511 telephone service does not directly allow for customer feedback. **AND**

2. Your agency has the resources to evaluate and modify, as necessary, the 511 telephone service.

THEN

A recommended TSMO strategy to consider is: **Conduct market research on customer satisfaction with traveler information to identify weaknesses.**

Resources to consider:

- [Iowa 511 Traveler Information System User Analysis](#)
- [Congestion Survey \(WSDOT\)](#)

4. ITS/TSMO Strategies: Information Dissemination

Review criteria below and select applicable ITS/TSMO strategies for: Increase number of visitors to traveler information website per year by X percent in Y years.

1a. If your traveler information website usage does not increase tremendously during commute periods. **OR**

1b. If your traveler information website usage does not increase tremendously during inclement weather. **AND**

2. Your agency has the resources to evaluate and modify, as necessary, the traveler information website.

THEN

A recommended TSMO strategy to consider is: **Increase the number or (or penetration of) popular features of traveler information websites, including:**

- **Camera views of traffic conditions;**
- **Travel time information;**
- **Locations of buses; and**
- **Locations of snowplows**

Resources to consider:

- [Managing Demand Through Travel Information Services](#)

1. If your agency does not yet provide a traveler information website. **AND**

2. Your agency has real-time information regarding traffic and travel conditions. **AND**

3. Your agency is willing to commit staff and financial resources to the long-term operation of a website.

THEN

A recommended TSMO strategy is: **Deploy a traveler information website.**

Resources to consider:

- [Criteria for Traffic Website Evaluation](#)
- [Real-Time Traveler Information Services Business Models: State of the Practice Review](#)

1. If your region is such that one or more major commercial or tourism routes travels through your region. **AND**

2. If a considerable portion of travelers on these routes are performing multi-state trips / multi-region trips. **AND**

3. If travelers would benefit from advanced information about conditions downstream.

THEN

A recommended TSMO strategy is: **Integrate travel information with neighboring agencies to offer a regional system or deliver system about neighboring areas.**

Resources to consider:

- [Model Deployment of a Regional, Multi-Modal 511 Traveler Information System](#)
- [USDOT Multi-state Corridor Operations and Management \(MCOM\) Program](#)

4. ITS/TSMO Strategies: Information Dissemination

Review criteria below and select applicable ITS/TSMO strategies for: Increase number of users of notifications for traveler information (e.g., e-mail, text message) by X percent in Y years.

Traveler Information

1. If your agency isn't periodically promoting its notification service. **AND**

2. If your agency is willing to support marketing efforts.

THEN

A recommended TSMO strategy is: **Market traveler information services.**

Resources to consider:

- [Model Deployment of a Regional, Multi-Modal 511 Traveler Information System](#)
- [511 Deployment Costs: A Case Study](#)

1. If your agency does not yet provide a notification service for traveler information. **AND**

2. Your agency has real-time information regarding traffic and travel conditions. **AND**

3. Your agency operates one or more routes that are particularly conducive to benefitting travelers by pushing alerts for the route. **OR**

4. You wish to have the option of pushing information to travelers based on the priority of the event/incident.

THEN

A recommended TSMO strategy is: **Deploy a notification service.**

Resources to consider:

- [Sixth Annual State DOT Social Media Survey](#)

1a. If your notification service only reports conditions along one route (i.e. not alternate routes). **OR**

1b. If your notification service does not offer other modal information. **OR**

2. If your notification service does not supplement information about subscribed routes with additional information (e.g. weather, future roadwork, etc.).

THEN

A recommended TSMO strategy to consider is: **Increase information pushed to include multiple routes, multiple modes, and increased information**

Resources to consider:

- [Iowa 511 Traveler Information System User Analysis](#)

1. If your agency has limited staff to manage traveler information notifications. **OR**

2. Your agency would like to expand the topics (e.g. individual road work projects, specific travel routes) available for customers to select for notifications.

THEN

A recommended TSMO strategy is: **Use an electronic communications delivery service.**

Resources to consider:

- [ConstantContact](#)
- [GovDelivery](#)

4. ITS/TSMO Strategies: Information Dissemination

Review criteria below and select applicable ITS/TSMO strategies for: Increase number of Web 2.0 (e.g., Twitter, Facebook) followers by X percent in Y months.

Traveler Information

1. If your agency does not yet provide traveler information via social media services.¹ **AND**
2. Your agency has real-time information regarding traffic and travel conditions. **AND**
3. Your agency is willing to commit staff and financial resources to the long-term operation of social media services.

THEN

A recommended TSMO strategy is: **Deploy social media services.**

Resources to consider:

- [Sixth Annual State DOT Social Media Survey](#)

1. If your agency's Road Condition Reporting System or ATMS can generate automated alerts of incidents or emergencies. **AND**
2. Your agency is supportive of using existing social media tools that the public subscribes to. **AND**
3. Your agency has resources they can dedicate to periodic monitoring and managing the data sent to social media tools.

THEN

A recommended TSMO strategy is: **Use dynamic, alert-ready social media solutions (e.g. Twitter) for real-time notifications of crashes, closures or major weather impacts.**¹

Resources to consider:

- [Estimate Benefits of Crowdsourced Data from Social Media](#)

1. If your agency currently displays information on social media tools, but subscription and usage is low. **AND**
2. Your agency has resources to commit a portion of staff time to responding to social media posts and actively engaging the social media community.

THEN

A recommended TSMO strategy is: **Actively use social media tools and have staff dedicated to maintaining social media presence (e.g. responding to reports from travelers).**²

Resources to consider:

- [WSDOT Twitter Feed](#)

¹ FHWA-JPO-14-165 "Estimate Benefits of Crowdsourced Data from Social Media" reports that dynamic systems such as Twitter are most suited to real-time notifications: http://ntl.bts.gov/lib/54000/54800/54829/Crowdsourced_Data_Report_-_Final_508_Version.pdf page 14.

² FHWA-JPO-14-165 "Estimate Benefits of Crowdsourced Data from Social Media" reports that states such as Michigan DOT have multiple staff monitoring their Twitter feed in real-time to respond to real-time problems reported by users: http://ntl.bts.gov/lib/54000/54800/54829/Crowdsourced_Data_Report_-_Final_508_Version.pdf page 14.

4. ITS/TSMO Strategies: Information Dissemination

Review criteria below and select applicable ITS/TSMO strategies for: Increase the accuracy and completeness of traveler information posted (on variable message signs, websites, and/or web 2.0 technologies) by reducing the number of incomplete and inaccurate reports by X percent in Y years.

Traveler Information

1. If entries to your RCRS are manually made by staff. **AND**

2a. If periodic data quality checks have shown reports to be incomplete or inaccurate. **OR**

2b. Periodic data quality checks have shown reports to be inconsistent.

THEN

A recommended TSMO strategy is:
Develop training and standard operating procedures for staff.

Resources to consider:

- [Best Practices for RCRS: Practices for Data Reliability, Accuracy, and Timeliness](#)

1. If incident entries to your RCRS are currently all manually made by staff. **AND**

2a. If customers have complained about incomplete or inaccurate incident reports. **OR**

2b. Periodic data quality checks have shown incident reports to be inconsistent. **AND**

3. If your agency can negotiate access to the law enforcement computer aided dispatch (CAD) database.

THEN

A recommended TSMO strategy is:
Automated ingest of law enforcement CAD data.

Resources to consider:

- [Best Practices for RCRS: Automated Ingest of Law Enforcement CAD Data](#)

1. If road work entries to your RCRS are currently all manually made by staff. **AND**

2a. If customers have complained about incomplete or inaccurate road work reports **OR**

2b. Periodic data quality checks have showing road work report to be inconsistent. **AND**

3. Your agency has a road work or lane closure database.

THEN

A recommended TSMO strategy is:
Integrate lane closure databases into RCRS.

Resources to consider:

- [Best Practices for RCRS: Integrating Lane Closure Databases into RCRS](#)

1. If road condition entries to your RCRS are currently all manually made by staff. **AND**

2a. If customers have complained about incomplete or inaccurate road work reports **OR**

2b. Periodic data quality checks have showing road work report to be inconsistent. **AND**

3. Your agency has an RWIS network.

THEN

A recommended TSMO strategy is:
RCRS ingest of weather data.

Resources to consider:

- [Best Practices for RCRS: RCRS Ingest of Weather Data](#)

1. Assess Operations Objective: Trip Planning Tools

Review criteria below to assess this category of operations objective and determine if it should be further reviewed.

1. If your agency has identified a goal to reduce carbon emissions related to regional commuter trips. ¹

OR

2. If your region has one or more transit services that are underutilized or have identified a goal to attract new riders who do not typically use transit. ²

OR

3. If feedback from travelers suggest that a barrier to using transit is lack of understanding about service availability, transit connections, or routes. ³

THEN

You should consider adopting one or more of the operations objectives in category: [Traveler Information: Trip Planning Tools](#)

Otherwise, return to [Operations Objectives Home: Traveler Information](#)

2. Select Operations Objective: Trip Planning Tools

Select specific operations objective(s) using the criteria below.

Traveler Information

1a. If you wish to achieve a significant reduction in congestion.¹ **OR**

1b. If you wish to improve the efficiency of the surface transportation system within your region.²
AND

2a. Your region does not operate a regional multi-modal Trip Planning System. **OR**

2b. Your region operates a Trip Planning System, and you are aware of geographic areas within your region where transit providers operate but their routes and schedules are not incorporated into the Trip Planning System.

THEN

You should consider adopting the Operations Objective titled: [Enhance regional multimodal trip planning tools to X data sources by year Y.](#)

1a. If you wish to achieve a significant reduction in congestion.¹ **OR**

1b. If you wish to improve the efficiency of the surface transportation system within your region.²
AND

2a. If feedback from commuters, local travelers, and visitors suggests that you region’s Trip Planning System is not easy to use. **OR**

2b. If you are able to test your Trip Planning System with individuals who are not regular transit users, and they express difficulty understanding and using the Trip Planning System. **OR**

2c. If there are aspects of your Trip Planning System that require local knowledge of addresses or key landmark names that are not familiar to visitors. **OR**

2d. If you track usage of your Trip Planning System, and statistics reveal overall usage decreasing.

THEN

You should consider adopting the Operations Objective titled: [Increase the ease of use of Trip Planning Systems by X percent by Y year.](#)

1a. If you wish to achieve a significant reduction in congestion.¹ **OR**

1b. If you wish to improve the efficiency of the surface transportation system within your region.²
AND

2. If testing and customer feedback from users of your region’s Trip Planning System reveal that the system is easy to understand and use. **AND**

3a. If your region experiences lower use of the Trip Planning System than similar sized regions operating similar systems (<insert actual values>). **OR**

3b. Transit agencies within your region have not noticed a reduction in calls requesting trip planning information. **OR**

3c. Public outreach or surveys reveal public knowledge of your Trip Planning System is less than desired.

THEN

You should consider adopting the Operations Objective titled: [Increase the number of uses of Trip Planning Systems by X by year Y.](#)

1 ITS Architecture: Increase the ease of use of trip planning tools by X percent by year Y, Associated goal #1 – also Planning for Operations Desk Reference

2 ITS Architecture: Increase the ease of use of trip planning tools by X percent by year Y, Associated goal #2 – also Planning for Operations Desk Reference

3. Operations Objective Fact Sheet: Trip Planning Tools

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- **Enhance regional multimodal trip planning tools to X data sources by year Y.**
 - Increase the ease of use of trip planning tools by X percent by year Y.
 - Increase the number of uses of multimodal trip planning tools by X percent by year Y.

- Performance Measures**
- The number of data sources providing information for multimodal trip planning tools.
 - Trip planning tools ease of use rating.
 - Number of uses of trip planning tools.

- Anticipated Data Needs**
- Identification of all multimodal trip planning tools and their data sources.
 - Trip planning tool ease-of-use rating obtained by customer survey.
 - Number of uses of trip planning tools.

- Data Resources and Partners**
- All operating agencies within the region.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Trip Planning Tools

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Enhance regional multimodal trip planning tools to X data sources by year Y.
 - **Increase the ease of use of trip planning tools by X percent by year Y.**
 - Increase the number of uses of multimodal trip planning tools by X percent by year Y.

- Performance Measures**
- The number of data sources providing information for multimodal trip planning tools.
 - Trip planning tools ease of use rating.
 - Number of uses of trip planning tools.

- Anticipated Data Needs**
- Identification of all multimodal trip planning tools and their data sources.
 - Trip planning tool ease-of-use rating obtained by customer survey.
 - Number of uses of trip planning tools.

- Data Resources and Partners**
- All operating agencies within the region.

To learn about ITS/TSMO strategies to accomplish this operations objective, [click here](#).

3. Operations Objective Fact Sheet: Trip Planning Tools

Review additional information about the selected operations objective and click below to learn more about potential ITS/TSMO strategies.

- Operations Objectives**
- Enhance regional multimodal trip planning tools to X data sources by year Y.
 - Increase the ease of use of trip planning tools by X percent by year Y.
 - **Increase the number of uses of multimodal trip planning tools by X percent by year Y.**

- Performance Measures**
- The number of data sources providing information for multimodal trip planning tools.
 - Trip planning tools ease of use rating.
 - Number of uses of trip planning tools.

- Anticipated Data Needs**
- Identification of all multimodal trip planning tools and their data sources.
 - Trip planning tool ease-of-use rating obtained by customer survey.
 - Number of uses of trip planning tools.

- Data Resources and Partners**
- All operating agencies within the region.

To learn about ITS/TSMO Strategies to accomplish this operations objective, [click here](#).

4. ITS/TSMO Strategies: Trip Planning Tools

Review criteria below and select applicable ITS/TSMO strategies for: Enhance regional multimodal trip planning tools to X data sources by year Y.

Traveler Information

1a. If your region does not operate a Regional Trip Planning System that enables users to select origins and destinations and receive multi-modal trip plans. **OR**

1b. If your region operates a Trip Planning System, but it is not General Transit Feed (GTF) based.

THEN

A recommended ITS/TSMO strategy is: **Develop or join one of the commercially available, online GTF based Trip Planning Systems.**

Resources to consider:

- [GTF specification reference](#)
- [Google Transit FAQ](#)
- [Open source transit trip planning solution](#)

1. If your goal is to increase the number of transit providers included in your Trip Planning System. **AND**

2. If one or more transit providers within your region do not operate transit route software capable of exporting routes in GTF format, but are interested in being included in your regional trip planning system.

THEN

A recommended ITS/TSMO strategy is: **Local transit agencies to develop GTF compatible transit schedules by hand (either manually or using a contractor supplied tool).**¹

Resources to consider:

- [Online Transit Trip Planner for Small Agencies Using Google Transit](#)

1. If your region includes public or private entities willing to cooperate to share availability and/or rates for ancillary services (e.g. parking, reservations, ferry, rail, airport).

THEN

A recommended ITS/TSMO strategy is: **Expand the regional Trip Planning System to include ancillary systems and services.**²

Resources to consider:

- [Transit Integration Report: Getting There Together](#)

¹ Caltrans: Online Transit Trip Planner for Small Agencies Using Google Transit http://www.dot.ca.gov/newtech/researchreports/reports/2011/2011-09_task-2028_modal.pdf.

² ITS Architecture ATIS05-ISP <http://www.iteris.com/itsarch/html/mp/mpatis05.htm>.

4. ITS/TSMO Strategies: Trip Planning Tools

Review criteria below and select applicable ITS/TSMO strategies for: Increase the ease of use of trip planning tools by X percent by year Y.

Traveler Information

- 1a. If your agency or region is considering a trip planning tool. **OR**
1b. You operate an existing trip planning tool but feel the user interface is not easy for end users to use. **AND**

2. Funding is limited to invest in development of a user friendly interface.

THEN

A recommended ITS/TSMO strategy is: **Use of Open Source Software (OSS) Trip Planning Tools (to minimize site specific costs for user interfaces).**

Resources to consider:

- [Benefits of OSS Transit Planning systems.](#)

- 1a. If travelers to your region include a high percentage of tourists/visitors unfamiliar with the local transportation network. **OR**

1b. Your region is recognized as a tourist attraction, with recognizable landmarks or named attractions.

THEN

A recommended ITS/TSMO strategy is: **Focus the trip planning system on tourism content and orientation toward tourists.**¹

Resources to consider:

- [Acadia National Park ATIS Evaluation, 2005](#)
- [Branson Trip Planning Evaluation](#)

1. If your region's trip planning system offers point to point trip planning. **AND**

2. There is a recognition that at least a moderate amount of users are accessing the system while en route.

THEN

A recommended ITS/TSMO strategy is: **Minimize the amount of data that must be manually input by travelers.**²

Resources to consider:

- [ITS-JPO ITS Benefits Reference](#)

1 Assessment of Traveler Information and 511 Impacts upon Tourist Destinations and National Parks: USDOT 2010 (results show orientation of trip planning systems to tourist was effective and increased ease of use).

2 Development and Validation of Internet-Based Personalized Travel Assistance System for Mobility Management: Tomotaka Usui, et.al

<http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/01621A874A9F981C8525777B005D6D24?OpenDocument&Query=Home>

4. ITS/TSMO Strategies: Trip Planning Tools

Review criteria below and select applicable ITS/TSMO strategies for: Increase the number of uses of multimodal trip planning tools by X percent by year Y.

1. If your regional trip planning tool involves multiple agencies cooperating together to operate the trip planning tool. **AND**
2. Collectively the partner agencies could pool resources to fund marketing efforts (either through cash or in-kind contributions). **AND**
3. There is no organized marketing approach for the Trip Planning System.

THEN

A recommended TSMO strategy is: **Identify a local entity to be responsible for marketing, monitoring the effectiveness of Trip Planning Systems.**¹

Resources to consider:

- [Branson TRIP Evaluation Summary](#)

1. If your region includes public or private entities willing to cooperate to share availability and/or rates for ancillary services (e.g. parking, reservations, ferry, rail, airport). **AND**
2. Partner agencies currently publish real-time information about ancillary services for sharing with other agencies (or are willing to). **AND**
3. There is a recognized need from travelers for the information available about ancillary services (e.g. travelers need parking information).

THEN

A recommended TSMO strategy is: **Expand the regional Trip Planning System to include ancillary systems and services.**²

Resource to consider:

- [Reference report](#)
- [Published article](#)

1. If an objective of your regional Trip Planning system is to support traveler throughout their entire trip.

THEN

A recommended TSMO strategy is: **Develop Trip Planning Tool user interfaces to be as user friendly for personal devices (Smart Phone or tablet) as for desktop computers.**³

Resources to consider:

- [Google trip planning study report](#)

1 RITA, ITS Benefits: 2006 Evaluation of Branson TRIP found benefits of trip planning system, but noted the lack of marketing as a challenge

2 USDOT, ITS JPO: National Evaluation of the Safetrip-21 Initiative (shared benefits of mobile applications for transit trip planning systems)

3 Google service on trip planning showed that 42% of travelers are more likely to use their smart phone or tablet for travel related information while on a trip (up from 33% in 2012)