

Space Coast Transportation Planning Organization

Intelligent Transportation Systems Master Plan

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Space Coast Transportation Planning Organization
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List of Acronyms

AAM	Active Arterial Management
ConOps	Concept of Operations
DMS	Dynamic Message Sign
EPA	Environmental Protection Agency
FDOT	Florida Department of Transportation
GDOT	Georgia Department of Transportation
ITS	Intelligent Transportation Systems
LRTP	Long Range Transportation Plan
RTOP	Regional Traffic Operations Program
SCAT	Space Coast Area Transit
SCTPO	Space Coast Transportation Planning Organization
SOS	State of the System
TPO	Transportation Planning Organization
TSM&O	Transportation System Management & Operations
TSP	Transit Signal Priority

1. Introduction

As the associated areas collectively known as the “Space Coast” continue to expand, so does the demand for an advanced and modern transportation network to meet the increasing levels of congestion. The old method of “scrape it and pave it” is making way for a more cost efficient method of meeting increasing traffic demands by turning to technology. Intelligent Transportation Systems (ITS) have proven to provide unmatched service to freeway management agencies within Florida, saving the state, and its residents, millions of dollars annually in terms of delay reduction, fuel consumption, gas emissions, and safety benefits. Today these same principles are working their way to key arterials, in what is being called “Active Arterial Management” (AAM) in order to provide a fair and balanced transportation network for all commuters.

The Space Coast Transportation Planning Organization (SCTPO) Intelligent Transportation System (ITS) Master Plan will provide a framework for determining the region’s future ITS needs. This master plan will formulate a strategy for the development and maintenance of Brevard County’s ITS network; incorporate various methodologies in conformance with national, statewide, and regional architecture, and aid in the formation of a sound basis for design, plans, specifications, estimates, operations and maintenance to phase implementation for the potential ITS projects.

2. ITS Visions, Goals & Objectives

Before the development of the ITS Master Plan, vision, goals, and objectives should be established in order to guide the Steering Committee and project team. Performance measures should also be defined in order to track progress towards the goals and objectives established for the ITS Master Plan. The success of the ITS Master Plan will be in the implementation of ITS projects and achievement of established performance measures. The goals, objectives, and performance measures identified in this section will help set the foundation for future success.

ITS Master Plan Vision

Before establishing goals and objectives for the ITS Master Plan, a clear vision statement should be defined. Vision statements from the SCTPO, Brevard County, the Florida Department of Transportation (FDOT) ITS Program, and the FDOT Transportation Systems Management and Operations (TSM&O) Program, presented below, were reviewed to help the project team identify an initial SCTPO ITS Vision statement.

- SCTPO Vision Statement:
 - “To become the benchmark planning forum trusted for its leadership and respected for its integrity and inclusiveness in developing and implementing transportation projects and programs that enrich Brevard County.”
- Brevard County Vision Statement:
 - “A community which excels and is recognized for:
 - Providing for the health, safety, education and social needs of our community;
 - Protecting the environment and conserving our valuable natural resources;
 - Building a diverse, strong economic base with the needed infrastructure to support a quality lifestyle;
 - Creating cooperative partnerships between the government, business, community organizations and our residents; and
 - Maximizing performance and communication to provide excellent service to our customers.”
- FDOT ITS Vision Statement:
 - “Be the national leader in ITS by promoting multi-jurisdictional coordination for the provision of an efficient, secure, reliable, and safe transportation system.”
- FDOT TSM&O Vision Statement:
 - “To operate our transportation system at the highest level of cost effective performance.”

After review of the above visions statements, the project team created the following initial SCTPO ITS Vision statement:

“Maximize the use of the existing Space Coast transportation system by providing increased accessibility, reliability, and safety as a part of a fully integrated multi-modal experience.”

Accessibility, reliability, and safety should be at the forefront of any project, and the ITS Master Plan is no exception. The existing Space Coast transportation system can be built upon and improved to increase these three main themes within Brevard County. Automobile users are considered the primary benefactor of ITS projects but the ITS Master Plan will also include multi-modal elements, most of which will specifically target Space Coast Area Transit (SCAT) and its users.

This Vision was presented and tentatively accepted by the SCTPO at the ITS Master Plan Kick-Off Meeting on February 18, 2014. The draft SCTPO ITS Vision statement will be presented at the first Steering Committee meeting in order to obtain input and feedback. The ITS Vision statement will be revised, if necessary, and used as the guiding principle for the ITS Master Plan.

Goals Relating to the ITS Master Plan

In order to fully realize the ITS Vision and provide a guiding framework for developing the ITS Master Plan, the 2035 Long Range Transportation Plan (LRTP) was reviewed to determine how ITS strategies could support the primary goals outlined in the LRTP. The four primary goals of the LRTP are:

1. Improve Economic Vitality through Better Access and Intermodal Connectivity for People and Goods

Implementation of an ITS Master Plan for Brevard County can have a variety of direct and indirect impacts on the economic vitality of the region. One of the ways this can be done is through improved access and connectivity to Brevard County's strategic intermodal hubs resulting from various ITS strategies. These ITS strategies include the addition of active arterial traffic management, improved signal timings/signal coordination, and improved real-time congestion management strategies.

2. Improve the Safety and Security of the Transportation System

The safety and security of the transportation system can be enhanced by improving the ITS infrastructure throughout the region. The use of video surveillance, the reduction in average emergency response times, and the reduction of evacuation clearance times can be achievable through ITS infrastructure enhancements.

3. Improve Mobility through Effective Management and Operations of the Transportation System

ITS infrastructure improvements are one of the key drivers for improved mobility throughout Brevard County's transportation system. ITS strategies such as Dynamic Message Signs (DMS), improved signal timings/signal coordination, Transit Signal Priority (TSP), active arterial traffic management, travel time reliability measurement methods, and improved emergency response

procedures can greatly enhance mobility by improving total travel time, travel time reliability, and ease of access.

4. Improve Sustainability and Livability

ITS infrastructure has the ability to significantly impact total hours of delay on the arterial transportation system. ITS can also enhance transit operations and patron information resulting in increased ridership with the added byproduct of fewer cars. With improved ITS infrastructure, greenhouse gas emissions will be reduced, improving sustainability and livability in the region. ITS improvements outlined in Goals 1 through 3 will also support overall sustainability and quality of life in Brevard County.

Objectives Relating to the ITS Master Plan

After ITS strategies supporting the four LRTP goals were identified, the objectives for these goals were reviewed to determine specific ITS elements which could be reported and measured. These objectives are separated into primary, objectives directly supported by ITS strategies, and secondary, objectives supported by an ITS strategy applied for a primary objective.

In addition, a performance measure has been identified for each LRTP objective as a starting point for quantifying the goal the objective is targeting. ITS related performance measures have been generated based on the measures outlined for the primary and secondary objectives discussed in this section. The SCTPO will rely on the following performance measures and targets to evaluate progress towards achieving the ITS Master Plan goals and ultimately the goals of the LRTP. To strive for consistency of measurements over time, the SCTPO will set a current baseline data point for each performance measure. Once the baseline is established, the SCTPO can update the performance measures and track progress as a part of the State of the System (SOS) Report.

Primary Objectives

The primary LRTP objectives and corresponding performance measures applicable to the ITS Master Plan are discussed below:

Objective 2.3 – Increase the number of roadway miles under surveillance by 50%

Measure: 2.3.1 – Number of roadway miles under surveillance

ITS Performance Measure: The total number of Brevard County non-limited access facility roadway miles under surveillance should be used to measure this

objective. Based on the 2035 LRTP, this data has yet to be collected. Approximately 40 total miles of surveillance were installed as a part of the FDOT Daytona Area Smart Highway (DASH) projects, 30 to 35 miles of which are in Brevard County. The Brevard County ITS plan, the [FDOT 511 website](#), and other Brevard County agency resources can be used to determine the baseline conditions for this measure. These resources, in addition to meetings with various Brevard County area stakeholders, will provide an accurate baseline number to be compared to future conditions.

Objective 3.1 – Reduce system wide delay for cars, trucks, and transit

Measure 3.1.1 – Vehicle hours of delay on the system.

ITS Performance Measure: Average vehicle hours of delay per person per day is used to measure progress towards objective 3.1 in the 2035 SCTPO LRTP. In 2011, total delay per person on the system was nine minutes. Based on projected population and traffic volumes in 2035, the anticipated target delay is 15 minutes (0.25 hours) per person. This statistic should be used to measure the possible impact future ITS improvements have on delay conditions in Brevard County. Those corridors having the highest delay can be identified for future ITS improvements.

Examples of other jurisdictions having implemented programs aimed at reducing delay include the following:

- Georgia’s Regional Traffic Ops Program (RTOP) reported the following after just 16 months (reference GDOT RTOP ConOps):
 - Reduced number of stops by 8.3%;
 - Traffic Volume Increased by 9%;
 - Eliminated 1.4 million hours of delay;
 - Reduced stopped time delay by 12%; and
 - Saved 700,000 gallons of fuel.
- Los Angeles reportedly synchronized all of their signals and reported a city wide average speed increase of 16% and major intersection delay decrease of 12%.
- The Active Arterial Management oriented FDOT Statewide Needs Plan estimated the following:
 - Average reduced delay due to adequate and sufficient signal retiming of 8% annually;

- Average reduced delay of 3% annually due to the implementation of Adaptive Traffic Control Systems; and
- Average incident reduction of 20-25% during incidents.

Objective 3.2 – Reduce corridor delay for cars, trucks, and transit with traffic management

Measure 3.2.1 – Percent of corridors actively monitored or managed

ITS Performance Measure: The number of corridors actively monitored and/or managed (in lane-miles) is used to measure objective 3.2 in the 2035 SCTPO LRTP. In 2011, the total amount of actively monitored/managed corridor miles on the system was 10 lane-miles. In 2035, the anticipated target is 240 lane-miles. This statistic should be used to measure the breadth of ITS implementation in the Brevard County area.

Objective 3.3 – Improve reliability and predictability of travel

Measure 3.3.1 – Variability of travel time on priority corridors

Performance Measure: Based on the 2035 LRTP, this data is yet to be collected. Various methods are used across the country to measure travel time reliability, most of which require ITS infrastructure (i.e. continuous vehicle speed data collection). Travel time reliability/predictability can also be measured using the following annual data that is more accessible based on current ITS conditions in Brevard County:

- Average incident response time (coordinate with local fire and police services, see also secondary Measure 2.2.1);
- Miles of actively monitored/managed lanes (see also primary Measure 3.2.1);
- Miles and average duration of lane closures;
- Weather special events; and
- Crashes per lane mile (collected as part of Annual Countywide Safety Report).

It is recommended the SCTPO work with local Brevard County agencies to implement the regular collection of one or more of the data sources above.

Objective 3.4 – Improve real time transit management

Measure 3.4.1 – Percent of transit routes with real time monitoring or management

ITS Performance Measure: Currently there are no transit routes in Brevard County with real-time monitoring or management. However, as real-time transit management methods are added, progress toward achieving this objective can be measured by calculating the percentage of transit routes which have incorporated real time monitoring methods. The SCTPO should coordinate with Space Coast Area Transit (SCAT) to obtain this data as time progresses.

Objective 3.5 – Improve real time traffic and transit information

Measure 3.5.1 – Percent of travelers with access to real time traffic/transit information

ITS Performance Measure: It is suggested the SCTPO conduct a traveler survey (vehicle and transit users) to determine what percentage of travelers currently have access to traffic and transit information. This traffic and transit information includes parking availability information, DMS, next bus technology, and real-time congestion information, among other information. After ITS improvements are made, a traveler survey should be conducted to determine progress toward this objective.

Secondary Objectives

The secondary objectives and corresponding performance measures applicable to the ITS Master Plan are discussed below:

Objective 1.4 – Maintain the connectivity of intermodal hubs (seaport, airport, spaceport, transit and rail stations)

Measure 1.4.1 – Vehicle hours of delay on the system.

ITS Performance Measure: Not unlike Measure 3.1.1, vehicle hours of delay per person can be used to measure progress towards objective 1.4 in the 2035 SCTPO LRTP. When trying to maintain connectivity to the intermodal hubs, tracking delay of freight movement into and out of the intermodal hubs should be a focus. Port Canaveral, one of the largest ports in Florida, serves as both an import/export port along with a thriving cruise industry. Minimizing delay along FDOT maintained SIS facilities will enhance freight movement and get cruise

passengers to the Port more efficiently. Coordination of ITS improvements along SIS facilities will need to take place with the FDOT.

Delay on the system can also impact transit and high demand corridors which may connect to intermodal hubs. ITS strategies such as Automatic Vehicle Location (AVL) and Transit Signal Priority (TSP) will help improve transit flows, making the intermodal hubs more accessible. As with Measure 3.1.1, the anticipated target delay of 15 minutes per person should be used to measure the possible impact future ITS improvements have on delay conditions near and around the intermodal hubs.

Objective 2.2 – Reduce average response times by 10% for each priority crash type (aggressive driving, intersection crashes, vulnerable road users and lane departures)

Measure 2.2.1 – Average crash response and clearance times by crash type

ITS Performance Measure: Based on the 2035 LRTP, this data is yet to be collected. An effort should be taken by the SCTPO to coordinate with Brevard County emergency response departments to obtain information on average response times seen for aggressive driving crashes, intersection crashes, vulnerable road user (bicycle and pedestrian) crashes, and lane departure crashes. Average response times can be obtained to establish a baseline (existing) condition to compare future average response and clearance times after ITS strategies have been implemented.

Objective 2.7 – Improve ability to evacuate during an emergency event with reduced clearance times and increased capacity during evacuations.

Measure 2.7.1 – Evacuation clearance times

ITS Performance Measure: Based on the 2035 LRTP, this data is yet to be collected. An effort should be taken by the SCTPO to coordinate with Brevard County emergency service agencies to determine this statistic along critical evacuation routes, as identified in the SOS Report. Any recorded data from previous evacuation emergency events should be reviewed to determine a baseline condition. After ITS strategies are implemented, evacuation clearance times should be measured to quantify the potential impact ITS improvements have had on evacuating the County.

Measure 2.7.2 – Evacuation roadway capacity

ITS Performance Measure: Evacuation roadway capacity should also be used to measure the possible impact future ITS improvements can have on the ability to evacuate residents in Brevard County. Using FDOT Quality/Level of Service criteria, evacuation routes should be analyzed to determine generalized, planning-level evacuation capacity (and capacity deficiencies) in the baseline (current) and future year conditions. As part of this analysis, lane reversal of evacuation roadways should be reviewed. For example on a four lane facility, three of the four lanes could be used for the evacuation while the fourth lane could remain in the opposite direction for emergency vehicles.

Objective 4.1 – Reduce greenhouse gas emissions

Measure 4.1.2 – Per capita greenhouse gas emissions from mobile sources and vehicle miles of travel per person

ITS Performance Measure: The two methods of measurement outlined by the 2035 LRTP to quantify reductions in greenhouse gas emissions are per capita greenhouse gas emissions from mobile sources and vehicle miles of travel per person. When corridor ITS improvements are made, the number of vehicle stop-starts is decreased, resulting in decreased carbon emissions along the corridor. [The National Emissions Inventory](#) (collected by the EPA) aggregates carbon monoxide emissions (from mobile sources) data on a county-by-county basis. This data can be used to compare the baseline (2011) condition of 89,373 tons of total carbon monoxide emissions to future year conditions after ITS improvements are made.

Vehicles miles of travel per person should also be used to measure the possible impact future ITS improvements can have on reducing greenhouse gas emissions in Brevard County. This data can be calculated from the annual SOS Report.

Summary of Goals, Objectives, and Performance Measures

Figure 1 on the follow page summarizes the goals, objectives, and performance measures established for the ITS Master Plan.

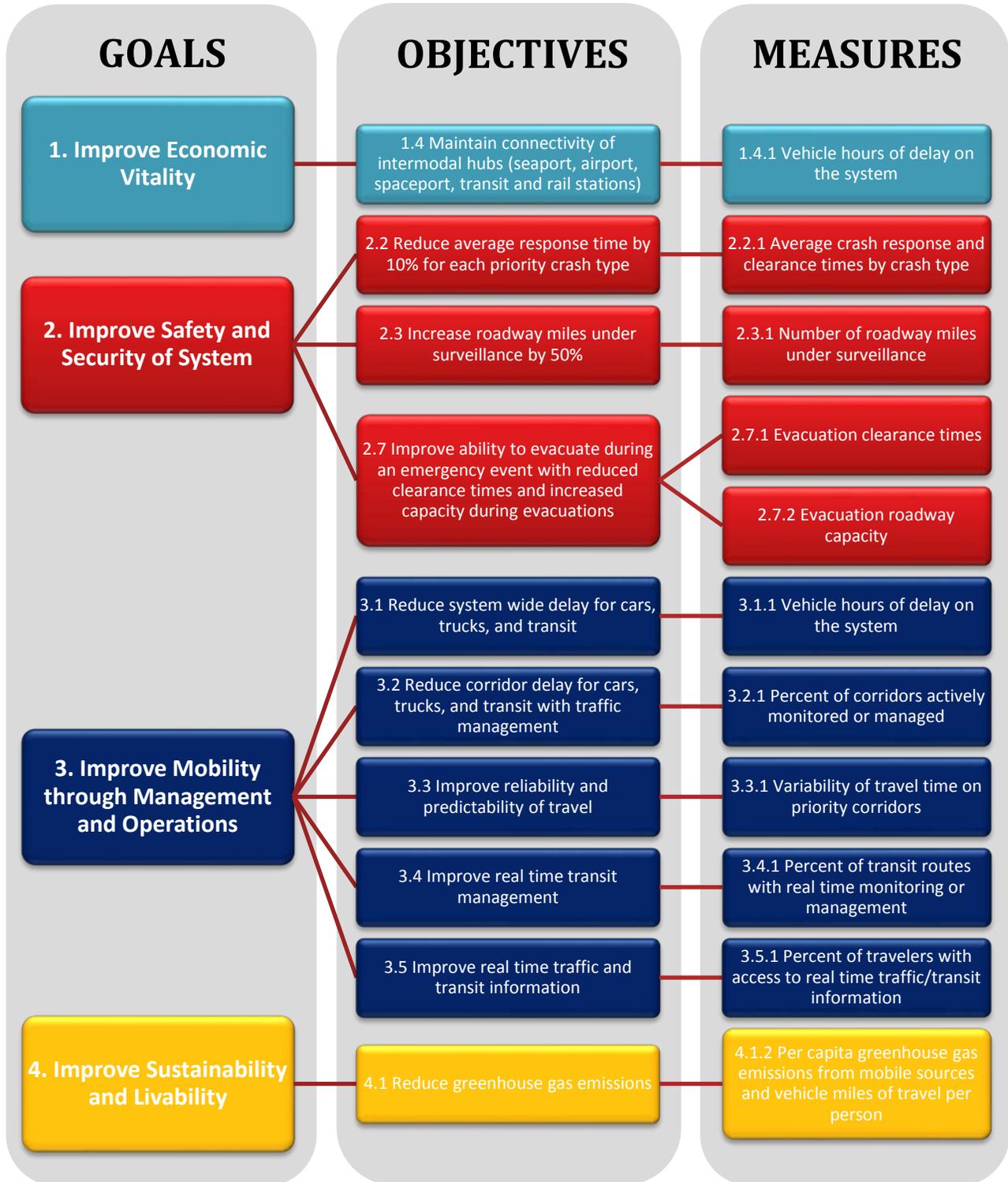


Figure 1 – ITS Master Plan Goals, Objectives, and Performance Measures

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“To Fight Gridlock, Los Angeles Synchronizes Every Red Light,” Ian Lovett, April 2013