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ALABAMA DEPARTMENT OF TRANSPORTATION

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS







































Transportation Systems Management and Operations (TSMO) is a cross-cutting approach meant to optimize existing infrastructure through better integration, coordination, and systematic implementation of key operational strategies.

It offers resources and strategies to:

- realize the full capacity of the existing transportation system;
- increase reliability for freight and auto;
- improve safety and reliability;
- target safety and operational problem locations to deliver performance-driven improvements to the existing system.





Our roads are busier than ever before and with more drivers on the road, the potential for crashes and increased congestion is greater than ever.

A bigger system is not always the best way to optimize performance. Which is why, behind the scenes, we are constantly finding ways to fine tune the performance of our transportation system.

TSM&O provides a strategic approach to improving the state's transportation system to help you reach your destination, safely, efficiently, and conveniently.





TSM&O utilizes AASHTO's Capability Maturity Model to measure an agency's strengths and weaknesses in six (6) areas:

- Business processes
- Systems and technologies
- Performance measurement
- Culture
- Organization and staffing
- Collaboration



The ALDOT TSM&O Program addresses nine (9) service layers:

- ITS and Communications
- Traffic Signals
- Traffic Management Centers
- Traveler Information
- Traffic Incident Management
- Emergency Transportation Operations
- Work Zone Management
- Active Transportation and Demand Management
- Connected and Autonomous Vehicle



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What is TSM&O?

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849

5,567

4,414



The data...

Alabama had 156,576 crashes in 2017:

- Fatal Injury
- Incapacitating Injury
- Non-Incapacitating Injury
- Possible Injury
- Property Damage Only
- Unknown





The data...

3,152 of the 156,576 crashes in 2017 were WORK ZONE RELATED:

Fatal Injury 25
Incapacitating Injury 81
Non-Incapacitating Injury 238
Possible Injury 321
Property Damage Only 2,425
Unknown 62



The data...

Work Zone Related Crashes the past FIVE (5) Years







23 CFR 511

Establishes the provisions and parameters for a Real-Time System Management Information Program for State DOTs and others to provide accessibility to traffic and travel conditions information by other public agencies, the traveling public, and by other parties who may deliver value-added information products.



23 CFR 511

Minimum requirements for traffic and travel conditions made available by realtime information programs are:

- Construction activities
- Roadway or lane blocking incidents
- Roadway weather observations
- Travel time information
- Information accuracy
- Information availability



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Traveler Information – "Pull" system







Traveler Information – "Push" system







Traveler Information – "Push" system







Traveler Information – "Push" system











ALGO Traffic provides live traffic camera feeds, updates on Alabama roads, and access to exclusive



READ MORE







Traveler Information – "Push" system

November of 2016

Apps:

Android Downloads:	9,759
iOS Downloads:	24,989

Twitter:

Tweets:	85,316
Followers:	4,248
Following:	171

Website (users):

799,001 unique users have accessed the website 2427 daily active users for the website

Website (percentage of users by browser):

Chrome 79.74% Safari 10.32% Safari (in-app) 3.73% Internet Explorer 2.83% Firefox 1.12%





Current Applications

- Traffic speeds
- Lane blockage or Road closures due to:
 - Work zone activities
 - Crashes
 - Incidents
 - Weather
 - Special events
- Rest Area(s) / Welcome Center(s)

Future Applications

- Geo-fenced push notifications
- Parking availability
- Kiosks
- Customer surveys
- ASAP
- Travel time
- NWS integration
- Mobile Bay Ferry wait time
- CAV



Data Sources

- Field hardware
- Probe data feeds
- Social media
- News media
- Collaborative partnerships
- CAD

Maximize INPUTS to Maximize OUTCOMES













Managing traffic during construction is necessary to minimize traffic delays, maintain motorist and worker safety, complete roadwork in a timely manner, and maintain access for businesses and residents.

Effective work zone traffic management <u>includes assessing work zone impacts</u> and documenting strategies for mitigating the impacts in a transportation management plan (TMP).

The <u>Work Zone Safety and Mobility Rule</u> requires TMPs for all Federal-aid highway projects.





Work zone traffic management strategies should be identified based on:

- project constraints,
- construction phasing/staging plan,
- type of work zone, and
- anticipated work zone impacts.

Once these strategies are implemented, they need to be monitored to ensure they effectively manage work zone impacts.



Smart Work Zones applications include:

- Real-time traveler information,
- Queue warning,
- Dynamic lane merge,
- Incident Management,
- Variable speed limits,
- Automated enforcement,
- Entering/Exiting construction vehicle notification, and
- Performance measurement



Performance measures include:

- volume,
- travel time, queue length,
- delay,
- number of incidents,
- incident response and clearance times,
- contractor incidents,
- community complaints,
- user costs, and
- cumulative impacts from adjacent construction activities.





Work Zone Management – Real-time traveler information







Work Zone Management – Real-time traveler information







Work Zone Management - Real-time traveler information





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Work Zone Management – Real-time traveler information







Work Zone Management – Queue warning









Work Zone Management – Queue warning







Work Zone Management – Queue warning







Work Zone Management – Dynamic lane merge



Benefits

- Alerts drivers that they are approaching slow or stopped traffic.
- Allows queue to "stack" in multiple lanes, which reduces the overall queue length by approximately half.
- Reduces the differential in speed between lanes, providing for safer lane changes.
- Gives drivers positive instructions on lane usage and merging points, which helps reduce road rage and misunderstandings between drivers.





Work Zone Management – Dynamic lane merge



Consider for Use

- When the work zone requires a two-to-one lane drop.
- When traffic demand exceeds the capacity of the open lane.
- When traffic demand could create an extensive queue length which may affect other access points or may extend beyond reasonable placement of advance warning signage.
- When congestion caused by lane closures varies many times throughout a work day





Work Zone Management – Dynamic lane merge











Work Zone Management – Dynamic lane merge

















Work Zone Management – Entering/Exiting construction vehicles



No De-acceleration Lane



NOTE: Some temporary traffic control devices may have been omitted from this diagram for clarity purposes.

Benefits

- Alerts drivers of slowly accelerating trucks preparing to enter or cross the roadway. .
- Alerts drivers of decelerating trucks preparing to exit the roadway and warns drivers not to follow the trucks.
- Provides real-time information to road users so they can slow down, change lanes, or prepare to stop.
- Decreases tailgating when the system is activated.
- Reduces crashes involving haul trucks and secondary crashes upstream.





Work Zone Management – Entering/Exiting construction vehicles



Consider for Use

- On work zones where site distance is limited, especially for high speed, rural roadways.
- In areas where there is an increase in the potential conflicts between construction vehicles and the motoring public.

No De-acceleration Lane



NOTE: Some temporary traffic control devices may have been omitted from this diagram for clarity purposes.





Work Zone Management – Other applications

- Changeable speed limits
- Alternate route systems
- Travel time
- Expected delay
- Automated work zone speed enforcement
- Oversized load detection
- Work space intrusion
- Excessive speed warning systems
- Water/Ice detection system







Section 6F.60 Portable Changeable Message Signs

The primary purpose of portable changeable message signs in TTC zones is to advise the road user of **unexpected situations**. Portable changeable message signs are particularly useful as they are capable of:

A. Conveying complex messages,

- B. Displaying real time information about conditions ahead, and
- C. Providing information to assist road users in making decisions prior to the point where actions must be taken.







Section 6F.60 Portable Changeable Message Signs

Some typical applications include the following:

A. Where the speed of vehicular traffic is expected to drop substantially;
B. Where significant queuing and delays are expected;
C. Where adverse environmental conditions are present;
D. Where there are changes in alignment or surface conditions;
E. Where advance notice of ramp, lane, or roadway closures is needed;
F. Where crash or incident management is needed; and/or
G. Where changes in the road user pattern occur.







Section 6F.60 Portable Changeable Message Signs

Portable changeable message signs should be used as a **SUPPLEMENT** to and **NOT** as **A SUBSTITUTE** for conventional signs and pavement markings.









Why TSM&O?

Congestion wastes time, fuel, and money, and is a direct cost to the traveling public.

Congestion costs Americans over \$160 billion annually including:

- accelerated vehicle depreciation, additional repair costs, increased fuel consumption and tire wear;
- lost time and wasted fuel from traffic congestion; and
- the financial cost of traffic crashes, including insurance costs and lost household productivity





Why TSM&O?

Companies are increasingly looking at levels of congestion when deciding to re-locate or expand. A **sustainable transportation system** is a critical political-socio-economic factor that is considered in industry recruitment, new jobs, and economic growth.







Why TSM&O?







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How can you help?

- Do our Business Processes support the planning process?
- Are alternative solutions considered in the Scope of Work or GDCP?
- Do we need to spend millions per mile, when thousands per mile yield the same outcome with an equal or higher benefit?
- Are we coordinating work zone schedules with the RTMC?
- Are we utilizing technology in conformance with the MUTCD?
- Are we delivering performance-driven improvements to the existing system?
- Provide feedback on how AlgoTraffic can be enhanced.





"In this volatile business of ours, we can ill afford to rest on our laurels, even to pause in retrospect. Times and conditions change so rapidly that we must keep our aim constantly focused on the future." - Walt Disney

"Never let the fear of striking out keep you from playing the game." - Babe Ruth

"You miss 100 percent of the shots you never take." - Wayne Gretzky

"Leaders die, products become obsolete, markets change, new technologies emerge, and management fads come and go, but core ideology in a great company endures as a source of guidance and inspiration" – Harvard Business Review



QUESTIONS

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