



TSMO & MOD Integration

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TSMO Verses MOD

TSMO

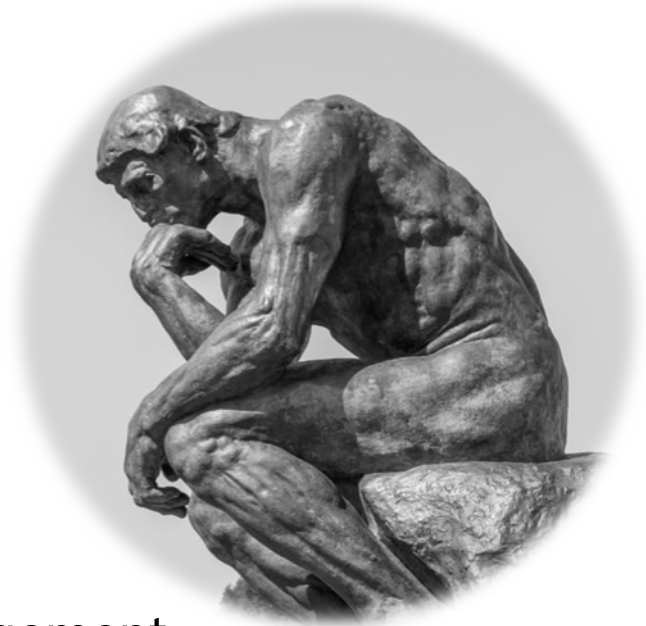
An **integrated** set of strategies to optimize the performance of existing infrastructure through the implementation of **multimodal** and intermodal, cross-jurisdictional **systems, services**, and projects designed to preserve capacity and improve security, **safety**, and reliability of the **transportation system**

MOD

An innovative, user-focused approach which leverages emerging mobility services, **integrated transit networks and operations**, real-time data, connected travelers, and cooperative **Intelligent Transportation Systems (ITS)** to allow for a more traveler-centric, **transportation system-of-systems** approach, providing improved **mobility options** to all travelers and users of the system in an **efficient** and **safe** manner.

TSMO Strategies Verses MOD

- Work Zone Management
- Traffic Incident Management
- Special Event Management
- Road Weather Management
- Transit Management
- Freight Management
- Traffic Signal Coordination
- Traveler Information
- Ramp Management
- Congestion Pricing
- Active Transportation and Demand Management
- Integrated Corridor Management
- Access Management
- Improved Bicycle and Pedestrian Crossings
- Connected and Automated Vehicle Deployment



A black and white close-up portrait of Bob Dylan, looking slightly downwards and to the right with a serious expression. He is wearing a collared shirt.

**THE TIMES
THEY ARE
A-CHANGIN'
BOB
DYLAN**

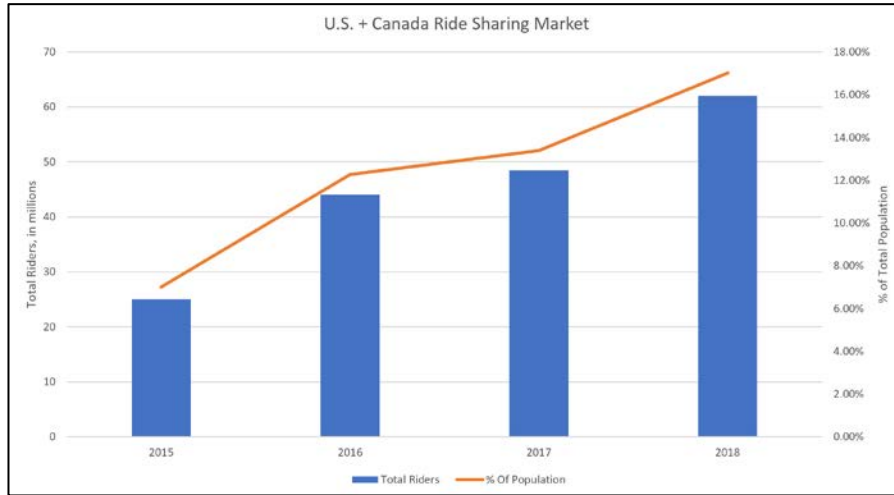
THE LONESOME DEATH OF RATTIE CARROLL
BOOTS OF SPANISH LEATHER
RESTLESS FAREWELL / WITH GOD ON OUR SIDE
THE TIMES THEY ARE A-CHANGIN'
ONLY A PAWN IN THEIR GAME
WHEN THE SHIP COMES IN / ONE TOO MANY MORNINGS
BALLAD OF MOLLIE BROWN / NORTH COUNTRY BLUES

The line it is drawn
The curse it is cast
The slow one now
Will later be fast
As the present now
Will later be past
The order is
Rapidly fadin'
And the first one now
Will later be last

For the times they are a-changin'.

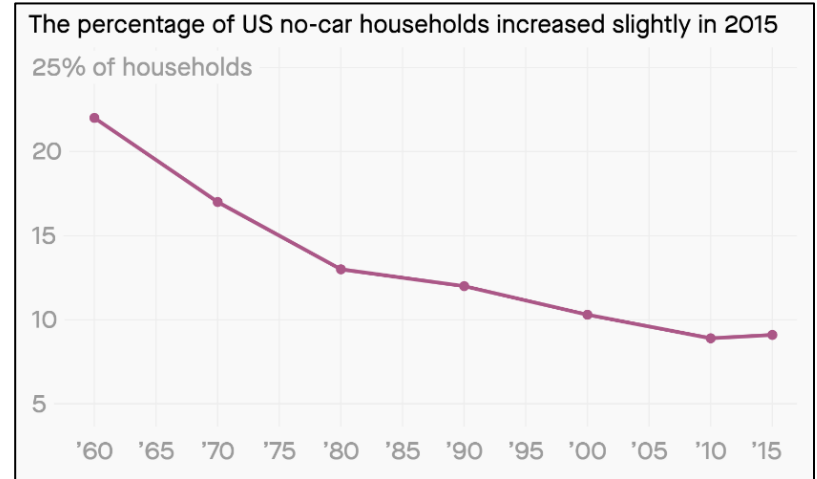
“The Times, They are A-changing”

Use of Ride Hailing Services



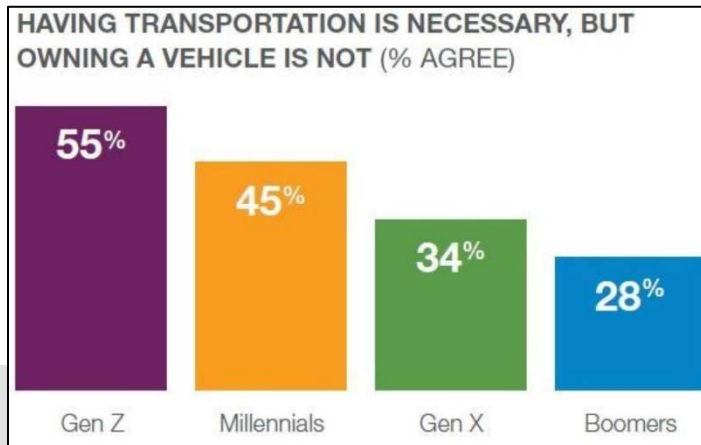
Source: Second Measure & Lyft

Car Ownership Dropping?



Source: US Census & Quartz

Owning a Car is not necessary



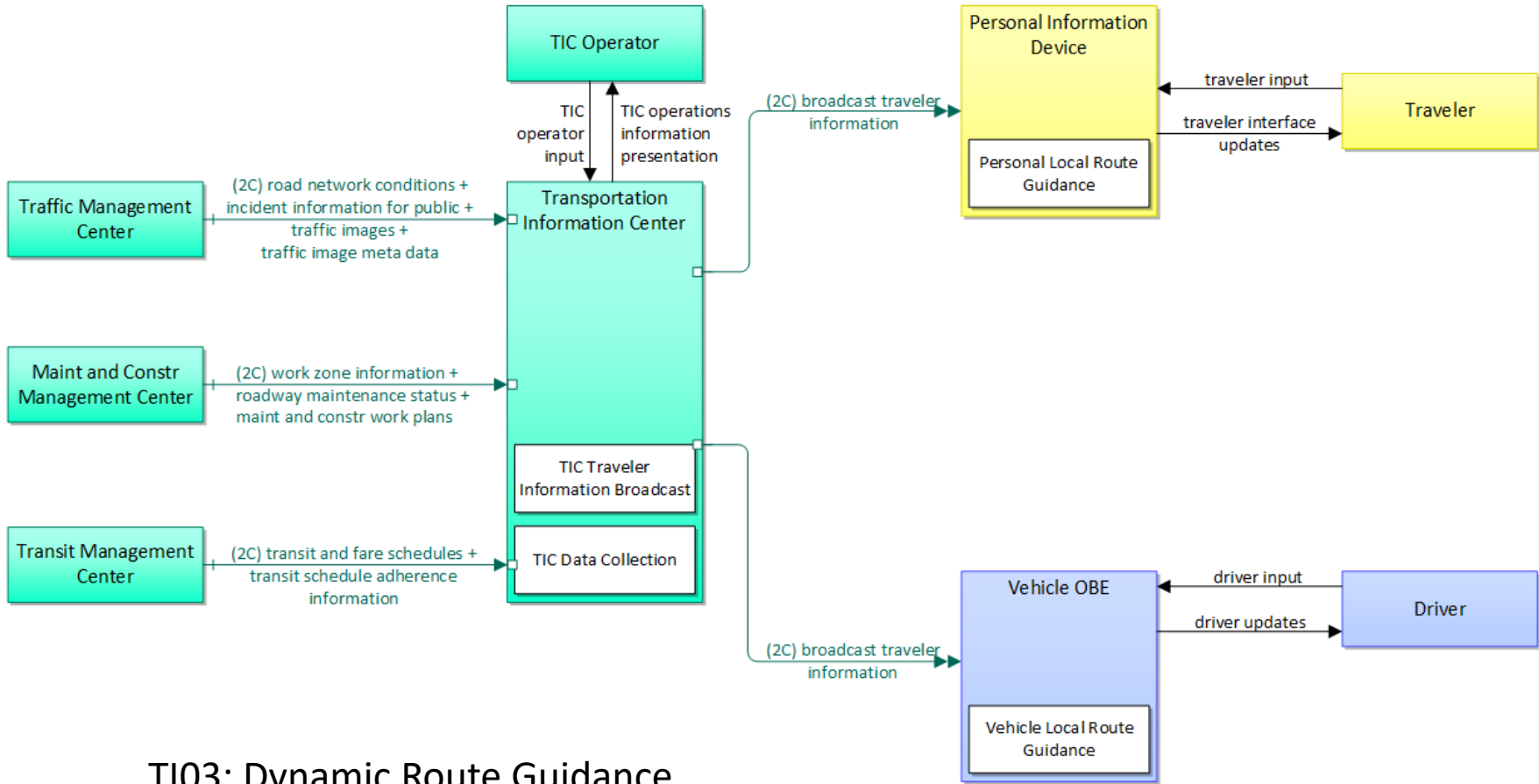
Source: Cox Automotive

Dynamic Routing Systems, Curse or Cure?

Email Example:

“As a resident of the upper Cosby area near Lindsay Gap and Groundhog road we are experiencing a tremendous amount of tourist traffic that GPS is directing from interstate 40 to exit 447. This is the Hartford exit. From there drivers take Hartford Road to Lindsay Gap then to Groundhog to Highway 32 and then 321 to Gatlinburg. This has been an extreme strain and burden on the local county roads, specifically Lindsey Gap, Groundhog Rd and even Trail Hollow. On the weekends we have cars at a rate of 200 an hour on these small one lane roads. This is an extreme safety issue for children riding school buses and for the safety of our entire community.”

ITS Architectures & Dynamic Route Guidance



TI03: Dynamic Route Guidance

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Connected Vehicle Applications

V2I Safety

- Red Light Violation Warning
- Curve Speed Warning
- Stop Sign Gap Assist
- Spot Weather Impact Warning
- Reduced Speed/Work Zone Warning
- Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

- Emergency Electronic Brake Lights (EEBL)
- Forward Collision Warning (FCW)
- Intersection Movement Assist (IMA)
- Left Turn Assist (LTA)
- Blind Spot/Lane Change Warning (BSW/LCW)
- Do Not Pass Warning (DNPW)
- Vehicle Turning Right in Front of Bus Warning (Transit)

Agency Data

- Probe-based Pavement Maintenance
- Probe-enabled Traffic Monitoring
- Vehicle Classification-based Traffic Studies
- CV-enabled Turning Movement & Intersection Analysis
- CV-enabled Origin-Destination Studies
- Work Zone Traveler Information

Environment

- Eco-Approach and Departure at Signalized Intersections
- Eco-Traffic Signal Timing
- Eco-Traffic Signal Priority
- Connected Eco-Driving
- Wireless Inductive/Resonance Charging
- Eco-Lanes Management
- Eco-Speed Harmonization
- Eco-Cooperative Adaptive Cruise Control
- Eco-Traveler Information
- Eco-Ramp Metering
- Low Emissions Zone Management
- AFV Charging / Fueling Information
- Eco-Smart Parking
- Dynamic Eco-Routing (light vehicle, transit, freight)
- Eco-ICM Decision Support System

Road Weather

- Motorist Advisories and Warnings (MAW)
- Enhanced MDSS
- Vehicle Data Translator (VDT)
- Weather Response Traffic Information (WxTINFO)

Mobility

- Advanced Traveler Information System
- Intelligent Traffic Signal System (I-SIG)
- Signal Priority (transit, freight)
- Mobile Accessible Pedestrian Signal System (PED-SIG)
- Emergency Vehicle Preemption (PREEMPT)
- Dynamic Speed Harmonization (SPD HARM)
- Queue Warning (Q-WARN)
- Cooperative Adaptive Cruise Control (CACC)
- Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
- Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
- Emergency Communications and Evacuation (EVAC)
- Connection Protection (T-CONNECT)
- Dynamic Transit Operations (T-DISP)
- Dynamic Ridesharing (D-RIDE)
- Freight-Specific Dynamic Travel Planning and Performance
- Drayage Optimization

Smart Roadside

- Wireless Inspection
- Smart Truck Parking

Mobility On Demand Integration?



I-24 Smart Corridor (Integrated Corridor Management)

I-24 Smart Corridor Mission:

To improve the **safety and reliability of all travel** along the corridor through the proactive management of intelligent and connected infrastructure, and the formation of strong operational partnerships between local and state agency stakeholders.



I-24 Smart Corridor Goals:

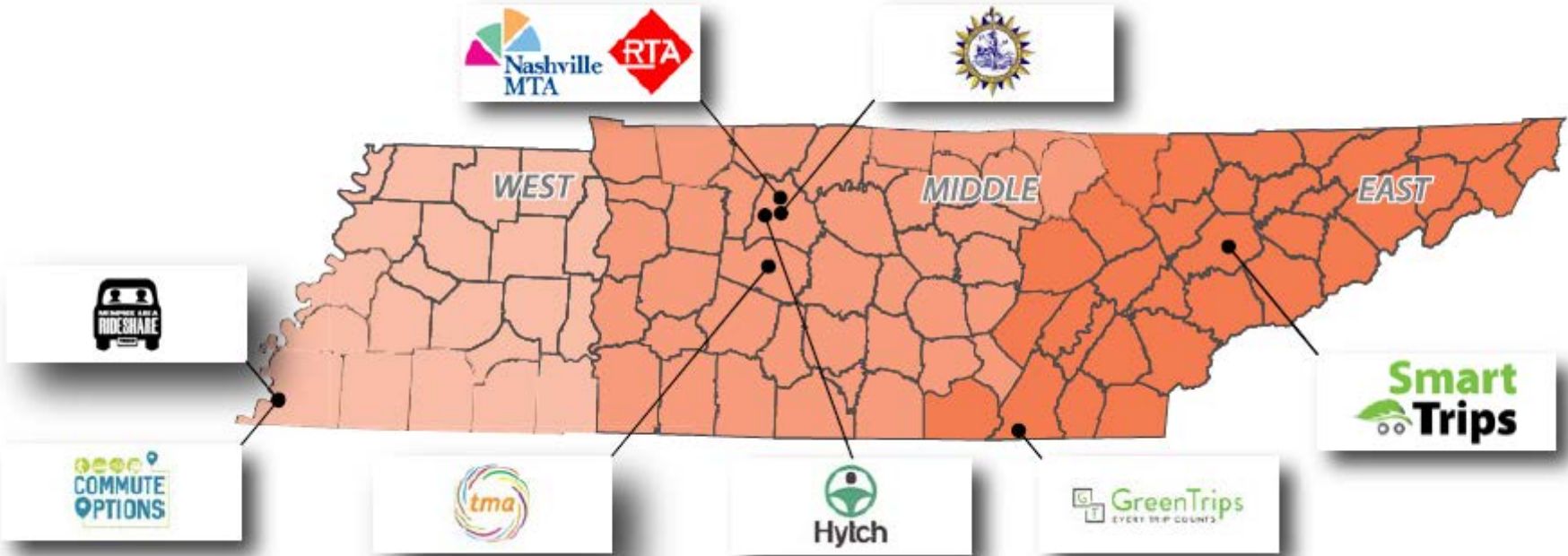
Goal 1: Increase Travel Time Reliability

Goal 2: Increase Mobility of all Modes

Goal 3: Reduce the Concentration of Crashes

Goal 4: Develop Agency Coordination

Travel Demand Management & CMAQ Program





Thank You