



TRB's National Cooperative Highway Research Program
(NCHRP) Project 03-108

Guidance on Quantifying Benefits of Traffic Incident Management Strategies

31 July 2014



Guidance for Quantifying Benefits of TIM (NCHRP 03-108)

Project Objective – Develop concise guidance to quantify & monetize TIM outcomes

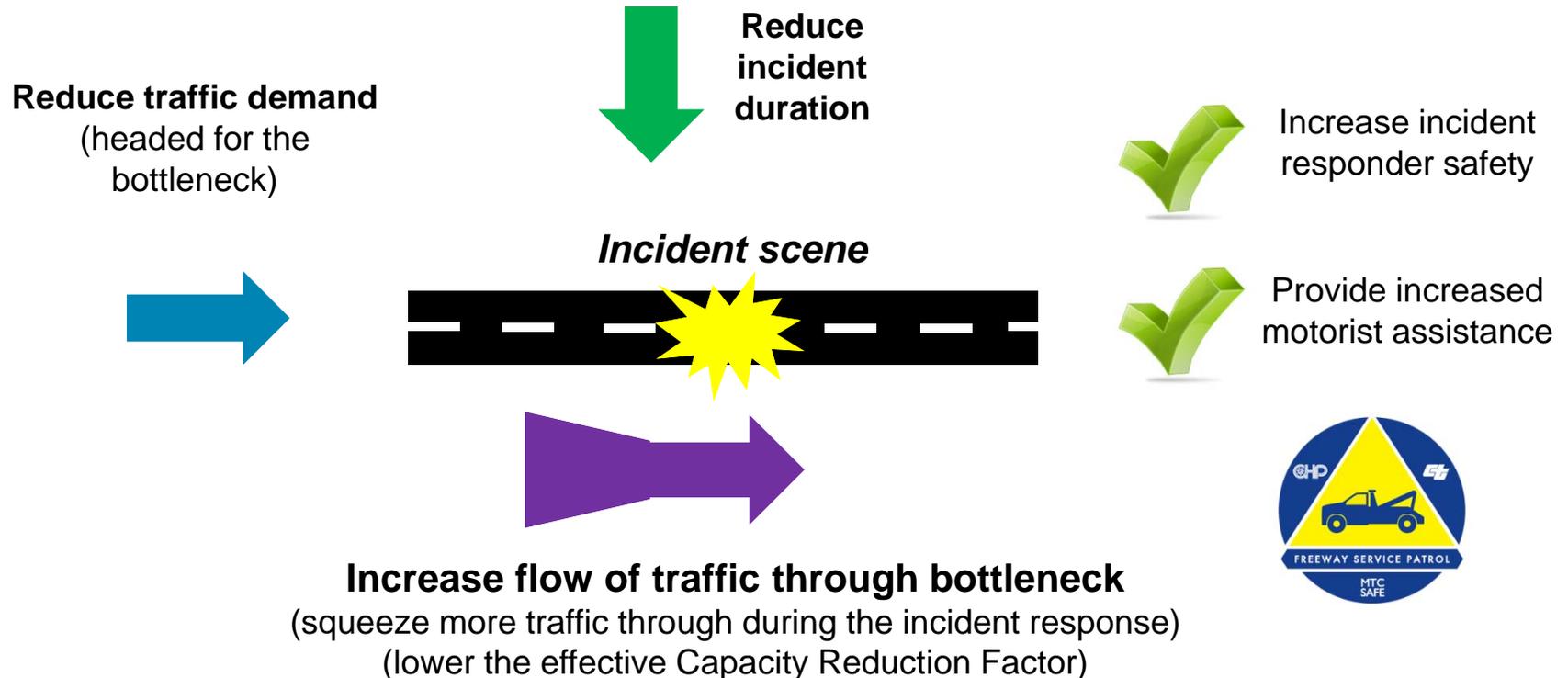
- Guidance to address varying resources and data availability
- Demonstrative Applications
- Audience is TIM program mid-level managers & analysts

Research Approach

- ✓ Review past and ongoing efforts on TIM performance measures, outcomes, and monetization
- ✓ Engage State Stakeholder and broader public on guidance needs
- ❑ Compare methods for estimating and monetizing TIM outcomes using multiple data sources
- ❑ Share finding with demonstrative applications

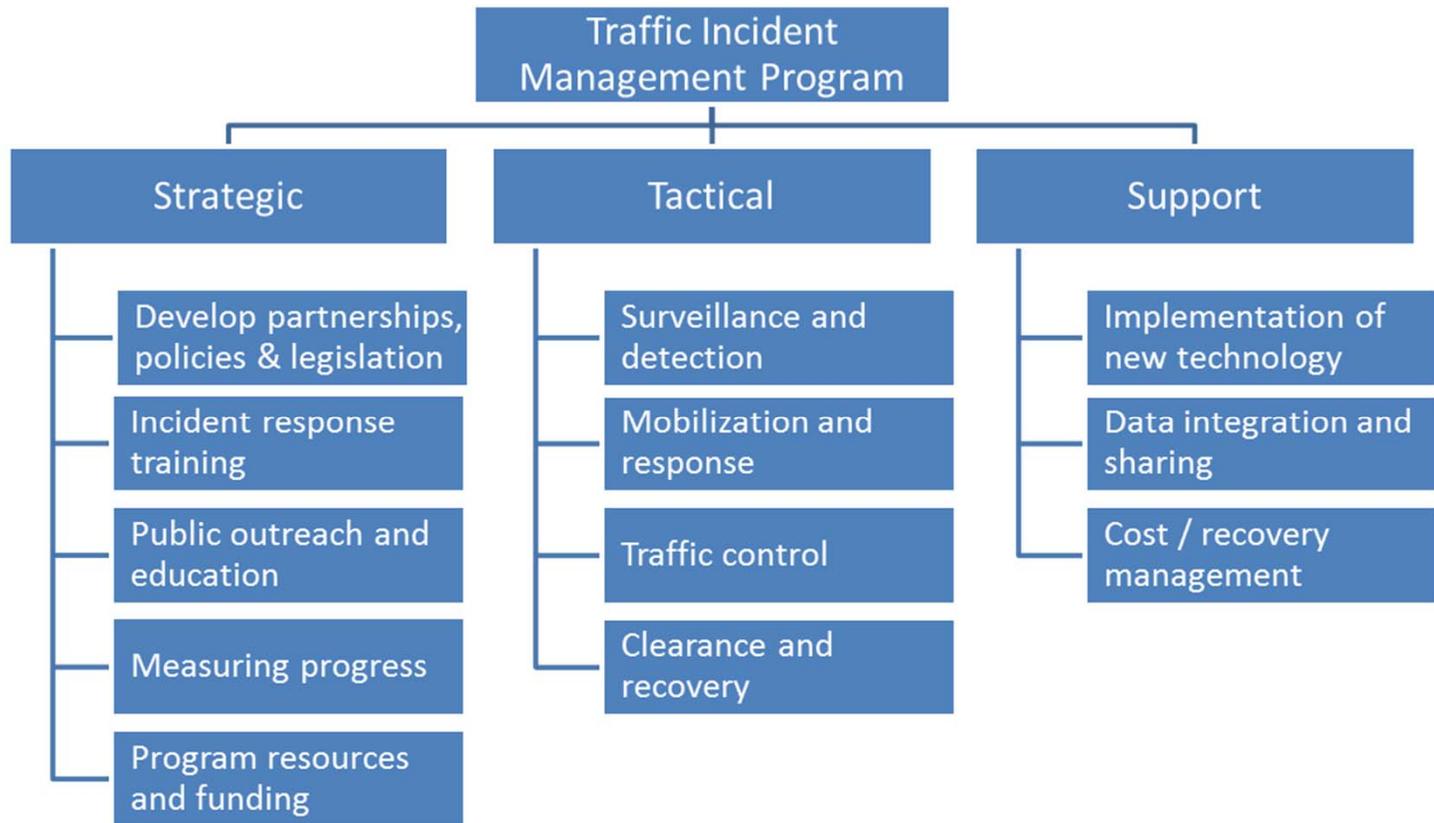
How Do TIM Strategies Provide Benefits?

- TIM strategic, tactical, and support activities aim to affect/enhance incident detection, verification, mitigation, response and clearance



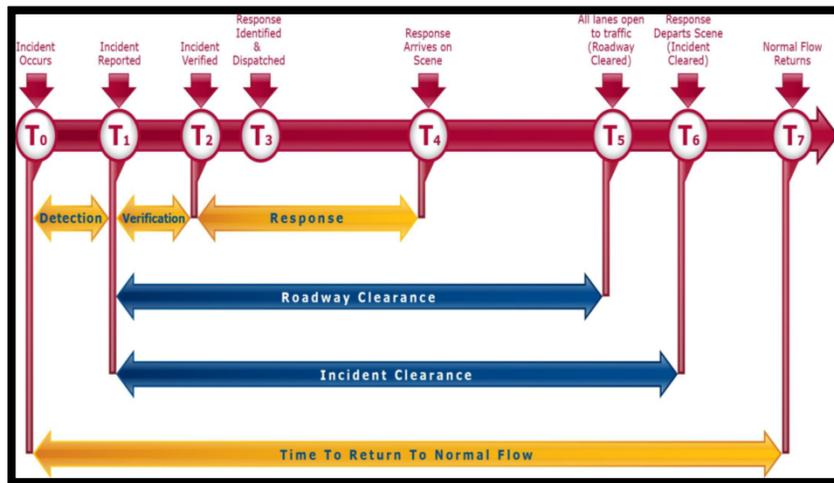
Common Terminology for TIM conversation

- **Activities** strategic, tactical, and support activities such as safety patrol, scene management, and training

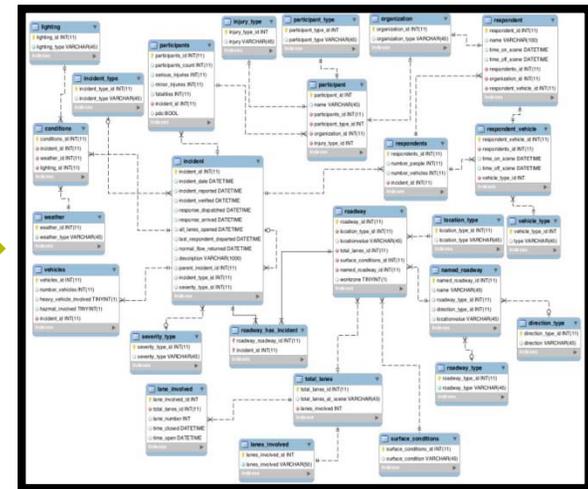


Common Terminology for TIM conversation

- Activities** strategic, tactical, and support activities such as safety patrol, scene management, and training
- Performance measures:** recorded/aggregated data specific to TIM including incident characteristics and *timeline*



Incident Timeline Data



Performance Measurement Database
(incident type, lanes involved roadway data, response vehicles, weather conditions)

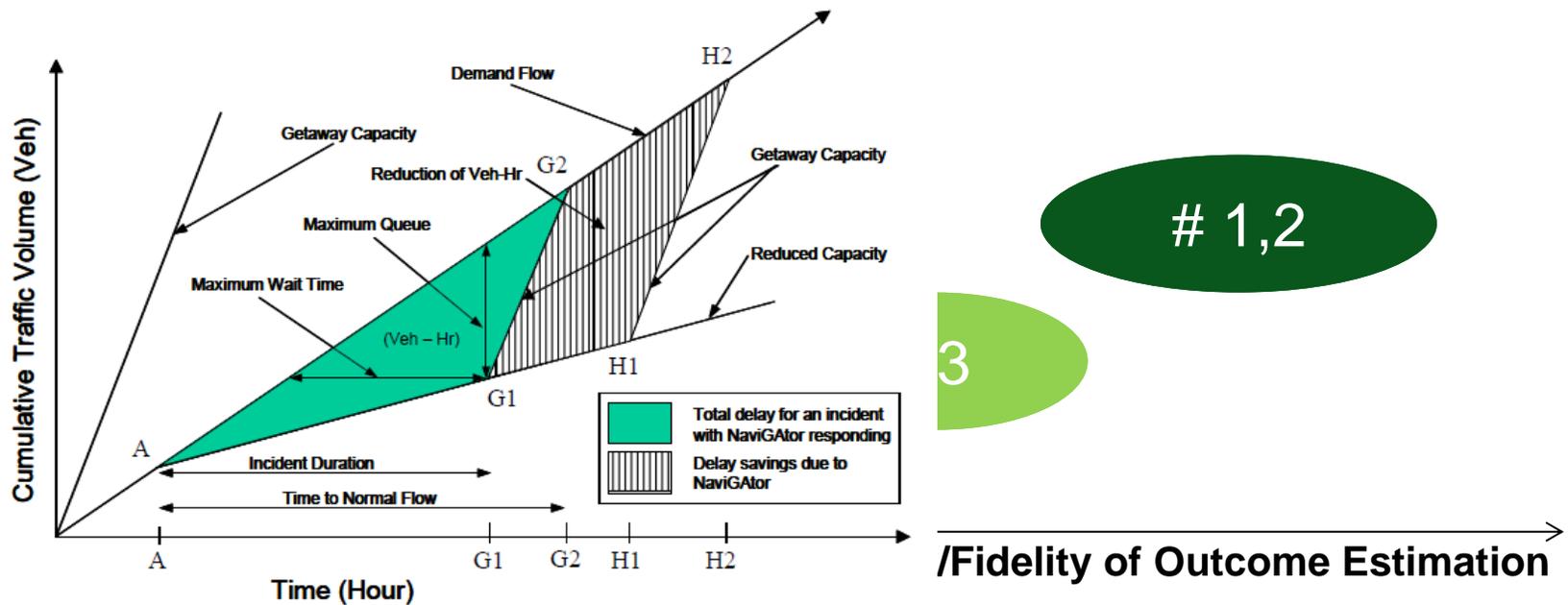
Common Terminology for TIM conversation

- **Activities** strategic, tactical, and support activities such as safety patrol, scene management, and training
- **Performance measures:** recorded/aggregated data specific to TIM including incident characteristics and *timeline*
- **Outcomes**
 - Mobility – delay & reliability*
 - Environmental – emissions, fuel*
 - Safety – secondary incidents, responder incidents*
 - Traveler/public satisfaction – motorist satisfaction*
 - Cost reduction – operational efficiencies*

ALL OUTCOMES CAN BE QUANTIFIED
SOME OUTCOMES CAN BE MONETIZED

Measures To Outcomes: Mobility

- Motorist Delay is quantified using four classes of methods
 - Empirical analysis
 - Simulation modeling
 - Queuing, Regression
 - Generalized impact parameter aggregation



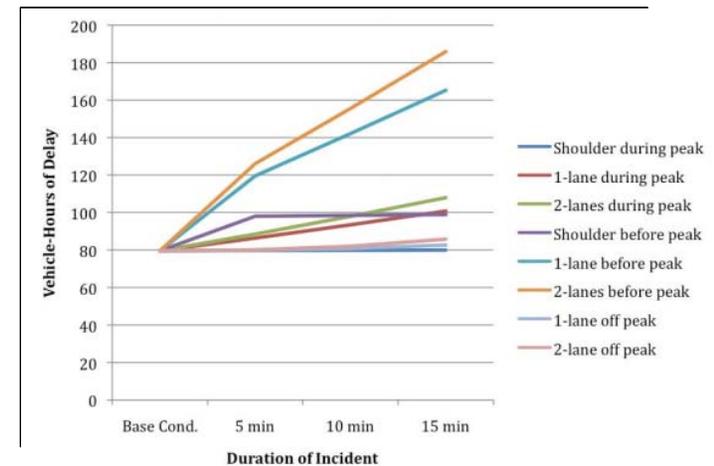
Measures to Outcome – Delay Example

■ Empirical Analysis with Parameters/assumptions

1. Estimate baseline delays by facilities, times of day, day of week, weather using archived data on speed, flow type data
2. Estimate delay during incidents using above parameters and by incident duration
3. Regression or other method correlating incident duration to delay
4. Estimate reduction in incident duration from TIM activities
5. Apply step 3 to estimate delay reduction

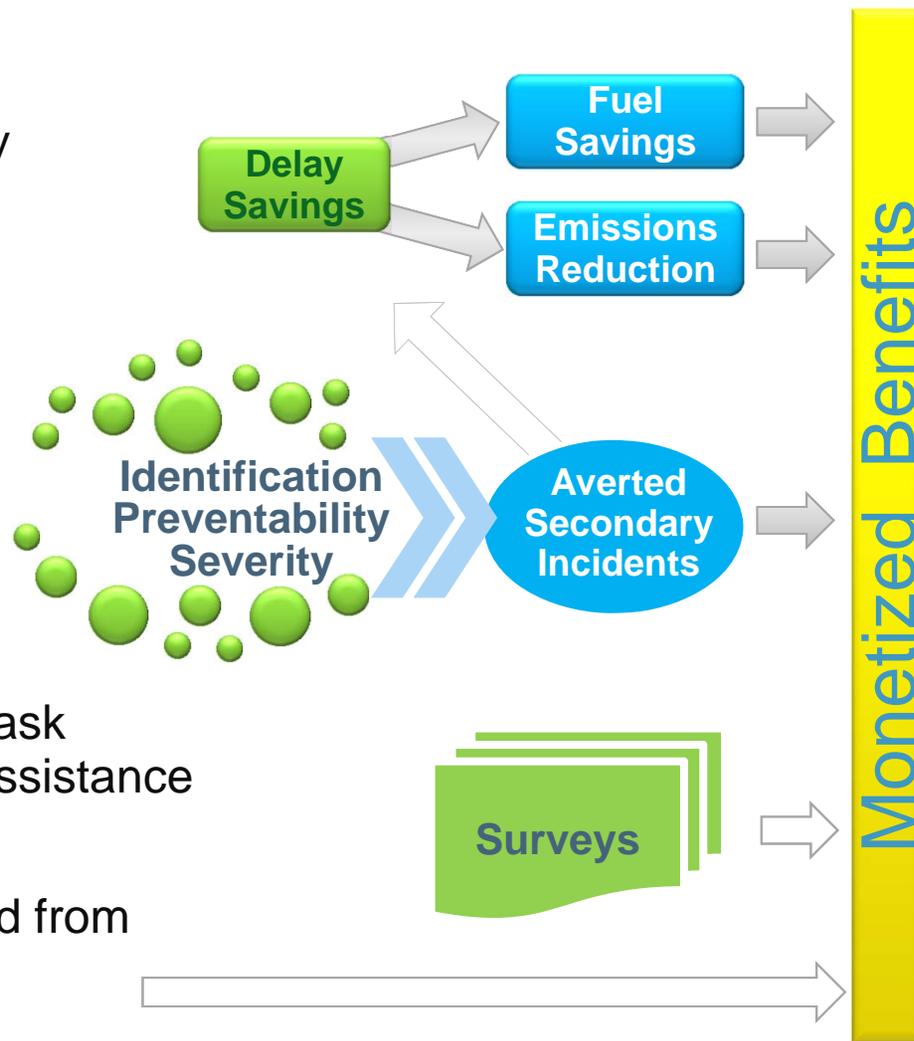
■ Simulation Tools

- CORSIM
- RIMS
- FREEVAL
- VISSIM
- PARAMICS



Measures To Outcomes

- Environmental
 - Fuel use and emissions typically computed from delay savings applying parameters
- Safety
 - Secondary incidents estimated by applying parameters
 - Incidents involving responders are infrequent; national stats
- Traveler Satisfaction
 - Motorist assistance valuation – ask motorists to put a price tag on assistance
 - Motorist Assistance Satisfaction
- Operational Efficiencies estimated from program assessments



Four Different TIM Programs

Four Practices for TIM Outcomes

Practices for Quantifying & Monetizing TIM Outcomes							
TIM Program	TIM Data Collection	Delay	Secondary Incidents	Emissions	Fuel Consumption	Motorist Assist	Routinely Assessed Outcomes
Idaho	Yes						Yes
Georgia*	Yes	Queuing	Parametric			Survey	No
Washington	Yes	Empirical					Yes
Maryland	Yes	Simulation	Regression	Parametric			Yes

*TIME analysis conducted in 2006



NCHRP 03-108 Project Next Step

- Select subset of methods to test using different data sets to assess variations in benefits estimates

