



# Traffic Incident Management Benefit-Cost Tool (TIM-BC)

*December 4, 2015*



U.S. Department of Transportation  
**FEDERAL HIGHWAY ADMINISTRATION**



# Overview



- Incidents on Highways:
  - Time
  - Emissions
  - Infrastructure damages
- Various Traffic Incident Management (TIM) strategies
  - Goal:
    - Responder safety
    - Safe, quick clearance
    - Prompt, reliable, interoperable communications<sup>1</sup>

<sup>1</sup>National Traffic Incident Management Coalition, National Unified Goal for Traffic Incident Management: Working Together for Improved Safety, Clearance, and Communications.

# Overview



- Determine the most effective TIM strategy
  - Evaluate the benefits and costs (B/C)
  - Compare effectiveness
- Various tools for B/C ratios of TIM strategies :
  - A wide range of estimation methodologies
  - B/C ratio estimation results:
    - Vary widely
    - Sensitive to choices of methodologies
  - Numerous Benefit-Cost (B/C) estimation studies are Costly

# Project Objective



- Objective:
  - Develop a TIM Benefit/Cost estimation tool
    - Methodologies
      - Standardized
      - Universal
      - Equitable
    - Simple to use
    - Less data intensive

# Project Objective



- Develop a user-friendly TIM Benefit-Cost tools evaluating a series of TIM strategies
  - Service Safety Patrol, Driver removal law, authority removal law, shared quick-clearance goals, pre-established towing service agreements, dispatch collocation, TIM task-forces, SHRP2 training.
- Solicit feedback on the tools from practitioner webinar and a focus (advisory) group
- Be able to consistently compare the benefits and costs of various TIM strategies in many scenarios

# TIM-BC Tool



- Web-based
- User-friendly
- Assist
  - State and local engineers
  - Decision-makers
- Evaluate and compare the monetary value of TIM programs
- FHWA Official TIM-BC Website

<http://www.fhwa.dot.gov/software/research/operations/timbc/>

# TIM-BC Main Interface




 U.S. Department of Transportation  
Federal Highway Administration 

## Traffic Incident Management Benefit-Cost Tool


Measure the mobility, safety and environmental  
benefits of TIM programs

 Safety Service Patrol


▶ LAUNCH

 Driver Removal Laws


▶ LAUNCH

 Authority Removal Laws

▶ LAUNCH

 Shared Quick-Clearance Goals

▶ LAUNCH

 Pre-established Towing Service Agreements


▶ LAUNCH

 Dispatch Colocation

▶ LAUNCH

 TIM Task Forces

▶ LAUNCH

 SHRP2 Training

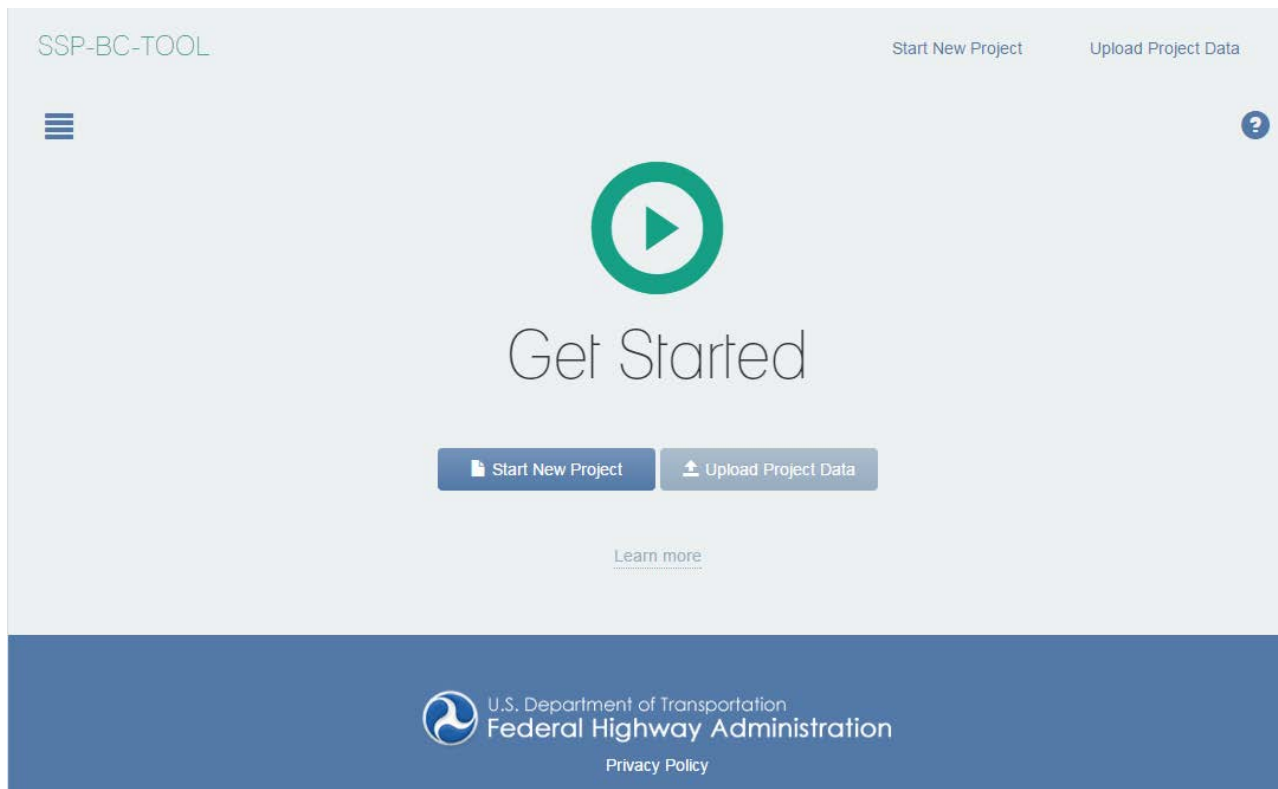
▶ LAUNCH



# SSP-BC Tool (1)



- Home Screen
  - Start a new SSP project
  - Load an existing SSP project







# SSP-BC Tool (2)



- Input Project Details

- E.g. Location, number of segments, annual number of incidents, annual total program cost

SSP-BC-TOOL Save Project Data Start New Project Upload Project Data

Example

State: ⓘ

Number of Segments: ⓘ

Study period duration in months: ⓘ

Number of Annual Incidents on Program Roadway: ⓘ

Annual Total Program Cost: ⓘ

# SSP-BC Tool (3)



- Annual Cost Calculation

SSP-BC Tool

Home icon

Menu icon

## Calculate Program Cost ?



Annual Total: \$ 161280

Annual Fixed Cost:

Patrol Vehicle Type	Number of Vehicles	Driver's Hourly Rate (\$/hr)	Working Hours per Day	Working Days per Month	Fuel (gal/month)	Provided Gas (\$/month)	Vehicle Maintenance (\$/month)	Other (\$/month)	Monthly Total
Vehicle Type	2	40	8	21	0	0	0	0	\$ 13440
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0
Vehicle Type	0	0	0	0	0	0	0	0	\$ 0

You've added a new table row. [Undo?](#)

# SSP-BC Tool (4)



- Input Segment Information
  - E.g. roadway geometry, traffic information, incident information

SSP-BC-TOOL Save Project Data Start New Project Upload Project Data

Example Project

Segment: Segment 1

First segment

Modesto, CA

### Roadway Geometry

SEGMENT LENGTH IN MILES:

NUMBER OF RAMPS:

NUMBER OF TRAFFIC LANES BY DIRECTION:

GENERAL TERRAIN: Flat

HORIZONTAL CURVATURE: Straight

### SSP Program Information

OPERATION TIME:

AM Peak  
 PM Peak  
 Weekday Off Peak  
 Weekend

INCIDENT DURATION:

Choose how to enter savings:

ENTER AVERAGE DURATION SAVINGS: (Minutes)

### Traffic Information

POSTED MAINLANE SPEED LIMIT (MPH):

Time	Traffic Volume (VEH/H/Lane)	Truck Percentage (0-100)
AM PEAK	<input type="text" value="2000"/>	<input type="text" value="12"/>

### Incident Information

#### AM Peak

Incident Blockage Severity	Average Incident Duration (Minutes)	Number of Managed Incidents
Shoulder Blockage	<input type="text" value="15"/>	<input type="text" value="250"/>
One Lane Blockage	<input type="text" value="27"/>	<input type="text" value="100"/>

PERCENTAGE OF ESTIMATED SECONDARY INCIDENTS (enter as 0-100):

### Weather Information (ensure selections add up to 100%)



- Project Output
  - Summarizes the calculated benefits elements and benefit-cost ratio of the SSP program
    - Benefits: delay savings (hours), fuel savings (gallons), secondary incidents prevented, and emissions savings (MT)
  - Export PDF reports with the results

# SSP-BC Tool (6)



- Project Output – Summary page + PDF report

Test\_Case\_2

Segments:

Select All Select None

Test2\_seg1

Test2\_seg2

PRODUCE REPORT

Savings

Study period duration: 12 months

DELAY SAVINGS (HOURS):	87.01	<input checked="" type="checkbox"/>
FUEL (GALLONS):	-17802.79	<input checked="" type="checkbox"/>
SECONDARY ACCIDENTS:	2.35	<input checked="" type="checkbox"/>
HYDROCARBON (HC, MT):	-1.09	
CARBON MONOXIDE (CO, MT):	-8.13	
NITROGEN OXIDE (NOx, MT):	-0.54	
CARBON DIOXIDE (CO2, MT):	-175.45	
SULFUR OXIDE (SOx, MT):	-2.82	

BENEFIT-COST RATIO OF CHOSEN FACTORS:

8.45

# Thank you!

## Contact



Pavle Bujanović, Ph.D.  
CARMA Program Technical Manager  
FHWA Office of Operations R&D



Email  
[pavle.bujanovic@dot.gov](mailto:pavle.bujanovic@dot.gov)