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Safety Service Patrol Idea Sharing Network – Session II: Performance Measures

WSDOT Incident Response Program Purpose

- Effectively manage traffic incidents to minimize congestion
- Reduce traffic delays and associated costs to the economy
- Improve motorist safety by reducing secondary collisions
- Restore normal traffic flow and the free movement of people, goods and services as safely and quickly as possible

Clearing Roads. Helping Drivers.

Saving Lives



Some WSDOT TIM Partners



U.S. Department of Transportation
Federal Highway Administration



Washington Ambulance Association



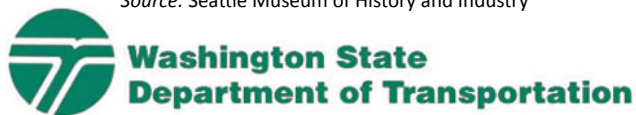
History of IRT Program

1963

Deployed 4 trucks
on floating bridges
Start of the program



Source: Seattle Museum of History and Industry



2002

Expanded program
Added roving patrols
during peak traffic periods
in congested areas



Source: WSDOT Flickr



WSDOT IRT Mission

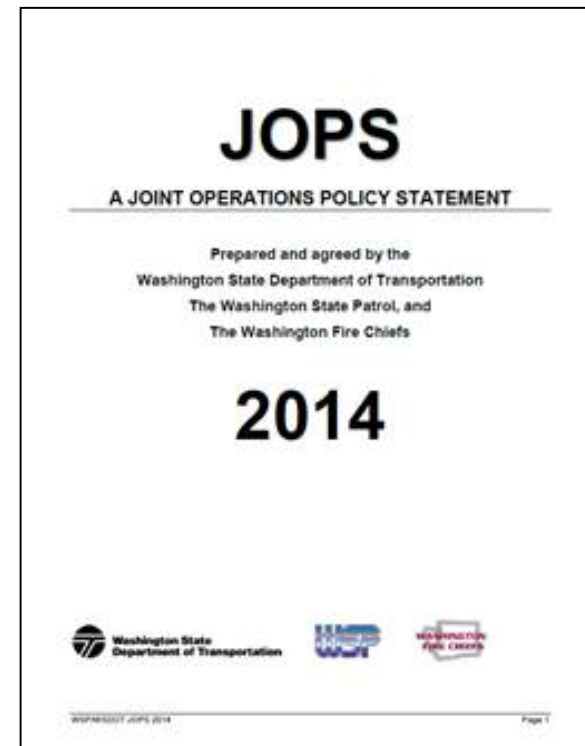


The mission of WSDOT's Incident Response program is to clear traffic incidents safely and quickly, minimizing congestion and the risk of secondary incidents. The statewide program has a biennial budget of \$9 million, funding about 47 full-time equivalent positions (approximately 80 trained drivers) and 62 dedicated vehicles. Teams are on-call 24/7 and actively patrol 493 centerline miles (about 32 percent of all urban centerline miles) of highway on major corridors around the state such as I-5 or I-205 during peak traffic hours.



Joint Operations Policy Statement

- WSDOT IRT is unique and successful because of the close working relationship with the WSP
- “Joint Operations Policy Statement” or JOPS (2002)
 - WSDOT, the WSP and the Washington Fire Chiefs developed JOPS to govern all aspects of Traffic Incident Management (TIM)



Major Contributing Factors

- 5 major contributing factors that add time to roadway and incident clearance efforts:
 1. Commercial Vehicle Involvement (>26.000 GVW)
 2. Fatality
 3. Fire
 4. Hazardous Material Cargo or Chemical Spill
 5. Rollover



WA State Safe, Quick Clearance (SQC) and Open Roads

Quick Clearance Law*

(Open Roads Policy/Roadway Clearance & Hold Harmless Liability Waiver)

RCW 46.52.020(2)(b) Duty in case of personal injury or death or damage to attended vehicle or other property – Penalties.

(b) A law enforcement officer or *representative of the department of transportation may cause a motor vehicle, cargo, or debris to be moved from the roadway*; and neither the department of transportation representative, nor anyone acting under the direction of the officer or the department of transportation representative is liable for damage to the motor vehicle, cargo, or debris caused by reasonable efforts of removal.

**RCW is abbreviated- - see full statute*



Roadway Clearance

Steer It/Clear It – Fender Bender Law*

(Open Roads Policy)

RCW 46.52.020(2)(a) Duty in case of personal injury or death or damage to attended vehicle or other property – Penalties.

*(2)(a) The driver of any vehicle involved in an accident resulting only in damage to a vehicle which is driven or attended by any person or damage to other property must move the vehicle as soon as possible **off the roadway** or freeway main lanes, shoulders, medians, and adjacent areas to a location on an exit ramp shoulder, the frontage road, the nearest suitable cross street, or other suitable location.*

**RCW is abbreviated- - see full statute*



Responder Safety

Move Over Law/Slow Down Law*

(Emergency Roadside Assistance/Responder Safety)

RCW 46.61.212(1)(iii), (2) Approaching emergency zones.

(1) The driver of any motor vehicle, upon approaching an emergency zone, which is defined as the adjacent lanes of the roadway two hundred feet before and after (a) a stationary authorized emergency vehicle that is making use of audible and/or visual signals meeting the requirements of RCW [46.37.190](#), (b) a tow truck that is making use of visual red lights meeting the requirements of RCW [46.37.196](#), (c) other vehicles providing roadside assistance that are making use of warning lights with three hundred sixty degree visibility, or (d) a police vehicle properly and lawfully displaying a flashing, blinking, or alternating emergency light or lights, shall:

(iii) If changing lanes or moving away would be unreasonable or unsafe, proceed with due caution and reduce the speed of the vehicle.

(2) A person may not drive a vehicle in an emergency zone at a speed greater than the posted speed limit.

**RCW is abbreviated- - see full statute*



Training



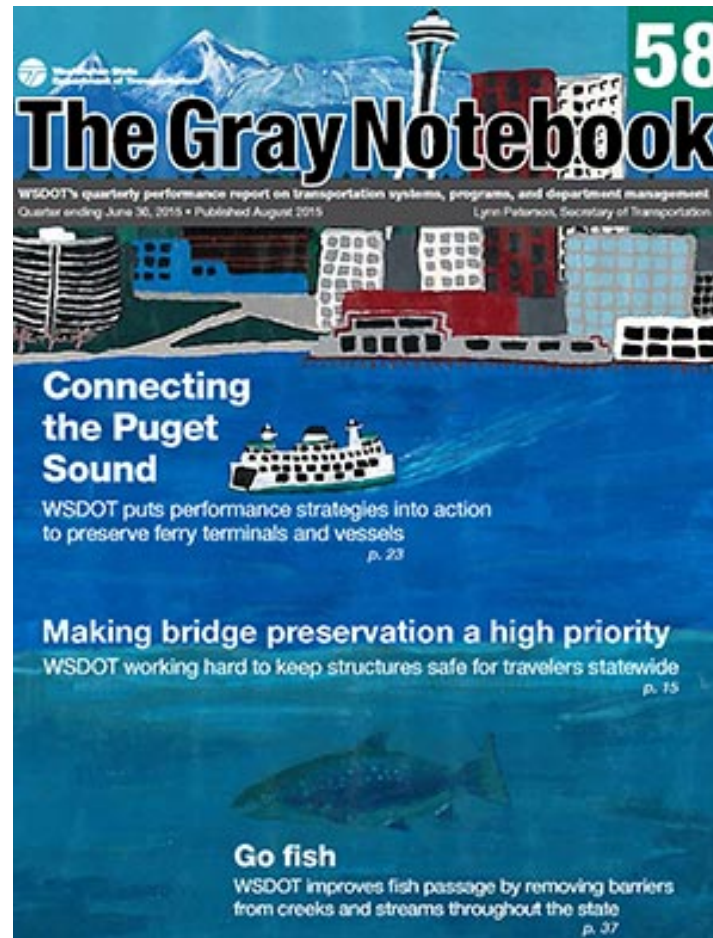
- The National TIM Responder Training Program is the first reliability product being rolled out under SHRP 2
- FHWA SHRP2 TIM Training Program – National effort to train all roadway emergency responder disciplines

TIM Training

- Designed to establish the foundation for and promote consistent training of all roadway responders to achieve the three objectives of the TIM National Unified Goal (NUG):
 - Responder safety
 - Safe, quick clearance
 - Prompt, reliable, interoperable communications

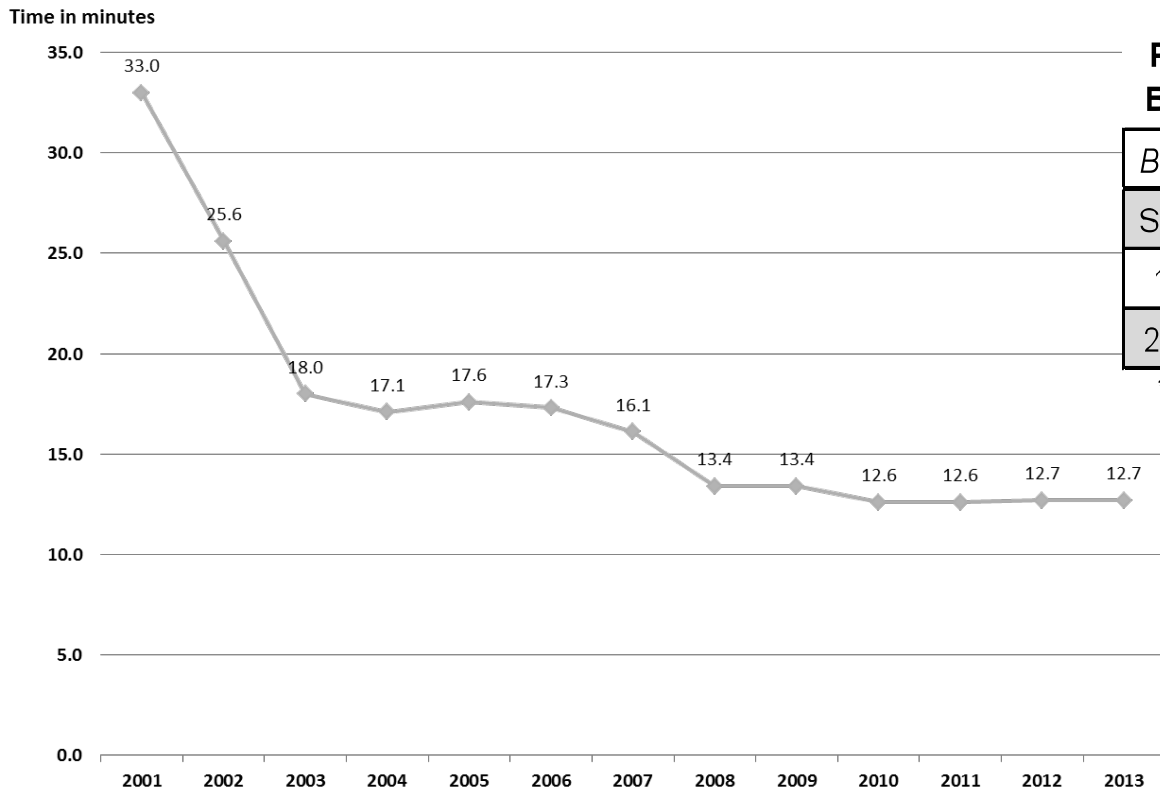


The Gray Notebook



Key Congestion Measures that Communicate Performance

Annual average clearance time responded by Incident Response program



Percentage of Capacity Reduction by Blocking Incident & Size of Roadway*

Blocking	2-lane	3-Lane	4-Lane
Shoulder	25%	16%	11%
1-Lane	68%	47%	44%
2-Lanes	100%	78%	66%

* one direction

Source: UW TRAC

Data Source: Washington State Patrol and WSDOT Traffic Office.



Defining Incident Response Performance Measurement

Performance measure	Definition	Measuring unit
Roadway clearance time	The time between the first recordable awareness of an incident (detection, notification, or verification) by a responding agency and first confirmation that all lanes are available for traffic flow.	Time in minutes
Incident clearance time	The time between the first recordable awareness of the incident and the time at which the last responder has left the scene.	Time in minutes
Secondary incidents ¹	These incidents are identified as the number of unplanned incidents beginning with the time of detection of the primary incident where a collision occurs either within the incident scene or within the queue, including the opposite direction, resulting from the original incident.	Number of incidents

Data source: FHWA Traffic Incident Management Handbook.

Notes: 1 Number of secondary incidents avoided as a result of the IR team's presence is a nationally recommended performance measure. Neither WSDOT nor the state patrol currently collect this data. WSDOT is estimating secondary incidents and associated benefits – see gray box on page 19.



Incidents and Benefits

- WSDOT teams helped clear 12,552 incidents this past quarter, providing an estimated \$19.3 million in economic benefits
- Statewide incident responses decreased 4.6% while clearance times increased 7.9% this quarter compared to the same quarter in 2014

Fewer Incidents/Longer Clearance

WSDOT sees fewer incident responses compared to last year; clearance times increase

Second quarter (April through June) 2014 and 2015

2015 - Q2 **12,552**
incident responses

 **12.3**-minute average
incident clearance time

2014 - Q2 **13,153**
incident responses

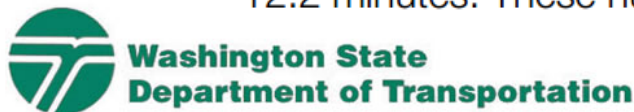
 **11.4**-minute average
incident clearance time

incident responses **4.6%** ↓
decreased

clearance time **7.9%** ↑
increased

Data source: Washington Incident Tracking System.

Notes: Data above only account for incidents to which an IR unit responded. IR data reported for the current quarter (Q2 2015) are considered preliminary. In the previous quarter (Q1 2015), WSDOT responded to 11,076 incidents, clearing them in an average of 12.2 minutes. These numbers have been confirmed and are now finalized.



Incidents >90 Minutes

WSDOT teams respond to 160 over-90-minute incidents

WSDOT Incident Response units provided assistance at the scene of 160 incidents that lasted more than 90 minutes during the first quarter of 2015. This is 22 more incidents — roughly 16 percent — than the same quarter in 2014. While these over-90-minute incidents accounted for 1.3 percent of all incidents, they resulted in 22.5 percent of incident-related delay costs.



IRT Benefit Cost Analysis

WSDOT's Incident Response prevents \$19.3 million in delay and secondary incidents

April through June 2015; Incidents by duration; Times in minutes; Costs and benefits in millions of dollars

Incident duration	Number of incidents ¹	Percent blocking ²	Average roadway clearance time ³ (blocking only)	Average roadway clearance time ³ (all incidents)	Average incident clearance time ⁴ (all incidents)	Cost of incident-induced delay	Economic benefits from IR program ⁵
Less than 15 min.	9,820	19.1%	4.5	0.8	4.9	\$12.3	\$5.7
Between 15 and 90 min.	2,572	53.9%	24.3	13.3	29.6	\$21.6	\$9.5
Over 90 min.	160	84.4%	174.3	149.1	185.4	\$9.8	\$4.1
Total	12,552	27.0%	20.1	5.3	12.3	\$43.8	\$19.3
Percent change from second quarter 2014	↓ 4.6%	↑ 5.5%	↑ 9.9%	↑ 39.5%	↑ 7.9%	↑ 6.9%	↑ 5.0%

Data source: Washington Incident Tracking System.

Notes: Some numbers do not add up due to rounding. 1 Teams were unable to locate 615 of the 12,552 incidents. Because an IR team attempted to respond, these incidents are included in the total incident count, but are not factored into other performance measures. 2 An incident is considered blocking when it shuts down one or more lanes of travel. 3 Roadway clearance time is the time between the IR team's first awareness of an incident (when a call comes in or the incident is spotted by a patrolling IR unit) and when all lanes are available for traffic flow. 4 Incident clearance time is the time between an IR team's first awareness of an incident and when the last responder has left the scene. 5 Estimated economic benefits include benefits from delay reduction and prevented secondary incidents. See [WSDOT's Handbook for Corridor Capacity Evaluation, pp. 40-42](#), for WSDOT's methods to calculate IR benefits.



Economic Benefits of the IRT Program

$$\text{Economic benefits of IR program} = \text{Economic benefits of reduced traffic delay} + \text{Economic benefits of secondary incidents avoided}$$

$$\text{Economic benefits of reduced traffic delay} = \sum_{n=1}^{\text{Number of incidents}} \left(\text{Cost of incident induced delay} \times 0.25 \right)$$

Rate of incident delay prevented

Cost of Incident-induced delay is the economic impacts of delay that occurred due to incidents to which WSDOT IR crews responded (see p. 8 for a definition of what constitutes “delay”). WSDOT estimates the cost of delay at \$244 per minute of incident duration for non-blocking incidents and \$345 per minute of blocking incidents based on research from the University of Washington’s Transportation Center (TRAC).

$$\text{Cost of Incident Induced delay} = \sum_{n=1}^{\text{Number of incidents}} \left(\text{Incident clearance time} \times \text{Cost of delay per minute of incident} \right)$$

Incident type



$$\text{Economic benefits of secondary Incidents avoided} = \sum_{n=1}^{\text{Number of incidents}} \left(\text{Incident clearance time} \times 0.2 \times \$286 \text{ per minute of secondary incident} \right)$$

FHWA incident prevention rate

Incident clearance time is the average time between the first recordable awareness of the incident (detection, notification, or verification) and the time the last responder has left the scene. These times are recorded in the field by IR teams. WSDOT reports statewide incident clearance time on a quarterly basis and annually.

$$\text{Incident clearance time} = \frac{\text{Time last responder left the scene} - \text{Time of first recorded awareness}}{\text{Number of incidents responded to}}$$



IRT Customer Feedback

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Customer feedback: Incident Response teams provide quick assistance in second quarter 2015

WSDOT IR teams give comment cards to drivers they help. Below are samples of the comments received from drivers WSDOT assisted during the second quarter of 2015:

- I was honestly surprised at how quickly [Incident Response] were at the scene and fixed the problem. Very nicely done. Thank you.
- Jim was incredible. He just happened to be behind us, saw the incident and came to the rescue.
- Everything is perfect 100 percent. [Incident Response] stopped one minute after my tire blew and Jan had me going in less than 10 minutes. Thank you so much!

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