

CAMPO Meeting

Wrong Way Driver (WWD) & Advance Signal Warning System (ASWS) Program Updates

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- 5 WWD Program Implementation



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WWD Overview



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Background and Purpose

- USA - 500 tragic deaths each year on average
 - 1% of all national fatalities
- Nevada - 5-6 tragic deaths each year on average
 - 2% of all state fatalities



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NDOT Interim Approval



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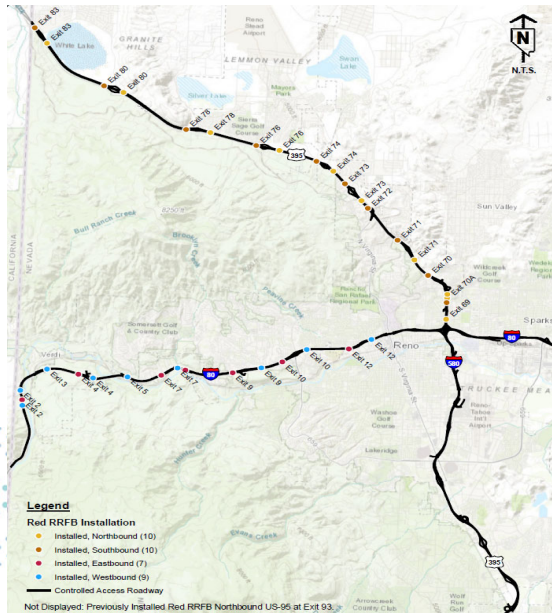
NDOT Interim Approval for WWD System Deployment

- January 7, 2016, NDOT obtains interim approval from FHWA
- Late 2019, NDOT requests to modify the original list
- February 2020, FHWA provided interim approval of the modified list



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NDOT Interim Approval



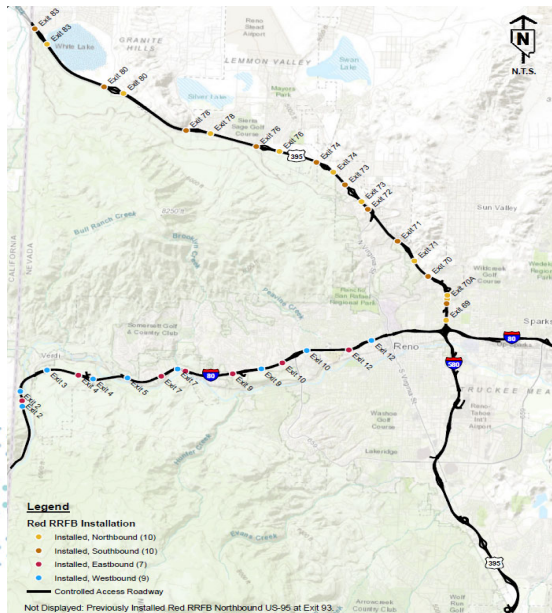
Sites previously approved:

- US-95 Durango Drive Interchange (Exit 93) NB (Infrastructure only)
- US-395 Oddie Boulevard Interchange (Exit 69) NB/SB
- US-395 Clear Acre Lane (Exit 70) NB
- US-395 North McCarran Boulevard Interchange (Exit 70) NB/SB
- US-395 Parr Boulevard Interchange (Exit 71) NB/SB
- US-395 North Virginia Street Interchange (Exit 72) SB
- US-395 Golden Valley Road Interchange (Exit 73) NB/SB
- US-395 Lemmon Drive Interchange (Exit 74) NB/SB
- US-395 Stead Boulevard Interchange (Exit 76) NB/SB
- US-395 Red Rock Road Interchange (Exit 78) NB/SB
- US-395 White Lake Parkway Interchange (Exit 80) NB/SB
- US-395 Village Parkway Interchange (Exit 83) NB/SB



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NDOT Interim Approval



Additional sites approved:

- I-80 Gold Ranch Road (Exit 1) WB
- I-80 West Verdi Interchange (Exit 2) WB/EB
- I-80 Verdi Interchange (Exit 3) WB
- I-80 Garson Boomtown Road Interchange (Exit 4) WB/EB
- I-80 East Verdi Interchange (Exit 5) WB
- I-80 Mogul Interchange (Exit 7) WB/EB
- I-80 West 4th Street Interchange (Exit 8) EB
- I-80 Robb Drive Interchange (Exit 9) WB/EB
- I-80 West McCarran Boulevard Interchange (Exit 10) WB/EB
- I-80 Keystone Avenue Interchange (Exit 12) WB/EB



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FHWA Reporting



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FHWA Interim Approval Reporting

- NDOT provides semi-annual reports to FHWA
- Report 6 Findings (Since June 2020– December 31, 2022)
 - 216 WWD events were observed
 - Approximately 65% of events occurred at nighttime
 - 83% of WWD events occurred in clear weather conditions
 - When the flashing system activated
 - 84% of vehicles were confirmed turnarounds
 - 9% were confirmed mainline entries



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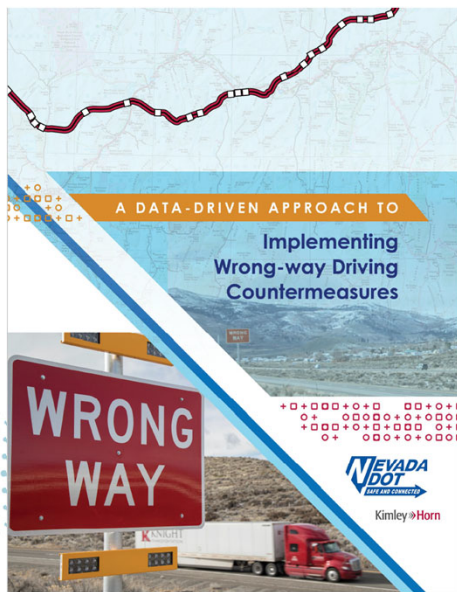
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NDOT Data Driven Approach Implementing WWD Countermeasures



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NDOT Data Driven Approach Implementing WWD Countermeasures

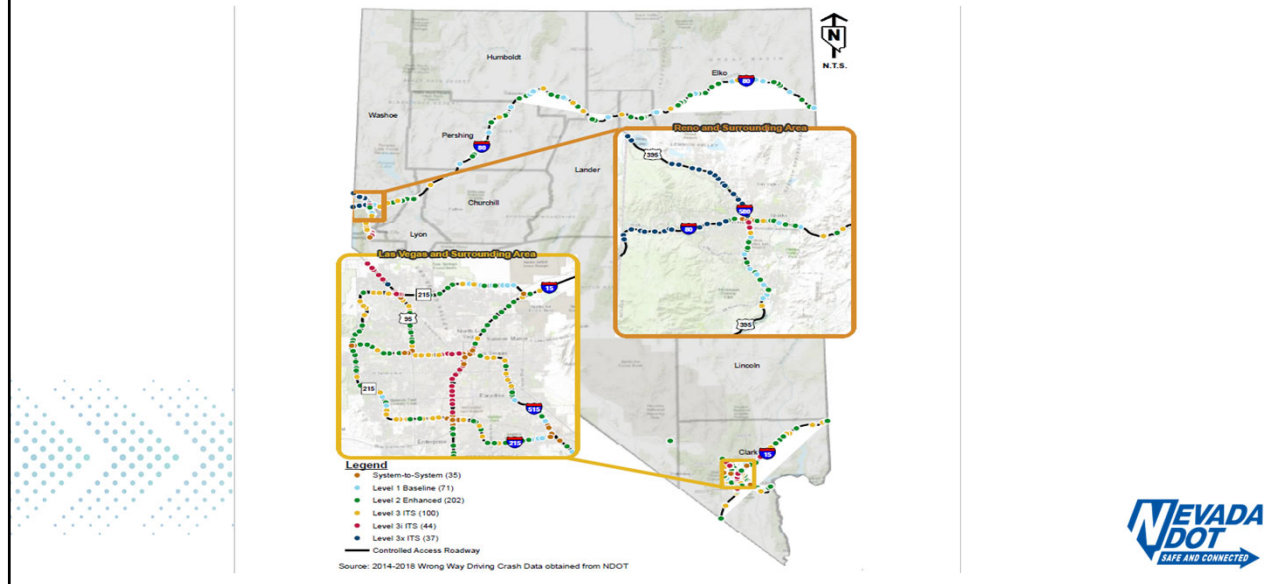


- Data Driven Approach
 1. Analyze WWD crashes, citations, and risk factors
 2. Identify WWD mitigation strategies
 3. Develop a countermeasure implementation plan



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NDOT Data Driven Approach Implementing WWD Countermeasures



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NDOT Data Driven Approach Implementing WWD Countermeasures

- Recommendations:
 1. Level 1 Baseline Improvements: Signage, pavement markings, and delineators.
 2. Level 2 Enhanced: Level 1 Improvements plus additional signage and delineation.
 3. Level 3 ITS Improvements: WWD flashing beacon system

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NDOT WWD Warning System Technology Update



- MUTCD Compliance
 1. Red Beacon
 2. White LED Border



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WWD Program Implementation



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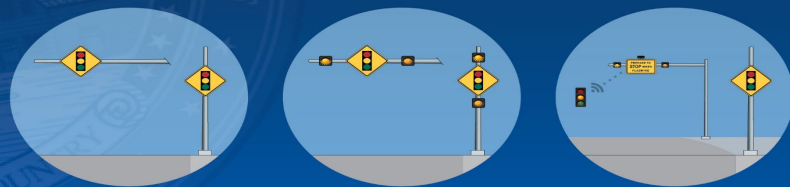
WWD Program Implementation

- In Carson City: Contract 3763
 - Installing WWD systems on I-580 at Fairview Dr., US 50, College Parkway, Arrowhead Dr., and N. Carson St.
- Numerous project in design or construction:
 - Design: US 395 North Valleys Phase 1B and Phase 2
 - Design: I-80 from Keystone to Stateline
 - Construction: SBX
 - Operations: ITS Maintenance Contract phasing out older WWDS model
- Level 1, 2, and 3 Ramp Strategies incorporated in project planning level



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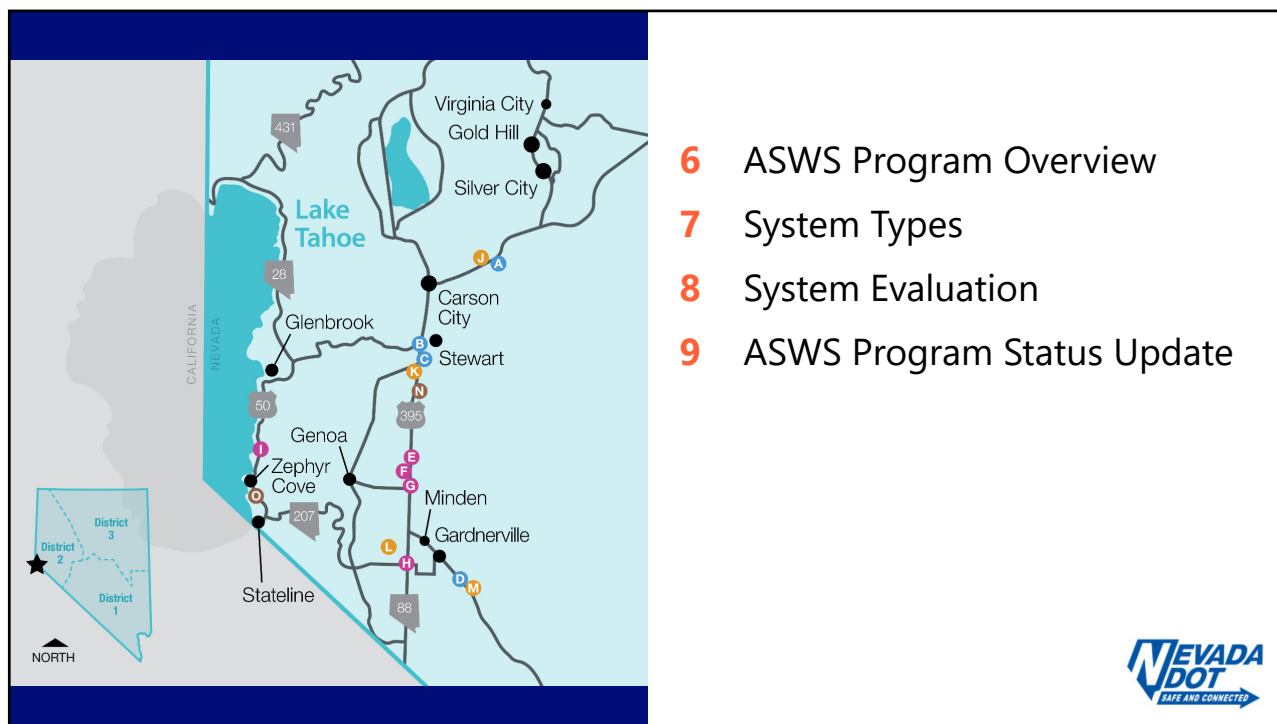
Statewide Advance Signal Warning System Changes



Project Overview



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The map displays the state of Nevada with various locations marked by colored dots and letters (A through O). Major cities and towns shown include Virginia City, Gold Hill, Silver City, Carson City, Stewart, Genoa, Zephyr Cove, Minden, Gardnerville, and Stateline. Highway shields for routes 431, 28, 50, 207, 395, and 88 are visible. Lake Tahoe is labeled in the northwest. An inset map shows the three districts of Nevada: District 1, District 2, and District 3. A north arrow is located in the bottom left corner. The Nevada DOT logo, with the tagline 'SAFE AND CONNECTED', is in the bottom right corner.

- 6 ASWS Program Overview
- 7 System Types
- 8 System Evaluation
- 9 ASWS Program Status Update

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6 ASWS Overview



The slide features a large white number '6' on the left, followed by the text 'ASWS Overview' in a bold, dark font. A horizontal blue line is positioned below the number '6'. The Nevada DOT logo, with the tagline 'SAFE AND CONNECTED', is located in the bottom right corner.

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Goal

- GOAL: Developed a unified approach statewide that promoted uniformity and consistency in the treatment of ASWS specific to each intersection's individual needs.
- This will enhance the safety of the traveling public and promote better driver behavior.



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ASWS Signs

- ASWS are used to alert drivers of upcoming traffic conditions, especially the potential need to stop at a signalized intersection.
- ASWS include the yellow signs stationed over the roadway that often feature flashing yellow lights to warn of a traffic signal ahead.



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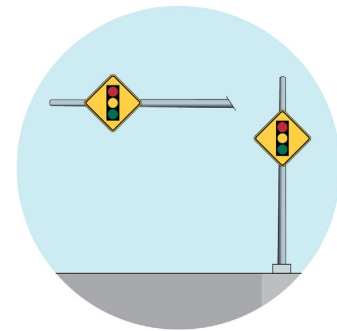
ASWS System Types



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ASWS SYSTEM TYPES

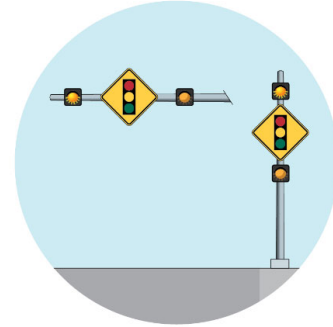
- **STATIC SYSTEM:**
 Only includes signage alerting drivers to an upcoming traffic signal or intersection.
- Best used if:
 - Signal is visible from an adequate distance but there is still a need to provide some advance warning.



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ASWS SYSTEM TYPES

- **PASSIVE SYSTEM:** Includes signage and a continuously flashing beacon.
- Best used if:
 - Signal is visible from an adequate distance, but drivers are transitioning from a rural to an urban area.
 - Signal is isolated, unexpected, and/or road speeds are above 45mph.



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ASWS SYSTEM TYPES

- **ACTIVE SYSTEM:** Includes signage and a flashing beacon that is connected to the signal controller, and only flashes during a signal change, such as from green to yellow, or when a signal is red.
- Best used if:
 - Signal has limited sight distance that doesn't provide proper reaction time.
 - Area has heavy truck traffic, winter or other conditions that require additional stopping distance or reaction time.



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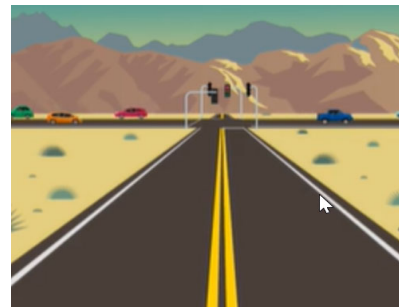
ASWS Evaluation



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ASWS Updates- When to Remove

- ASWS were previously installed based upon speed thresholds.
- NDOT's update to mirror updated Manual on Uniform Traffic Control Devices (MUTCD) guidance and account for field conditions.
- As part of the project each location had a field review conducted.
- Site specific conditions were accounted for as part of the recommendations.



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ASWS Updates – When to Remove

- Study and project promote uniformity and consistency in ASWS throughout Nevada.
- Enhance safety and promote better driver behavior.
- Effort aims to reduce red-light running and speeding some of the most serious traffic problems in the nation.
- Estimates show vehicles running red lights result in more than 200,000 people being injured and approximately 900 deaths nationwide per year.



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ASWS Updates- Timing Modification

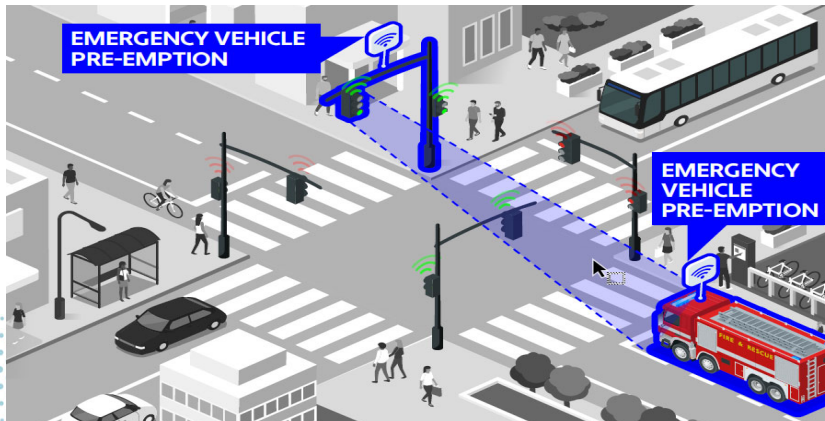
- Timing is being modified to promote safer driving behaviors. Currently, at certain intersections, an advanced notice is being given to drivers and they are “overdriving” or attempting to “beat” the signal and running red lights.
- Timing varies for each advance signal and is dependent upon the geometry and site conditions at each location.



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ASWS Updates- Emergency Vehicle Pre-Emption & Pedestrian Priority

- Still fully functional without ASWS system



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ASWS Updates- Federal Compliance

- NDOT guidance was based on MUTCD guidance notably that ASWS should be considered when two signal indications are not continuously visible in advance of the traffic signal.
- The underlying concern with the ASWS as installed, is drivers have adapted to a learned response of driving the flashing lights rather than the signal indications, contributing to higher speeds along the corridor.
- The signal indications are clearly visible in advance of the signal, so that drivers approaching at a reasonable speed can stop relatively comfortably.
- ASWS in this case is acting as an early warning device.



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ASWS Updates: Carson City- Tahoe- Douglas County Area (Modifications)



TRAFFIC SIGNAL REMAINS, ELIMINATE ADVANCE WARNING SIGN

- A (EB) US-50 / Arrowhead Dr / Deer Run Rd
- B (NB) US-395 / Topsy Ln
- C (NB) US-395 / Sunridge Dr
- D (SB) US-395 / Muller Pkwy

MODIFY TIMING

- E (NB) US-395 / Stephanie Way
- F (NB) US-395 / Johnson Ln
- G (NB) US-395 / Airport Rd
- H (NB/SB) SR-88 / Waterloo Ln / Mottsville Ln
- I (NB) US-50 / Zephyr Cove

CONVERT TO PASSIVE

- J (WB) US-50 / Arrowhead Dr / Deer Run Rd
- K (NB) US-395 / Mica Dr
- L (EB/WB Side Streets) SR-88 / Waterloo Ln / Mottsville Ln
- M (NB) US-395 / Muller Pkwy

MODIFY TO STATIC

- N (SB) US-395 / Mica Dr
- O (NB) US-50 / Elks Point Rd

(SB) Southbound (NB) Northbound
(EB) Eastbound (WB) Westbound



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Program Update



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ASWS Program Status Update

- ASWS Guidelines completed in 2020
- Decommissioning completed for the entire state in 2022
- Continuing to monitor all the systems:
- We will initiate the After Decommissioning Study in 2023 to compare with the Before Study



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