Advanced Signal Warning System (ASWS)

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BACKGROUND AND SCOPE

Guidance for the Installation of ASWS

- **Overview of Existing NDOT Guidance**
- **Literature Review**
  - Location Selection
  - Design Guidance
  - Signing Layout
  - Timing Parameters
- **Updated Guidance**
  - Location Selection Guidance
  - Design Guidance
  - Signing Layout
  - Timing Parameters

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BACKGROUND AND SCOPE

Statewide Existing ASWS Evaluation

- **Intersection Evaluation**
  - Evaluation Sites
  - Data Collection
  - Evaluation Forms

- **Recommendations**
  - Sites Recommended for Modification of Existing System
  - Sites Recommended for Removal of Existing System

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WHY THE NEED

- Most states use the MUTCD Standard Passive ASWS since research has shown that Active ASWS reduces, rather than improves highway safety
- The need for updated guidance following sound Engineering principles in compliance with MUTCD for driver consistency and uniformity not only statewide, but nationwide

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LIST OF STUDY LOCATIONS

Main	Cross Street	Intersection ID	Facing Direction
I-15	Sahara Off-Ramp	12	North
SR 160	Durango	9	East
SR 160	Durango	9	West
SR 160	Homestead	8	East
Lake Mead Pkwy	Athens Ave	15	East
Boulder Hwy	Gibson	14	South
Boulder Hwy	Gibson	14	North
Sahara	Industrial	13	East
US 93	Veterans Memorial	17	East
US 93	Veterans Memorial	17	West
Pyramid	Calle De La Plata	7	North
Pyramid	Disc Dr	6	South
Pyramid	Disc Dr	6	North
SR 88	Waterloo/Mottsville	21	South
SR 88	Waterloo/Mottsville	21	North
US 395	Muller Pkwy	22	East

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LIST OF STUDY LOCATIONS

Main	Cross Street	Intersection ID	Facing Direction
US 395	Muller Pkwy	22	West
US 395	Johnson Ln	23	South
US 395	Stephanie	24	South
US 395	Mica Dr	25	South
US 395	Mica Dr	25	North
US 395	Sunridge Dr	26	South
US 395	Topsy Ln	27	South
US 395A	Mt Rose Hwy	28	North
US 50	Elks Point Rd	29	East
US 50	Zephyr Cove	30	South
US 50	Arrowhead Dr/Deer Run Rd	31	West
US 50	Arrowhead Dr/Deer Run Rd	31	East
SR 227	SR 228	32	East
SR 227	SR 228	32	West
SR 227	Errecart Blvd/Powderhouse Rd	33	South

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LIST OF STUDY LOCATIONS

Main	Cross Street	Intersection ID	Facing Direction
SR 227	Errecart Blvd/Powderhouse Rd	33	North
US 395A	Mt Rose Hwy	28	South
Mt Rose Hwy	Thomas Creek Rd	19	West
Mt Rose Hwy	Thomas Creek Rd	19	East
Mt Rose Hwy	Wedge Pkwy	20	West
Carson St	Arrowhead	18	North
Flamingo	Decatur	10	West
Flamingo	Hotel Rio Dr	11	East
SR 163	Casino Dr	16	West

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SCHEDULE

Task	Month			
	May	June	July	August
Develop Field Checklist	X			
Literature Review	X	X	X	X
Updated Guidance	X	X		
Intersection Evaluation	X	X	X	

Existing NDOT Guidance

- ASWS aims to warn motorists of a red signal and to eliminate as much of the dilemma zone as possible
  - **Active ASWS:** Flashing beacon only for pending yellow/red indication
  - **Passive ASWS:** Flashing beacon at all times
  - **Static ASWS:** Static signage, no flashing beacon

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Existing NDOT Guidance

- ASWS should be considered:
  - At isolated signalized intersections or at the first signalized intersection approaching an urban area
    - Approach speed ≥ 45 mph
  - Where visibility of the traffic signal is limited
    - Curves, structures, trees

SPEED (mph)	SPEED (Ft./Sec.)	D_A	D_Z	T_D (Calc)	T_D (Apply)
35	52	250	254	2.7	3
40	59	305	287	2.7	3
45	66	360	320	2.8	3
50	74	425	353	2.9	3
55	81	495	386	3.1	4
60	88	570	419	3.4	4
65	96	645	452	3.5	4

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Existing NDOT Guidance

- ASWS should be placed at a distance according to AASHTO guidelines for stopping sight distance
- ASWS should be placed at **all traffic signals where the sight distance is less than recommended by the AASHTO *Green Book***

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Other States Criteria for Consideration

Minnesota[1]

1. Isolated or Unexpected Signalized Intersection
2. Limited Sight Distance
3. Dilemma Zone
4. Crashes
5. Heavy Truck Volume
6. Engineering Judgment

Utah[2]

1. Limited Sight Distance
2. Obstructions
3. Crash Pattern
4. Isolated Intersection
5. Truck Traffic and Approach Grade
6. Engineering Judgment

- Criteria are generally similar between states but differ slightly
- Both require **engineering judgment** to make a final decision

[1] From the MnDOT *Traffic Signal Timing and Coordination Manual*.
[2] From the UDOT *Evaluation and Installation Guidelines for Utah Advance Warning Signal Systems*

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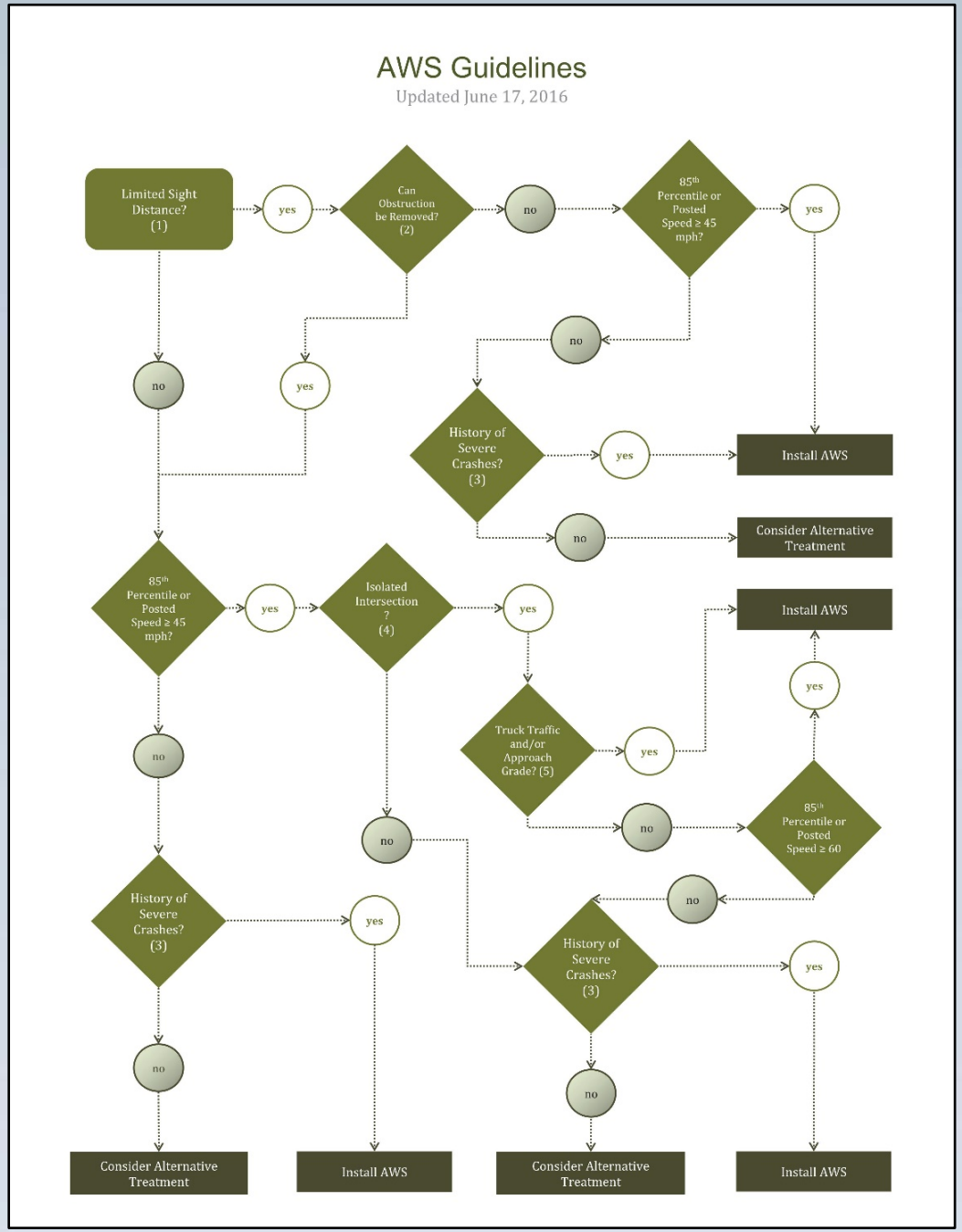
Utah DOT Criteria for Consideration of Advanced Signal Warning Systems[1]



[1] From the UDOT *Evaluation and Installation Guidelines for Utah Advance Warning Signal Systems*.

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QUESTIONS

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