



Saving Lives by Wrong-Way Detection (WWD) and Warning Systems: Design and Implementation.

November 19, 2020



Kimley»»Horn

Agenda

1	Wrong-way Driving Facts	3
2	Wrong-way Detection (WWD) and Warning System: Design Overview	4
3	Case Study: NTTA WWD Design	10
4	Case Study: TxDOT SAT District IH-35	17
5	Next Steps	27
6	Future Considerations	29

Wrong-Way Driving Facts



Traffic Fatalities

an estimated
3,639
PEOPLE

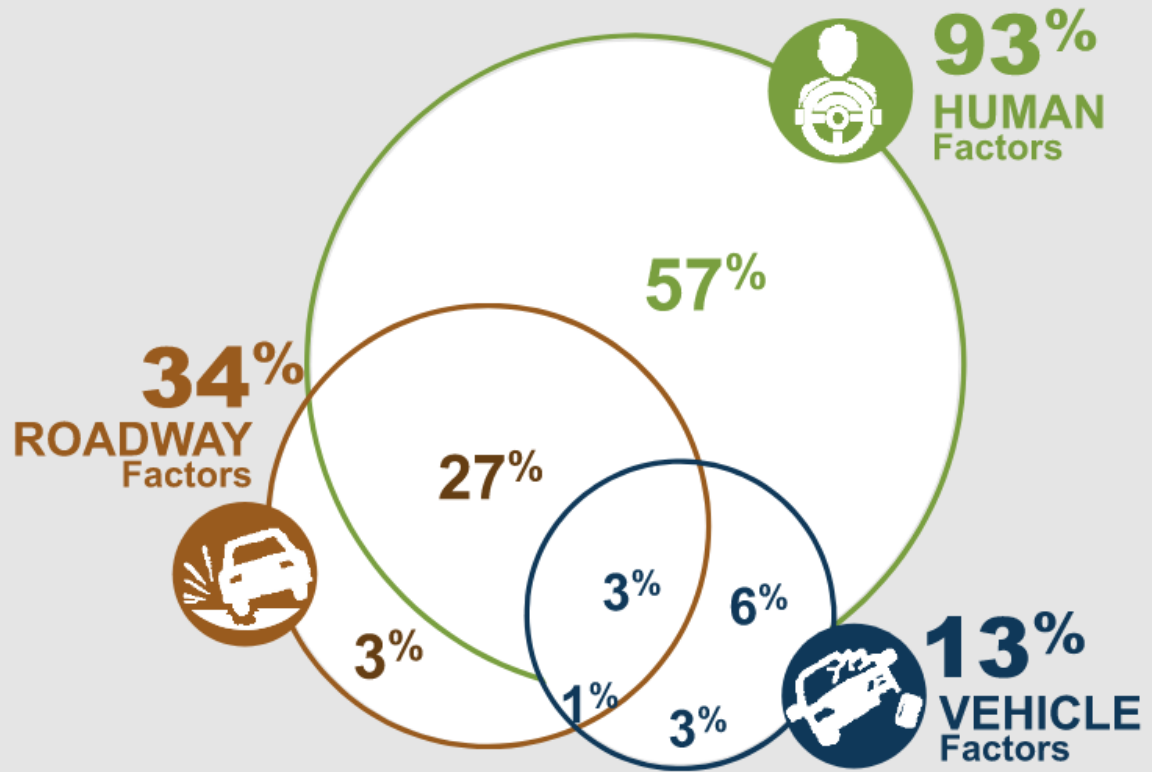
LOST THEIR LIVES
on Texas highways
in 2018

about
10
PEOPLE

WERE KILLED
EVERYDAY

NOVEMBER
7th
2000

LAST DEATHLESS
DAY on Texas roadways



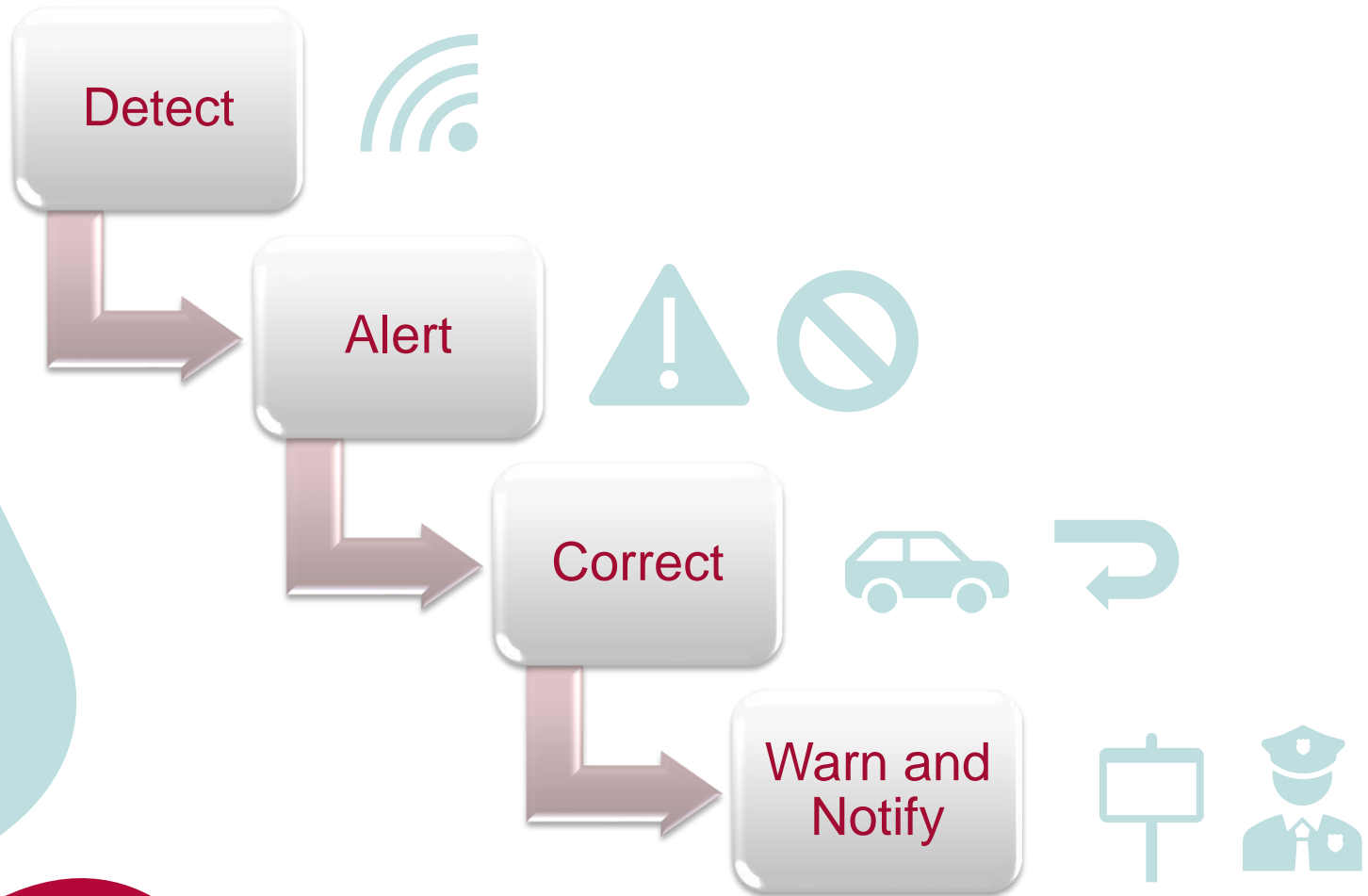
Source: Highway Safety Manual

Source: TxDOT CAT Initiative

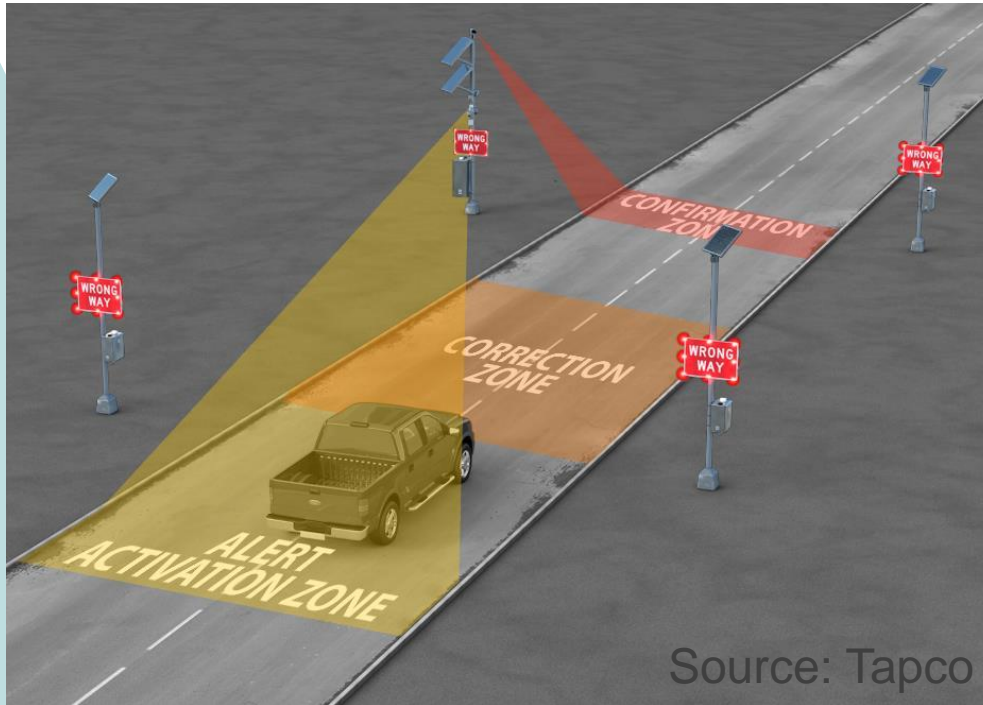
WWD Design Overview: Benefits



WWD Design Overview



WWD Design Overview



Source: Tapco

Design Features

Warning Signs	<ul style="list-style-type: none"> • Static Signs with Flashing LED • Static Signs with Flashing Beacons • Static Signs with Rectangular Rapid Flashing Beacons (RRFB) • LED Raised Pavement Markers (RPM) • Audible Notifications
Warning Sign Mounting	<ul style="list-style-type: none"> • Existing Posts • New "P" Posts • New Ped Poles
Detection	<ul style="list-style-type: none"> • Thermal Cameras with Pan-Tilt-Zoom cameras • Radar with Pan-Tilt-Zoom Cameras • Detection Pods
Power	<ul style="list-style-type: none"> • Solar • Conventional
Communication	<ul style="list-style-type: none"> • Cellular • Wireless Radio • Fiber

WWD Design Overview

- Thermal Sensing Camera



Source: Tapco

WWD Design Overview



WWD Design Overview

Scenario 1

- Static Signs with Flashing LED
- Existing Posts
- Solar Power
- Thermal Detection on New Ped Pole
- Cellular/Wireless Communication

~17-23K

Scenario 2

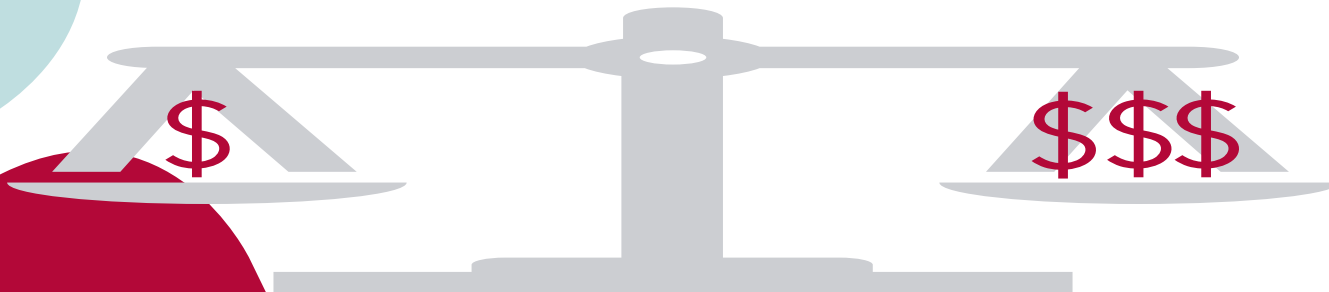
- Static Signs with Flashing LED
- New Ped Poles
- Solar Power to warning poles
- Conventional Power to Detection Pole
- Thermal Detection on New Ped Pole
- Cellular/Wireless Communication

~30-40K

Scenario 3

- Static Signs with Rectangular Rapid Flashing Beacons (RRFB)
- New Ped Poles
- Thermal Detection on New Ped Pole
- Conventional Power
- Fiber Communication

~50-60K



Case Study: NTTA WWD Design



NTTA Using Thermal Cameras In Pilot Program To Detect Wrong-Way Drivers

September 1, 2020 at 2:00 pm

Filed Under: cameras, Dallas Tollway, DFW News, North Dallas Tollway, North Texas Tollway Authority, nttta, pilot program, thermal camera, Wrong Way Sign, Wrong-Way Driver, Wrong-way driving



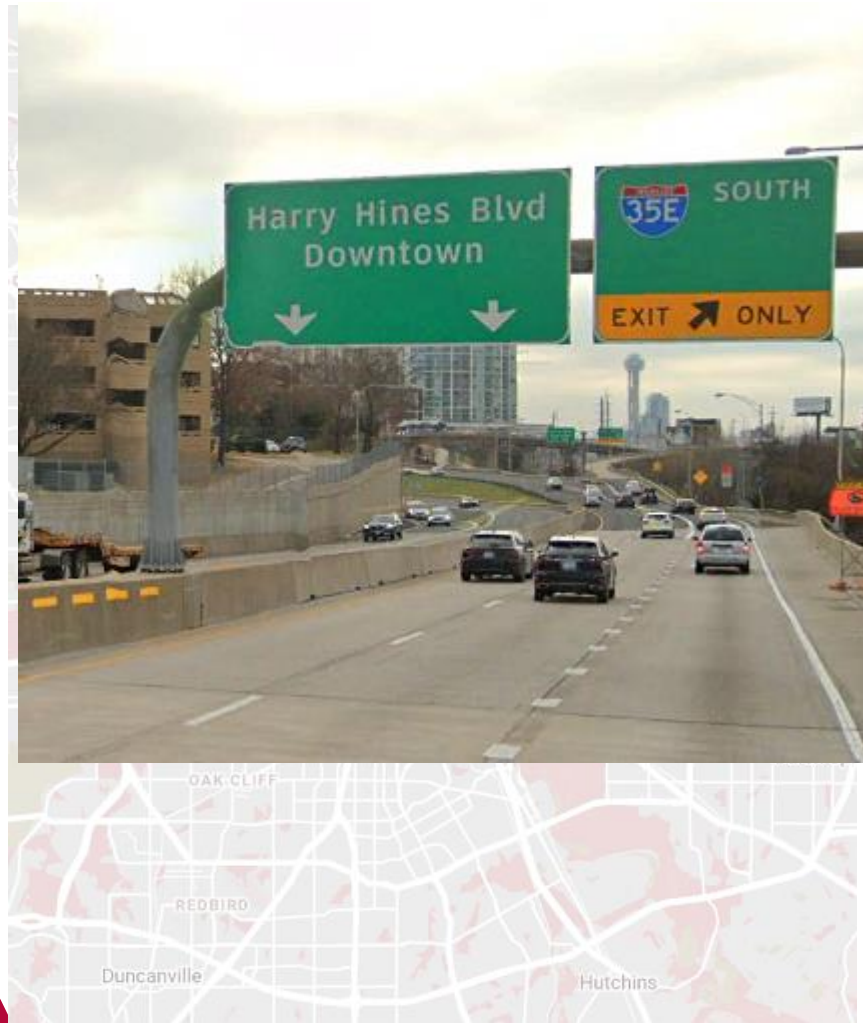
In April, three people were killed in a wrong-way crash on the Dallas North Tollway.

Just three months later, another wrong-way crash on the same highway left two people dead.

"The issue with the wrong way driver instances is they are first and foremost almost exclusively impaired drivers, and often times severely impaired drivers," Rey said. "So the challenge becomes how to communicate with the driver."

NTTA is testing out a new program to help prevent these accidents by alerting the driver of their mistake.

Case Study: NTTA WWD Design





Katy Trail

Harry Hines to DNT On Ramp

Harry Hines/
Houston St Signal

DNT South End/ Harry
Hines Off Ramp

Harry Hines Blvd

WWD U-Turn
from Harry Hines

WWD from Traffic
Signal

Harry Hines Blvd

Wolf St

Case Study: NTTA WWD Design



Design Features

Warning Signs

- Static Signs with Rectangular Rapid Flashing Beacons (RRFB)

Warning Sign Mounting

- New Ped Poles
- 30' long pole with mast arm

Detection

- Thermal Cameras with Pan-Tilt-Zoom cameras

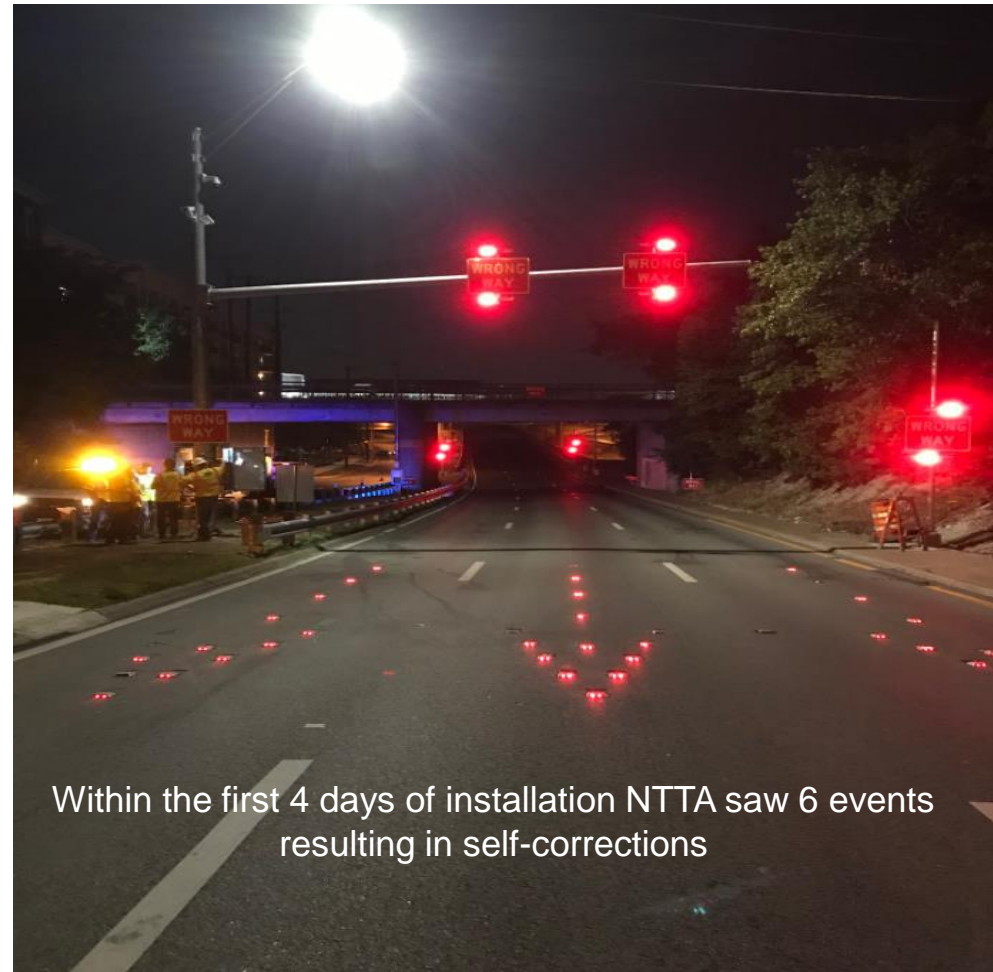
Power

- Conventional

Communication

- Cellular
- Hardwire within the system

Case Study: NTTA WWD Design



Within the first 4 days of installation NTTA saw 6 events resulting in self-corrections

Case Study: NTTA WWD Design

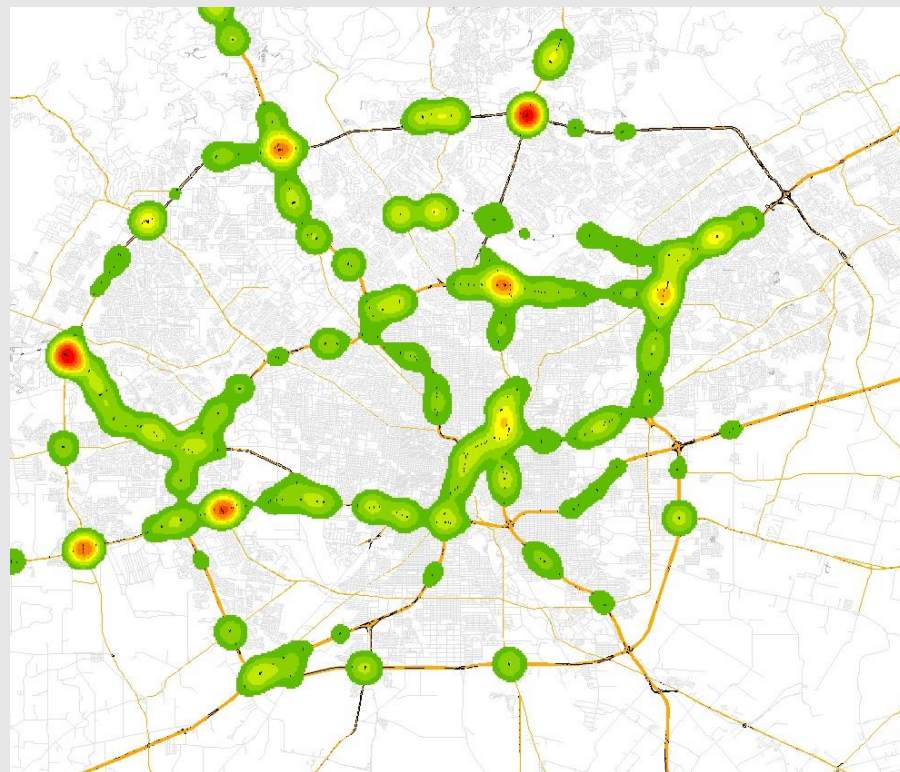


Self Correction from
Harry Hines to DNT
Ramp U-Turn

Case Study: NTTA WWD Design



Self Correction from
Harry Hines/Wolf
traffic signal to DNT
Ramp



SAN ANTONIO DISTRICT CASE STUDY

John Gianotti, P.E.

SAVING LIVES

83 serious crashes prevented by TransGuide Operators & SAPD Officers and Dispatchers since 2011

<u>2011</u>	<u>2012</u>	<u>2013</u>	
10	13	6	
<u>2014</u>	<u>2015</u>	<u>2016</u>	
11	7	8	
<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
11	4	4	3



Different Systems



Very simple
Flashing LED sign
(Tapco)

Complex Radar w/video, LED signs and
notification
(TraffiCalm System)



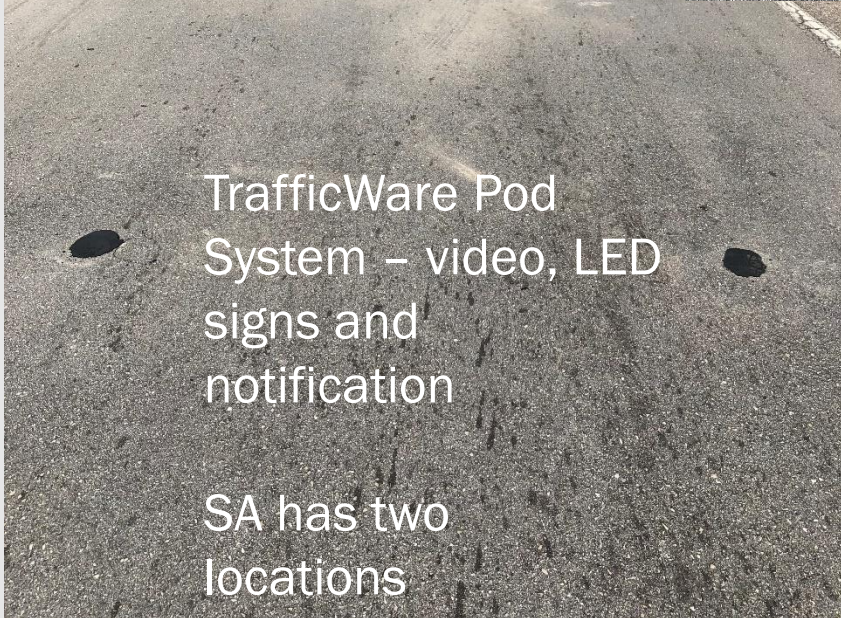
Flir cameras

Tapco Flir System –
video, LED signs
and notification

SA has two
locations installed
so far...



Pod system



TrafficWare Pod System – video, LED signs and notification

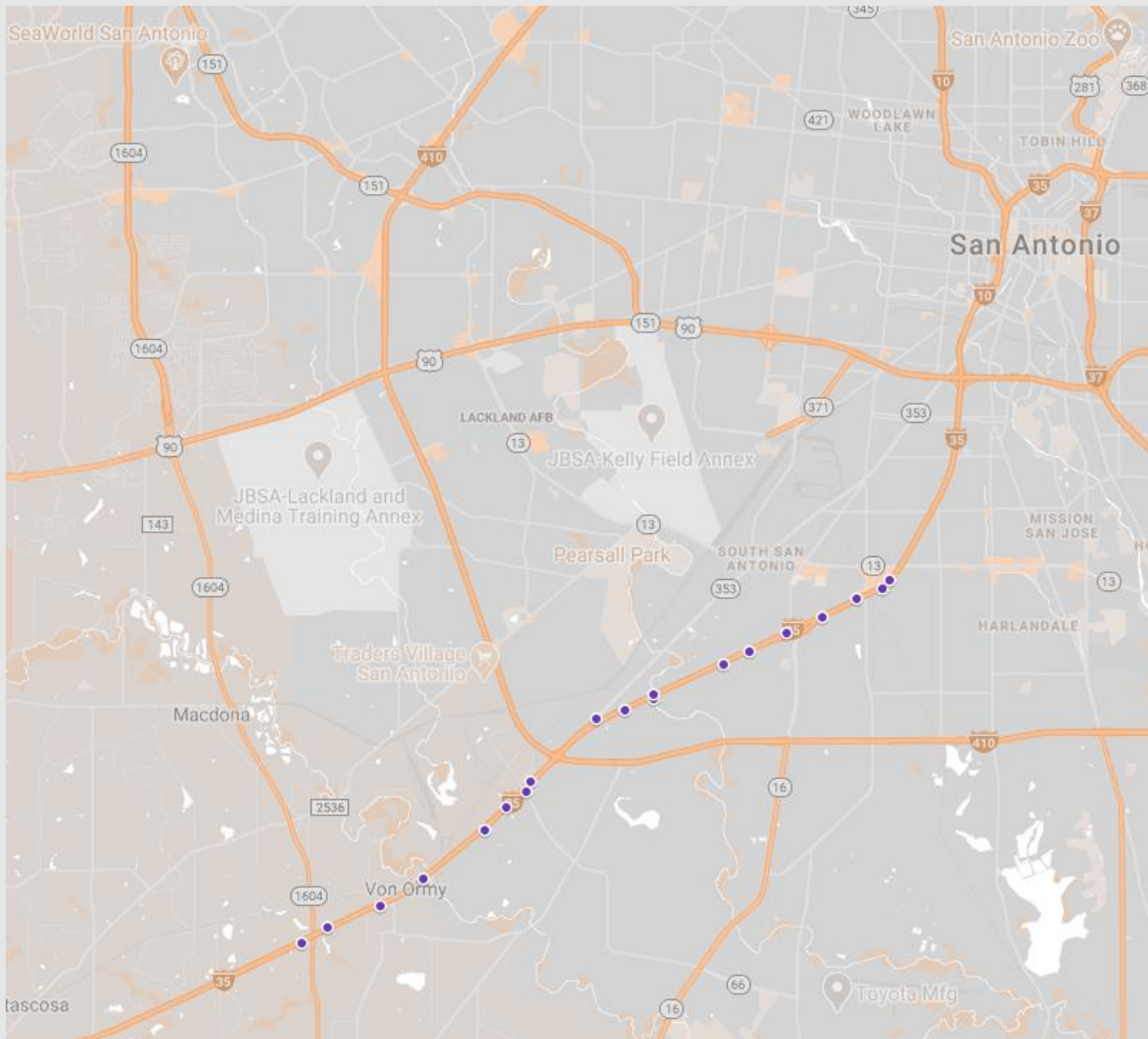
SA has two locations



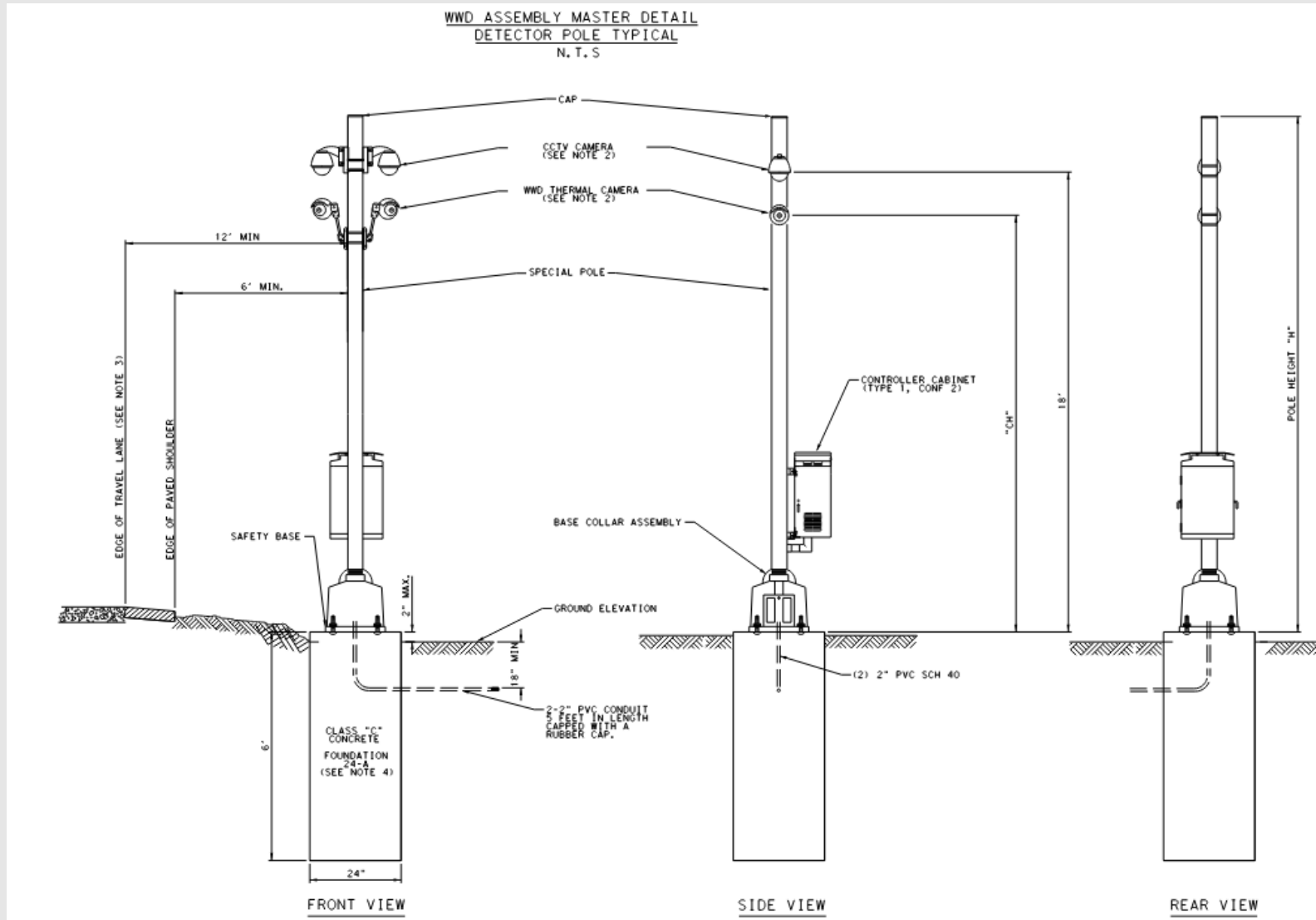
IH-35 WWD System Overview

- WWD design for 18 off-ramps along IH-35
- Combination of existing sign poles and new sign poles
- Conventional power to detection Poles
- Solar power to warning signs
- Cellular Communication

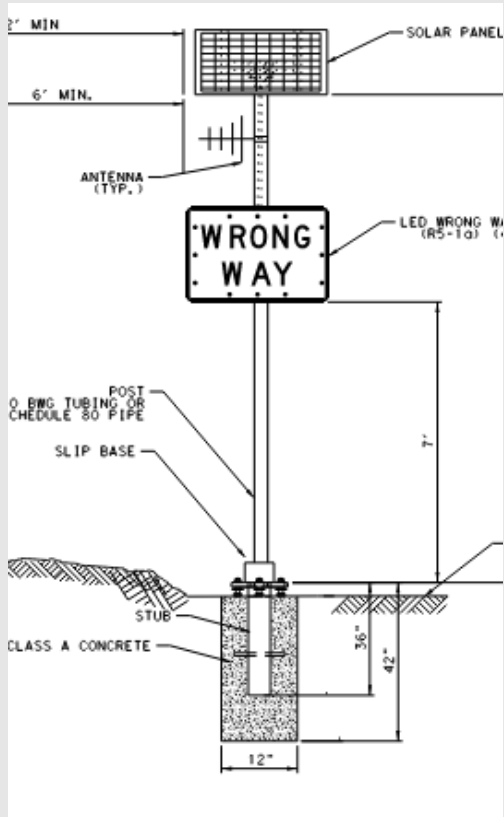
IH-35 WWD System Overview



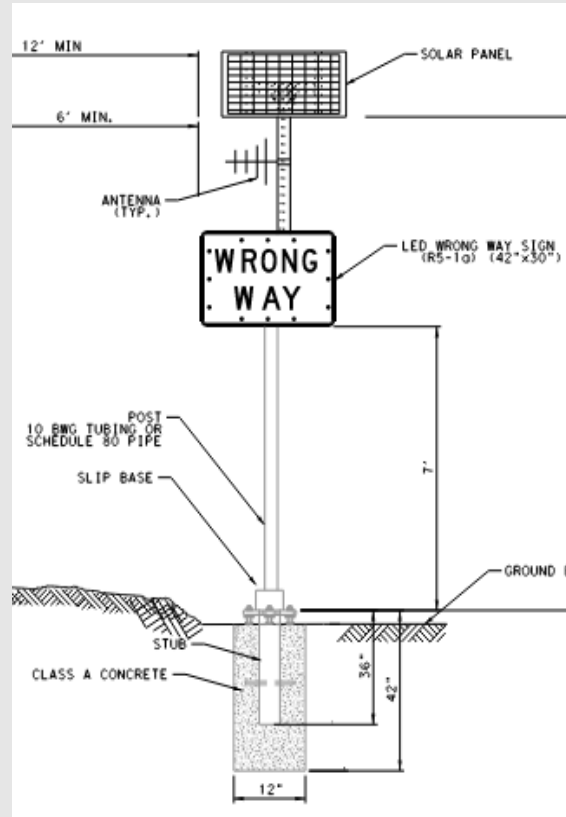
Proposed Detection Pole



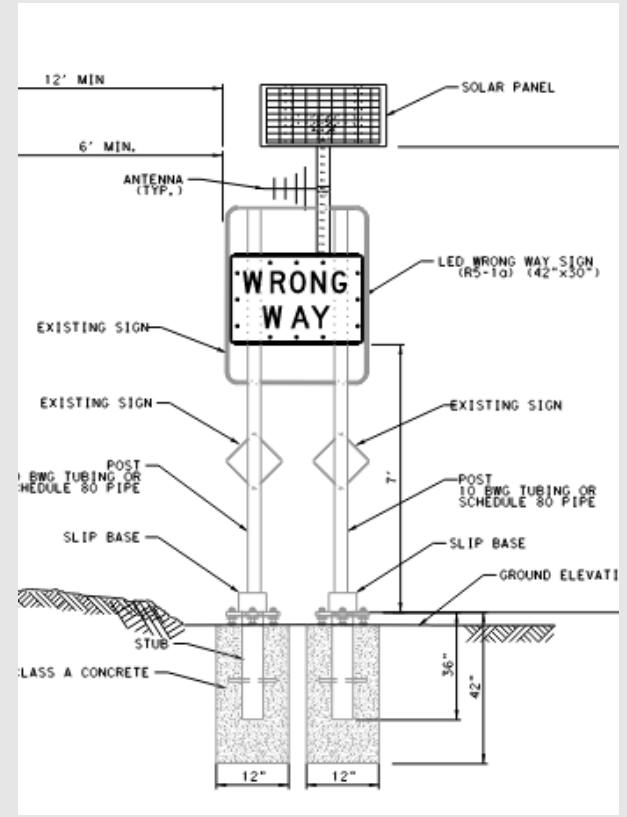
Warning Signs Mounting Options



Proposed Post



Existing Post



Existing Dual Post

Funding Opportunities for WWD Systems

- Highway Safety Improvement Program (HSIP)
- Road to Zero (RTZ)
- Traffic Enforcement Program (STEP) Traffic Safety Grants
- Included in Highway PS&E project (Cat 1)

Next Steps



Source: TxDOT CAT Initiative

Next Steps



Source: Tapco

Future Consideration

- Explore funding opportunities
- Identify conflict areas
- Study potential WWD locations
- Vendor demonstration
- Pilot Test
- Integrate system with CV Programs
 - RSE Units
- Share results
- Share lessons learned

Thank you

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Expect More. Experience Better.

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