San Antonio Wrong Way Driver Initiative

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The San Antonio Wrong Way Driver Task Force

- **The San Antonio Wrong Way Driver Task Force was organized in the spring of 2011 specifically to examine the factors contributing to the wrong way driving problem in San Antonio, and to identify possible methods of addressing the wrong way driver problem**

- **Agencies Participating:**
  - **Texas Department of Transportation**
  - **The San Antonio Police Department**
  - **City of San Antonio Department of Public Works**
  - **The Bexar County Sheriff's Department**
  - **The Federal Highway Administration**
  - **The Texas Transportation Institute**

Task Force Goals And Challenges:

- Goals
  - Identify high risk locations
  - Investigate prior WWD related research
  - Investigate WWD Counter Measures implemented elsewhere
  - Identify potential WWD Counter Measures for San Antonio
  - Identify funding resources for implementation of WWD Counter Measures

- Challenges
  - Determining points of entry for WWDs
  - How to get the attention of drivers that are severely impaired
  - Number of ramps-
    - More than 400 exit ramps in San Antonio metro area
  - Manual of Uniform Traffic Control Devices Compliance
    - Spike Strips are not MUTCD compliant

Steps Taken by Agencies

- San Antonio Police Department
  - Aug 2010- Implemented E-Tone WWD notification for its radio network
  - Nov 2010- Initiated use of portable spike strips
  - Jan 2011- Implemented code in CAD system identifying WWD events
  - Jul 2011- Traffic Investigations Section instructed to focus on determining entry point/exit ramps used by WWDs

- TxDOT/TransGuide
  - Mar 2010- TransGuide Operations began documenting all WWD events
    - Previously documented WWD accidents
  - May 2011- TransGuide system operators authorized to display WWD warning message on DMS when SAPD issued E-Tone for WWD alert
    - Previously operators verified the WWD, and then placed the messages

TransGuide DMS Wrong Way Driver Warning Message

-No lane instruction directions given
-Displayed until WWD stopped, accident found, or until SAPD cancels Alert
-Message displayed first, then operator searches for vehicle using cameras

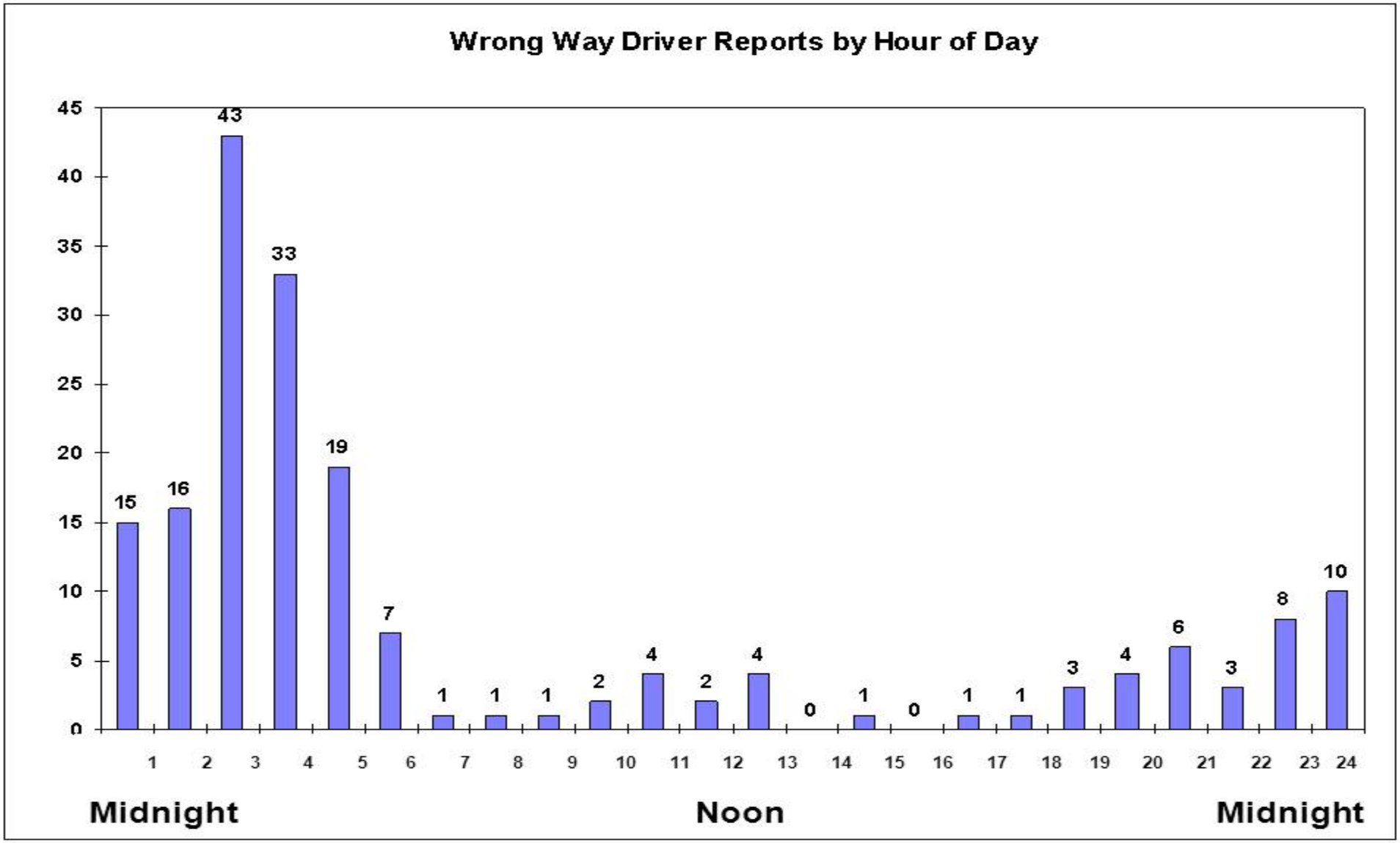
Role of the TransGuide Operations Center in the Apprehension of Wrong Way Drivers

- TxDOT and SAPD have been co-located at TransGuide since 1996

- In 2011 there were 14 documented WWD events where:
  - A 911 caller alerted SAPD Dispatcher at TransGuide of a wrong way driver
  - The wrong way driver was located by a TxDOT/TransGuide operator with a CCTV camera prior to a crash
  - The SAPD dispatcher working at TransGuide was able to alert SAPD officers on the highways of the location and direction of the wrong way driver
  - The officers on the highway apprehended the wrong way driver prior to an accident

- 5 camera assisted apprehensions thus far in 2012

Wrong Way Driver Reports analyzed by hour of day show that 80% happen at night, with 45% occurring between 2 AM and 4 AM



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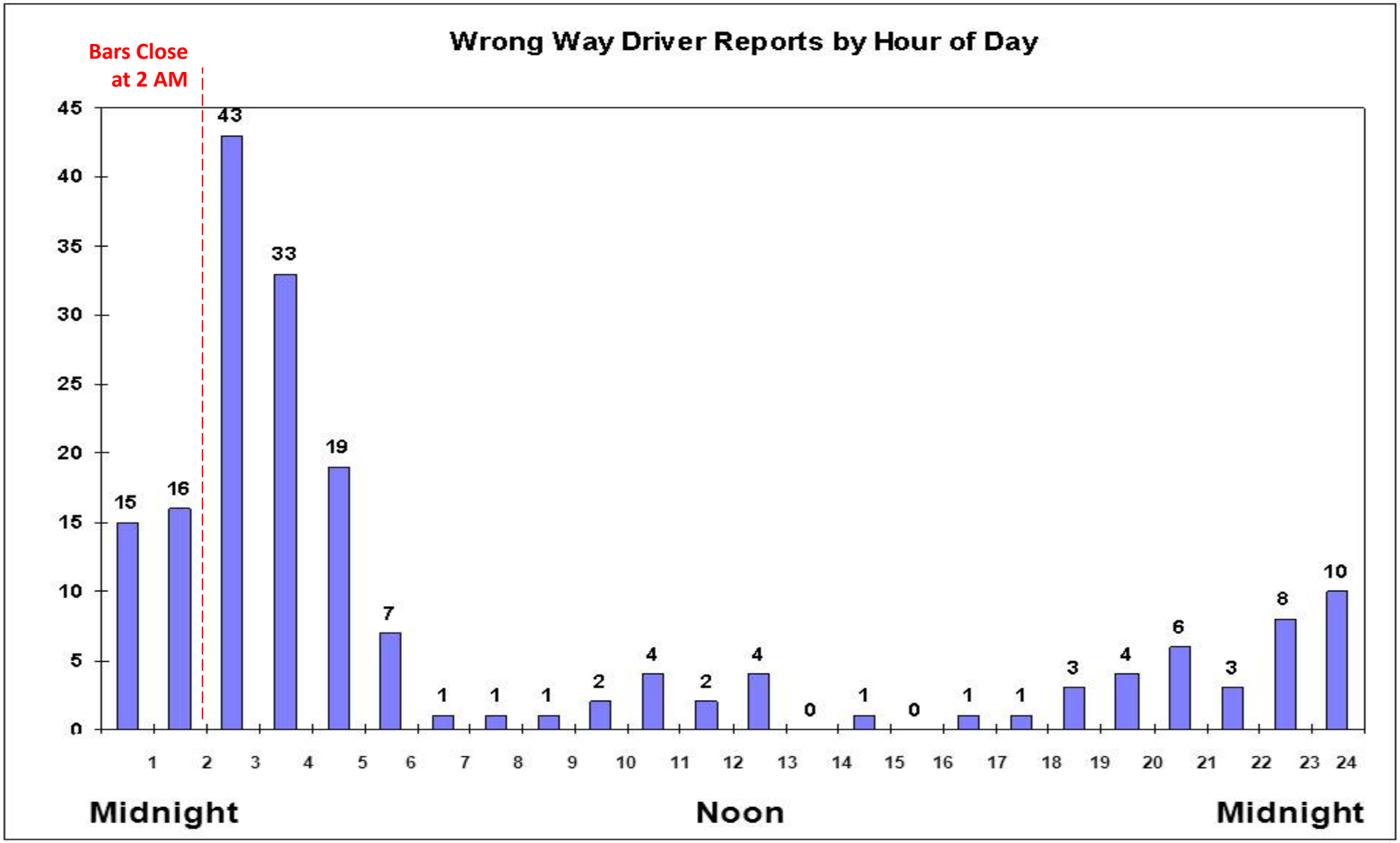


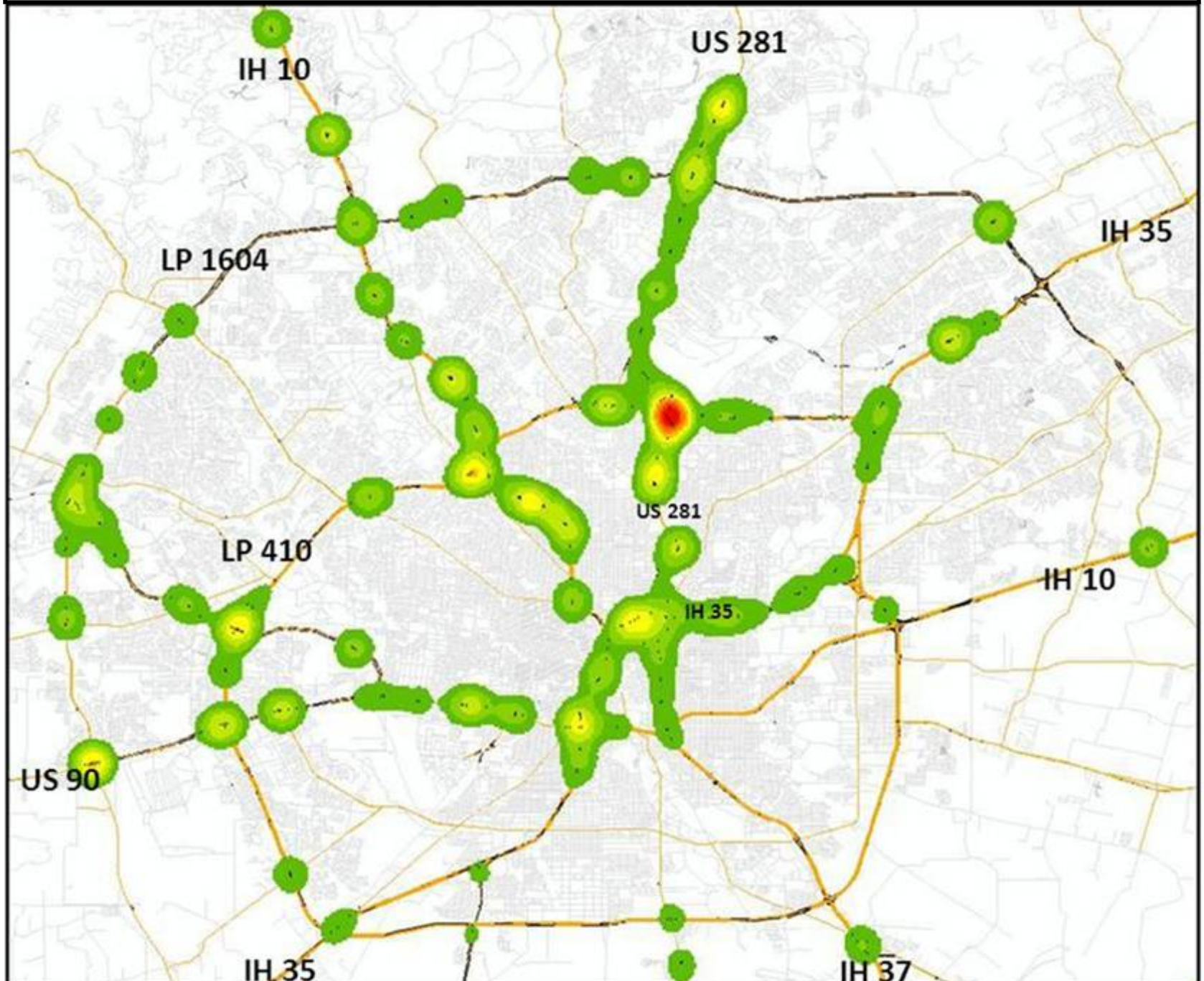
Development of GIS Map of Wrong Way Driver Events

- WWD Event Data Sources Available:
  - TxDOT Crash Record Information System (CRIS) reports
    - CRIS records filtered for “wrong way” events
  - TxDOT TransGuide Operator reports
  - San Antonio Police Department CAD data

- All reports of WWDs, not just accidents & apprehensions

- Developed by TTI
  - WWD reports typically referenced nearest cross street or major interchange
  - To provide a comprehensive analysis of WWD activity across corridors throughout the urbanized area, spatial analysis features in the GIS software were applied to create a density, or “heat,” map of WWD activity

San Antonio Area GIS Map/Density Map- Wrong Way Driver Location Reports 2011



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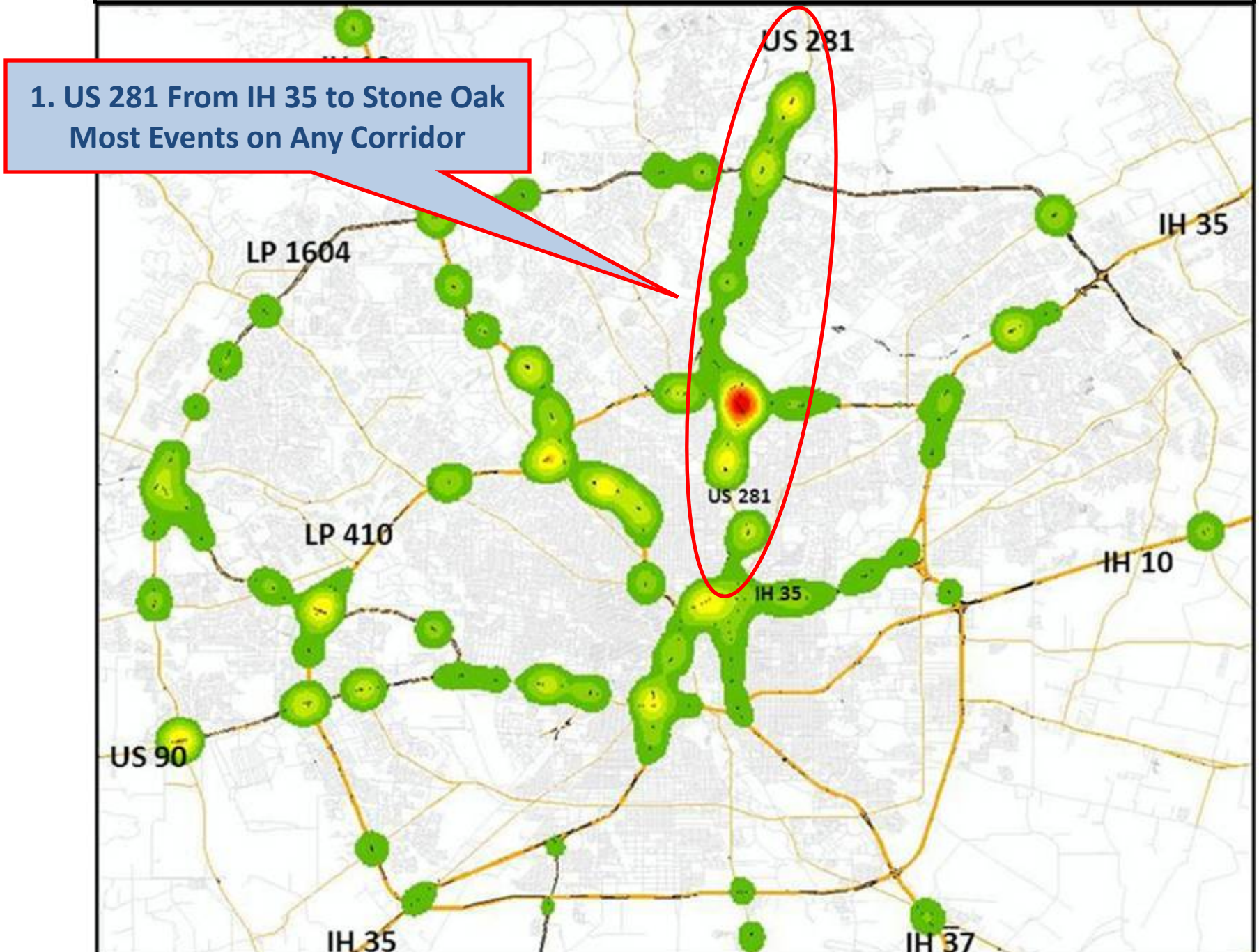

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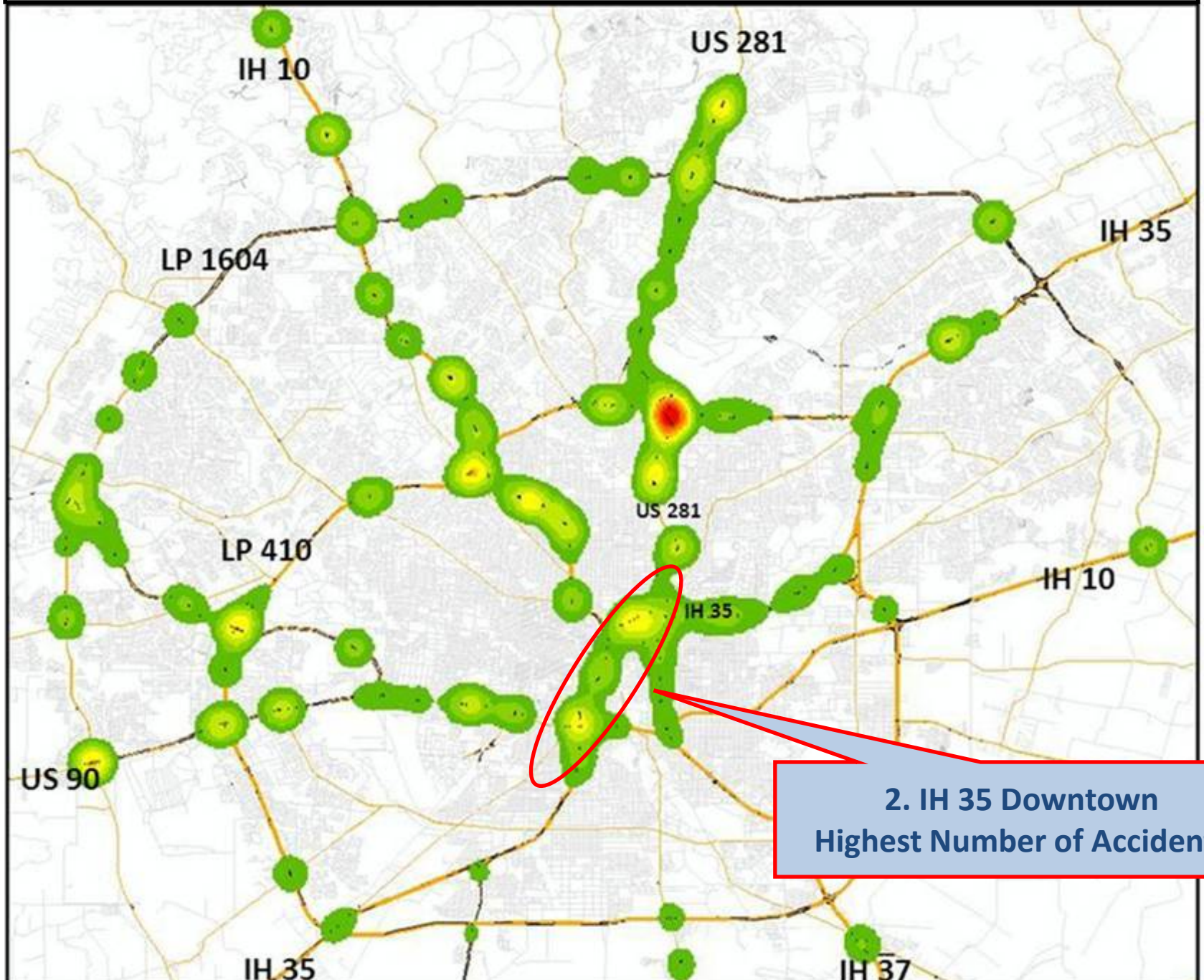


Countermeasures Identified

- **Enhanced Static Signing & Pavement Markings**
- **On-Site Driveway Channelization**
- **Detection Technologies (Radar Sensors)**
- **Active/Illuminated Signing**

Enhanced Static Signing

- Prior research has shown that increased visibility of "WRONG WAY" and "DO NOT ENTER" signs can reduce the instances of wrong way driving

- San Antonio implemented measures recommended in a prior study:
  "Countermeasures for Wrong-Way Movement on Freeways: Overview of Project Activities and Findings", TTI 2003/2004
  - Field Inspection of all ramps using 2004 TTI Study Checklist
  - Ensure all required signs, pavement markings and RPM's are in place and visible
  - Recommend additional (supplemental) measures:
    - Add reflective tape on sign posts
    - Increased size of ONE WAY signs
    - Additional WRONG WAY & DO NOT ENTER signs at critical locations
    - Lowered sign heights*

* Note: San Antonio is not implementing lowered sign heights at this time

On-Site Driveway Channelization

- **Force traffic into correct direction using on-site driveway channelization (curb or striping with RPMs)**

- **Voluntary action on part of property owners**

Detection Technologies (Radar Sensors)

- Selected radar detectors from two manufacturers for evaluation as WWD detection devices for San Antonio, one type of radar detector will be used for exit ramps, and the other will be used for mainlane WWD system locations
  - Radar unit selected for exit ramps is the standard unit used by TAPCO in conjunction with its illuminated signing ($1,000/unit)
  - Radar unit selected for the mainlane systems is the Wavetronix HD sensor ($7,000/unit)

- TxDOT & Southwest Research Institute worked with suppliers to integrate the wrong way data with Lonestar software
  - The date, time and location of the event is logged, an alarm is generated at the TransGuide Operations Manager's workstation, and email notifications are provided

Active/Illuminated Signing

- Over 80% of the wrong way driver events occur at night

LED Illuminated
Wrong Way Signs

LED Blank Out Signs

LED Illuminated Wrong Way Signs

LED ILLUMINATED
WRONG WAY SIGN
AS SEEN FROM A DISTANCE

LED ILLUMINATED
WRONG WAY SIGN
AS VEHICLE APPROACHES

The flashing LED lights will be visible to the wrong driver from a distance

As the WWD gets closer to the sign, the vehicle headlights will illuminate the retroreflective WRONG WAY message (greater visibility than LEDs)

Fully MUTCD Compliant (size, shape, retrorelfectivity)

LED Blank Out Signs

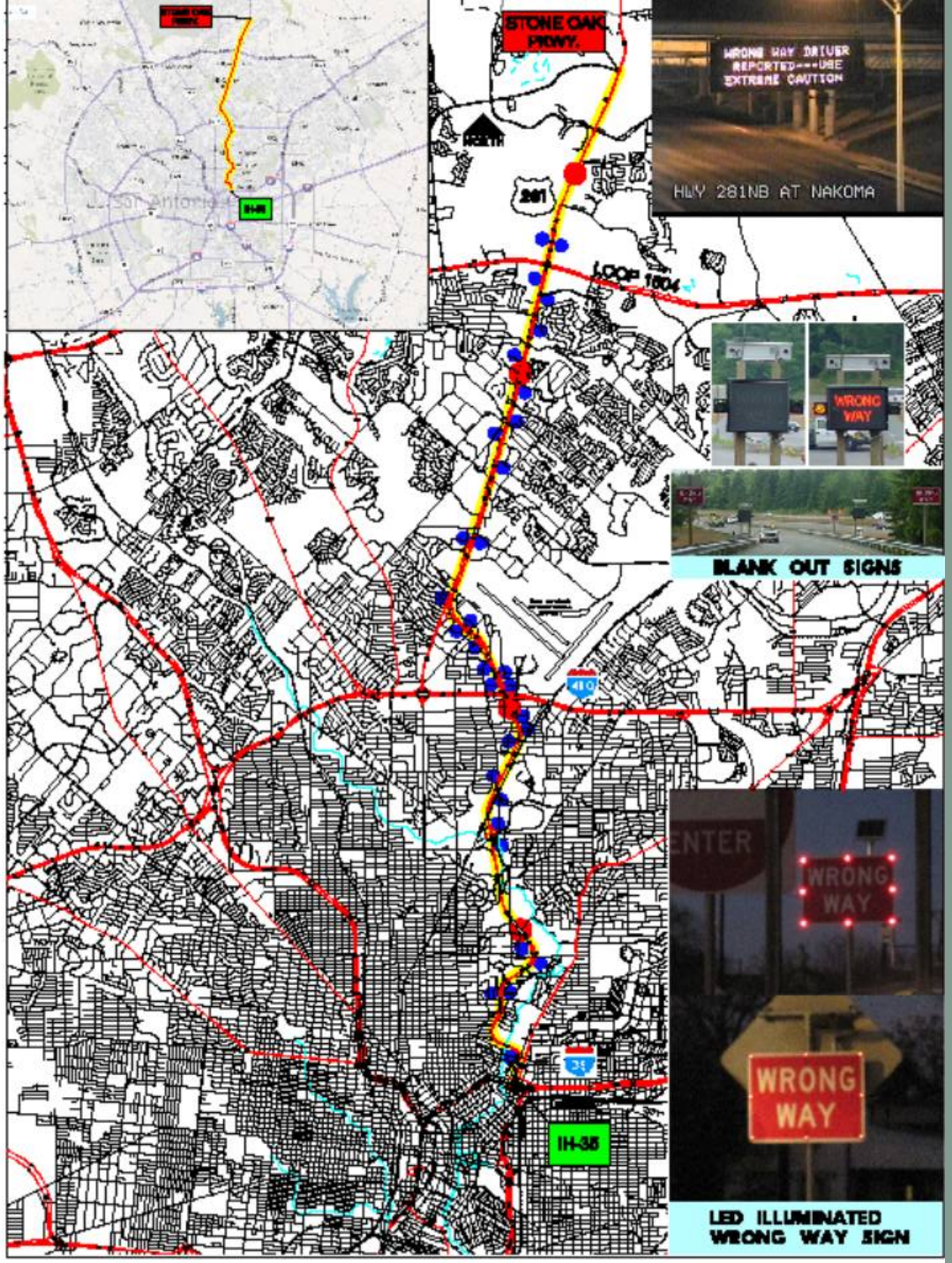
Blank Out Sign is an LED DMS panel capable of displaying a single message when activated, otherwise message panel is “blank”

WWD Active Countermeasures

- Exit Ramps
  - Installing 2 TAPCO LED Illuminated Wrong Way Signs
    - Photocell activated for night and low visibility operation
  - Installing 1 TAPCO Radar Detector
  - Radar unit will provide notification of wrong way detection using TxDOT communication network connection to TMC

- Mainlanes Systems
  - Installing 1 TAPCO LED Illuminated Wrong Way Sign & 1 SES Blank Out Sign on each shoulder
  - Installing 1 Wavetronix HD Radar Detector in advance of sign location
  - MAINLANE SYSTEMS WILL BE RADAR DETECTOR ACTIVATED due to visibility of illuminated signs to drivers on the other side of the median
  - Radar unit will provide notification of wrong way detection using TxDOT communication network connection to TMC

US 281 Pilot Project



Limits: From IH 35 (downtown)
To Stone Oak Parkway

15 Miles

29 Exit Ramps
- **2 LED Illuminated Wrong Way Signs**
- **1 Radar Detection Unit**

7 Mainlane Locations
- **LED Illuminated Wrong Way & LED Blank Out Sign installed on both shoulders**
- **1 Radar Detection Unit**

-Installation began Jan 2012
-LED Illuminated Wrong Way Sign Installation is Completed
-Radar Unit Installation is Ongoing
-Mainlane System Installation in September
-Budget $500,000

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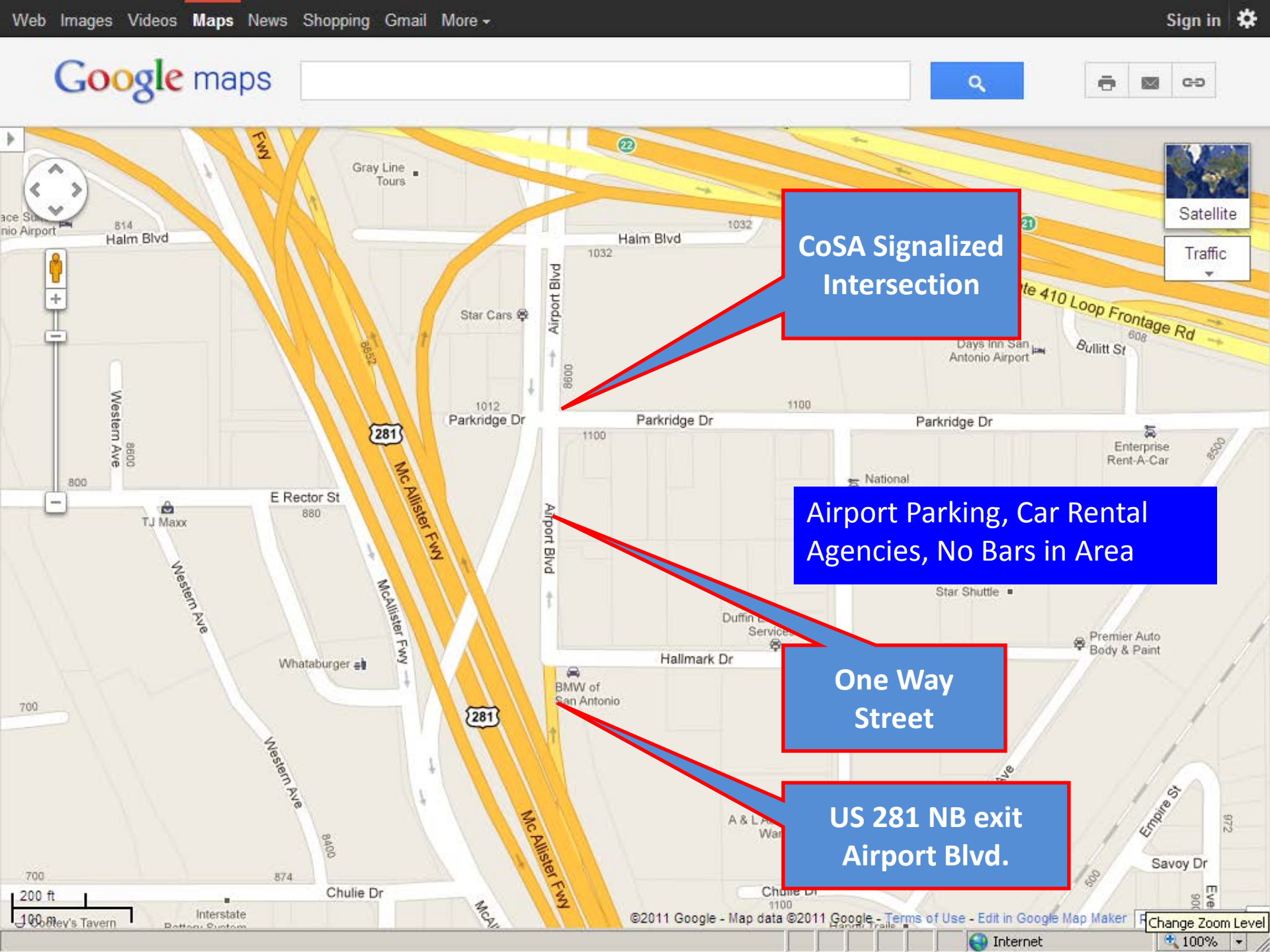
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Airport Parking, Car Rental Agencies, No Bars in Area
One Way Street
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BMW of San Antonio
TJ Maxx
Whataburger
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- Reflective RPM arrows were present
- Wrong Way and Do Not Enter Signs present, **BUT:**
- Red/White Signs mounted on Red/White Columns

- **Wrong Way and Do Not Enter Signs not visible**
- **No Wrong Way/Do Not Enter Signs between signal and ramp**

-Relocated Wrong Way & Do Not Enter Signs
-Added reflective tape to sign mounts
-Wrong Way Signs are LED Illuminated
-Installed radar detector


-Supplemental Wrong Way & Do Not Enter Signs added between signalized intersection and ramp
-Wrong Way Signs are LED Illuminated
NOW
BIGGER AND
BETTER
DO NOT ENTER
DO NOT ENTER

TxDOT Research Project 0-6769
Wrong Way Driving Countermeasures

- **Research project will evaluate the effectiveness of WWD countermeasures implemented on US 281 and IH 35 Corridors, elsewhere in Texas and around the country**

- **Will evaluate detection methods used to detect wrong way drivers in San Antonio, Dallas (NTTA), Houston (HCTRA) and elsewhere**

- **Will review MUTCD guidelines for Illuminated Signing applications for WWD countermeasures and make best practice recommendations**

- **The research project will commence in the fall of 2012, and is expected to be completed in two years**

TxDOT Research Project 0-6769
Wrong Way Driving Countermeasures

- **Research Plan**
  - **Task 1: Assess State-of-Knowledge in the US and Texas**
  - **Task 2: Evaluate Countermeasures in a Closed-Course Environment**
    - **Monitored, intoxicated test subjects on a closed course at night in an instrumented vehicle**
  - **Task 3: Evaluate countermeasures and detection systems in an operational environment**
    - **Utilize data from San Antonio, Dallas and Houston WWD countermeasure deployments to assess their impacts**
  - **Task 4: Develop and assess wrong-way driver warning messages**
    - **Determine what message(s) to deliver to right-way drivers**
  - **Task 5: Develop recommendations and report**

WWD Research Testing

- **Example of eye-tracking heat map to document driver looking behavior (signs, pavement lines, etc.)**

Summary- SA WWD Task Force Lessons Learned

- Adopted lessons learned from prior research and countermeasure deployment projects
  - TTI Study 2003/2004
  - NTTA Project- Task Force Summary Report
  - HCTRA Detection Project

- Law enforcement (SAPD) took steps that aided in identifying problem areas:
  - E-Tone Radio Network Alerts
  - Created specific code in CAD systems for wrong way driver reports
  - Critical data for developing GIS map

- Many opportunities for sharing lessons learned
  - Dallas, Houston and San Antonio all have active WWD efforts
  - WWD sessions have been included in many technical conferences (ITS Texas November 2011, ITS America May 2012)
  - TxDOT Research Project
  - NTSB special investigation on wrong way accidents (report to be released fall 2012)

QUESTIONS?