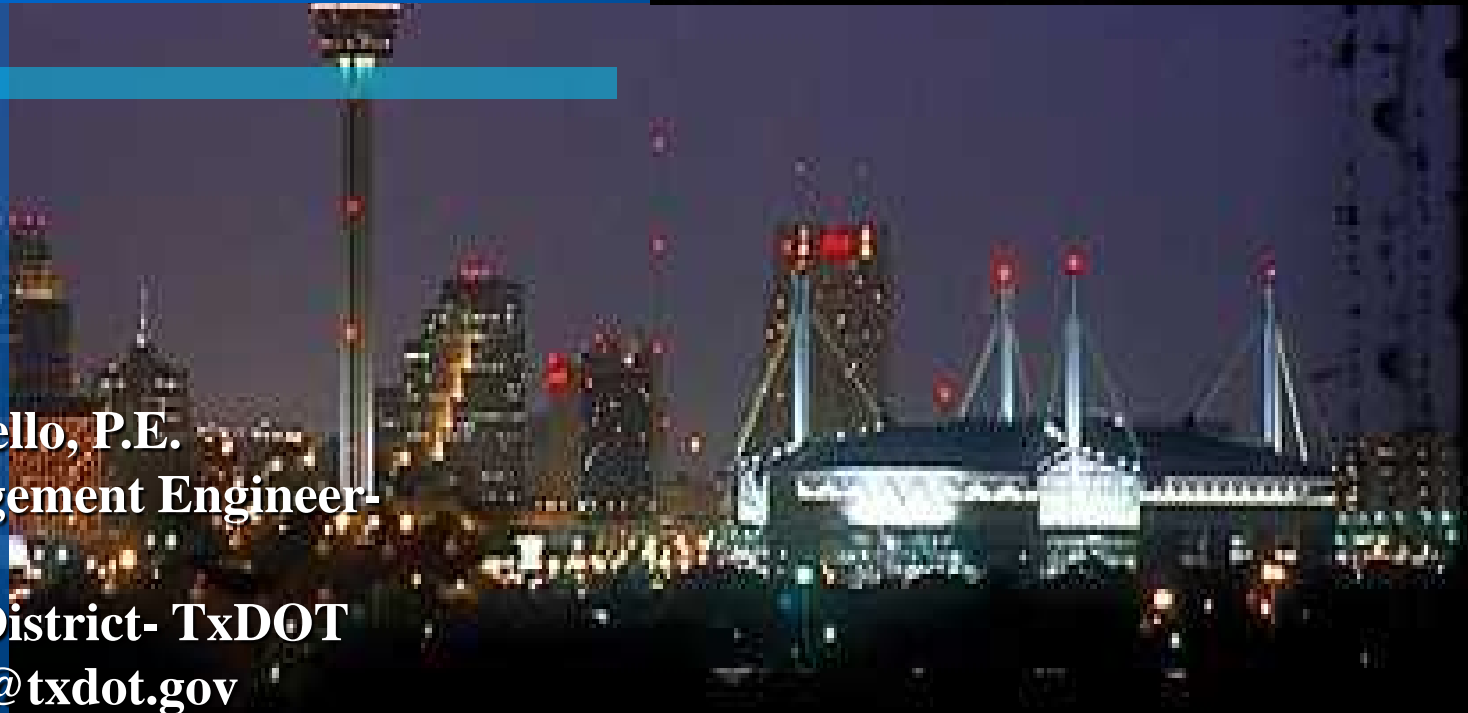


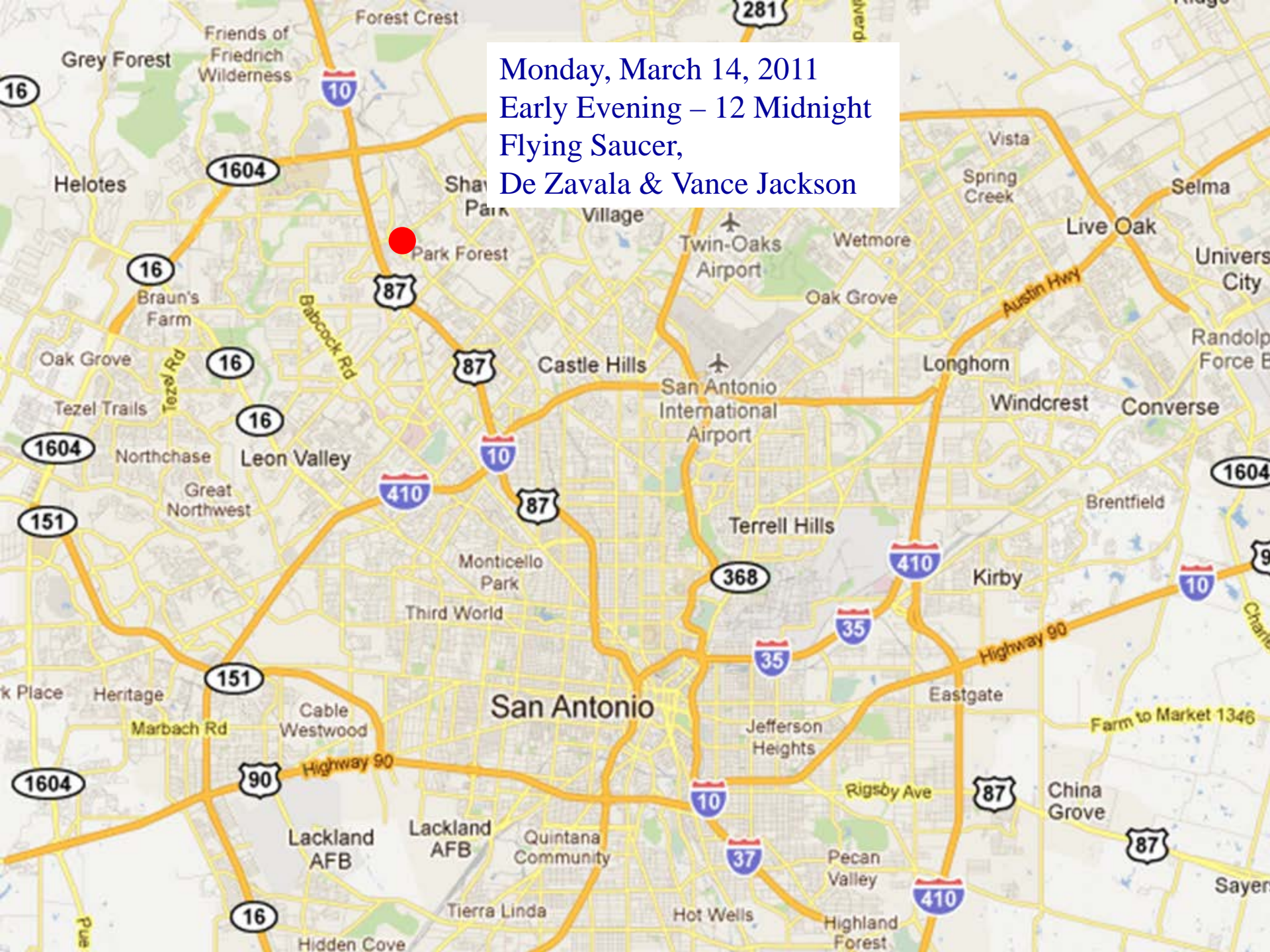
San Antonio Wrong Way Driver Task Force

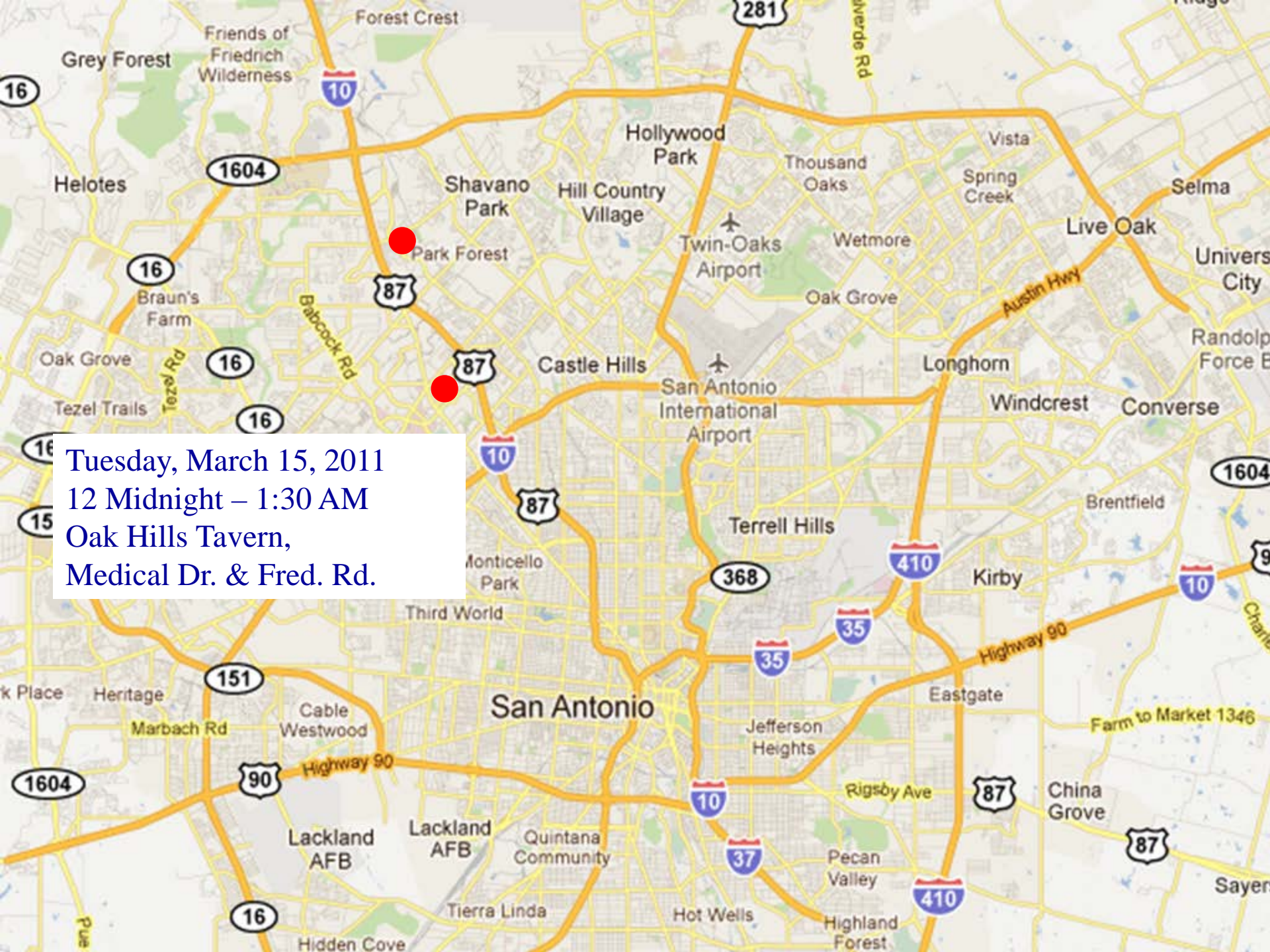


Brian G. Fariello, P.E.
Traffic Management Engineer-
TransGuide
San Antonio District- TxDOT
brian.fariello@txdot.gov

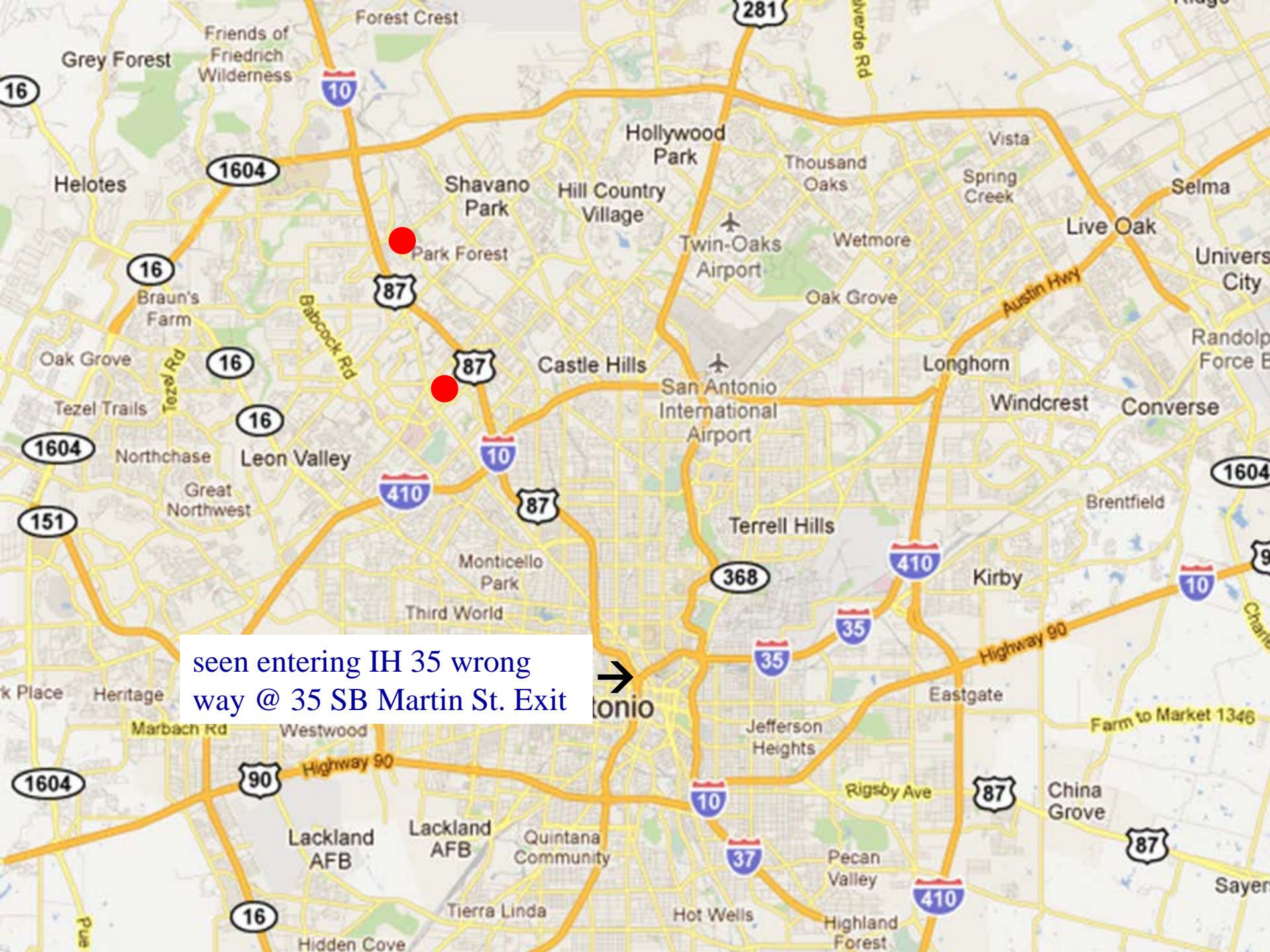


Monday, March 14, 2011
Early Evening – 12 Midnight
Flying Saucer,
De Zavala & Vance Jackson





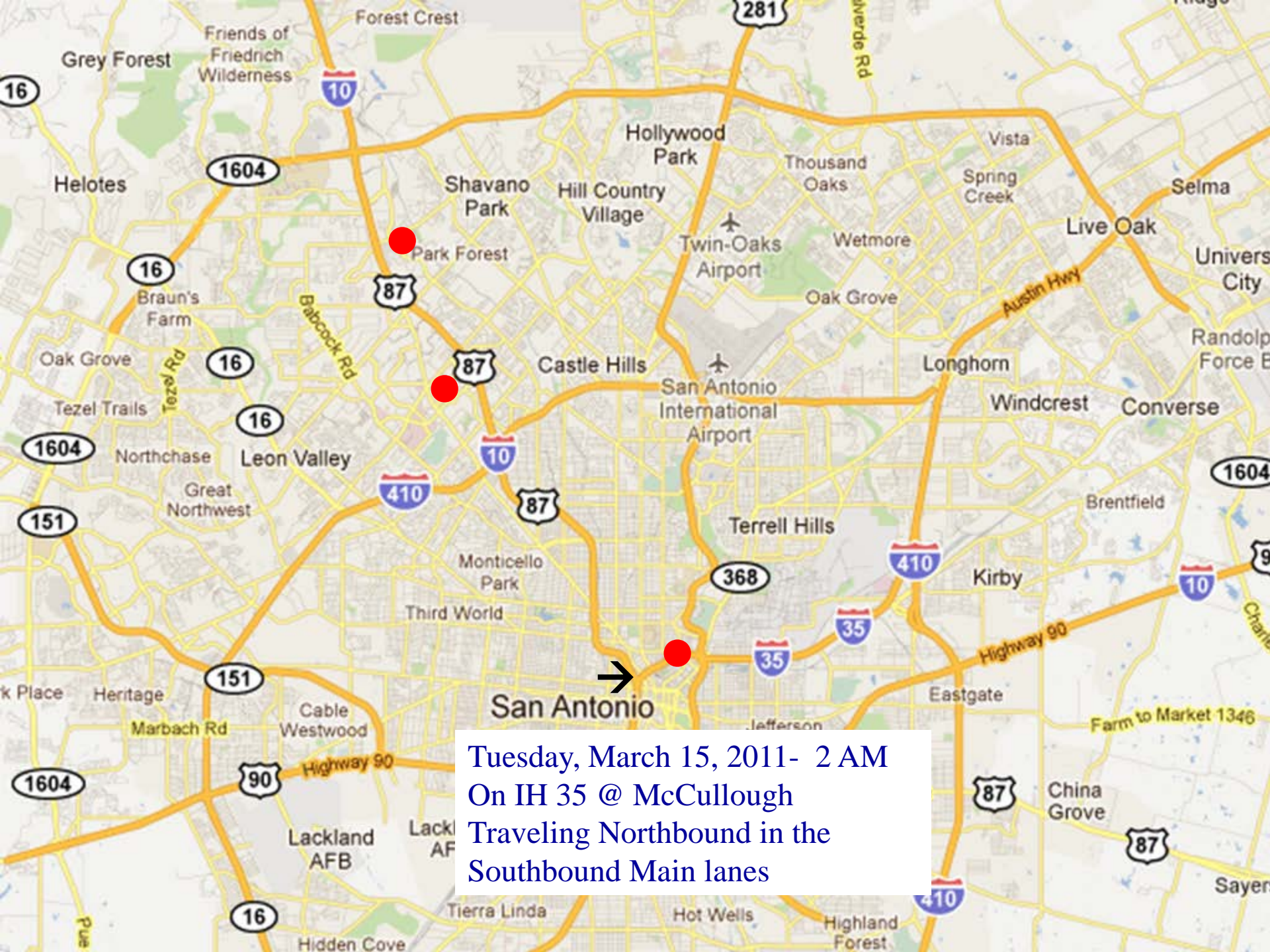
Tuesday, March 15, 2011
12 Midnight – 1:30 AM
Oak Hills Tavern,
Medical Dr. & Fred. Rd.



seen entering IH 35 wrong way @ 35 SB Martin St. Exit



lonio



Tuesday, March 15, 2011- 2 AM
On IH 35 @ McCullough
Traveling Northbound in the
Southbound Main lanes

**IH 35 @ McCullough, 2 AM, March 15, 2011-
2 fatalities, WWD & SAPD Officer Stephanie Brown**

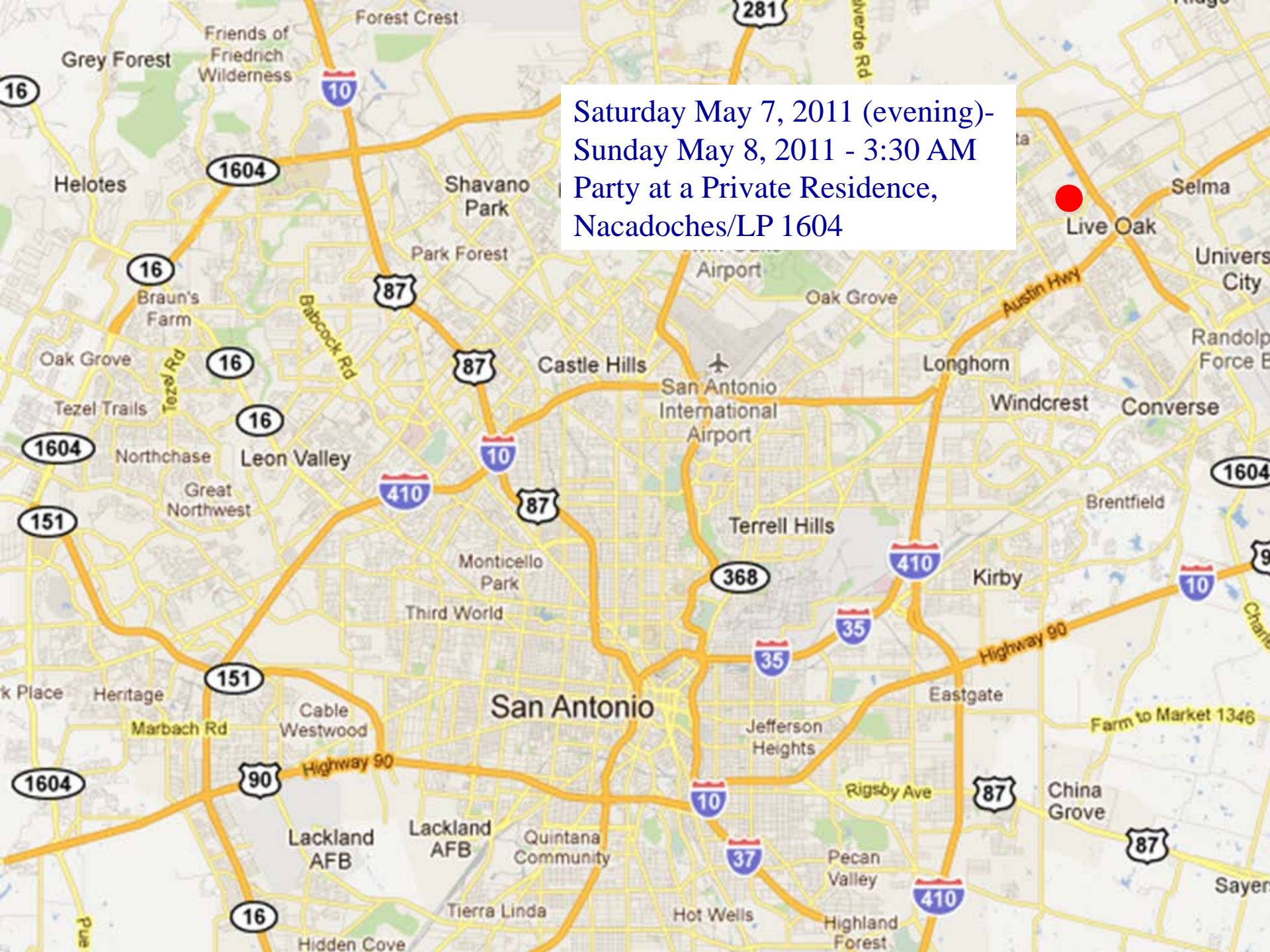


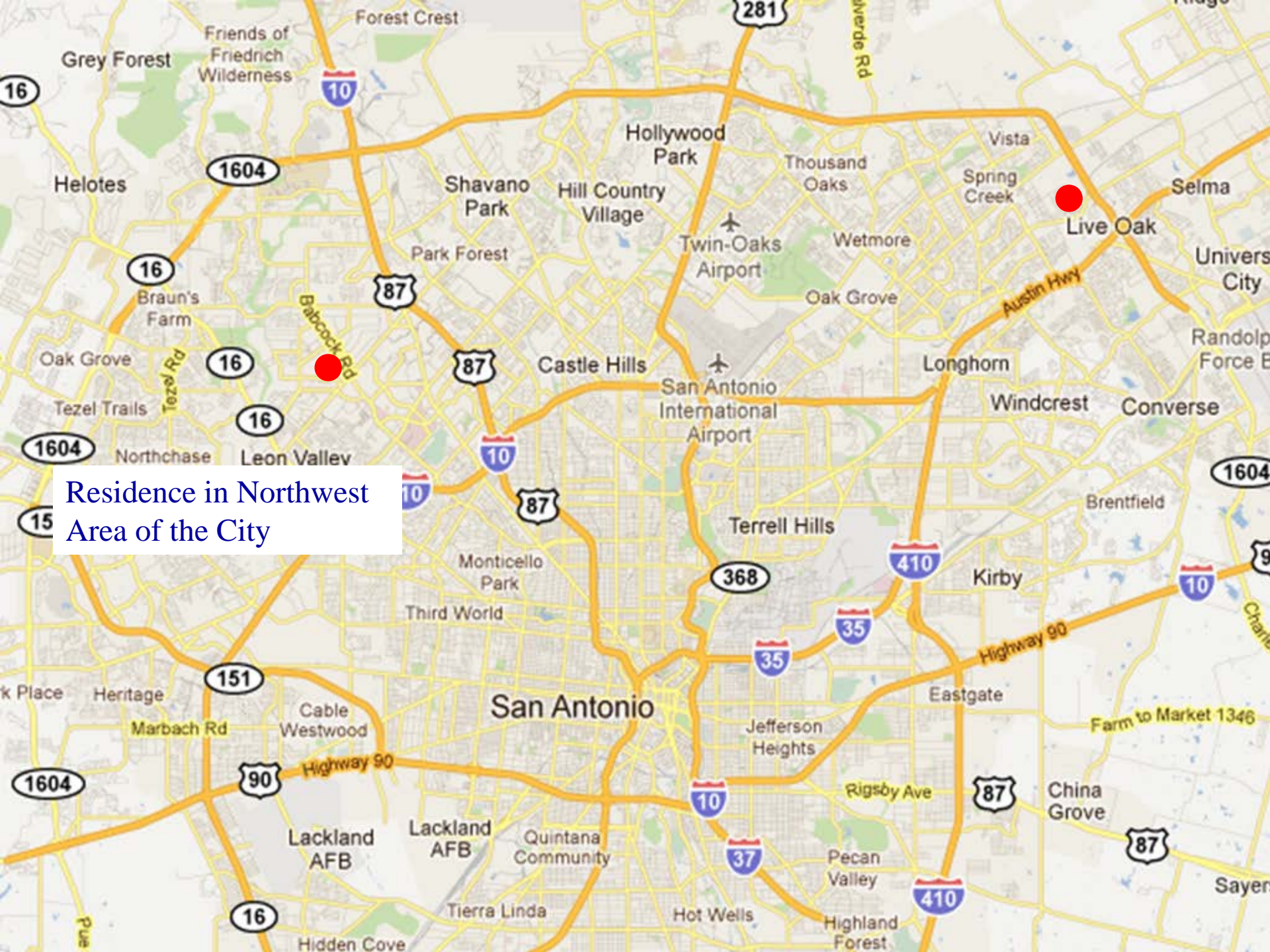
KENS 5 KILLED IN THE LINE OF DUTY

4:59 74°

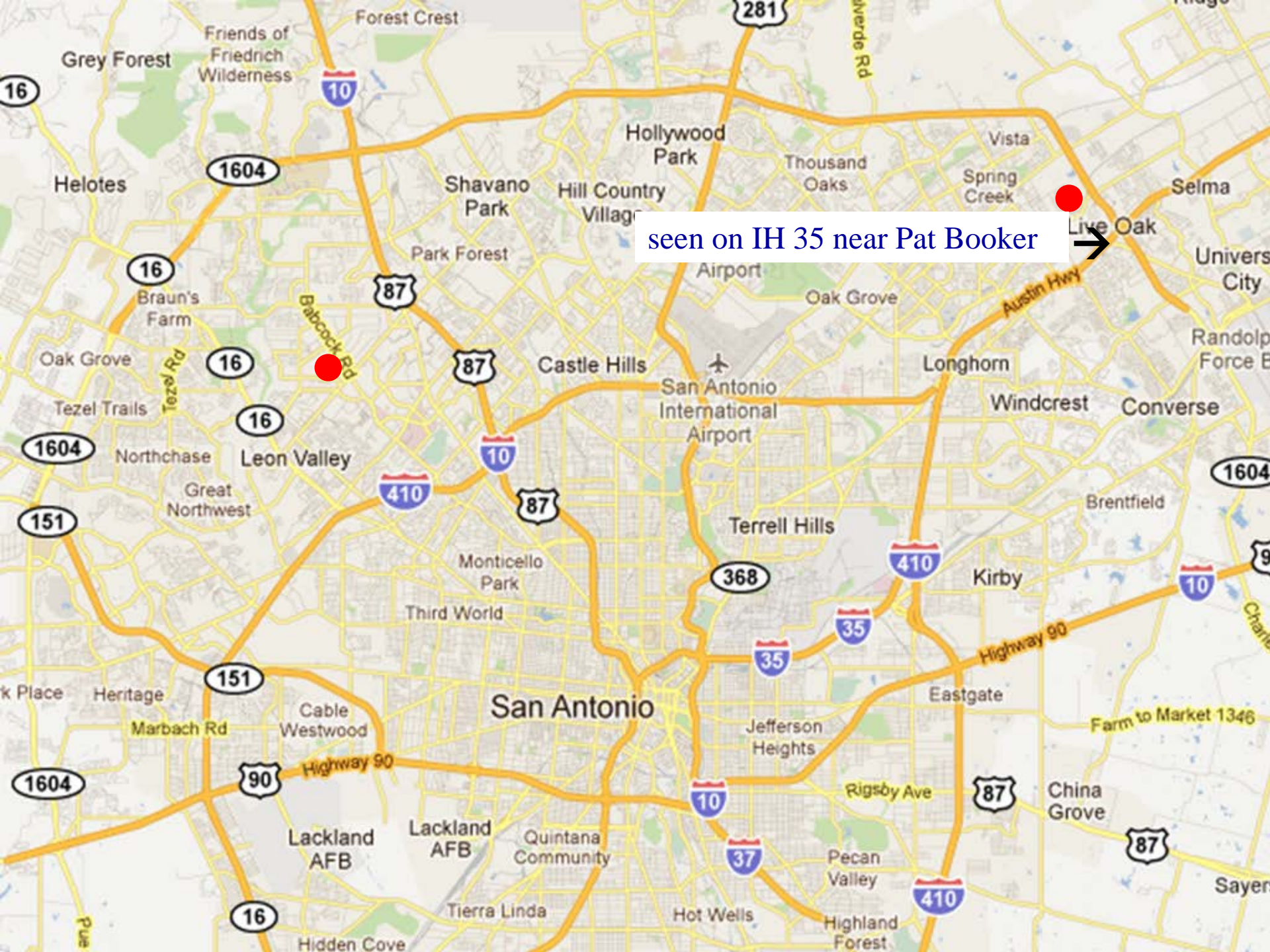
- No reports of WWD prior to accident
- Less than one minute of drive time from ramp to accident location (3500 ft.)

Saturday May 7, 2011 (evening)-
Sunday May 8, 2011 - 3:30 AM
Party at a Private Residence,
Nacadoches/LP 1604



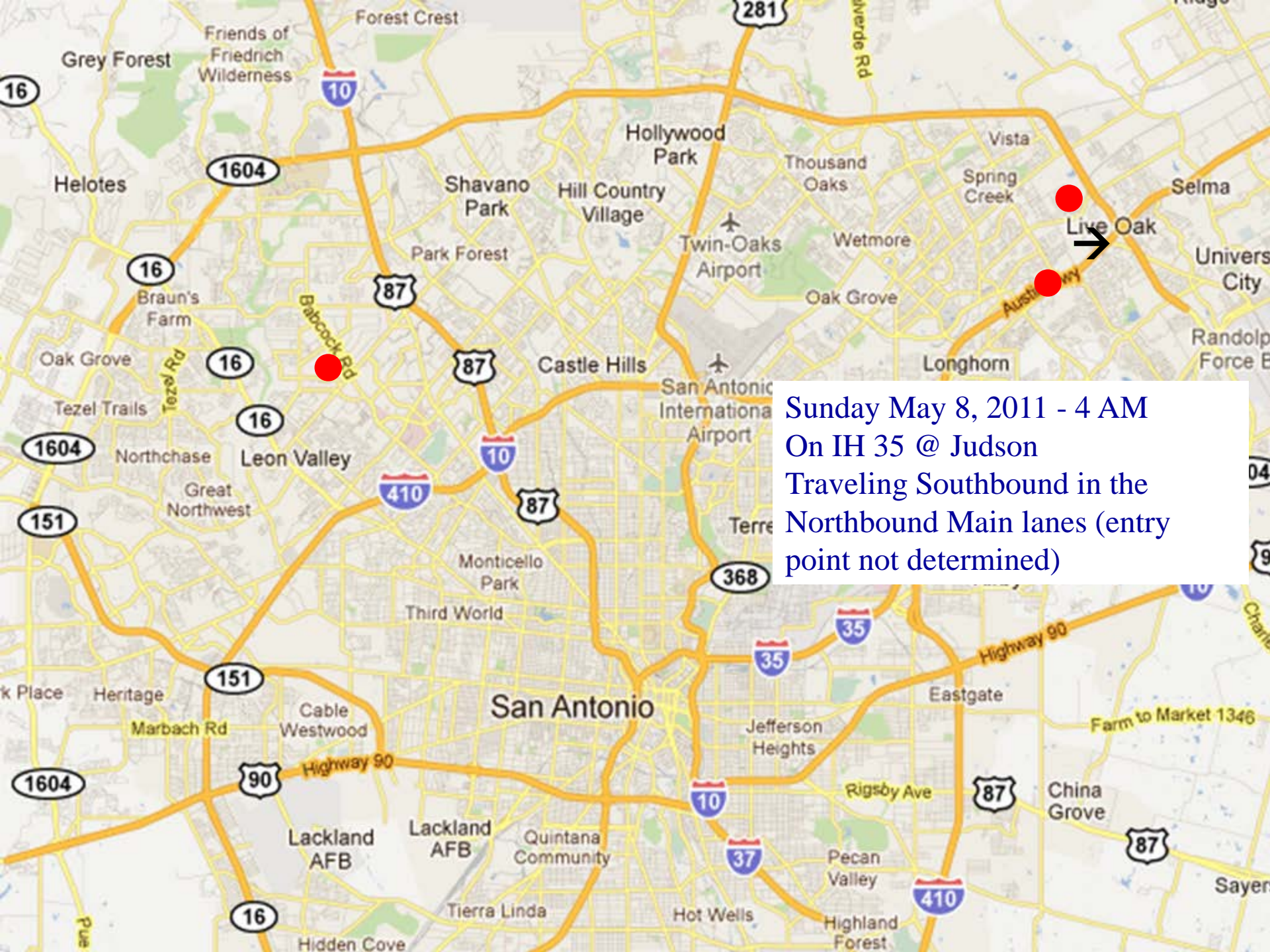


Residence in Northwest Area of the City

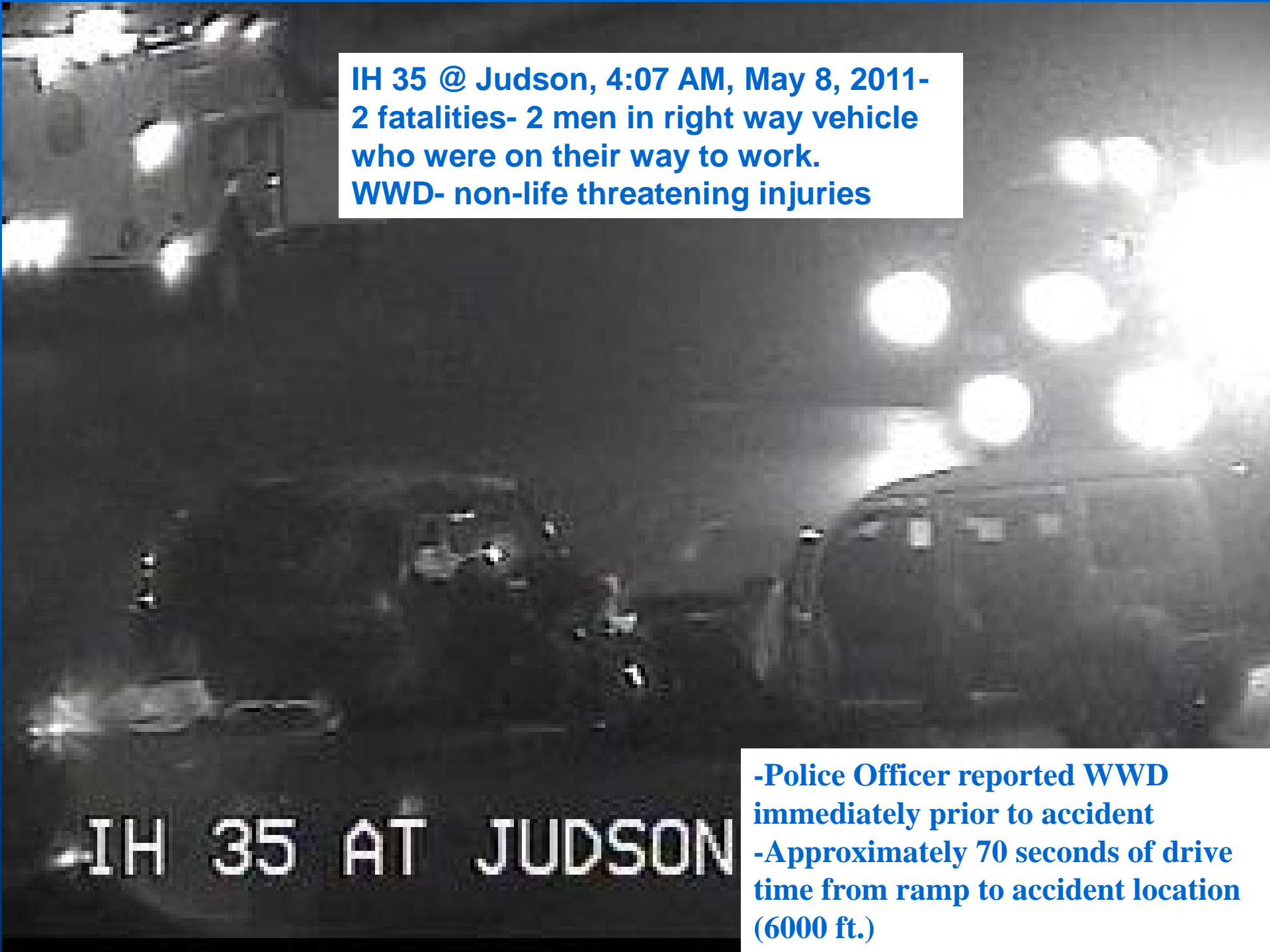


seen on IH 35 near Pat Booker





Sunday May 8, 2011 - 4 AM
On IH 35 @ Judson
Traveling Southbound in the
Northbound Main lanes (entry
point not determined)



**IH 35 @ Judson, 4:07 AM, May 8, 2011-
2 fatalities- 2 men in right way vehicle
who were on their way to work.
WWD- non-life threatening injuries**

**-Police Officer reported WWD
immediately prior to accident
-Approximately 70 seconds of drive
time from ramp to accident location
(6000 ft.)**

-IH 35 AT JUDSON

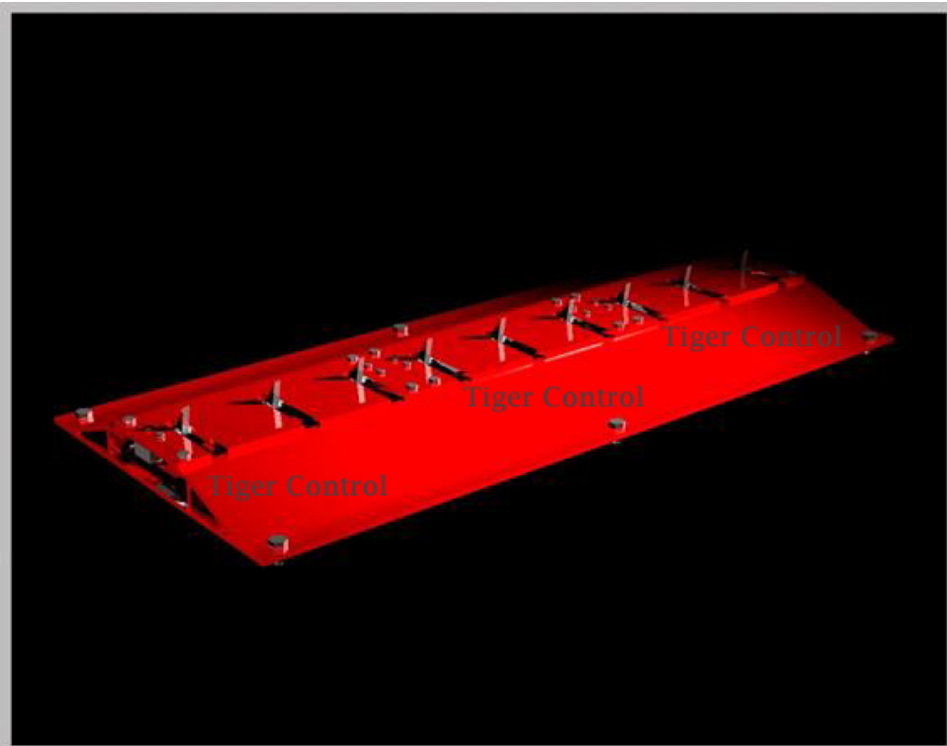
Investigated WWD Event Lessons Learned

- Drivers were impaired, with extremely high BAC
- Drivers were initially driving in correct direction on freeway
- Drivers either missed exit, or were driving away from their intended destination to begin with
- Driver eventually exited freeway, wrong way event resulted from impaired driver attempting to re-enter freeway
- **Conclusion: The solution is not as simple as identifying the locations of drinking establishments and the nearest exit ramps**

Wrong Way Driver Issue

- There had been multiple Wrong Way Driver (WWD) incidents in San Antonio in the months and years preceding the death of Officer Brown
- Last WWD fatality had occurred October 14, 2010, with additional non fatality accidents occurring from October 2010 through March 2011
- Death of Officer Brown resulted in significant response from law enforcement, media and the public
- Numerous inquiries, and suggestions for a solution:

SPIKE STRIPS IN THE EXIT RAMPS!!!!



Engineering Analysis- Spike Strips

- Spike Strips- investigated as a potential WWD counter measure as far back as the 1960's
- **Not designed for high-speed, high-volume traffic conditions (freeway ramps):**
 - The spikes did not cause the tires to deflate quickly enough to prevent a vehicle from entering the freeway
 - Not designed for use where speeds exceed 5 mph
 - Spikes can break leaving stubs that damage the tires of right-way vehicles
 - Right-way drivers perceive strips as a hazard, hit their brakes creating a hazardous situation
 - Freezing conditions may prevent the spikes from folding down when driven over in the right direction
 - Pose a hazard to motorcycles and small cars exiting in the correct direction
- Texas Department of Transportation does not have the legal authority to stop a vehicle by damaging its tires

SA WWD Task Force- Participants

- TxDOT- San Antonio District
 - Traffic Engineering, Traffic Management, PIO
- TxDOT- Traffic Operations Division
 - Traffic Engineering, Traffic Management, Traffic Safety
- San Antonio Police Department
 - **Traffic Section Captain; Deputy Chief**
- City of San Antonio Public Works
 - Traffic Management
- Bexar County Sheriff's Department
- Federal Highway Administration
- Texas Transportation Institute
- First meeting May 5, 2011; monthly meetings since

SA WWD Task Force- 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**

SA WWD Task Force- Challenges

- Determining points of entry for WWDs-
 - Entry is rarely witnessed
 - WWDs may be seriously injured or killed in accident
 - WWDs apprehended have extremely high BAC (.23, .25, +)
 - Dealing with drivers that are not cognizant
 - WWDs instructed not to talk by their attorneys
- **How to get the attention of drivers that are severely impaired**
- Number of ramps-
 - More than 400 exit ramps in San Antonio metro area
- **MUTCD Compliant Solution**

Institutional Measures Implemented

- SAPD implemented E-Tone WWD notification for its radio network (August 2010)
- SAPD first authorized to use portable spike strips in Nov. 2010
- **SAPD implemented code in CAD system identifying WWD events (January 2011)**
- SAPD Traffic Investigations Section instructed to focus on determining entry point/exit ramps used by WWDs (July 2011)

Institutional Measures Implemented

- TransGuide Operations began documenting all WWD events (March 15, 2010)
 - Previously documented WWD only in event of accident
- **TransGuide system operators authorized to display WWD warning message on DMS when SAPD issued E-Tone for WWD alert (May 9, 2011)**
 - Previously operators were instructed to verify the WWD, and then place the messages

**WRONG WAY DRIVER
REPORTED---USE
EXTREME CAUTION**

Institutional Measures Implemented

**WRONG WAY DRIVER
REPORTED---USE
EXTREME CAUTION**

- Message does not provide lane instruction
- Operator begins looking for WWD with cameras after message is placed
- Message displayed until WWD located and stopped, accident identified or E-Tone alert cancelled

WRONG WAY DRIVER
REPORTED---USE
EXTREME CAUTION

HWY 281NB AT NAKOMA

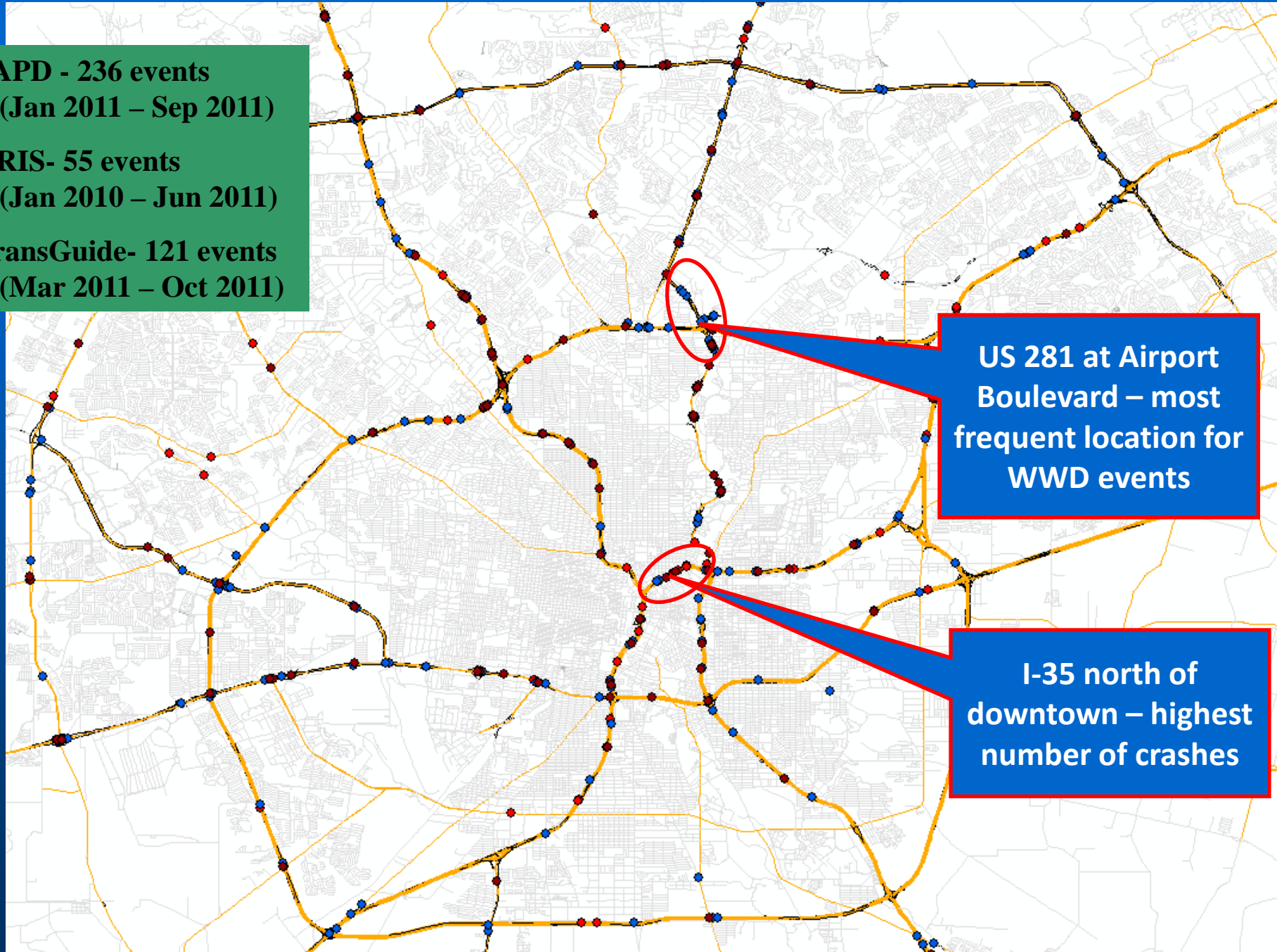
Developed WWD Event GIS Map (TTI)

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

SAPD - 236 events
- (Jan 2011 – Sep 2011)

CRIS- 55 events
- (Jan 2010 – Jun 2011)

TransGuide- 121 events
- (Mar 2011 – Oct 2011)



**US 281 at Airport
Boulevard – most
frequent location for
WWD events**

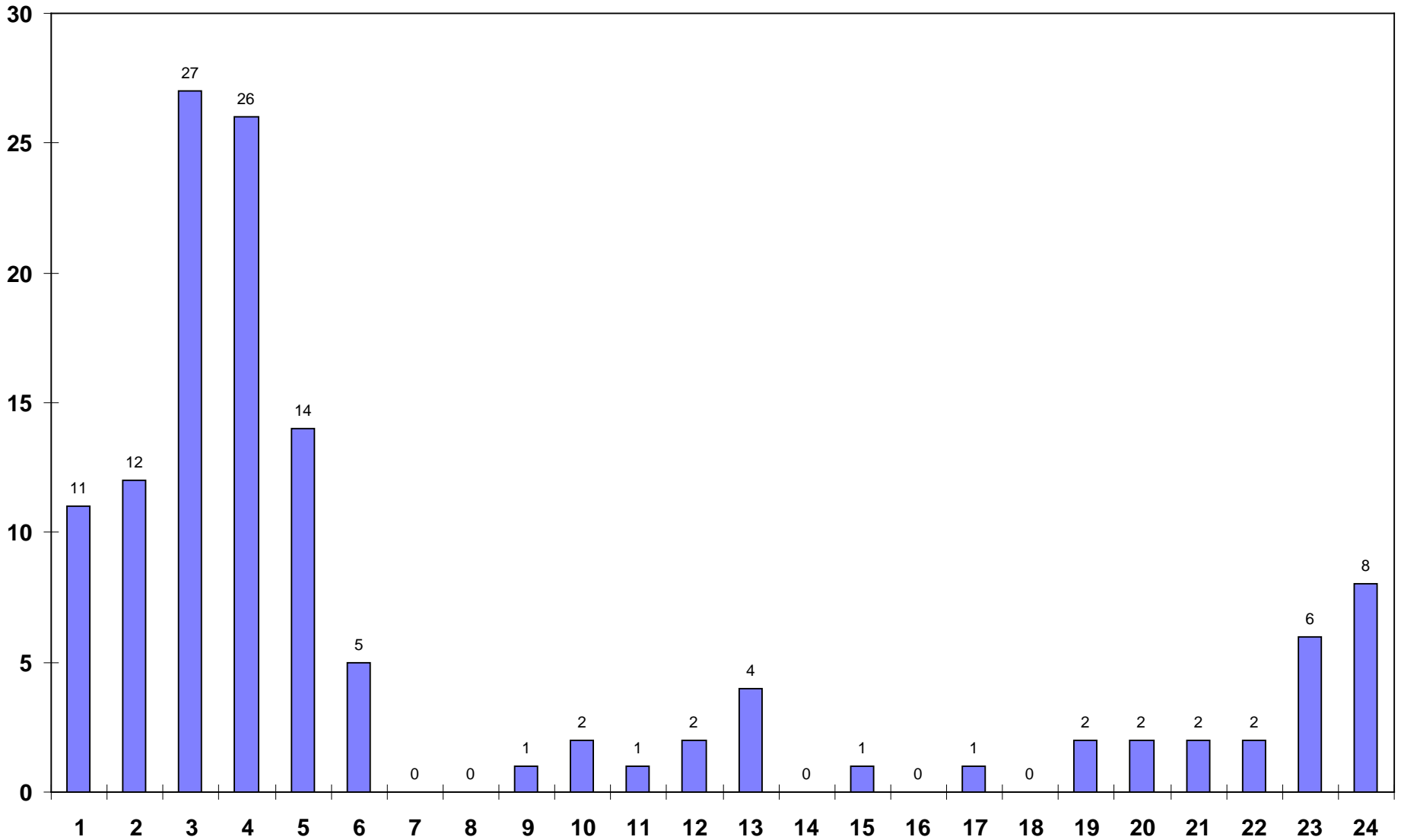
**I-35 north of
downtown – highest
number of crashes**

San Antonio Combined Data WWD Event Map

TransGuide Operations WWD Statistics

- 129 TransGuide WWD reports 3/15/11 – 10/31/11 (230 days)
 - No accident, vehicle not apprehended- 106 (81%)
 - DWI arrest, no accident or injuries- 10 (8%)
 - Accident occurred, no injuries or arrest (driver fled)- 4 (3%)
 - DWI confirmed, serious injury or fatality- 8 (6%)
 - Apprehended disoriented elderly driver- 2 (1%)
 - **Average of one reported WWD every two days (1.78 days)**
 - **WWD warning message displayed 85 times since 5/9/11**
 - **WWD located with CCTV camera- 11 times**
- 109 WWDs (85%) between 10 PM and 6 AM
- 53 WWDs (41%) between 2 AM and 4 AM
- None of the 20 day time incidents (6 AM to 10 PM) have resulted in fatal or serious injury accident

WWD Reports by Hour of Day

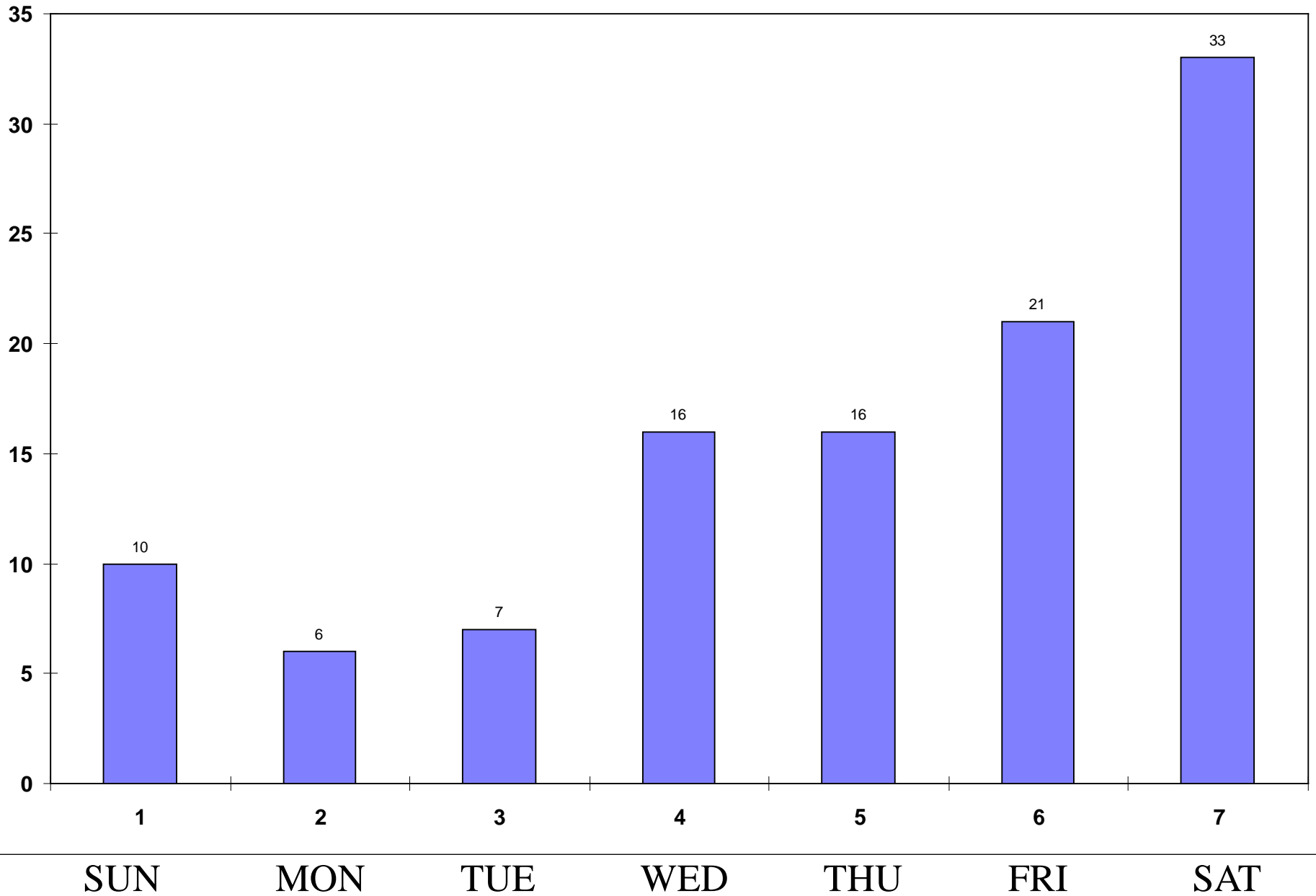


Midnight

Noon

Midnight

WWD Reports by Day of Week (10 PM listed day to 6 AM following day)



Identified WWD Counter Measures

- Enhanced Static Signing
- On-Site Driveway Channelization
- Detection Technologies
- Active/Illuminated Signing

WWD Enhanced Static Signing

- These measures were recommended in a prior TTI study
- Ensure all required signs and RPM's are in place and visible (Field Inspections/TTI Study Checklist)
- Add reflective tape on sign posts
- Increased size of ONE WAY signs
- Additional WRONG WAY & DO NOT ENTER signs at critical locations
- Note: San Antonio is not implementing lowered sign heights at this time

On-Site Channelization



- Force traffic into correct direction using on-site driveway channelization
- Voluntary action on part of property owners

WWD Detection Technologies

- Trap loops
 - Have single loops in many ramps already
 - Low cost if loops present in area already, high cost for new
 - TxDOT moving away from intrusive detection (2005)
- Sensys Networks Detection System
 - In-pavement sensor system
 - High cost
- Wavetronix HD Radar Sensor
 - Non intrusive
 - High cost
- TAPCO Radar
 - Non-intrusive
 - Low Cost (\$900 radar, \$1800 radar and solar panel)

WWD Active Signing Technologies

- Active Signing
 - Message Boards (Blank Out Signs)- Display Text Message when activated
 - LED Illuminated Wrong Way Signs- Standard Size & Shape Wrong Way sign, with flashing LEDs around the border
- Placement Issues
 - WWDs known to move to their right lane, look down and follow right hand pavement markings
- Operation
 - Can be detector activated (flash for a few seconds)
 - Can be photocell activated (night time operation)
 - Can operate 24/7

LED Illuminate Wrong Way Sign



Detector Activated Message Sign
(Blank Out Sign)



WWD Technology Demonstration Site

- Established demonstration site at IH 35 SB exit to Nogalitos (SW of downtown), near IH 35/US 90/IH 10 interchange
- Radar Unit Evaluation
 - Installed Wavetronix and TAPCO radar detectors
 - Working with TRF/SwRI and suppliers to integrate radar data from TAPCO & Wavetronix with TxDOT Lonestar software to provide notification alarm
 - Will close ramp and test accuracy of devices through test runs
- Two TAPCO LED Illuminated Wrong Ways Signs will be installed at this location

Selection of a Test Corridor

- Investigated WWD Events show it is not as simple as identifying drinking establishment locations and the nearest exit ramps
- TransGuide, SAPD & CRIS reports provide locations where WWDs are observed or the accident location. Although we can identify high risk corridors, at this time it is not possible to accurately determine the exact ramp locations where vehicles are entering freeways
- Determining the effectiveness of the WWD counter measures will be limited if the counter measures are installed on only a few of the ramps
- **Conclusion: Need to fund the installation of the devices on an entire corridor section so that the number of WWD reports before and after can be compared to determine if counter measures are effective**

Selected US 281 Corridor

- Selected US 281 from IH 35 Interchange to Stone Oak Parkway as test corridor (approx. 15 miles)
- 25% of all WWD events reported have been on this corridor
- History of fatality and non fatality accidents involving WWDs
- US 281 @ Airport Blvd has highest number of incidents of any single location
- US 281 NB exit to Airport has non-typical geometric design
- Corridor is a freeway section from IH 35 to Sonterra (12 miles)
- 4 & 6 lane divided highway from Sonterra to Stone Oak (3 miles)
 - Wide median with cable barrier separation
 - Limited lighting
 - Superstreet configuration
 - 2 development locations with multiple bars

US 281 WWD Operational Test Corridor

- Exit Ramps
 - 17 Northbound
 - 13 Southbound
 - 30 Ramps Total
- Installing 1 detection device and 2 LED illuminated Wrong Way Signs at each exit ramp
 - Detection device used to generate an alarm at TransGuide
 - LED signs will be set for photocell actuated night time operation
- LED Illuminated Wrong Way Signs are MUTCD compliant, however they will be placed in addition to existing required signs (supplemental signing)

US 281 WWD Operational Test Corridor

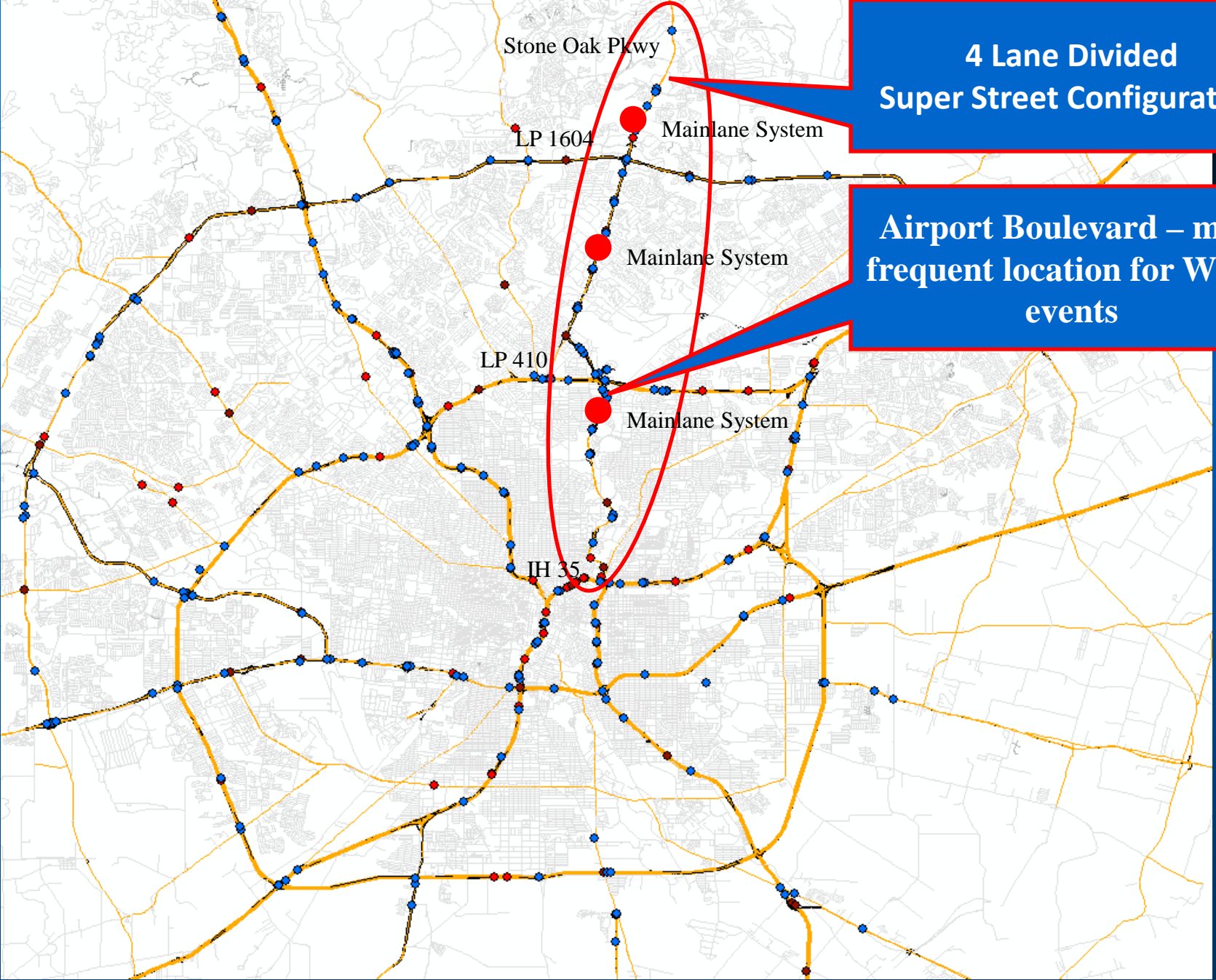
- Locations for Mainlane Devices
 - US 281 between LP 1604 and Redland Road (multiple bars)
 - US 281 between Thousand Oaks & Bitters (construction zones)
 - US 281 @ Airport (NB & SB)
- Installing detection devices and detector activated illuminated signing at each location
- LED signing on mainlanes will be detector activated
 - Looking at combination of LED Illuminated Wrong Way Signs and Blank Out Signs
 - Placed on inside and outside shoulders
 - Some type of shroud limiting visibility of signs to traffic on opposite side of median

US 281 WWD Operational Test Corridor

- CoSA will approach developments regarding voluntary on-site channelization
- Estimated cost of WWD Counter Measures:
 - \$7,500 each for 30 ramps
 - \$15,000 each for 3 mainlane locations
 - Total cost \$270,000
 - Authorized \$300,000 for installation of counter measures
- Timeline
 - Adding purchase and installation of materials to existing signing and/or ITS maintenance contracts
 - Installation could begin as early as December 2011
 - Integration of radar data TBA (target is Nov. 2011)
 - Hoping to have system operational in early 2012

**4 Lane Divided
Super Street Configuration**

**Airport Boulevard – most
frequent location for WWD
events**



US 281 WWD Operational Test Corridor

Next Steps

- Establish program for field inspections of all ramps using check list
- Complete before and after evaluation of Operational Test Corridor
- Develop Summary and Recommendations Report
- Establish priorities for remaining corridors, get projects funded
- TRF, SAT & TTI submitted WWD Research project statement (2012)
 - focusing on evaluation of effectiveness of counter measures
 - ranked 2nd out of 17 projects selected by TAP 4 committee
 - Research would commence in fall 2012 (2 year study)

ITS America

- Discussions at ITS World Congress and conference call with Tom Kern of ITSA; ITSA has agreed to assist in promoting national dialog and information exchange
- Establish a WWD Community of Practice within the ITS America Coordinating Council
- ITS America will run a story in Transportation Technology News to increase awareness and promote the establishment of a group within the Coordinating Council
- Options include a session on WWD, a stand-alone convening or workshop (if there is a level of interest) to address the challenges, and an interactive exhibit at ITS America Annual Meeting
- ITS America will work with TxDOT to set up a meeting with the Joint Program Office and other officials at the US DOT and with TRB, as appropriate, to share information on the San Antonio initiative and identify and work closely with US DOT on this from an ITS perspective