Ray Dominic Maldonado

Transportation GIS Analyst
Good Morning!

Hello All,

I thank you for your time and appreciate this opportunity to share with you my thesis on *Wrong Way Driving in San Antonio, Texas* and custom geoprocess, the *Ray Dominic Maldonado (RDM) Transportation Model*.

Should you have questions I can be reached at rdmaldonado@ymail.com.
Geographic Information Systems?

- Vector Data
  - Points
    - Crashes, POI’s
  - Lines
    - Roads, Routes
  - Polygons
    - Boundaries, Parcels
- Raster Data
  - Basemaps
    - Bing, OSM, Google
Highway Performance Monitoring System

- National Information System for aggregating all Public Roadway data
- TX is 1st with 300,000mi+ of roadways, CA is 2nd with ~150,000mi+
- Collect, Report, Calibrate, Route, QA
- Could layer Percent Passing route events with WWD routes for spatial analysis

http://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/
**Bexar County, Texas**

<table>
<thead>
<tr>
<th>People QuickFacts</th>
<th>Bexar County</th>
<th>Texas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population, 2012 estimate</td>
<td>1,786,704</td>
<td>26,059,203</td>
</tr>
<tr>
<td>Population, 2010 (April 1) estimates base</td>
<td>1,714,777</td>
<td>25,145,561</td>
</tr>
<tr>
<td>Population, percent change, April 1, 2010 to July 1, 2012</td>
<td>4.1%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Population, 2010</td>
<td>1,714,773</td>
<td>25,145,561</td>
</tr>
<tr>
<td>Persons under 5 years, percent, 2011</td>
<td>7.5%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Persons under 18 years, percent, 2011</td>
<td>26.9%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Persons 65 years and over, percent, 2011</td>
<td>10.4%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Female persons, percent, 2011</td>
<td>50.9%</td>
<td>50.4%</td>
</tr>
<tr>
<td>White persons, percent, 2011 (a)</td>
<td>86.9%</td>
<td>80.9%</td>
</tr>
<tr>
<td>Black persons, percent, 2011 (a)</td>
<td>6.0%</td>
<td>12.2%</td>
</tr>
<tr>
<td>American Indian and Alaska Native persons, percent, 2011 (a)</td>
<td>1.3%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Asian persons, percent, 2011 (a)</td>
<td>2.6%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander persons, percent, 2011 (a)</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Persons reporting two or more races, percent, 2011</td>
<td>2.0%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Persons of Hispanic or Latino Origin, percent, 2011 (b)</td>
<td>58.9%</td>
<td>38.1%</td>
</tr>
<tr>
<td>White persons not Hispanic, percent, 2011</td>
<td>30.2%</td>
<td>44.8%</td>
</tr>
<tr>
<td>Living in same house 1 year &amp; over, percent, 2007-2011</td>
<td>80.4%</td>
<td>82.1%</td>
</tr>
<tr>
<td>Foreign born persons, percent, 2007-2011</td>
<td>12.8%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Language other than English spoken at home, percent age 5+, 2007-2011</td>
<td>42.8%</td>
<td>34.4%</td>
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<tr>
<td>High school graduate or higher, percent of persons age 25+, 2007-2011</td>
<td>81.7%</td>
<td>80.4%</td>
</tr>
<tr>
<td>Bachelor's degree or higher, percent of persons age 25+, 2007-2011</td>
<td>25.5%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Veterans, 2007-2011</td>
<td>153,044</td>
<td>1,618,413</td>
</tr>
<tr>
<td>Mean travel time to work (minutes), workers age 16+, 2007-2011</td>
<td>24.2</td>
<td>24.8</td>
</tr>
</tbody>
</table>

Want more? [Browse data sets for Bexar County](#)
Wrong Way Driving Crash & Route Analysis

- San Antonio, Bexar County ranks 4th in the top 5 counties of TX (314) regarding WWD

- Compared to DFW and Houston, San Antonio’s metropolitan population is significantly smaller so Crashes per Capita is a better indicator of the situation

- The geographic disbursement of crashes is relatively dense as much of the population and businesses are in Central & North side of Bexar County
Wrong Way Driving Crash & Route Analysis

Total 2006-2011 WWD Crashes in Bexar County by Commercial Motor Involved

<table>
<thead>
<tr>
<th></th>
<th>CMV Involved</th>
<th>No CMV Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>305</td>
</tr>
</tbody>
</table>

Total 2006-2011 WWD Crashes in Travis, Bexar, Tarrant, Dallas, and Harris counties

<table>
<thead>
<tr>
<th></th>
<th>Bexar</th>
<th>Dallas</th>
<th>Harris</th>
<th>Tarrant</th>
<th>Travis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>314</td>
<td>584</td>
<td>843</td>
<td>334</td>
<td>226</td>
</tr>
</tbody>
</table>
Wrong Way Driving Crash & Route Analysis

County Area: 1239.82 sq. mi.
Wrong Way Driving Crash & Route Analysis

**Total 2006-2011 WWD Crashes in Bexar County by Harm Event**

- RR Train: 2
- Pedestrian: 3
- Pedalcyclist: 8
- Parked Car: 6
- Overturned: 2
- Other Object: 1
- Other Non-Collision: 1
- Motor Vehicle: 211
- Fixed Object: 81

**Total 2006-2011 WWD Crashes in Bexar County by Day of Week**

- Sun: 52
- Mon: 40
- Tue: 30
- Wed: 44
- Thu: 35
- Fri: 49
- Sat: 64
Wrong Way Driving Crash & Route Analysis
Wrong Way Driving Crash & Route Analysis

Total 2006-2011 WWD Crashes in Bexar County by Wrong Way Driver’s Vehicle Body Style

- Station Wagon: 1
- Van - All Varieties: 11
- Van: 4
- Unknown: 13
- Truck Tractor: 7
- Truck: 3
- Sport Utility Vehicle: 38
- Sedan 4D: 55
- Pickup: 1
- N/A: 1
- Fire Truck: 1
- Dump: 1
- Convertible: 1
- Bus: 1
- 4D Passenger Car: 46
- 2D Sedan: 24
- 2D Passenger Car: 9

Total 2006-2011 WWD Crashes in Bexar County by Fatality

- Non-Fatal: 301
- Fatal: 13
Wrong Way Driving Crash & Route Analysis

- Closest Facility Model using Net.Analyst, ArcGIS 10.1
- ModelBuilder → .GPK
- Network Dataset (BM-911)
Wrong Way Driving Crash & Route Analysis
Wrong Way Driving Crash & Route Analysis

- San Antonio – Wrong Way Driver Task Force is unsure how drivers are entering roadways
- Incidents: WWD Crashes (CRIS)
- Facilities: Alcohol Retailers (TABC)
- Barriers: Jurisdictional Boundaries
- “One Way” Traffic Parameter can be toggled to different values to simulate varying levels of DUI/DWI
- Result dataset is outputted to user’s choice of ArcGIS version .LPK file
Wrong Way Driving Crash & Route Analysis

• RDM Transportation Model
  – Routes all crashes back from facility of origin
  – Provides Driving Directions from Facility to Incident, even for Wrong Way direction of travel
  – Each route is unique, and spatially tied to its facility
Holiday Crash Analysis

Total 2006-2011 WWD in Bexar County by Date
Tourist Crash Analysis

Traffic Jam Safety Committee requested data for crashes caused by Impaired tourists; but now we can compare geographies of WWD and contributing factors thereof to discern if our roadway network is comparatively difficult to navigate for residents of specific regions; especially with the use of HPMS as basedata.

http://www.sametroplan.org/imap
Public Involvement & WWD Analysis

http://www.sametroplan.org/WCP/WCP.html
Safety Committees & User Groups

- Interagency Planning and Cost Sharing
- Focus Efforts on Collaborative Projects
- Official forum for Public & Private Organizations to discuss ideas, and relay information to media
- Receive feedback on parameters of newly developed tools like RDM Transportation Model

http://www.scaug.org/ALAMOGIS
http://yptransportation.org/chapters/yptausin/
http://www.transguide.dot.state.tx.us/sat/wwd/
http://www.sametroplan.org/trafficjam/members.html
http://www.sametroplan.org/Committees/SGCC/SGCC.html
Alternative Transit = Safe Transit?

Monday, April 2, 2012

Where do you B: Guest Blog

One of our MFb’s (most frequent b-cyclers), Ray Maldonado, has clocked some serious mileage and trips since he became a member of the program. He is a pro at using the system and taking advantage of its benefits. He was kind enough to share his B-cycle experience/expertise with us. Thanks, Ray. You rock.

Dear B-Cycle,

Like any multimodal resident of San Antonio I’m always looking for new ways to travel efficiently, quickly, and most of all safely. When my coworkers told me about B-Cycle I was intrigued with the idea of bike sharing especially downtown where dense traffic restricts getting to points of interests in a timely manner. At the time I had a mountain bike, and lived near my office (MPO; SouthTown). Less than a month of bike ownership later I broke a pedal, caught a flat, and the bike was stolen from my complex. Soon after that I subscribed to B-Cycle’s annual program and sold my motorcycle, my only motorized transport. From October 2011 – January 2012 I B-Cycled to work everyday and even on weekends to enjoy downtown scenery; Christmas décor on the Riverwalk was amazing! After just three months of daily riding I had traveled 200+ miles, scored all kinds of freebies on Nuride.com, and saved up enough to buy a motorcycle & truck! Not to mention I could feel the health benefits of muscle strength, increased energy, and weight loss. It’s been a fun ride, and as the weather improves I hope to be back on B-Cycle regularly :-) 

Ride Safe,

Ray Maldonado

http://sabcycle.blogspot.com/2012/04/where-do-you-b-guest-blog.html

- Ultimately, it is our duty as Transportation Analysts and Enforcers to keep roadways as safe as possible so efficient traffic and transit can persist without risk of injury or danger otherwise.
Questions...?

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