I-10 Speed Study Update

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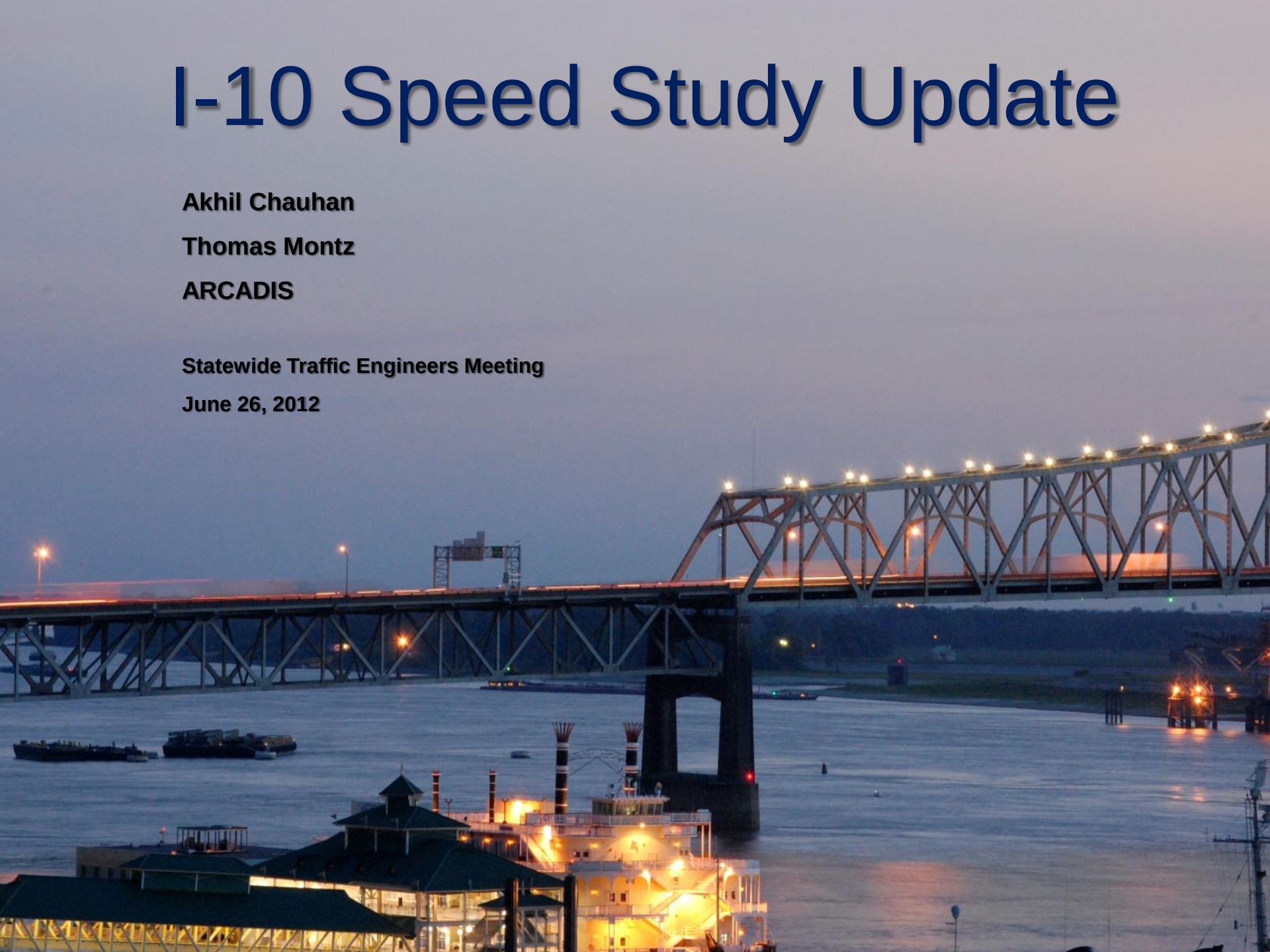
ARCADIS

Statewide Traffic Engineers Meeting

June 26, 2012



“Get Ready for Rush Hour”

- LINK

References: 1. www.youtube.com
2. http://www.imdb.com/title/tt0111257/

Overview

1. Speed Limit: Purpose
2. Speed Limit: History
3. Regional Experience
4. Nationwide Speed Limits
5. Project Needs & Goals
6. I-10 Analysis Overview
   - Roadway Attributes
   - I-10 Crash Analysis
   - I-10 Spot Speed Analysis
7. Crash Analysis Conclusions
8. Speed Analysis Conclusions
9. Going Forward

1. Speed Limits: Purpose

- Reduce Speed Associated Risks
- Enhance Safety
  - Limiting Function
  - Coordinating Function

References: 1. http://www.thesbnn.com/?p=12960
2. National Academy of Sciences. (Ed.).1998. Managing Speed [Special Report 254]. *Transportation Research Board National Research Council*
3. http://korsgaardscommentary.blogspot.com/2011/10/its-time-to-put-brakes-on-speed-limit.html

2. Speed Limits: History

- Pre 1974 – States Set Speed Limit
- 1974 – 1987 – “National Maximum Speed Limit” (NMSL) = 55 mph
- 1987 – States Set Speed Limit
  - Interstates Increased to 65 mph
- 1995 – NMSL Repealed, States Set Speed Limit

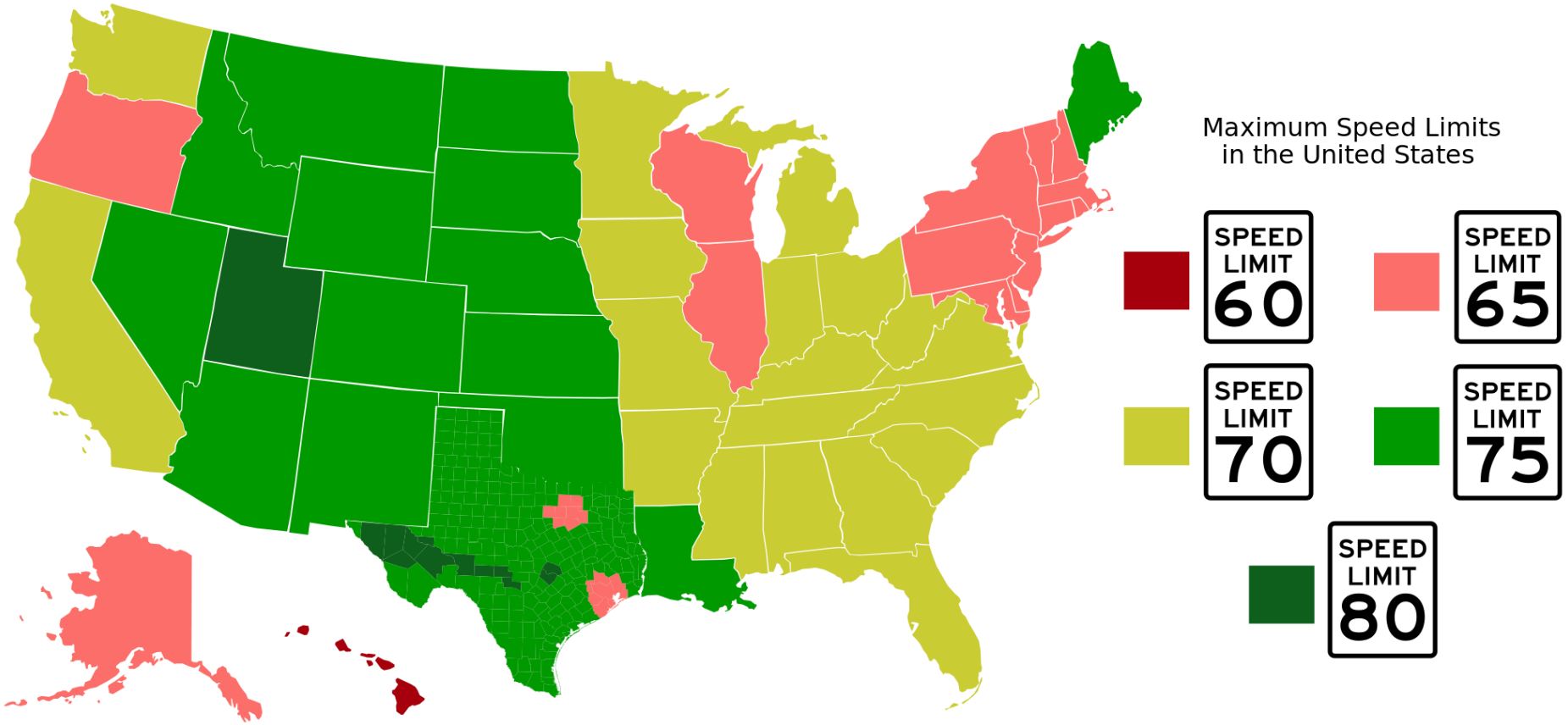
References: 1. http://en.wikipedia.org/wiki/National_Maximum_Speed_Law

3. Regional Experience

- Louisiana:
  - A ~ 200 Mile Long Portion of I–49 Posted 75 mph
  - Between Opelousas and Shreveport
- Texas:
  - Certain Counties Post 80 mph
  - Certain Counties Considering Posting 85 mph

References: 1. http://theadvocate.com/csp/mediapool/sites/Advocate/assets/templates/FullStoryPrint.csp?cid=340351&preview=y
2. http://www.dallasnews.com/news/transportation/20110406-some-texas-speed-limits-could-be-bumped-to-85-the-fastest-in-in-the-nation.ece

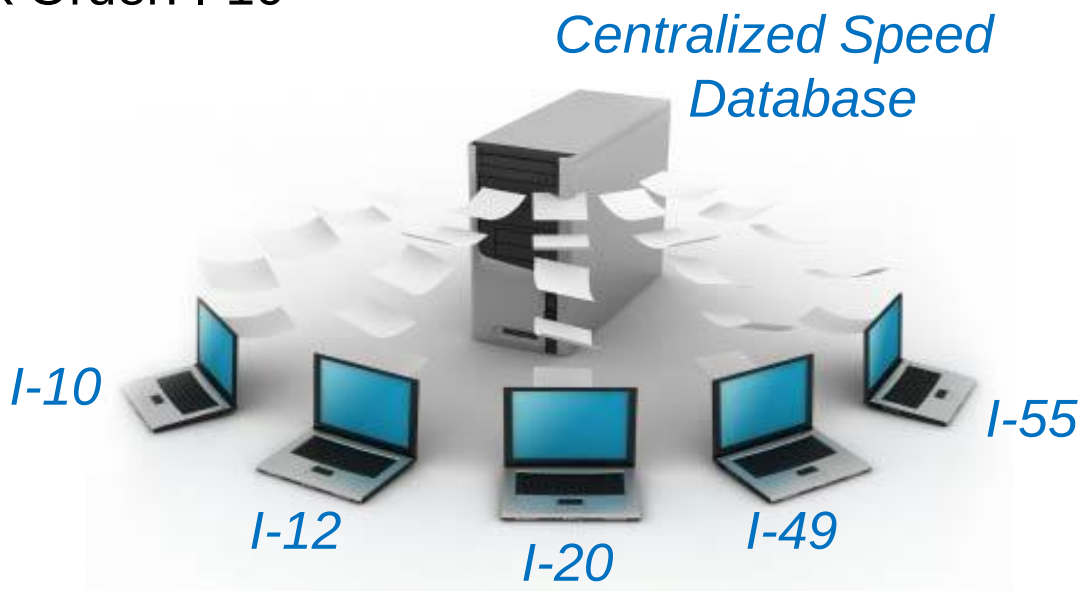
4. Nationwide Speed Limits



References: 1. http://en.wikipedia.org/wiki/Speed_limits_in_the_United_States

5. Project Needs & Goals

- Develop Comprehensive Speed Database for Major Highways in Louisiana
- Centrally Located Speed Limits and Speed Studies Information
- Start with Interstates -> Major & Minor Arterials
- First Task Order: I-10



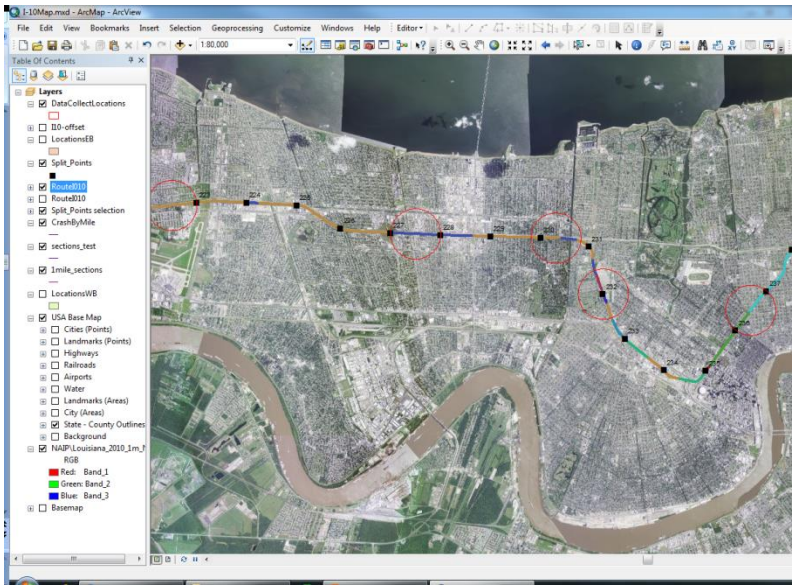
References: 1. http://blog.ub.ac.id/midcool/category/sti/

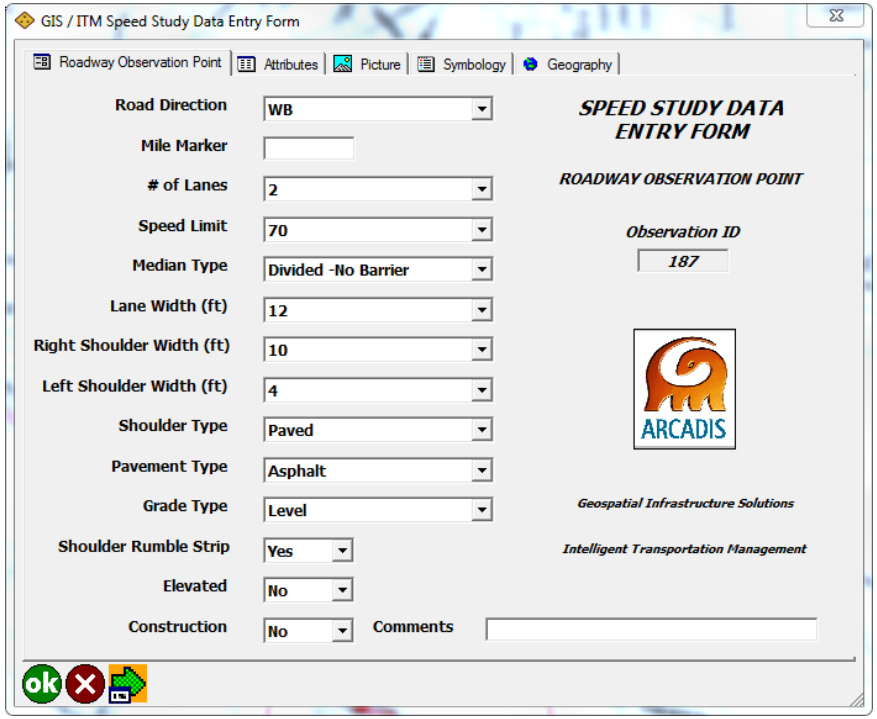
6. I – 10 Speed Analysis Overview

- Roadway Attributes
- Crash Analysis
  - Crash Frequency by Parish & by Type (2008-2010)
  - Crash Rates by Parish vs. Statewide Averages
- Data Collection
  - 15 Base Locations
  - 1 Location per Parish
  - 25 Additional Locations – in Urban Areas
- Spot Speed Analysis
  - $50^{th}/85^{th}/95^{th}$ Percentile Speed
  - 10 mph Pace
- Develop Chief Engineers Orders (if necessary)
- Develop GIS database of Speed Statistics

6. Roadway Attributes

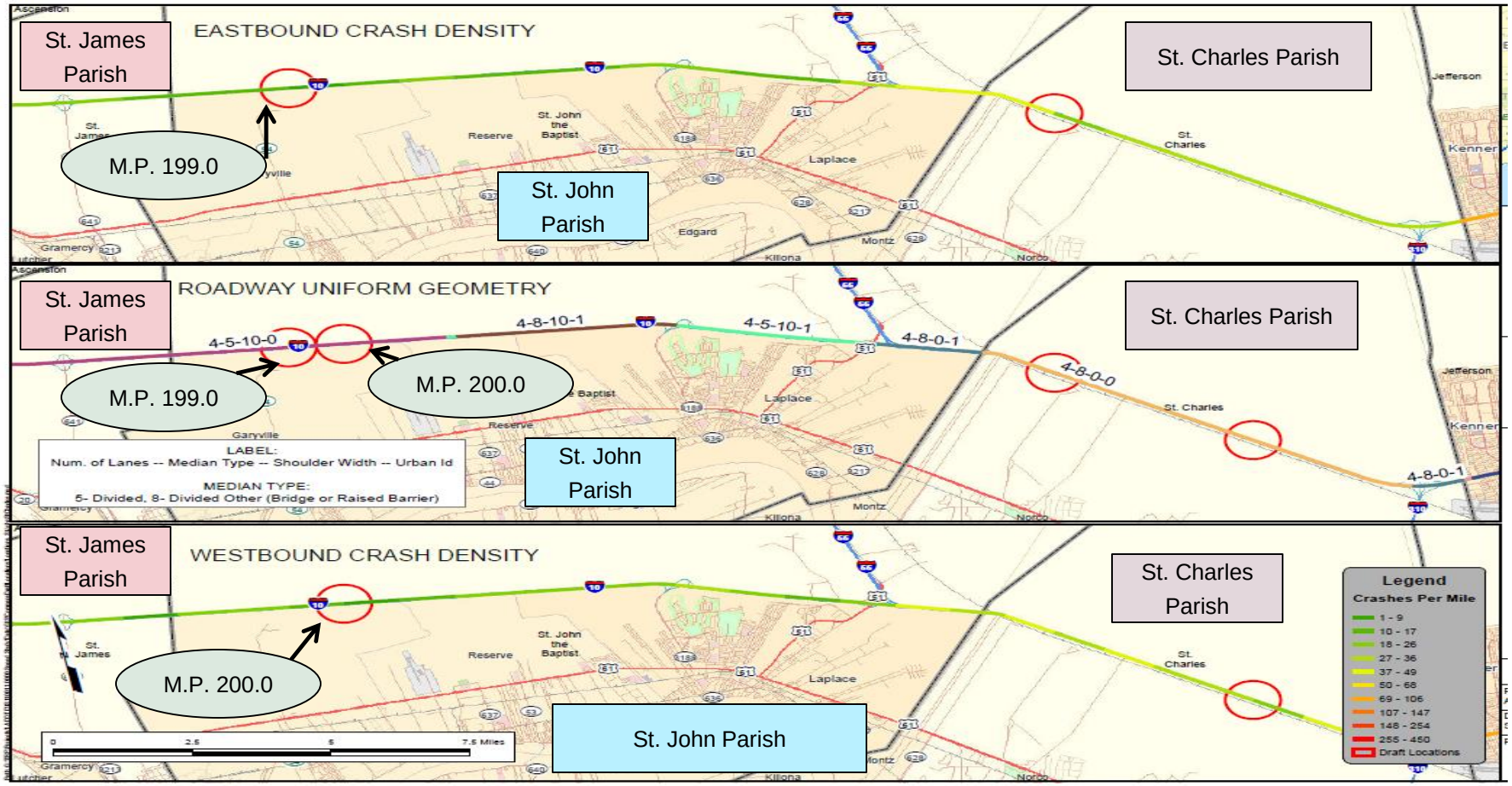
- Obtained Official DOTD Roadway Database and Shapefiles in ArcGIS format.
- Obtained Tabular Highway “Needs” Database for I-10
  - Converted To ArcGIS
- Merged these Two Databases
- Used Data to Identify Segments with Uniform Geometric Attributes
- Field Verified Databases using Specially Developed Data Entry Form (ArcPad)





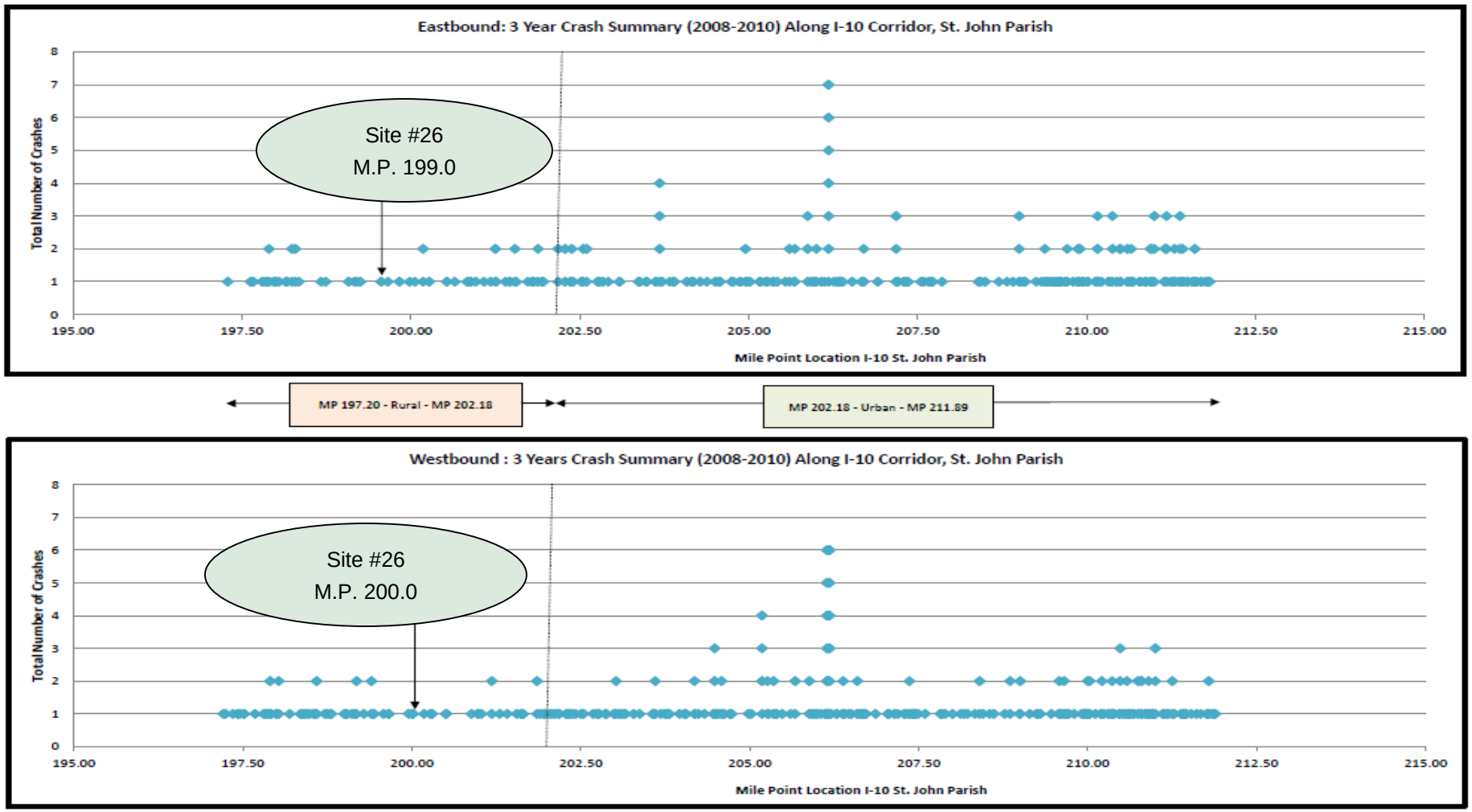
6. I – 10 Crash Analysis (Density)

- St. John Parish (Includes Site #26) M.P. 199.0 EB & 200.0 WB



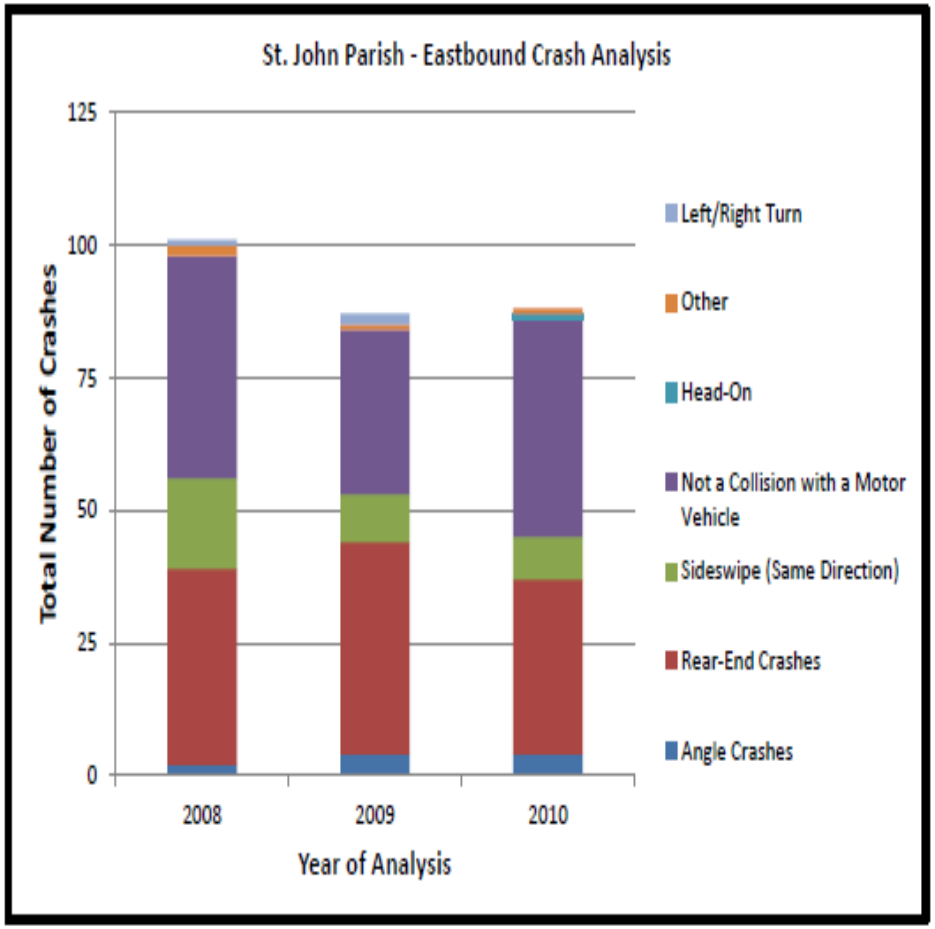
6. Crashes vs. Mile Points

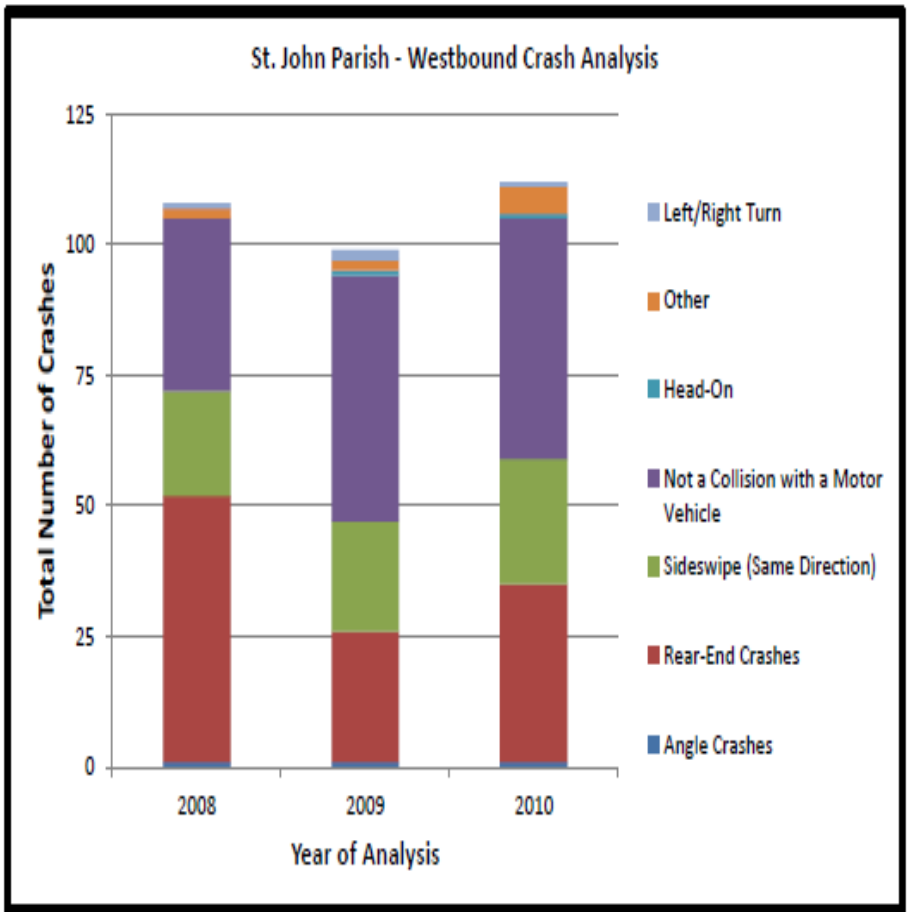
St. John Parish



6. I – 10 Crash Analysis (Type)

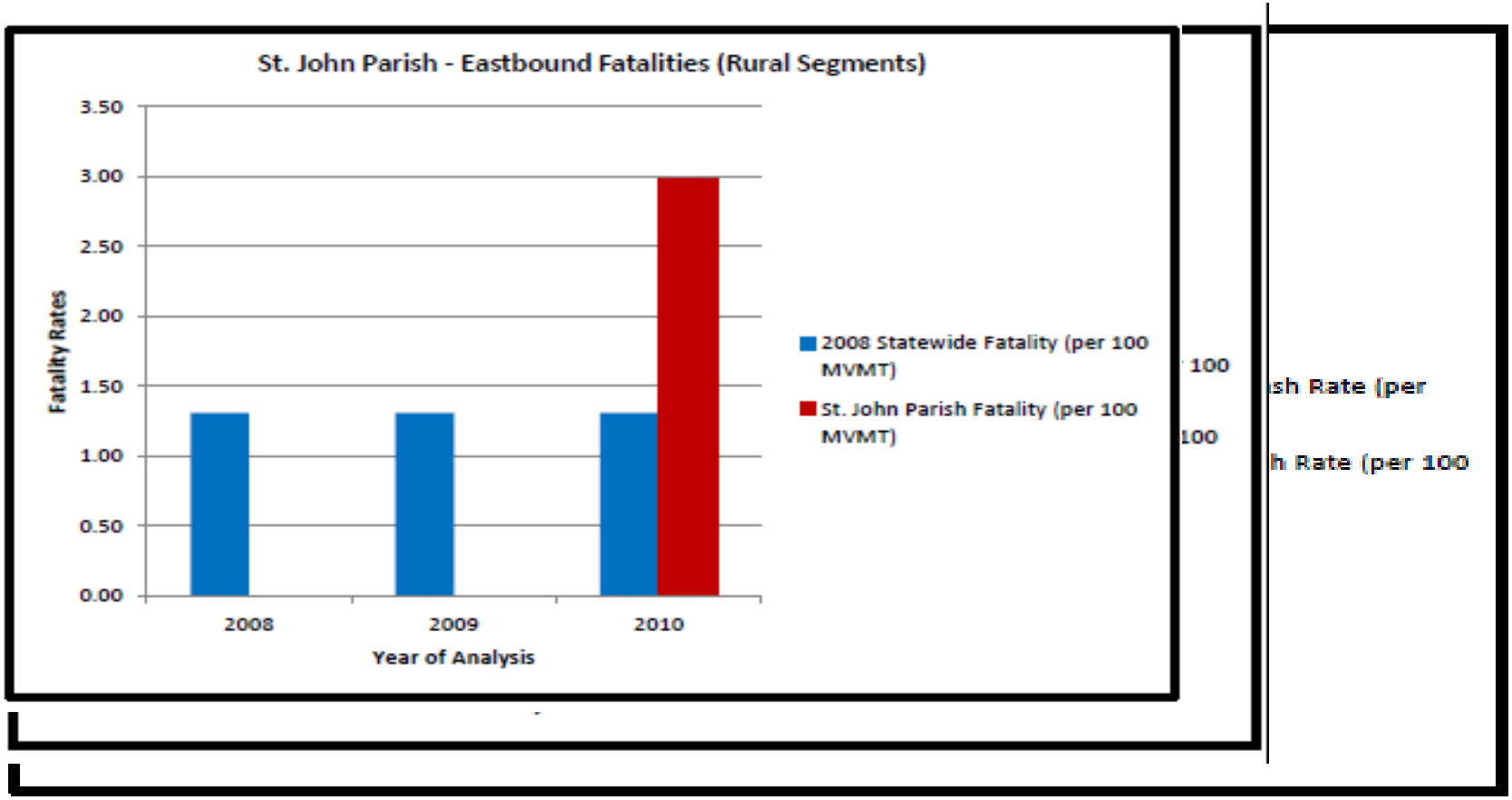
- St. John Parish by Direction & by Type



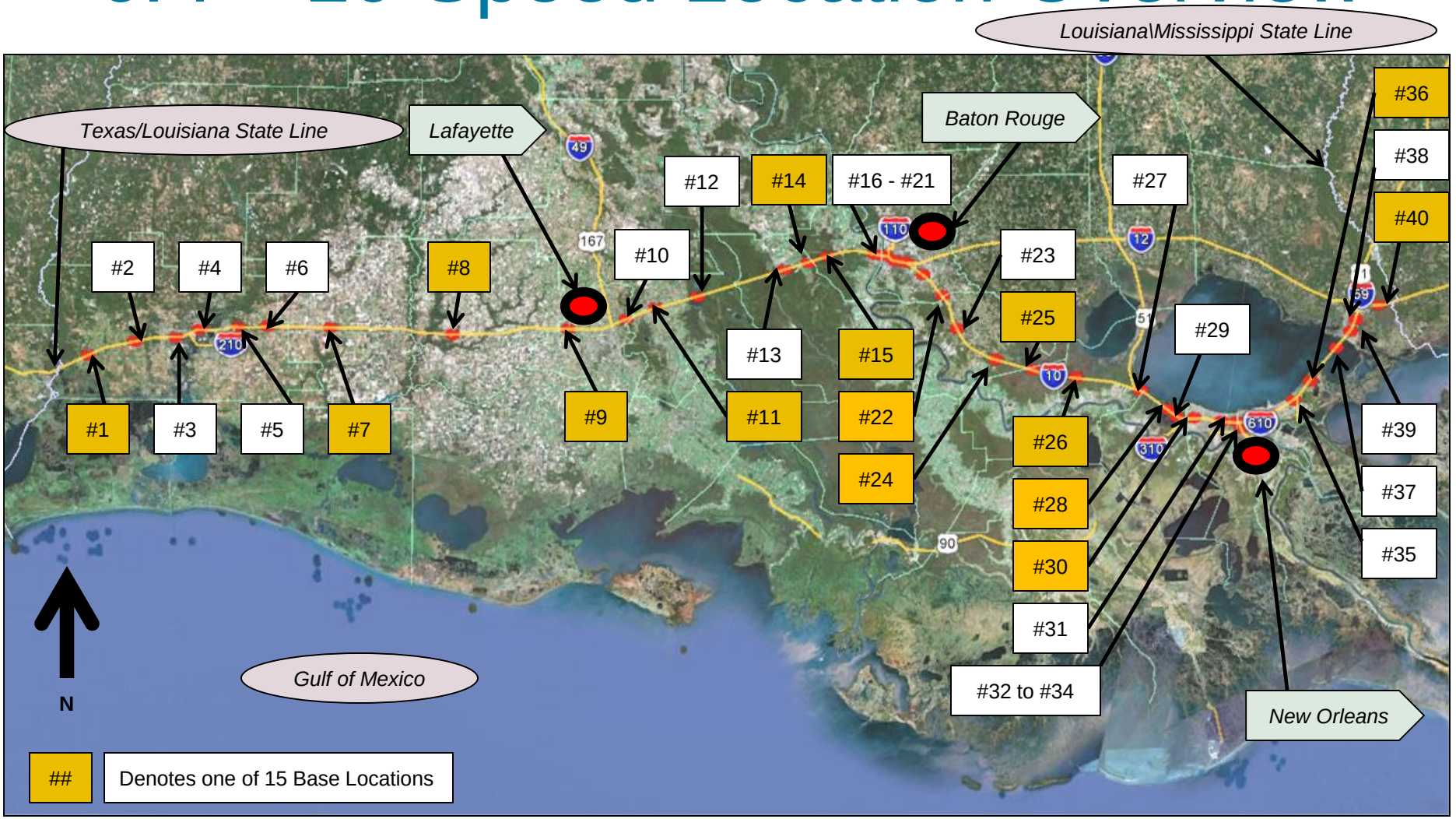


6. Crash Rates vs State Averages

- St. John Parish Eastbound



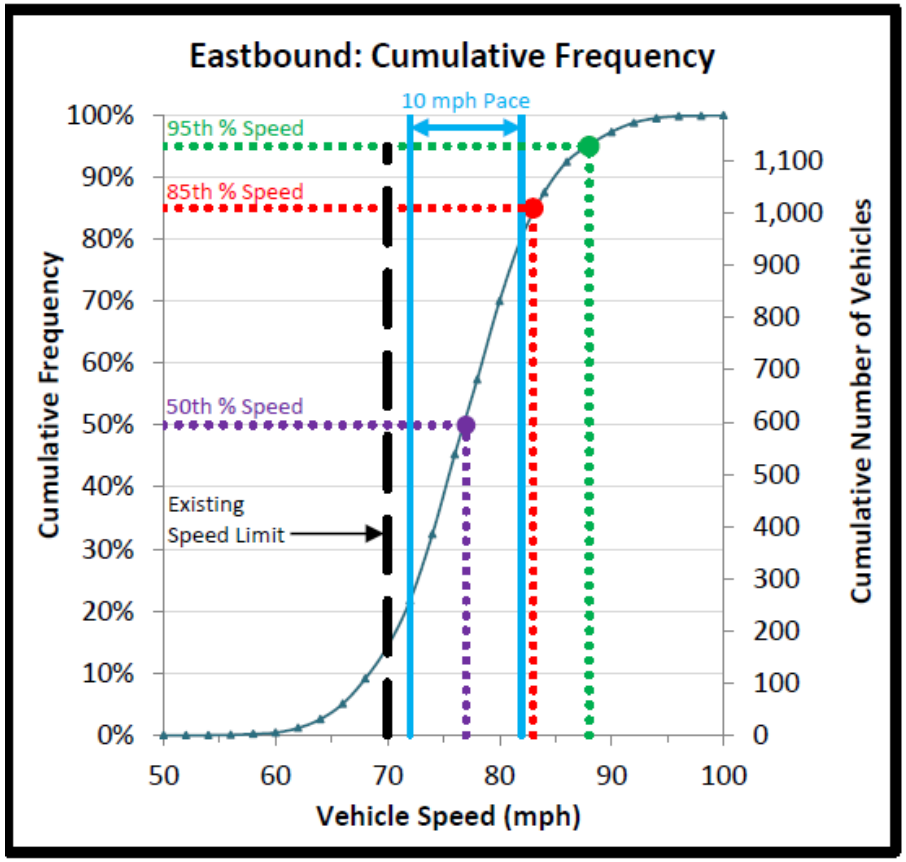
6. I – 10 Speed Location Overview

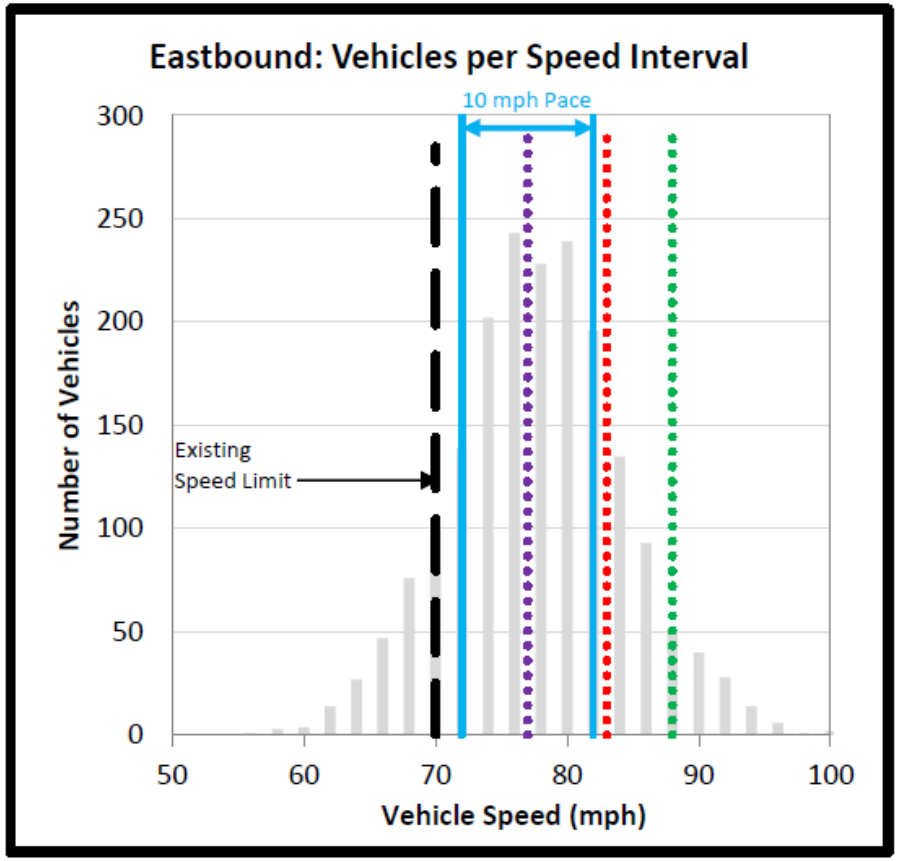


References: 1. Google Earth

6. I – 10 Spot Speed Analysis

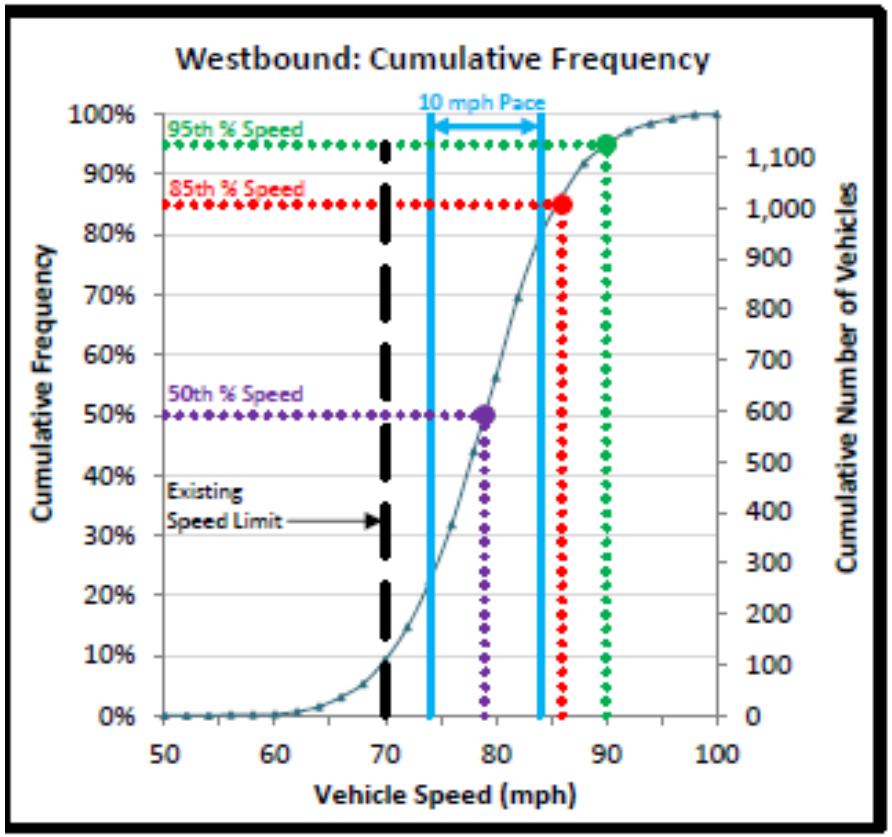
- St. John Parish - Site #26 – M.P. 199.0 – Eastbound
- 10am to 2pm & > 5.0 seconds Headway

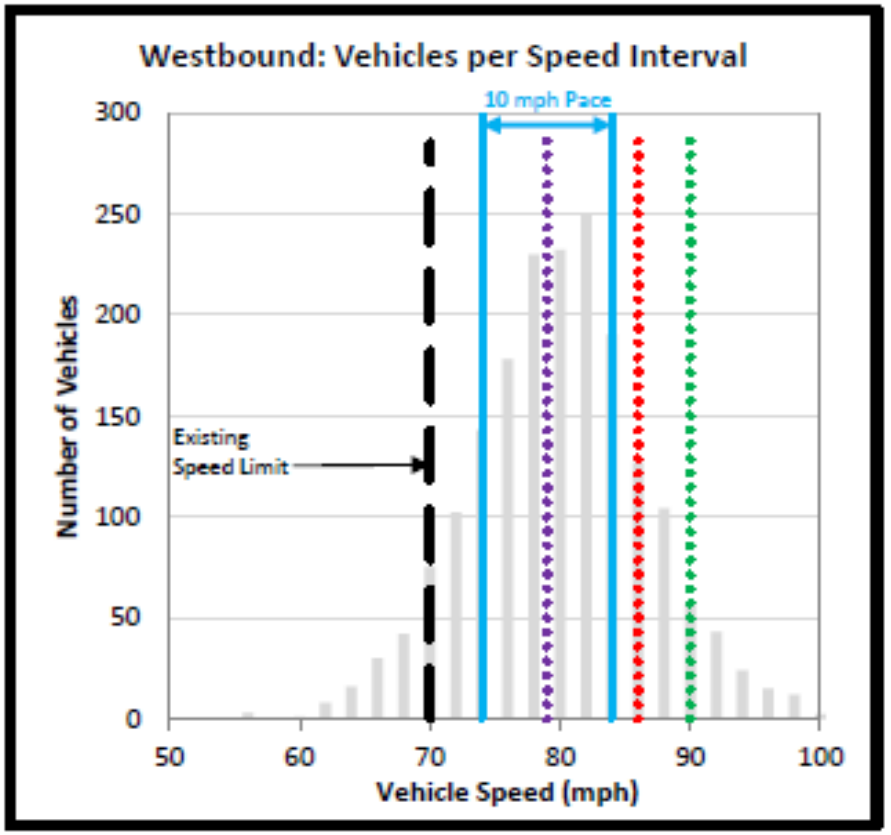




6. I – 10 Spot Speed Analysis

- St. John Parish - Site #26 – M.P. 200.0 – Westbound
- 10am to 2pm & > 5.0 seconds Headway





6. Headways vs Time Intervals

- St. John Parish (Includes Site #26) M.P. 199.0 EB & 200.0 WB

St. John Parish - Site 26					
Spot Speed Study Results - Eastbound	**Headway > 5.0s 10a - 2p**	**Headway > 4.0s 10a - 2p**	**All Headways 10a - 2p**	**Headway > 5.0s 7a - 7p**	**All Headways 7a - 7p**
Mile Point	199.0	199.0	199.0	199.0	199.0
Existing Speed Limit	70 mph	70 mph	70 mph	70 mph	70 mph
Wednesday 04-25-2012	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	7:00 AM - 7:00 PM	7:00 AM - 7:00 PM
Total Vehicles Analyzed	1888 vehicles	2224 vehicles	4250 vehicles	5607 vehicles	14414 vehicles
% Vehicles	44%	52%	100%	39%	100%
Mode Speed (Highest Frequency Speed)	75 mph	76 mph	76 mph	78 mph	78 mph
Mean Speed (Average Speed)	77 mph	77 mph	77 mph	77 mph	77 mph
50th Percentile (Median Speed)	77 mph	77 mph	77 mph	77 mph	77 mph
85th Percentile Speed	83 mph	83 mph	83 mph	84 mph	83 mph
95th Percentile Speed	88 mph	88 mph	87 mph	88 mph	87 mph
Speed Variance (Max Speed vs. Min Speed)	43 mph	43 mph	51 mph	52 mph	55 mph
10 mile per hour Pace	72 mph to 82 mph	72 mph to 82 mph	72 mph to 82 mph	72 mph to 82 mph	72 mph to 82 mph
Vehicles in 10 mph Pace	1113 vehicles	1306 vehicles	2486 vehicles	3241 vehicles	8475 vehicles
Spot Speed Study Results - Westbound	**Headway > 5.0s 10a - 2p**	**Headway > 4.0s 10a - 2p**	**All Headways 10a - 2p**	**Headway > 5.0s 7a - 7p**	**All Headways 7a - 7p**
Mile Point	200.0	200.0	200.0	200.0	200.0
Existing Speed Limit	70 mph	70 mph	70 mph	70 mph	70 mph
Wednesday 04-25-2012	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	7:00 AM - 7:00 PM	7:00 AM - 7:00 PM
Total Vehicles Analyzed	1884 vehicles	2248 vehicles	4493 vehicles	5583 vehicles	14603 vehicles
% Vehicles	42%	50%	100%	38%	100%
Mode Speed (Highest Frequency Speed)	81 mph	81 mph	81 mph	76 mph	80 mph
Mean Speed (Average Speed)	79 mph	79 mph	79 mph	80 mph	79 mph
50th Percentile (Median Speed)	79 mph	79 mph	79 mph	80 mph	79 mph
85th Percentile Speed	86 mph	85 mph	85 mph	87 mph	85 mph
95th Percentile Speed	90 mph	90 mph	89 mph	91 mph	89 mph
Speed Variance (Max Speed vs. Min Speed)	45 mph	45 mph	46 mph	67 mph	67 mph
10 mile per hour Pace	74 mph to 84 mph	74 mph to 84 mph	74 mph to 84 mph	75 mph to 85 mph	75 mph to 85 mph
Vehicles in 10 mph Pace	1087 vehicles	1313 vehicles	2637 vehicles	3186 vehicles	8539 vehicles

6. Site Comparison

Site Comparison - Headway > 5.0s & 10a - 2p

Spot Speed Study Results - Eastbound	Site 13	Site 22	Site 23	Site 25	Site 26	Site 28	Site 29	Site 30
	Iberville Parish	East Baton Rouge Parish	Ascension Parish	St. James Parish	St. John Parish	St. Charles Parish	St. Charles Parish	Jefferson Parish
Mile Point	136.0	168.0	174.5	191.0	199.0	213.0	213.0	222.8
Existing Speed Limit	70 mph	70 mph	70 mph	70 mph	70 mph	60 mph	60 mph	60 mph
Wednesday 04-25-2012	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM
Total Vehicles Analyzed	786 vehicles	1673 vehicles	707 vehicles	1880 vehicles	1888 vehicles	685 vehicles	673 vehicles	2625 vehicles
% Vehicles	17%	21%	11%	42%	44%	11%	10%	25%
Mode Speed (Highest Frequency	72 mph	73 mph	71 mph	73 mph	75 mph	63 mph	66 mph	70 mph
Mean Speed (Average Speed)	71 mph	70 mph	74 mph	73 mph	77 mph	66 mph	66 mph	67 mph
50th Percentile (Median Speed)	71 mph	70 mph	74 mph	73 mph	77 mph	66 mph	66 mph	67 mph
85th Percentile Speed	77 mph	75 mph	80 mph	79 mph	83 mph	72 mph	71 mph	72 mph
95th Percentile Speed	80 mph	79 mph	83 mph	83 mph	88 mph	76 mph	74 mph	76 mph
Speed Variance	46 mph	50 mph	40 mph	54 mph	43 mph	41 mph	45 mph	62 mph
10 mile per hour Pace	66 mph to 76 mph	65 mph to 75 mph	70 mph to 80 mph	69 mph to 79 mph	72 mph to 82 mph	60 mph to 70 mph	60 mph to 70 mph	61 mph to 71 mph
Vehicles in 10 mph Pace	447 vehicles	1051 vehicles	418 vehicles	1162 vehicles	1113 vehicles	450 vehicles	471 vehicles	1781 vehicles

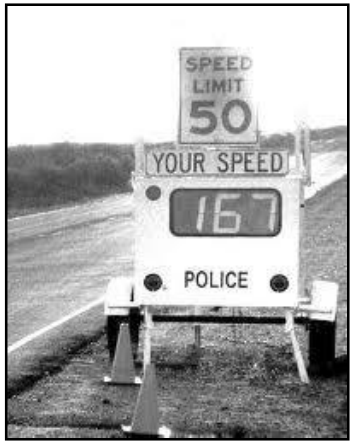
Spot Speed Study Results - Westbound	Site 13	Site 22	Site 23	Site 25	Site 26	Site 28	Site 29	Site 30
	Iberville Parish	East Baton Rouge Parish	Ascension Parish	St. James Parish	St. John Parish	St. Charles Parish	St. Charles Parish	Jefferson Parish
Mile Point	136.0	168.2	174.5	191.0	200.0	217.0	217.0	222.8
Existing Speed Limit	70 mph	70 mph	70 mph	70 mph	70 mph	60 mph	60 mph	60 mph
Wednesday 04-25-2012	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM	10:00 AM - 2:00 PM
Total Vehicles Analyzed	908 vehicles	1753 vehicles	647 vehicles	1855 vehicles	1884 vehicles	831 vehicles	733 vehicles	2746 vehicles
% Vehicles	22%	21%	10%	41%	42%	15%	11%	24%
Mode Speed (Highest Frequency	71 mph	75 mph	73 mph	74 mph	81 mph	64 mph	66 mph	63 mph
Mean Speed (Average Speed)	73 mph	75 mph	74 mph	75 mph	79 mph	66 mph	67 mph	65 mph
50th Percentile (Median Speed)	73 mph	75 mph	74 mph	75 mph	79 mph	65 mph	66 mph	64 mph
85th Percentile Speed	79 mph	81 mph	80 mph	80 mph	86 mph	71 mph	73 mph	71 mph
95th Percentile Speed	84 mph	85 mph	84 mph	85 mph	90 mph	74 mph	77 mph	75 mph
Speed Variance	57 mph	50 mph	45 mph	45 mph	45 mph	39 mph	60 mph	49 mph
10 mile per hour Pace	69 mph to 79 mph	70 mph to 80 mph	69 mph to 79 mph	70 mph to 80 mph	74 mph to 84 mph	60 mph to 70 mph	61 mph to 71 mph	59 mph to 69 mph
Vehicles in 10 mph Pace	501 vehicles	991 vehicles	409 vehicles	1199 vehicles	1087 vehicles	596 vehicles	498 vehicles	1593 vehicles

##	Denotes one of 15 Base Locations

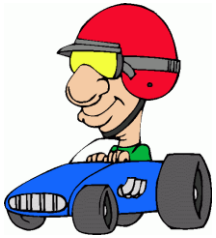
7. Crash Analysis Conclusions

- 80% to 90% of Crashes in Each Parish
  - Rear-End, Side-Swipe (Same Direction) & Collisions Not Involving Another Motor Vehicle
- Highest Number of Crashes
  - East Baton Rouge Parish - 24.1% of Crashes in 5.2% of Total Study Corridor Length
- Highest Number of Fatalities
  - Calcasieu Parish & Orleans Parish - 28.2% of Fatalities (14.1% Each) in 17% (16.1% and 11.0%, respectively) of Total Study Corridor Length
- Highest Number of Injuries
  - Orleans Parish - 20.7% of Injuries in 11.0% of Total Study Corridor Length

8. Speed Analysis Conclusions



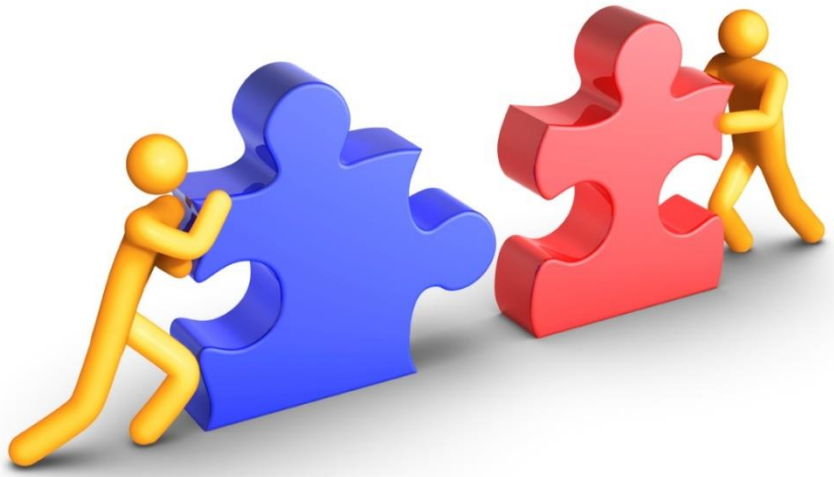
- Spot Speed Analysis
  - Completed for 8 Sites (5 Base Locations)
  - Wednesday – 10am to 2pm CDT
- 50th Percentile Speed > Posted Speed Limit by ~ 5 mph
- 85th Percentile Speed > Posted Speed Limit by ~ 10 mph
- 95th Percentile Speed > Posted Speed Limit by ~ 15 mph
- Lower Limit of 10 mph Pace ~ Posted Speed Limit



References: 1. http://www.sodahead.com/entertainment/do-you-follow-directly-behind-the-speeding-cop-no-lights-on-down-the-interstate-or-wait-until-he/question-992747/

9. Going Forward

- Complete Data Collection
- Complete Spot Speed Analysis at All 40 Data Collection Sites
- Chief Engineers Orders
- Speed Database



Imagine the Result

Questions/Comments?

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