The Evolution of the San Antonio-Bexar County Metropolitan Planning Organization's Safety Program

TTI Traffic Safety Conference

June 5, 2012

Jeanne Geiger, Lydia Kelly, Stephanie Velasquez, Cecilio Martinez

San Antonio • Bexar County MPO Metropolitan Planning Organization

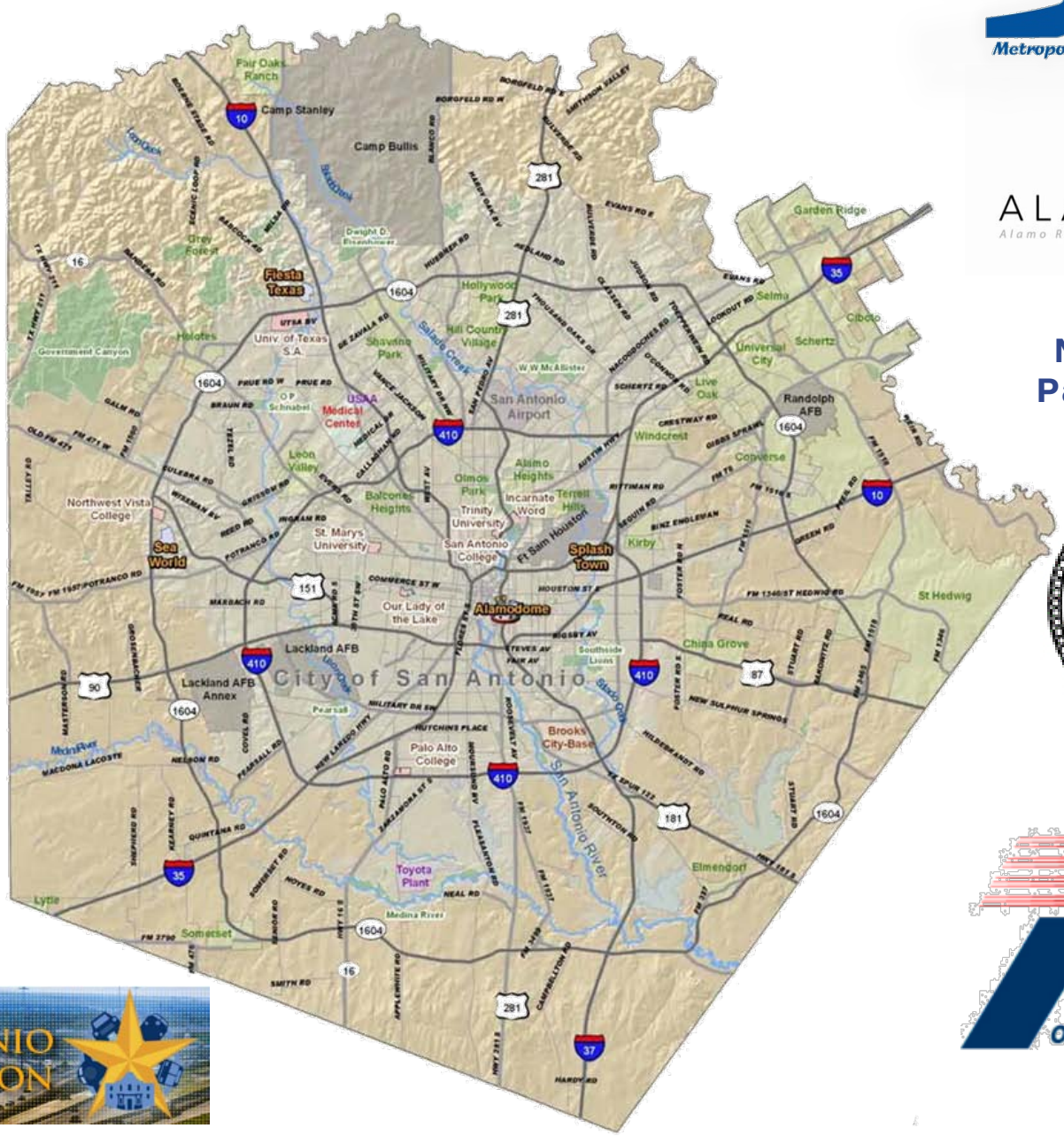
Regional Safety Program

The San Antonio – Bexar County MPO Planning Area and Partners

San Antonio • Bexar County MPO Metropolitan Planning Organization

AACOG Alamo Area Council Of Governments

ALAMO RMA Alamo Regional Mobility Authority



Northeast Partnership

Greater Bexar County Council of Cities

VIA

SAN ANTONIO MOBILITY COALITION

Texas Department of Transportation

The Evolution of the San Antonio-Bexar County Metropolitan Planning Organization's Safety Program

- Getting Started: Public Outreach Strategies and Programs
- Sustaining the Effort: Partnerships and Safety Studies
- The Next Level: Data Analysis in Transportation Safety Planning
- Questions

Presented by

Lydia Kelly
Bicycle & Pedestrian Transportation Planner
Phone: (210) 230-6911
Email: kelly@sametroplan.org

Stephanie Velasquez
Regional Transportation Planner
Phone: (210) 230-6908
Email: velasquez@sametroplan.org

Cecilio Martinez
Senior GIS & Web Analyst
Phone: (210) 230-6905
Email: martinez@sametroplan.org

www.sametroplan.org

825 South Saint Mary's St. | San Antonio, Texas 78205 | Phone: 210-227-8651 | Fax: 210-227-9321

"We Plan to Keep You Moving!"

Getting Started: Public Outreach Strategies and Programs

Lydia Kelly
Bicycle & Pedestrian Transportation Planner
Phone: (210) 230-6911
Email: kelly@sametroplan.org

Components of the Safety Program

Bicycle/Pedestrian Planning

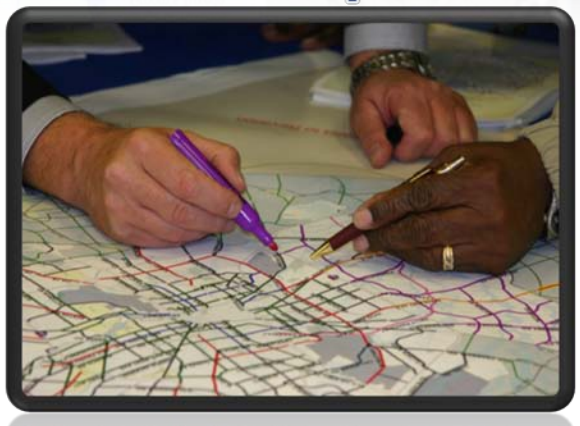
Safety Studies

Data Analysis

Project Selection

Committees

Public Input



Getting Started

Bicycle and Pedestrian Mobility Advisory Committees

- BMAC formed in 1995 and PMAC in 1997
- Agency staff and citizen representation
- Monthly meetings
- 3 "Bike Night" meetings a year

Walk & Roll Program

- Walk & Roll Rally Supports National Bike to Work Month
- Encourages businesses to support active transportation
- Encourages residents to "try" active transportation
- Just celebrated 16th year of Walk & Roll activities

Walkable Community Program

- Walkable Community / Safe Routes to School Workshops
- Pedestrian and Bicycle Safety Classes for children and adults
- Bike rodeos/ Helmet distribution /related activities
- Defensive Driving Class Support

Elements desired for a Walkable Community

Access

Safety

Land Use

Aesthetics

The Benefits of a Walkable Community

Transportation Benefits– reduced traffic congestion, improved safety, calms traffic, preserves road infrastructure.

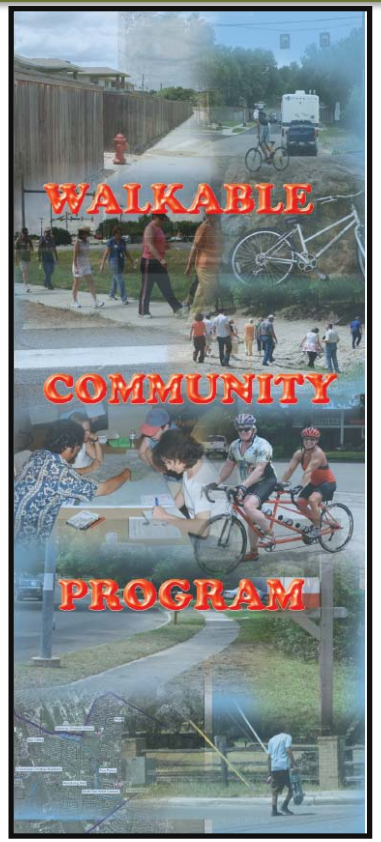
Economic Benefits – increased retail sales (restaurants, lodging establishments, retail stores), job creation, and enhancement of nearby property values.

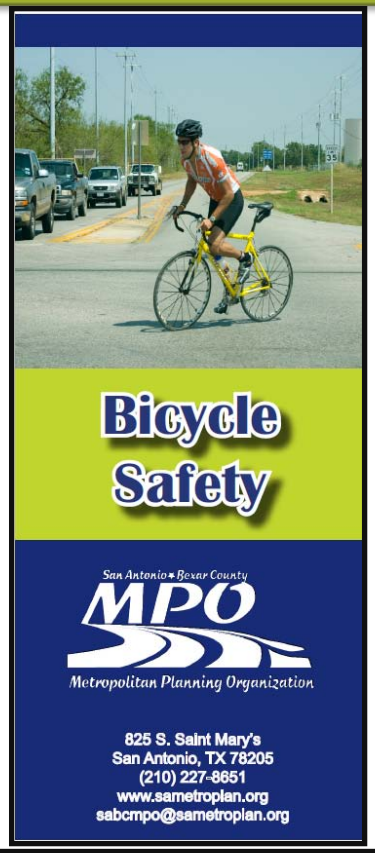
Environmental Benefits – improved air quality and energy conservation.

Social Benefits - quality-of-life benefits from living in communities with more open space and greenways and that provide more opportunities for walking or cycling.

Health and Fitness Benefits– it is well recognized that Americans would benefit in many ways from a more active lifestyle. Bike lanes, sidewalks and trails promote healthy choices.

MPO Safety Brochures





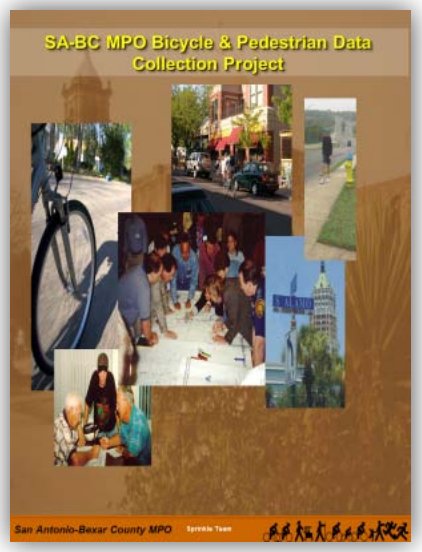
Sustaining the Effort: Partnerships and Safety Studies

Stephanie Velasquez
Regional Transportation Planner
Phone: (210) 230-6908
Email: velasquez@sametroplan.org

Sustaining the Effort: Partnerships and Safety Studies

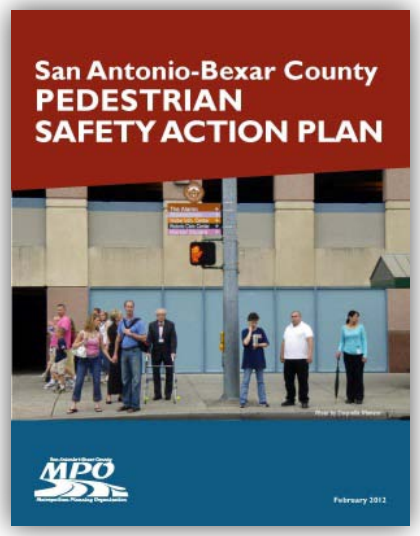
- 2001 – 2005: Safety effort gained momentum through initial outreach programs
- 2006:
  - Literature review identified best practices
  - Used available crash data (limited)
- 2009:
  - Began to work with TxDOT using Crash Record Information System (CRIS) data
  - Completed the most recent Bicycle Level of Suitability (BLOS)
  - Completed and adopted the Road Diet Study

Recent Safety Related Studies

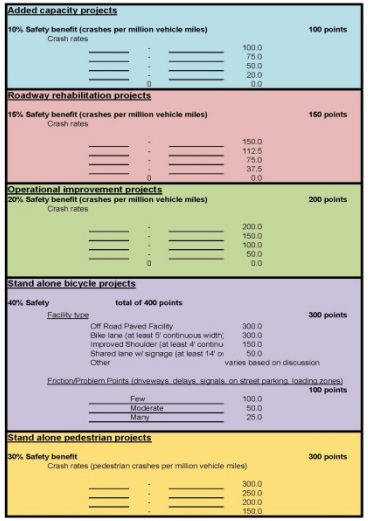


Bicycle & Pedestrian Data Collection Project (BLOS and Road Diet) (2009)

San Antonio Regional Bicycling Travel Patterns Survey (2010)



Pedestrian Safety Action Plan (2012)



Added capacity projects

10% Safety benefit (crashes per million vehicle miles) — 100 points

Crash rates

_____	-	_____ 100.0
_____	-	_____ 75.0
_____	-	_____ 50.0
_____	-	_____ 20.0
_____	0	0.0

Roadway rehabilitation projects

15% Safety benefit (crashes per million vehicle miles) — 150 points

Crash rates

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Operational improvement projects

20% Safety benefit (crashes per million vehicle miles) — 200 points

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Stand alone bicycle projects

40% Safety — total of 400 points

Facility type — 300 points

Off Road Paved Facility	300.0
Bike lane (at least 5' continuous width)	300.0
Improved Shoulder (at least 4' continu	150.0
Shared lane w/ signage (at least 14' o	50.0
Other	varies based on discussion

Friction/Problem Points (driveways, delays, signals, on street parking, loading zones) — 100 points

Few	100.0
Moderate	50.0
Many	25.0

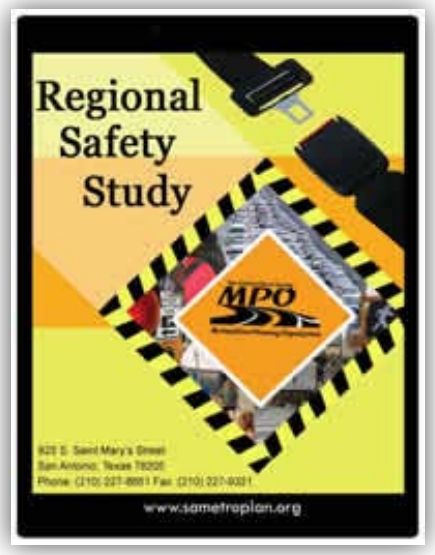
Stand alone pedestrian projects

30% Safety benefit — 300 points

Crash rates (pedestrian crashes per million vehicle miles)

_____	-	_____ 300.0
_____	-	_____ 250.0
_____	-	_____ 200.0
_____	-	_____ 150.0

Project Scoring Criteria (2012)



Regional Safety Study (2010)

2010 Safety Study

- Acknowledged exceptional growth over the next 20 years; expecting 600,000 new residents
- Introduced CRIS and safety data to our region
- Budget constraints limit the ability for needed transportation improvements making safety even more of a pressing issue
- Efforts to reduce the frequency and severity of crashes has long been underway, this study offers a more coordinated effort across local jurisdictions
- Responded to data requests from:
  - City of San Antonio Public Works Department
  - San Antonio Police Department
  - Bicycle and Pedestrian Mobility Advisory Committees

2010 Safety Study Overview

Introduction

- Transportation Safety in the Planning Process
- Regional Safety Committee
- Methodology
- Legislative Information
- Regional Crash Assessment
- Areas of Analysis (these 8 represent 76% of reported crashes)
  - Impaired Driving
  - Distracted Driving
  - Road Rage/Aggressive Driving
  - Cell Phone Use
  - Speeding
  - Bicycle Crashes
  - Pedestrian Crashes
  - Motorcycle Crashes
- Analysis
- Next Steps
- Technical Appendix

2010 Safety Study Overview

- Areas of Analysis
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  - Road Rage / Aggressive Driving
  - Cell Phone Use
  - Speeding
  - Bicycle Crashes
  - Pedestrian Crashes
  - Motorcycle Crashes

2008 Crash Data

Overview of the MPO Study Area - Bicycle Stats

Total Crashes	Deaths	Injuries			
		Incapacitating	Non-Incapacitating	Possible Injury	Total Injuries
205	2	14	80	96	190

Total Persons	Total Vehicles
469	211

Incapacitating Injury - Any injury, other than a fatal injury, which prevents the injured person from walking, driving or normally continuing the activities capable of performing before the injury occurred.

Non-Incapacitating Injury - Any injury, other than a fatal injury or incapacitating injury, which is evident to observers at the scene of the collision in which the injury occurred.

Possible Injury - Any injury that is reported or claimed which is not a fatal injury, incapacitating injury or non-incapacitating injury.

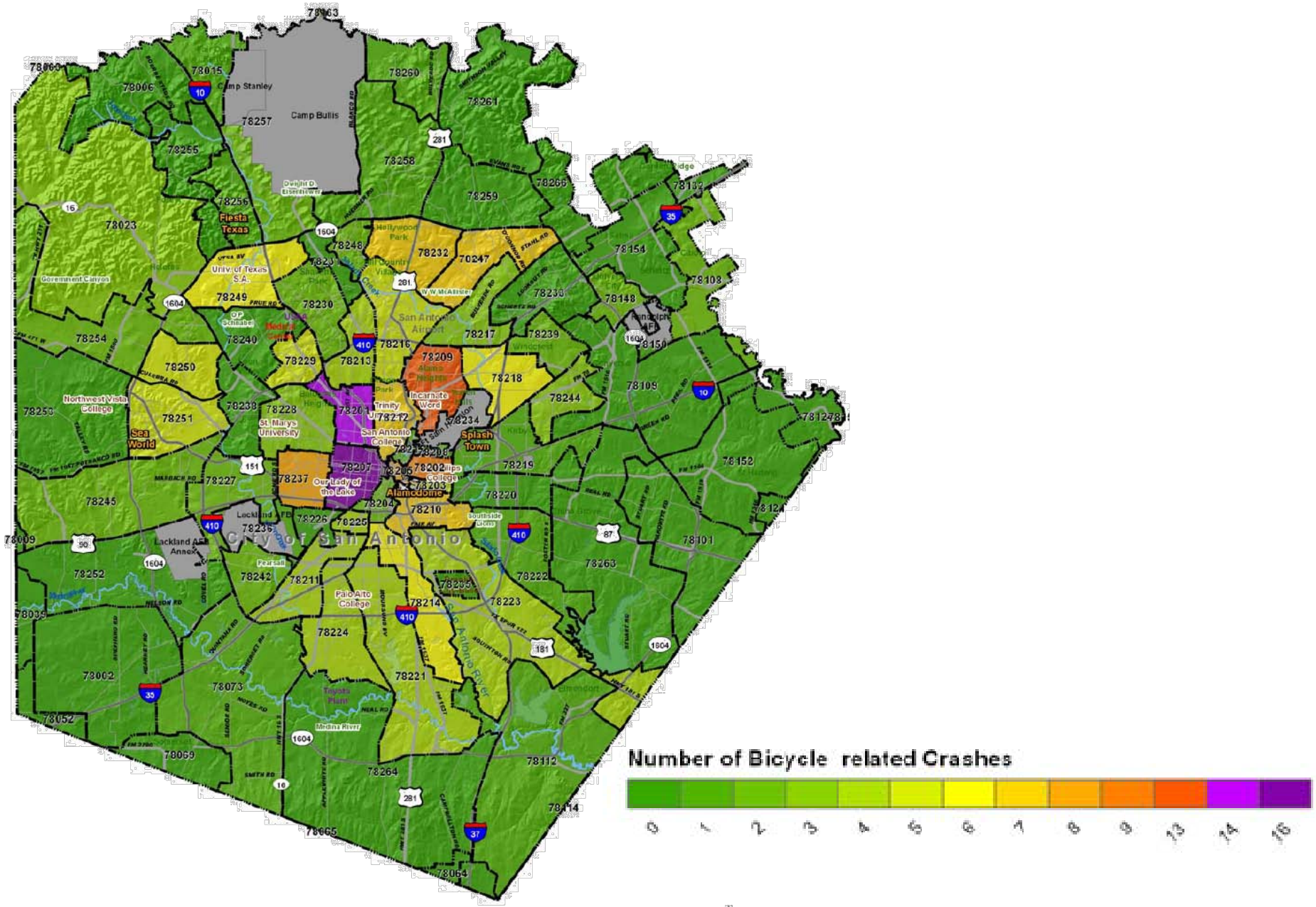
Did you know?

- The first automobile crash involving a cyclist in the United States occurred in New York City in 1896, when a motor vehicle collided with a bicyclist. (www.cycling.org)
- Cyclists were the highest paid athletes in the U.S. until Babe Ruth joined the Yankees.(www.cycling.org)
- Helmet use has been estimated to reduce head injury risk by 85 percent.
- Twenty-onestates and the District of Columbia have helmet laws applying to young bicyclists; none ofthese laws applies to all riders. (www.helmets.org)

Safety Time

On average, one bicyclist is involved in a crash with a vehicle *every other day* in our region.

2010 Safety Study Overview


Number of Bicycle related Crashes
0
1
2
3
4
5
6
7
8
9
13
14
16
City of San Antonio
Camp Stanley
Camp Bullis
Fiesta Texas
Univ. of Texas S.A.
Government Canyon
Northwest Vista College
Sea World
St. Mary's University
Lackland AFB
Lackland AFB Annex
Pearsall
Our Lady of the Lake
Alamodome
Incarnate Word
Trinity
San Antonio College
Splash Town
Palo Alto College
Toyota Plant
Medina River
San Antonio River
Randolph AFB
Kirby
Converse
Universal City
Windcrest
Alamo Heights
Hollywood Park
Olmos Park
Terrell Hills
Leon Valley
Balcones Heights
Castle Hills
Shavano Park
Helotes
Macdona
Somerset
Lytle
Pleasanton
Poteet
Jourdanton
Devine
Natalia
Dunbar
Medina
Lacoste
Von Ormy
Elmendorf
Cibolo
Selma
Schertz
Converse
Kirby
Leon Valley
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Universal City
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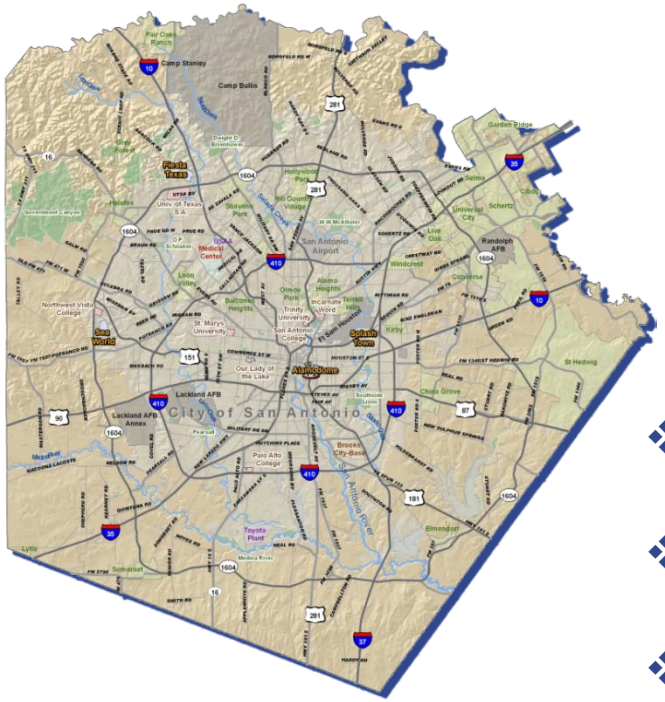
Shavano Park
Balcones Heights
Alamo Heights
Hollywood Park

2010 Safety Study Overview

Study Methodology


Camp Stanley
Camp Bullis
Fair Oaks Ranch
Boerne
Fredericksburg
Pleasanton
Poteet
Pearsall
Devine
Floresville
Seguin
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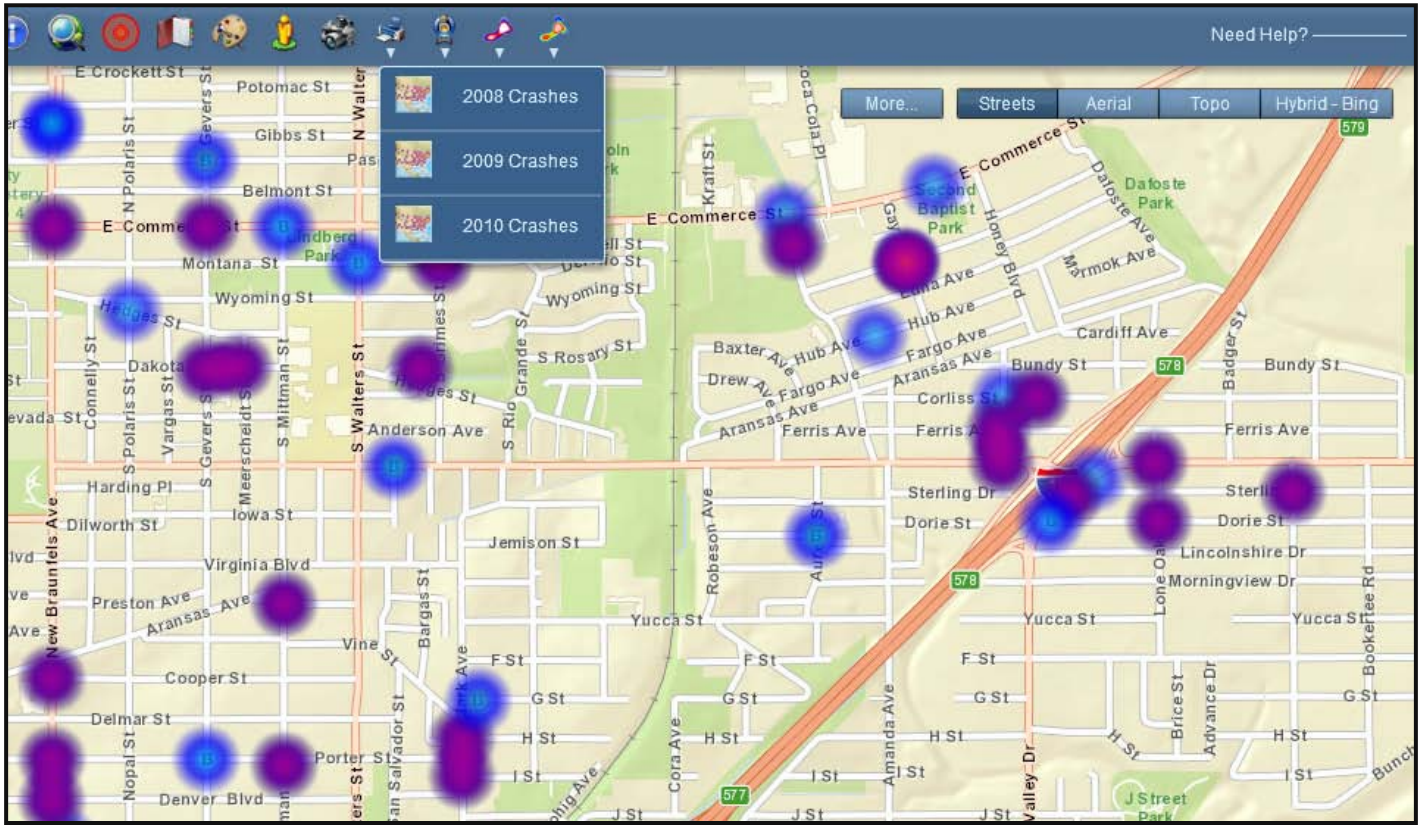
Brooks City-Base
Palo Alto College
Toyota Plant
Elmendorf
Chala Grove
St Hedwig
Lytle
Somerset
Medina River
San Antonio River
Salado Creek
Leon Creek
Medina Lake
Mission Reach
Alamo Heights
Terrell Hills
Olmos Park
Kirby
Windcrest
Converse
Universal City
Schertz
Cibolo
Randolph AFB
Live Oak
Garden Ridge

2010 Safety Study Overview: Next Steps

- Expand data analysis efforts
- Develop an online public friendly format
- Use the most recent available three years of data
- Develop an online application that allows public agencies to directly access data: “iMap”



Who helps us make decisions?

- Transportation Safety Committee
  - Texas Department of Transportation
  - San Antonio Police Department
  - City of San Antonio
  - Silver Eagle Distributors
  - Bexar County Sheriff's office
  - Bexar County GIS Department
  - Mother's Against Drunk Driving
  - Federal Highway Administration

How is the Crash Data Used?

- City of San Antonio Bond Project Selection for 2012
- MPO Project Selection Process
- Walkable Community Workshops
- Bicycle Master Plan
- Pedestrian Safety Action Plan
- San Antonio Police Deployment of Resources
- Education and Awareness Campaigns
- Support Data for Grant Applications (ex: Northside Independent School District)
- Information is made available through the MPO's website

City of San Antonio Bond Program

2012 Bond Projects with 2009 Crash Data

2012 Bond Project :	Limit To:	Limit From:
AT AND T CENTER PKWY	IH 35	HOUSTON

Legend: 2012 Bond Projects with 25ft buffer; 2009 Crash Data; Signalized Intersections

0 385 770 Feet

Total Crashes : 3 Total Injuries: 0 Deaths : 1

Additional Crash Info					
Total Vehicles :	5	Total Pedestrian :	0	Total Incapacitating Injury :	0
Total Persons :	7	Total Bicyclist :	0	Total Non-Incapacitating Injury :	0
Total Drivers :	5	Total Motorcyclist :	0	Total Possible Injury :	0
Total Passengers:	2			Total Non - Injury :	4

Roadway Segment Crash Rate:	
# Crashes: 3	CRASH RATE
Length: 1.2	0.63
Ave. Daily Traffic Vol. 10763	Crashes per Million Vehicles Miles Traveled (MMVT)

Part of the San Antonio - Bexar County Safety Program
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DISCLAIMER:
The MPO makes no claims, promises or guarantees about the accuracy, completeness or adequacy of this information and expressly disclaims liability for any errors or omissions. The appropriate use of such data in other planning programs and studies must be determined entirely by the planners and analysts of the firm or agency undertaking such projects.

MPO Project Scoring Process

No	Entity	Roadway Name	Number of Crashes	Crash Rate per VMT
57	TxDOT	IH 410 Pedestrian Accommodations	0	0.00
59	TxDOT	Loop 13 Pedestrian Facilities	15	1.39
60	TxDOT	Loop 13 Pedestrian Facilities	3	0.68
67	TxDOT	US 87 Bicycle Accommodations	3	0.72

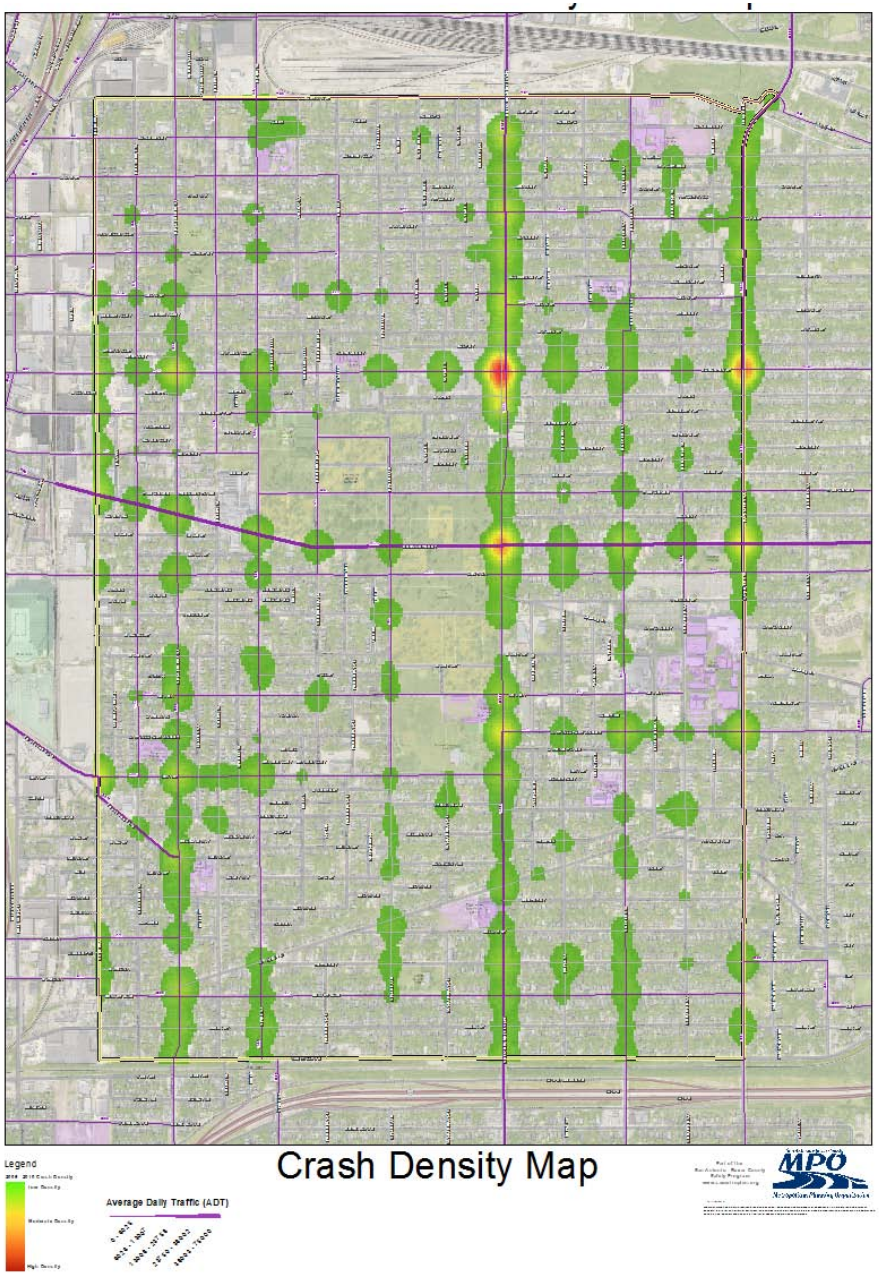
The formula for calculating the crash rate for a roadway segment is presented below. The "Rate" (R) is expressed in crashes per **M**illion **V**ehicle **M**iles **T**raveled (MVMT), which is standard to the Traffic Engineering profession.

$$R = \frac{A * 1{,}000{,}000}{V * 365}$$

Where:

A = Average number of crashes along the study roadway per year
L = Length of roadway segment in miles
V = Average Daily Traffic Volume along the roadway

Walkable Community Workshops



Crash Density Map

Bicycle Master Plan

3 Year Analysis of Bicycle Crashes

MPO Study Area - Overview Stats

Grand Total Bike Crashes	Grand Total Bike Deaths	Grand Total Injuries				Helmet Information	
		Incapacitating	Non-Incapacitating	Possible Injury	Total Injuries	Number of Cyclist involved in a crash wearing a helmet	Number of Cyclist involved in a crash not wearing a helmet
514	7	44	189	210	443	66	388

Unit Information

Grand Total Crashes	Total Persons	Total Vehicles	Total Bicyclists	Total Motorcyclist	Total Pedestrian	Unknown Helmet Info
155,949	1,204	522	520	1	0	66

3 Year Analysis of Bicycle Crashes

San Antonio City Limits- Overview Stats

Total Bike Crashes	Total Bike Deaths	Grand Total Injuries				Helmet Information	
		Incapacitating	Non-Incapacitating	Possible Injury	Total Injuries	Number of Cyclist involved in a crash wearing a helmet	Number of Cyclist involved in a crash not wearing a helmet
462	5	35	166	198	399	55	355

Unit Information

Total Crashes	Total Persons	Total Vehicles	Total Bicyclists	Total Motorcyclist	Total Pedestrian	Unknown Helmet Info
138,348	1,066	469	466	1	0	56

3 Year Analysis of Bicycle Crashes

Inside Loop 410 - Overview Stats

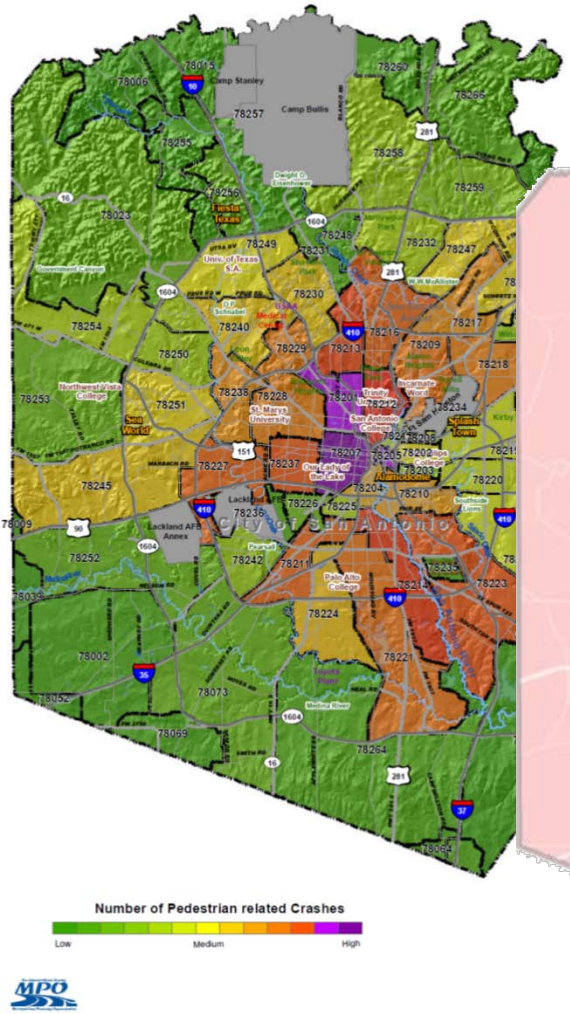
Total Bike Crashes	Total Bike Deaths	Grand Total Injuries				Helmet Information	
		Incapacitating	Non-Incapacitating	Possible Injury	Total Injuries	Number of Cyclist involved in a crash wearing a helmet	Number of Cyclist involved in a crash not wearing a helmet
324	3	22	124	130	276	30	260

Unit Information

Total Crashes	Total Persons	Total Vehicles	Total Bicyclists	Total Motorcyclist	Total Pedestrian	Unknown Helmet Info
75,412	738	328	326	1	0	36

Pedestrian Safety Action Plan

Pedestrian Crash Counts by Zip Codes



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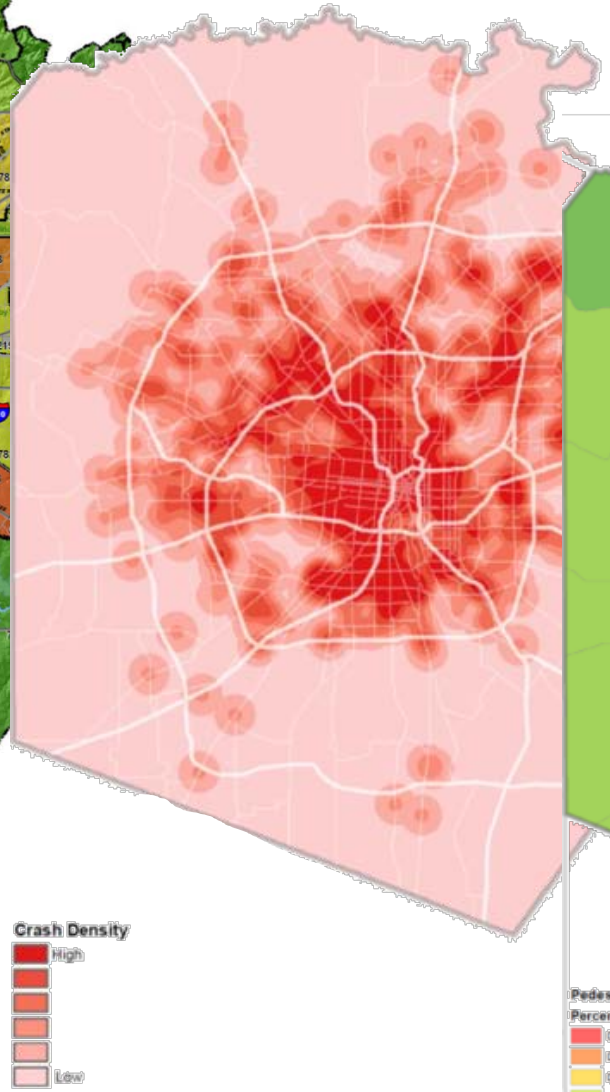
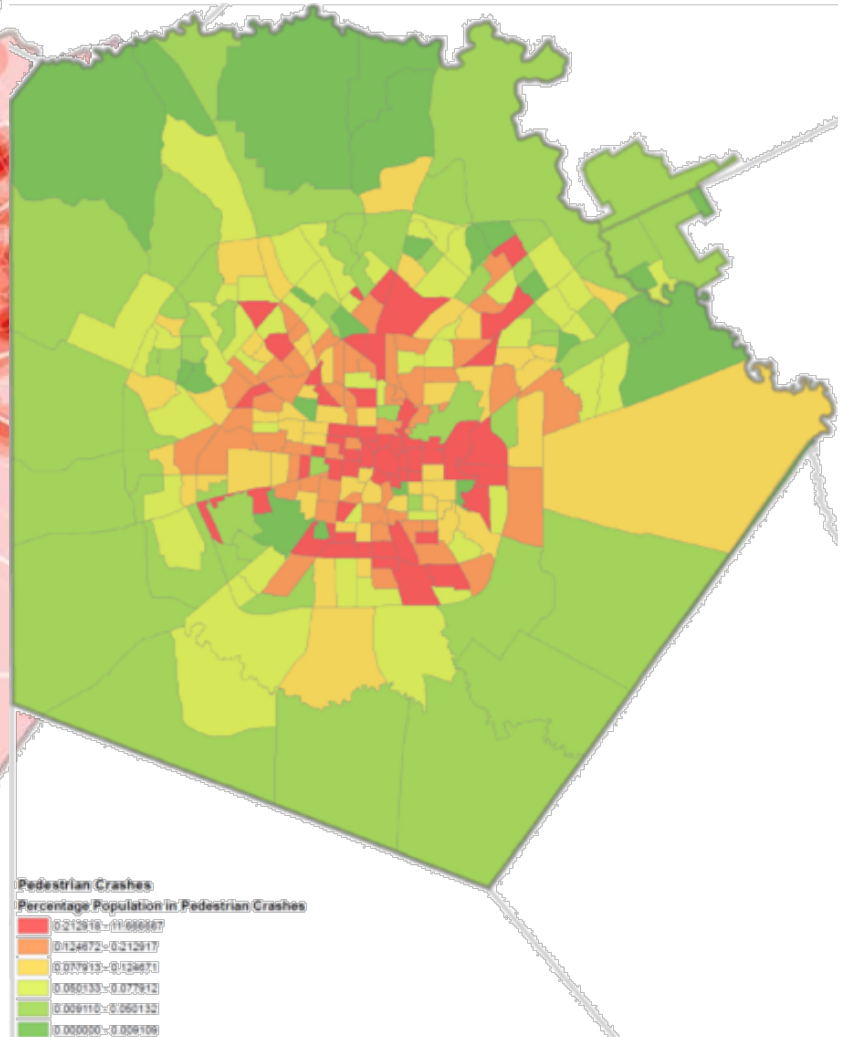
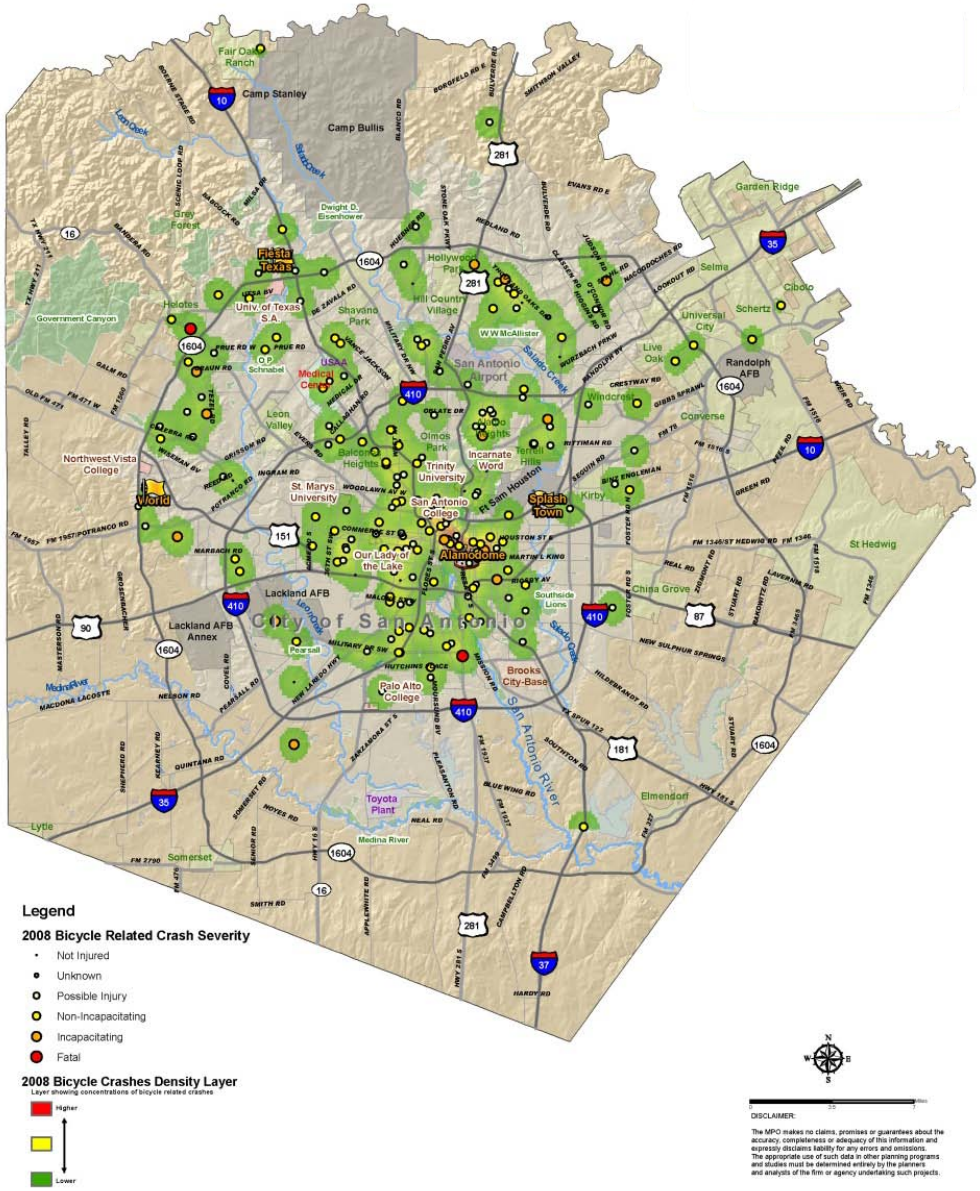
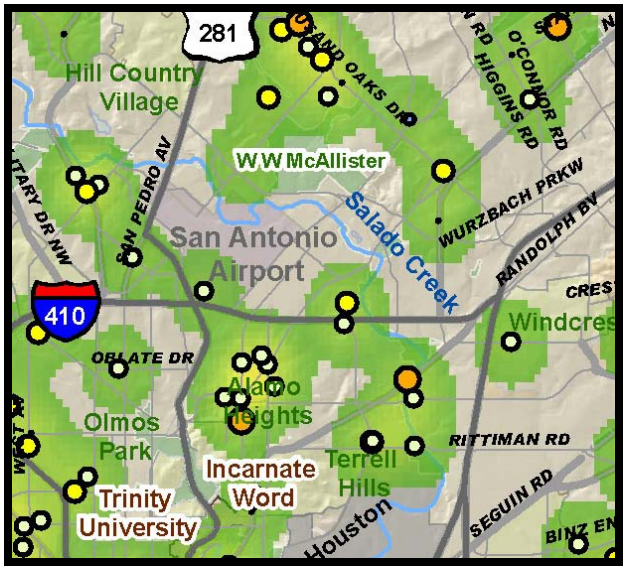


Pedestrian Crash Counts by Census Tracts



Education Campaigns/Grant Applications





Legend

2008 Bicycle Related Crash Severity

- Not Injured
- Unknown
- Possible Injury
- Non-Incapacitating
- Incapacitating
- Fatal

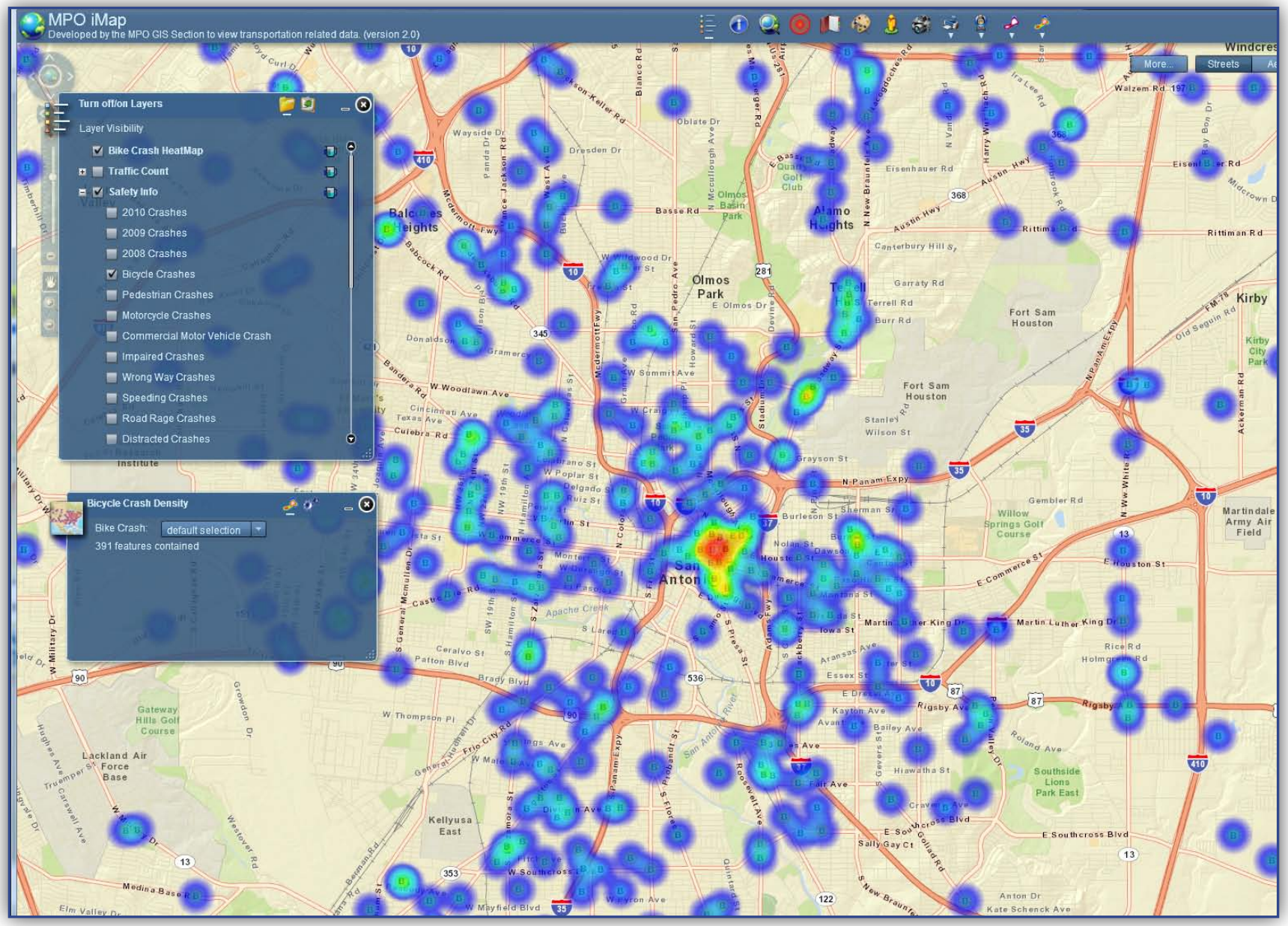
2008 Bicycle Crashes Density Layer

Layer showing concentrations of bicycle related crashes

Higher

Lower

iMap Application Showing Crash Data



Find out more at www.sametroplan.org

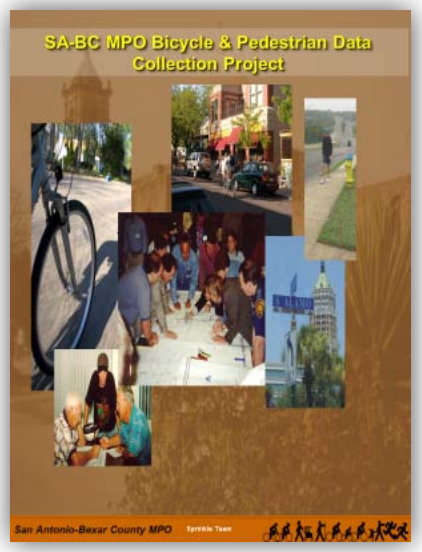
MPO's 2012 Safety Study

- New Partnerships with Non-Traditional Stakeholders
- Feedback has enhanced quality of data collection, analysis and reporting methods
- More information can be accessed online
- More in-depth information for each of the analysis areas
- Further analyze the additional contributing factors
- Uses CRIS data for most recent three years

The Next Level: Data Analysis in Transportation Safety Planning

Cecilio Martinez
Senior GIS & Web Analyst
Phone: (210) 230-6905
Email: martinez@sametroplan.org

A Closer Look at the Safety Related Studies



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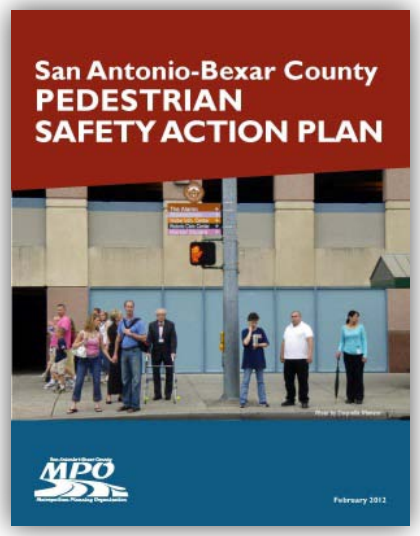

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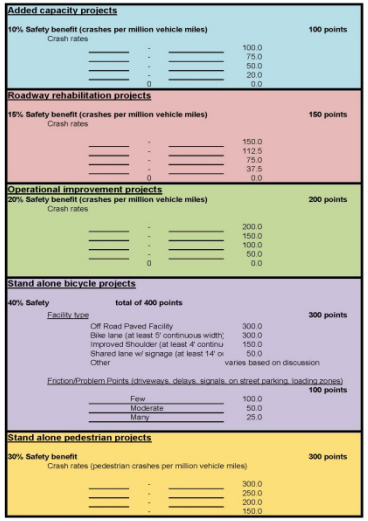

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Many	25.0

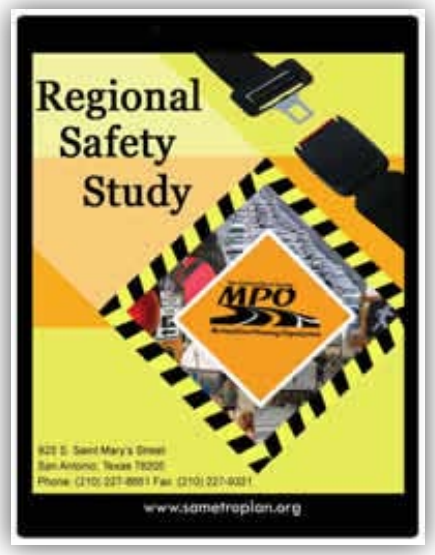
Stand alone pedestrian projects

30% Safety benefit — 300 points

Crash rates (pedestrian crashes per million vehicle miles)

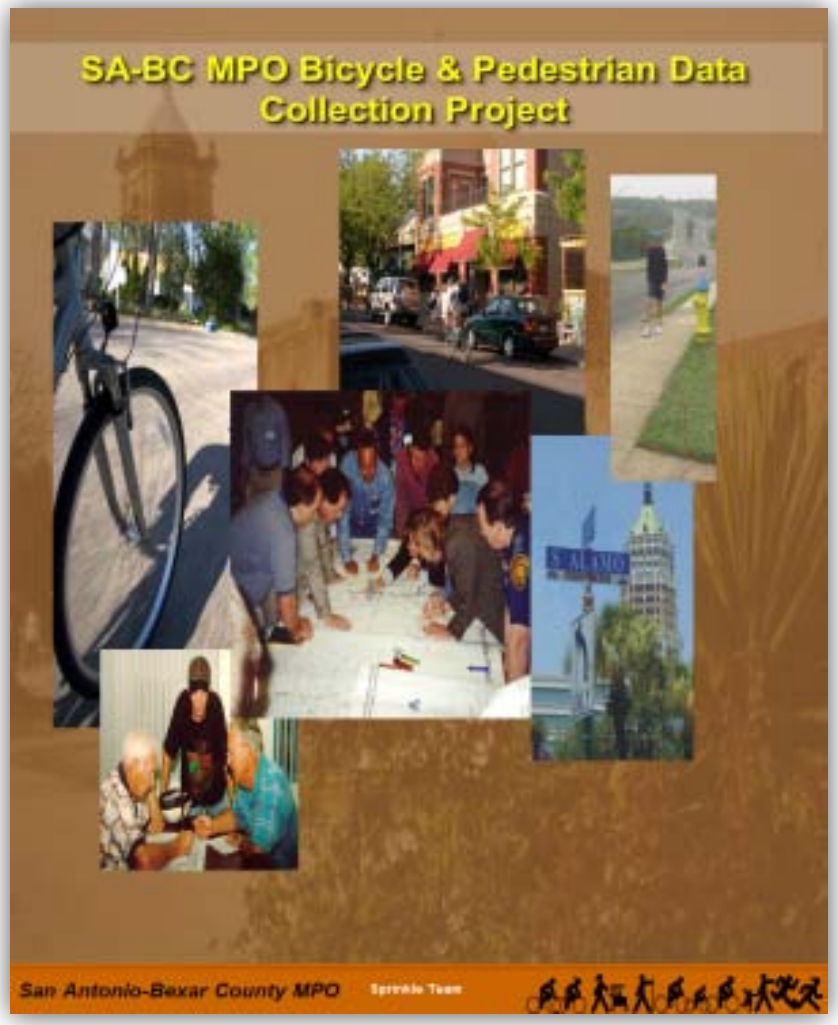
_____	-	_____ 300.0
_____	-	_____ 250.0
_____	-	_____ 200.0
_____	-	_____ 150.0

Project Scoring Criteria (2012)



Regional Safety Study (2010)

Bicycle & Pedestrian Data Collection Project



Phase I: Data Collection and Analysis

- Bicycle Level of Suitability
- Bicycle Maps

Phase II: Identification of Potential Bicycle Facilities

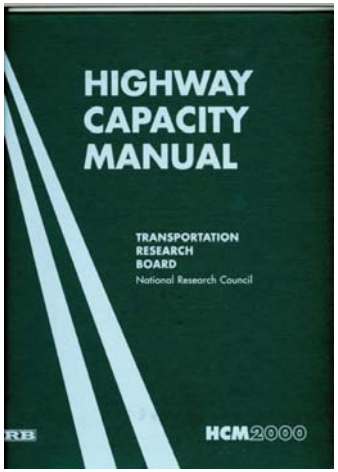
- Roadway Restripe Candidates
- Road Diet Candidates
- Add Paved Shoulders

What is Bicycle Level of Suitability(BLOS)?

What is Bicycle Level of Suitability (BLOS)?

Bicycle Level of Suitability (BLOS) attempts to place a rating on the experience of bicycling on the transportation networks of collector, arterial, service and local roads. The rating ranges from A to F, good to bad respectively along the lines of the automobile level of service (LOS) model.

$$a_1 \ln(Vol_{15}/L) + a_2 SP_t(1+10.38HV)^2 + a_3(1/PC_5)^2 - a_4(W_e)^2 + C$$

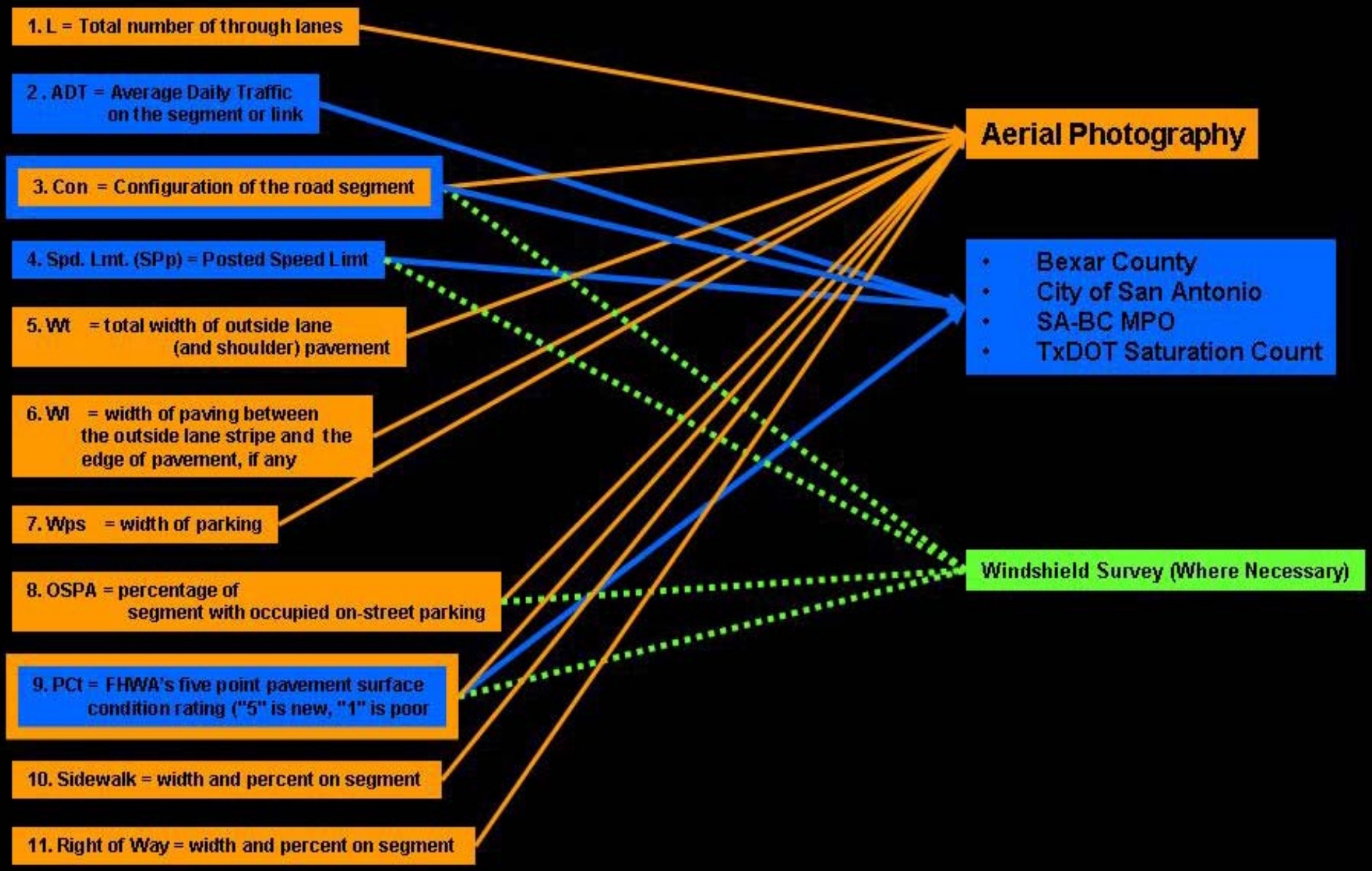


where:

Vol_{15}	=	directional traffic (15 minutes time period)
L	=	total number of *through* lanes
SP_t	=	effective speed limit (see below)
		$SP_t = 1.12\ln(SP_P - 20) + 0.81$
		SP_P = Posted speed limit
HV	=	percentage of heavy vehicles
PC_5	=	FHWA's five point surface condition rating
W_e	=	Average effective width of outside through lane

Sprinkle CONSULTING

Key Inputs for BLOS Evaluation



Why Aerial Photography or Orthophoto Imagery?

Orthophoto Imagery

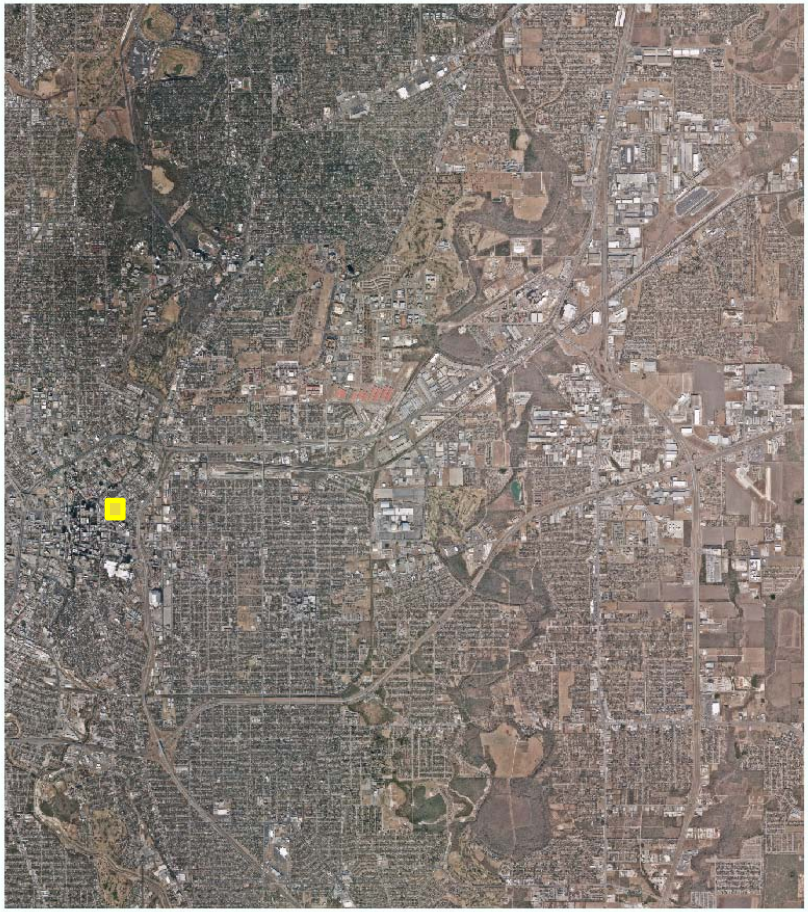
Digital orthophoto is a computer-generated image of an aerial photograph or aerial digital image in which displacements caused by camera orientation and terrain have been corrected and the image has been projected to a standardized map projection.

In other words, digital orthophotos are special photos because they have been processed to be spatially accurate.

The MPO has imagery at 4 inch pixel resolution

The resolution number represents the distance covered by one pixel in the image. Therefore, a 4 inch image is an image where 1 pixel is equal to 4 inches.

Aerial Photography

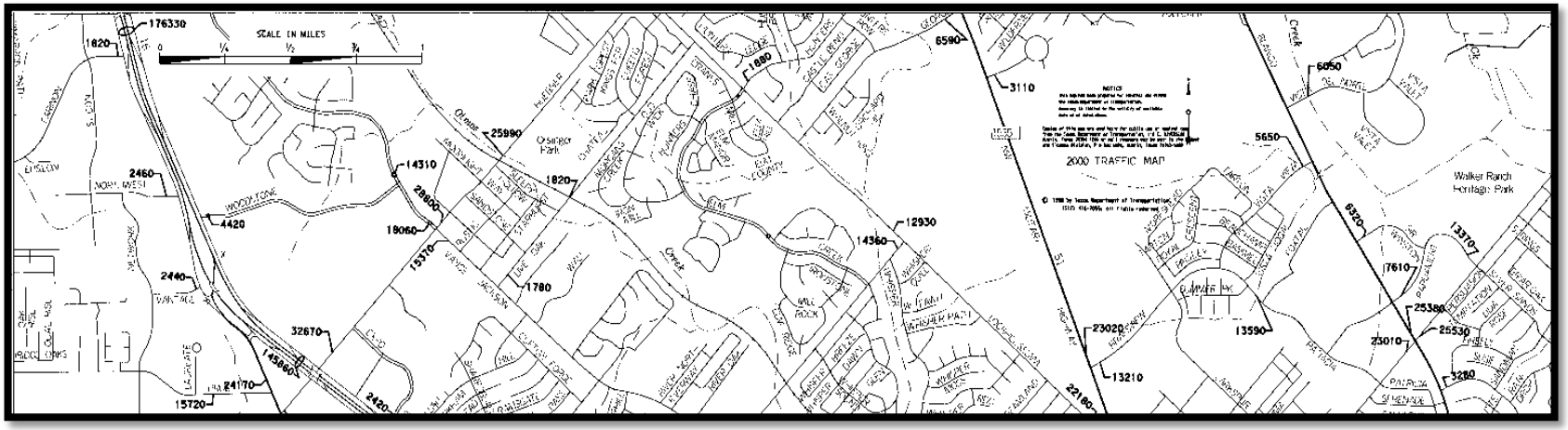


Our imagery is updated every year from our partnership with the City of San Antonio, Bexar County Appraisal District and Bexar Metro 9-1-1, which are part of the MPO's Strategic Geospatial Coordination Committee (SGCC).

Quickly Identify Geometrics

Traffic Counts

Texas Department of Transportation



City of San Antonio

Microsoft Access - [Traffic Count Data Base : Table]

File Edit View Insert Format Records Tools Window Help

Major Street	Locatio	Cross Street	Direction	Date Counted	Volume	85%
19th	S of	Culebra	NB	9/24/2002	1185	
19th	S of	Monterey	SB	2/1/2005	2037	
19th	S of	Monterey	NB	2/1/2005	2022	
22nd	S of	Laurel	NB	1/22/2004	238	
22nd	S of	Larurel	SB	1/22/2004	382	
22nd	S of	Laurel	NB	1/22/2004	238	
22nd	S of	Laurel	SB	1/22/2004	382	
26th Street	N of	Travis	NB	4/6/2005	695	
26th Street	N of	Travis	SB	4/6/2005	771	
28th	S of	Poplar	NB	5/22/2002	722	

Record: 1 of 3981

Enter the number of Vehicles per Day

Bexar County

Adobe Acrobat Standard - [Alpha_Traffic_Counts.pdf]

File Edit View Document Tools Advanced Window Help

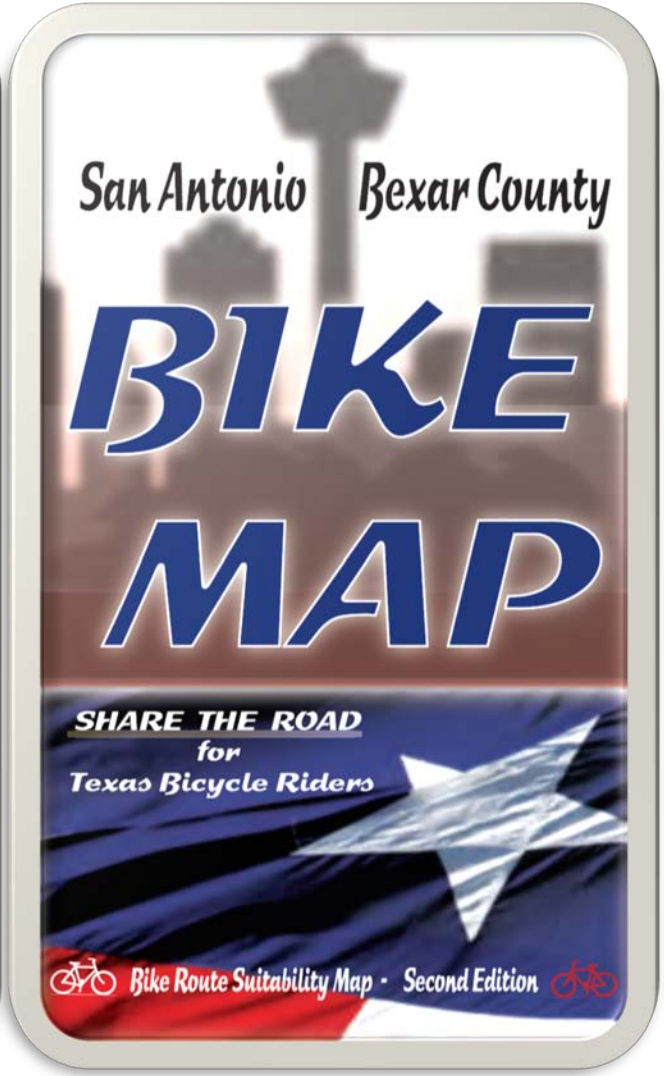
180%

LOCATION	STA #	2005	2004	2
3rd ST South of MACDONA-LACOSTE RD	714	129	140	
4th ST South of MACDONA-LACOSTE RD	715	228	276	
6th ST South of MACDONA-LACOSTE RD	718	109	98	
7th ST South of MACDONA-LACOSTE RD	719	111	108	
ABBOTT RD East of F.M. 1518	253	513	537	
ABBOTT RD North of F.M. 1346	348	331	332	
ABBOTT RD West of F.M. 1518	252	264	218	
ABBOTT RD West of F.M. 2538	250	203	196	
ADAMS HILL DR East of HUNT LN	296	COSA	COSA	C
ADAMS HILL DR West of HUNT LN	298	COSA	COSA	C
ADDERSLY DR South of LOOP 1604	99	COSA	COSA	C
ADDISON RD NORTH West of U.S. 281 SOUTH	533	496	462	
ADDISON RD SOUTH West of U.S. 281 SOUTH	532	125	129	

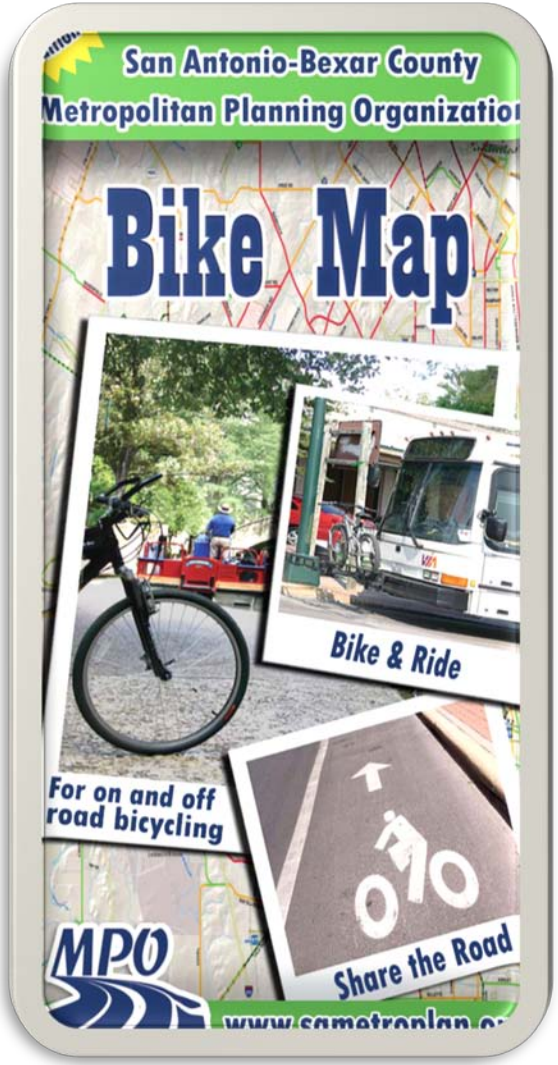
11 x 8.5 in

Bike Maps Showing BLOS and Existing Facilities

2003

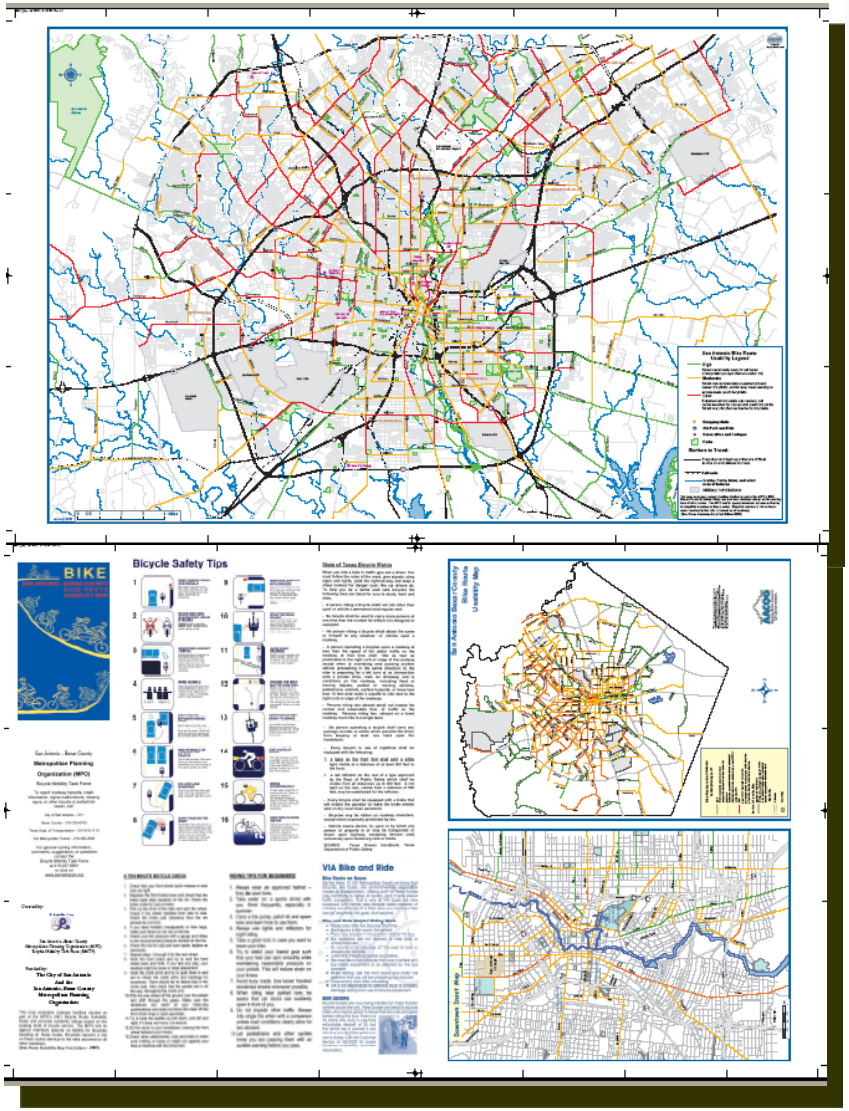


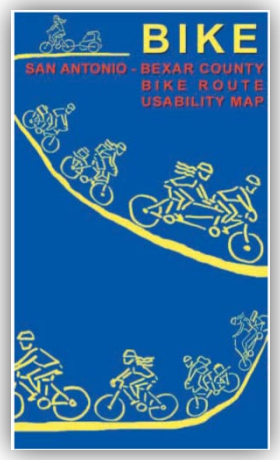
2005



2009

2001 Bicycle Study with 2003 Bicycle Map



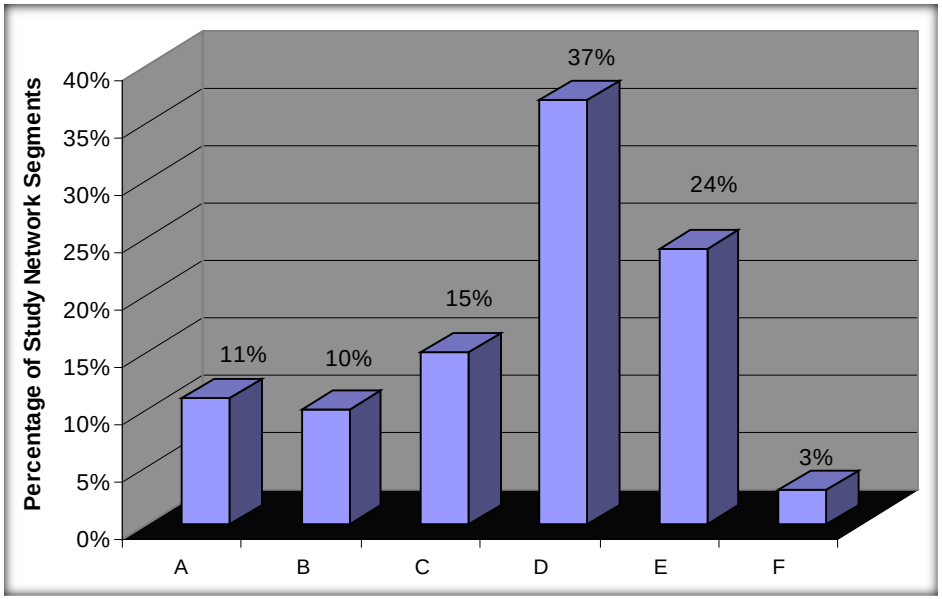


1,000 miles of roadway studied

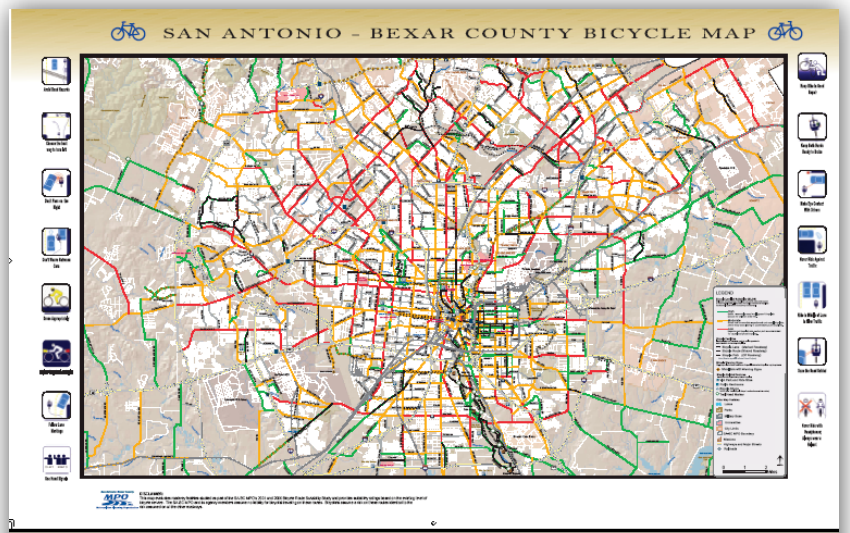
34 miles of bicycle facilities existed

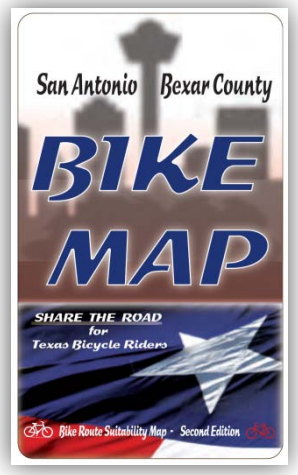
10,000 bike map copies

Bicycle Level of Suitability



2005 Bicycle Study with Bicycle Map



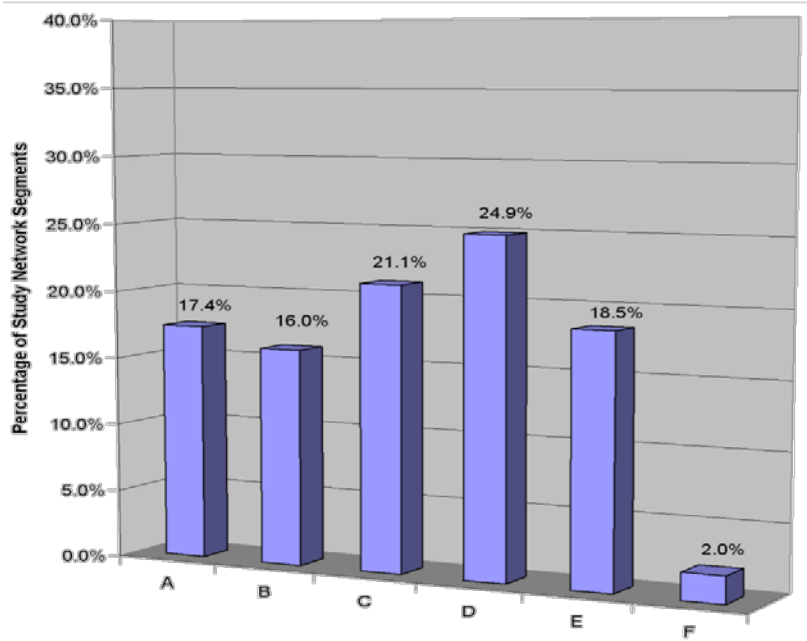


1,400 miles of roadway studied

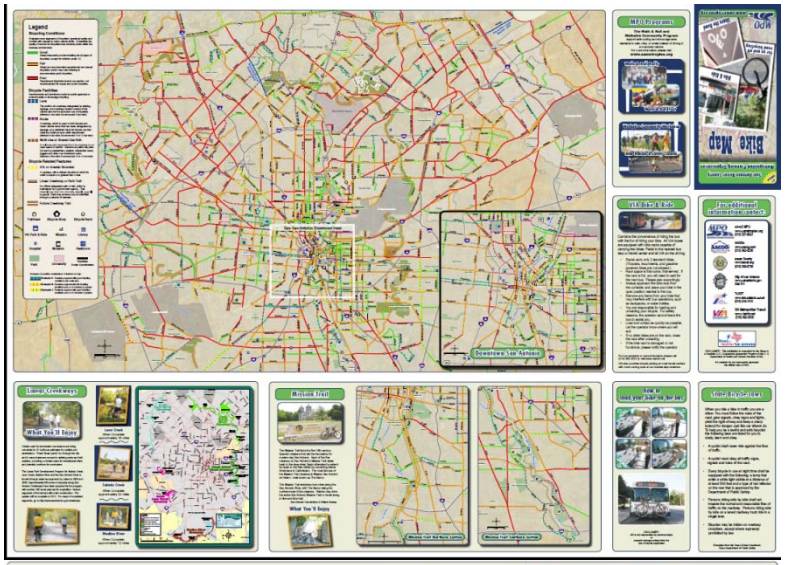
66 miles of bicycle facilities existed

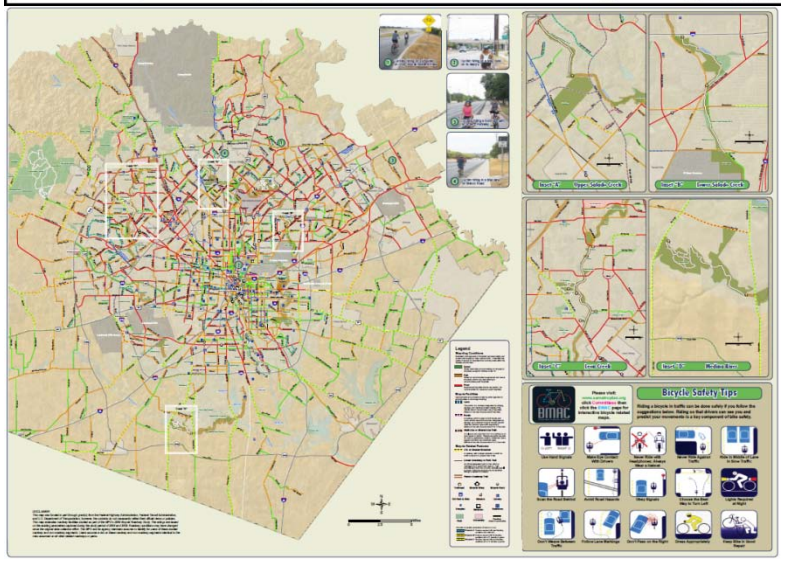
45,000 bike map copies

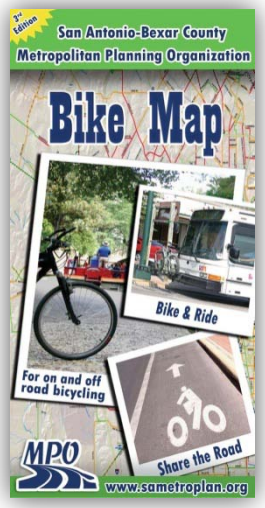
Bicycle Level of Suitability



2009 Bicycle Study with Bicycle Map



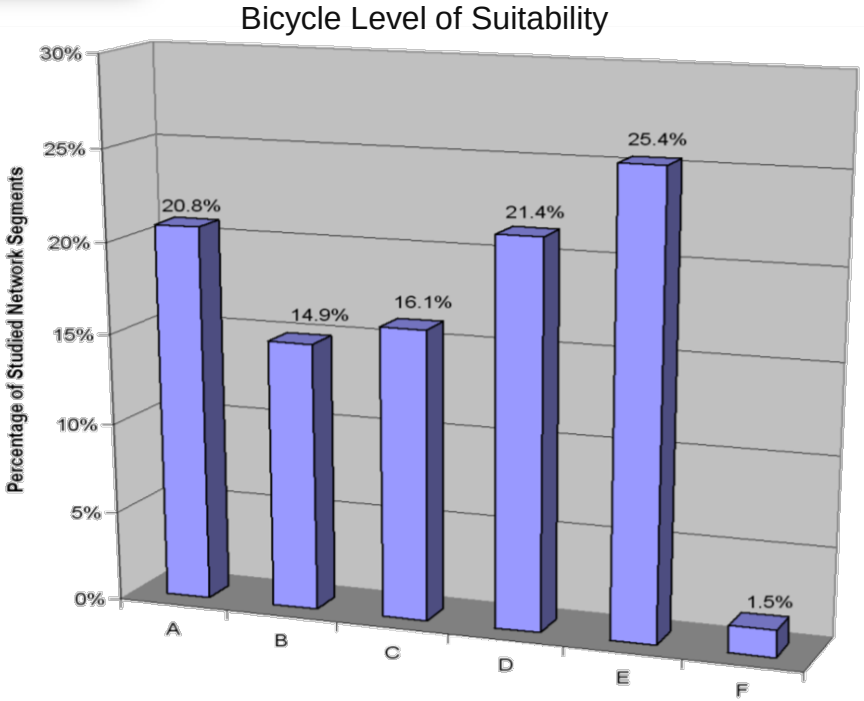




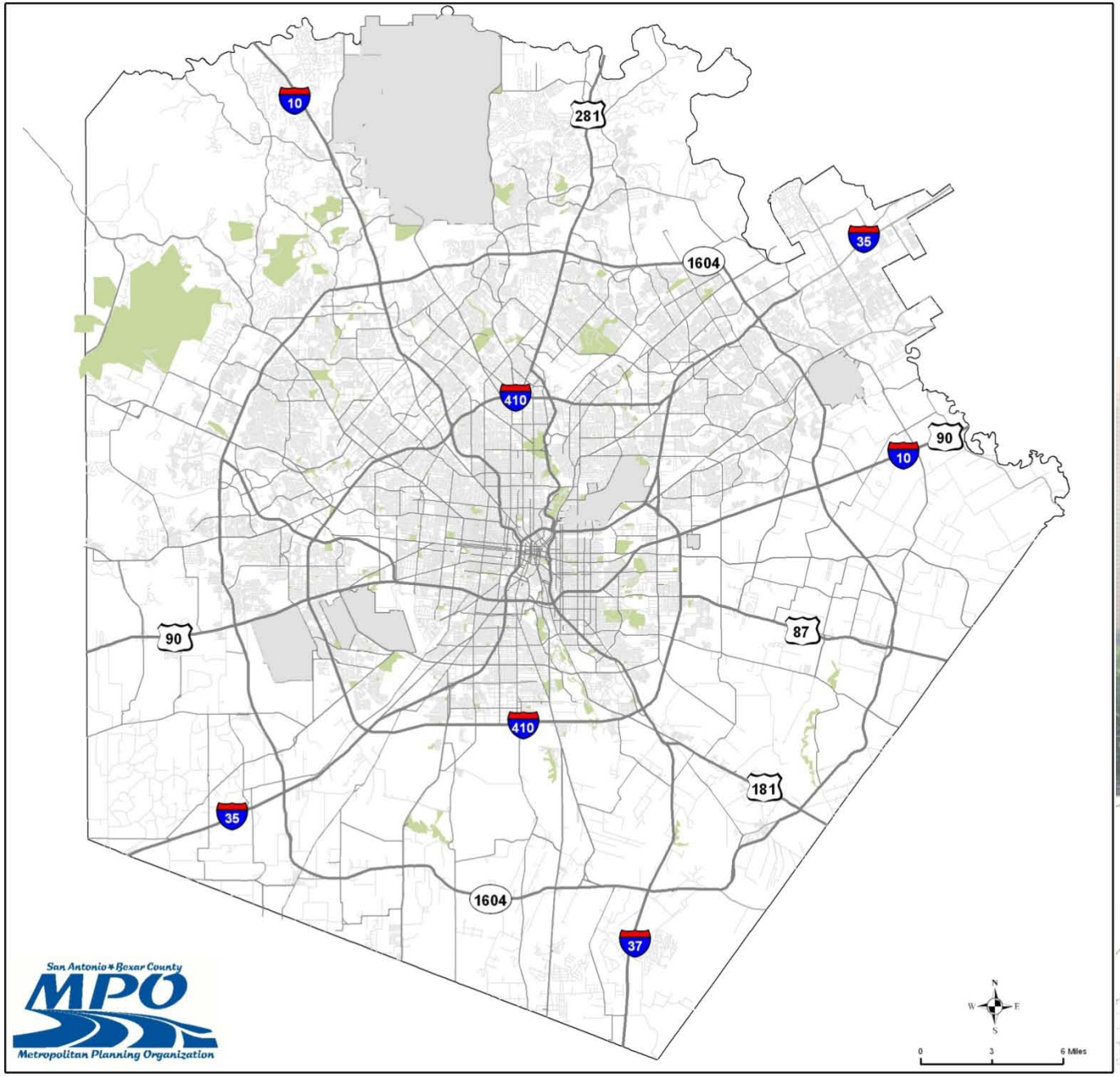
1,664 miles of roadway studied

136 miles of bicycle facilities

30,000 bike map copies



Bicycle Facilities

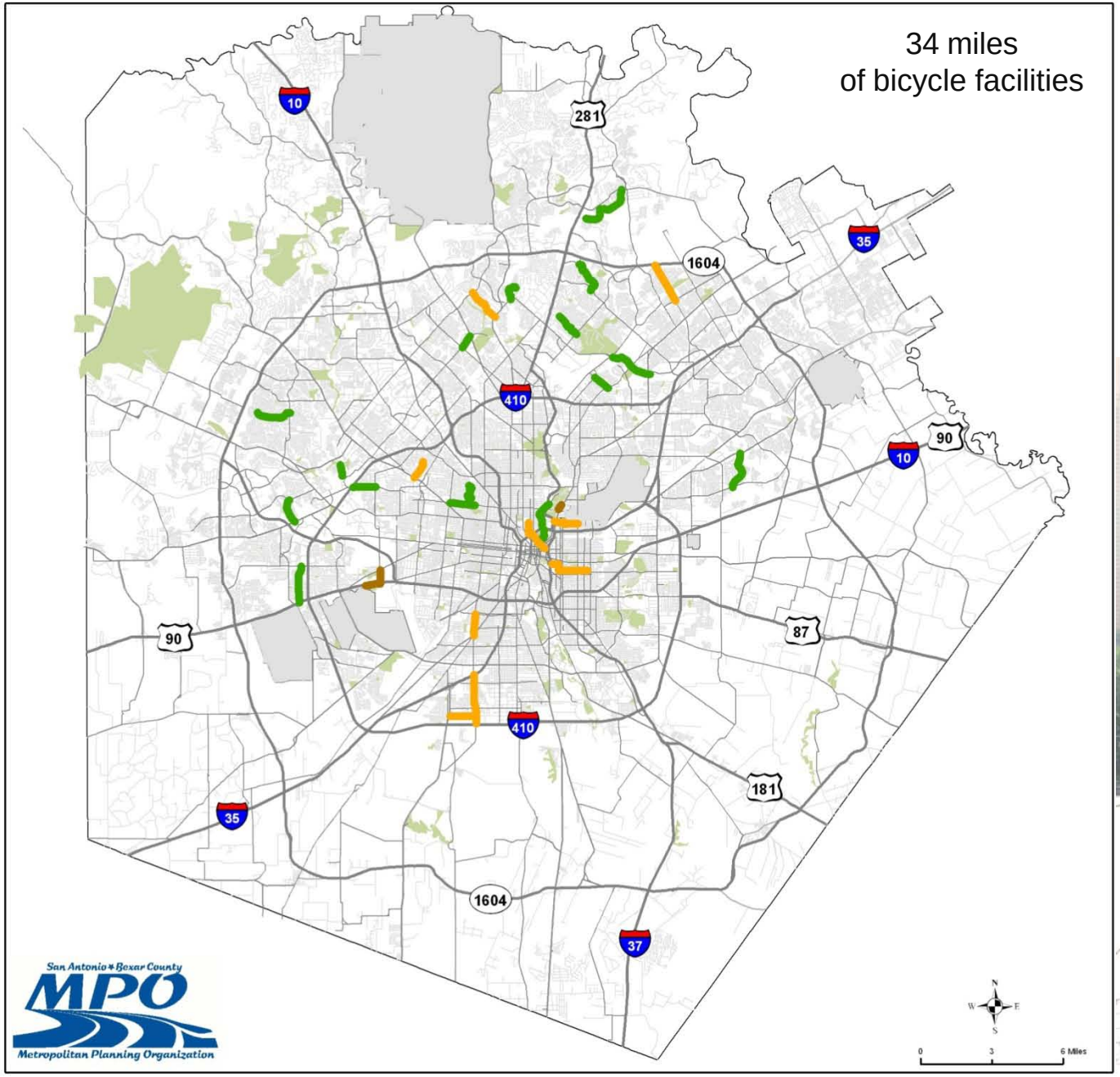


Legend

- Lane
- Route
- Path

Bicycle Facilities in 2000

34 miles
of bicycle facilities



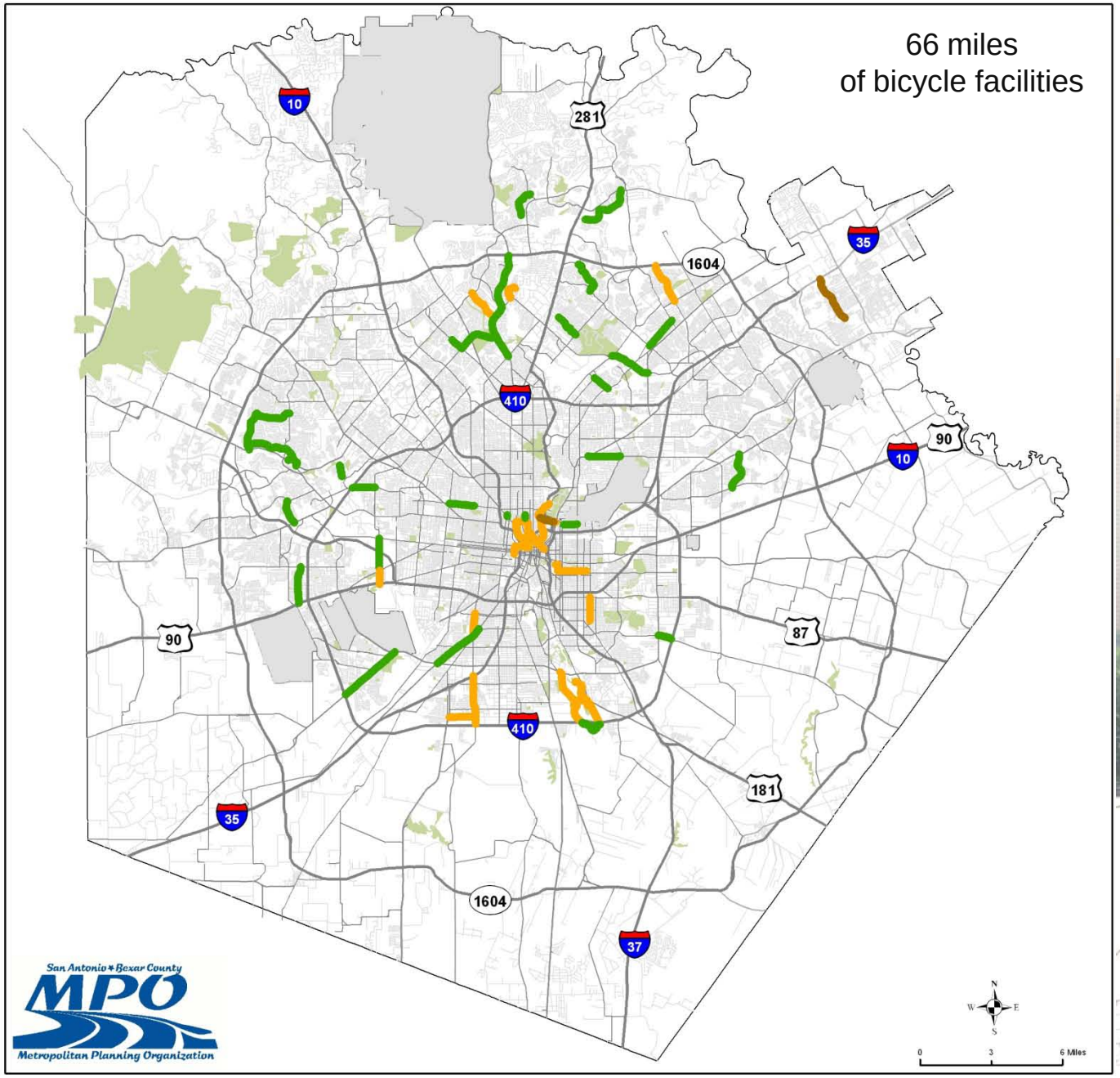
Legend

- Lane
- Route
- Path

San Antonio + Bexar County
MPO
Metropolitan Planning Organization

Bicycle Facilities in 2004

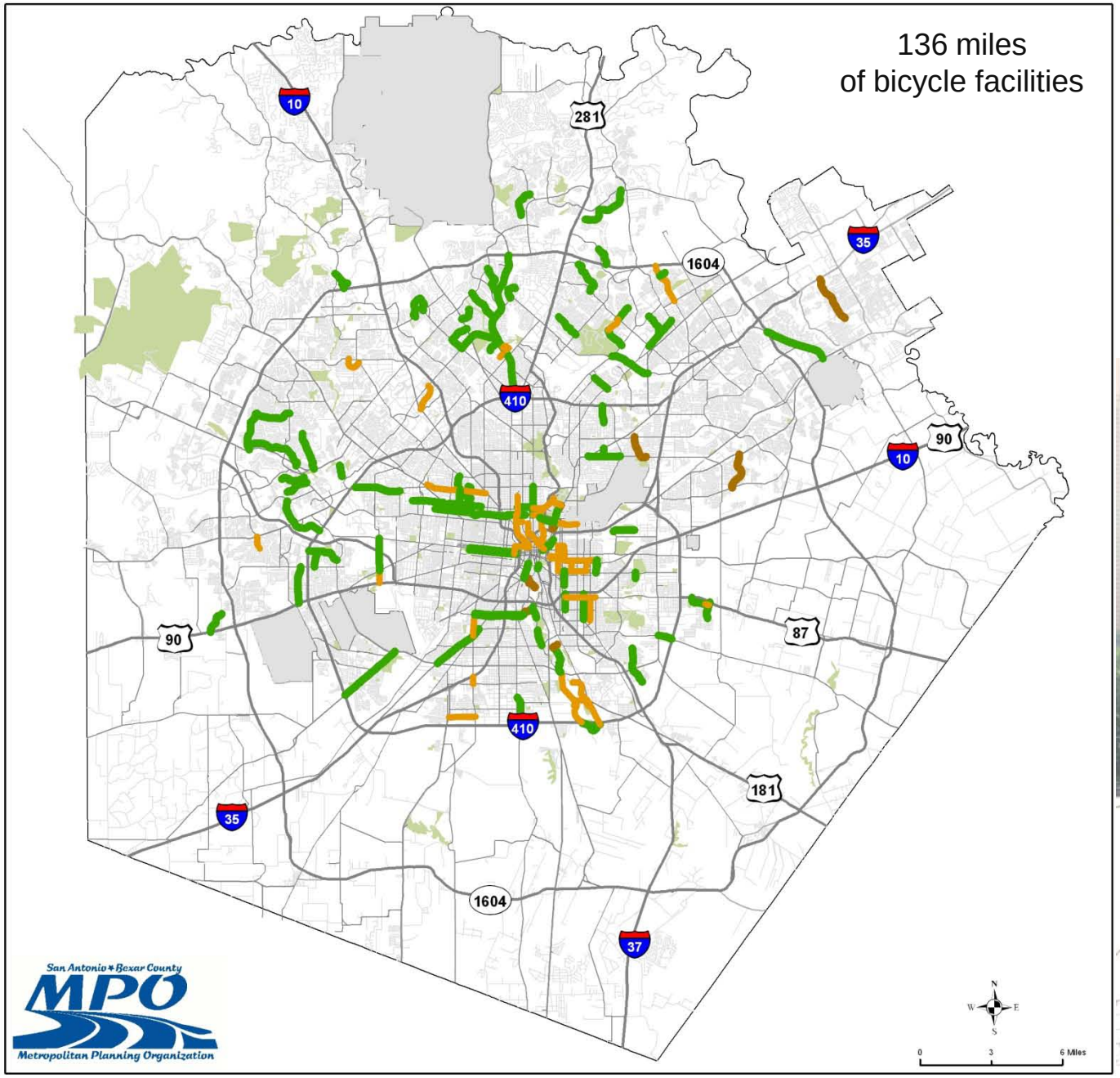
66 miles
of bicycle facilities



Legend

- Lane
- Route
- Path

Bicycle Facilities in 2009

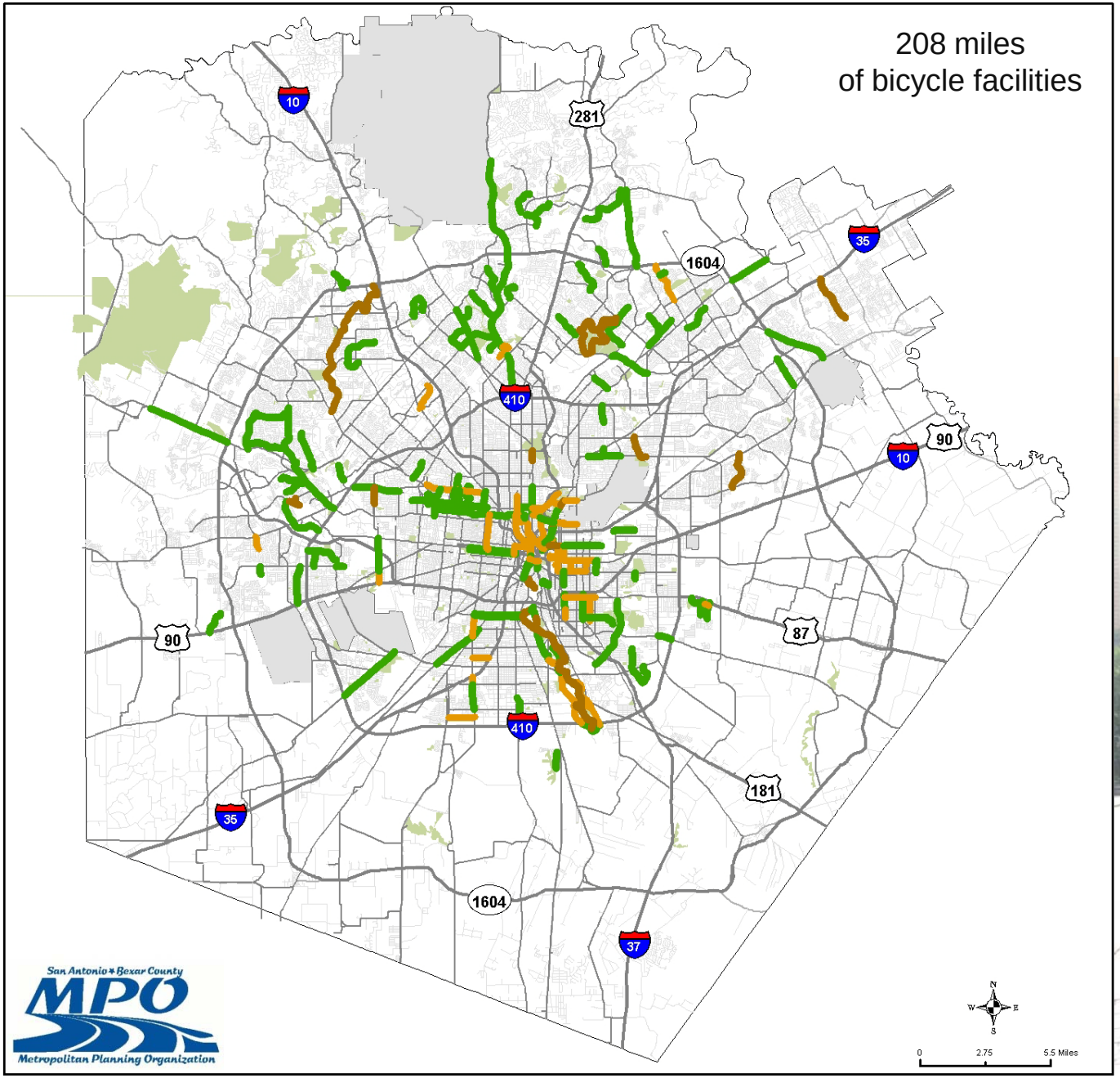


Legend

- Lane
- Route
- Path

Bicycle Facilities in 2011

208 miles
of bicycle facilities

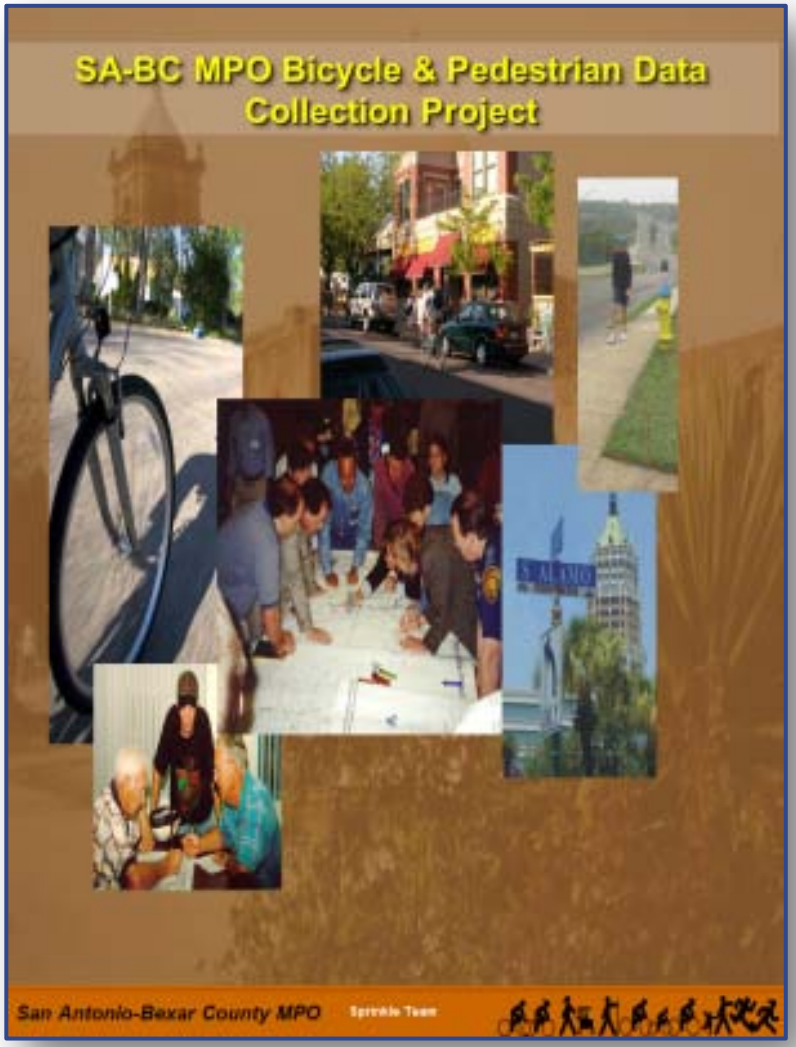


San Antonio • Bexar County
MPO
Metropolitan Planning Organization

Legend

- Lane
- Route
- Path

Bicycle & Pedestrian Data Collection Project Phase II



1. Existing/Programmed Paved Shoulders or Bike Lanes
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. Add Paved Shoulders
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II

1. **Existing / Programmed Paved Shoulders or Bike Lanes**
   - Shoulders 4 feet or greater
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. Add Paved Shoulders
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II

1. Existing/Programmed Paved Shoulders or Bike Lanes

2. **Bicycle LOS Threshold Met**
   - Bicycle LOS “B” for all collector and local streets, as well as arterials within one mile of the existing/planned Linear Creekway system
   - Bicycle LOS “C” for all other arterial streets

3. Roadway Restripe Candidate

4. Road Diet Candidate

5. Add Paved Shoulders

6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II

1. Existing/Programmed Paved Shoulders or Bike Lanes

2. Bicycle LOS Threshold Met

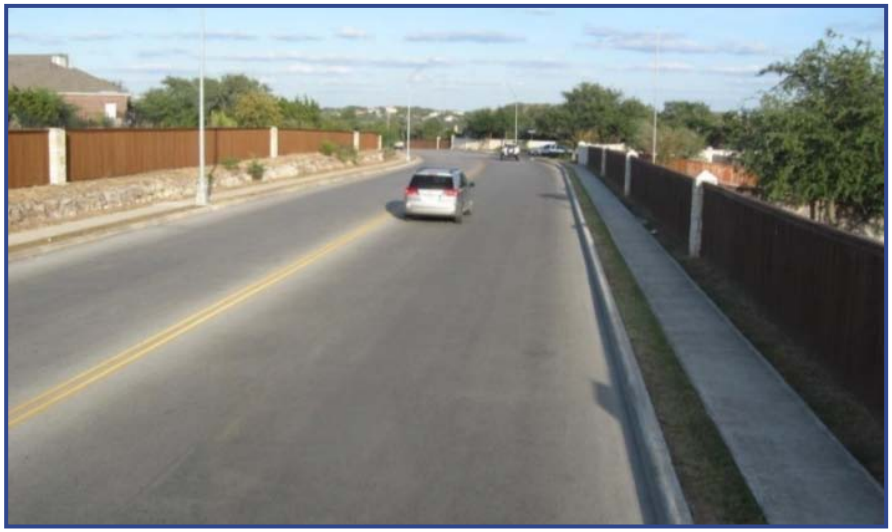
3. **Roadway Restripe Candidate**
   - City of San Antonio: 10 foot lane width (11 feet if along a VIA route or a road with significant horizontal curvature)
   - TxDOT: 11 foot lane width
   - Bexar County: 12 foot lane width

4. Road Diet Candidate

5. Add Paved Shoulders

6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II



1. Existing/Programmed Paved Shoulders or Bike Lanes

2. Bicycle LOS Threshold Met

3. **Roadway Restripe Candidate**
   - City of San Antonio: 10 foot lane width (11 feet if along a VIA route or a road with significant horizontal curvature)
   - TxDOT: 11 foot lane width
   - Bexar County: 12 foot lane width

4. Road Diet Candidate

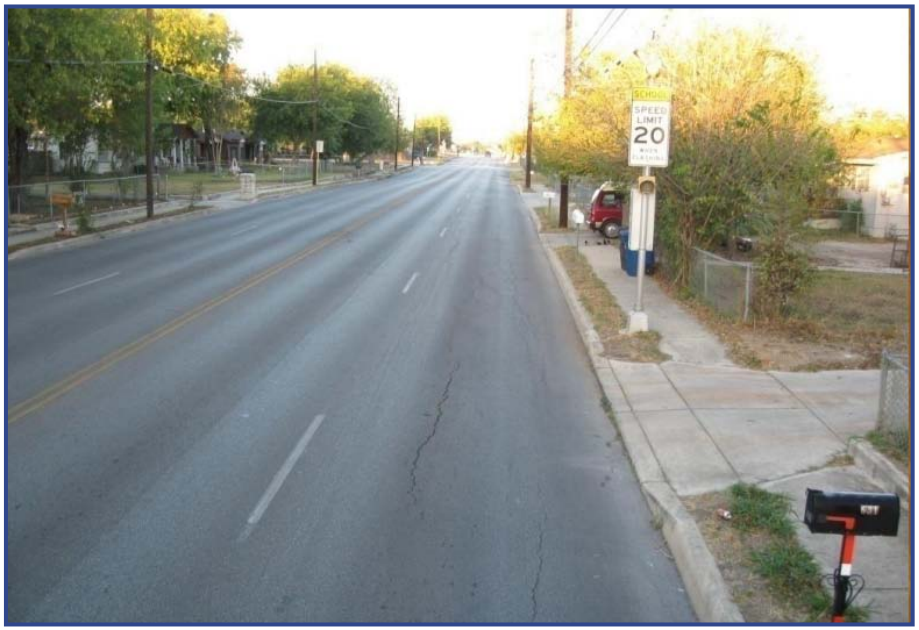
5. Add Paved Shoulders

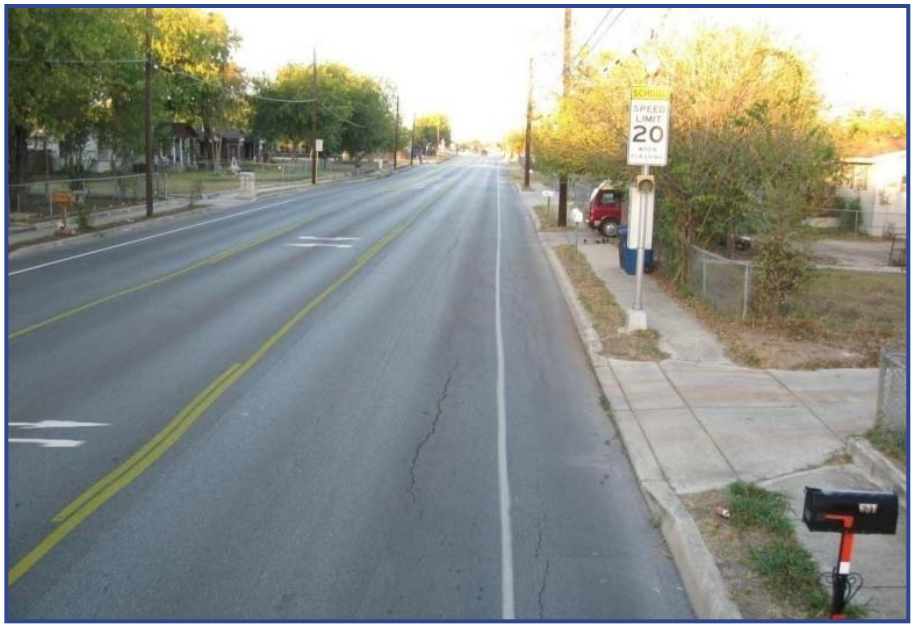
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II

1. Existing/Programmed Paved Shoulders or Bike Lanes
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. **Road Diet Candidate**
   - Motor Vehicle LOS “C” or better
5. Add Paved Shoulders
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II



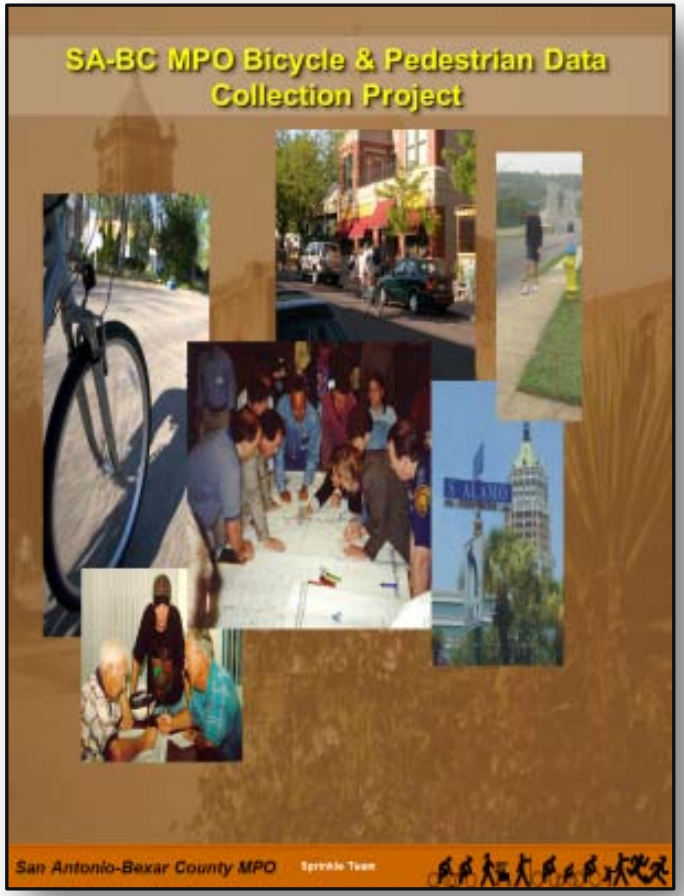


1. Existing/Programmed Paved Shoulders or Bike Lanes
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. **Road Diet Candidate**
   - Motor Vehicle LOS “C” or better
5. Add Paved Shoulders
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II

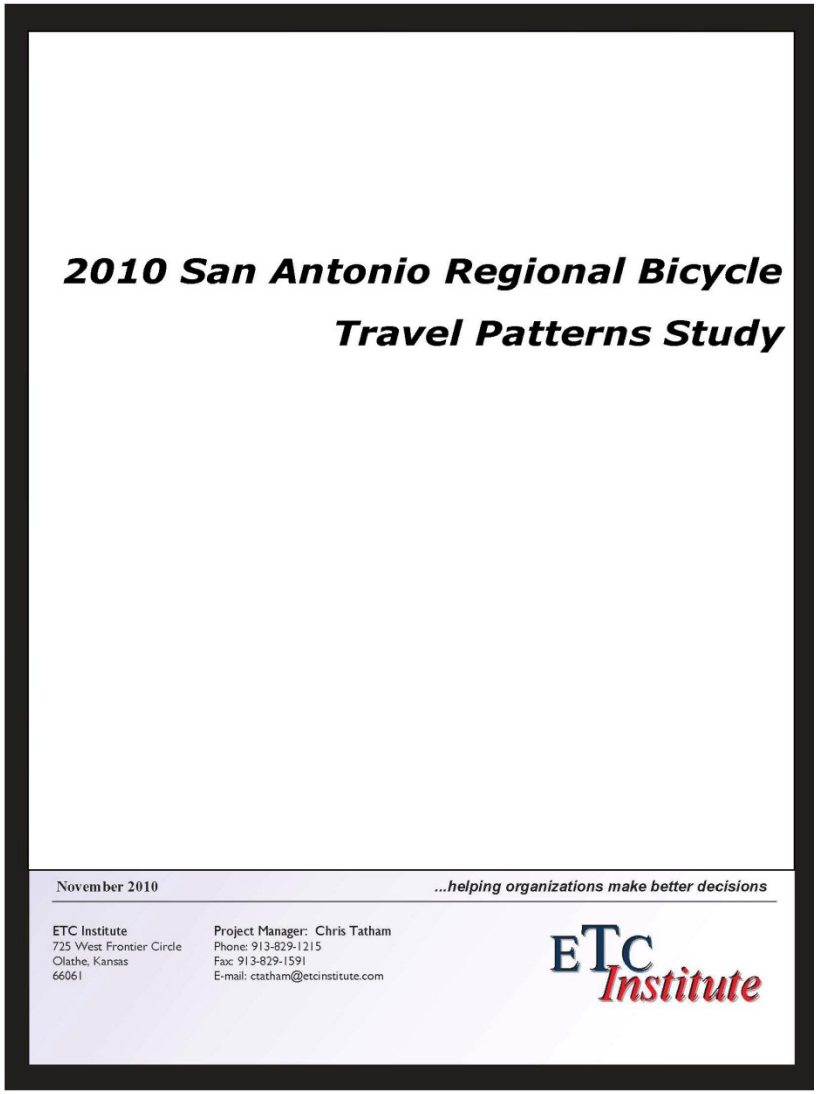
1. Existing/Programmed Paved Shoulders or Bike Lanes
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. **Add Paved Shoulders**
   - If Right-Of-Way is available and Cross Section allows for it
6. Detailed Corridor Study Needed

Bicycle & Pedestrian Data Collection Project Phase II



1. Existing/Programmed Paved Shoulders or Bike Lanes
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. Add Paved Shoulders
6. **Detailed Corridor Study Needed**
   - Conditions warrant additional study to determine feasibility

San Antonio Regional Bicycling Travel Patterns Survey



2010 San Antonio Regional Bicycle Travel Patterns Study

November 2010

...helping organizations make better decisions

ETC Institute
725 West Frontier Circle
Olathe, Kansas
66061

Project Manager: Chris Tatham
Phone: 913-829-1215
Fax: 913-829-1591
E-mail: ctatham@etcinstitute.com

ETC Institute

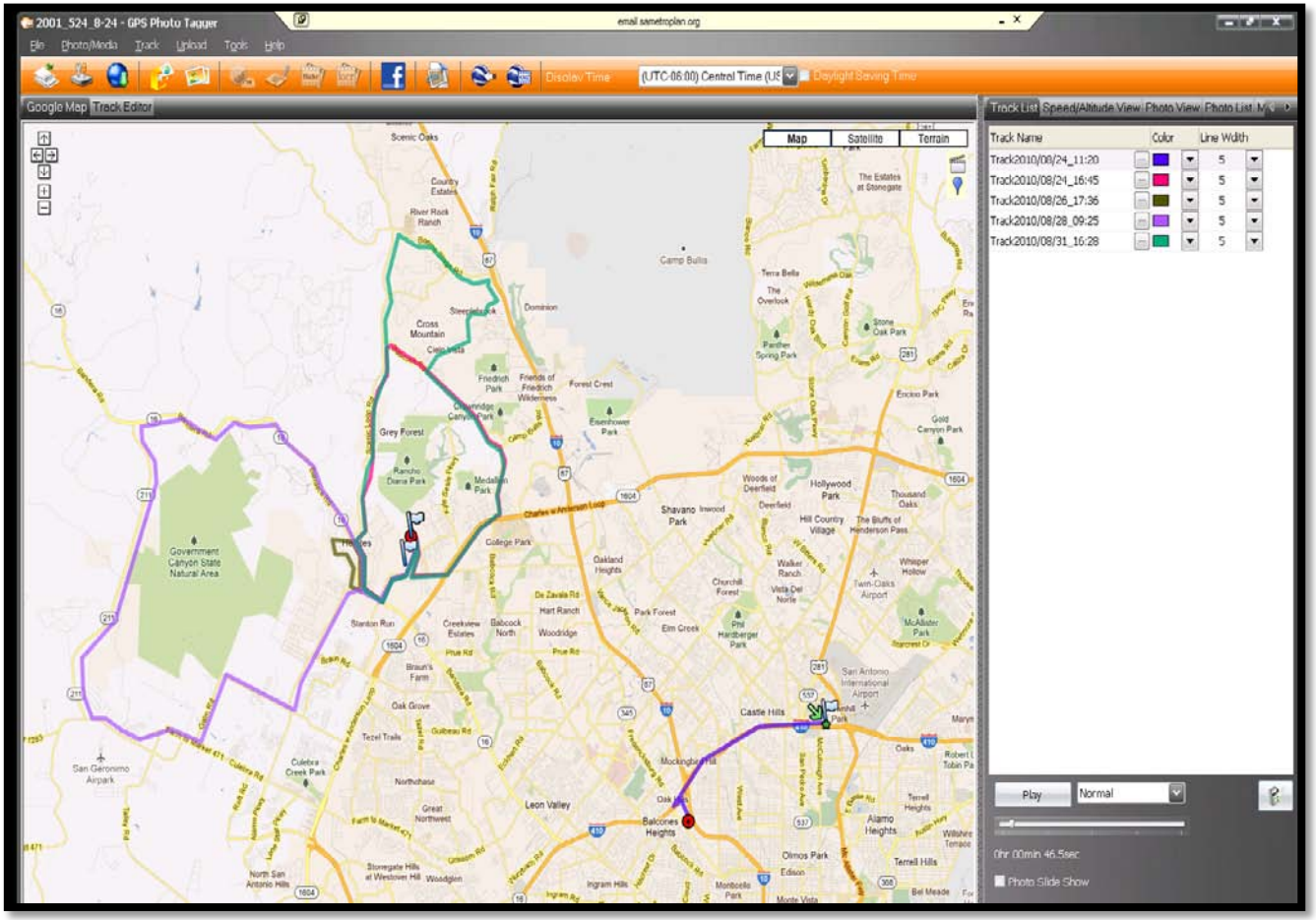
To gather data from residents (bicyclists and non-bicyclists) to better understand existing and potential bike travel in the region, including:

- Estimated number of residents who bike
- The reasons people bike
- Where people bike
- The frequency that people bike
- Barriers to biking
- Perceptions of current conditions for biking in the region
- The types of biking improvements that are needed

San Antonio Regional Bicycling Travel Patterns Survey

The GPS survey was administered to 208 bicyclists

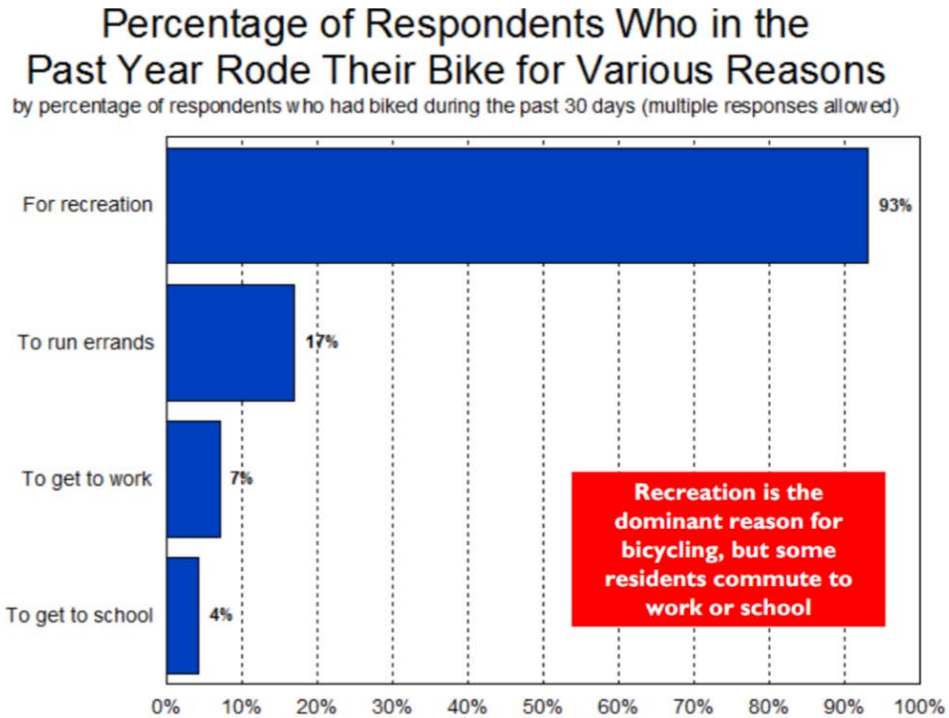
- 152 randomly selected bicyclists
- 56 active bicyclists who were members of cycling clubs, etc.

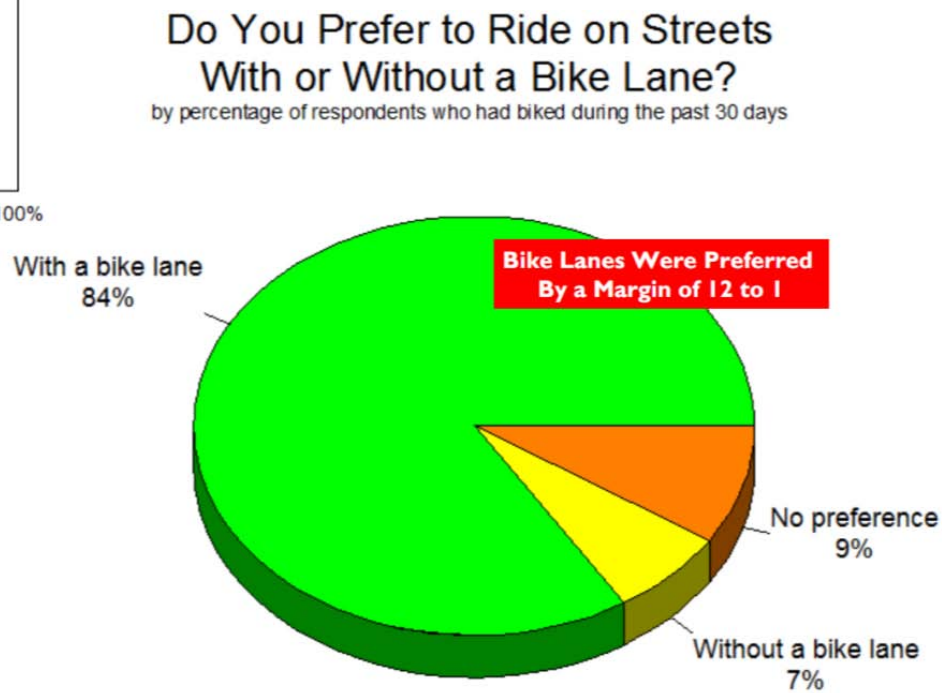


The GPS device was carried by bicyclists for one week.
The GPS device recorded the routes used, speed, and other information that helps us understand bike travel demand in the region and better plan for future facilities.

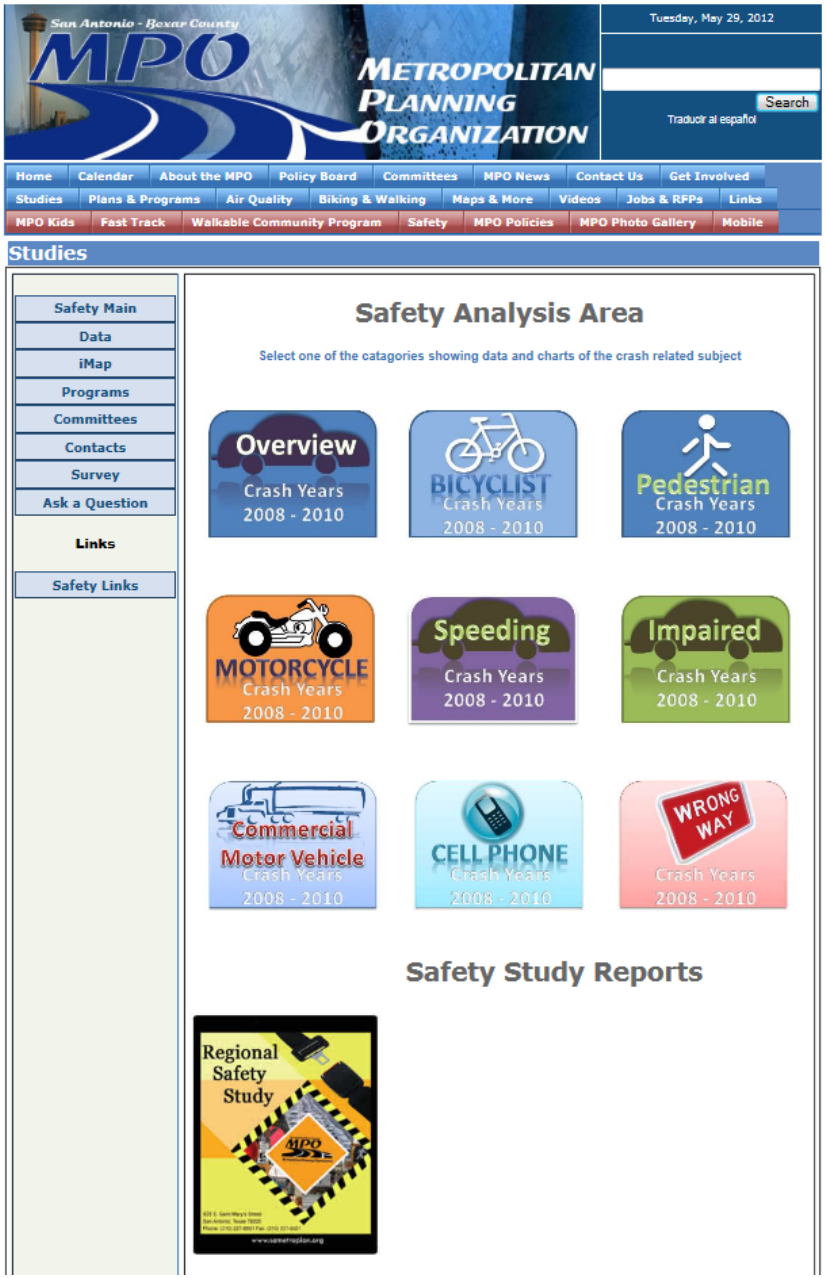
San Antonio Regional Bicycling Travel Patterns Survey

Examples of Results





Regional Safety Study (2010 and beyond)



- Access to Texas Department of Transportation's Crash Record Information System (CRIS)
- Frequency
  - Density or Heat Maps
  - Simple Analysis (Time of Day)
- Rate
  - Midway Segment Analysis
  - Intersection Analysis
- Crash Analysis Areas
  - Distracted Driving
  - Impaired Driving
  - Speed
  - Bicycle
  - Pedestrian
  - Motorcycle
  - Commercial Motor Vehicle
  - **Hot Topics**
    - Road Rage
    - Cell Phone
    - Wrong Way

Crash Records Information System (CRIS)

Photo courtesy San Antonio Express-News

Crash

Crash Number

Crash Number

Unit

Photo courtesy San Antonio Express-News

Crash Number

Person

Photo courtesy San Antonio Express-News

CRIS Crash Data Attributes

Crash

Photo courtesy San Antonio Express-News

CRIS Crash Data Attributes

Conditions

Wthr_Cond_ID

Surf_Cond_ID

Rpt_Surf_Type_ID

Traffic_Cntl_ID

Road_Cond_ID

Road_Relat_ID

Light_Cond_ID

Adt_Curnt_Amt

Nbr_Of_Lane

Shldr_Width_Left

Shldr_Width_Right

Location

Street_Name

Street_Nbr

Obj_Struck_ID

Collsn_ID

Othr_Factr_ID

Hwy_Sys

Lat

Long

Func_Sys_ID

Injuries

Incap_Injry_Cnt

Nonincap_Injry_Cnt

Poss_Injry_Cnt

Non_Injry_Cnt

Unkn_Injry_Cnt

Tot_Injry_Cnt

Death_Cnt

Crash_Sev_ID

Harm_Evnt_ID

CRIS Unit Data Attributes

Photo courtesy San Antonio Express-News

CRIS Unit Data Attributes

Vehicle Info

Veh_Unit
Veh_Mod_Year
Veh_Make_ID
Veh_Mod_ID
Veh_Type_ID
Veh_Body_Styl_ID
Veh_Trvl_Dir_ID

Contributing Factors

Contrib_Factr_1_ID
Contrib_Factr_2_ID
Contrib_Factr_3_ID
Contrib_Factr_P1_ID
Contrib_Factr_P2_ID
Contrib_Factr_P3_ID

Driver Info

Drvr_Age
Drvr_Death_Date
Drvr_Death_Time
Drvr_Ethnicity_ID
Drvr_Gndr_ID
Drvr_Airbag_ID
Drvr_Ejct_ID
Drvr_Rest_ID
Drvr_Helmet_ID
Drvr_Injry_Sev_ID
Drvr_Alc_Spec_Type_ID
Drvr_Alc_Rslt_ID
Drvr_Bac_Test_Rslt
Drvr_Drg_Spec_Type_ID
Drvr_Drg_Rslt_ID

Injuries

Incap_Injry_Cnt
Nonincap_Injry_Cnt
Poss_Injry_Cnt
Non_Injry_Cnt
Unkn_Injry_Cnt
Tot_Injry_Cnt
Death_Cnt

CRIS Person Data Attributes

Photo courtesy San Antonio Express-News

CRIS Person Data Attributes

Person

Prsn_Type_ID
Prsn_Occpnt_Pos_ID
Prsn_State_ID
Prsn_Age
Prsn_Death_Date
Prsn_Death_Time
Prsn_Gndr_ID
Prsn_Helmet_ID
Prsn_Ejct_ID
Prsn_Airbag_ID
Prsn_Alc_Spec_Type_ID
Prsn_Alc_Rslt_ID
Prsn_Bac_Test_Rslt
Prsn_Drg_Spec_Type_ID

Injuries

Incap_Injry_Cnt
Nonincap_Injry_Cnt
Poss_Injry_Cnt
Non_Injry_Cnt
Unkn_Injry_Cnt
Tot_Injry_Cnt
Death_Cnt

CRIS – Attributes “COLLSN_ID”

OMV VEHICLE GOING STRAIGHT
OMV VEHICLE TURNING RIGHT
OMV VEHICLE TURNING LEFT
OMV VEHICLE BACKING
OMV OTHER
ANGLE - BOTH GOING STRAIGHT
ANGLE - ONE STRAIGHT-ONE BACKING
ANGLE - ONE STRAIGHT-ONE STOPPED
ANGLE - ONE STRAIGHT-ONE RIGHT TURN
ANGLE - ONE STRAIGHT-ONE LEFT TURN
ANGLE - BOTH RIGHT TURN
ANGLE - ONE RIGHT TURN-ONE LEFT TURN
ANGLE - ONE RIGHT TURN-ONE STOPPED
ANGLE - BOTH LEFT TURN
ANGLE - ONE LEFT TURN-ONE STOPPED
SD BOTH GOING STRAIGHT-REAR END
SD BOTH GOING STRAIGHT-SIDESWIPE
SD ONE STRAIGHT-ONE STOPPED
SD ONE STRAIGHT-ONE RIGHT TURN
SD ONE STRAIGHT-ONE LEFT TURN
SD BOTH RIGHT TURN
SD ONE RIGHT TURN-ONE LEFT TURN
SD ONE RIGHT TURN-ONE STOPPED
SD BOTH LEFT TURN
SD ONE LEFT TURN-ONE STOPPED
OD BOTH GOING STRAIGHT
OD ONE STRAIGHT-ONE BACKING
OD ONE STRAIGHT-ONE STOPPED
OD ONE STRAIGHT-ONE RIGHT TURN
OD ONE STRAIGHT-ONE LEFT TURN
OD ONE BACKING-ONE STOPPED
OD ONE RIGHT TURN-ONE LEFT TURN
OD ONE RIGHT TURN-ONE STOPPED
OD BOTH LEFT TURNS
OD ONE LEFT TURN-ONE STOPPED
O ONE STRAIGHT-ONE ENTER OR LEAVE PARKING SPACE
O ONE RIGHT TURN-ONE ENTER OR LEAVE PARKING SPACE
O ONE LEFT TURN-ONE ENTER OR LEAVE PARKING SPACE
O ONE ENTER OR LEAVE PARKING SPACE-ONE STOPPED
O BOTH ENTERING OR LEAVING A PARKING SPACE
O BOTH BACKING
O ALL OTHERS
NOT REPORTED

CRIS – Attributes “Crash_Sev_ID”

UNKNOWN
INCAPACITATING INJURY
NON-INCAPACITATING
POSSIBLE INJURY
FATAL
NOT INJURED

CRIS – Attributes "CONTRIB_FACTR_ID"

0. NOT APPLICABLE
1. ANIMAL ON ROAD- DOMESTIC
2. ANIMAL ON ROAD- WILD
3. BACKED WITHOUT SAFETY
4. CHANGED LANE WHEN UNSAFE
5. DEFECTIVE OR NO HEADLAMPS
6. DEFECTIVE OR NO STOP LAMPS
7. DEFECTIVE OR NO TAIL LAMPS
8. DEFECTIVE OR NO TURN SIGNAL LAMPS
9. DEFECTIVE OR NO TRAILER BRAKES
10. DEFECTIVE OR NO VEHICLE BRAKES
11. DEFECTIVE STEERING MECHANISM
12. DEFECTIVE OR SLICK TIRES
13. DEFECTIVE TRAILER HITCH
14. DISABLED IN TRAFFIC LANE
15. DISREGARD STOP AND GO SIGNAL
16. DISREGARD STOP SIGN OR LIGHT
17. DISREGARD TURN MARKS AT INTERSECTION
18. DISREGARD WARNING SIGN AT CONSTRUCTION
19. **DISTRACTION IN VEHICLE**
20. **DRIVER INATTENTION**
21. DROVE WITHOUT HEADLIGHTS
22. **FAILED TO CONTROL SPEED**
23. FAILED TO DRIVE IN SINGLE LANE
24. FAILED TO GIVE HALF OF ROADWAY
25. FAILED TO HEED WARNING SIGN
26. FAILED TO PASS TO LEFT SAFELY
27. FAILED TO PASS TO RIGHT SAFELY
28. FAILED TO SIGNAL OR GAVE WRONG SIGNAL
29. FAILED TO STOP AT PROPER PLACE
30. FAILED TO STOP FOR SCHOOL BUS
31. FAILED TO STOP FOR TRAIN
32. FAILED TO YIELD ROW - EMERGENCY VEHICLE
33. FAILED TO YIELD ROW - OPEN INTERSECTION
34. FAILED TO YIELD ROW - PRIVATE DRIVE
35. FAILED TO YIELD ROW - STOP SIGN
36. FAILED TO YIELD ROW - TO PEDESTRIAN
37. FAILED TO YIELD ROW - TURNING LEFT
38. FAILED TO YIELD ROW - TURN ON RED
39. FAILED TO YIELD ROW - YIELD SIGN
40. FATIGUED OR ASLEEP
41. FAULTY EVASIVE ACTION
42. FIRE IN VEHICLE
43. FLEEING OR EVADING POLICE
44. FOLLOWED TOO CLOSELY
45. HAD BEEN DRINKING
46. HANDICAPPED DRIVER (EXPLAIN IN NARRATIVE)
47. ILL (EXPLAIN IN NARRATIVE)
48. IMPAIRED VISIBILITY (EXPLAIN IN NARRATIVE)
49. IMPROPER START FROM PARKED POSITION
50. LOAD NOT SECURED
51. OPENED DOOR INTO TRAFFIC LANE
52. OVERSIZED VEHICLE OR LOAD
53. OVERTAKE AND PASS INSUFFICIENT CLEARANCE
54. PARKED AND FAILED TO SET BRAKES
55. PARKED IN TRAFFIC LANE
56. PARKED WITHOUT LIGHTS
57. PASSED IN NO PASSING LANE
58. PASSED ON RIGHT SHOULDER
59. PED/PEDALSYS/MOT.CON.FYTROW TO VEHICLE
60. SPEEDING - UNSAFE (UNDER LIMIT)
61. **SPEEDING - (OVERLIMIT)**
62. TAKING MEDICATION (EXPLAIN IN NARRATIVE)
63. TURNED IMPROPERLY - CUT CORNER ON LEFT
64. TURNED IMPROPERLY - WIDE RIGHT
65. TURNED IMPROPERLY - WRONG LANE
66. TURNED WHEN UNSAFE
67. **UNDER INFLUENCE - ALCOHOL**
68. **UNDER INFLUENCE - DRUG**
69. WRONG SIDE - APPROACH OR IN INTERSECTION
70. WRONG SIDE - NOT PASSING
71. **WRONG WAY - ONE WAY ROAD**
72. **CELL/MOBILE PHONE USE**
73. **ROAD RAGE**
74. OTHER FACTOR (WRITE ON LINE ABOVE)

94. REPORTED NOT VALID
95. NOT REPORTED

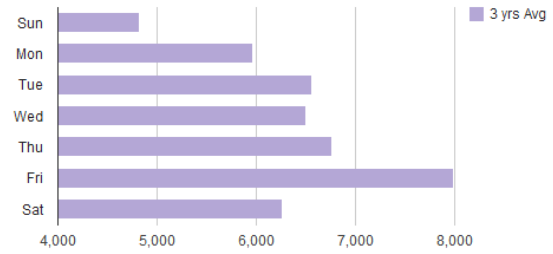
CRIS: Analysis Areas

3 year Average | 2010 | 2009 | 2008 | Definition | Back

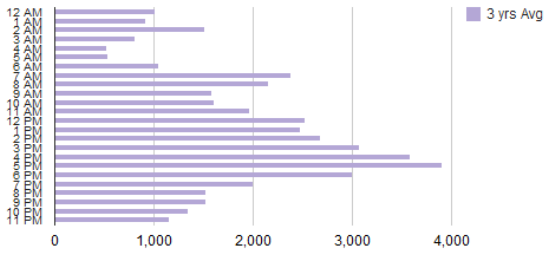
3 Years Crash Average

Total Crashes	Non-Incapacitated	Incapacitated	Possible Injuries	Fatalities
44,854	3,413	813	14,544	157

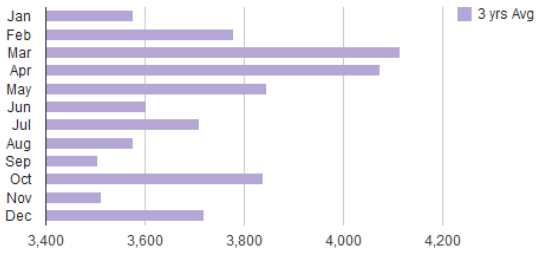
3 Years Average of Day of the Week Crashes



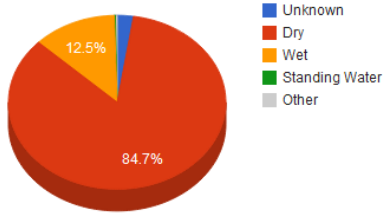
3 Years Average Time of Day



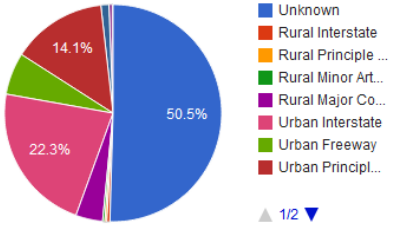
3 Year Average Crashes by Month



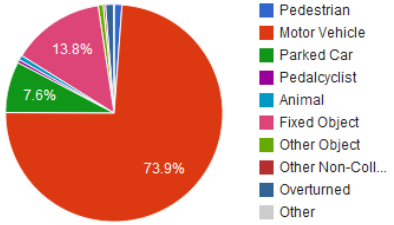
3 Years Average Crashes by Surface Conditions



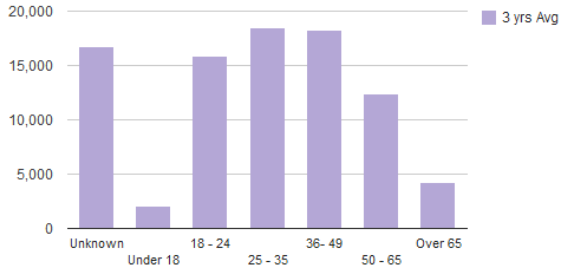
3 Years Average Crashes by Road Type



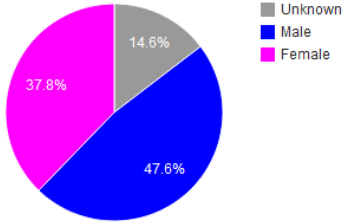
3 Years Average Crashes by Harm Event



3 Years Average Crashes by Age of Driver



3 Years Average Crashes by Drivers Gender

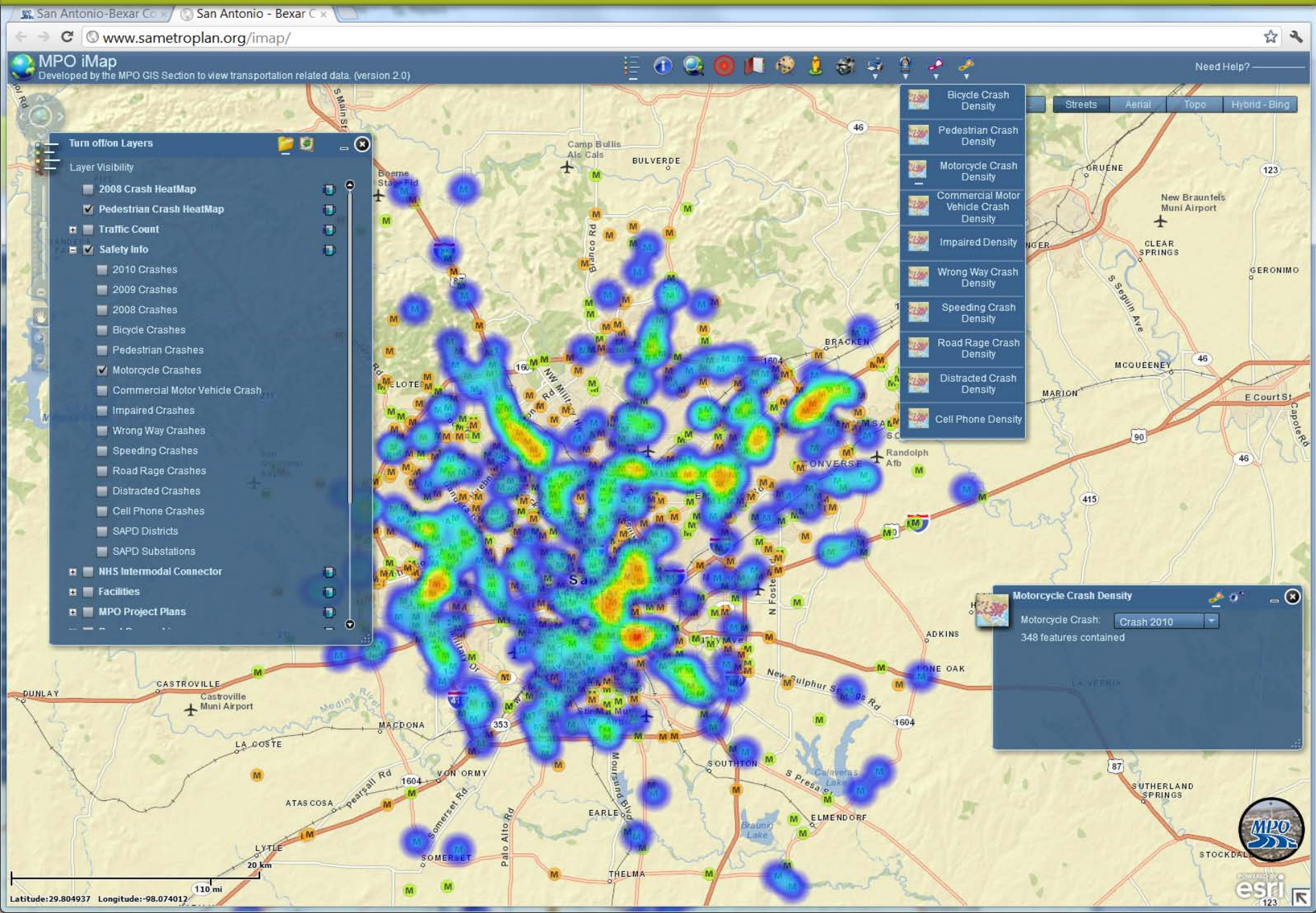


www.sametroplan.org/safety

CRIS: Analysis Areas

CRIS: Analysis Areas – Special Analysis

CRIS: Analysis Areas - iMap



Crash Rate: Roadway Segment

The formula for calculating the crash rate for a roadway segment is presented below. The "**Rate**" (R) is expressed in crashes per **M**illion **V**ehicle **M**iles **T**raveled (**MVMT**), Which is standard to the Traffic Engineering profession.

$$R = \frac{A * 1{,}000{,}000}{L * V * 365}$$

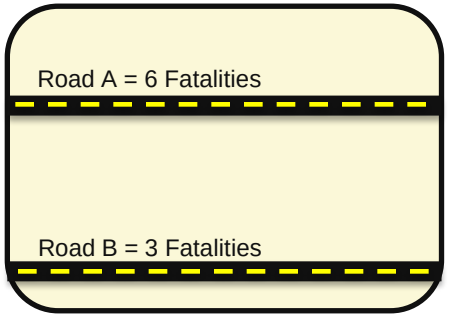
Where:

A = Average number of crashes along the study roadway per year
L = Length of roadway segment in miles
V = Average Daily Traffic Volume along the roadway

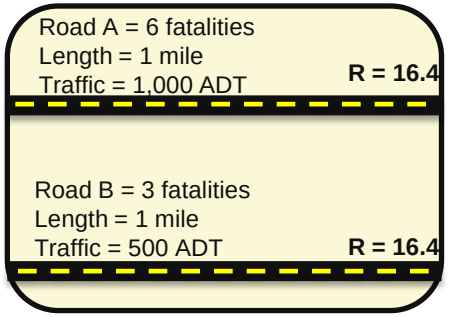
http://www.mhd.state.ma.us/downloads/footprint/roads/procedures09.pdf

Understanding Crash Rates

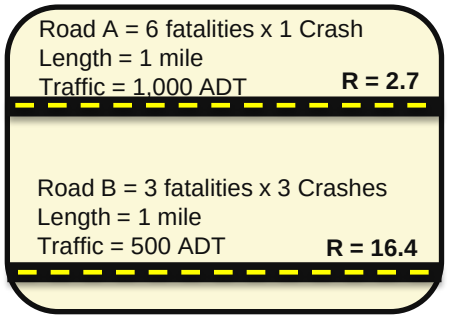
In order to discuss the issue of roadway fatalities, it is crucial to understand the differences between the terms "**Fatality Count**," "**Fatality Rate**," and the "**Fatal Crash Rate**."



Fatality Count: a simple tally of the number of people killed in automobile crashes-- are the least useful criteria for analyzing roadway safety trends. Reports and studies based on the numbers of fatalities have little merit or meaning within the context of roadway safety trends.



Fatality Rate: which is the number of fatalities on a per-vehicle-mile-driven basis (usually based on 100 million vehicle miles traveled) is a more accurate means of measuring highway safety.



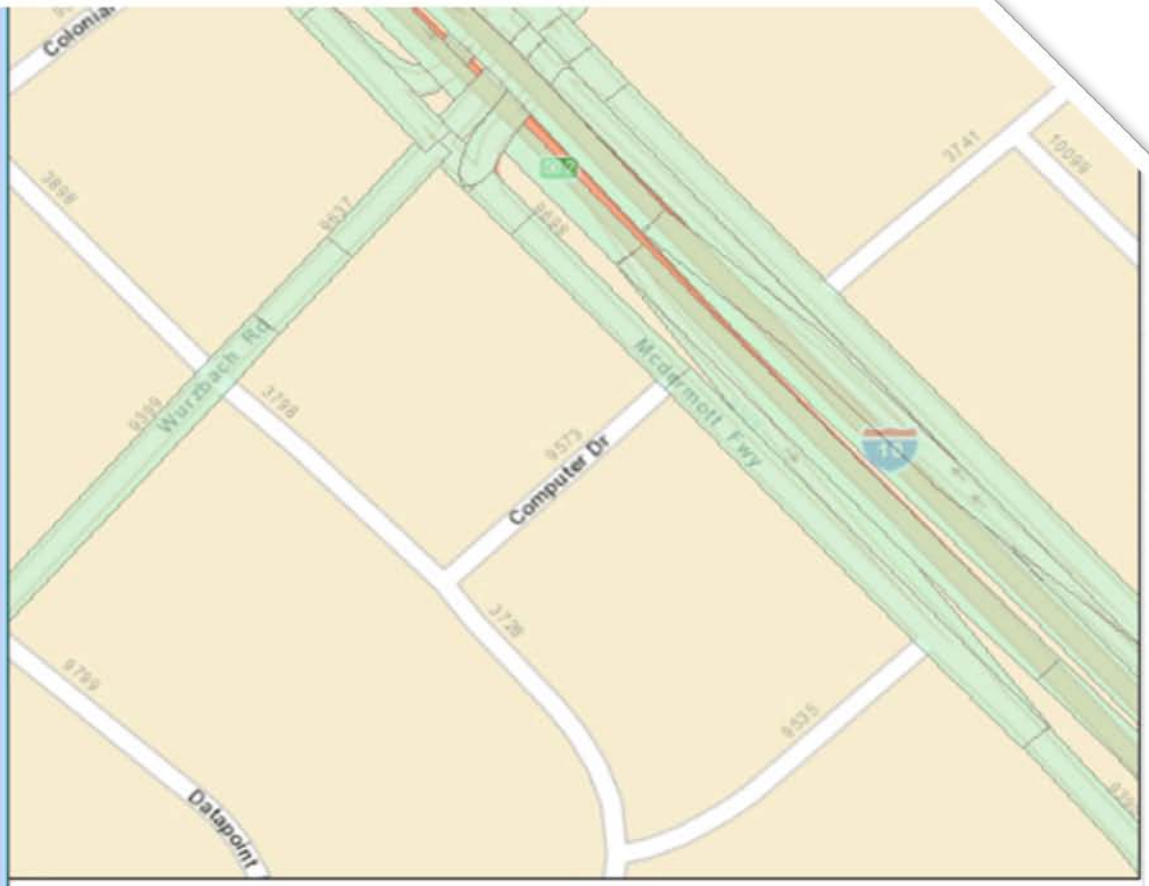
Fatal Crash Rate: which is the number of fatal accidents on a per-vehicle-mile-driven basis (fatal accidents per 100 million vehicle miles traveled), is the most accurate means of measuring highway safety trends.

http://www.scdot.org/getting/traffic_counts.shtml

Data Sources: Regional Travel Demand Model

Location: 2,107,216.326 13,741,265.648 Unknown Units

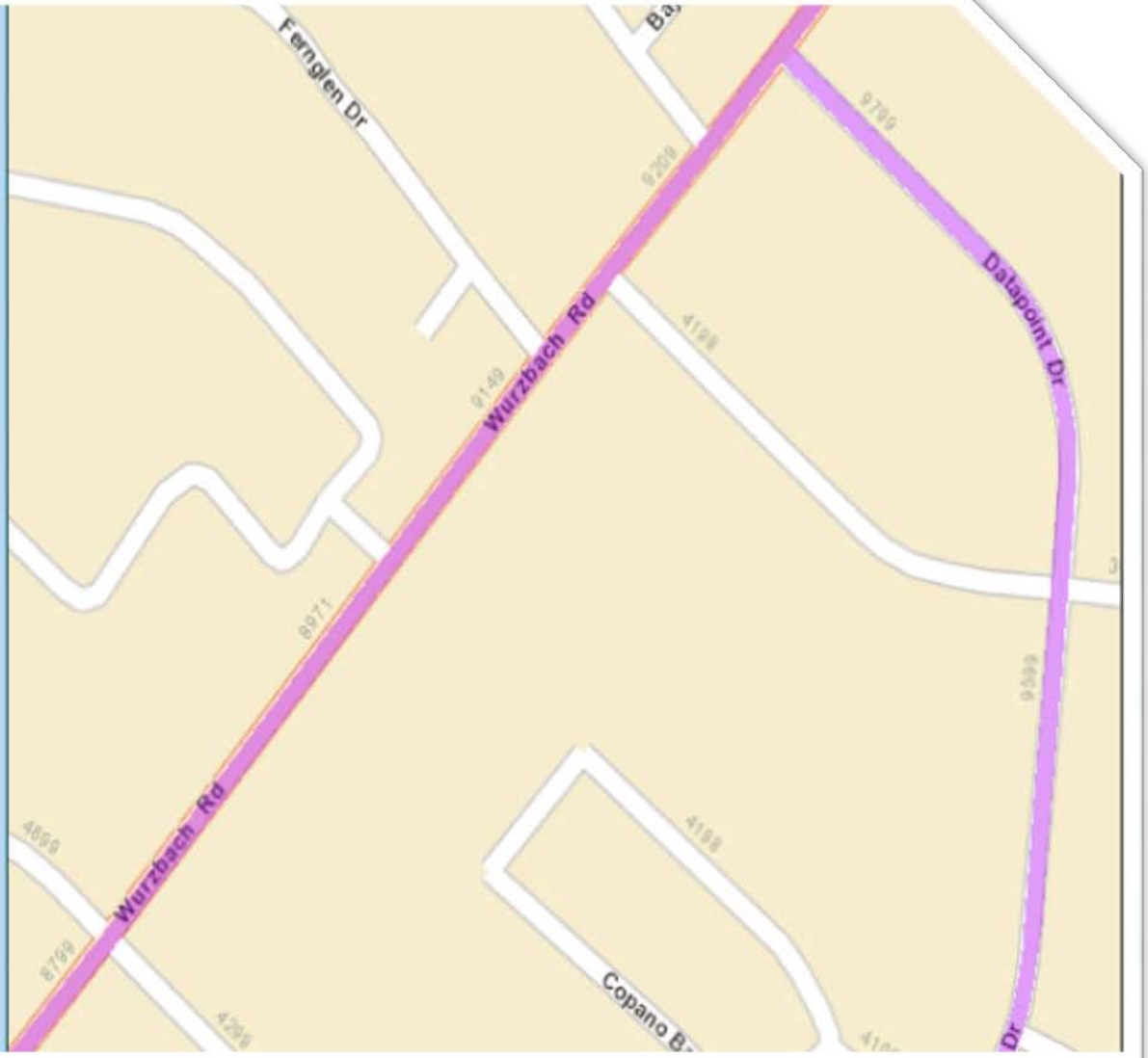
Field	Value
AB_CAPACIT	16500
AB_FLOW	4352
ALPHA	0.15
ATYPE	2
BA_CAPACIT	0
BA_FLOW	0
BETA	4
BUFF_DIST	30
CMP_VC15	0.82
CMPVOL15	13456
COUNT05	11501
Count_	1
COUNTY	Bexar
COUNTYCODE	1
Crash_Rate	0.000162
DIR	1
FID	1905
FID_1	1905
FTYPE	20
FUNCL	7
ID	2226074
LANES	3
LENGTH	0.46
MPO	1
POSTED_SPE	45
hape	Polygon
D	25
OAD	24.94
M	IH 10
	0



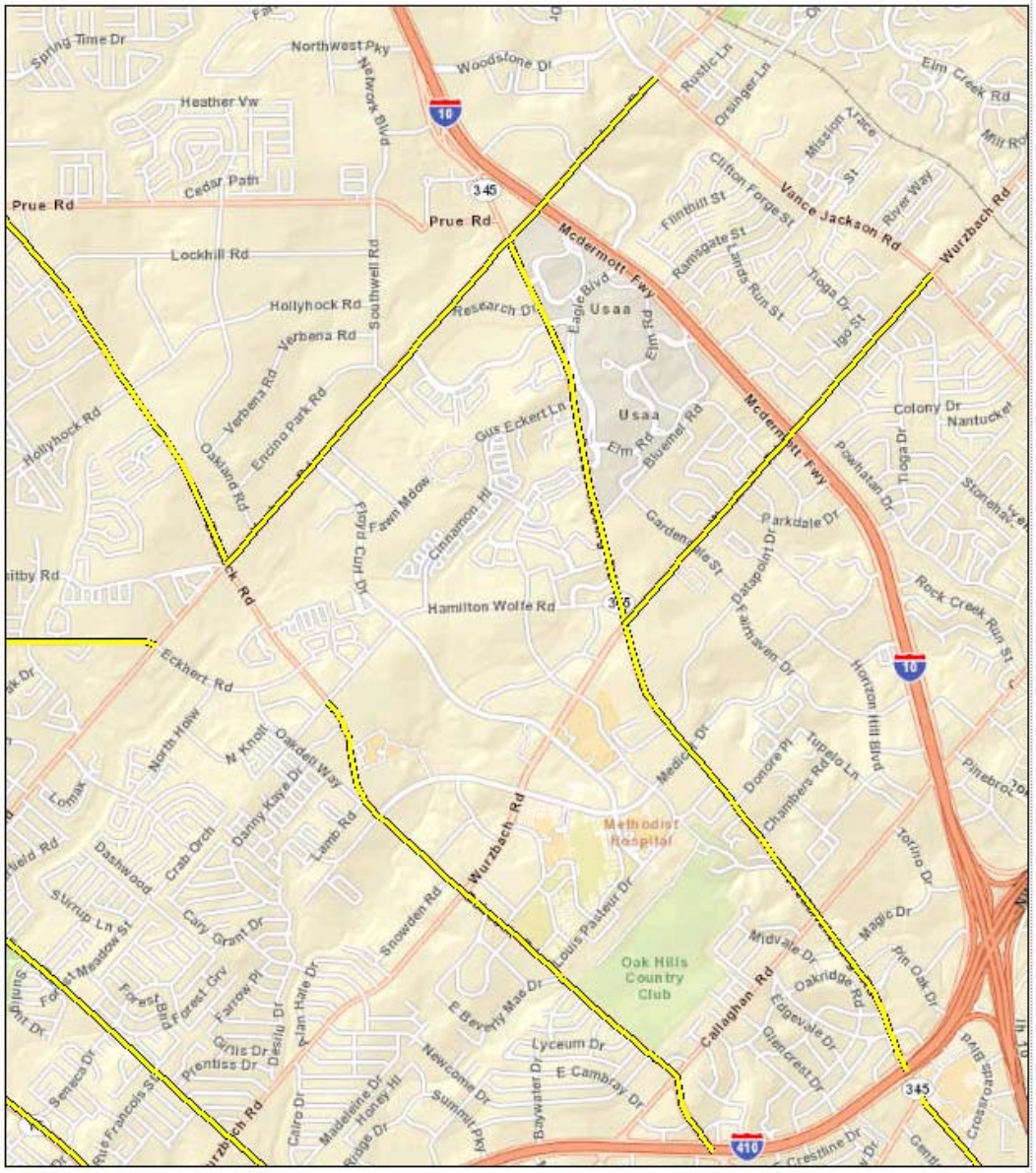
Data Sources: BLOS Database

Location: 2,107,000.462 13,740,100.665 Unknown Units

Field	Value
ADT	29302
BLOS	E
CON	S
CONDITION	Poor
DISCLAIMER	SUBJECT TO REVISION
FID	443
FROM_S_1	Vance Jackson
LANES	4
MILES	1.869444
NAME_1	Wurzbach
PCL	3
PCS	0
SEG_ID2	2183
Shape	Polyline
SP	40
TO_S_1	Fredericksburg
WL_1	11.5
WS_1	0



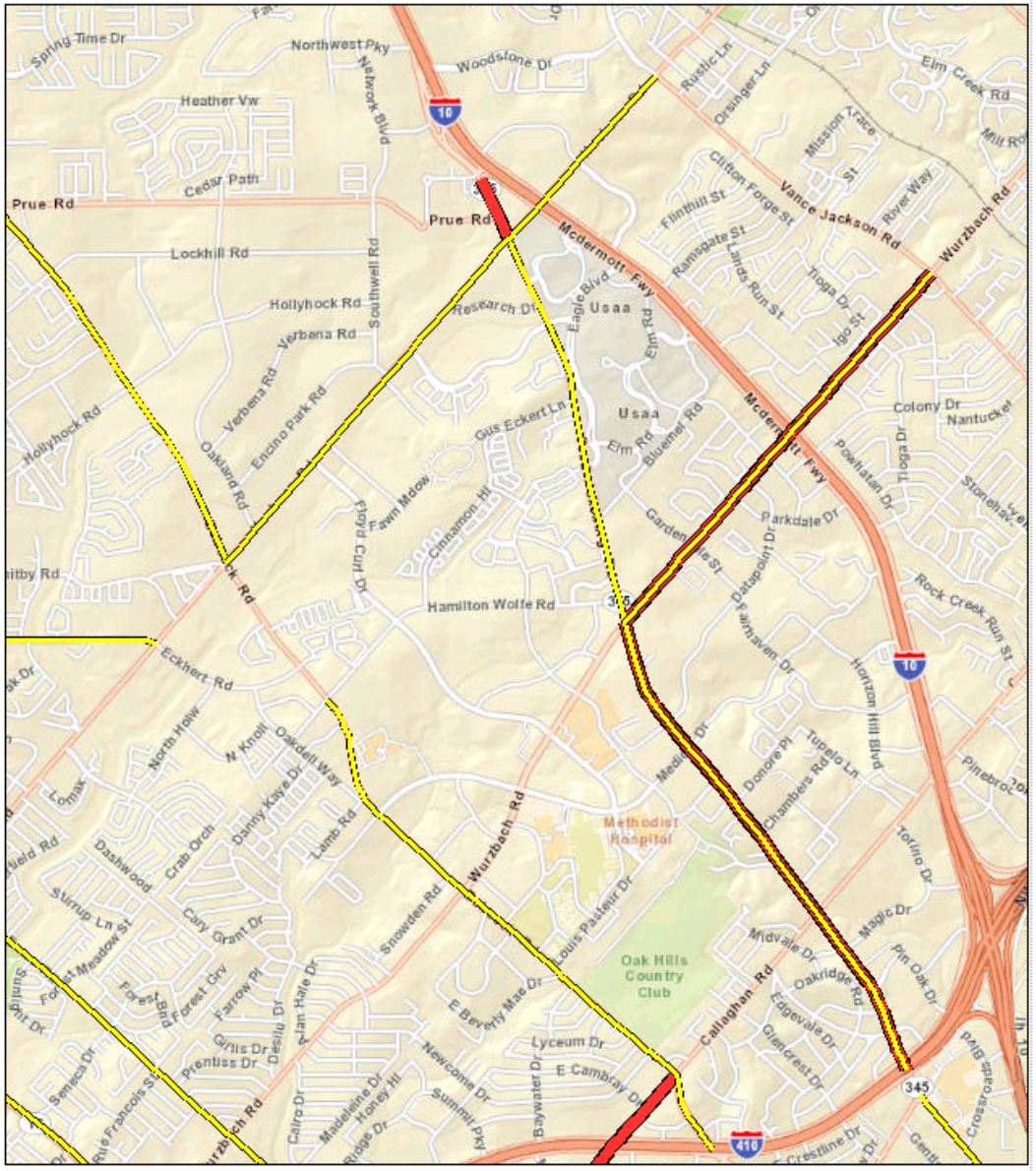
Example: Highlighting Roadways with 50 Crashes or More



Legend

Roadway with 50 crashes or Greater

Example: Highlighting Roadways with 5 Crashes or more per Million Vehicle Miles Traveled

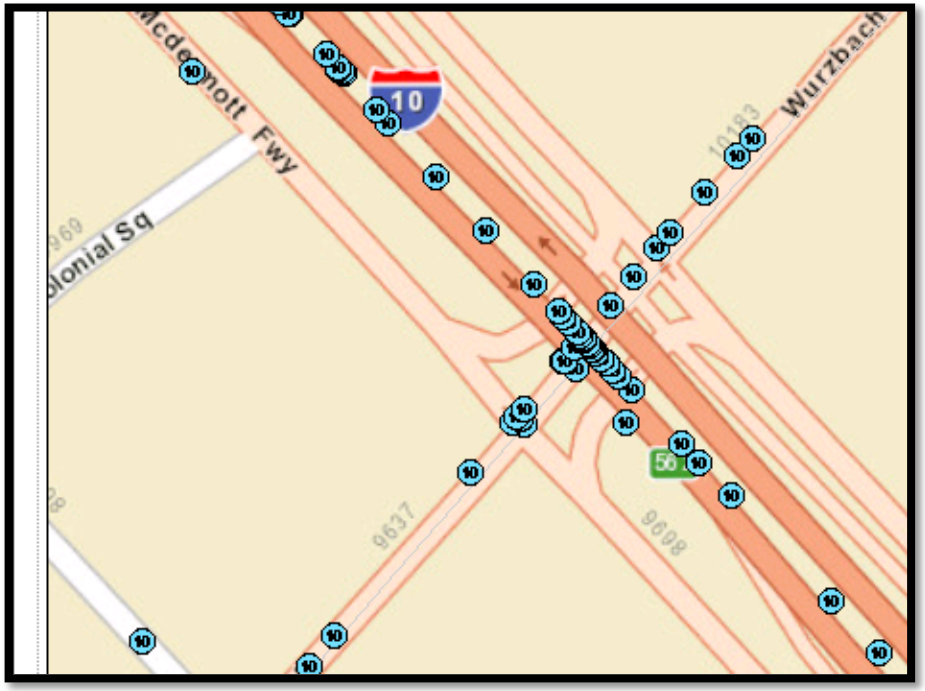


Legend

- Roadway with 50 crashes or Greater
- Roadway with Crash Rate of 5 or Greater

Things to Consider

- TxDOT's use of Reportable Motor Vehicle Crashes vs. all reported crashes
- Consistency of particular crash definitions of users querying the CRIS database
- Missing data due to omitted Latitude - Longitude coordinate locations
- Analysis is impacted by the spatial placement of frontage road crashes on mainlanes



Safety Program Refinement

- Analyze regional crash trends
- Adopt performance measures
- Obtain additional funding
- Identify countermeasures for implementation
- Reach out to new stakeholders
- Implement recently adopted plans and programs

As our research, analysis, and technological capabilities expand we continue to discover new challenges and opportunities

Questions

Lydia Kelly
Bicycle & Pedestrian Transportation Planner
Phone: (210) 230-6911
Email: kelly@sametroplan.org

Stephanie Velasquez
Regional Transportation Planner
Phone: (210) 230-6908
Email: velasquez@sametroplan.org

Cecilio Martinez
Senior GIS & Web Analyst
Phone: (210) 230-6905
Email: martinez@sametroplan.org

www.sametroplan.org

825 South Saint Mary's St. | San Antonio, Texas 78205 | Phone: 210-227-8651 | Fax: 210-227-9321

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