

MAG Strategic Transportation Safety Plan (STSP)

Task 5 – Incorporate Safety Into RTP Working Group Meeting

#1

June 11, 2014

TASK 5 Working Group

OBJECTIVES:

Promote Multimodal Safety Culture

Enhance Awareness of Bicycle and Pedestrian Safety

Increase Attention to Safe Access to Transit

TASK 5 Working Group - Introductions

PARTICIPANTS:

MAG Transit Committee

MAG Bike & Pedestrian Committee

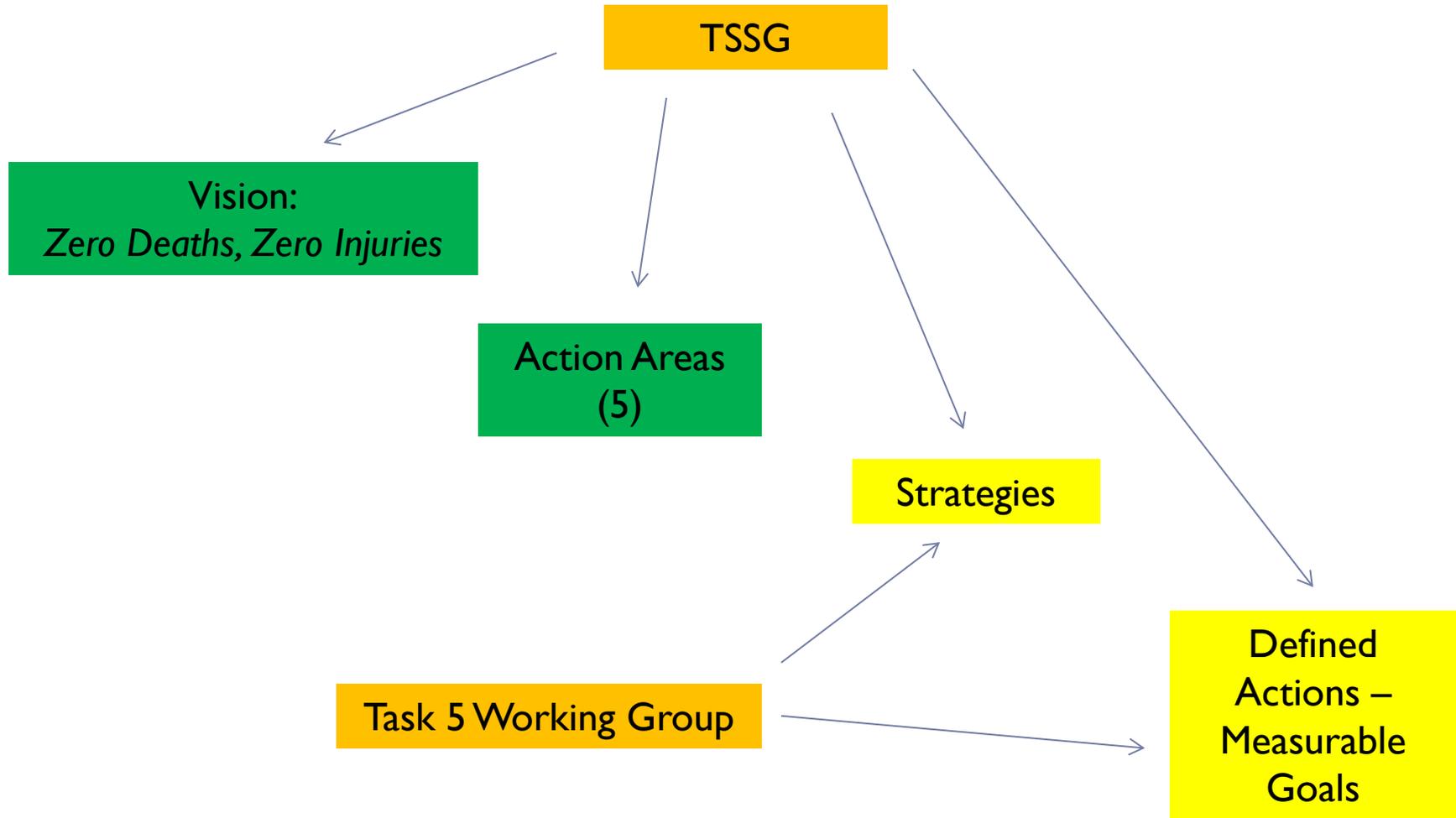
MAG Transportation Safety Committee

MAG Staff

Consultant Staff – Lee Engineering

STSP Overview

MAG STSP Process



STSP Work Plan Tasks

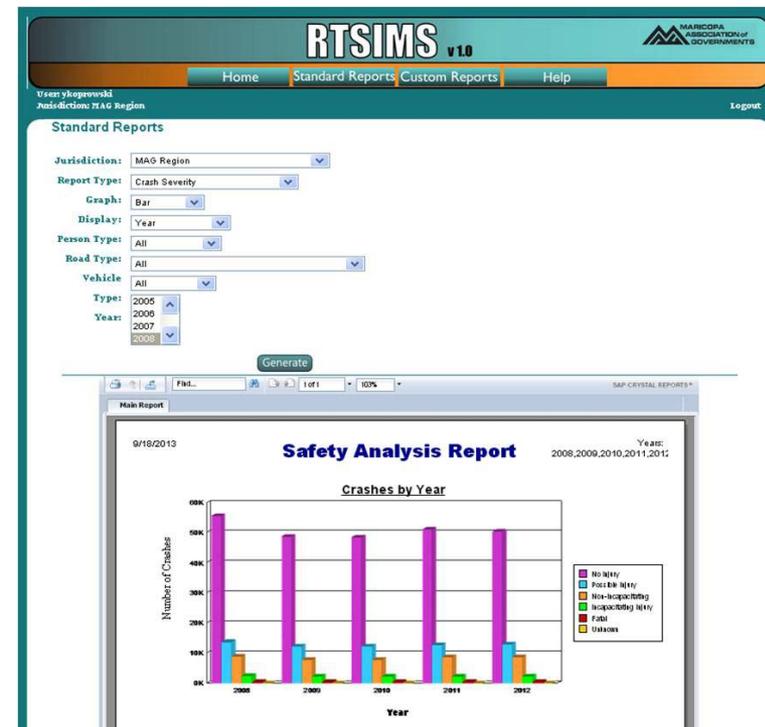
1. **Crash Analysis – Current State of Transportation Safety**
 2. **Establish Regional Vision and Goals**
 3. **Develop Action Areas, Strategies, and Performance Measures**
 4. **Network Screening Methodologies for Prioritization of Road Safety Needs**
 5. **Incorporating Safety in the Regional Transportation Plan**
 6. **Develop a Strategy to Incorporate Safety Enhancements in Road Infrastructure Projects**
 7. **Improving Safety via Traffic Operations and Technology Solutions**
 8. **Monitoring and Reporting on System Performance and Program Effectiveness**
 9. **Implementation Plan 2015 – 2025**
 10. **Draft Final Report, Executive Summary and Presentations**
-

State of Transportation Safety

What is the Risk in Our Region?

Current State of Transportation Safety

- ▶ Review of 2008 – 2012 crash data
- ▶ Focus on fatal and serious injury crashes
- ▶ Regional Transportation Safety Information Management System (RTSIMS)
 - ▶ MAG Crash analysis tool
 - ▶ From 2005 STSP



Statewide Fatal Crashes

Statewide
Fatal Crashes
2008-2012
3744

47%

Rest of State
1970 – 53%

MAG Planning Area
1774 – 47%

80%

Freeway
352 – 20%

Arterials & Local Roads
1422 – 80%

Older Driver – 67 (17%)
Younger Driver – 114 (28%)
Teen Driver – 31 (8%)
Truck – 110 (27%)
Motorcycle – 64 (16%)
Young Drvr/ Mtrcyl – 13 (20%)

Not Inters-Related
869 – 60%

Inters-Related
553 – 40%

Single Vehicle 50%

Rear End – 80 (23%)
Head On – 19 (5%)
Sideswipe (Same Dir) – 16 (5%)

Older Driver – 112 (13%)
Younger Driver – 264 (30%)
Teen Driver – 84 (10%)
Pedestrian – 145 (28%)
Bicyclist – 44 (5%)
Truck – 83 (10%)
Motorcycle – 221 (25%)
Young Drvr/ Mtrcyl – 55 (25%)

Signalized
304 – 55%

Stop Controlled
129 – 23%

Single Vehicle 43%

Other – 240 (28%)
Head-On – 83 (10%)
Rear End – 52 (6%)
Angle – 51 (6%)
Left Turn – 28 (3%)
Sideswipe (Same Dir) – 17 (2%)

Angle 38%
Left Turn 27%

Other – 50 (16%)
Single Vehicle – 34 (11%)
Rear End – 23 (8%)

Older Driver – 126 (23%)
Younger Driver – 217 (39%)
Teen Driver – 76 (14%)
Pedestrian – 99 (18%)
Bicyclist – 27 (5%)
Truck – 66 (12%)
Motorcycle – 158 (29%)
Young Drvr/ Mtrcyl – 62 (39%)

Angle 65%

Single Vehicle – 17 (18%)
Other – 13 (14%)
Rear End – 2 (2%)
Left Turn – 1 (1%)
Transit Bus – 2 (1.6%)

Statewide Serious Injury Crashes

Statewide
Serious Injury Crashes
2008-2012
(Not Available)

Rest of State
(Not Available)

MAG Planning Area
11,380

85%

Arterials & Local Roads
9,650 – 85%

Freeway
1,730 – 15%

Not Inters-Related
4,183 – 43%

Inters-Related
5,467 – 57%

Younger Driver 38%

Older Driver – 158 (9%)
Truck – 205 (12%)
Motorcycle – 399 (23%)
Young Drvr/ Mtrcyl – 122 (31%)

Single Vehicle 42%
Rear End 36%

Sideswipe (Same) – 176 (10%)
Angle – 80 (5%)
Head On – 20 (1%)

Teen Driver 35%

Older Driver – 545 (12%)
Pedestrian – 355 (14%)
Bicyclist – 314 (8%)
Truck – 347 (8%)
Motorcycle – 1,223 (29%)
Young Drvr/ Mtrcyl – 379 (31%)

Single Vehicle 36%

Rear End – 802 (19%)
Angle – 616 (15%)
Other – 433 (10%)
Left Turn – 273 (7%)
Head On – 240 (6%)
Sideswipe (Same Dir) – 192 (5%)

Angle 34%
Left Turn 33%

Signalized
3,631 – 66%

Single Vehicle – 245 (7%)
Other – 228 (6%)
Head On – 140 (4%)
EMS Vehicle – 8 (0.2%)
Transit Bus – 34 (0.9%)

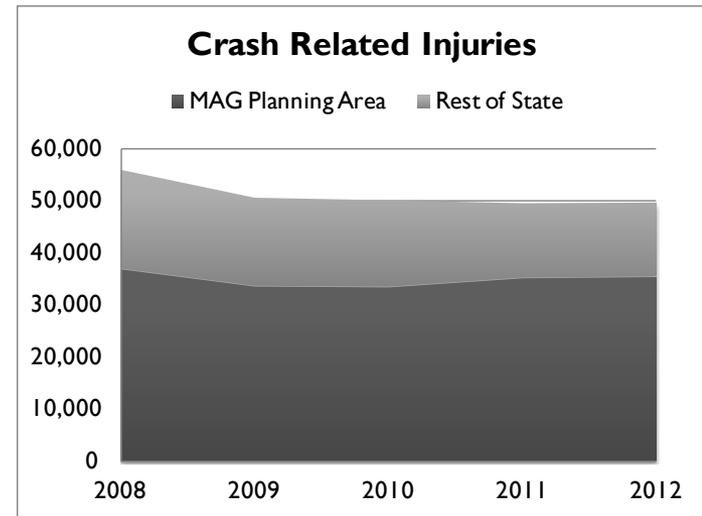
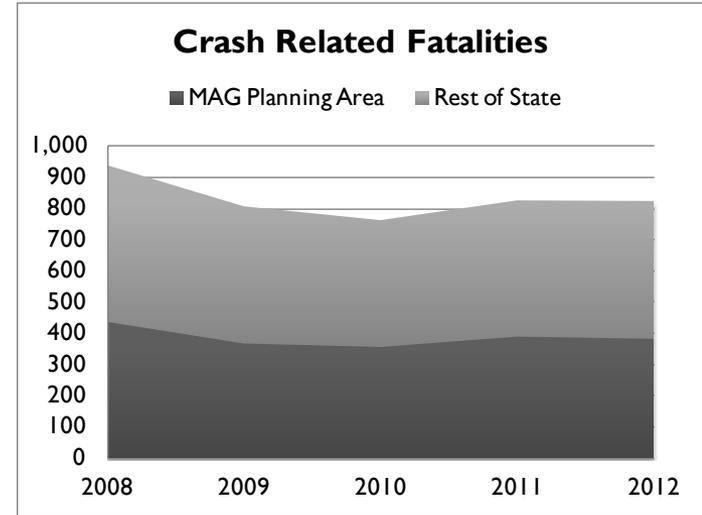
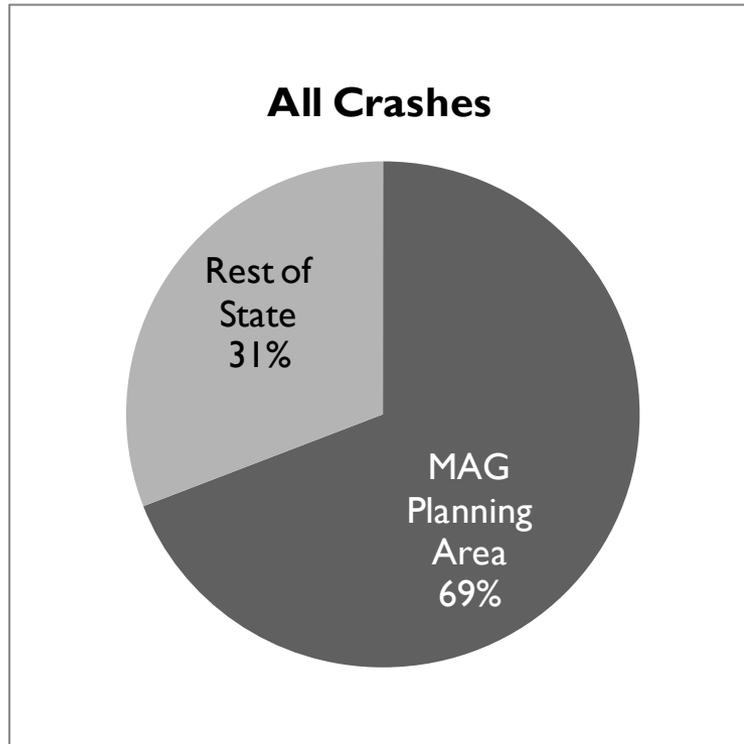
Stop Controlled
794 – 15%

Older Driver – 1,009 (18%)
Younger Driver – 2,226 (41%)
Teen Driver – 896 (16%)
Pedestrian – 476 (9%)
Bicyclist – 415 (8%)
Truck – 513 (9%)
Motorcycle – 1,092 (20%)
Young Drvr/ Mtrcyl – 415 (38%)

Angle 61%

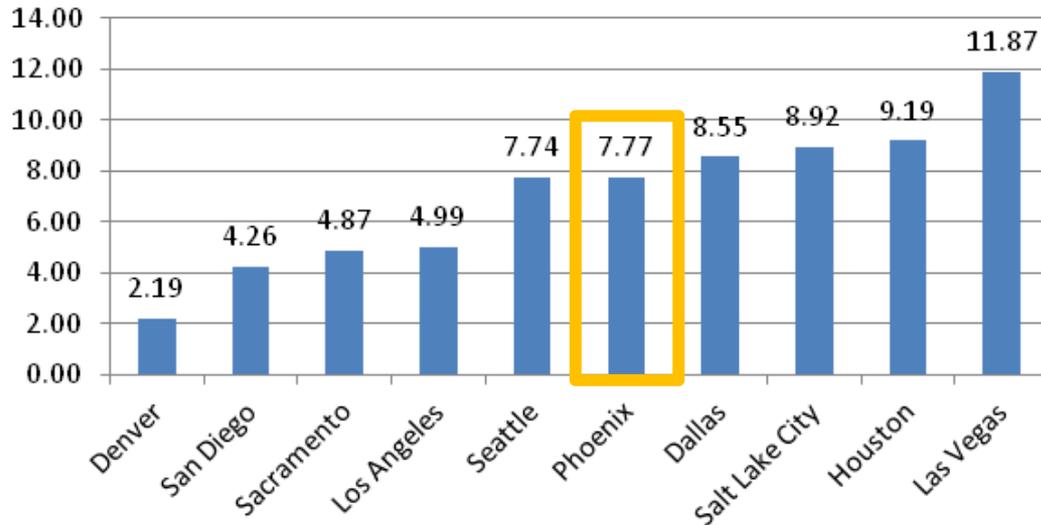
Left Turn – 121 (15%)
Single Vehicle – 96 (12%)
Other – 37 (5%)
Rear End – 30 (4%)
Transit Bus – 5 (0.6%)

Crash Comparison: State to MAG Region

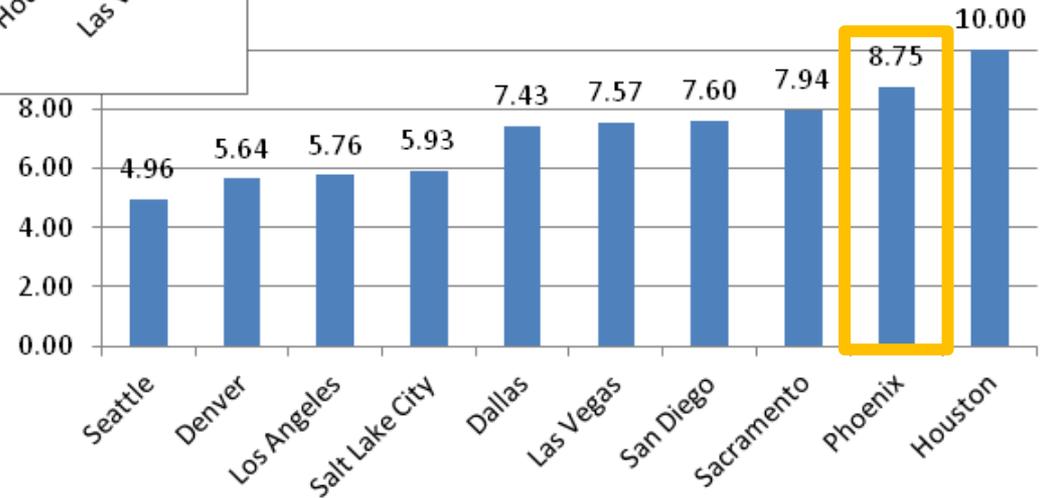


Comparison to Selected Urban Regions

Injuries per 1,000 persons

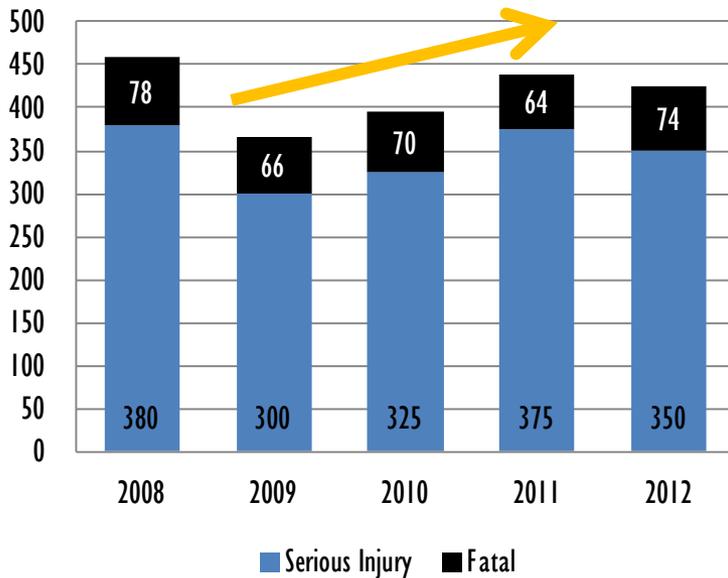


Fatalities per 100,000 persons

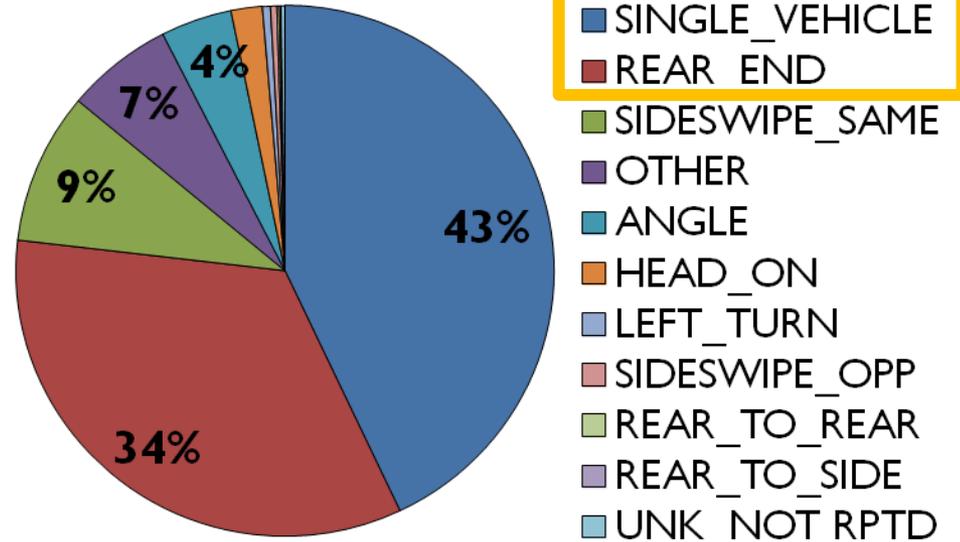


Freeway: Fatal and Serious Injury Crashes

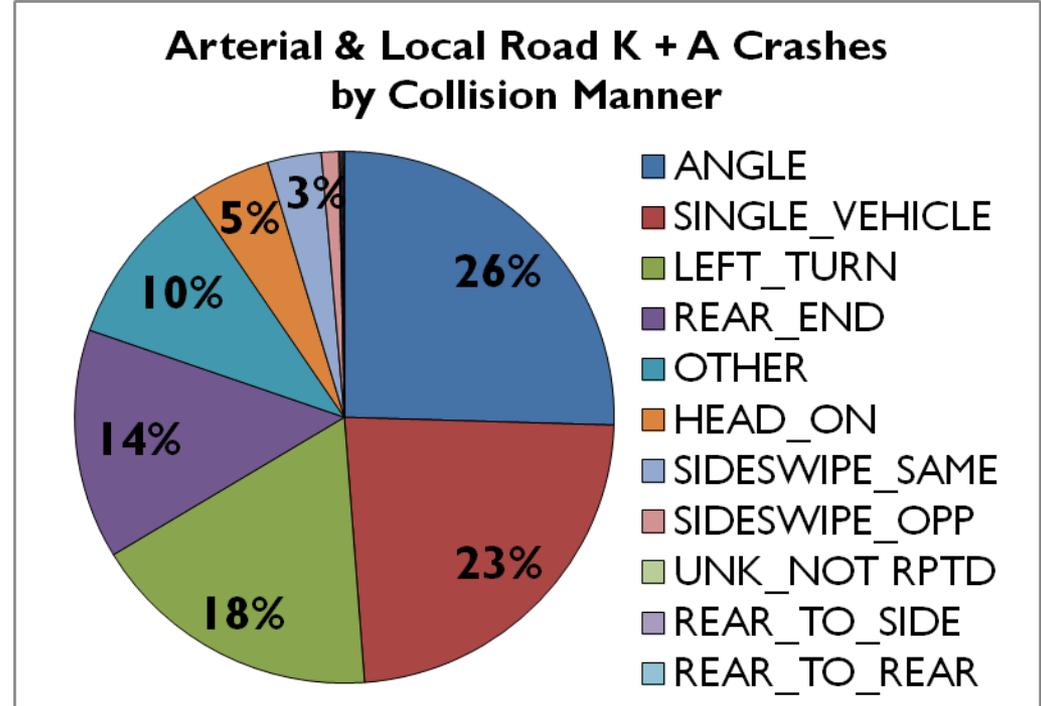
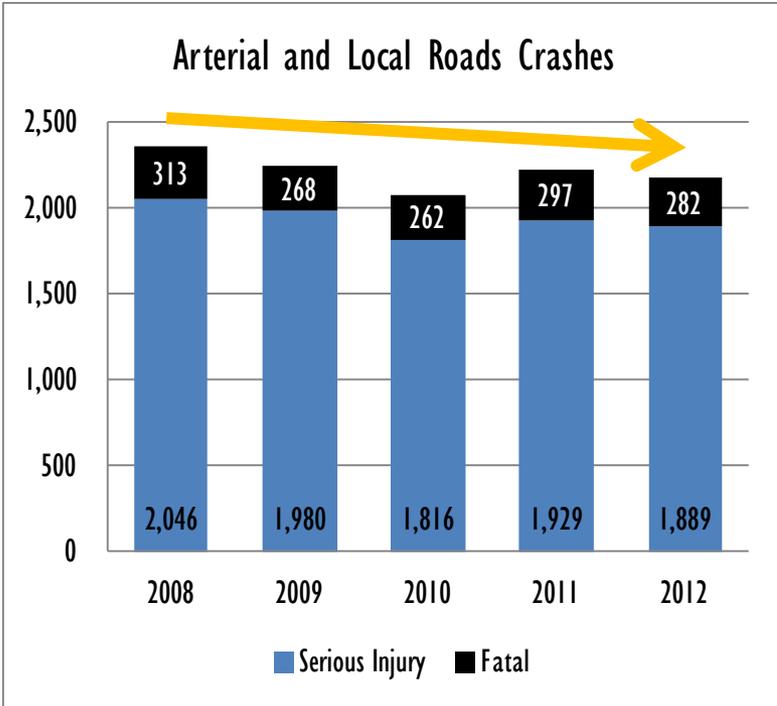
Freeway Crashes



Freeway K + A Crashes by Collision Manner



Arterial & Local: Fatal and Serious Injury Crashes



NOTE: Fatal and Serious Injury crashes on arterials is about 5 times as that on freeways

Driver Conditions & Behavior

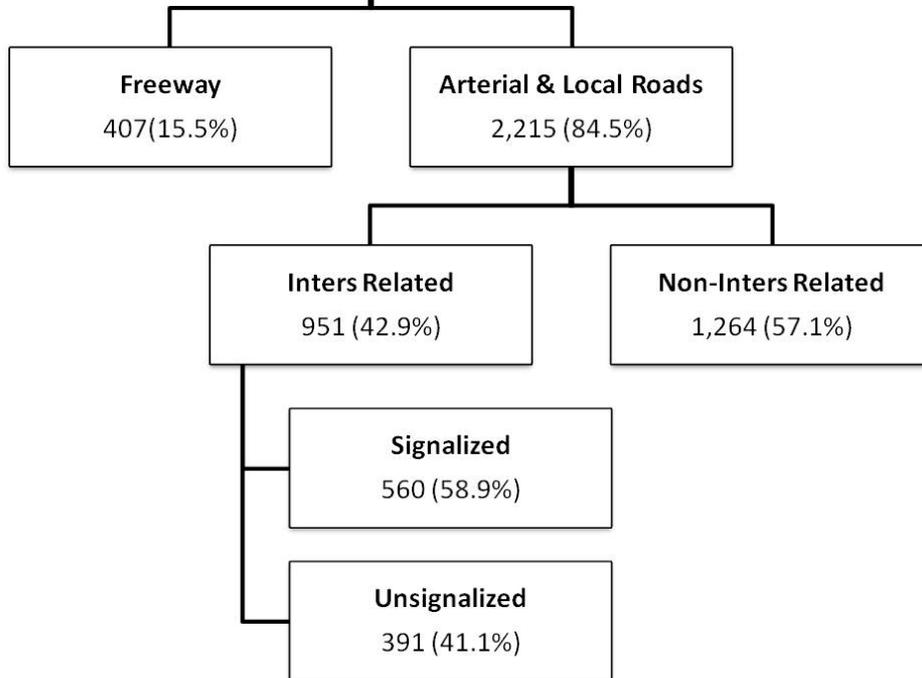
MAG Planning Area
Fatal (K) & Serious Injury (A)

Involving Alcohol, Drugs, Meds

2,622

19.9% of all K+A crashes
42.4% of all K crashes
16.4% of all A crashes

42.4%
of all Fatal



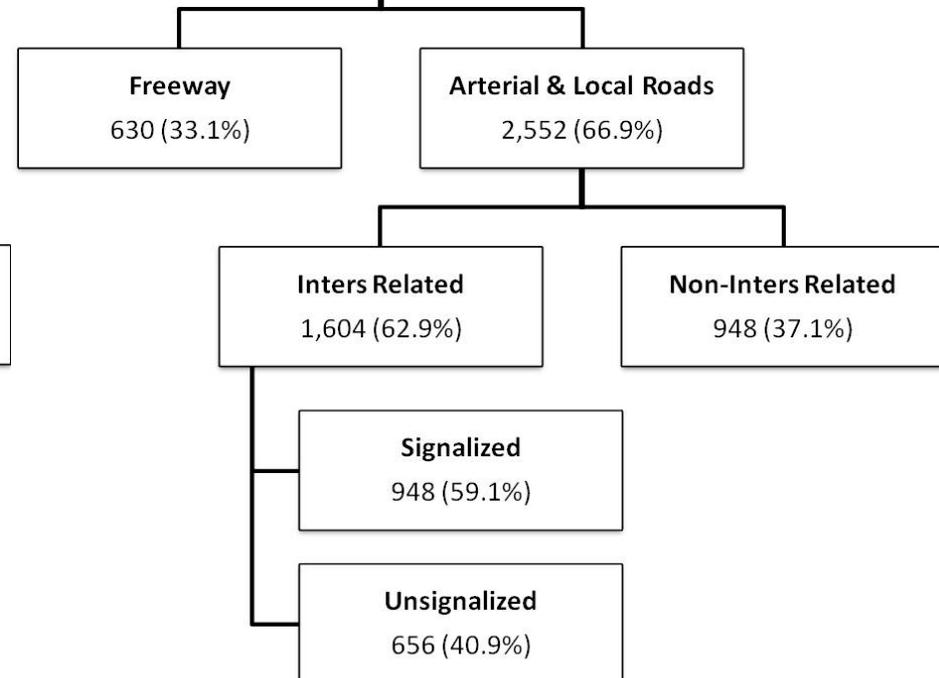
MAG Planning Area
Fatal (K) & Serious Injury (A)

Restraint Not Used

3,812

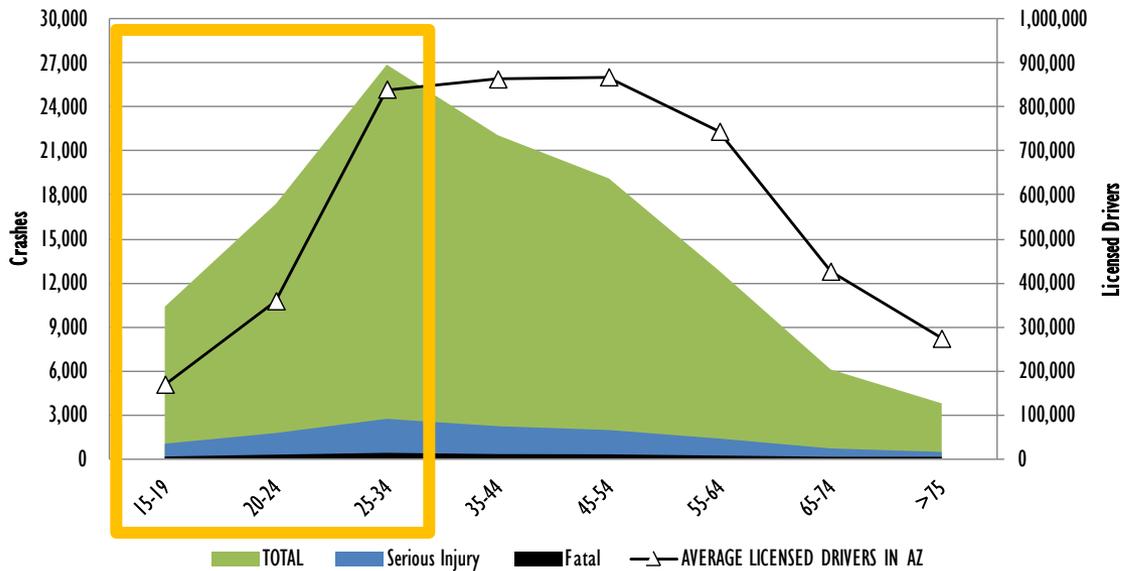
29.0% of all K+A crashes
46.4% of all K crashes
26.3% of all A crashes

46.4%
of all Fatal

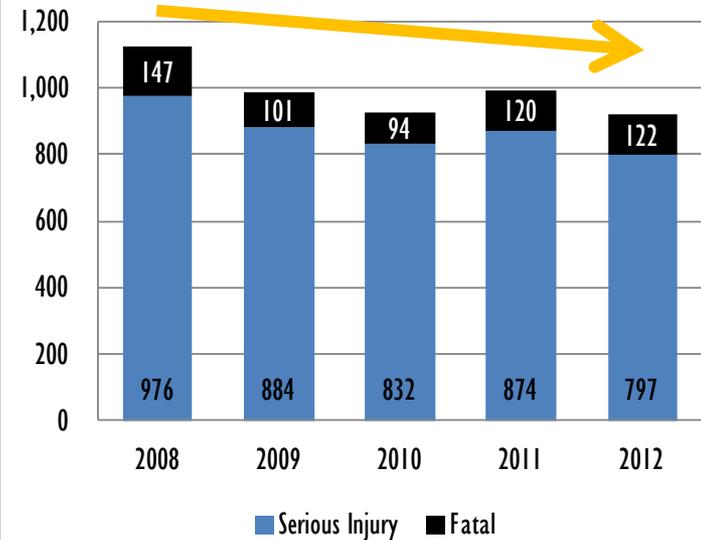


Younger Drivers

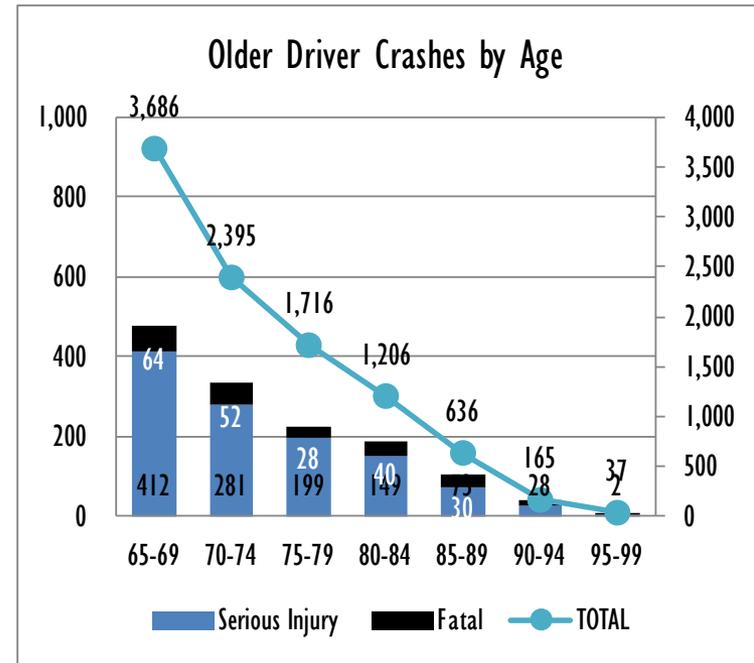
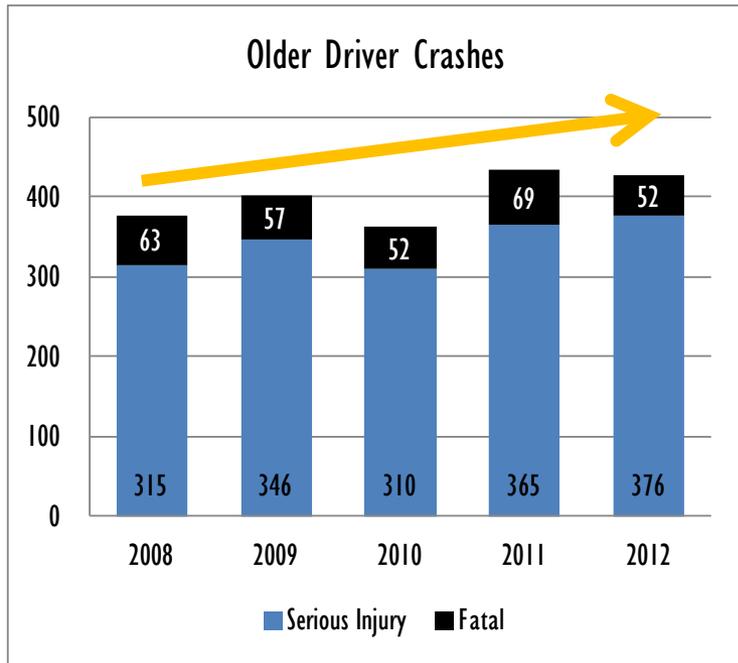
Crashes in the MAG Planning Area by Driver Age Compared to Licensed Drivers in Arizona



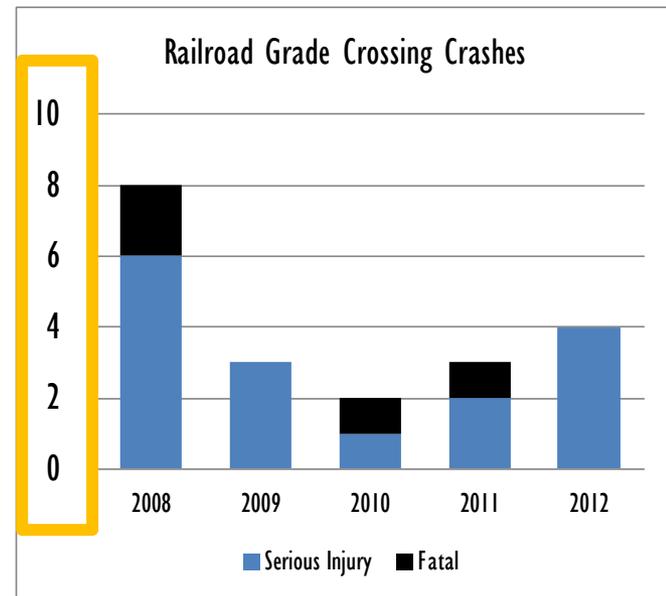
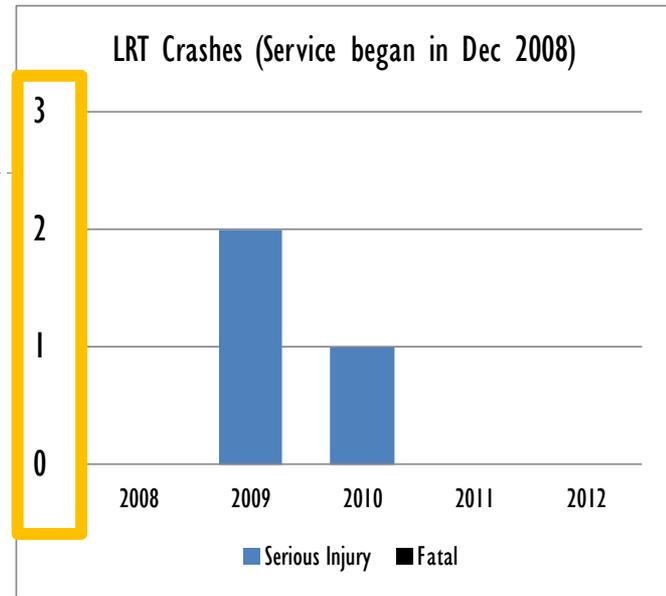
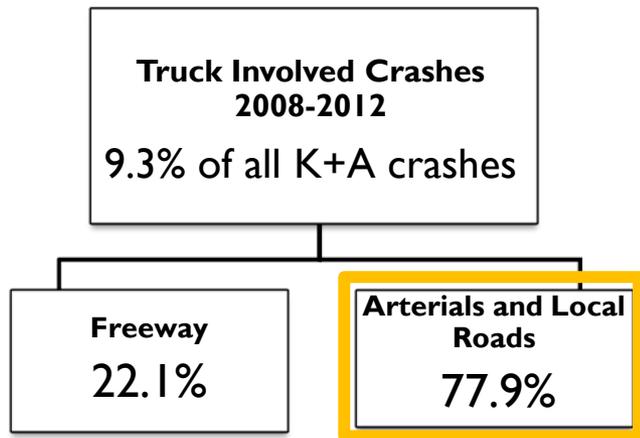
Younger Driver Crashes



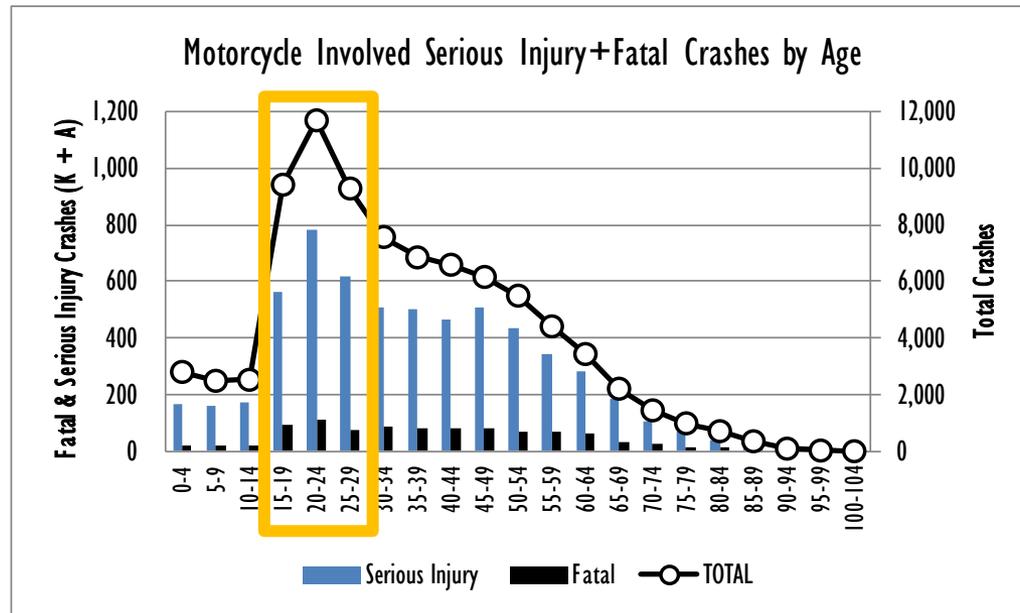
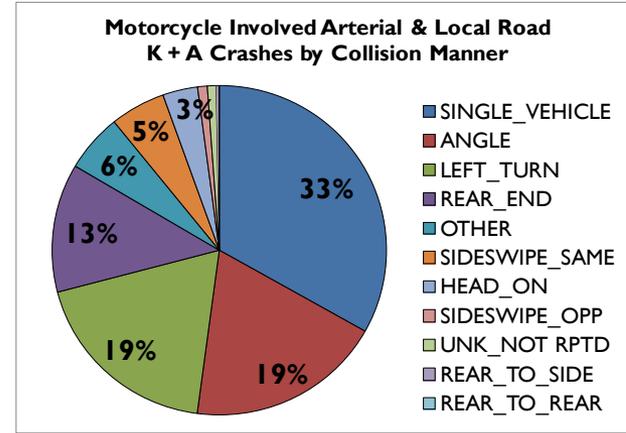
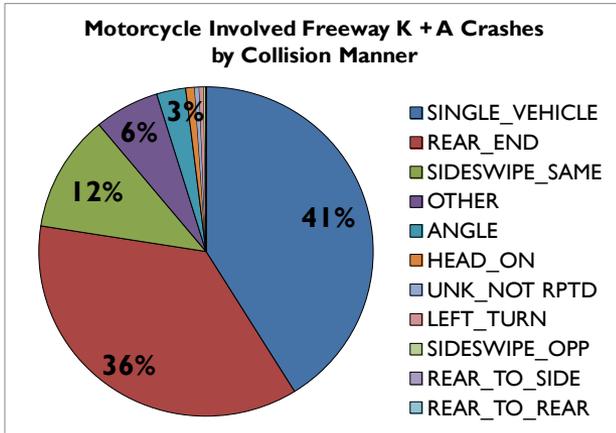
Older Drivers



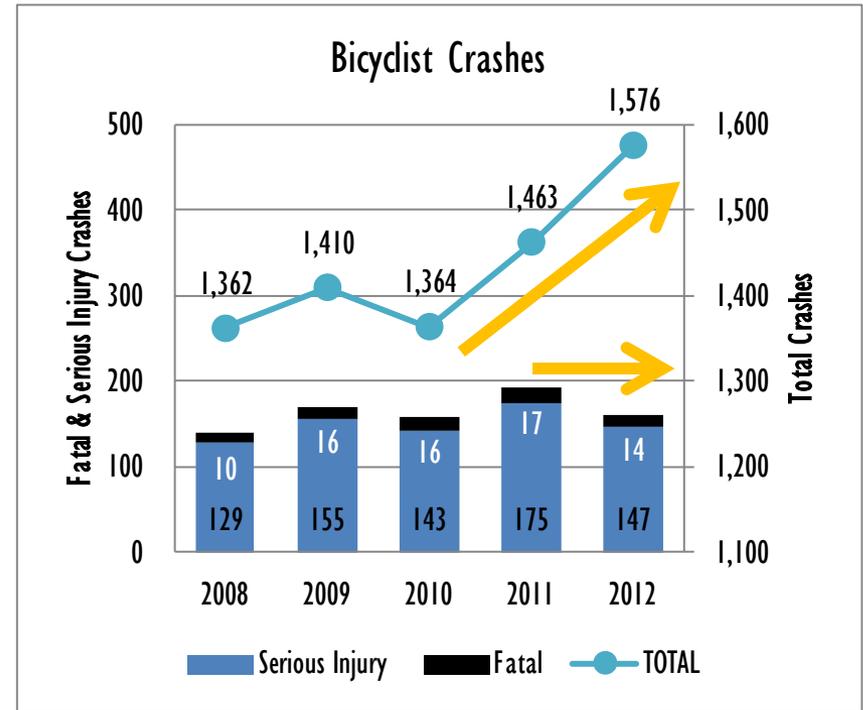
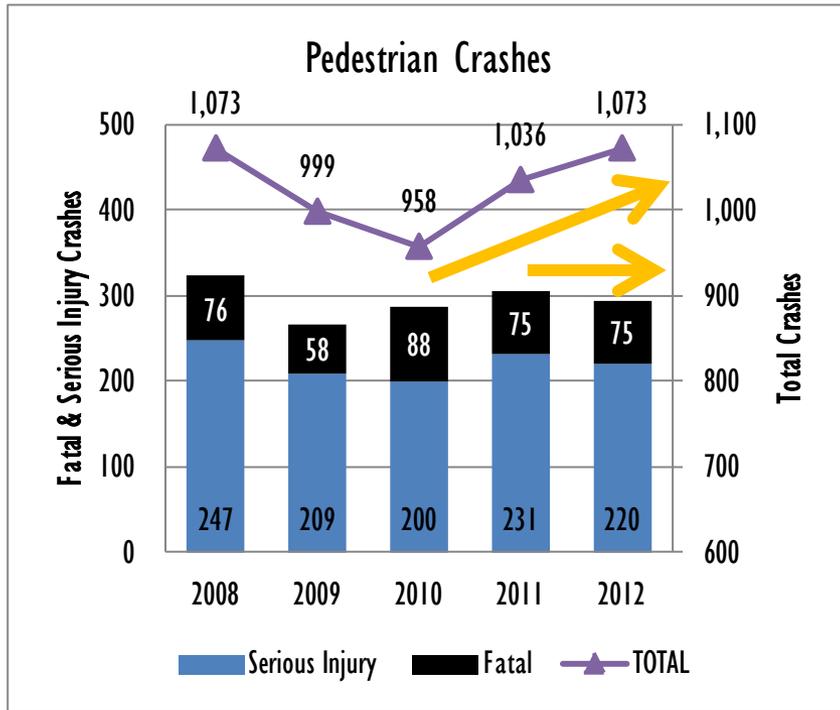
Trucks and Trains



Motorcycles



Vulnerable Users – Pedestrians & Bicyclists



Inters Related
575 (40.7%)

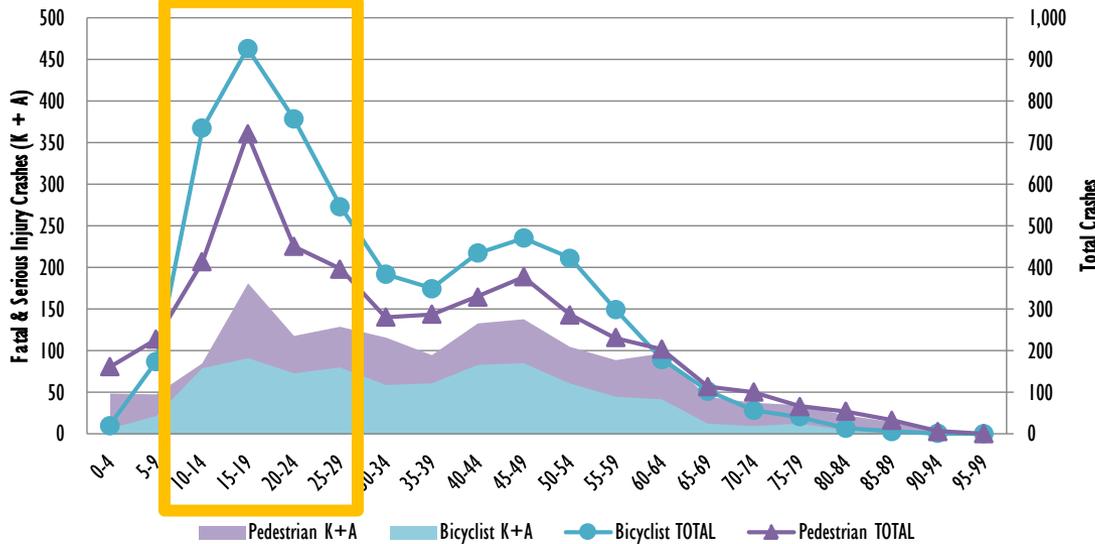
Non-Inters Related
838 (59.3%)

Inters Related
442 (55.3%)

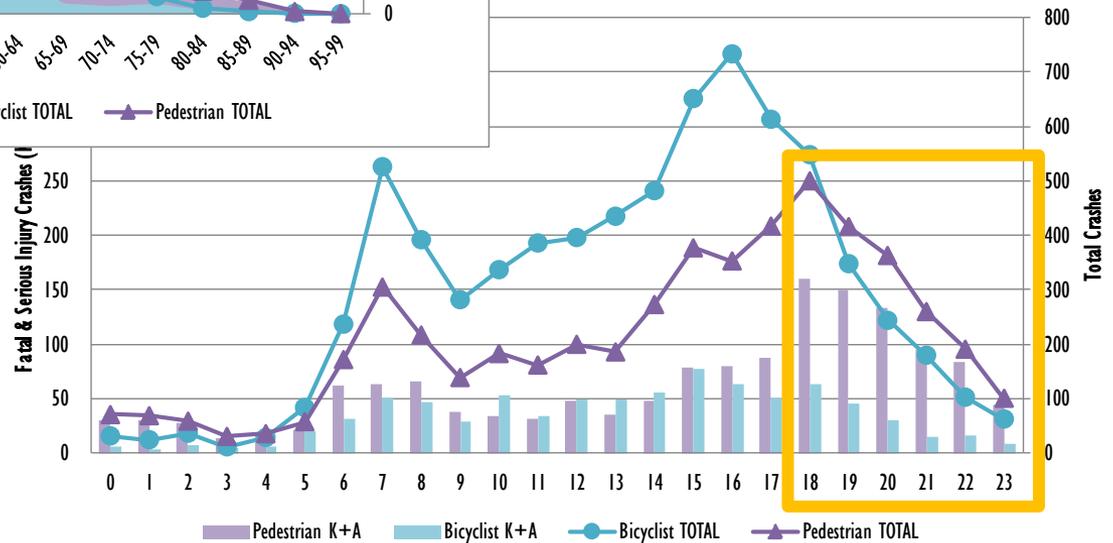
Non-Inters Related
358 (44.7%)

Vulnerable Users — By Age and Hour of Day

Vulnerable User Crashes by Age

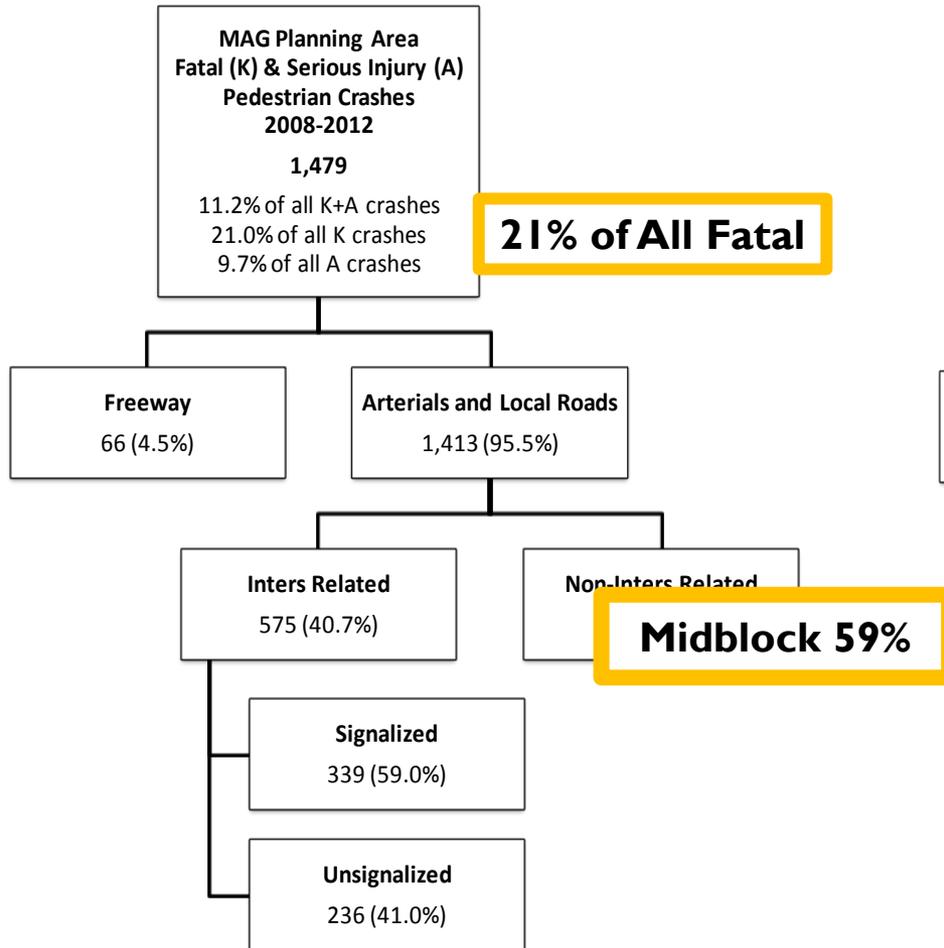


Crashes by Hour of the Day

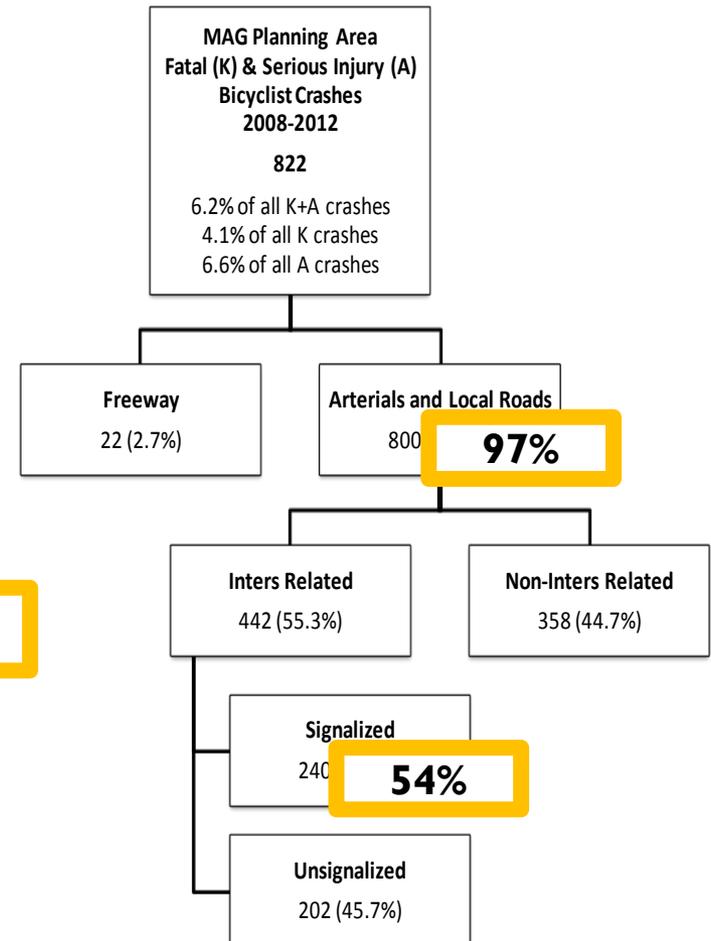


Vulnerable Users – Pedestrians & Bicyclists

Crashes Involving Pedestrians



Crashes Involving Bicyclists



What is the Risk in Our Region?

69% of All Crashes

69% of All Fatalities

69% of All Serious Injury

80% on Arterial/Local Roads

85% on Arterial/Local Roads

5 Times more Fatal & Serious Injury Crashes on Arterial/Local Roads

Pedestrian & Bicyclist Crashes INCREASE....

....as Licensure and # of vehicle crashes DECREASE

Data Indicates More Transit Use with More Desired or Planned

59% Fatal & Serious Injury Crashes
Involving Pedestrians: Midblock

55% Fatal & Serious Injury Crashes
Involving Bicyclists: Signalized Intersections

ALL Transit Users are Pedestrians and/or Bicyclists

MAG STSP Action Areas

- ▶ Eliminate Death and Serious Injuries.....
 - ▶ From Impaired Driving
 - ▶ From Speeding and Aggressive Driving
 - ▶ Related to Intersections
 - ▶ Involving Pedestrians, Bicyclists and Persons with Disabilities
 - ▶ Involving Young Roadway Users

- ▶ Data
 - ▶ Collection, Quality, Availability, Integration & Analysis for Decision Making

Related to Intersections: Action Areas & Strategies

Action Area	Strategies	Documented Effectiveness*	Lead Agency	Implementation Progress Measure (output)	Goal-Oriented Measure (outcome)
Eliminate Death and Serious Injuries Related to Intersections	Select Improvements based on screening for high crash locations.	-	MAG Member Agencies ADOT	# of MAG member agencies that identified high crash risk intersections in the past year.	Reduction (3-yr moving avg) in Fatal and Serious Injury Crashes including: # of Crashes at all intersections, # of Crashes at signalized intersections, # of Crashes at STOP controlled intersections, # of Deaths and Serious Injuries at Intersections per 100,000 population.
	Implement systemic improvements			# of systemic improvements targeting intersections with high crash risk in the past year.	
				# of RSA's conducted at intersections with high crash risk in the past year.	
				# of proven design features implemented.	
	Implement countermeasures that go beyond minimum standards (including street design or beyond MUTCD requirements)	-	MAG Member Agencies ADOT	<u>Defer to efforts of the SHSP.</u>	
	Conduct targeted enforcement of high crash locations.	HIGH	MAG Member Agencies ADOT	# of intersections equipped with automated enforcement systems.	
	Automated enforcement at high crash locations.	HIGH			
	Provide education related to intersection safety.	-	AAA ADOT AARP	% of representative population educated.	

Identify new practices or standards that integrate safety into planning and design

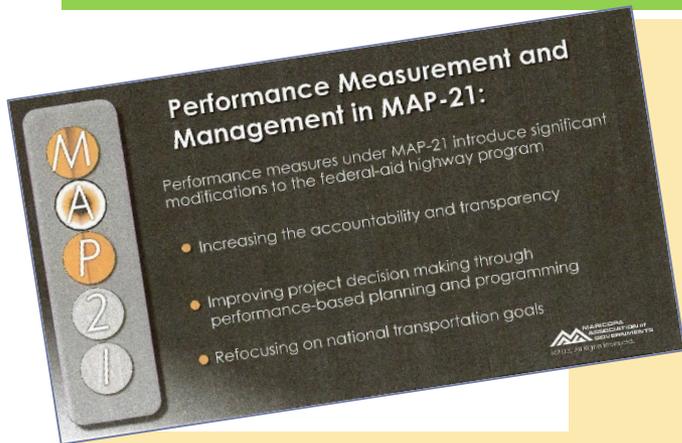
Vulnerable Users: Action Areas & Strategies

Action Area	Strategies	Lead Agency	Progress Performance Measure (output)	Goal Oriented Measurement (outcome)	
Eliminate Death and Injury for Vulnerable Road Users - Pedestrians, Bicyclists and Persons with Disabilities	Install pedestrian Hybrid Beacons (HAWKs).	MAG Member Agencies	# of pedestrian crossing enhancements installed such as a HAWK, pedestrian crossing island, etc. marked crossings).	Reduction (3-yr moving avg) in Fatal and Serious Injury Crashes involving a pedestrian. # of Pedestrian Deaths and Serious Injuries. Reduction (3-yr moving avg) in Serious Injury and Fatal Crashes involving a bicyclist. # of Bicyclist Deaths and Serious Injuries.	
	Install medians and	MAG			
	Ensure Safety and Multimodal Connectivity in Planning and Design				% of MAG member agencies that bine safety with multimodal rectivity reviews in planning and gn.
	Integrate safety analysis and design throughout the planning process.	ADOT	complete streets policies that rely on safety analysis and design.		
	Provide bicycle detection at signalized intersections.	MAG Member Agencies	# or % of traffic signals with bicycle detection.		
	Enforcement	Establish bicycle helmet laws for children.	GOHS ADOT MAG Member Agencies		Defer to efforts of the SHSP.
Decrease wrong-way riding and traffic control violations by bicyclists.		GOHS MAG Member Agencies	# or % of jurisdictions with bicycle wrong-way riding prohibitions		

Increased Emphasis: Multimodal Safety

3.1 Increased Emphasis: Multimodal Safety

Federal MAP-21 Influences

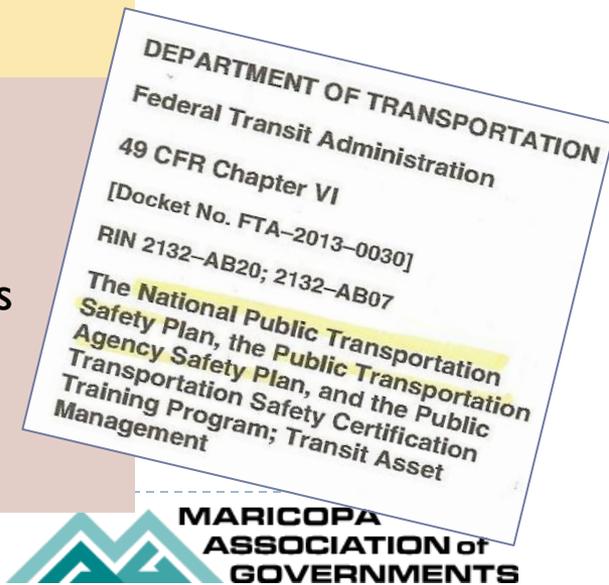


- Six elements of performance-related provisions:
(1) National Goals, (2) Measures, (3) Targets, (4) Plans, (5) Reports, (6) Accountability
- USDOT establishes performance measures
 - 1st of 3 proposed rules published March 2014
HSIP...comments due 6/30/2014
 - Transit—separate rulemakings

- Targets—States set by 4/2015, and MPOs by 10/2015
- MPO plans describe how plans will achieve targets

MAP-21, FTA National Public Transportation Safety Plan

- Advanced notice of rulemaking issued in late 2013
- Safety Management System (SMS) “Approach”
- MPOs must “consider” transit agency plans and targets
- (new) *Public Transportation Agency Safety Plan*



3.2 Increased Emphasis: Multimodal Safety

MAG & Regional Influences

Policies and Documents

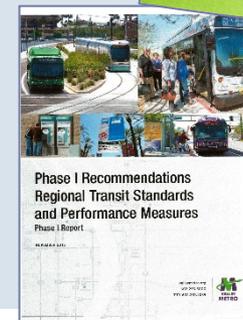
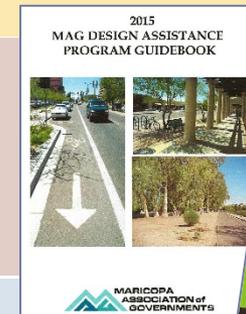
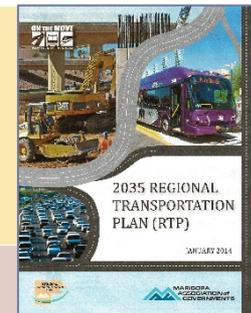
- RTP...Chapter 21, “Transportation Safety”
- Goals & objectives, evaluation criteria, performance measures
- Transportation Safety Committee

Programs

- Transportation Improvement Program (TIP)
- Design Assistance Program
- Transportation Alternatives Program (TAP)

MAG / Regional Studies

- STSP-Strategic Transportation Safety Plan (on-going)
- Designing Transit Accessible Communities (2013)
- RPTA Bus Stop Standards (2008)
- Complete Streets Guide (2011)
- Regional Bikeway Master Plan (2007)
- Pedestrian Policies and Design Guidelines (2005)
- VM Standards and Performance Measures (on-going)



3.3 Increased Emphasis: Multimodal Safety

Related Research

NCHRP (National Cooperative Highway Research Program)

- *Framework for Institutionalizing Safety in the Transportation Planning Process* (on-going)

TCRP (Transit Cooperative Research Program)

- *Bus Stop Design and Location Guidelines* (1996)
- *Guidebook for Mitigating Fixed-Route Bus-and-Pedestrian Collisions* (2008)
- *Guidebook for Developing a Transit Performance-Measurement System* (2003)

FTA (Federal Transit Administration)

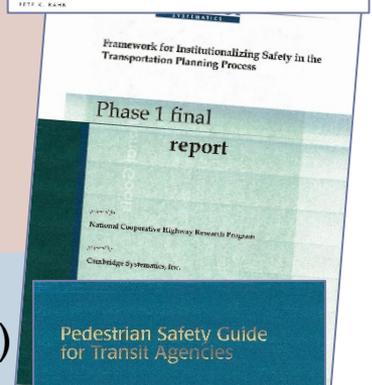
- *Transit Safety Management and Performance Measurement* (2011)
- *Pedestrian Safety Guide for Transit Agencies* (2008)

FHWA (Federal Highway Administration)

- *A Primer on Safety Performance for the Transportation Planning Process* (2009)
- *Pedestrian Safety Guide for Transit Agencies* (2008)



Performance Management for Transportation Organizations
Developing and Applying Metrics That Drive Performance
1977 v. 64-66



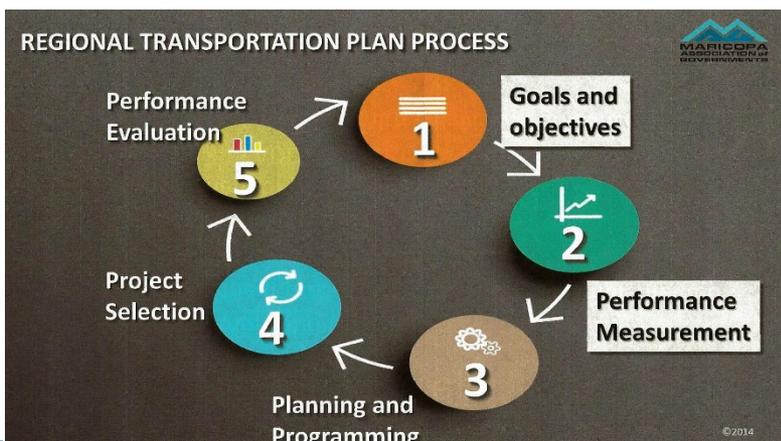
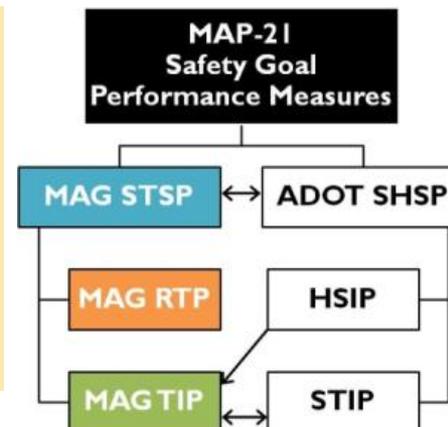
Safety in the Regional Planning & Programming Process

4.1 Safety in the Regional Planning & Programming Process

Linkages

ADOT-MAG

- MAG's *STSP* action areas need to be within the umbrella of the ADOT *SHSP* (due to be finalized in summer 2014)
- ADOT's *HSIP* is aligned with the *SHSP*
- MAG *TIP* needs to be consistent with the *HSIP*

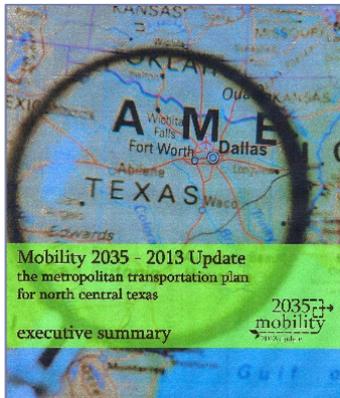


RTP-TIP

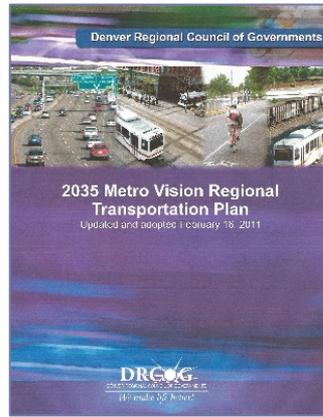
- Performance measurement and evaluation are key components
- TIP Project evaluation criteria link with performance measures

4.2 Safety in the Regional Planning & Programming Process

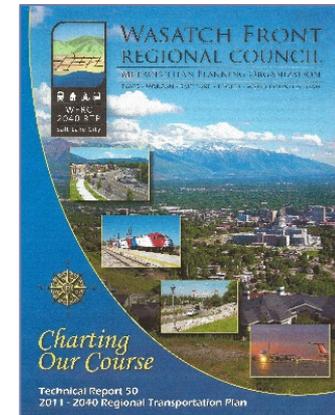
Review of 5 MPOs



NCTCOG
Dallas- Fort
Worth



DRCOG
Denver



WFRC
Salt Lake
City



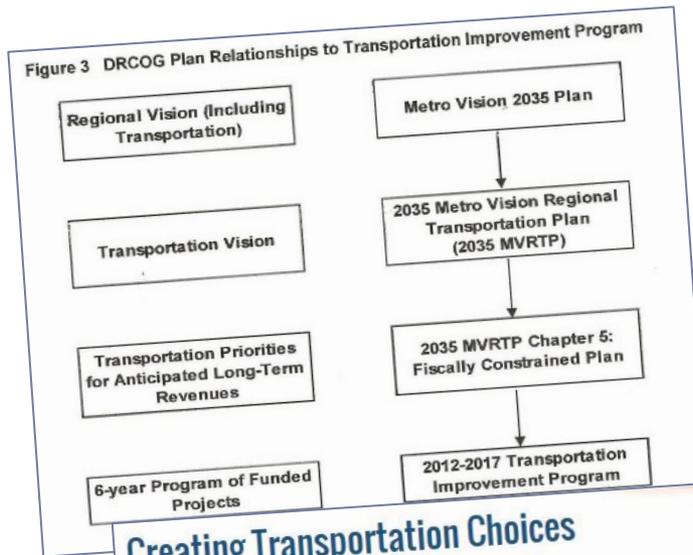
RTC
Reno



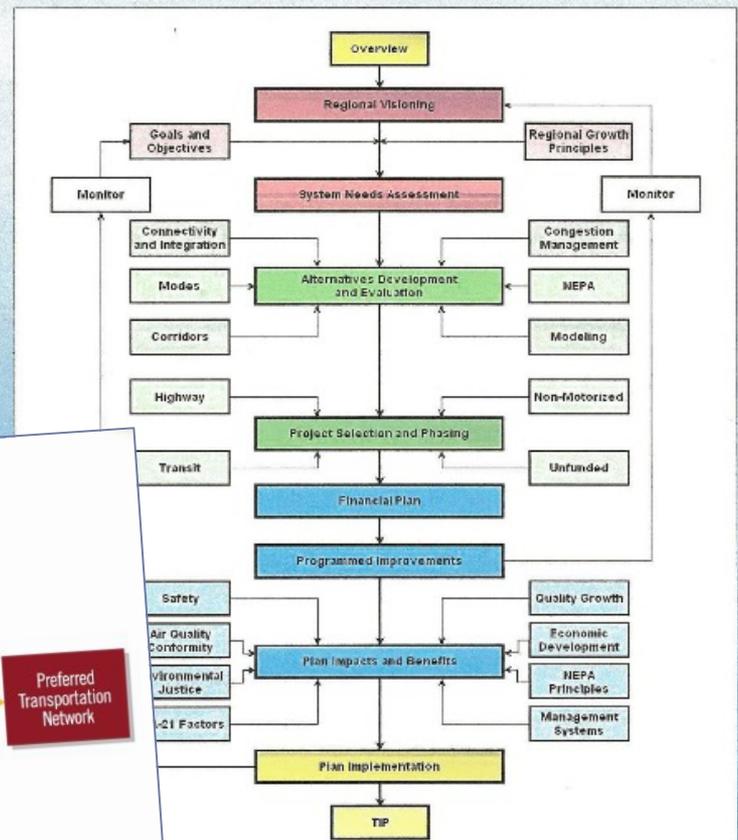
SANDAG
San Diego

4.3 Safety in the Regional Planning & Programming Process

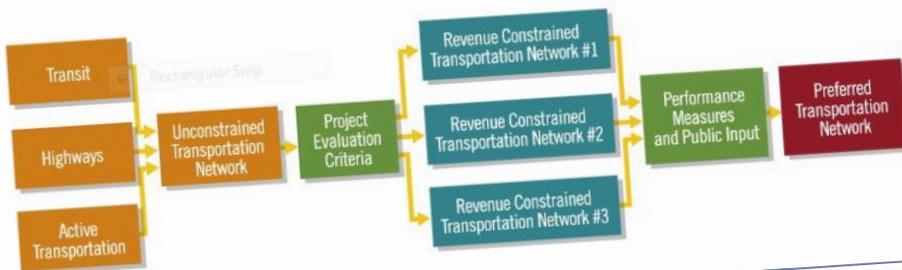
5 MPOs—Planning Processes



RTP 2040 Planning Process



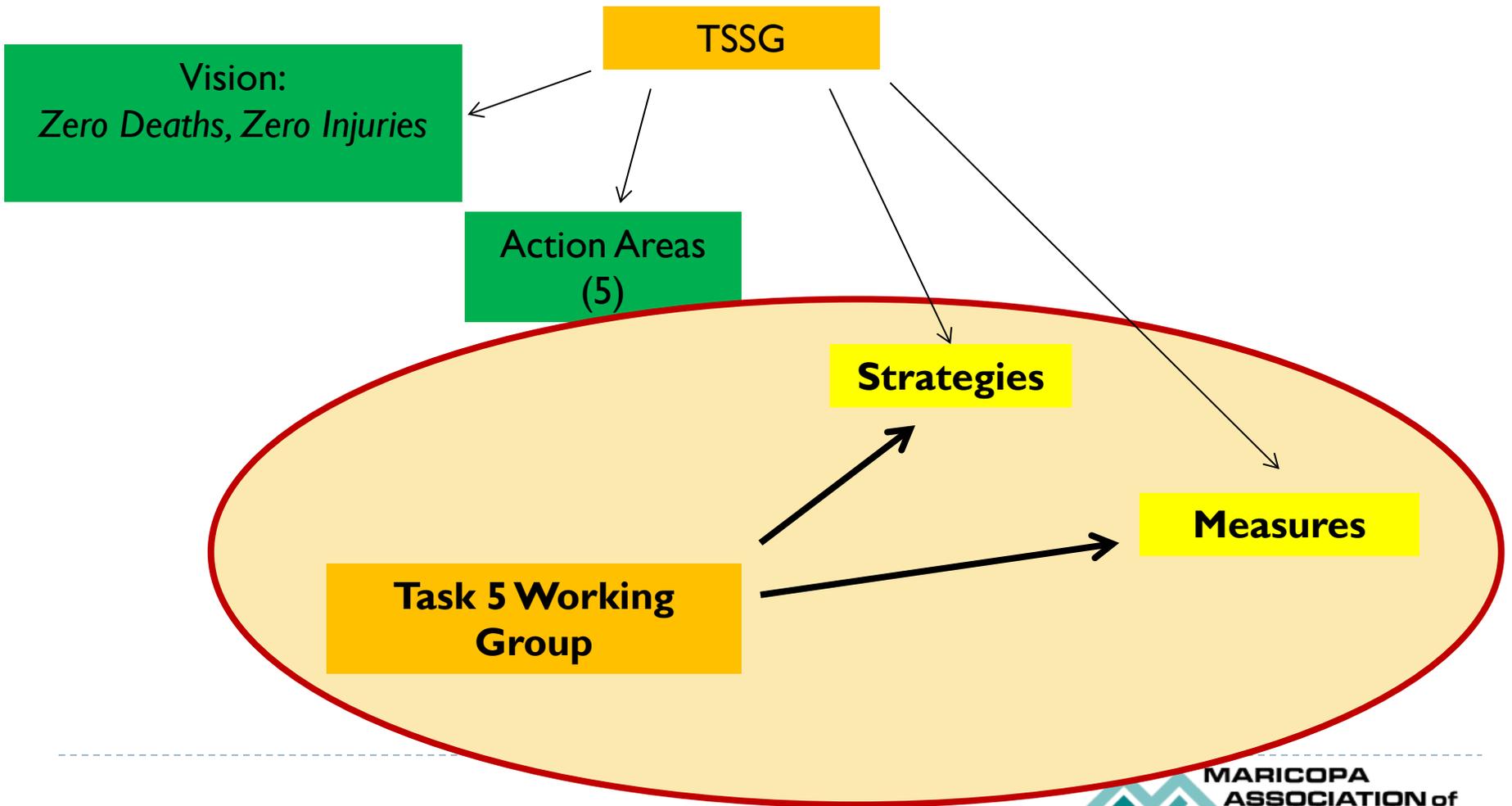
Creating Transportation Choices



Achieving Safer Multimodal Travel Through Our Plans and Projects

5.1 Achieving Safer Multimodal Travel Through Our Plans and Projects

Today's Task: Safety Strategies & Measures



5.2 Achieving Safer Multimodal Travel Through Our Plans and Projects

Primary Considerations

Requirements —MAP-21 influences

+

Regional processes, policies, practices, projects —gaps, deficiencies, loose ends, emerging changes

+

External practices and programs —potential transferable lessons and ideas from others

+

Available transportation safety research —practical, practitioner-oriented changes

5.3 Achieving Safer Multimodal Travel Through Our Plans and Projects

Turning MAG Plans into Projects

The Plans Exist

- *Complete Streets Guide*
- *Designing Transit Accessible Communities*
- *Regional Bikeway Master Plan*
- *Pedestrian Policies and Design Guidelines*

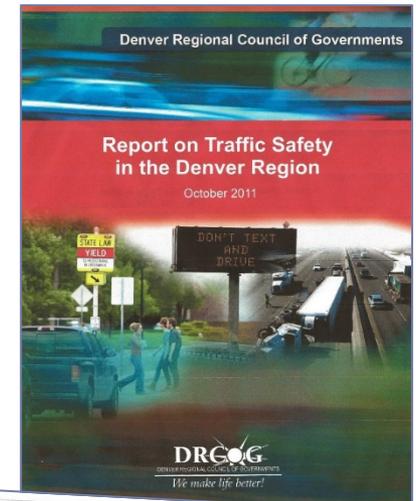
...However, Funding Programs are Modest for Non-Motorized Transportation Alternatives

- Transit Life Cycle / and FTA—for transit ops and facilities determined by transit operators
- Transit Life Cycle / FHWA CMAQ—very competitive among wide range of projects
- FHWA HSIP—very competitive for high rated safety projects
- Transportation Alternatives Program (TAP)—best opportunity
- Design Assistance Program—planning only, limited \$

5.4 Achieving Safer Multimodal Travel Through Our Plans and Projects

5 MPOs—Ideas for Transferable Practices

- *Tracking performance* —Reno’s RTC tracks safety performance in its agency Annual Report (i.e., status toward reaching targets); NCTCOG produces annual performance summary in the form of a fact sheet
- *Comprehensive safety reports* —DRCOG produces 3 comprehensive reports on transportation safety (traffic safety, ped & bike safety, transportation operations)
- *Capital plans, projects* —SANDAG has an Active Transportation Working Group; program includes “Safe Routes to Transit Plan”; NCTCOG has a plan for 1,728 miles of “Veloweb,” an off-street system of shared-use bicycle-pedestrian paths



National Performance Measure	RTP Goal	Annual Transit Performance Measures	Performance Target	2013 Performance Measure Status	2013 Performance Target Status
Safety Performance Measures	Improve Safety	Preventable transit accidents per 100,000 miles of service	• 0 (improving)	RTC SDG 1.87 (average of July 2013-December 2013)	Working toward goal
		RTC ACCESS I.D.L.		551	Working toward goal
		Number of crashes and number of crashes per vehicle miles traveled (CVMT)	• Reduce by 50% by 2020	551	Working toward goal
		Number of serious injuries per VMT	• Reduce by 50% by 2020	9	Working toward goal
		Number of fatalities and fatalities per VMT	• Reduce by 50% by 2020	9	Working toward goal
		Miles of bicycle lanes added and persons of the Bicycle Pedestrian Master Plan	• 3-7% of sales implemented per year	The master plan identified 148 miles of existing bicycle lanes and proposed adding 20.2 miles of bike lanes in the Bicycle and Pedestrian Master Plan. 2012 added 20.2 miles of bike lanes - 216 2013 - 8.6 miles of bike lanes added per	Exceed goal

5.5 Achieving Safer Multimodal Travel Through Our Plans and Projects

Research-Safety in the Planning Process

NCHRP 08-76—7 principles comprise a "Framework"

- 1 Include safety expertise on transportation planning committees
- 2 Define and include safety in the vision, goals, and objectives in transportation planning documents
- 3 Include safety in the context of other transportation goals and objectives (i.e., bicycle, pedestrian, highway, transit safety)
- 4 Establish safety performance measures
- 5 Collect and analyze safety data
- 6 Establish safety as a decision factor
- 7 Monitor safety performance and evaluate safety programs and policies

5.6 Achieving Safer Multimodal Travel Through Our Plans and Projects

Research—Some Common Themes

- Last 500' – 1,000' of bicyclist and pedestrian journey needs planning and design attention
- Bus stop planning and design should be proactive
 - Improvement of existing stops should be an ongoing daily program
 - Stop environments should be pedestrian- and bicycle-friendly
- Agency partnering is critical, particularly between bicycle planners-traffic engineers and transit operators-traffic engineers
- Data collection involving pedestrian and bicyclist crashes are typically deficient, especially reporting of crashes near bus stops by cause and contributory factors

5.7 Achieving Safer Multimodal Travel Through Our Plans and Projects

Example Performance Measures & Targets

<u>Performance Measures</u>	<u>Targets</u>
Preventable transit accidents per 100,000 miles of service (RTC)	0
No. of crashes per VMT (RTC)	Reduce by 50%
Miles of bicycle lanes added as % of Plan (RTC)	3-7%
Fatal crash rate per 100 million VMT (DRCOG)	Reduce to 0.60 by 2035 (0.68 in 2010)

5.8 Achieving Safer Multimodal Travel Through Our Plans and Projects

Example MAG Evaluation Criteria

<u>Criteria</u>	<u>Metrics</u>	<u>Weight</u>
Does this project improve safety of transit users or providers? (MAG Transit State of Good Repair)	Nice to have/Will need to be addressed at one point/High priority	0-3 pts (6%)
Directly addresses peds & bicyclists traffic safety concerns (MAG Transit Accessibility)	Nice to have/Will need to be addressed at one point/High priority	0-3 (6%)
This project addresses bike/vehicle or ped/vehicle safety conflicts (MAG DAP)	n/a	0-5 (5%)
Number of safety improvements (MAG TAP)	n/a	0-12 (3.6%)
Project addresses quantifiable and/or perceived crash risk (MAG TAP)	n/a	0-6.67 (2%)

5.9 Achieving Safer Multimodal Travel Through Our Plans and Projects

MAG STSP Action Areas

3 of 6 relate to multimodal travel

- Improve data collection, quality, availability, integration, and analysis for decision-making
- Eliminate death and serious injury related to intersections
- Eliminate death and serious injury for vulnerable road users (pedestrians, bicyclists, motorcyclists, persons with disabilities)

5.10 Achieving Safer Multimodal Travel Through Our Plans and Projects

Zero Deaths – Zero Injuries

- **Strategies:** For safer multimodal travel we will focus on two STSP Action Areas
 1. Vulnerable road users
 2. Intersections

5.11 Achieving Safer Multimodal Travel Through Our Plans and Projects

Zero Deaths – Zero Injuries

- **Strategies:** For safer multimodal travel we will focus on two STSP Action Areas
 1. Vulnerable road users
 2. Intersections
- **Performance Measures:** How do we judge our region's performance toward achieving safer travel?

5.12 Achieving Safer Multimodal Travel Through Our Plans and Projects

Zero Deaths – Zero Injuries

- **Strategies:** For safer multimodal travel we will focus on two STSP Action Areas
 1. Vulnerable road users
 2. Intersections
- **Performance Measures:** How do we judge our region's performance toward achieving safer travel?
- **Evaluation Criteria:** To achieve safer travel, what criteria can we use to evaluate and rank plans/projects?

Wrap-up
Next Meeting:
Week of July 14th 2014
“Do the Doodle”