SA-BC MPO Bicycle & Pedestrian Data Collection Project

Road Diet Analysis
April 14, 2010 Bike Night BMAC Meeting
Sprinkle Consulting, Inc.
Phase 1 - Project Accomplishments

- Updated geometric and traffic data from two prior studies (2001 and 2005)
- Expanded network coverage
- Collected / updated 60,000 data items
- Evaluated existing bicycling and walking conditions using advanced performance metrics
- Facilitates:
  - 3rd edition of MPO’s *Bike Map*
  - “Road Diet” candidate identification (Phase II)
  - City of San Antonio Bicycle Master Plan
Preliminary Corridor Plan (continued):
Inclantown Road, US Highway 1 to SR A1A

4 Lane Undivided - Before

- ADT = 8,000
- Motor Vehicle LOS = C
- Bicycle LOS = D

2 Lane Undivided - After

- ADT = 8,000
- Motor Vehicle LOS = C
- New Bicycle LOS = B
Expanded Scope to Include:

Roadway Restripes, Road Diets, and Adding Shoulders

Lane Width Reduction
(Roadway Restripe)

4 Lane Undivided
Road Diet

One Way Street
Road Diet

Add Shoulders

San Antonio-Bexar County MPO
Roadway Restripe Example (Before & After)

Photo by Sprinkle Consulting, Inc.

San Antonio-Bexar County MPO
Over-arching Themes of Phase II

1. Magnitude of the Analyses
   
   15 decisions * 1,650 segments = 25,000 analyses

2. Scope of the Analyses
   
   Planning-level, MPO initiative covers large network

3. What to do with the Analyses
   
   Implementing jurisdictions should study recommendations at a corridor level for feasibility, funding identification, and implementation plan
Phase II:
Facility Decision Tree

1. **Existing/Programmed Facility**
   - Yes → No Recommended Improvement
   - No → Bicycle LOS Met

2. **Bicycle LOS Met**
   - Yes → No Recommended Improvement
   - No → Surplus Pavement Width

3. **Surplus Pavement Width**
   - Yes → Restripe for Bike Lanes/Shoulders
   - No → Surplus Lanes

4. **Surplus Lanes**
   - Yes → Reallocate Pavement for Bike Lanes/Shoulders
   - No → Curb and Gutter Section or Significant Regrading Needed

5. **Curb and Gutter Section or Significant Regrading Needed**
   - Yes → Detailed Corridor Study Needed (Potential Sidepath, Parallel Route, Bike Boulevard, Shared Lane Marking, etc. Corridor)
   - No → Paved Shoulder (Rural Bike Lanes)
Analysis Recommendations

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
Implementing Jurisdiction Decisions:
Existing “Bicycle Facility” Minimum Width

CoSA: 4 ft.
Bexar Co.: 4 ft.
TxDOT: 4 ft.
Coverage Snapshot (through Step 1)

Existing/Programmed + Bicycle LOS Met + Restripe Candidates + Road Diet Candidates = 395 miles (24% of network)
Analysis Recommendations

1. Existing/Programmed Paved Shoulders or Bike Lanes (395 miles)
2. Bicycle LOS Threshold Met
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. Add Paved Shoulders
6. Detailed Corridor Study Needed
Implementing Jurisdiction Decisions: Minimum Bicycling Conditions (LOS Threshold)

- 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
Coverage Snapshot (through Step 2)

Existing/Programmed
+ Bicycle LOS Met
+ Restripe Candidates
+ Road Diet Candidates
= 791 miles
(48% of network)
Analysis Recommendations

1. Existing/Programmed Paved Shoulders or Bike Lanes (395 miles)
2. Bicycle LOS Threshold Met (396 Miles)
3. Roadway Restripe Candidate
4. Road Diet Candidate
5. Add Paved Shoulders
6. Detailed Corridor Study Needed
Implementing Jurisdiction Decisions:

Roadway Restriping Minimum Lane Width

CoSA: 10 ft. (11 ft. if along a VIA route or a road with significant horizontal curvature)

TxDOT: 11 ft.

Bexar Co.: 12 ft.
Roadway Restripe Assumptions

- Total pavement width (field-collected) compared against width needed for existing lanes and new 4-ft. bike lanes
- 12 ft. preserved for existing two-way left turn lanes
Roadway Restripe Assumptions

- 8 ft. preserved for existing striped on-street parking

- Candidate roadways for restriping with un-striped on-street parking are noted for in-depth parking study (20 cases)
2-lane Roadway Restripe Example (Before)

Photo by Sprinkle Consulting, Inc.
2-lane Roadway Restripe Example (After)

Photo by Sprinkle Consulting, Inc.
2-lane Roadway Restripe Example (Before & After)

Bicycle LOS = 2.55 ("C") → Bicycle LOS = 1.42 ("A")

44% improvement

Photo by Sprinkle Consulting, Inc.
4-lane Roadway Restripe Example (After)

Photo by Sprinkle Consulting, Inc.
4-lane Roadway Restripe Example (Before & After)

Bicycle LOS = 4.40 (“D”)  

20% improvement  

Bicycle LOS = 3.50 (“C”)
Coverage Snapshot (through Step 3)

Existing/Programmed + Bicycle LOS Met + Restripe Candidates + Road Diet Candidates = 1,049 miles (64% of network)
Analysis Recommendations

1. Existing/Programmed Paved Shoulders or Bike Lanes (395 miles)
2. Bicycle LOS Threshold Met (396 miles)
3. Roadway Restripe Candidate (258 miles)
4. Road Diet Candidate
5. Add Paved Shoulders
6. Detailed Corridor Study Needed
# Implementing Jurisdiction Decisions:

## Minimum Motor Vehicle LOS Threshold

### TABLE 4-1: GENERALIZED ANNUAL AVERAGE DAILY VOLUMES FOR FLORIDA'S URBANIZED AREAS*

#### UNINTERUPTED FLOW HIGHWAYS

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<th>Level of Service</th>
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#### STATE TWO-WAY ARTERIALS

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#### FREEWAYS

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#### BICYCLE MODE

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#### PEDESTRIAN MODE

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#### NON-STATA ROADWAYS

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#### BUS MODE (Scheduled Fixed Route)

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#### ARTERIAL NON-STATE ROADWAY ADJUSTMENTS

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#### ONE-WAY FACILITIES

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*The Sprinkle Team

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San Antonio-Bexar County MPO
Road Diet Example (Before)

Photo by Sprinkle Consulting, Inc.
Road Diet Example (After)

Photo by Sprinkle Consulting, Inc.
Road Diet Example (Before & After)

Bicycle LOS = 3.70 ("D")  
Bicycle LOS = 2.97 ("C")  
20% improvement
Analysis Recommendations

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
Coverage Snapshot (through Step 1)

Existing/Programmed + Bicycle LOS Met + Restripe Candidates + Road Diet Candidates = 395 miles (24% of network)
Coverage Snapshot (through Step 2)

Existing/Programmed + Bicycle LOS Met + Restripe Candidates + Road Diet Candidates = 791 miles (48% of network)
Coverage Snapshot (through Step 3)

Existing/Programmed

+ Bicycle LOS Met

+ Restripe Candidates

+ Road Diet Candidates

= 1,049 miles
(64% of network)
Coverage Snapshot (through Step 4)

Existing/Programmed + Bicycle LOS Met + Restripe Candidates + Road Diet Candidates = 1,139 miles (69% of network)
Analysis Recommendations

1. Existing/Programmed Paved Shoulders or Bike Lanes (395 miles)
2. Bicycle LOS Threshold Met (396 miles)
3. Roadway Restripe Candidate (258 miles)
4. Road Diet Candidate (90 miles)
5. Add Paved Shoulders
6. Detailed Corridor Study Needed
The analyses indicate the possibility creating approximately 700 new miles of directional bike lanes simply by reallocating existing pavement width!
Add Paved Shoulders Requirements

- Open Shoulder (no C&G)
- Roadside Profile
  Condition of “1” (minimal regrading necessary)
Network Snapshot (through Step 5)
Analysis Recommendations

1. Existing/Programmed Paved Shoulders or Bike Lanes (395 miles)
2. Bicycle LOS Threshold Met (396 miles)
3. Roadway Restripe Candidate (258 miles)
4. Road Diet Candidate (90 miles)
5. Add Paved Shoulders (123 miles)
6. Detailed Corridor Study Needed
Detailed Corridor Study Needed (DCSN): Potential Solutions*

- Road diets for 4-lane undivided roads (can sometimes improve motor vehicle operations and safety)
- Shared use paths (sidepaths), dependent upon available ROW, grade, and geometric characteristics
- Parallel/offset routes (potentially with “bike boulevards”)

* All require corridor-level studies by implementing jurisdictions
Sharrows

Bike Boulevards

Comfort Stripes/
Buffered Bike Lanes

Sidepaths

Photo by Sprinkle Consulting, Inc.

Photo by Sprinkle Consulting, Inc.

Photo by Sprinkle Consulting, Inc.

Photo by Sprinkle Consulting, Inc.
Representative Case Studies (Cross-Sections)

- Candidate locations suggested by Project Oversight Committee
- Includes both roadway restripes and road diets
- Designed to be typical (applicable across the region)
Martin Luther King (New Braunfels to W.W. White)

- 4-lane undivided
- TPW: 42 ft.
- 8,000 ADT (posted speed 35 mph)
- Bicycle LOS “D”
- Road Diet Candidate
Martin Luther King (New Braunfels to W.W. White)

42 ft. available

Bicycle LOS 3.88 “D”

4/11/12/11/4

Bicycle LOS 3.04 “C”

22% improvement

Photo by Sprinkle Consulting, Inc.
Military Drive (U.S. 90 to Five Palms)

- 6-lane divided
- TPW: 37 ft.
- 43,000 ADT (posted speed 45 mph)
- Bicycle LOS “E”
- Roadway Restripe Candidate
Military Drive (U.S. 90 to Five Palms)

37 ft. available
Bicycle LOS 5.20 “E”

11/11/11/4
Bicycle LOS 4.52 “E”
13% improvement

Photo by Sprinkle Consulting, Inc.
Floyd Curl (Louis Pasteur to Huebner)

- 4-lane divided
- TPW: 25 ft.
- 9,000 ADT (posted speed 30 mph)
- Bicycle LOS “D”
- Road Diet Candidate

Photo by Sprinkle Consulting, Inc.
Floyd Curl (Louis Pasteur to Huebner)

25 ft. available

Bicycle LOS 3.89 “D”

15/5/5

Bicycle LOS 0.00 “A”

100% improvement

Photo by Sprinkle Consulting, Inc.
Benefits of Buffered Bike Lanes ("Comfort Stripes")

- Space itself (included in LOS calculations)
- Psychological benefit of perceived barrier
- Benefits of a sidepath without the operational challenges
- Provides MV deceleration lane
- Provides Transit Stops & Transitions
Brazos (Guadalupe to Durango)

- 4-lane undivided
- TPW: 42 ft.
- 8,000 ADT (posted speed 30 mph)
- Bicycle LOS “D”
- Road Diet Candidate
Brazos (Guadalupe to Durango)

42 ft. available

Bicycle LOS 4.00 “D”

4/11/12/11/4

23% improvement

Bicycle LOS 3.10 “C”
Fredericksburg (Loop 410 to Callaghan)

- 6-lane w/ TWLTL
- TPW: 90 ft.
- 53,000 ADT (posted speed 40 mph)
- Bicycle LOS “E”
- Roadway Restripe Candidate
Fredericksburg (Loop 410 to Callaghan)

90 ft. available

Bicycle LOS 4.96 “E”


Bicycle LOS 3.67 “D”

26% improvement
6-lane w/ TWLTL
TPW: 72 ft.
24,000 ADT (posted speed 35 mph)
Bicycle LOS “D”
Road Diet Candidate
Broadway (Josephine to Hildebrand)

72 ft. available

Bicycle LOS 4.44 “D”


66% improvement

Bicycle LOS 1.50 “A”
San Pedro (Rector to Lockhill-Selma)

- 6-lane divided
- TPW: 37 ft.
- 56,000 ADT (posted speed 40 mph)
- Bicycle LOS “E”
- Roadway Restripe Candidate

Photo by Sprinkle Consulting, Inc.
San Pedro (Rector to Lockhill-Selma)

37 ft. available

Bicycle LOS 4.98 “E”

11/11/11/4

15% improvement

Bicycle LOS 4.23 “D”
Military Drive (Roosevelt to Goliad)

- 6-lane divided
- TPW: 33 ft.
- 28,000 ADT (posted speed 45 mph)
- Bicycle LOS “E”
- Road Diet Candidate

Photo by Sprinkle Consulting, Inc.
Military Drive (Roosevelt to Goliad)

33 ft. available

Bicycle LOS 4.49 “D”

12/12/4/5

Bicycle LOS 1.11 “A”

75% improvement
Pavement Reallocation Implementation Guide

- Routine Resurfacing
- Removal of Existing Stripes
- Adjusting Traffic Control Devices
  - Signage
  - Pavement Markings
  - Signals
  - Detection Loops
- Treatment of Existing On-Street Parking
Applications

• City of San Antonio’s *Bicycle Master Plan*
• Immediate Transformations
• Federal Grants
• Increase Bicycling, Safety, Community Health – Active Transportation
SA-BC MPO Bicycle & Pedestrian Data Collection Project

Road Diet Analysis
April 14, 2010 Bike Night BMAC Meeting
Sprinkle Consulting, Inc.

The Sprinkle Team