RALEIGH BICYCLE PAVEMENT MARKING DESIGN PROJECT

CITYWIDE GOALS + ADOPTED PLANS *and* POLICIES

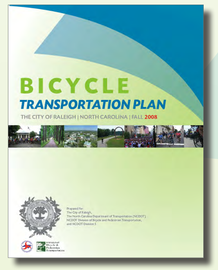
Transportation in Raleigh

"Transportation is more than the movement of goods and services - it is the movement of people with a variety of mode choices. It is important to us to ensure those choices and to lay the framework for a quality system that moves people safely, efficiently, and enjoyably throughout the City." **- City of Raleigh's Office of Transportation Planning**

The City of Raleigh 2030 Comprehensive Plan, Adopted 2009

Transportation Policy 5.1 - Enhancing Bike/Pedestrian Circulation: *"Enhance pedestrian and bicycle circulation, access, and safety along corridors, downtown, in activity and employment centers, at densely developed areas and transit stations, and near schools, libraries, and parks."*

Transportation Policy 5.2 - Incorporating Bicycle and Pedestrian Improvements: *"All new developments, roadway reconstruction projects, and roadway resurfacing projects in the City of Raleigh's jurisdiction should include appropriate bicycle facilities as indicated in the Recommended Bicycle Network of the 2008 City of Raleigh Bicycle Transportation Plan.*



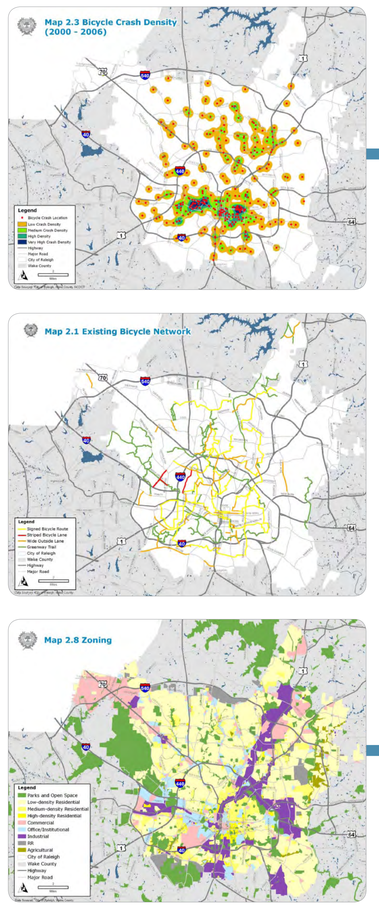
City of Raleigh Bicycle Transportation Plan

1. How important to you is improving bicycling conditions in the Raleigh area? (select one)

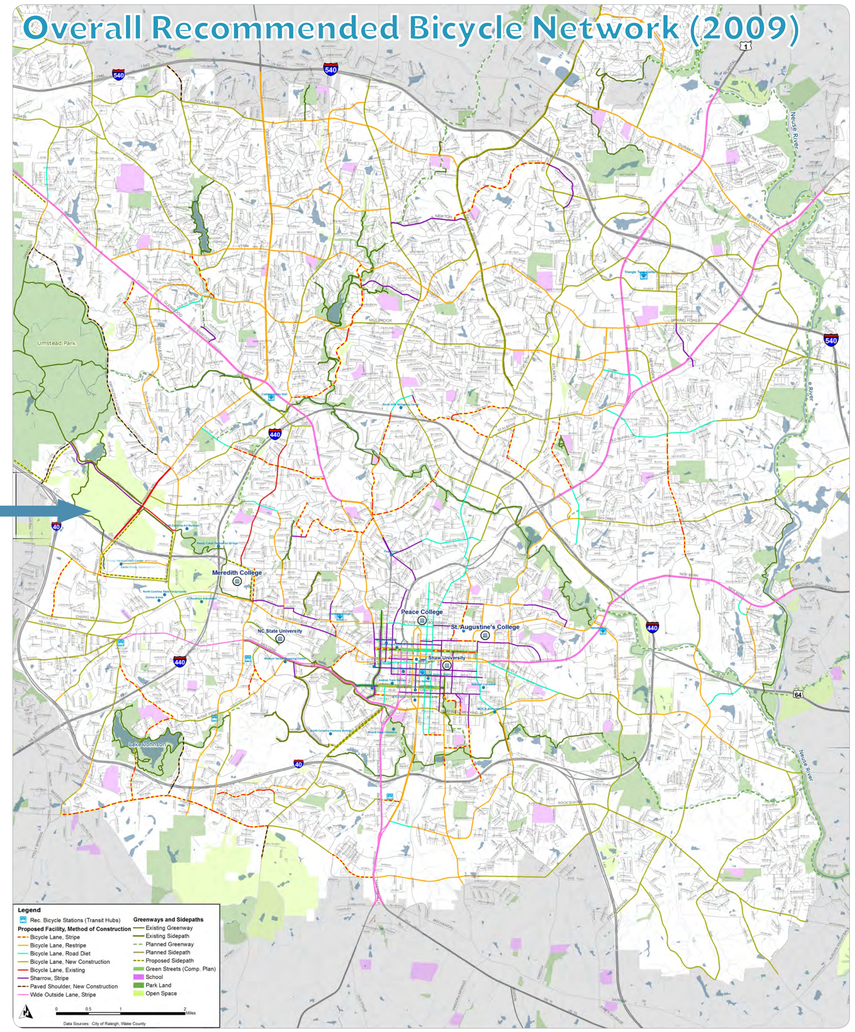
	Response Percent	Response Count
Very important	93.5%	780
Somewhat important	5.4%	45
Not important	1.1%	9
answered question		834

Left: Key response from the Raleigh Bicycle Transportation Plan Comment Form (with 800+ respondents)

Below: Overall Recommended Bicycle Network (original version from adopted plan)



Above: Three examples of many types of analysis done before developing the overall network.



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PROJECT TIMELINE

2008

2008: Year-long planning and public input process for the Raleigh Bicycle Transportation Plan

800+ Public Comment Forms: 94% of respondents say improving bicycling conditions is very important to them

List of priority projects developed for the Bike Plan, based on safety, connectivity, public input, and other criteria

Committee meetings and public workshops during the development of the Bike Plan

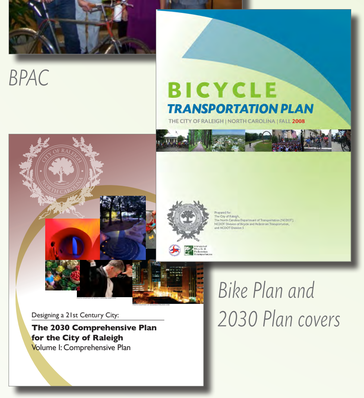
2013

2009: Raleigh Bicycle Transportation Plan adopted

Raleigh 2030 Comprehensive Plan adopted, further supporting implementation of the Bicycle Plan

The all-volunteer, citizen-led Bicycle and Pedestrian Advisory Commission (BPAC) was formed and began regular monthly meetings *(providing guidance on this project and other bicycle and pedestrian projects)*

BPAC



Bike Plan and 2030 Plan covers

2011: CMAQ Grant/ Project funding approved

2012-2013: On-site data collected and analyzed for 27 miles of potential projects

2013: Refined list of 22 projects, based on adopted bike plan priorities, previously adopted CIP projects, and terms of the CMAQ grant

Began preliminary analysis for bicycle projects

On-site assessment of a project corridor

2014

JANUARY:
Four public meetings featuring the 22 bicycle projects

FEBRUARY:
Begin design for bicycle projects

APRIL:
Public input to review draft design

JULY:
Complete final design for bicycle projects

OCTOBER:
Begin construction

Public meeting (image from the Raleigh Bike Map)

2015

Continue construction of bicycle projects

Complete update of Raleigh's 2009 Bicycle Transportation Plan

Update the Raleigh Bike Map with newly built bicycle facilities

Bike lane construction

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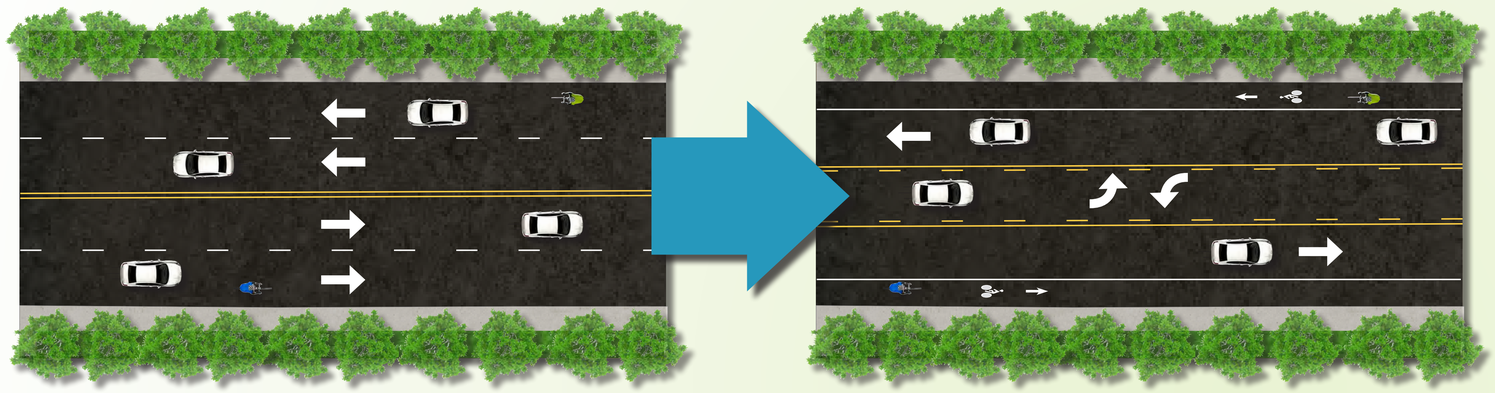
BENEFITS *of* COMPLETE STREET RETROFITS

How can we provide more choices for people to travel safely on our streets?

One way to do this is a "Complete Street Retrofit", reallocating a street's space to better accommodate the full range of road users. As shown below, a four-lane road that primarily serves motor vehicle traffic might be retrofitted to three lanes (two through lanes and a center turn lane). The remaining space left over can be reallocated to bicycle lanes, sidewalks, and/or on-street parking to provide a greater variety of travel options.



The redesign strategies used to retrofit a street should be chosen based on the street's context and the community's vision for the space. In addition to lane conversion, other retrofitting strategies include narrowing vehicle lanes, adding bike lanes, improving pedestrian infrastructure, changing the configuration of on-street parking, and adding roundabouts and medians.

Room for Everyone

Under most traffic conditions, complete street retrofits have minimal effects on vehicle capacity, because left-turning vehicles are moved from through lanes into a common two-way left-turn lane (or median turn pockets). This is especially true where average daily traffic (ADT) is below approximately 20,000 vehicles. In some cases the retrofit accommodates higher ADTs as seen in the examples at right.

Location	Road	ADT: Before	ADT: After
San Leandro, CA	East 14th Street	17,700	16,700
Duluth, MN	21st Ave. East	17,000	17,000
Ramsey County, MN	Rice Street	18,700	16,400
Toronto, Canada	St. George Street	15,000	15,000
Kirkland, WA	Lake Washington Blvd	23,000	25,900
Seattle, WA	North 45th Street	19,400	20,300
Covington, WA	SR 516	29,900	32,800
Bellevue, WA	Montana Street	18,500	18,500
East Lansing, MI	Grand River Blvd.	23,000	23,000
Santa Monica, CA	Main Street	20,000	18,000
Helena, MT	US 12	18,000	18,000
San Francisco, CA	Valencia Street	22,200	20,000
Oakland, CA	High Street	22,000	24,000
Orlando, FL	Edgewater Drive	20,500	21,000
Seattle, WA	Madison Street	17,000	18,000
Reno, NV	South Wells Ave	18,000	17,500
University Place, WA	67th Ave	17,000	15,000
University Place, WA	Cirque Ave	16,900	14,400
East Lansing, MI	West Grand River Ave	18,000	18,000
East Lansing, MI	Abbott Road	15,000	21,000

Sources:

- *Burden, D. and P. Lagerwey. (1999). Road Diets: Fixing the Big Roads. Walkable Communities, Inc. http://www.walkable.org/assets/downloads/roaddiets.pdf Accessed January 14, 2014.*
- *Federal Highway Administration. (2007). Mitigation Strategies for Design Exceptions, Chapter 3: The 13 Controlling Criteria – Lane Width. FHWA, Washington, DC. http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.htm Accessed January 14, 2014.*
- *Federal Highway Administration. (2012). Proven Safety Countermeasures: Medians and Pedestrian Crossing Islands in Urban and Suburban Areas, FHWA-SA-12-011, FHWA, Washington, DC.*
- *Federal Highway Administration. (2012). Proven Safety Countermeasures: "Road Diet" (Roadway Reconfiguration), FHWA-SA-12-013, FHWA, Washington, DC.*
- *Noyce, D.A., Talada, V., and Gates, T.J. (2006). Safety and Operational Characteristics of Two-Way Left-Turn Lanes, MN/RC 2006-25, Minnesota Department of Transportation, St. Paul, Minnesota.*
- *Persaud, B., Lyon, C., Eccles, K., Lefler, N., Carter, D., and Amjadi, R. (2008). Safety Evaluation of Installing Center Two-Way Left-Turn Lanes on Two-Lane Roads, FHWA-HRT-08-042, FHWA, Washington, DC.*
- *Project for Public Spaces website. Rightsizing Streets. http://www.pps.org/reference/rightsizing/ Accessed January 14, 2014.*
- *Reynolds, C.O., Harris, M.A., Teschke, K., Cripton, P.A., and Winters, M. (2009). The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature, Environmental Health 8(47).*

What are the benefits?

Complete street retrofits improve corridors for all users, creating safer space for driving, bicycling, and walking. Designing the street as an inviting place for all travel modes can generate a number of benefits *(from the reports cited at bottom-left):*

- *Retrofitting creates safer crossings for all road users by reducing the number of traffic lanes to cross and the speed of oncoming traffic. Pedestrian crash risk is reduced when pedestrians cross two- and three-lane roads, compared to roads with four lanes.*
- *Retrofitting improves speed limit compliance and decreases crash frequency and severity by reducing motor vehicle speeds and erratic driving behavior. Roadways that have been modified from four travel lanes to two travel lanes with a two-way left-turn lane experience a 29% reduction in all roadway crashes.*
- *Bike lanes improve bicyclist safety and create a buffer space between pedestrians and vehicles. A review of 23 studies found that bicycle facilities reduce crashes and injuries among cyclists.*

Hillsborough Street in Raleigh (before and after)

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