Township of Woodbridge
Bicycle Route and Phasing Plan

Existing Main Street Streetscape, Downtown Woodbridge, N.J.

Potential Bicycle Lanes

Prepared by

Sam Schwartz Engineering D.P.C.

Aug 19, 2015

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Vision Statement, Goals, and Objectives

Plan Vision: The Township of Woodbridge aims to create a bicycle plan for central Woodbridge and Avenel. The plan will detail locations for bicycle facilities that, once installed, will provide a connected and useful network to encourage cycling among residents and visitors to the study area.

Plan Goals and Objectives:

1) To provide safe and comfortable bicycle facilities for users of all ages and abilities

2) To connect key destinations within the study area, including but not limited to: parks, schools, train stations, retail hubs, and other community facilities.

3) To encourage and demonstrably increase bicycle usage within the study area

4) To formalize bicycling as a legitimate mode of transportation within the Township

5) To advance the Township's Complete Streets policy

Existing Conditions Analysis

The Township currently lacks bicycle facilities on its streets, and there is essentially no formal recognition of bicyclists' rights to use the roadway on any streets in the Township. Central Woodbridge and Avenel are both limited in terms of "all-ages" bicycle connectivity due to the presence of numerous high-speed arterials (e.g. Rahway Avenue, Route 1/9), railroad tracks with few crossing opportunities, and waterways. Absent upgrades to bicycle infrastructure, these barriers constrain the ability of Woodbridge residents and visitors to move about the Township comfortably on a bike.

Using a Level of Traffic Stress (LTS) framework (developed originally by Dutch bicycle planners to focus on developing an all-ages network), it was observed that while many of Central Woodbridge's and Avenel's residential streets were low-stress for bicyclists, their connections across the Township's barriers created high-stress segments. Arterial streets like Rahway Avenue rated high on the LTS scale as well, indicating that investments are needed in bicycle infrastructure on key corridors.

Given the Township's desire to create a bicycle culture and other goals and objectives related to its adopted Complete Streets policy, along with existence of some latent demand for cycling, a bicycle plan for Central Woodbridge and Avenel was required.

Policy Changes, Programs and Improvements Needed

Through the Woodbridge Bicycle Connect plan, a number of recommendations were made to address the existing conditions analysis and respond to the Township's goals and objectives. A bicycle routing plan with facility type recommendations was created in order to guide investment in bicycle facilities. The plan includes facilities that were placed with consideration of connecting key destinations including 4 schools, 7 parks, 2 train stations, 1 library, and the Main Street retail corridor during Phase 1.

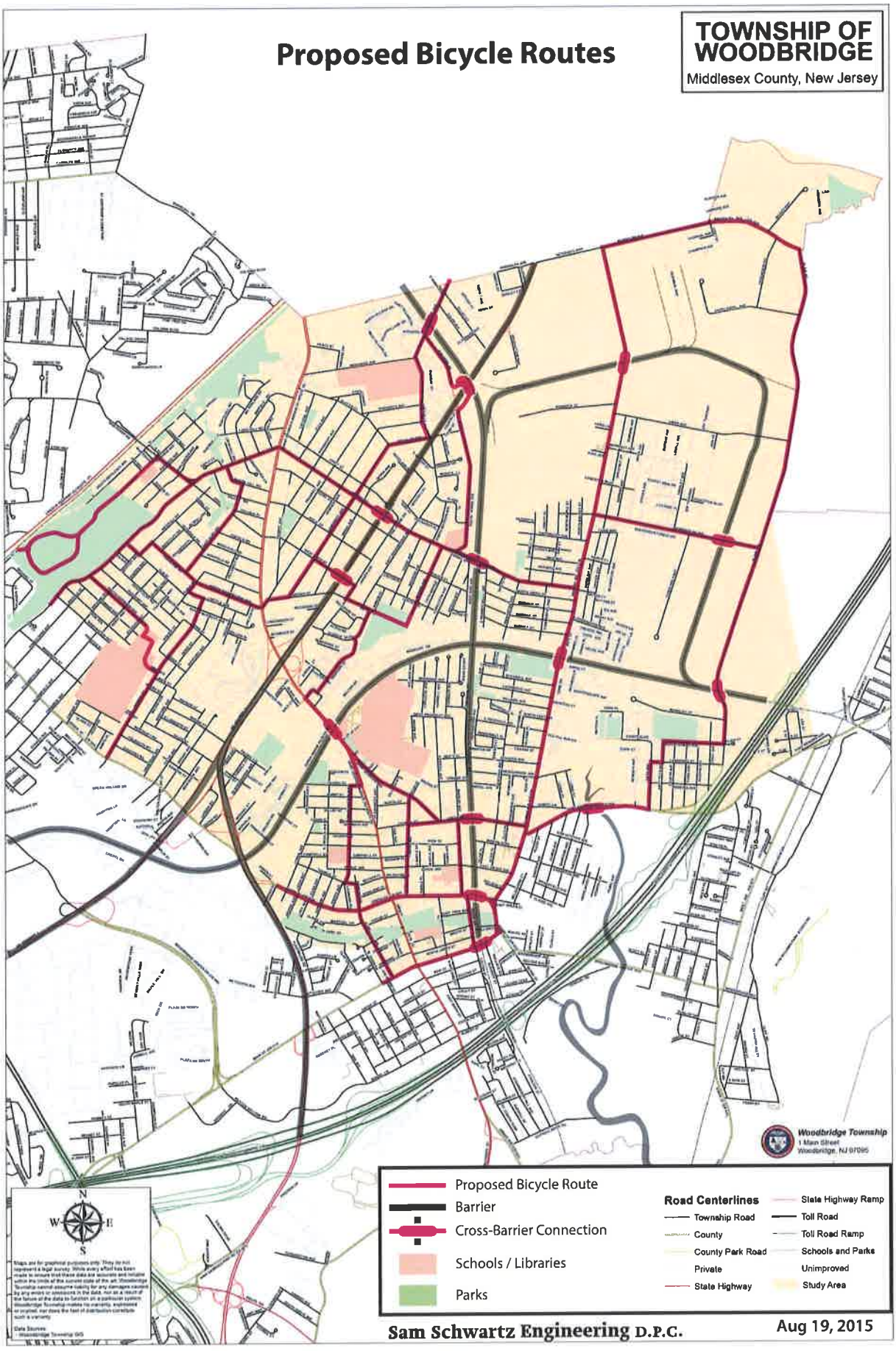
Improvements recommended through the plan include on-street bicycle lanes on major streets, with some including painted buffers and, potentially, vertical physical separation to create "separated bike lanes." These are complimented with a system of shared lanes (using "sharrows") to create neighborhood "bicycle boulevards" to connect the study area's various residential neighborhoods to the key destinations. A mix of facility types was considered important in creating a rational bicycle network that provided safe connections while gaining the most efficient possible return on investment. Stakeholder meetings among Township officials were held to consider specific needs in the placement of these facilities.

Implementation Plan / Strategy

Cost estimates were developed based on the number of miles each facility type (on-street / buffered lanes vs. shared lanes) contributed to the plan. Once these estimates were refined and the locations of bicycle facilities were finalized, the plan was divided into three phases in order to provide a focus for investment and to start placing bicycle facilities in the areas where they would have the greatest immediate effect.

Phase 1, currently in design, covers much of Central Woodbridge, including the Main Street retail corridor and area around New Jersey Transit's Woodbridge train station. Phase 1 also includes bicycle boulevards on numerous residential streets north of Main Street in order to create a network that reaches multiple schools and parks. The first phase also features an on-street bike lane on Rahway Avenue from Main Street north to Omar Avenue, in order to provide consistent north-south connectivity and decrease the stress of bicycling on this major arterial street in the Township. The Avenel neighborhood will be served with connections to the Avenel train station, the Avenel Street Elementary School, and Avenel Park. Finally, portions of Phase 1 east of Rahway Avenue provide additional connections to several of the Township's parks, including its large Ernest L. Oros Wildlife Preserve.

Phase 1 detailed drawings are in progress as of August 2015 and once completed will be submitted for NJDOT review. Following consent, the Township plans to stripe markings and install signage required to make Phase 1 of the Woodbridge Bicycle Connect plan a reality. Phases 2 and 3, which include areas beyond the core network, will be implemented in years following.


Proposed Bicycle Routes
TOWNSHIP OF WOODBRIDGE
Middlesex County, New Jersey
Woodbridge Township
1 Main Street
Woodbridge, NJ 07095
Proposed Bicycle Route
Barrier
Cross-Barrier Connection
Schools / Libraries
Parks
Road Centerlines
Township Road
County
County Park Road
Private
State Highway
State Highway Ramp
Toll Road
Toll Road Ramp
Schools and Parks
Unimproved
Study Area
N
W
E
S
Sam Schwartz Engineering D.P.C.
Aug 19, 2015


Level of Traffic Stress / Bicycle Comfort Level on Proposed Bicycle Routes
TOWNSHIP OF WOODBRIDGE
Middlesex County, New Jersey
Woodbridge Township
1 Main Street
Woodbridge, NJ 07095
Bicycle Comfort Level
High Comfort
Medium Comfort
Low Comfort
Extremely Low Comfort
Barrier
Cross-Barrier Connection
Schools / Libraries
Parks
Road Centerlines
Township Road
County
County Park Road
Private
State Highway
State Highway Ramp
Toll Road
Toll Road Ramp
Schools and Parks
Unimproved
Study Area
N
W
E
S
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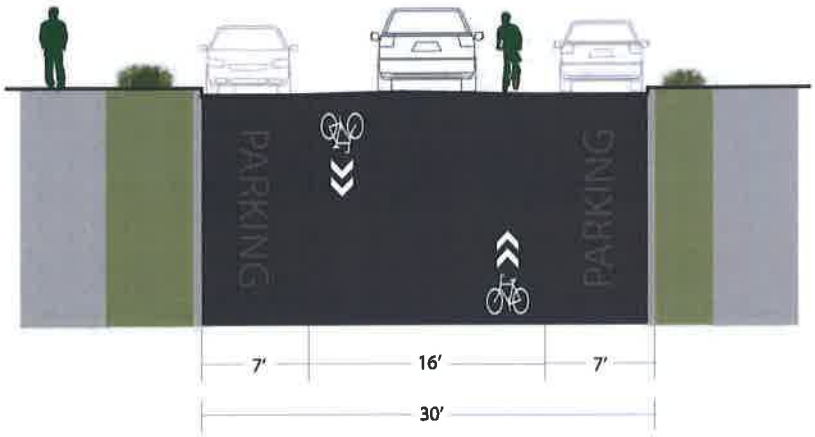
Concept Designs

1 **30' Streets** | Typical Residential Streets such as East Washington, Elmwood and West Park Avenues

Shared Lanes ("Sharrows")

1- Neighborhood Streets (Typ 30') - Shared Lanes ("sharrows")



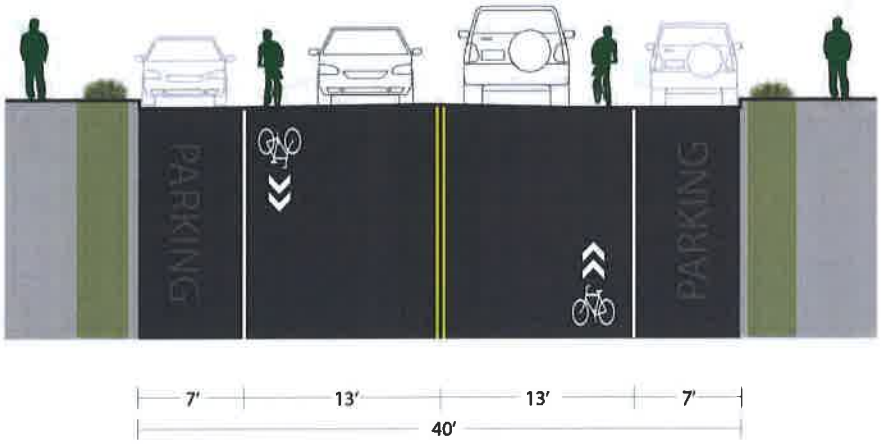
Concept Designs

2A

40' Streets | Major and Minor Thru Streets
such as Avenel Street, Green Street and Rahway Avenue

Shared Lanes ("Sharrows")

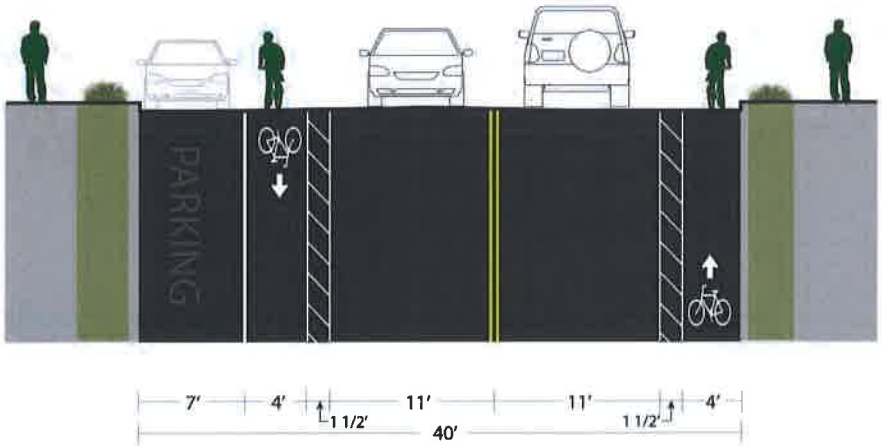
2a- Major Thru and Minor Thru Streets (Typ 40') - Shared Lanes ("sharrows")



2B

Buffered Bike Lanes

2b- Major Thru and Minor Thru Streets (Typ 40') - Buffered Bike Lanes



Concept Designs

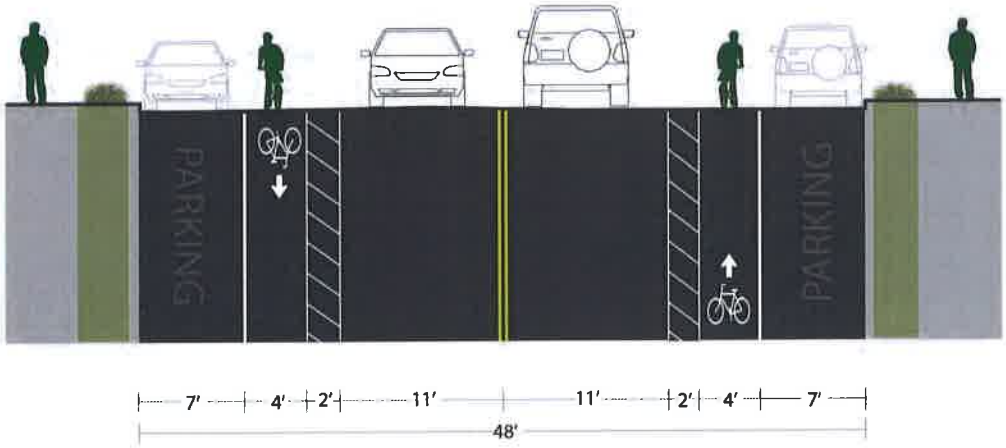
3A

48' Streets

Main Street in Downtown Woodbridge

Buffered Bike Lanes

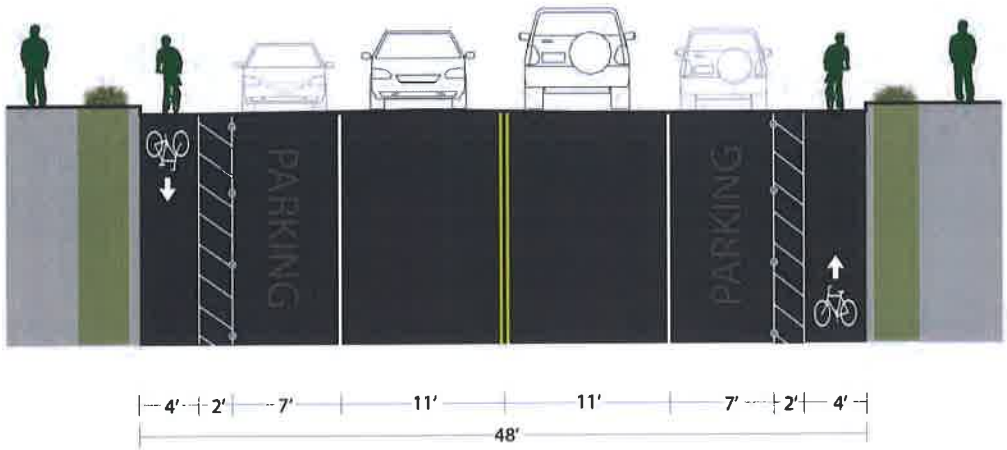
3a- Minor Thru Streets (48': Main Street) - Buffered Bike Lanes



3B

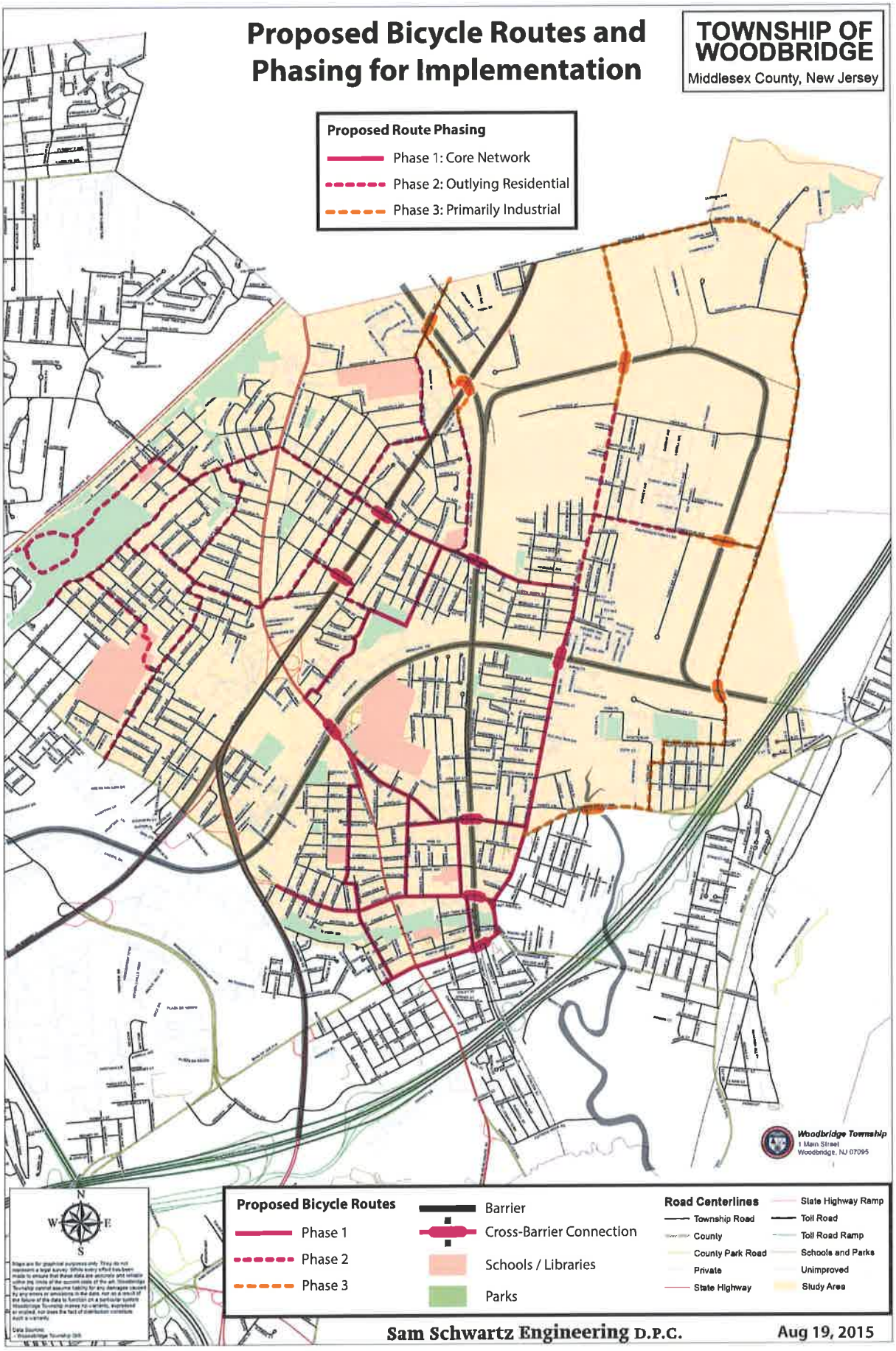
Partially Protected Bike Lanes

3b- Minor Thru Streets (48': Main Street) - Parking Protected Bike Lanes



Main Street Rendering

At 48' wide, **Main Street** between Pearl Street and Dixon Drive could accommodate buffered bike lanes. Dedicated bicycle facilities like these could **attract cyclists** of all ages to the center of Woodbridge, providing an **economic lift** for Downtown commercial establishments and a more **active street life** on Main Street.


Proposed Bicycle Routes and Phasing for Implementation
TOWNSHIP OF WOODBRIDGE
Middlesex County, New Jersey
Proposed Route Phasing
Phase 1: Core Network
Phase 2: Outlying Residential
Phase 3: Primarily Industrial
Woodbridge Township
1 Main Street
Woodbridge, NJ 07095
N
W
E
S
Proposed Bicycle Routes
Phase 1
Phase 2
Phase 3
Barrier
Cross-Barrier Connection
Schools / Libraries
Parks
Road Centerlines
Township Road
County
County Park Road
Private
State Highway
State Highway Ramp
Toll Road
Toll Road Ramp
Schools and Parks
Unimproved
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Cost Estimate Template

Woodbridge - Bicycle Facility Concept Design - Cost Template

Road Name	From (N or W)	To (S or E)	Street Width (typ)	Length (ft)	Design Type	Cost Per LF ($)	Cost	Phase
Avenel	5th Ave / South Inman	Rahway	40	2,820	Buffered	20	$ 56,400	1
Avenel	Route 1/9	5th Ave / South Inman	40	1,690	Buffered	20	33,800	1
Barron	Freeman	Green	40	1,610	Shared	10	16,100	1
Berry	Pollon	Main	30	200	Shared	10	2,000	1
Church	Linden	Freeman	35	650	Shared	10	6,500	1
E Washington	Van Buren	Thomas	30	2,100	Shared	10	21,000	1
Elmwood	Green	Main	30	1,620	Shared	10	16,200	1
Francis	Thomas	Green	30	560	Shared	10	5,600	1
Freeman	St Georges Ave	Church	30	1,600	Shared	10	16,000	1
Freeman	Church	Rahway	38	1,910	Shared	10	19,100	1
Green	Oakwood	Francis	40	1,916	Shared	10	19,160	1
Green	Francis	Rahway	40	2,950	Buffered	20	59,000	1
Hudson Blvd	Tappen	Roanoke	30	700	Shared	10	7,000	1
Linden	Freeman	Green	35	2,160	Shared	10	21,600	1
Main Street	Dixon	Pearl	48	2,130	Buffered	20	42,600	1
Main Street	Pearl	Berry	40	630	Shared	10	6,300	1
Pearl	Green	Main	30	1,130	Shared	10	11,300	1
Rahway	Green	Pollon	45	520	Buffered	20	10,400	1
Rahway	Martin Terrace	Green	40	1,230	Buffered	20	24,600	1
Rahway	Freeman	Martin Terrace	50	500	Buffered	20	10,000	1
Rahway	Avenel	Freeman	40	5,280	Buffered	20	105,600	1
Roanoke	Hudson Blvd	Route 35	38	1,930	Shared	10	19,300	1
Route 35	Roanoke	St Georges Ave (Wb HS)	50+	1,700	Protected	25	42,500	1
Route 35	St Georges Ave (Wb HS)	Van Buren	50	630	Protected	25	15,750	1
St Georges Ave	Route 35	Freeman	40	680	Buffered	20	13,600	1
Tappen	Hudson Blvd	West Park	30	850	Shared	10	8,500	1
Thomas	E Washington	Francis	30	220	Shared	10	2,200	1
Van Buren	E Washington	Route 35	30	225	Shared	10	2,250	1
West Park	Avenel	Tappen	30	1,840	Shared	10	18,400	1
Avenel	Route 35	Demorest	40	1,930	Buffered	20	38,600	2
Avenel	Demorest	Route 1/9	40	720	Buffered	20	14,400	2
Chain O Hills	Route 35	New Dover	30	2,020	Shared	10	20,200	2
Chain O Hills	New Dover	Washington	30	3,850	Shared	10	38,500	2
Demorest	Douglas	Avenel	30	1,330	Shared	10	13,300	2
Demorest	Avenel	West Smith	30	1,600	Shared	10	16,000	2
Demorest	West Smith	Tappen	30	980	Shared	10	9,800	2
Douglas	Leesville	Demorest	30	880	Shared	10	8,800	2
East Cliff	North Hill	Highland	30	2,300	Shared	10	23,000	2
Elm	Chain O Hills	West Hill	30	370	Shared	10	3,700	2
Fairview	New Dover	Merrill Park Circle	30	2,370	Shared	10	23,700	2
Highland	West Hill	South Hill	30	1,270	Shared	10	12,700	2
Homestead	Rahway	Essex Ave East	40	2,080	Buffered	20	41,600	2
Inman	1st St	Avenel	40	2,750	Buffered	20	55,000	2
Jansen	West Smith	Tappen	30	330	Shared	10	3,300	2
Leesville	Woodbine	Douglas	30	1,750	Shared	10	17,500	2
Lincoln	South Hill	Worth	30	350	Shared	10	3,500	2
Marshall	Washington	Worth	30	1,080	Shared	10	10,800	2
Merrill Park Circle	(full circle)	(full circle)	32	3,170	Buffered	20	63,400	2
New Dover	Fairview	Outlook	30	300	Shared	10	3,000	2
New Dover	Outlook	Chain O Hills	36+	650	Buffered	20	13,000	2
North Hill	Chain O Hills	East Cliff	30	560	Shared	10	5,600	2
North Washington	South Hill	Route 35	30	1,500	Shared	10	15,000	2
Rahway	Paddock	Avenel	40	4,030	Buffered	20	80,600	2
Remsen	Tappen	Route 35	40	230	Buffered	20	4,600	2
South Harrison	Chain O Hills	Washington	38	1,660	Shared	10	16,600	2
South Hill	N Washington	Lincoln	30	250	Shared	10	2,500	2
Tappen	Jansen	Hudson Blvd	30	550	Shared	10	5,500	2
Tappen	Remsen	Demorest	35	460	Shared	10	4,600	2
West Hill	Highland	Elm	30	370	Shared	10	3,700	2
West Smith	Demorest	Jansen	30	1,060	Shared	10	10,600	2
Worth	Lincoln	Green	30	4,000	Shared	10	40,000	2
6th Ave	Langford	Port Reading	30	1,020	Shared	10	10,200	3
Blair	Markley	Grand	40	520	Buffered	20	10,400	3
Blair	Randolph	Homestead	60	6,530	Buffered	20	130,600	3
Blair	Homestead	Markley	26 - 50 (varies)	3,850	Buffered	20	77,000	3
East 5th Ave	Grand	Langford	30	450	Shared	10	4,500	3
Grand	East 5th Ave	Blair	30	1,300	Shared	10	13,000	3
Homestead	Essex Ave East	Blair	40	1,540	Buffered	20	30,800	3
Inman	Rt 1/9 underpass	1st St	30	460	Shared	10	4,600	3
Langford	6th Ave	East 5th Ave	30	250	Shared	10	2,500	3
Leesville	Elliot	Woodbine	35	1,500	Shared	10	15,000	3
Port Reading	Bamford	6th Ave	45	1,480	Buffered	20	29,600	3
Port Reading	Rahway	Bamford	38	1,280	Buffered	20	25,600	3
Rahway	Randolph	Paddock	40	3,450	Buffered	20	69,000	3
Randolph	Rahway	Blair	42	4,450	Buffered	20	89,000	3
Rodgers	Leesville	Rt 1/9 underpass	35	1,300	Buffered	20	26,000	3
Rt 1/9 underpass	Rodgers	Inman	35	1,030	Protected	25	25,750	3

Subtotal	$ 1,819,410
Contingencies (15%)	272,912
Design, Permitting (25%)	454,853
Construction Mgt & Inspection (18%)	327,494
TOTAL COST	**$ 2,874,668**

Inputs

Facility Type	Cost Per LF
Shared	10
Buffered	20
Protected	25
Incremental Costs	
Contingencies	15%
Design, Permitting	25%
Constr. Mgmt, Inspection	18%

Breakdown:	Phase 1	Phase 2	Phase 3
Subtotal	$ 632,760	$ 623,100	$ 563,550
Contingencies (15%)	94,914	93,465	84,533
Design, Permitting (25%)	158,190	155,775	140,888
Construction Mgt & Inspection (18%)	113,897	112,158	101,439
TOTAL COST	$ 999,761	$ 984,498	$ 890,409

Cost Template Summary by Phase

Phase	Feet	Miles	Miles - Shared Lanes	Miles - Buffered Lanes	Miles - Protected Lanes	Cost - Materials	Incremental Costs	Total Cost
1	41,981	8.0	4.1	3.4	0.4	$ 632,760	367,001	$ 999,761
2	46,750	8.9	5.9	2.9	0.0	$ 623,100	361,398	$ 984,498
3	30,410	5.8	0.9	4.6	0.2	$ 563,550	326,859	$ 890,409
Total	119,141	22.6	11.0	10.9	0.6	$ 1,819,410	$ 1,055,258	$ 2,874,668

RESOLUTION OF THE PLANNING BOARD OF THE TOWNSHIP OF WOODBRIDGE ADOPTING THE "TOWNSHIP OF WOODBRIDGE BICYCLE ROUTE AND PHASING PLAN"

WHEREAS, the Earth is the shared home for all of humanity; and

WHEREAS, the activities of humans affect the Earth's environment, including in ways that are detrimental to the Earth's environment; and

WHEREAS, it is responsibility of all humans to protect the environment from degradation, and to insure a clean and safe environment for future generations; and

WHEREAS, the Township of Woodbridge has recognized environmental sustainability as an important responsibility and has adopted numerous policies aimed at conserving natural resources, reducing carbon dioxide, and energy efficiency; and

WHEREAS, the Woodbridge Township Planning Board adopted the amended "Green Buildings and Environmental Sustainability Master Plan Element in 2012" to promote environmentally sustainable land use practices; and

WHEREAS, climate change has been occurring on Earth as a result of excessive emissions of carbon dioxide into the environment; and

WHEREAS, automobiles are one of the primary sources of carbon dioxide; and

WHEREAS, greater use of bicycles can reduce the use of automobiles, improve health, and reduce the amount of carbon dioxide emitted into the atmosphere; and

WHEREAS, the Township of Woodbridge was awarded the 2013 Sustainable Jersey Small Grants Program – Funded by Walmart; and

WHEREAS, the Township of Woodbridge used the 2013 Sustainable Jersey Small Grants Program – Funded by Walmart to retain Sam Schwartz Engineering D.P.C. to evaluate the potential for bicycle lanes in the Township; and

WHEREAS, Sam Schwartz Engineering D.P.C. prepare the "Woodbridge Township Bicycle Route and Phasing Plan;" which recommends particular bicycle routes and different types of bicycle facilities in the Township; and

NOW, THEREFORE, LET IT BE RESOLVED, by the Planning Board of the Township of Woodbridge, State of New Jersey, that the Planning Board hereby adopts the "Woodbridge Township Bicycle Route and Phase Plan," dated August 19, 2015, prepared by Sam Schwartz Engineering D.P.C.

I hereby certify that the foregoing is an exact and true copy of the Resolution adopting the Woodbridge Township Bicycle Route and Phasing Plan, dated August 19, 2015 by the Planning Board of the Township of Woodbridge at a public meeting held on September 9, 2015.

ADOPTED: September 9, 2015

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Lysa Colonna, Secretary
Planning Board
Township of Woodbridge