

Appendices

There are three appendices in the following pages for the BiPed Plan Update to cover additional information that could not be included in the plan. They are:

APPENDIX A
Bicycle Level of Service Model Summary

APPENDIX B
Greensboro Land Development Ordinances For Bicycle Parking And Support Facilities

APPENDIX C
Public Involvement

**“People won’t invest
in good buildings on
a bad street; you have
to start with a good
street to create a good
place.”**
~Michael Ronkin



A Bicycle Level of Service Modal Summary

BACKGROUND

Level of Service (LOS) is a framework that transportation professionals use to describe existing conditions (or suitability) for a mode of travel in a transportation system. The traffic planning and engineering discipline has used LOS models for motor vehicles for several decades. Motor vehicle LOS is based on average speed and travel time for motorists traveling in a particular roadway corridor. In the 1990s, new thinking and research contributed to the development of methodologies for assessing levels of service for other travel modes, including bicycling, walking, and transit. Specific methodologies for bicycle level of service have been developed and used by a number of cities, counties, and states around the U.S. since the mid-1990s. This Plan adopts the Bicycle Level of Service (Bicycle LOS) Model assessment method.

When considering level of service in a multi-modal context, it is important to note that LOS measures for motor vehicles and bicycles are based on different criteria and are calculated on different inputs. Motor vehicle LOS is primarily a measure of speed, travel time, and intersection delay. Bicycle LOS is a more complex calculation, which represents the level of comfort a bicyclist experiences in relation to motor vehicle traffic.

BICYCLE LEVEL OF SERVICE MODEL

The ***Bicycle Level of Service Model (Bicycle LOS Model)*** is an evaluation of bicyclist perceived safety and comfort with respect to motor vehicle traffic while traveling in a roadway corridor. It identifies the quality of service for bicyclists or pedestrians that currently exists within the roadway environment.

The statistically calibrated mathematical equation titled the ***Bicycle LOS Model***¹ (Version 2.0) is used for the evaluation of bicycling conditions in shared roadway environments. It uses the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. With statistical precision, the ***Model*** clearly reflects the effect on bicycling suitability or “compatibility” due to factors such as roadway width, bike lane widths and striping combinations, traffic volume, pavement surface condition, motor vehicle speed and type, and on-street parking.

The ***Bicycle Level of Service Model*** is based on the proven research documented in *Transportation Research Record 1578* published by the Transportation Research Board of the National Academy of Sciences. It was developed with a background of over 150,000 miles of evaluated urban, suburban, and rural roads and streets across North America. Many urban planning agencies and state highway departments are using this established method of evaluating their roadway networks. The Virginia Department of Transportation is

¹Landis, Bruce W. et. al. “Real-Time Human Perceptions: Toward a Bicycle Level of Service.” *Transportation Research Record 1578*, Transportation Research Board, Washington, DC, 1997.



using the **Bicycle LOS Model** in both the Richmond and Northern Virginia regions. The model has also been applied in Anchorage AK, Baltimore MD, Birmingham AL, Buffalo NY, Gainesville FL, Houston TX, Lexington KY, Philadelphia PA, Sacramento CA, Springfield MA, Tampa FL, Washington, DC, Winston- Salem, NC, and by the Delaware Department of Transportation (DelDOT), Florida Department of Transportation (FDOT), New York State Department of Transportation (NYDOT), Maryland Department of Transportation (MDOT) and many others.

Appendix A

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Appendix C

Widespread application of the original form of the **Bicycle LOS Model** has provided several refinements. Application of the **Bicycle LOS Model** in the metropolitan area of Philadelphia resulted in the final definition of the three effective width cases for evaluating roadways with on-street parking. Application of the **Bicycle LOS Model** in the rural areas surrounding the greater Buffalo region resulted in refinements to the “low traffic volume roadway width adjustment.” A 1997 statistical enhancement to the **Model** (during statewide application in Delaware) resulted in better quantification of the effects of high speed truck traffic [see the $SP(1+10.38HV)^2$ term]. As a result, **Version 2.0** has the highest correlation coefficient ($R^2 = 0.77$) of any form of the **Bicycle LOS Model**.

Version 2.0 of the **Bicycle Level of Service Model (Bicycle LOS Model)** will be employed to evaluate collector and arterial roadways in the Greensboro Metropolitan Area. Its form is shown below:

$$\text{Bicycle LOS} = a_1 \ln(\text{Vol}_{15}/L_n) + a_2 SP_t (1+10.38HV)^2 + a_3 (1/PR_5)^2 + a_4 (W_e)^2 + C$$

Where:

Vol_{15} = Volume of directional traffic in 15 minute time period

$$\text{Vol}_{15} = (\text{ADT} \times D \times K_d) / (4 \times \text{PHF})$$

Where:

ADT = Average Daily Traffic on the segment or link

D = Directional Factor (assumed = 0.565)

K_d = Peak to Daily Factor (assumed = 0.1)

PHF = Peak Hour Factor (assumed = 1.0)

L_n = Total number of directional through lanes

SP_t = Effective speed limit

$$SP_t = 1.1199 \ln(SP_p - 20) + 0.8103$$

Where:

SP_p = Posted speed limit (a surrogate for average running speed)

HV = percentage of heavy vehicles (as defined in the 1994 Highway Capacity Manual)

PR_5 = FHWA's five point pavement surface condition rating (refer to **Table A.1**)

W_e = Average effective width of outside through lane:

Where:

$$W_e = W_v - (10 \text{ ft} \times \% \text{ OSPA}) \text{ and } W_1 = 0$$

$$W_e = W_v + W_1 (1 - 2 \times \% \text{ OSPA}) \text{ and } W_1 > 0 \text{ \& } W_{ps} = 0$$

$$W_e = W_v + W_1 - 2 (10 \times \% \text{ OSPA}) \text{ and } W_1 > 0 \text{ \& } W_{ps} > 0 \text{ and a bike lane exists.}$$

Where:

W_t = total width of outside lane (and shoulder) pavement

OSPA = percentage of segment with occupied on-street parking

W_1 = width of paving between the outside lane stripe and the edge of pavement

W_{ps} = width of pavement striped for on-street parking

W_v = Effective width as a function of traffic volume

And:

$$W_v = W_t \text{ if } \text{ADT} > 4,000 \text{ veh/day}$$

$$W_v = W_t (2 - 0.00025 \times \text{ADT}) \text{ if } \text{ADT} < 4,000 \text{ veh/day and if the street/road is undivided and unstriped}$$

$$a_1: 0.507 \quad a_2: 0.199 \quad a_3: 7.066 \quad a_4: -0.005 \quad C: 0.760$$

$(a_1 - a_4)$ are coefficients established by the multivariate regression analysis.



5.0 (Very Good)	Only new or nearly new pavements are likely to be smooth enough and free of cracks and patches to qualify for this category.
4.0 (Good)	Pavement, although not as smooth as described above, gives a first class ride and exhibits signs of surface deterioration.
3.0 (Fair)	Riding qualities are noticeably inferior to those above; may be barely tolerable for high-speed traffic. Defects may include rutting, map cracking, and extensive patching.
2.0 (Poor)	Pavements have deteriorated to such an extent that they affect the speed of free-flow traffic. Flexible pavement has distress over 50 percent or more of the surface. Rigid pavement distress includes joint spalling, patching, etc.
1.0 (Very Poor)	Pavements that are in an extremely deteriorated condition. Distress occurs over 75 percent or more of the surface.

TABLE A.1

PR₅ = FHWA's five point pavement surface condition rating²

The Bicycle LOS score resulting from the final equation is pre-stratified into service categories "A", "B", "C", "D", "E", and "F" ("A" is best, and "F" is worst), according to the ranges shown in **Table A.2**, reflecting users' perception of the road segments level of service for bicycle travel. This stratification is in accordance with the linear scale established during the referenced research (i.e., the research project bicycle participants' aggregate response to roadway and traffic stimuli). The Model is particularly responsive to the factors that are statistically significant. An example of its sensitivity to various roadway and traffic conditions is shown below.

Because the model represents the comfort level of a hypothetical "typical" bicyclist, there are some bicyclists who may feel more comfortable and others who may feel less comfortable than the Bicycle Level of Service

calculated for a roadway. A poor Bicycle Level of Service grade does not mean that bikes should be prohibited on a roadway.

LEVEL OF SERVICE	BICYCLE LOS SCORE
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	> 5.5

TABLE A.2

Bicycle Level-of-Service Categories

It suggests to a transportation planner that the road may need other improvements (in addition to shoulders) to help more bicyclists feel comfortable using the corridor.

APPLICATION

The Bicycle LOS Model is used by planners, engineers, and designers throughout the US and Canada in a variety of planning and design applications. Applications include:

1. Conducting a benefits comparison among proposed bikeway/roadway cross-sections
2. Identifying roadway restriping or reconfiguration opportunities to improve bicycling conditions
3. Prioritizing and programming roadway corridors for bicycle improvements
4. Creating bicycle suitability maps
5. Documenting improvements in corridor or system- wide bicycling conditions over time

²U.S. Department of Transportation. Highway Performance Monitoring System-Field Manual. Federal Highway Administration. Washington, DC 1987.

Bicycle LOS Model Sensitivity Analysis

Appendix A

$$\text{Bicycle LOS} = a_1 \ln(\text{Vol}_{15}/L_n) + a_2 \text{SP}_t(1+10.38\text{HV})^2 + a_3(1/\text{PR}_5)^2 + a_4(W_e)^2 + C$$

Appendix B

Where:

$$a_1: 0.507 \quad a_2: 0.199 \quad a_3: 7.066 \quad a_4: -0.005 \quad C: 0.760$$

Appendix C

T-statistics:

$$a_1: (5.689) \quad a_2: (3.844) \quad a_3: (4.902) \quad a_4: (-9.844)$$

Baseline inputs:

$$\text{ADT} = 12,000 \text{ vpd} \quad \% \text{HV} = 1 \quad L = 2 \text{ lanes}$$

$$\text{SP}_t = 40 \text{ mph} \quad W_e = 12 \text{ ft} \quad \text{PR}_5 = 4 \text{ (good pavement)}$$

	<u>BLOS</u>	<u>% Change</u>
Baseline BLOS Score	3.98	N/A

Baseline BLOS Score

Lane Width and Lane Striping Changes

$W_t = 10 \text{ ft}$	4.20	6% increase
$W_t = 11 \text{ ft}$	4.09	3% increase
$W_t = 12 \text{ ft}$ - (baseline avg)	3.98	No change
$W_t = 13 \text{ ft}$	3.85	3% reduction
$W_t = 14 \text{ ft}$	3.72	7% reduction
$W_t = 15 \text{ ft}$ ($W_1 = 3 \text{ ft}$)	3.57	10% (23%)
	(3.08)	reduction
$W_t = 16 \text{ ft}$ ($W_1 = 4 \text{ ft}$)	3.42	14% (32%)
	(2.70)	reduction
$W_t = 17 \text{ ft}$ ($W_1 = 5 \text{ ft}$)	3.25	18% (43%)
	(2.28)	reduction

	<u>BLOS</u>	<u>% Change</u>
Traffic Volume (ADT) Variations		
ADT = 1,000 Very Low	2.75	31% decrease
ADT = 5,000 Low	3.54	11% decrease
ADT = 12,000 Average	3.98	No change
<i>(baseline average)</i>		
ADT = 15,000 High	4.09	3% increase
ADT = 25,000 Very High	4.35	9% increase
Pavement Surface Conditions		
$\text{PR}_5 = 2$ Poor	5.30	33% increase
$\text{PR}_5 = 3$ Fair	4.32	9% reduction
$\text{PR}_5 = 4$ Good	3.98	No change
<i>(baseline average)</i>		
$\text{PR}_5 = 5$ Very Good	3.82	4% reduction
Heavy Vehicles in Percentages		
HV = 0 No Volume	3.80	5% decrease
HV = 1 Very Low	3.98	No change
<i>(baseline average)</i>		
HV = 2 Low	4.18	5% increase
HV = 5 Moderate	4.88	23% increase ^a
HV = 10 High	6.42	61% increase ^a
HV = 15 Very High	8.39	111% increase ^a

Traffic Volume (ADT) Variations

Pavement Surface Conditions

Heavy Vehicles in Percentages

^aOutside the variable's range (see Reference 1)



B Greensboro Land Development Ordinances For Bicycle Parking & Support Facilities

The City of Greensboro has bicycle parking requirements in its Land Development Ordinance (LDO) under Article 11, Off-Street Parking and Loading. It generally applies to all new buildings constructed and all new uses established in the specified zoning districts. Bicycle parking and support facilities are noted under 30-11-8, Short-Term Bicycle Parking, and 30-11-13, Alternative Compliance Parking Plans. The related text of these sub-sections is reproduced below.

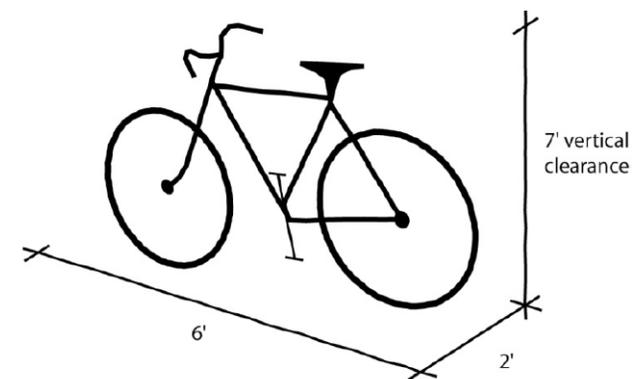
30-11-8 SHORT-TERM BICYCLE PARKING

T30-11-8.1 Spaces Required

- A. Short-term bicycle parking is required in commercial parking garages and in MU-M, MU-H, CN, RM-26 and RM-40 districts at the minimum rate of 1 bicycle space per 10 parking spaces provided. In all cases, at least 2 short-term bicycle parking spaces must be provided. No use is required to provide more than 25 short-term bicycle parking spaces.
- B. The Planning and Community Development Director is authorized to approve a Type 1 Modification waiving or reducing the number of short-term bicycle parking spaces required for a particular use in accordance with 30-4-11.

30-11-8.2 Design and Location

- A. Required short-term bicycle parking spaces must be provided in bicycle parking racks, and each bike space must have minimum dimensions of 2 feet in width by 6 feet in length and a minimum overhead vertical clearance of 7 feet. Racks must be affixed securely to the ground or a building.
- B. Bicycle racks must be safe, sturdy, secure and manufactured for use as bicycle racks.



Short-term bicycle parking space design and location



Appendix A

Appendix B

Appendix C

- C. Required short-term bicycle parking spaces may be located indoors or outdoors, provided they are located within 100 feet of a public building entrance or in an alternative location approved by the Planning and Community Development Director through the Type 1 Modification process. Short-term bicycle parking spaces must be located on private property unless the Planning and Community Development Director approves location within the public right-of way (i.e., on the sidewalk) through the Type 1 Modification process. If required bicycle parking facilities are not visible from the public building entrance, signs must be posted indicating their location.
- D. When more than 10 bicycle parking spaces are required, the Planning and Community Development Director may, through the Type 1 Modification process, allow a reduction of up to 2 required vehicle parking spaces to accommodate bicycle parking.

30-11-13 ALTERNATIVE COMPLIANCE PARKING PLANS

30-11-13.7 Authorized Alternatives

The following alternative compliance parking plans (or combinations thereof) may be considered for approval:

- A. Shared parking (See 30-11-13.8);
- B. Off-site parking (See 30-11-13.9);
- C. Special facilities for cyclists (See 30-11-13.10);
- D. Transit accessibility (See 30-11-13.11);
- E. Available on-street parking spaces (See 30-11-13.12); and
- F. Reduction in the number of off-street parking spaces required by up to 10% to allow an existing development to retrofit parking to conform to the landscaping regulations or to allow an existing or new development to preserve trees within or adjacent to a parking lot.

30-11-13.10 Special Facilities for Bicyclists

The Planning and Community Development Director may authorize up to a 10% reduction in the number of required off-street parking spaces for developments or uses that provide additional facilities to accommodate bicyclists. Examples of such accommodations include enclosed bicycle lockers, secure indoor bicycle parking spaces, employee shower facilities and dressing areas for employees. A reduction in parking may not be granted merely for providing required short-term bicycle parking spaces.



C Public Involvement

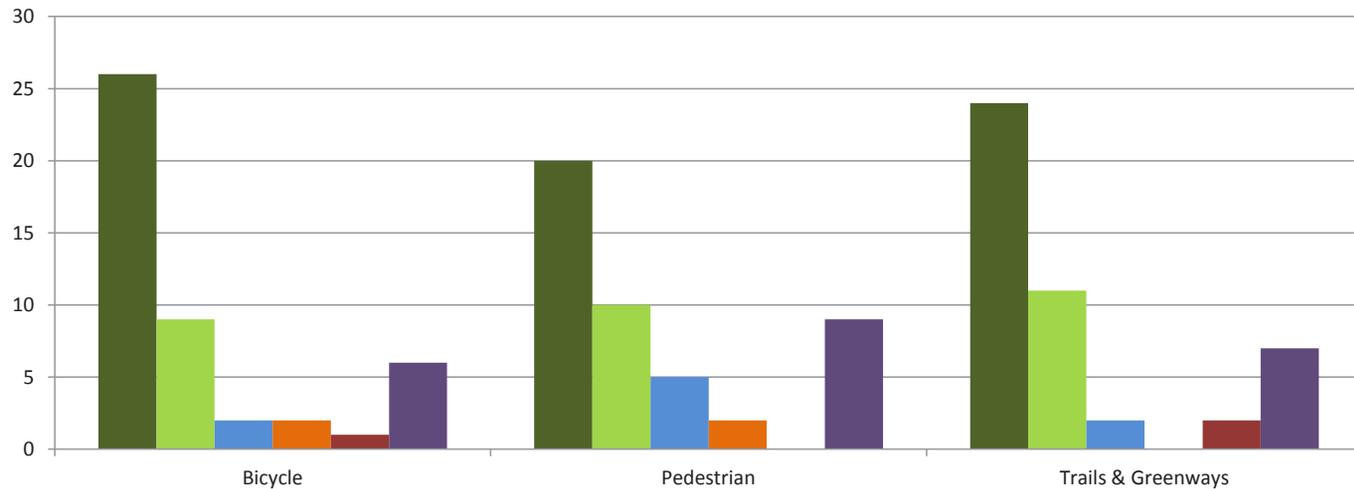


PART 1: SURVEY RESPONSES FROM THE PUBLIC

Over the course of the development of the BiPed Plan Update, MPO staff conducted numerous surveys, input sessions, and public meetings to gather feedback on various aspects of the plan. The MPO received 46 responses from the public on a nine-question survey made available during the public review period which was held from August 14, 2015 to September 14 2015. The public comments are reproduced below along with responses to each comment from the MPO.

QUESTION 1: How well do you agree with the recommendations in the Draft 2015 BiPed Plan Update?

■ Strongly Agree
 ■ Slightly Agree
 ■ Neutral
 ■ Slightly Disagree
 ■ Strongly Disagree
 ■ No Response



PUBLIC COMMENTS ON QUESTION 1	MPO RESPONSES
General Comments	
I haven't reviewed these plans closely enough to provide informed assessment. However I strongly agree with attention paid to BiPed routes and planning.	Thank you for your support and comment.
The recommendations are clearly well thought out	
Considering it is using my tax money I don't fully support it, since I'm not likely to use the trails or paths often. But I see the need for them for people who will.	



Appendix A

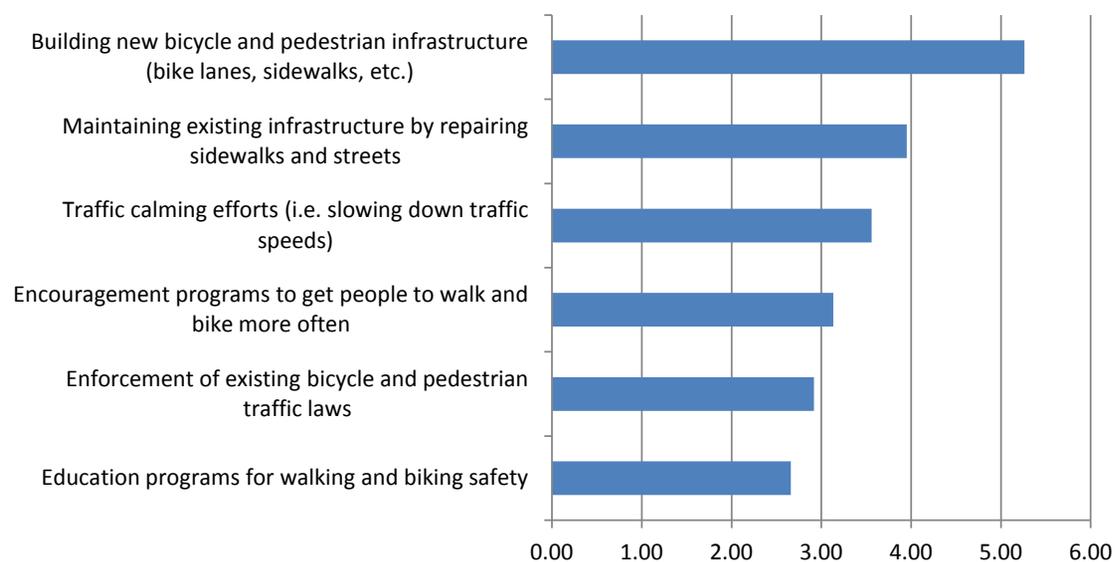
Appendix B

Appendix C

PUBLIC COMMENTS ON QUESTION 1		MPO RESPONSES
General Comments		
The implementation timeline is too long. More on road bicycle and pedestrian improvements should be completed in less time. Otherwise, the plan appears to address improvements in areas where improvement is most needed		Thank you for your comment. Staff will work to expedite projects as time and funding allow.
Non-motorized transit has the power to cure so many problems (budgetary, health (mental and physical), energy dependence, et al) it seems negligent not to apply maximum effort to expanding both these options and the safety and convenience of these options.		
I think the recommendations are a realistic and well considered first step. However, the recommendations do not go as fast or as far as I think is advisable to increase the mode share for bicycling and walking significantly.		
Greensboro needs to be more pedestrian and bicycle friendly.		Thank you for your comment. The City is making every effort to make our community more pedestrian and bicycle friendly. This plan is one of the efforts towards that.
People will walk and bike more often if infrastructure is provided.		Thank you for your comment. We totally agree with your idea. Please look at our Recommendations in the Infrastructure sections of the Bicycle, Pedestrian, and Trail and Greenway Chapters to see our priorities for future infrastructure development.
With the number of bicycle injuries and fatalities from cars, the need for better bike/car separation and safety seems obvious. Likewise, pedestrians who must travel between points where there are no sidewalks are at serious risk. Finally, the greenways are now cut up in ways that are most unfortunate, for example, at Martinsville Rd (next to Rice Toyota) and at Pisgah Church/Battleground. Rectifying the dangerous conditions created there and in similar spots is imperative. And avoiding similar mistakes at Cornwallis/Lawndale and other locations along the greenway to build out from the old Chandler Concrete location will be very important.		Thank you for your comment. Connectivity has been a major goal of this document, for all modes of travel. Staff will make it a priority to study the intersection of Pisgah Church & Battleground and other intersections along greenways and trails.
To the extent that I have some modest disagreements with the 3 sets of recommendations is that they point to how far we have yet to go to grow away from the All-Auto mentality that we have lived with for so many decades. The three sets of recommendations will not fundamentally restructure transportation in the Triad, but they point the way to thoughtful incremental change. I guess that is all we can realistically expect. But I look at places that I know like Madison, Wisconsin or German cities like Koblenz and it is painful to realize how small our steps are.		Thank you for your comment. The plan recognizes the need to do more in the MPO, although great progress has been made. Staff will work to expedite projects as time and funding allow.
A Biped Plan is absolutely needed in GSO and our citizens need to be informed by the press, signage and thru our representatives' camera coverage. This is indeed one of the most important ventures of modern Greensboro. It will impact our city and economy going forward. Let's make sure it's a positive step. More security will be paramount especially on the downtown sections. Is GSO ready to become the next BEST city to live in NC or the Southeast?		Thank you for your comment. Staff will seek to increase the visibility of the plan and the accomplishments that have been made and the priorities going forward.
Bicycle Comments		
I am a regular bicycle rider, and I think the bike recommendations do not adequately protect bike lanes from unsafe maneuvers from cars, who routinely cross into unprotected bike lanes for their convenience. We need more progress on protected bike lanes!		Thank you for your comment. Several recommendations have been made for protected bicycle lanes, and the MPO will review additional locations where they may be feasible.

PUBLIC COMMENTS ON QUESTION 1	MPO RESPONSES
Bicycle Comments	
We need more bike lanes in Greensboro for the safety of bicyclists and for consistency/certainty in what to do around bicyclists for drivers.	Thank you for your comment. The BiPed Plan recommends more than 330 miles of bicycle lanes in Greensboro.
I bike frequently and am excited about the idea of shoulders on 150, Lake Brandt, etc. Boy are they needed there!!	Thank you for your support of these recommendations.
Trails and Greenway Comments	
I support the Downtown Greenway and A&Y Greenway as priorities	Thank you for your comment and support.
I support creation of the Downtown Greenway for all of the economic, health and community building it provides. Other similar investments also improve the city's quality of life and its attractiveness for new businesses and families to thrive.	Thank you for your comments and support for this important project.
We do NOT need to make nature trails into city trails!! There are too many bikes on the trails now - and most of the cyclists think they have the right of way over the pedestrians. Focus on putting bike lanes on roads and if there isn't a bike lane then the cyclist should stay off the road and stay on	Thank you for your comment. This plan does not propose paving existing natural surface trails. Although further education may be needed on trail/greenway etiquette, we also understand that some greenways may need to be wider to handle the traffic they are currently seeing. Finally, although bike lanes encourage and separate bicycle traffic, bicycles are vehicles and thus may ride on any road unless legally prohibited such as on controlled-access roadways.
There is already way too much traffic on the greenway... Being that my house resides with access to the greenway I already feel that my privacy is being invaded considering my house was built before the greenway even existed. The cyclists races are absurd and they are almost always rude and disrespectful while I walk on the greenway. Many people also disregard traffic laws while cycling on the road.	Thank you for your comment. Although further education may be needed on trail/greenway etiquette, we also understand that some greenways may need to be wider to handle the traffic they are currently seeing.

QUESTION 2: Please rate the importance of different strategies for improving bicycle and pedestrian safety on a scale of 1-6, with 6 being the most important and 1 being the least important.



QUESTION 3: Are there needs you consider important that were not addressed in the Draft BiPed Plan Update?

Appendix A

Appendix B

Appendix C

PUBLIC COMMENTS ON QUESTION 3	MPO RESPONSES
General Comments	
<p>Naming specific changes to existing speed limits on specific streets. Spring Garden Street should be 25 mph zone between downtown and Holden.</p>	<p>Thank you for your comment. Unfortunately it is outside of the scope of this plan to recommend streets for speed limit reductions. We will share your comment on the Spring Garden Street speed limit with Greensboro Traffic Engineering Staff for review.</p>
<p>I'm not sure why there are speedbumps, road humps, or whatever you want to call them, mentioned in the plan. I have talked with the City on several occasions about having speed bumps/humps put in our neighborhood and have gotten nowhere except with a bunch of excuses. I'm not understanding why they are allowed in some areas and they aren't in others. While I understand there is an issue as far as emergency vehicles go, I don't find that to be a good enough reason when I'm walking my child down our neighborhood street and almost get hit by cars that are going 40-45 mph. Sidewalks would be nice as well, but I don't think our streets are wide enough for to add those. I like in River Hills Plantation, behind the Cardinal.</p> <p>It would also be helpful, and might encourage those who live close to walk more, if there was a sidewalk on Old Oak Ridge that went from Pleasant Ridge (or even around Pleasant Ridge and down to E.P. Pearce) all the way down to the Lowes Shopping Center on Old Oak Ridge (across from the fire station). I think that would encourage more people in that area to walk instead of driving short distances to get groceries, and would also encourage those runners, who like to run during "rush hour" to run on the sidewalk and not in the street.</p>	<p>Thank you for your comment. Greensboro currently does not have a traffic calming program; however, we agree that slowing traffic is an important aspect of bicycle and pedestrian safety. The City would need to direct additional resources to create a program, which is a recommendation of this plan.</p> <p>Staff will review your suggestion for a sidewalk on Old Oak Ridge Road and determine if a project can be developed at this time.</p>
<p>Yes. Developers should not be allowed to build in areas where transportation infrastructure is not adequate to meet the current traffic load. They should be required to fund improvements to the impacted roads</p>	<p>Thank you for your comment. Within the City of Greensboro, in some cases developers are required to fund a Traffic Impact Study to determine if a new development will overburden the existing local roadways with new traffic. If the study shows that this is the case, they may be required to construct additional roadway infrastructure such as turn lanes or traffic signals to mitigate the traffic impacts as a condition of their development.</p>
Bicycle Comments	
<p>1) I think the proposed bicycle improvements to Gate City Blvd east of Elm/Eugene should all be short term projects to take advantage of the current repaving project.</p> <p>2) I think either the connection of at least one of Four Seasons Blvd or Pinecroft to Van Story should be a short term priority</p> <p>3) I think Sharrows should be considered as an interim measure for bicycle lane projects that remain as MT or LT</p>	<p>Thank you for your comment.</p> <p>1) After reviewing Gate City Blvd East of Elm/ Eugene, we changed the segment from Murrow Blvd to Willow Rd to short term. The other sections along Gate City Blvd are not feasible in the short term timeframe.</p> <p>2) We changed Four Season Blvd from Creek Ridge Road to Vanstory Street to short term timeframe.</p> <p>3) Shared lane markings (sharrows) must be placed carefully and in the appropriate context. Not all roadways would benefit from sharrows, and it would also be cost-prohibitive to install and maintain these new markings all over the city. Roadways where sharrows would be beneficial have been identified in the plan on Map 2-6 in the Bicycle Recommendations section</p>



PUBLIC COMMENTS ON QUESTION 3	MPO RESPONSES
Bicycle Comments	
I read only the biking parts and thought they were well done. That's what concerns me the most, as a bike commuter at peak traffic times.	Thank you for your comment and support.
The needs of the motor vehicle drivers and educating them about all the new ideas for bike stuff; I didn't know about "sharrows"; or special bike boxes at intersections; or bike lights. As new fancy bike stuff is added stuff needs to be taught to the vehicle drivers.	Thank you for your comment. The City of Greensboro is participating in Watch for Me NC Program and has made efforts in educating public to increase safety awareness. Staff will make efforts to make this plan visibility to help public understand new concepts.
A strong and CONTINUOUS crack down on dangerous vehicle operation. It seems speed limits are treated as minimums, stop sign stops are entirely optional, and stop lights only come into effect after the red has lit for several seconds (not even that for right turning vehicles). I personally witness 1-2 red lights being run on Yanceyville between Lindsay and Bessemer per day. Also, has there been any consideration made towards how bicycle traffic on Lake Brandt Rd will be affected by construction of the Urban Connector? My take talking with that group indicated there might be an upsurge in traffic as Lake Brandt and Cotswald are merged to from a continuous road from Battleground to the Lawndale intersection. Yes, the A&Y will be bridged over the UC but what about the traffic that uses Lake Brandt to get down to the A&Y from North Haven, North Oaks, Southern Shores and the other subdivisions?	This will require further evaluation. Thanks to your comment we will go back and review the situation and what if anything can be done at that location to facilitate bicycling.
Rental bicycle program to encourage daily use by those without a bike--visitors, students, etc.	The MPO supports a Bike Share program and recommends this program in the Policies and Programs Section in the Bicycle Chapter.
Greensboro needs bikeshare!	
More protected lanes!	Thank you for your comment. Several recommendations have been made for protected bicycle lanes, and the MPO will review additional locations where they may be feasible.
Trails and Greenways Comments	
Yes - what about trails that allow horses?? This was totally ignored even though there is a large horse riding community in Greensboro, Summerfield & Oak Ridge.	Thank you for your comment. While that is a valid point, no specific input about such trails was received in the development of the BiPed plan from public comments or area jurisdictions. We encourage interested parties to collaborate with like minded individuals and groups to provide more detailed information for future plan updates.
Yes - fixing the existing problems at Pisgah Church/Battleground and Martinsville Road/Rice Toyota needs attention. I understand the problems there were created by poor zoning or land use decisions in the past, but they need correction.	Thank you for your comment. These areas remain under study, as do potential ways to mitigate issues in those areas, including the possibility of intersection or other roadway modifications to improve pedestrian and bicycling conditions in those areas.
Please consider providing greater support for the Downtown Greenway. It has proven economic benefits, and can provide major health benefits, education benefits and environmental benefits, plus be great for the growth and overall success of Greensboro and the broader region.	Thank you for your comment and support this important project.

QUESTION 4: Are there any projects or programs proposed that you feel should not be included in the Draft BiPed Plan Update?

Appendix A

Appendix B

Appendix C

PUBLIC COMMENTS ON QUESTION 4	MPO RESPONSES
General Comments	
Shouldn't there be some utilization of the trolley tracks downtown? The existing tracks could be utilized to help revitalize downtown as much as any greenway project.	Thank you for your comment. Unfortunately, it is out of our scope to research the trolley tracks in this plan. We will research this information for future plan updates.
Bicycle Comments	
Educating programs for street repair crews. Whenever Spring Garden Street, for example, is patched for any number of repairs, invariably the patch jobs are uneven and therefore dangerous to cyclists. Also, repainting of stripes, when it happens, is generally up not to standard.	Thank you for your comment. We will share your comment with Field Operations Department.
"Sharrows" should be installed immediately in areas that are targeted for future bike lanes or widening.	Shared lane markings (sharrows) must be placed carefully and in the appropriate context. Not all roadways would benefit from sharrows, and it would also be cost-prohibitive to install and maintain these new markings all over the city. Roadways where sharrows would be beneficial have been identified in the plan on Map 2-6 in the Bicycle Recommendations section.
Bike sharing or rentals near downtown	The MPO supports Bike Share program and recommends this program in Policies and Programs Section in Bicycle Chapter.
Trails and Greenways Comments	
It seems to be asking for more workers for the trails. While this is important, this may not be the place to ask for it, since you have not provided the current staffing numbers. What about the trails outside of GSO city limits?	The number of maintenance staff that work for the Greensboro Parks & Recreation Department is detailed in the Trails & Greenways Chapter under Maintenance. For trails and greenways outside the City of Greensboro, please contact the Parks and Open Space Department of Guilford County.
I'm skeptical that education programs will do much, and to the extent that they siphon precious resources from the greenway construction. I rather we didn't spread ourselves so thin, and the greenway plans are so extensive and so expensive that I'd rather concentrate on that particular infrastructure and downplay anything that dilutes those efforts. People will come once the wonderful greenway network achieves critical mass.	Thank you for your comment. Please see our Recommendations for Top Priority Trails and Greenways in the Trails and Greenways Chapter. The MPO is focusing on developing these trails and greenways as a top priority.
Yes - I am a frequent user of the Greenway & Trails system (Pedestrian). I run a lot on my own, but also walk my dog quite a bit on the trails. One of my biggest complaints is always that there are MINIMAL/NO trash receptacles on the paved greenway. As a result, I notice a lot of people either not picking up after their dogs, or leaving bags full of feces along the trail. I really think the greenway system would benefit from having a few trash receptacles and perhaps doggy bags along the way.	Thank you for your comment. We will share your comment with Greensboro Parks and Recreation Department.
Finishing the downtown greenway, connecting it out to Haw River State Park and building the greenway out to Chandler Concrete and beyond should be high priorities.	Thank you for your comment. The project priorities you mention are top greenway project recommendations in the plan.
Stop paving in nature areas & add bike lanes on roads	Thank you for your comment. Trails and greenways are not only for bicycling but also for health and economic development. Therefore, besides adding bike lanes on road, we also build trails and greenways for these purposes.



QUESTION 5: Please share any other comments you may have.

PUBLIC COMMENTS ON QUESTION 5	MPO RESPONSES
General Comments	
I think it inappropriate to have large 3 and 4 lane one-way streets in downtown. Speed limits should be reduced through downtown as well.	Thank you for your comment. Unfortunately it is outside of the scope of this plan to recommend streets for speed limit reductions. We will share your comment with Greensboro Traffic Engineering Staff for review.
Glad this has been done	Thank you for your comment and support!
Wonderful plan. Please implement ASAP.	
Is there a way to get PART to expand to more locations in the county's (I.e. Extend further out from GSO?)	We are not sure. We will pass this comment along to PART
Bicycle Comments	
Thank you, thank you. I try really hard to be visible when biking, but still feel that I'm putting my life at risk biking on Greensboro roads.	Thank you for your comment. We are making efforts to make our region more biking friendly and safely. This plan is one of our efforts towards it.
Use of the MUTCD markings for traffic signal loops can't come too soon.	Thank you for your comment and support of this recommendation. Staff will review locations where these markings would provide the most benefit.
The plan to provide a shoulder on Lake Brandt Rd will save lives - that is a primary route for cyclists moving from the City to the country and back again and it is now a nightmare for both drivers and bike riders. Two other places that need help in particular are the Battleground/Lawndale/Cornwallis crossing - again a nightmare for pedestrians, drivers and bike riders - and Lawndale/Cone with that dangerous ramp going down from Cone Blvd to Lawndale in the direction of the Target store. It is not safe for anyone - drivers, bike riders or pedestrians. Thanks.	Thank you for your comment. Lake Brand Road is one of the top priority paved shoulder recommendations in the plan. The Battleground and Lawndale locations you mention will be further evaluated to determine potential mitigation.
I have lived in the DC Metro (WABA), Bay Area (CA) and visited Portland, OR on several occasions. Greensboro has done a great job in making cycling accessible throughout the entire city. Thank you!	Thank you for your comment!
Please figure out a way to get NCDOT to add paved shoulder in Corny. Maintenance must be skipped up. Aggressive construction must continue, don't wait 8 years to do the next update!	Thank you for your comment. We will share the comment about paved shoulders in Corny with NCDOT.
North Church St and Hwy 150 from Summerfield to Hwy 29 should be a huge priority for being paved with bike lanes on both sides. The amount of vehicle traffic has really boomed since the three Northern schools and new shopping center were located there. Having to drive behind bikes is a dangerous situation. There are few places to safely and LEGALLY pass, cars get angry with you because you don't pass, long lines of cars stack up behind bikes, cars try to pass where they shouldn't and it puts everyone in danger. I've been in this situation and it's not good. I also think a light is badly needed at N. Church St and the Archer Gate/Spencer Dixon Rd funky place. I think the light should be set for both intersections as if it was one cross road only, allowing the cars on N. Church in both directions to turn left with a left turn light, then both go ahead straight or turn right. Then the lights should change so that Archer Gate/Spencer Dixon are allowed to both turn left; then go across or turn right. It would make traffic flow better, protect bicycles riding in that area who are coming to that strange intersection on a curve and hill with little forward visible sight, and reduce the accidents there tremendously between students and other vehicles.	Thank you for your comment. North Church and NC 150 from Summerfield to US 29 is a top priority for paved shoulders in this plan.



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PUBLIC COMMENTS ON QUESTION 5		MPO RESPONSES
Pedestrian Comments		
I have never seen enforcement of the existing traffic laws designed to protect pedestrians. I have often had my life endangered by vehicular traffic. Citations are only given when the victim is at Moses Cone or in the morgue.	Thank you for your comment. We are now participating in the Watch for Me NC Program, one of the State campaigns to enhance safety for bicyclists and pedestrians. Enforcement and education are two primary activities of this campaign. We will make more efforts to keep pedestrians safer on streets.	
Trails and Greenways Comments		
I have lived adjacent to the BurMil Park for 20+ years and throughout that time have noticed that the park has become overrun with cyclists and cycle races. The majority of cyclists are RUDE to pedestrians and feel that the people walking should jump out of the way of a cyclist! I am tired of cycle races taking over the park and effecting my weekend walks when trails are blocked off. It really is getting ridiculous.	Thank you for your comment. Although further education may be needed on trail/greenway etiquette, we also understand that some greenways may need to be wider to handle the traffic they are currently seeing.	
Oh how I wish the greenway construction was not progressing so slowly! But I understand the reasons why this is.	Thank you for your comment and understanding!	
Complete the A&Y connector to the Downtown Greenway as soon as possible. This would help with economic development and connectivity for the area.	Thank you for your comment and support. We are working on these projects.	
The Downtown Greenway needs to be completed ASAP, both for transportation and economic development		
I very much support creation of the Downtown Greenway for its economic, health, and community building benefits		
Please replace bridges on Lake Daniel Greenway as soon as possible. Please repair/replace concrete on Lake Daniel Greenway near Friendly Ave.	Thank you for the comment. Key short term recommendations of the plan include development of a trail and trail bridge conditions inventory to prioritize maintenance and replacement needs. The items you noted are sure to be high priorities. The BiPed Plan also recommends increased funding for greenway reconstruction and repair and including funding under the next City Transportation Bond. So please continue to discuss the needs for this with others and with your elected officials.	
I also support the connection of Revolution Mill with The Latham Park Greenway via greenway trail as well as a greenway connection between Gateway University Park/ Gateway and the Downtown Greenway. A connection directly from NCA&T to the innovation cornerstone site should be considered & also please include development of a bike lane progress in this update!	Thank you for your comment and support!	

QUESTION 6: In what ZIP code is your home located? (enter 5-digit ZIP code; for example, 00544 or 94305)

ZIP CODE	NUMBER OF RESPONSES
27127	1
27310	2
27358	1
27401	4

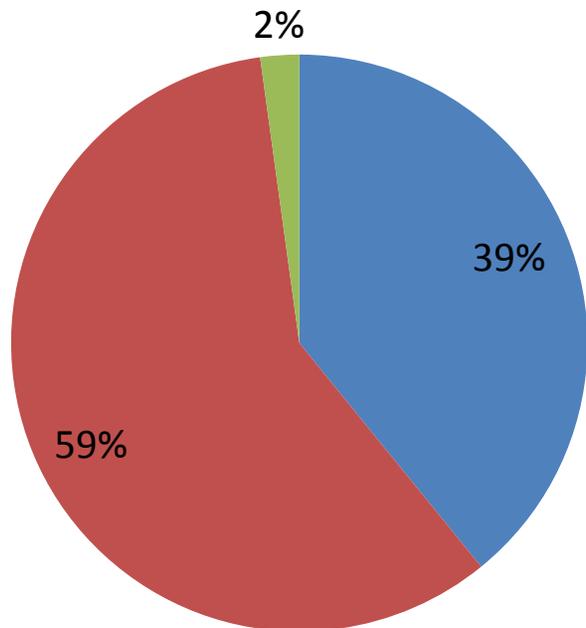
ZIP CODE	NUMBER OF RESPONSES
27403	8
27405	3
27406	2
27407	1

ZIP CODE	NUMBER OF RESPONSES
27408	6
27409	1
27410	7
27421	1

ZIP CODE	NUMBER OF RESPONSES
27455	6
No response	3

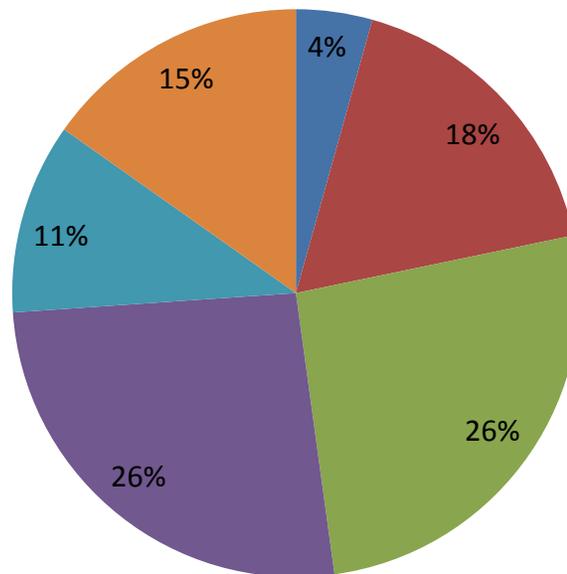
QUESTION 7: What is your gender?

Female Male No response



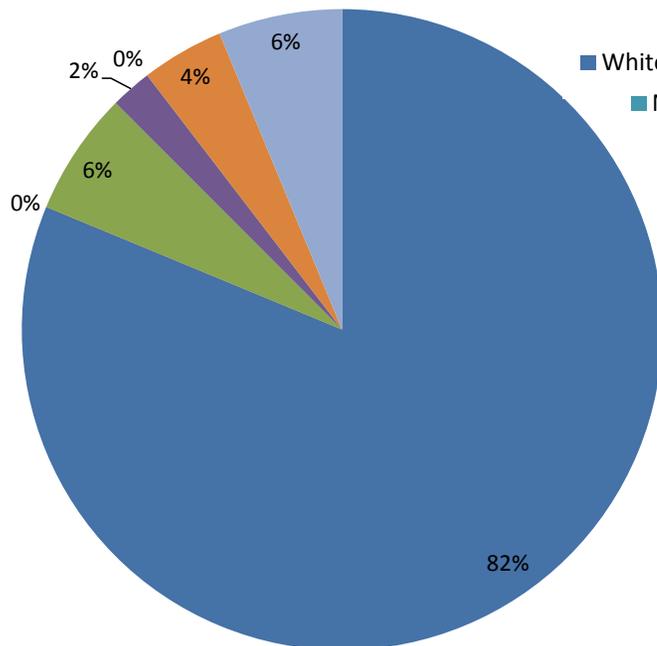
QUESTION 8: Please check the age group that applies to you.

21 and under 22-35 36-49 50-64 65 and Older No response



QUESTION 9: What is your ethnicity?

White Hispanic African-American Asia-Pacific Islander
Native American Other (please specify) No response



PART 2: GENERAL COMMENTS FROM THE PUBLIC

Greensboro MPO Responses to Cycling In Greensboro (BIG) Comments on BiPed Plan Update dated September 14, 2015

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BIG COMMENTS	MPO RESPONSES
<p>PAGES 2-56 – 2-58: Please include information about National Bicycle and Pedestrian Documentation Project. The National Bicycle and Pedestrian Documentation Project has developed methodology to create a summary report that highlights the valuable information that can be gained from year-long automatic bicycle and pedestrian counts. More information can be found at http://bikepeddocumentation.org/.</p>	<p>Discussion of the National Bicycle and Pedestrian Documentation Project (NBPD) is already included in the Bicycle Chapter and the Pedestrian Chapter under the “Non-motorized Counting Programs and Data Collection” and “Usage and Volume” sections, respectively. The Greensboro MPO has used equipment from Eco-Counter, which provides software to create summary documentation of count data. Automated counters installed through the NCDOT Pilot Bicycle and Pedestrian Counting Program can also be accessed through Eco-Counter.</p>
<p>PAGE 2-79: Please add information about the past Share the Road campaign, including criticisms of the campaign and new strategies currently under consideration by NCDOT.</p>	<p>Information about the GSO Shares the Road campaign has been added to the Bicycle Chapter under the Safety section in the area requested. We do not believe it is appropriate in this setting to detail criticisms of Share the Road signs or comment on potential changes in sign policy at NCDOT.</p>
<p>PAGE 2-97: Under BICYCLE ACCOMODATIONS, please consider using sharrows as an interim measure for medium term (MT) and long term (LT) bicycle lane projects.</p>	<p>Shared lane markings (sharrows) must be placed carefully and in the appropriate context. Not all roadways would benefit from sharrows, and it would also be cost-prohibitive to install and maintain these new markings all over the city. Roadways where sharrows would be beneficial have been identified in the plan on Map 2-6 in the Bicycle Recommendations section.</p>
<p>PAGE 2-100: TABLE 2.10: Bicycle Facility Recommendations by Facility Type and Phasing:</p> <ul style="list-style-type: none"> • Change proposed bicycle lanes on Gate City Blvd from Elm-Eugene St to Murrow Blvd, Murrow Blvd to Willow Rd and E. Florida St. to I-40 to short term (ST) projects to take advantage of the current repaving project. • Change Four Seasons Blvd from Creek Ridge Rd to Vanstory St. to a ST priority. 	<p>Four Seasons Boulevard from Creek Ridge Road to Vanstory Street, as well as Gate City Boulevard from Murrow Boulevard to Willow Road have been changed to short term projects. The other sections along Gate City Boulevard are not currently feasible in the short term timeframe.</p>
<p>PAGE 2-106: Under USAGE AND VOLUME, please recommend using data collected from the Pilot Bicycle and Pedestrian Counting Program with NCDOT and the Greensboro MPO Bicycle and Pedestrian Counting Program in the National Bicycle and Pedestrian Documentation Project.</p>	<p>MPO staff will take this under consideration as data becomes available from the data collection methods currently being used by the MPO.</p>
<p>PAGE 2-106: Under MAINTENANCE, please include a recommendation for the City to dedicate specific funds in the transportation budget for pedestrian and bicycle projects, in addition to the recommendations that the City increase the resurfacing budget, including an increased maintenance component on the next City Transportation Bond.</p>	<p>This recommendation has been included under the Infrastructure Recommendations section and under the Bicycle Accommodations section of the Summary.</p>
<p>Please identify potential locations for scratch and remark projects from the list of recommended bicycle facilities.</p>	<p>The City must pilot the scratch and remark process in order to determine where such places may be feasible and whether it is a process that can be used effectively for bicycle lanes. Therefore the potential for scratch and remark projects will be determined on a case-by-case basis and cannot be finalized at this time.</p>



BIG COMMENTS	MPO RESPONSES
<p>PAGE 2-107: Please recommend considering the following under SAFETY:</p> <p>Replacing “Share the Road” signs with “May Use the Whole Lane” signs or a similar message that clearly articulates bicycles should be treated as vehicles.</p> <p>Installing signs to either warn motorists to “Check Mirrors for Bikes before opening Doors” or to warn cyclists to “Avoid the Door Zone” in locations where on-street parking is allowed. Both Elm and Greene St in the busy section of downtown are high-risk locations.</p> <p>Advisory signs to tell the public bikes belong on the road, not on the sidewalk.</p>	<p>Signs will be placed in locations where they are appropriate, where the messaging will address a particular safety issue or concern that has been identified, and that are MUTCD approved. MPO Staff will review locations where new or improved signage may be needed based on the Bicycle Safety Analysis and where crash data points to a specific problem that must be addressed. The BiPed Plan Update does not cover specific bicycle-related signage as this is discussed in existing guidance such as the MUTCD.</p>

Greensboro MPO Responses to West Friendly Avenue/Guilford College Alliance Comments on BiPed Plan Update dated September 14, 2015

WGA/GCA COMMENTS	MPO RESPONSES
<ol style="list-style-type: none"> 1. Particularly at Intersection of Friendly and College, need to adjust pedestrian crossing signals to add additional time for pedestrian crossing (primarily to facilitate crossing by persons with disabilities) 2. High Traffic Hours/Heavy Pedestrian Use Area: Installation of blinking/flashing light or appropriate signage and road markings on approach to Quaker Village area from west and east on Friendly Avenue to increase pedestrian awareness; consider decrease in speed limit on Friendly in area from 35 to 30. 3. Enhancement of Pedestrian Crosswalks: Address placement of additional, more prominent street markings and/or pavement “noise” to alert drivers of pedestrian crossings, particularly at Friendly Avenue and College/New Garden and Friendly Avenue and Dolley Madison Road 4. Signal at Friendly and Dolley Madison: Addition of left turn signal from Friendly Ave. traveling east onto Dolley Madison 	<p>Thank you for your comments. MPO staff will pass these requests on to GDOT Engineering for further review and to make a determination on the appropriate treatments to address these concerns.</p>
<p>Current proposed bike lane Muirs Chapel to Friendly to College/ New Garden-change from mid-term goal to short-term goal (i.e., from 10 years to 5 years)</p>	<p>This section of Muirs Chapel must be reviewed more closely and GDOT Engineering must collect more traffic data to make a final determination on this project. The recommendation will remain in the medium term phasing until this review can be completed.</p>
<p>Bike lane/and complete sidewalks to connect Friendly Avenue and Quaker Village area to Jefferson Village via Friendly Avenue to Jefferson Road and Hobbs Road and to shopping center at intersection of New Garden Road and Jefferson Road. Add to BiPed Plan for mid-term.</p>	<p>Staff will need to review the bicycle facility requests more closely. It is unlikely that this section of Friendly Avenue will be feasible for bicycle lanes unless it is widened to include space for these facilities. Jefferson Road would need to be reviewed to determine if bicycle lanes are feasible. However, Jefferson Road is a highly connective street and it would be beneficial to fill in the sidewalk gaps along the roadway. A sidewalk project will be added to the mid-term for Jefferson Road.</p>
<p>Enhanced bicycle markings at intersections of Friendly Avenue at Westridge Road, Muirs Chapel, Dolley Madison.</p>	<p>There are currently no bicycle facilities on Muirs Chapel Road or Dolley Madison Road, thus it is unclear what type of marking or accommodation is warranted in these locations. The intersection of Westridge Road and Friendly Avenue may warrant further review as there is a bicycle route that follows Lakewood Drive to the south, across from the intersection with Friendly and Westridge.</p>

General Comments Received via E-mail

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COMMENTS RECEIVED VIA EMAIL	MPO RESPONSES
<p>I concur with the comments submitted by BIG and especially those comments that would make signage clearer re: bicyclists being on the road, i.e. changing Share the Road signs to something more descriptive. I had planned to complete the online survey this weekend, but due to an emergency in my family could not. I was encouraged that a lot is being planned to make the GSO area safer for bicycling. I know many people in the Guilford College area and live about a mile from there. Guilford College students and staff are more interested in sustainable transportation, including bicycling, than many. Hence please include these suggestions: Make the Guilford College area roads safer for cyclists, especially College Rd & Fleming Rd, New Garden Rd, and Friendly Avenue especially within a couple miles, but even out a few miles from the college. Whatever measures could be taken to make these roads safer would help. Making Oak Ridge and Guilford College Rd safer would be good too.</p>	<p>Thank you for your comments. Your comments are well-timed as City staff has been meeting with the West Friendly Avenue/Guilford College Alliance on these issues. See the responses to the comments from BIG and the WGA/GCA for more information.</p> <p>Staff will continue to work with the community residents and review opportunities for creating more bicycle-friendly roadways in this area. There are recommendations for bicycle facilities in the plan in this area of Greensboro on Map 2-6 in the Bicycle Chapter.</p>
<p>I want to voice my opinion that the BG connection to the A&Y is about as poorly done as it could be done. It goes up or down a very steep sidewalk along Old Battleground and connects to the A&Y at a busy intersection of Old Battleground and Lake Brandt Roads. This is a significant safety issue as well. These two signature greenways should connect just north or south of the Weaver Bridge. It could easily go along the Palmetto or Nat Greene trails. Maybe not easily but it could be done. How does one get this considered?</p>	<p>Thank you for your comments. The plan recommends that greenway crossings and connections be evaluated to ensure that they are safe and comfortable for all users. Your request has been forwarded to the Greensboro Parks and Recreation Department for them to review.</p>
<p>An area (146 acres) between the old alignment of High Point Road and the Gate City Boulevard relocation was annexed in April of 2015. There are no firm plans for the property and it is on the market. Just curious what provisions, if any, can be made in the BiPed Plan for bicycle and pedestrian access to this site, if it is to be developed at a large scale. In particular, I'm interested if there is a way to plan for access to the site from the backside of the Adams Farm neighborhood. Yes, directly across the railroad tracks, the new and near-completion Gate City blvd and near Pilot Elementary.</p>	<p>Thank you for your comments and bringing this to our attention. Although there are many challenges to building a greenway facility or other type of bicycle/pedestrian access across the train tracks and the relocated Gate City Boulevard, staff will review this more closely to see what other types of improvements in the area would be warranted. Sidewalk will be installed on the existing alignment portions of Gate City Boulevard when the project is finished in May 2016. In addition, sidewalk gaps will be filled in on Mackay Road with construction currently expected in 2018.</p>
<p>The BiPed plan sounds amazing! I was quite surprised to see the map of bike and pedestrian crash sites over a the 2007-2012 period. Maybe the finished greenway will be a safer path and help prevent accidents. We are very excited about the completion of the GSO Greenway and the A&Y. Please keep us updated as there is additional info.</p>	<p>Thank you for your comments and support!</p>

