APPENDIX F:
Methodology

Bicycle Network Development and Project Prioritization Methodology

This Appendix describes the planning and analytic processes that led to the development of the future bicycle network presented in the Pedestrian and Bicycle Chapter of Alexandria's Transportation Master Plan. Further, it explains the methodology leading to the prioritization and ranking of the recommended bicycle and pedestrian projects. The Appendix is divided into two sections:

Network Development: which describes the process used to develop the final proposed bicycle facility network.

Project Prioritization: which catalogues the criteria used to rank the proposed bicycle and pedestrian facility recommendations by level of importance to their respective networks.

Network Development

Following a review of the 2008 Transportation Master Plan bicycle infrastructure recommendations, the Study team used a multi-step approach to develop the recommended network of bicycle facilities. This included an analysis of comments received via the online crowdsourcing map and public meetings, compilation of planned facilities from past City studies and Small Area plans, a development of a draft network of roadways connecting regional/local destinations and neighborhoods, an examination of traffic volumes, a desktop review of numerous roadways, and a field assessment of existing roadway characteristics.

A draft study network of roadways was developed to help focus the fieldwork on those roadways connecting i) regional destinations (e.g., Old Town Alexandria, Mark Center, Landmark Mall); ii) citywide activity centers (e.g., Del Ray Commercial District); and iii) neighborhood destinations such as schools, parks and smaller shopping districts. Public input was critical to the identification of key destinations that needed to be linked by the future bicycle network

The Study Team then reviewed the most updated traffic count data from VDOT's Traffic Engineering Office,[1] and conducted a desktop review of the selected roadways to further distill the study network. This helped the study team recognize which areas of the City experience the highest volumes of automobile traffic (and may have an effect on bicycle modeshare), and which streets exhibit the highest potential for reconfiguration allowing for the implementation of bicycle friendly facilities.

The Study Team then conducted fieldwork using the refined network and focused on capturing roadway characteristics (ex. lane widths), any issues or barriers (ex. railroad tracks, rivers, highways), and potential opportunities to enhance the connectivity between neighborhoods and activity centers. Larger issues with roadways having an impact on bicyclist safety and comfort such as limited right of way, conflict points, and configuration of lanes were also noted. Other issues affecting bicyclists recorded included traffic conditions, posted speed limits, perceived speeding and lack of yielding. Finally, locations where connectivity could be enhanced with small improvements were noted for spot improvements.

Field work inputs, data analyses and public input were all synthesized to develop the final recommended bicycle network. The final recommendations were then divided into three generalized facility group types: enhanced bicycle corridors, shared roadways, and trails. This was deliberately done to allow for some flexibility for future design decisions to be made on a case-by-case basis. These three facility groups are

[1] The most recent Annual Average Daily Traffic Data available was for 2012.

explained in Section 3 of this Chapter. The draft recommended network was vetted with the Project Management Team, the Technical Advisory Committee, the Ad Hoc Advisory Committee, several City Commissions, and the public. Revisions were made based on the input of these groups, many focused on ensuring a continuous experience for bicyclists and compatibility with other City plans (i.e. the Eisenhower West Small Area Plan).

Project Prioritization

Following the development of the pedestrian and bicycle project recommendations, each project was ranked to help prioritize its implementation. All projects were prioritized using the 10-step method developed for National Cooperative Highway Research Program (NCHRP) Report 803: *Pedestrian and Bicycle Transportation Along Existing Roads – ActiveTrans Priority Tool Guidebook*. All bicycle and trail projects were derived from the final bicycle network. Sidewalk projects were primarily composed of features from the 2008 Bicycle and Pedestrian Master Plan, with some additional projects from the Case Study Area fieldwork.

The prioritization process used a combination of factors and variables to rank each project:

- **Factors** were defined as broad categories that represent important themes related to the pedestrian and bicycle environment. Such factors included:
    - *Existing and Potential Demand*: Recognizes the areas of the City where the greatest demand and greatest needs are for bicycle and pedestrian infrastructure.
    - *Geography*: Assigns a higher score to projects on the west side of the city, in order to help ensure geographic equity.
    - *Connectivity:* Does the proposed project provide a continuous connection between regional and local activity centers?
    - *Safety:* Could the implementation of the project address safety concerns including the number of bicycle and pedestrian crashes?
- **Variables** were defined as measurable characteristics related to each factor and may include features of roadways, households, neighborhoods or other data. The full list of variables can be found in the tables below.

To help rank the proposed projects, each factor received an individual weight. The weights were recommended by the project team using best practices on project prioritization, and refined by numerous stakeholders including City staff, the Project Management Team, Ad Hoc Advisory Committee Members, Technical Advisory Committee Members, and the General Public. The final sets of factors, variables and weights are provided in the table on the following page.

Bicycle, Trail and Sidewalk Project Prioritization Factors, Variables and Weights			
Factor	**Variable**	**Search Distance**	**Weight**
Existing & Potential Demand	Population Density	N/A	**3**
	Future Population	N/A	
	Employment Density	1/4 mile	
	Bicycle Mode Share	N/A	
	WikiMap Comments ("Place I ride," "Place I want to ride")	# along project corridor	
	Attractors (libraries, community centers, parks, schools)	1/2 mile	
	Transit (Metro & BRT stations)	1/2 mile	
	Transit (bike share stations, bus stops)	1/4 mile	
Geography	Project Serves Western Alexandria	Y/N	**3**
Connectivity*	Connections to Existing Bicycle Facilities	# of connections	**2**
Safety	WikiMap Comments ("Barrier to biking")	# per mile	**2**
	Crashes (bicycle crashes and fatalities)	# within 100 feet of project	
*This Factor was only used on the Bicycle and Trail projects, and was not relevant to the Sidewalk projects.			