Harrisonburg Bicycle and Pedestrian Plan Update

ActiveTrans Methodology

I. Introduction

The ActiveTrans Priority Tool was used to prioritize the individual bicycle and pedestrian projects contained in the 2016 Bicycle and Pedestrian Plan. With many needs and limited resources, this method provided an impartial and data-driven way to rank potential projects, raising low-cost alternatives, low-impact projects, urgent safety priorities, and proposals of greatest community impact to the top of the list. For more information about the ActiveTrans Priority Tool, see www.pedbikeinfo.org/planning/tools_apt.cfm.

The ActiveTrans model has been used successfully in a number of communities, but was re-worked and re-calibrated for this plan to fit the unique characteristics of Harrisonburg and the priorities of its residents and leaders.
There are four types of proposed projects:

- **Pedestrian Segments**
  These are sidewalks
- **Pedestrian Intersections**
  Where new or existing segments cross streets with vehicular traffic
- **Bicycle Segments**
  These are on-road bicycle facilities
- **Shared Use Paths**
  Off-street paths and trails for both pedestrians and bicyclists

The following pages explain the ActiveTrans tool's five major factors, and how the variables for each category have been applied to the proposed projects.

II. Major Factors

The many variables included in the ActiveTrans analysis were divided into five main factors, containing variables that range from public desires to physical measurements and assessments of safety. Because these variables can be so different, each category was weighted differently. Each parent category started] with a weight from 1 to 10 that determines how much impact on the final results each group of variables had.

Stakeholder Input

Ideas for new potential bicycle or pedestrian infrastructure projects based on public input about needs, desires, and existing problem areas, as well as projects already proposed in the 2010 Bicycle and Pedestrian Plan, the 2011 Comprehensive Plan, or the city's Capital Improvements Plan.

Category Weight: 3

Constraints

Physical and other issues that will determine how complex or expensive a proposed project would be to build, including the need to move utilities or purchase land, and whether a project could be divided into several phases to help ease constraints.

Category Weight: 10

Existing Conditions

Conditions on the ground at the location of potential projects that can help determine both the complexity of projects and how vital the need for them is. Variables include speed, road width, traffic volumes, and intersection features.

Category Weight: 10

Connectivity

With the goal of building up a city-wide network of bicycle and pedestrian facilities that make it possible to travel anywhere in the city without the need for a car, assessing projects based on the importance of their place within the overall network.

Category Weight: 6

Equity

Assessing areas of highest activity and highest needs to promote improvements where they will be useful to the greatest number of city residents, especially for underserved population segments for whom driving may not be an option.

Category Weight: 6

III. Individual Variables

Individual variables within each of the five parent categories were scored based on metrics that are specific to each; yes or no, vehicles per day, distance across an intersection, citizen input from public work sessions, traffic speeds, persons per square mile, etc. For each variables or measurement, a decision has to be made as to what deserves priority; is it more important to add bicycle and pedestrian facilities to high traffic streets, or low traffic streets? Should we improve intersections with short crossings first because they are easier, or long crossings first because they pose greater risks to pedestrian safety? The answers to these priority decisions are found below for each ActiveTrans variable, along with which projects (*Pedestrian Segments, Pedestrian Intersections, Bicycle Segments, or Shared Use Paths)* each variable applies to.

Stakeholder Input

Number of Citizen Comments

Applies to: All Projects

The projects assessed by the ActiveTrans tool were generated by public comments gathered through:

- A Wiki Mapping exercise conducted by the Harrisonburg-Rockingham Metropolitan Planning Organization between April 19th and June 28th, 2013.
- One public input session held on May 19th, 2015,
- Five subsequent focus group meetings in Fall 2015, and
- Public comments collected during the development of this plan, the bulk was collected in May and June 2015.

Projects were scored based on the number of mentions or identifications each received during the public input process. The ActiveTrans analysis prioritized those projects with the highest level of public support or concern.

Included in an Existing Plan

Applies to: All Projects

The ActiveTrans analysis prioritized those projects that were already included in existing City plans including the 2010 Bicycle and Pedestrian Plan, the 2011 Comprehensive Plan, and the city's Capital Improvements Plan. Projects with previous inclusions in these plans were prioritized over newly suggested projects.

Constraints

Available Right of Way

Applies to: All Projects

Pedestrian and bicycle projects that can be constructed within existing rights-of-way (property owned by the City) will be easier, faster, and less costly to build. Therefore, the model prioritized projects that can be accomplished without purchasing additional right-of-way. The availability of right-of-way was estimated by taking measurements from the city's existing GIS mapping. The analysis required 8 feet of available space for pedestrian segments, or 17 feet for shared use paths. If these widths were not available at any point along the proposed segment, the project was judged to require additional right-of-way. For bicycle segments, a general assessment of pavement space was made, judging the potential to install bicycle lanes without widening roads or reducing number of vehicle travel lanes.

Major Utility Relocation

Applies to: All Projects

Utilities include electric, gas, water, sewer, etc. Utility relocation can be complex and expensive. The ActiveTrans analysis promoted those projects that can likely be constructed without disturbing existing utility locations, both above and underground. A visual inspection of proposed projects was used to generally assess utility conflicts, although some underground utility conflicts can be hard to see. Projects were scored as having either no conflicts, minor conflicts affecting utility pedestals and other small features, of major conflicts requiring the relocation of overheard utility poles.

Opportunity to Phase Project

Applies to: All Projects

Breaking projects into two or more phases can ease the disruption of construction, spread costs over multiple years, or make the project easier to implement. This ActiveTrans analysis prioritized those projects that can be accomplished in multiple phases. Projects were scored as either having the opportunity for multiple phases, or not having this opportunity based on a general assessment by the Department of Public Works, with the model promoting those projects which were judged to have multiple phase flexibility.

Existing Conditions

Vehicle Lanes

Applies to: Pedestrian Segments, Shared Use Paths

The ActiveTrans model was constructed to prioritize pedestrian projects along smaller 2-lane roads and neighborhood streets, separating pedestrian routes and shared use paths from heavily traveled automobile routes for increased safety and pedestrian comfort. For the purposes of this analysis, shared center turn lanes were included in the overall vehicle lane count. For Bicycle Segments, see Traffic Stress.

Speed Limit

Applies to: Pedestrian Segments, Pedestrian Intersections, Shared Use Paths

In line with an overall approach to develop a pedestrian network on small roads and neighborhood streets, the ActiveTrans model prioritized pedestrian projects along streets with slower moving traffic, separating pedestrian routes from fast moving automobile routes to increase safety and pedestrian comfort. For Bicycle Segments, see Traffic Stress.

Average Daily Traffic

Applies to: Pedestrian Segments, Pedestrian Intersections, Shared Use Paths

Prioritizing sidewalks, bike lanes, and path projects along low volume streets further promotes the approach of establishing a pedestrian network along small neighborhood streets rather than main roads in order to enhance pedestrian comfort and safety. However, this priority was reversed for pedestrian intersections, where high traffic volumes mean that safety and crossing improvements are a high priority. For Bicycle Segments, see Traffic Stress.

Traffic Stress

Applies to: Bicycle Segments Only

The Traffic Stress Index was established as a part of the Harrisonburg Community Bike Map Project to rate city streets based on their suitability for riders of different levels, from children and beginners to confident expert cyclists. The Traffic Stress Index was calculated by considering variables such as traffic, roadway speeds, road width, and whether bicycle lanes were present. These existing traffic stress scores were incorporated into the ActiveTrans model to promote bicycle segments that have the lowest stress and highest comfort for riders of all levels. For the map and Review Guide, visit www.harrisonburgva.gov/bike-map.

Type of Traffic Control

Applies to: Pedestrian Intersections Only

For pedestrian intersection projects, the model rated whether traffic controls are currently in place, and what kind. Intersections were ranked as either having no traffic signal, a traffic signal only, or a traffic signal that includes pedestrian crossing signals. Intersections that currently have no existing signal at all were prioritized by the model.

Presence of Raised Median

Applies to: Pedestrian Intersections Only

When crossing wide streets or divided routes, a raised median between travel lanes moving in opposite directions can serve as a refuge for crossing pedestrians, letting them confront only one direction of traffic at a time. Where a median is available or planned as part of a future improvement project, a proposed crossing project can be made to be safer and more comfortable; therefore, projects including a median were promoted.

Distance from Nearest Traffic Signal

Applies to: Pedestrian Intersections Only

In the interest of safety, pedestrians should only cross roadways at intersections. Where intersections are far apart, pedestrians are not given convenient options to cross. For this reason, the ActiveTrans model gave higher priority to pedestrian intersection improvements when the next available intersection is farther away, promoting more, and more closely spaced, opportunities for pedestrian crossing.

ADA Compliance

Applies to: Pedestrian Intersections Only

The city's existing intersections vary in their compliance with the Americans with Disabilities Act (ADA), requiring curb ramps for wheelchair users and other disabled pedestrians. The model made improvements where ADA upgrades are needed a high priority, helping to serve the needs of all users. While curb ramps are necessary for many disabled users, they are also a great convenience for older users, young children, and parents with strollers.

Longest Crossing Distance

Applies to: Pedestrian Intersections Only

With variation in the width of city streets, pedestrians must sometimes cross long distances, especially when crossing major routes. Very long crossings are most in need of safe pedestrian options; therefore, the model ranked pedestrian intersection projects based on the longest crossing leg, prioritizing improvements to long crossings where pedestrian safety and comfort are most needed.

Connectivity

Connects to Existing Sidewalk, Bike Lane, or Path

Applies to: All Projects

The ultimate goal of the Bicycle and Pedestrian Plan is to construct a network of connected improvements that allow seamless pedestrian and bicycle trips in all areas of the city. To best meet this goal, the ActiveTrans analysis promotes those projects that connect to existing facilities, creating instant extensions of the existing bicycle and pedestrian network. Locations of proposed projects were compared to maps of existing bicycle and pedestrian facilities to accomplish this analysis.

Connects to Proposed Sidewalk, Bike Lane, or Path

Applies to: Pedestrian Segments, Bicycle Segments, Shared Use Paths

Secondary to promoting projects that connect to existing paths and sidewalks, the ActiveTrans model also gave higher rank to projects that offer connections to planned pedestrian or bicycle

improvements, ultimately promoting a network of connected improvements that allow seamless pedestrian and bike trips in all areas of the City.

Safe Route to School Link

Applies to: Pedestrian Segments, Bicycle Segments, Shared Use Paths

Safe routes to schools are especially important to the overall connectivity goals of the Bicycle and Pedestrian Plan, and promote safe and convenient opportunities for children to bike and walk to and from schools. The importance of projects that provide safe routes to schools is compounded by the availability of special grants to fund projects of this type. For the purposes of this analysis, the model promoted bicycle improvements located within 1 mile of a school, and pedestrian projects located with 0.5 miles of a school.

Along Public Transit Route

Applies to: Pedestrian Segments, Shared Use Paths

Connections between bicycle, pedestrian, and transit facilities further enhances the ability of residents and visitors to navigate Harrisonburg without access to an automobile. For this reason, the model promoted projects that are along established transit routes. Project segments that are parallel to existing transit routes are ranked higher by the model, as well as some non-parallel routes at the discretion of city staff and the Bicycle & Pedestrian Subcommittee.

Equity

Equity Score

Applies to: All Projects

While pedestrian and bicycle facilities are an amenity to many residents of Harrisonburg, they are a necessity for those who do not have access to a car because of their age, financial situation, or disability. To help deliver bicycle and pedestrian infrastructure to those who need it most, city staff and the Bicycle and Pedestrian Subcommittee devised an equity score of each project based on four criteria:

1. Percentage of the population classified as low and moderate income
2. Percentage of the population under 18 years old
3. Percentage of the population over 65 years old
4. Percentage of households who do not own a vehicle

Each of these factors was mapped for census block groups nearest a proposed project, and projects with high equity scores ranked higher by the ActiveTrans model.

Population Density

Applies to: All Projects

The ActiveTrans model promoted projects near where more people live in order to serve the greatest need for bicycle and pedestrian facilities, and to deliver the greatest benefit to residents for limited construction funds. This analysis uses census block group data for population density.

Activity or Employment Density

Applies to: All Projects

In order to prioritize projects where demand for pedestrian and bicycle routes is high, the model gave higher ranking to projects in or near activity and employment centers, creating options for biking or walking to work and other errands.