

**CITY COMMISSION AGENDA MEMO**  
**May 25, 2011**

**FROM:** Peter Clark, Civil Design Engineer

**MEETING:** May 31, 2011

**SUBJECT:** Bicycle Master Plan Update

**PRESENTERS:** Rob Ott, City Engineer  
Peter Clark, Civil Design Engineer  
Joey Lightner, Bicycle Intern

**BACKGROUND**

Bicycles are an increasingly important element to a healthy and vibrant community that people want to call home. In environments where bicycling is encouraged and appropriate facilities are available, residents report a greater sense of community, better quality of life, and greater overall happiness. Objective measures show that bicycle-friendly communities have less crime, higher property values, and less incidence of preventable disease, such as obesity, cancer, and hypertension. Because of this, it is important to promote cycling in the community.

The Bicycle Master Plan was developed through a joint project of the City of Manhattan and Kansas State University in 1998 and has since been cited as a possible reference for bicycle related projects in the City of Manhattan. Although it was not formally adopted by the Planning Board and City Commission as a part of the Comprehensive Plan, it is referenced in the Comprehensive Plan and the Manhattan Urban Area Subdivision Regulations. The Community Development Department has incorporated the Bicycle Plan's recommendations in staff reports to the Planning Board as part of the Planned Unit Development (PUD) review and platting process, particularly as it relates to identified bike routes, such as along Amherst Avenue, Miller Parkway, and McCall Road. Rarely have Public Works engineers for renovation used the Bicycle Master Plan, or to guide policy makers when new projects were being planned or current infrastructure updated.

It is unfortunate that while the goals of the Bicycle Master Plan are consistent with current goals of the Bicycle Advisory Committee and City staff, the 1998 Bicycle Master Plan does a poor job on advising implementation of those goals. Thus, few improvements to bicycle infrastructure have been accomplished since the creation of the 1998 Bicycle Master Plan. With the formal adoption of the Strategic Five-Year Plan for Bicycling, it is the hope to begin the process of making the City of Manhattan a more bicycle-friendly community by creating a structured plan for infrastructure implementation.

This document focuses on the next five years of bicycle infrastructure implementation in the City of Manhattan. The projects with the highest cost-to-benefit ratios are highlighted in Map 1 and outlined according to year in Table 1. Map 2 highlights all necessary infrastructure for a complete bicycle network, and Table 2 outlines the timeline for implementation of that infrastructure. All of the projects in Table 2 are necessary to complete a network for bicycle transportation within and around the City. It should be noted that each list is written in such a way as to prioritize projects based on need and expected net benefit.

## **DISCUSSION**

### **Types of Facilities**

Conceived as an interconnected web of bicycle facilities, this proposed network of trails, bicycle lanes, bicycle boulevards, and multi-use paths will serve to facilitate bicycle commuting throughout the City of Manhattan. Similarly to vehicular transportation plans, this plan focuses on connecting local points of interest in the most convenient way so that bicyclists are able to ride safely and comfortably from destination to destination.

Facility design should address two basic concepts:

1. An interconnected network of designated bicycle routes should provide access to every major destination in the City.
2. An average bicyclist should feel comfortable bicycling on designated routes during any time of the day.

### **Bicycle Boulevards**

At the core of this proposal are bicycle boulevards. A bicycle boulevard is a shared roadway (bicycles and motor vehicles share the space without marked bicycle lanes) where the through movement of bicycles may be given priority over motor vehicle travel on a local street. Traffic calming measures are used to control traffic speeds and discourage through trips by motor vehicles. These traffic control measures are designed to limit conflicts between automobiles and bicycles and favor bicycle movement on the bike boulevard.

Bicycle boulevards are the safest way for the average person to ride a bicycle in a city. By adding traffic calming features and reducing bicycle-vehicular conflicts, bicyclists will be able to travel safely from destination to destination.

The term bicycle boulevard has been used to describe many different attributes of shared roadways. For our purposes, a bicycle boulevard must provide at least three of the following five conditions:

1. Decreased speed limit to 20 miles per hour.
2. A shared-lane marking in each direction on every block to denote that bicyclist are to ride with traffic.

3. Right-of-way for bicycles at intersections should be considered.
4. Traffic-calming features.
5. Wayfinding signs that show distance or time to local destinations.

Traffic calming feature can include but are not limited to: traffic circles, divided medians, raised sidewalks, curb extensions, street trees, and midblock street closures.

### Bike Lanes

Bike lanes are a portion of the roadway that has been designated by striping, signage, and pavement markings to show exclusive use by bicyclists. Not only do bike lanes facilitate bicycling for the average person, they also make the movement of both motorists and bicycles more predictable.

According to the American Association of State Highway and Transportation Officials (AASHTO) Guide for the development of bicycle facilities, bike lanes must have the following critical dimensions:

1. 4 feet (1.2m): minimum width of bike lane on roadways with no curb and gutter
2. 5 feet (1.5m): minimum width of bike lane when adjacent to parking or from the face of the curb or guardrail
3. 11 feet (3.3m): total width for shared bike lane and parking area, no curb face
4. 12 feet (3.6m): shared bike lane and parking area with a curb face.

Furthermore, striping for a bike lane must be:

1. 6-inch wide (150mm): solid white line separating bike lane from motor vehicle lane (possibly increased to 8-inches (20mm) where emphasis is needed)
2. 4-inch wide (100mm): optional solid white line separating the bike lane from parking spaces.

At intersections, bike lane striping should not be installed. Rather it should stop at the near-side property line extended and then resume at the far side property line. However, dotted guidelines can be used where needed to assist bicyclist at particularly complex intersections or multi-lane roundabouts.

### Multi-Use Paths

Multi-use paths are used as a last resort to separate bicyclists from motorists on busy, multi-lane roadways (Average Daily Traffic > 10,000). While multi-use paths are facilities designated for bicycle and pedestrian traffic, trails are improved recreational facilities not designed for transportation purposes. To serve transportation needs, multi-use paths must be at least five feet in width and have a solid center white line separating directional traffic.

### Pavement Surface Quality

Pavement surfaces should be smooth, and the pavement should be uniform in width. Wide cracks, joints, or drop-offs at the edge of the pathway parallel to the direction of travel can trap a bicycle wheel and cause loss of control; holes and bumps can cause bicyclists to swerve into the path of motor vehicle traffic. Therefore, it is necessary that all surfaces be uniform and smooth.

### Drainage Inlet Grates

Drainage inlet grates and utility covers are potential obstructions that can cause serious damage to bicycle wheels and/or injury to the bicyclist. Therefore, bicycle safe grates and utility covers should be used on all roadways designated as bicycle routes.

## **Policies for Future Growth**

Providing safe facilities for pedestrian and bicycle transportation, in addition to automotive transportation, is key to developing a sustainable community. The following transportation policies should be incorporated into all development in Manhattan to facilitate pedestrian and bicycle transportation opportunities. As previously discussed, the transportation network alternatives should include bike lanes, trails, paths, alternative access points, and a network of interconnected roads, bike lanes, paths, and trails.

### Policy 1 – Path Design

Sidewalks, shared-use paths, street crossings, pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated, and maintained so that all pedestrians and bicycles, including people with disabilities, can travel safely and independently throughout any development.

### Policy 2 – Collector and Arterial Multi-Use Design

Arterial and collector roadways should be designed to provide for bicyclists and pedestrians to cross corridors as well as travel along them. While bicyclists and pedestrians may not commonly use a particular travel corridor for various reasons, they will still likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges should accommodate bicyclists and pedestrians in a manner that is safe, accessible, and convenient.

### Policy 3 – Multi-Use Facility Design

The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the Institution of Transportation Engineers (ITE) Recommended Practice "Design and Safety of Pedestrian Facilities."

### Policy 4 – Rural Roadway Design

In rural areas, paved shoulders should be included on roadways used by more than 1,000 vehicles per day. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble

strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

Policy 5 - Transportation Network

Every effort should be made to focus on the implementation of a grid pattern street connectivity. Any street segment longer than 500 feet should have bicycle and pedestrian access ways to link adjacent residential areas. Such access ways can be utilized for emergency vehicles and should be designed with appropriate widths and materials. Appropriate signage should also be used to direct bicycle and pedestrian traffic.

Policy 6 – Capital Projects

Capital Improvement Project funds should be used to develop new bicycle and multi-use transportation projects. The design and construction of new transportation facilities should anticipate and provide for future demand for bicycling and walking facilities. Current lack of connectivity should not preclude the funding of projects. For example, a bridge that is likely to remain in place for 50 years might be built with sufficient width for safe bicycle and pedestrian use in anticipation of those facilities availability at either end of the bridge, even if that is not currently the case.

Policy 7 – Land Use

Increased use of mixed-use development and practices should be used to decrease urban sprawl and reliance on the automobile. New subdivisions should be required to incorporate a mix of housing types and include retail and/or office components to help reduce the need for long commutes to work and services.

Note: This proposed policy is consistent with the adopted Manhattan Urban Area Comprehensive Plan’s policy statements in Chapter - 4 Land Use and Growth Management; Chapter 8 Mobility and Transportation; and Chapter 9 Housing and Neighborhoods, which generally promote mixed-use neighborhoods with multi-modal connectivity.

(This does not replace the current Bicycle Master Plan but is in addition to the current policy.)

**FINANCING**

City Administration recommends the following schedule of projects in Table 1, with their associated costs to be funded through the City’s Special Street and Highway Fund through 2016.

**Table 1. Strategic Five-Year Plan for Bicycling**

<b>Year</b>	<b>Project</b>	<b>Estimated Cost</b>
2012	Bike Boulevard on Moro Street from 11 <sup>th</sup> -4 <sup>th</sup>	\$15,000
<b>Total for 2012</b>		<b>\$15,000</b>

<b>2013</b>	Bike Boulevard on Laramie from 11 <sup>th</sup> - North Manhattan	\$4,000
	Bike Lanes on 11 <sup>th</sup> from Moro-Laramie	\$2,000
	Bike Boulevard on North Manhattan from City Park to Anderson	\$7,500
	Bike Boulevard on Humboldt from 19 <sup>th</sup> -4 <sup>th</sup>	\$18,000
<b>Total for 2013</b>		<b>\$31,500</b>
<b>2014</b>	Bike Boulevard on Houston from 17 <sup>th</sup> -4 <sup>th</sup>	\$20,000
	Bike Boulevard on 9 <sup>th</sup> Street (or 8 <sup>th</sup> ) from Bertrand-Yuma	\$23,000
<b>Total for 2014</b>		<b>\$43,000</b>
<b>2015</b>	Bike Boulevard on Vattier from N. Manhattan-4 <sup>th</sup>	\$15,000
	Bike Lanes on Yuma from 4 <sup>th</sup> to Valley Dr.	\$43,000
<b>Total for 2015</b>		<b>\$58,000</b>
<b>2016</b>	Bike Boulevard on Denison from Anderson-Humboldt	\$10,000
	Bike Boulevard on College Heights from Denison-Anderson	\$18,000
	Bike Lanes on South Manhattan Ave from Linear Trail-Poyntz	\$22,000
	Bike Boulevard on Hayes Dr from Casement-Allen Rd	\$5,000
<b>Total for 2016</b>		<b>\$55,000</b>

## **RECOMMENDATION**

City Administration is seeking feedback and direction on the implementation of the Strategic Five-Year Plan for bicycling.

## **POSSIBLE MOTION**

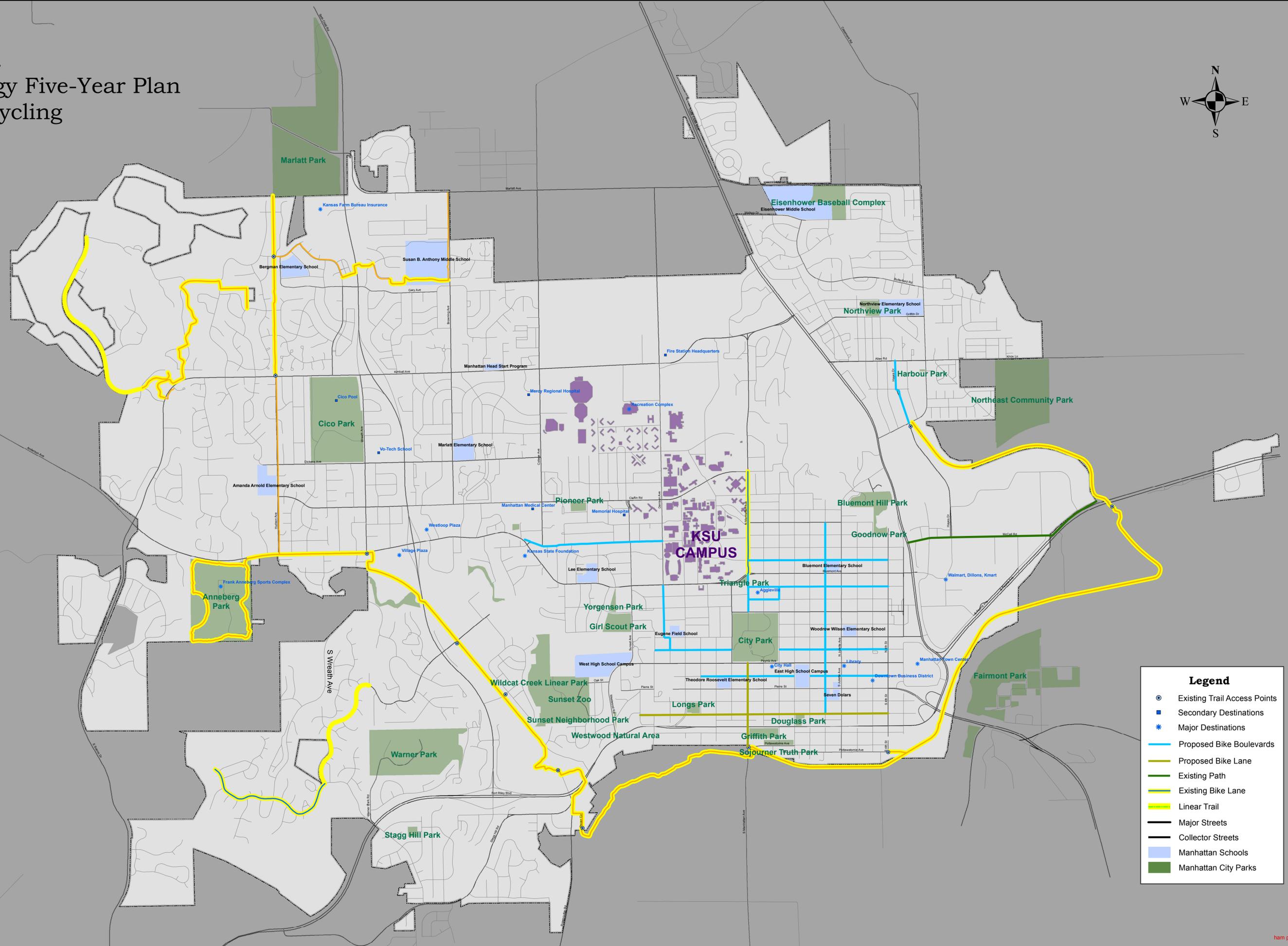
No motion is necessary as this is a work session.

PWC/11076

Enclosures:

1. Map 1 -Strategic Five-Year Plan for Bicycling
2. Map 2 -Total Infrastructure Recommendations
3. Table 2 -Total Infrastructure Recommendations

# Map 1. Strategy Five-Year Plan for Bicycling



**Legend**

- ⊙ Existing Trail Access Points
- Secondary Destinations
- ★ Major Destinations
- Proposed Bike Boulevards
- Proposed Bike Lane
- Existing Path
- Existing Bike Lane
- Linear Trail
- Major Streets
- Collector Streets
- Manhattan Schools
- Manhattan City Parks



**Table 2. Total Infrastructure Recommendations**

<b>Year</b>	<b>Project</b>	<b>Estimated Cost</b>
<b>2012</b>	Bike Boulevard on Moro Street from 11 <sup>th</sup> -4 <sup>th</sup>	\$15,000
	<b>Total for 2012</b>	<b>\$15,000</b>
<b>2013</b>	Bike Boulevard on Laramie from 11 <sup>th</sup> - North Manhattan	\$4,000
	Bike Lanes on 11 <sup>th</sup> from Moro-Laramie	\$2,000
	Bike Boulevard on North Manhattan from City Park to Anderson	\$7,500
	Bike Boulevard on Humboldt from 19 <sup>th</sup> -4 <sup>th</sup>	\$18,000
	<b>Total for 2013</b>	<b>\$31,500</b>
<b>2014</b>	Bike Boulevard on Houston from 17 <sup>th</sup> -4 <sup>th</sup>	\$20,000
	Bike Boulevard on 9 <sup>th</sup> Street (or 8 <sup>th</sup> ) from Bertrand-Yuma	\$23,000
	<b>Total for 2014</b>	<b>\$43,000</b>
<b>2015</b>	Bike Boulevard on Vattier from N. Manhattan-4 <sup>th</sup>	\$15,000
	Bike Lanes on Yuma from 4 <sup>th</sup> to Valley Dr.	\$43,000
	<b>Total for 2015</b>	<b>\$58,000</b>
<b>2016</b>	Bike Boulevard on Denison from Anderson-Humboldt	\$10,000
	Bike Boulevard/Lanes on Dickens from Denison-Hudson	\$8,000
	Bike Boulevard on College Heights from Denison-Anderson	\$15,000
	Bike Lanes on South Manhattan Ave from Linear Trail-Poyntz	\$20,000
	Bike Boulevard on Hayes Dr from Casement-Allen Rd	\$5,000
	<b>Total for 2016</b>	<b>\$58,000</b>
<b>2017</b>	Bike Boulevard/Lanes on Dickens from Denison-Hudson	\$80,000
	<b>Total for 2017</b>	<b>\$80,000</b>
<b>2018</b>	Connection on Dickens across Seth Child	\$75,000
	<b>Total for 2018</b>	<b>\$75,000</b>
<b>2019</b>	Sidewalks on Sarber Ln connecting to Wal-Mart	\$50,000
	City Park Bike Connections	\$15,000
	<b>Total for 2019</b>	<b>\$65,000</b>
<b>2020</b>	Multi-use Path on Hayes Dr from Casement-McCall Rd	\$90,000
	<b>Total for 2020</b>	<b>\$90,000</b>

<b>2021</b>	Connection improvements to the intersection at Bluemont and Tuttle Creek Blvd	\$25,000
	Bike Lanes on Browning from Dickens to Snowbird Dr	\$18,000
	Bike Boulevard the length of Garden Way	\$10,000
	Bike Boulevard on Tuttle St from Northview Elementary to Tuttle Creek Blvd	\$10,000
	Connect improvements to the intersection at Tuttle Creek Blvd and Kimball	\$33,000
	<b>Total for 2021</b>	<b>\$96,000</b>
<b>2022</b>	Bike Lane on Butterfield Rd from Casement to Mission Ave	\$20,000
	Bike Boulevard/Multi-use Path for Susan B Anthony Project	\$20,000
	Bike Boulevard/Multi-use Path for Yorgensen/Cemetery/Fremont Project	\$50,000
	<b>Total for 2022</b>	<b>\$90,000</b>
<b>2023</b>	Bike Boulevard/Multi-use Path for Zoo Project	\$78,700
	Bike Lanes on Stagg Hill Road from Fort Riley Blvd to Miller Pkwy	\$15,000
	<b>Total for 2023</b>	<b>\$93,700</b>
<b>2024</b>	Multi-use Path from Stagg Hill to Amherst around Target shopping district	\$100,000
	<b>Total for 2024</b>	<b>\$100,000</b>
<b>2025</b>	Bike Lanes on Stagg Hill Road from Fort Riley Blvd to Miller Pkwy	\$15,000
	Bike Lanes on Miller Pkwy from Davis to Amherst	\$15,000
	Bike Boulevard on Plymouth from Dickens to North Linear Trail	\$14,000
	Bike Boulevard on the length of Windsong Lane	\$8,000
	<b>Total for 2025</b>	<b>\$52,000</b>
	<b>Total Infrastructure Costs</b>	<b>\$947,200</b>