Safety Action Plan
Systems Plan Addendum

September 2022

7

Safety Action Plan

Purpose

The original Bicycle and Pedestrian Systems Plan (BPSP), published in February of 2020, identifies a comprehensive set of improvements necessary to a community where walking and biking are safe, enjoyable, comfortable, and dignified. In the long-term, it will provide a unified and thorough framework for transportation and recreation.

However, one issue remains immediate: safety. The City of Manhattan recognizes that the protection of every road user is not optional. Barriers to travel—the risk of physical harm being chief among them—must be eliminated.

The purpose of this action plan addendum is to identify and target proposed BPSP projects in danger-dense and need-heavy locations.

A slate of projects with an explicit safety focus—while maintaining the integrity of the Bicycle and Pedestrian Systems Plan—can streamline the realization of safety objectives and provide access to unique funding opportunities.

We believe that danger is an intolerable consequence of mobility. We desire a community where all modes of transportation are convenient, safe, and efficient. We know that diligence and vigor are necessary to fulfill this vision.

This action plan is imperative to an equitable transportation network, a sustainable community, and a safer Manhattan.

This addendum was adopted as part of the Bicycle and Pedestrian Systems Plan on September 6, 2022.

Building on the BPSP

Manhattan's Needs

Manhattan's bicycle and pedestrian network is vital. Manhattan is a young community where the percentage of those who rely on biking and walking is well above that for the state of Kansas.

Moreover, Manhattan's large, semi-transient population of college students creates both a distinctly dangerous roadway environment and a higher demand for bicycle and pedestrian infrastructure.

It is this infrastructure most often neglected by conventional safety plans. In Manhattan and the U.S. at large, bicyclist fatalities have not matched the decline of motorist fatalities—they have increased.

Safety Risks

Figure 28 displays the locations of highest risk, most notably: streets adjacent to Kansas State University's campus, the Aggieville entertainment district, and Manhattan's downtown.

Until safety is recognized as a paramount concern, lack of appropriate facilities in these areas will continue to put residents in harm's way.

226

Bicyclist and Pedestrian Serious Injuries, 2011-2021

4

Bicyclist and Pedestrian Fatalities, 2011-2021

71%

Proportion of crashes that occur in broad daylight.
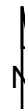
Figure 28: Bicycle and Pedestrian Crashes, 2011-2021

CRASH RISK MAP

CRASH TYPE

- 🟢 Pedestrian
- 🔴 Bicyclist

KEY ZONES

1	K-State's Core Campus
2	Aggieville District
3	Downtown

Engagement

Background

Through focus groups, social media, interactive mapping, demonstration projects, public meetings, and local partnerships, the Bicycle and Pedestrian Systems Plan established a deep foundation of community engagement.

To continue the collaborative legacy of the BPSP, this action plan addendum was developed with the help of the City's Bicycle and Pedestrian Advisory Committee (BPAC).

BPAC, a core entity in the construction of the original BPSP, represents Kansas State University, Riley County, Pottawatomie County, Manhattan's business community, and Manhattan citizens who actively use bicycle and pedestrian infrastructure.

Approach

The central objective of BPAC was to refine the system of analysis that identifies safety critical BPSP projects. They were well-placed to deliver three critical goals for this action plan addendum:

- **Consistency with the mission of the original BPSP.**

- **Inclusion of diverse perspectives.**

- **Application of user-centered feedback.**

During the spring and summer 2022 BPAC meetings, City staff presented potential analysis methods and opened discussion over evaluation factors. Over successive meetings, staff updated committee members on the addendum's progress and displayed preliminary results.

Feedback

Commentary from BPAC members crystalized into the following principles:

1

Serious injuries and fatalities are both unacceptable events. Weighting of crash records should be heavy and not distinguish between the two.

2

Effective safety evaluation should consider the impact of solutions on the bicycle and pedestrian network. Projects that resolve major gaps in the network are optimal.

3

The original BPSP ranking system was well-vetted and data driven. Its determinations should be important in subsequent analysis.

Safety Analysis

Overview

To select desirable projects from the BPSP, this addendum used a staged analysis that rendered scores for each project. At each stage, the list of projects was narrowed to exclude the lowest scores.

Staging Method

The stages judge, in order: safety, equity, and effectiveness. In total, the BPSP includes 130 potential projects. By dividing project evaluation into three stages, this addendum ensures that each recommended project scores well in not just one or two areas, but all three.

The safety stage measured the risk perceived by road users and the density of danger on specific roadways, updated with current data.

After this stage, 22 projects remained.

The equity stage utilized new U.S. Department of Transportation metrics provided as part of the Justice40 Initiative.

After this stage, 17 projects remained.

The effectiveness stage considered tactile project area features and the original proposal assessment provided by the BPSP.

**After this stage, 9 projects remained.**

Selection and Advancement

Within each stage, project scores were plotted with respect to relative project ranking. This allowed scoring gaps to be identified between incremental increases in rank. Projects on the upper end of the score gap advanced to the next stage.

Consider Figure 29, which shows a hypothetical scoring stage of 10 projects. The 7th ranked project is several points lower in score than the 6th ranked project. Conversely, the 6th, 5th, and 4th ranked project are equal in score. In this case, the addendum would advance the top six projects. If only the top five projects advanced, there would be little rationale for including the 5th ranked project and excluding the 6th ranked project.

In other words, it is optimal to determine the advancement point such that the highest scoring "loser" is still substantially less competitive than the lowest scoring "winner".

Figure 29: Example Scoring Plot
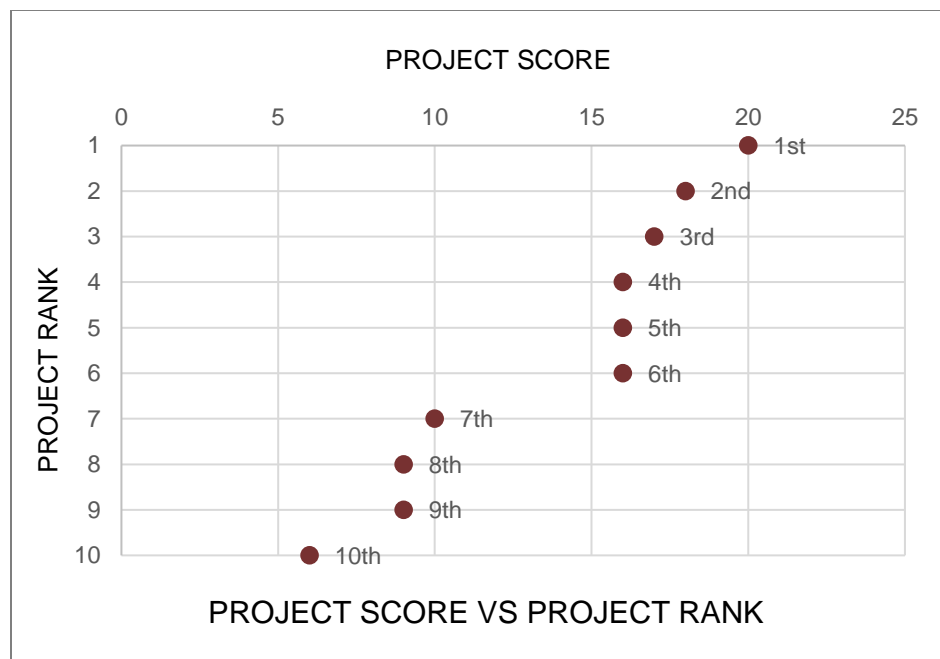
Scoring Criteria

Figure 30 shows each stage of analysis and its respective criteria.

Figure 30: Scoring Criteria

|	Criterion	Description	Source
Stage 1: Safety	Injuries and Deaths Per Mile	Total number of fatalities and serious injuries for bicyclists and pedestrians for each mile of project area.	Kansas Department of Transportation 2011-2021 crash data
	Bicycle Level of Traffic Stress	Cyclist level of comfort within the project area, based on traffic volume, posted speed limit, number of lanes, and infrastructure conditions.	Original BPSP determination
	Pedestrian Level of Service	Pedestrian level of comfort within the project area, based on provided pedestrian space, connectivity gaps, and crossing quality.	Original BPSP determination
Stage 2: Equity	Area of Persistent Poverty	The project area has a poverty rate of at least 20 percent.	U.S. DOT Census Tract indicators
	Historically Disadvantaged Community	The project area is designated as a "Historically Disadvantaged Community".	U.S. DOT Census Tract indicators
	Transportation Disadvantaged Community	The project area includes people who spend more money and time to get where they need to go.	U.S. DOT Census Tract indicators
	Health Disadvantaged Community	The project area is associated with adverse health outcomes, disability, and environmental exposure.	U.S. DOT Census Tract indicators
	Economy Disadvantaged Community	The project area has high poverty, low wealth, lack of local jobs, low homeownership, low educational attainment, and high inequality.	U.S. DOT Census Tract indicators

	Equity Disadvantaged Community	The project area has a high percentile of persons (age 5+) who speak English "less than well."	U.S. DOT Census Tract indicators
	Resilience Disadvantaged Community	The project area is vulnerable to hazards caused by climate change.	U.S. DOT Census Tract indicators
	Environment Disadvantaged Community	The project area has disproportionately high levels of certain air pollutants and high potential presence of lead-based paint in housing units.	U.S. DOT Census Tract indicators
Stage 3: Effectiveness	BPSP Implementation Category	Implementation ranking of the project. A measure of priority and feasibility that includes user demand and support.	Original BPSP determination
	Critical Connections	Total number of key crossings intercepted by the project area. These intersections link citywide bicycle and pedestrian networks, cross physical barriers, and/or experience high daily bicyclist and pedestrian volume.	Original BPSP determination
	Hazard Factors	Total number of features present in the project area that contribute to risk, such as sight obstacles or non-signaled crossings.	Safety Action Plan Addendum determination

Recommendations

After three stages of scoring, plotting, and trimming, nine projects from the BPSP remained. Figure 31 shows each project in the order of its final ranking. Figure 32 maps these projects.

Figure 31: Recommendation Table

Project Rank	Solution Type	Project Location	Project Boundary	Timeline (Years)
1	Separated Bike Lane	N. Manhattan Ave.	Bluemont Ave.to Claflin Rd.	1–5
2	Sidewalk	Anderson Ave.	N. Manhattan Ave. to 14th St.	1–5
3	Multi-Use Path	Kimball Ave.	College Ave. to Wreath Ave.	5–10
4	Multi-Use Path	Anderson Ave.	Connecticut Ave. to Wreath Ave.	5–10
5	Separated Bike Lane	Claflin Rd.	Dennison Ave. to College Ave.	10–15
6	Separated Bike Lane	Anderson Ave.	N. Manhattan Ave. to Sunset Ave.	10–15
7	Multi-Use Path	Casement Rd.	Hayes Dr. to Tuttle Creek Blvd.	5–10
8	Multi-Use Path	Tuttle Creek Blvd.	Casement Rd. to Bluemont Ave.	10–15
9	Separated Bike Lane	College Ave.	Dickens Ave. to Claflin Rd.	10–15

Figure 32: Recommended BPSP Projects
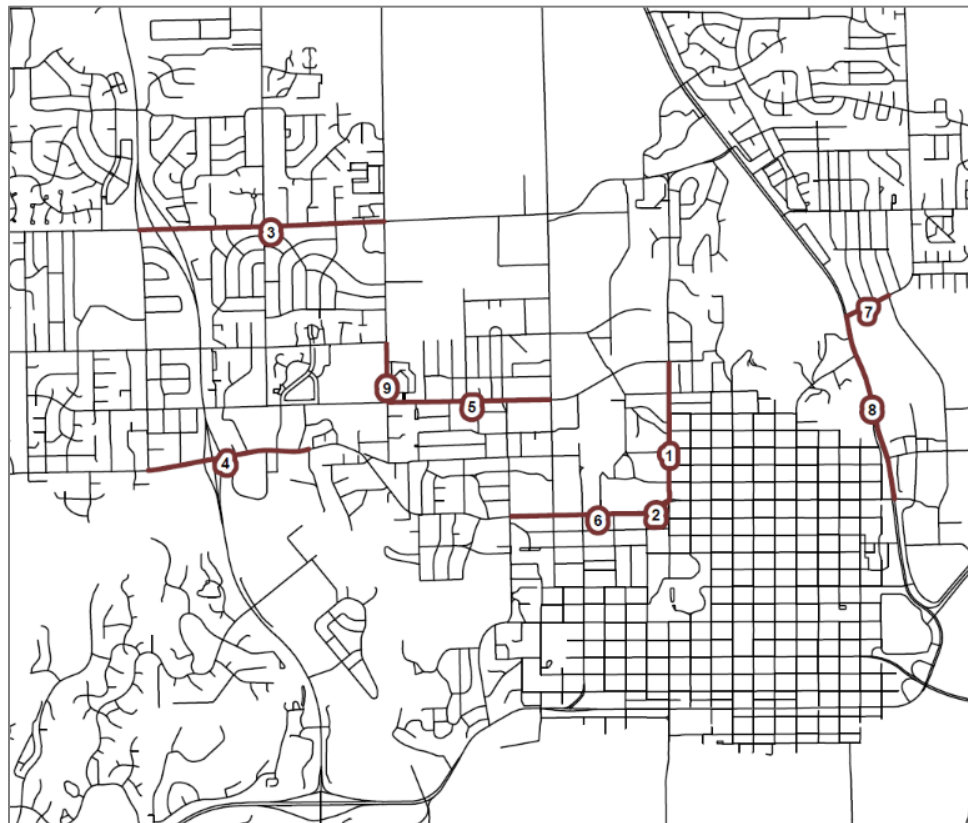
SAFETY CRITICAL PROJECTS

City of Manhattan Kansas

▬▬▬▬ Project Boundary

① Project Rank

N