Bicycle Master Plan

North Kansas City
Acknowledgements

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Advisory Committee
Officer Aaron Bassore, NKC Police Department
Linda Black, NKC Resident
Bryant DeLong, NKC City Council
Wade Eimore, NKC Resident
Randee Gannon, NKC Hospital
Sally Katz, NKC Resident
Richard Lanning, NT Realty
John Miller, StorSafe Warehouse & iWerx
Ryan Shafer, Clay County Health Department
Byron Spencer, NKC Planning Commission
Don Stielow, Mayor
Kiley Sutter, Velo Garage & Tap House
Kelli Votypka, NKC Parks & Recreation
Kathy West, NKC Resident
Dr. Matthew Woody, NKC Hospital
Caitlin Zibers, MARC

City Council
Mayor Don Stielow
Bryant DeLong
Rita Pearce
Jesse Smith
Valerie Pearman
Zach Clevenger
Rick Stewart
Fred Steffen
Tom Farr

City Staff
Eric Berlin, City Administrator
Kim Nakahodo, Assistant City Administrator
Sara Copeland, AICP, Community Development Director
Mallory Brown, Permit Technician
Bradley Hocevar, Planning Intern

Consultant Team
BikeWalkKC
WSP
Hoxie Collective
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Executive Summary
Background

What is a Bicycle Master Plan?

The Bicycle Master Plan provides high-level guidance to coordinate projects, programs, and initiatives that support safer streets, more inviting public spaces, and better access to North Kansas City destinations for everyone to enjoy. This plan outlines a comprehensive network of bicycle facilities that connects and serves all parts of the community, and details strategies to implement this network over time in coordination with other City priorities, infrastructure improvements, and economic development.

As a high-level policy document, the Bicycle Master Plan does not provide detailed design guidance for individual projects or replace the community engagement and outreach that shapes improvements on individual streets and corridors. Each part of the recommended network of bicycle improvements in this plan requires a more detailed design and engagement process, which offers opportunities to adapt improvements to the specific needs of the community as they evolve over time.

Engagement

Community engagement is crucial to create the right guiding policy for the diverse residents and stakeholders of North Kansas City. The planning process used many methods of community engagement in order to reach different audiences in different ways. The project team facilitated small focus groups to identify stakeholder interests and concerns, and convened larger public workshops where participants could define a shared vision together. The engagement process included innovative online tools for mapping and cataloguing public perceptions and experiences related to cycling. Programming including classes, pop-up demonstrations, and bike rides were used to not only raise awareness and participation in the Bicycle Master Plan but to gradually build a shared understanding of the purpose and promise of bike infrastructure in North Kansas City. Throughout the process an advisory committee with diverse perspectives served as a sounding board for plan concepts and recommendations. Between meetings, classes, and events approximately 415 people participated in person, with an additional 950 online contributions.

Goals and Outcomes

Why Bike North Kansas City?

A bike-friendly North Kansas City is one important part of the safe, livable, and inviting community people value and cherish. Recommendations in the Bicycle Master Plan supports safer streets, more inviting public spaces, and better access to North Kansas City destinations for everyone to enjoy.

Many of these priorities are captured in the vision of North Kansas City's adopted Comprehensive Master Plan. A North Kansas City where people of all ages and abilities can safely and comfortably get to destinations no matter how they choose to travel builds on the Master Plan's Vision Themes:

- Growing and attracting new and innovative businesses and supporting the local economy
- Attracting new residents
- Creating authentic and diverse public spaces
- Expanding the range of attractions

Most directly, a bike-friendly North Kansas City responds to the Comprehensive Master Plan’s goal to build a safe and multimodal transportation network. The Master Plan reflects community priorities for increasing connectivity, creating new and better bike lanes, connecting parks and open spaces to regional destinations, enhancing character and activity on public streets, and improving connections to Downtown Kansas City, Missouri.

Streets that Work for Everyone

Research and case studies across the country demonstrate that more people will bicycle when they have safe places to ride. Research also tells us that more people on bikes translates to safer streets. In the United States, less than 10% of people generally feel comfortable riding in mixed traffic. However, 53% may be interested in riding more often if there were better places to ride. Bicycle infrastructure that is safe, comfortable, and separated from traffic can attract traditionally under-represented demographics, including women, children, and seniors.

The North Kansas City Bicycle Master Plan uses an assessment of “Level of Traffic Stress” to formalize this concept of comfort and safety, and to provide a way to evaluate the usefulness and accessibility of recommended improvements. Level of Traffic Stress is discussed in more detail in the Analysis and Recommended Network sections of this plan.
Types of Cyclists

- 9% Enthusiastic and confident
- 53% Interested but concerned
- 37% Not able or interested
- 1% “I will ride my bike anywhere!”
- 1% “I love riding my bike and feel safe most of the time.”
- 9% “I want to bike more, but I don’t always feel safe.”
- 37% “I’m not physically able to ride a bike.”

“Revisiting the Four Types of Cyclists: Findings from a National Survey”
Transportation Research Record: Journal of the Transportation Research Board

Most Desired Outcomes

Community members were asked to identify their top priorities for the Bicycle Master Plan. The graph below represents the percent of total responses for each desired outcome out of a total of approximately two hundred responses. Increased safety, support of local businesses, and improvements to public spaces rated as the most important outcomes and directly relate to Vision Theme #4 of the North Kansas City Master Plan to build a safe and multimodal transportation network.

- Increase Safety: 17%
- Grow Local Business: 17%
- Enhance Public Space: 17%
- Strengthen Quality of Life: 13%
- Increase Health and Happiness: 12%
- Expand Access to Opportunity: 12%
- Support Tourism and Development: 9%
- Improve Job Retention & Performance: 4%
The Recommended Network identifies different types of bicycle infrastructure based on the conditions and context of each route. Physically separated bicycle facilities are not needed on quiet neighborhood streets, for example, while a painted stripe is not enough for most people to be comfortable biking on streets with heavy or fast-moving traffic. Bike facility recommendations are also made with consideration to street widths, adjacent businesses, available right-of-way, impacts on other modes of transportation, and other factors that affect the feasibility of potential improvements.

While each route on the Recommended Network will require a more detailed design and engagement process in order to be implemented, preliminary analysis shows that all recommended routes are feasible without reduction of auto travel lanes, minimal changes to existing on-street parking, and full accommodation of business access and operations.

Bicycle facilities on the Recommended Network include the following:

**Recommended Bicycle Facilities**

**Shared Lane Markings**
Also known as “sharrows,” shared lane markings are pavement markings that indicate that bicycles and automobiles share the same space on a roadway. They can be useful for alerting motorists to the presence of cyclists and assist cyclists with wayfinding. They are most appropriate for low traffic, low speed streets.

**Shared Streets / Bike Boulevards**
Shared streets or “bike boulevards” focus on traffic calming and signage. They are appropriate for low traffic, low speed streets, or for streets that could be made more comfortable with additional traffic calming. These streets are about more than bikes, and may include improved sidewalks, crosswalks, landscaping, wayfinding, or neighborhood branding.

**Bike Lanes**
Bike lanes use striping to identify a dedicated space on the road for people on bikes. Sometimes bike lanes have a painted buffer separating car traffic, but there is no physical protection between bikes and cars. Bike lanes provide some safety benefits and increased comfort on streets that aren’t too busy.

**Protected Bike Lanes**
Protected bike lanes provide a dedicated space for bikes separated from traffic by a physical barrier (curbs, landscaping, parked cars, etc). Protected bike lanes can be at street grade or above a curb and include one-way and two-way design options. Protected bike lanes provide high comfort for all ages and abilities, even on busy streets.

**Shared Use Paths**
Shared use paths are wide paths shared by pedestrians and cyclists that are typically located above the curb. They provide high comfort and safety for casual cyclists. Confident cyclists may wish to avoid pedestrian conflicts and low speeds on a shared use path. Busy areas require wider paths to be safe and comfortable.
Bicycle Network Map - Recommended Bicycle Facilities

Project concepts and additional information on individual routes can be found in the “Network Details” section of the appendices.
The purpose of this plan is to encourage biking, with all the benefits biking brings. To support more biking and encourage the large segment of people who are interested in biking if it was safer and more comfortable, the North Kansas City Bicycle Master Plan prioritizes a low level of traffic stress for all users on all routes in the Recommended Network.

Level of Traffic Stress provides a systematic way to evaluate the overall safety and comfort of people on bikes, as well as their willingness to travel out of their way to maintain that level of comfort. Some people are not able or interested in biking in any scenario. About ten percent of people are enthusiastic and confident about biking. Most people are interested in biking but concerned about safety.

**Level of Traffic Stress 1: All Ages and Abilities**

Most children, parents, and seniors would find Level of Traffic Stress 1 routes comfortable and safe for riding.

**Level of Traffic Stress 2: Interested But Concerned**

Interested but concerned riders may be comfortable with Level of Traffic Stress 2. These riders are representative of a typical adult and can accept some degree of stress while riding along a roadway.

**Level of Traffic Stress 3: Enthused and Confident**

Enthused and confident riders can tolerate Level of Traffic Stress 3 routes even though they may prefer to ride with a lower level of traffic stress.

**Level of Traffic Stress 4: Strong and Fearless**

Level of Stress 4 routes are tolerated for any significant distance only by strong and fearless riders who are comfortable riding in mixed-traffic environments.
Bicycle Network Map - Level of Traffic Stress

Level of traffic stress is affected by street conditions like traffic speed and traffic volume, as well as the availability of infrastructure that can protect and separate people on bikes from traffic. The following map illustrates the future level of traffic stress if the recommended bike network is implemented.
Analysis

This Bicycle Master Plan has been informed by a process of data analysis. By utilizing data, it is possible to determine characteristics of the built environment and areas of need for cyclists throughout the city in a systematic way without bias towards personal experience. This data analysis focused on both where people are likely to ride and on the type of environments cyclists experience.

Level of Traffic Stress

Cyclists can be classified by how much stress they are willing to tolerate on a street. It is important to know where cyclists are likely to encounter high levels of stress so that a network of facilities can be provided that serves all users. Without dedicated cycling facilities, most cyclists are not comfortable riding on the street with traffic.

The level of stress on a street can be reduced by providing dedicated cycling infrastructure. The table below shows how different types of bicycling facilities can provide a lower level of stress even on a street with high speeds and high traffic volumes. The facilities that create a lower stress environment also have been shown to reduce bicycle-motor vehicle crashes, injuries, and deaths. It is important to note that not every street needs a cycle track to provide a low-stress environment. Moderate speed and moderate traffic volume streets can serve Level-of-Stress-1 users even with simple bike lanes and buffered bike lanes in certain cases.

Level of Traffic Stress by Speed, Traffic Volume, and Type of Bike Facility

<table>
<thead>
<tr>
<th>Street Characteristics</th>
<th>Bike Facility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Type</td>
<td>Typical Street Designation</td>
</tr>
<tr>
<td>Residential Access</td>
<td>&lt;500</td>
</tr>
<tr>
<td>Residential Local</td>
<td>500-1,500</td>
</tr>
<tr>
<td>Residential Collector</td>
<td>1,500-3,000</td>
</tr>
<tr>
<td>Commercial/Industrial Collector</td>
<td>3,000-10,000</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>10,000-20,000</td>
</tr>
<tr>
<td>Major Arterial</td>
<td>&gt;20,000</td>
</tr>
</tbody>
</table>

Analysis

Routes and Destinations

During the Bicycle Master Plan process participants were asked what routes they biked today and what routes they would like to bike if it was safe and comfortable. Participants were also asked about popular destinations and locations where barriers made biking unsafe or uncomfortable. Feedback included many face-to-face conversations and public meeting discussions using maps to guide feedback. An online mapping tool was also available to collect data. This mapping tool collected and aggregated roughly one thousand contributions on routes, destinations, and barriers. Together, this feedback provides clear guidance on where people are biking and want to bike.
Risk of Severe Injury or Death When Hit by Car at Different Speeds

<table>
<thead>
<tr>
<th>Speed</th>
<th>Severe Injury</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 MPH</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>35 MPH</td>
<td>65%</td>
<td>33%</td>
</tr>
<tr>
<td>45 MPH</td>
<td>90%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Source: AAA Foundation for Traffic Safety

Evaluating Progress

An important component of any Bike Master Plan is evaluation. Are the goals of the plan being achieved? Are more people biking on improved corridors? Are more people biking overall? Where are people going? What are the impacts to local business? These and other questions can be monitored over time to evaluate the success of recommendations in the Bicycle Master Plan. There are many ways to evaluate success of the Bicycle Master Plan. The most useful measures will have the following characteristics:

- Focus on the number of people biking
- Focus on outcomes related to broader city priorities
- Use readily available data that is simple to compile
- Use data that is available annually if possible
- Use measures with a demonstrated link to biking based on scientific research

Bike Ridership Target

A key goal to this plan is to create an environment in the city where more people feel safe and comfortable riding bicycles to capitalize on the many benefits of cycling discussed in the plan. This plan explores how many people are cycling in the city today, and how many could be cycling in the city with plan implementation. Based on this analysis, the Bicycle Master Plan identifies the following targets for bike ridership:

**Short Term (5-year):**
1% bicycle mode share  
2.5% adults biking daily

**Medium Term (10-year):**
2.5% bicycle mode share  
6% adults biking daily

**Long Term (20-year):**
6% bicycle mode share  
15% adults biking daily

End of Trip Facilities

The Bicycle Master Plan identifies strategies to encourage biking in North Kansas City and to support biking as a viable option for transportation. For biking to be competitive with other modes of travel, it must be comfortable, convenient, and barrier-free.

Bike Parking and Repair Facilities

Infrastructure and amenities at the beginning and end of bicycle trips have a big impact on the desirability and practicality of biking. Convenient and visible bicycle parking, long-term storage and security options, maintenance and repair stations, and places for riders to freshen up after rides are examples of end-of-trip facilities that help make biking trips seamless and reliable. Both public infrastructure and private development amenities are necessary for a bike-friendly community.

Transit Integration

Coordination of bike and transit facilities has benefits for users of both modes of transportation. Biking helps those without access to a car travel further than they can by walking. This enhances the function of the transit system, increases the number of people who can conveniently access transit, and expands the number of destinations accessible to users. Connections to transit can help people who bike get to destinations that are too far or too difficult to reach by bike alone. This increases the viability and reliability of biking as a transportation option.

Managing Micromobility

Over the past several years, improving technology and changing mobility preferences have resulted in a rapid diversification of transportation options. Bikes, e-bikes, scooters, e-scooters, and other “micromobility” devices are providing new alternatives for short trips supported by apps and technical advancements that make these options more user-friendly than ever before.

These new micromobility options give more people more choices to get where they need to go and reduce barriers for people who are interested in alternative transportation options. If unmanaged these new transportation options can create new issues related to safety, operations and maintenance, waste, accessibility, sidewalk clutter, personal data, and other topics. Thoughtful standards for public and private operators (in combination with supportive infrastructure) will enable North Kansas City to enjoy all the benefits of evolving transportation choices while ensuring public streets and rights-of-way remain safe, accessible, and beautiful.
Implementation

Public Meeting Project Prioritization Exercise

Public meeting participants prioritized potential bike improvements based on relative project costs and a limited budget. The numbers on the graph represent the marbles or “budget” allocated to each project in the exercise. Armour Road connections under I-35 to major employers and riverfront trail connections were identified as the highest priority projects, despite their relatively higher costs. Improvements to Swift Street, Howell Street, and a connection east to Chouteau Trafficway were also prioritized.

Coordination with Existing Projects

This Project Coordination Chart outlines a decision process to assist with the implementation of the Bicycle Master Plan. By aligning projects in the Recommended Network with existing funding streams for maintenance and other infrastructure, the overall cost and timeline of implementation for the Bicycle Master Plan can be reduced.
Project Funding:

**State and Federal Programs**
- Surface Transportation Program
- Congestion Mitigation and Air Quality Program
- Transportation Alternatives Program
- Safe Routes to School Programs
- Federal Transit Administration Programs

**Other Funding Opportunities**
- Coordination with Street Striping Schedules
- Coordination with Planned Street Resurfacing
- Coordination with Other Infrastructure Projects
- Coordination with Private Partners

Codes and Policies

In July 2018, North Kansas City amended its traffic code to update and clarify code language relating to bicycles. The updated traffic code includes new definitions, protections for vulnerable road users, and clarifications of where pedestrians, cyclists, and drivers are permitted to travel. With the 2018 update, North Kansas City’s traffic code generally reflects modern best practice for defining and regulating activity on city streets related to biking. The 2018 Traffic Code update addressed the following topics:

- Definitions of Bicycles, Electric Bicycles, and Motor Bikes
- Vulnerable Road Users
- Riding to the Right and on Bike Paths
- Passing at a Safe Distance
- Driving and Parking in a Bicycle Lane
- Right of Way in a Crosswalk

The Bicycle Master Plan recommends amendments to the City’s Streets, Sidewalks, and Public Spaces Code to address right-of-way encroachment, parklets, and bike corrals.

The Bicycle Master Plan recommends amendments to the City’s development code to add fee-in-lieu options for bike parking and shared active transportation device parking credit.

Recommended Speed Reductions

Operations and Maintenance

The operations and maintenance of bicycle facilities is nearly as important as the planning and construction of those facilities. Poor maintenance on a bicycle facility often affects cyclists much more than drivers due to the mechanics of riding a bicycle. The Bicycle Master Plan details operations and maintenance standards for a variety of conditions and infrastructure, including:

- **Ensuring a Smooth Riding Surface** - This includes pavement surfaces, storm inlets, railroad grade crossings, and maintenance of pavement markings and delineators.
- **Maintaining a Clear Path** - This includes on-street bicycle facility debris, off-street bicycle facility debris, snow and ice, and vegetation.
- **Traffic Signal Operations** - This includes recommendations for pre-timed traffic signals and actuated traffic signals.
- **Street Construction** - This includes recommendations for bike-friendly temporary traffic control.

Speed Limits

Along with traffic volume, traffic speed is one of the key factors that affects the level of traffic stress for people on bikes. Where there are local streets with posted speed limits above 25 miles per hour that are also identified as routes on the Recommended Network, the Bicycle Master Plan recommends reductions of posted speeds to 25 miles per hour. Speed reductions are a simple and low cost way to increase comfort and safety on bike routes without requiring any changes to public infrastructure or adjacent properties. Streets recommended for speed limit reduction include:

- Vernon Street
- Linn Street
- Bedford Avenue
- 10th Avenue

Education and Programming

Successful implementation of North Kansas City’s Bicycle Master Plan requires addressing all the barriers that discourage people who are interested from choosing to bike. While the availability of safe and comfortable infrastructure is critical to encourage ridership, other programmatic elements are also essential to create a bicycle-friendly North Kansas City. Educational programming and events can teach people how to ride, provide access to bikes for those who cannot afford them, provide incentives for individuals and employers to encourage biking, and generally grow a supportive culture of biking in the community.