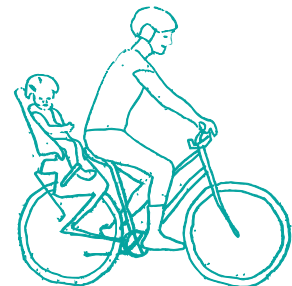
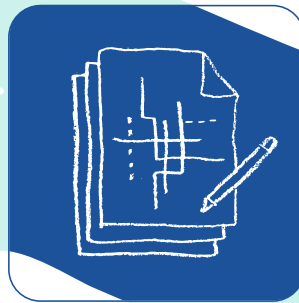
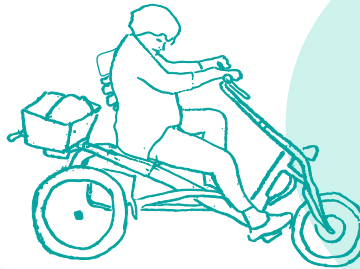


Urban Bikeway Design Guide  
**WORKING PAPER**



# Complete Connections

Building Equitable Bike Networks | March 2023

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## Updating the *Urban Bikeway Design Guide*

*Complete Connections: Building Equitable Bike Networks* is one of seven Working Papers being released by NACTO in 2022 and 2023 as part of the ongoing update to the NACTO *Urban Bikeway Design Guide*. The working papers will cover topics related to equitable planning, engagement, and implementation. The papers will help inform project delivery concerns and policy considerations that should accompany the design updates in the guide. NACTO will develop a complete update to the *Urban Bikeway Design Guide* in 2023 by synthesizing these working papers with state-of-the-practice design guidance.



**Making Bikes Count:**  
Effective Data Collection,  
Metrics, & Storytelling

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**Breaking the Cycle:**  
Reevaluating the Laws that  
Prevent Safe & Inclusive Biking

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**Shared Micromobility**  
Permitting, Process,  
and Participation

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**Moving Together:** Collaborating  
with Communities for More  
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**Designing for Small**  
Things With Wheels

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**Material Success:**  
Designing Durable  
Bikeways

MARCH 2023



**Complete Connections:**  
*Building Equitable Bike Networks*

THIS PDF IS →

## Introduction: A good bike network is an equitable one

**To be good, a bike network must be equitably planned, designed, prioritized, and implemented.**

Successful, effective networks are fundamentally equitable ones. In building *All Ages & Abilities* bike networks, practitioners must strive to connect riders of all ages, abilities, and backgrounds to a variety of destinations throughout the city—whether for work, school, or leisure. This equity-focused approach is what grows ridership broadly and helps biking infrastructure play a role in meeting today’s safety and sustainability challenges.

All too often, however, network expansion efforts miss disenfranchised communities, in both planning and implementation. As a result, cities find themselves with incomplete networks that serve some neighborhoods well and others not at all or leave major holes at key junctures that limit where people can safely go. Or, cities find that they have equitable networks on paper, capable of ensuring riders of all ages and abilities can ride safely, but implementation timelines

are not sequenced in ways that address city goals for ridership.

**To build good bike networks, an equity lens must be taken with all aspects of project development, not just engagement.**

To build bike networks that meet the needs of riders of all ages and abilities, and help cities reach their ridership, mobility, and sustainability goals, planners must center equity in their network development practice.

In most North American cities, equity is an increasingly common focus within community engagement phases of project development, and engagement itself is becoming more robust as practitioners recognize that community collaboration is critical

to good project design and long-term sustainability. But to build good bike networks, an equity lens must be taken with all aspects of project development, not just engagement. Historically disenfranchised communities should play a collaborative role in the planning phase for the entire network; community feedback and other forms of data should inform the prioritization process to help determine which projects are built first; and cities should be prepared to return to previously-built components of the network and revise them if they’re not working for the community.

Developing or expanding a bike network will always be incremental. Complete, equitable networks don’t spring up overnight. Instead, cities must pivot planning and development practices from a focus on equal coverage across cities to equitable, meaningful implementation based on the needs of each community as well as the city as a whole.



CAMBRIDGE

Photo: Petru Sofio

### Center Marginalized Communities to Address Inequities

For many decades, transportation policy, planning, and practice have deprived and disenfranchised marginalized groups from investments that would improve mobility, opportunity, and wealth. Highway construction, disparate investment in streets and sidewalks, and underfunding of transit has been used in nearly every U.S. city to destroy Black wealth or to deny the opportunity for people of color to build wealth through homes and businesses. Similar patterns apply to Indigenous or First Nations communities in both the U.S. and Canada. Marginalized groups differ from one city to the next, but, due to this documented history of explicitly racist policies and actions, all cities should consider race and ethnicity—particularly Black, Indigenous, Latine/x populations, and immigrant populations, among other marginalized communities—in identifying underserved and disconnected neighborhoods that warrant special focus.



## Guiding Principles

To implement an equitable bike network, practitioners need to proactively incorporate equity at every stage of planning, project development, and implementation. These principles function as a desk reference to guide equitable decision making throughout bike network planning and project development.

### Center purpose in every phase

- ⇒ **Define transportation equity and how biking fits into stated goals.** Establish biking as part of an equitable multimodal system. Identify synergies across modes, and make geographic and programmatic connections between them.
- ⇒ **Build a framework that connects both planning and implementation to goals.** Demonstrate how connecting people to and within neighborhoods supports broader goals, from economic activity and recovery to healthy environments and sustainability.

### Networks should meet goals and needs, not just existing demand

- ⇒ **Use both qualitative and quantitative tools.** Combine quantitative data and trends with historical context and community knowledge. Center equity by acknowledging any biases in data collection, analysis, or presentation, so that partners and stakeholders can help identify or even mitigate issues.
- ⇒ **Plan connections, not facilities.** Focus on making critical connections or improving unsafe corridors, not on dictating facility types, across the city. Consider facility type alternatives during project development by analyzing data and collaborating with communities to determine the most appropriate alignment and facility type.
- ⇒ **Support potential bike demand.** Implement the bike network in areas with high potential bike demand based factors like land use, density, and vehicle access. Only investing in areas with lots of biking can bolster ridership in those specific areas but will leave out other neighborhoods, almost certainly creating inequitable conditions.

**Focus on making critical connections or improving unsafe corridors, not on dictating facility types, across the city.**

## Cultivate a supportive environment

- ⇒ **Create a project list and prioritization process that you can commit to.** Seek buy-in on locations, metrics, and process, so that as resources become available and partners change, you can still advance projects that matter. The citywide bike plan must show agency partners, elected officials, and stakeholders how projects relate to goals.
- ⇒ **Collaborate with communities to improve projects and build stewardship.** Focus on strengthening trust and understanding project by project. Each success demonstrates program effectiveness, and each interaction builds toward lasting relationships.
- ⇒ **Design a communications plan to answer questions before they are asked.** Include a communications plan that centers transparency and documents decision-making at every stage of planning, prioritization, and implementation. A strong communications plan will cultivate a supportive environment for advancing future projects in the program.

## Networks are not built in a day

- ⇒ **Anticipate shifts and changes as the network expands.** Be transparent about changes in cost estimates, staff capacity, budget resources, political shifts, and other changes to the project or project schedule.
- ⇒ **Make the most of opportunities, using clear guidelines.** Work within and across agencies or divisions, with developers and property owners, and other partners to incorporate bikeway elements into any substantial road work along a priority biking corridor. Note synergies across projects to amplify benefits or reduce disruption and cost.





## Seek collaboration over input or involvement

- ⇒ **Work with communities to redesign safer streets.** Approach each collaboration with a desire to share project information and conditions while learning concerns and nuanced details, so that you can improve the project type, design, or timing, while addressing or mitigating stakeholder concerns.
- ⇒ **Don't avoid building complex or controversial projects especially in marginalized communities.** Anticipate creative, nuanced solutions to opposition focused on coalition, education, and collaboration. (See Addressing Opposition from Different Communities Requires a Nuanced Approach on page 12 in the companion working paper: *Moving Together: Collaborating with Communities for More Equitable Outcomes*). Advancing small, simple projects alongside large, complex ones will build advocacy and flexibility as the program shows efficacy and progress.
- ⇒ **Listen to and respect all stakeholders and consider all comments thoughtfully.** Seek understanding and acceptance where agreement seems unattainable. When a suggestion is not practical, clearly state the reasons. Know the history of the project area to better understand the context for concerns and comments. If a stakeholder or community has a bad relationship with the city, respect the history and invest in relationship building.

## Get started, monitor & adjust, do better each time

- ⇒ **Address safety needs and expect incremental progress.** If a project becomes politically infeasible or the city's bike network goals compete with a stakeholder's priorities, remain committed to the buildout of the bike plan even if the full scope is not possible in the short term. If a project needs to be rescoped, focus on improving safety.
- ⇒ **Evaluate progress towards goals through an iterative process.** Be wary of amplifying the status quo, and redirect programs before small mistakes grow into major headaches.
- ⇒ **Accept credit for accomplishments and accountability for missteps.** Evaluation processes might be understated, but many cities are already making adjustments based on annual reporting or analysis. Share details to foster relationships based on trust.

**If a stakeholder or community has a bad relationship with the city, respect the history and invest in relationship building.**

## Planning a citywide bike network

**A good bike plan is not solely a collection of projects, but a decision to engage in a cultural shift that prioritizes safe biking for all.** The bike plan needs to be part of the city's broader goals for equitable, sustainable access to neighborhoods. Equitable transportation networks are multimodal networks that provide safe and reliable infrastructure for people across the city to connect to destinations and hubs without needing to rely on a personal car. An equitable bike network must be designed to serve everyone, addressing safety and access to activities and destinations throughout the city by centering need—not just today's demand.

### What's in a bike plan?

To support equitable bike network implementation, bike plans typically include some variation of each of the following parts:

**Part 1: Policies, goals, and an equity framework.** Establish goals for the bike program that support the citywide transportation and equity vision. Be specific about why the bike program needs to be part of the citywide or department-wide equity framework and how the bike plan will support a more equitable transportation network.

**Part 2: Where and why are people biking and not biking.** Analyze the current biking environment and ask people—especially people representing marginalized groups—why biking for transportation is important. Collaborate with communities to understand how the bike plan can support multimodal transportation equity needs and then refine the goals in part 1.

**Part 3: Planned projects, programs, and policies.** Build a bike program based on a planned citywide network, programmatic priorities, and supportive policy needs. Demonstrate how the bike program supports the citywide transportation and equity goals.

**Part 4: Identify a high level implementation strategy.** This strategy should identify reliable funding opportunities; establish a framework and goals for equitable prioritization that reflects the community goals; and commit to program evaluation in annual or biannual progress reports.

Equitable bike networks need to be comfortable for people of all ages, abilities, and backgrounds. Cities must commit to implementing a bike network that meets an All Ages & Abilities standard. Some cities make this commitment within the bike plan while others underscore this commitment by referencing stand alone documents, like design guides or project development frameworks, that establish All Ages & Abilities standards.

## Plan connections, not facilities

To allow for equitable implementation, the citywide bike plan needs to cover and connect every part of the city. Not every bikeway will have the same purpose within the network. A citywide bike plan that fully connects people and neighborhoods will include investment in principal routes, neighborhood routes, and spot improvements for both safety and connectivity.

**Principal routes** are connections between multiple neighborhoods and facilitate longer bike trips such as commutes. They often cross barriers such as rivers or highways, typically connect to major destination clusters, and are as direct as is practical without sacrificing comfort, legibility, or bike priority. Principal routes will be the busiest routes in the bike network and should include space for passing and be navigable by children, visitors to the city, and people using longer or wider bikes than typical.

**Neighborhood routes** serve trips across one or two neighborhoods, and connect to principal routes. In addition to serving commuters, neighborhood routes are useful for daily life: shopping, access to schools, parks, social life, transit stops, and local services. Neighborhood routes often have alternative routing options and collaborating with the community can help identify the best street for the connection, even if it differs from what is shown on the citywide plan.

**Intersection and spot improvements** address critical connections or known problems that exist in the current network. Many cities have incomplete bike networks and often there are specific intersections or links that prevent comfortable use of an otherwise acceptable route—or locations where safety concerns have been documented or longstanding. Listing these connections establishes these safety needs as projects.

Plan the function of each route and commit to meeting All Ages & Abilities standards before specifying facility types or alignments. While cities can and should consult residents in individual neighborhoods about how a network should serve that community conceptually, this step is not about making design decisions, and engagement at the plan level does not replace engagement at a project level.

A key output of the citywide bike plan is a list or map of planned citywide projects that meet an All Ages & Abilities standard and represent biking connections that can be equitably prioritized for implementation. Make sure that residents, businesses, agency partners, elected officials and stakeholders understand that the bike network is a citywide priority that will connect *all* neighborhoods.

The Réseau express vélo or REV in Montreal is a planned All Ages and Abilities network of principal routes. This citywide bike network prioritizes comfort and safety by separating users, providing sufficient width for passing, and including signage and path markings to provide cohesive wayfinding.



New York City Department of Transportation (NYCDOT) identified conceptual alignments for principal routes (protected bike lanes and greenway network) and neighborhood nodes to indicate connections to neighborhood routes without determining specific alignment.

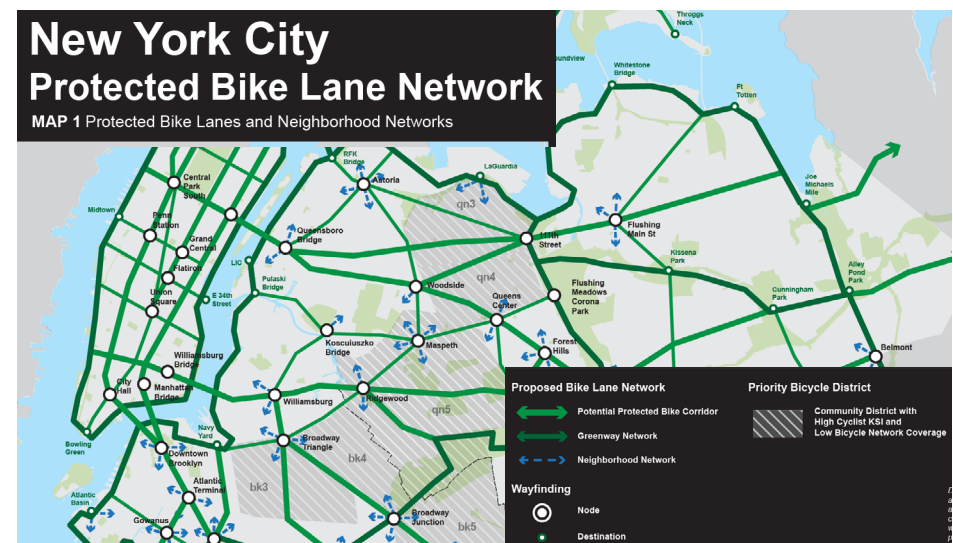






Photo: City of Denver

## Choosing a prioritization approach

**A successful bike plan includes both a list of citywide projects and a transparent framework for advancing projects equitably.** Without intentional prioritization, cities often advance projects based on ease of implementation, one-off requests, or pressure to build a little in each neighborhood—resulting in disconnected bike networks that serve nobody well. Need is not equally spread across the city and equitable implementation will not result in an equal amount of projects built or dollars spent in every district. Agencies should advance projects according to safety and connectivity goals, while also prioritizing projects for communities that have experienced past and ongoing disinvestment.

A strong framework for equitably prioritizing bike projects helps program staff clearly explain project prioritization decisions that deliver a safe, sustainable, and equitable bike network. Analyzing metrics to prioritize and compare projects creates a more objective and justifiable approach to prioritization, especially when community partners are included in developing metrics.

This section introduces two compatible approaches for applying quantitative metrics to compare projects:



### **Neighborhood-based approach**

Identify priority neighborhoods for coordinated implementation of multiple routes in a single neighborhood to create a well-connected bike network



### **Project-based approach**

Identify citywide priority projects based on scoring and comparing projects according to a set of metrics

When used together, these approaches support a balanced approach to equitable bike network expansion. Identifying priority projects through either quantitative approach should be paired with a qualitative analysis to balance project cost, complexity, and other considerations to create a right-sized action plan (see [Right-sizing an action plan](#), on page 19).



## Neighborhood-based approach

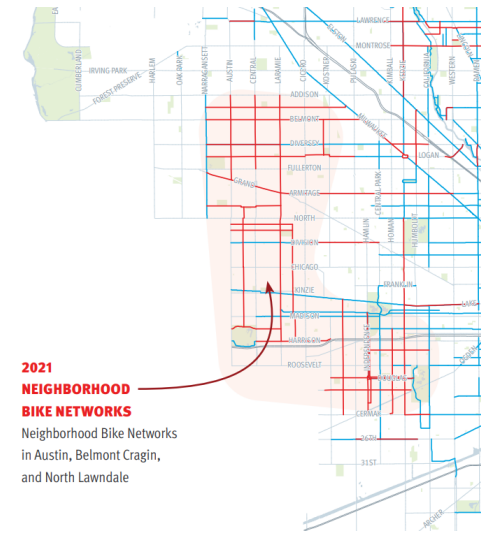
The neighborhood-based approach prioritizes marginalized communities with high potential bike demand for a complete network build-out. City staff analyze metrics to identify priority neighborhoods and commit to implementing multiple routes in each neighborhood as a set of concurrent or sequential projects. Focusing on multiple routes within a single neighborhood makes biking an option for more local trips and allows staff to work closely with people in the neighborhood to co-define what a complete bike network means at a neighborhood level. This type of prioritization allows cities to build stronger relationships by collaborating on multiple projects, rather than short or shallow relationships based on discrete projects every few years or longer. Because of the focus on network connectivity and relationship building, equitable neighborhood-based approaches prioritize marginalized communities with lots of potential for bikeable trips.

Once priority neighborhoods are identified, select the planned projects from each neighborhood to be considered for a short-term action plan. Projects need to include approximate scopes and budgets but project specifics should be co-designed with each community after right-sizing an action plan.

### Using prioritization metrics

Consider the following principles when conducting quantitative metric based prioritization.

- ⇒ **Collaborate with stakeholders to select metrics that fit your city well and are simple to update over time.** Using multiple metrics to compare projects can be more or less complex but always requires strong documentation at each step to ensure reproducibility.
- ⇒ **Use density metrics for better comparisons.** Comparing percentages fails to consider the total number of people in each geographic unit (i.e. the number of people impacted). Calculating population or housing density (i.e. total population in a geographic unit divided by the area of the geographic unit) allows for comparison that more transparently considers the population.
- ⇒ **Share methodology and rationale for prioritizing projects, and incorporate input.** Even when analysis is complex, the methodology needs to be shared in a way that makes sense to a broad audience. Clearly describe the principles, decision-making processes, and any related constraints. Develop and share program phasing and be transparent about schedule risks. Update the methodology and revise any qualitative considerations based on community and stakeholder feedback.

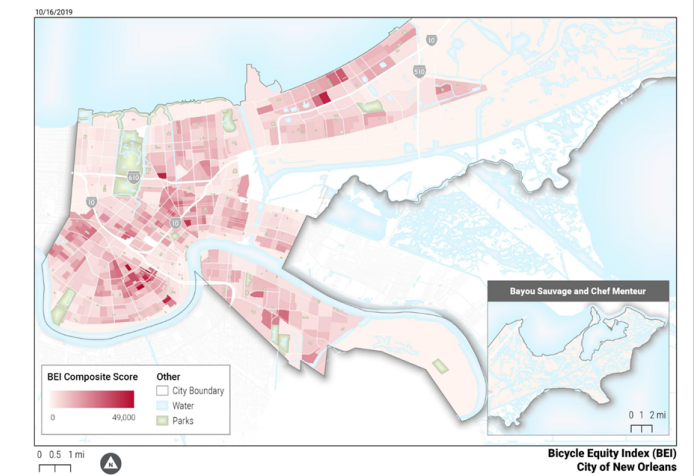


## Chicago adapts the neighborhood-based approach

The City of Chicago Department of Transportation (CDOT) applied a neighborhood-based approach to identify areas to implement a Neighborhood Bike Network. CDOT then worked collaboratively with communities to define the quick-build network priorities and Neighborhood Bike Network goals. After constructing the quick-build network, CDOT remains involved with the community, working to advance long-term projects in the neighborhood.

## New Orleans adapts the neighborhood-based approach

The City of New Orleans combined data-based prioritization methods and community engagement to create a successful implementation strategy. After mapping areas where investing in bikeways could benefit the highest number of transit dependent and historically-underserved people (metrics included density of: people under 18, people over 65, zero car households, people in poverty, and people of color), the City worked with local communities and community based organizations to get input on the process ahead of project development. Working with communities throughout the project prioritization process helped the city build relationships and established the bike network as a priority among a broad range of community based organizations working to make New Orleans more equitable.







## Project-based approach

The project-based approach uses one or more metrics to estimate how well individual projects address program goals. This approach uses metrics to identify priority projects based on potential bike demand, potential to improve bike safety, and connectivity improvements. Metrics for this approach should be easily quantifiable and informed by community collaboration, with a clear explanation of how these metrics show project benefits or support decision-making.

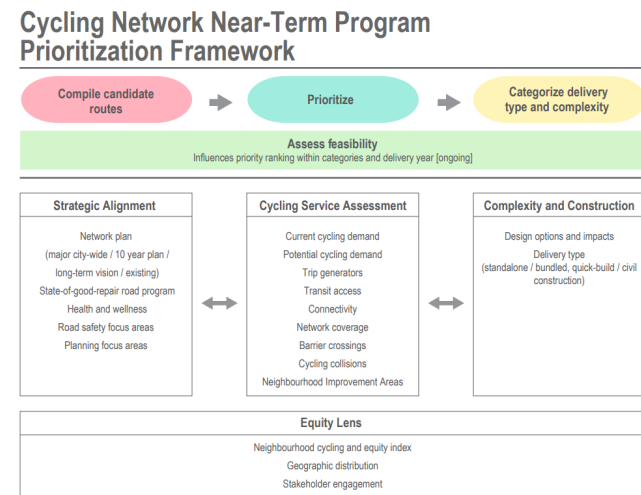
Using multiple metrics to develop a single, composite score can simplify calculations and make it easier to communicate a single list of prioritized projects; however, it also obscures the impacts of individual metrics. When creating a composite score, report the scores for each individual goal alongside the composite score to create a more transparent decision-making process.

Publicly communicate the purpose, method, and outcomes of the prioritization process along with next steps for implementation. If there are existing projects that don't seem to match priorities, update details, noting how priorities or conditions have changed. Once priority projects are identified, conduct qualitative analysis to develop a right-sized action plan.

### Toronto adapts the project-based approach

The City of Toronto created an assessment to quantitatively compare projects. The Cycling Service Assessment is a project-based approach that compares projects based on a nine-metric composite score. Before a project is programmed for implementation, the city conducts further analysis and engagement to confirm the preferred route and assess feasibility. This qualitative assessment includes an analysis of strategic alignment and project complexity.

The City of Toronto applies an equity lens at every decision point evaluating the geographic distribution of projects, conducting stakeholder engagement, and calculating the neighborhood cycling and equity index.



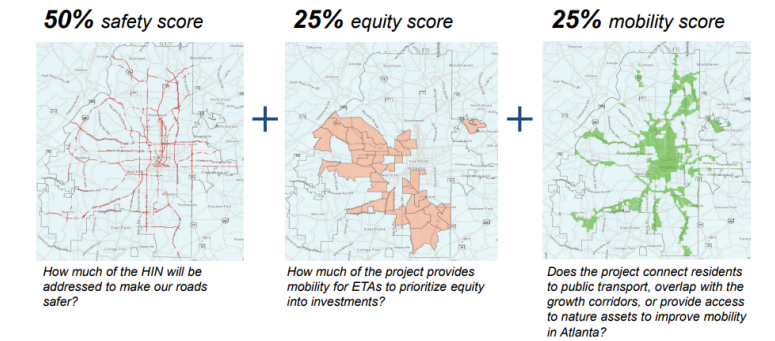
### Atlanta adapts the project-based approach

To compare complete street projects, the City of Atlanta created a single composite score composed of safety, equity, and mobility metrics. The city shared the methodology, the individual scores for safety, equity, and mobility, as well as the total score for each project.

After conducting the project-based prioritization process, the city worked with communities to collaborate on how to interpret the scores and reviewed qualitative factors to determine the final prioritized project list.

With this new prioritized framework, the city was able to focus resources on the new prioritized projects and rebalance the 2016-TSPLOST and Bond program financing. A similar safety, equity, and mobility framework prioritized projects for the 2022-voter approved TSPLOST and Bond program.

#### COMPLETE STREET ANALYSIS EXAMPLE: Each project was scored and mapped to inform prioritization decisions





## CAMBRIDGE



Photo: Petru Sofio

## Right-sizing an action plan

The action plan is a list of funded projects with approximate timelines and general scopes of work that is updated every 2-5 years based on funding and capacity to implement. Whereas the citywide bike plan can be aspirational, the action plan needs to be right-sized based on available funding, staff capacity, and procurement timelines. To right-size an action plan, consider project budgets and complexity, staff capacity, politicized priorities, and other opportunities to collaborate. A successful action plan is aggressive but achievable.

### Acknowledge capacity and balance complex projects with smaller efforts

Project complexity should include ease of implementation, extent of traffic analysis required, and level of engagement and relationship building expected. Complex or controversial projects often require more time or budget to sort through, whether that's finding the right solution, the right approach, or simply assembling resources across agencies or budget lines. City programs cannot advance too many projects at once. Include both more and less complex projects in the action plan to allow short-term wins while also advancing more complicated projects.

### Evaluate politicized priorities

Known political priorities will not necessarily be added to the action plan, but they need to be considered and analyzed alongside other projects. Be sure to include the project prioritization results for any political priorities, explaining the prioritization methodology, how the prioritization framework reflects citywide goals, and how those goals may differ from any political pressures.

Photo: City of Minneapolis  
Public Works Department





### Take advantage of opportunities for collaboration—when they make sense

Add projects that make sense based on other investments. The largest and most common opportunities for collaboration come from linear roadway work like resurfacings and roadway reconstructions, but collaborating with private developers can create opportunities to upgrade sections of existing bikeways or reserve space for future efforts. Before moving forward with an opportunity, conduct a feasibility evaluation to understand if the project is likely to be successful:

- ⇒ **Review contracts and funding mechanisms.** Bikeway projects may require different materials (e.g. bike lane pavement markings, signs, flexible delineators, etc.) or additional funding than a traditional paving project. Find additional funding sources and update contracts as needed to accommodate bikeway implementation.
- ⇒ **Make time for deeper community engagement.** Resurfacing schedules do not include time for collaborative engagement. Identify opportunities early and adjust the schedule and expectations internally, with implementation crews, and with communities to accommodate bikeway planning and design tasks.
- ⇒ **Understand internal staff capacity and focus effort on the best opportunities.** These opportunities still require planning, engagement, engineering, and design. If capacity is the limiting factor, apply staff judgment and first take advantage of opportunities that are unlikely to be recreated.

The Oakland Department of Transportation (OakDOT) leverages investments in paving to implement and upgrade bikeway projects. In 2019, OakDOT adopted a 3-year paving plan using equity, street condition and safety metrics to prioritize projects. With a department wide focus on equity and safety, the goals of the paving program support equitable implementation of the bike plan. The paving plan proactively identifies opportunities to implement bikeway infrastructure and other safety improvements. The department distributes funding across program areas to implement these safety and bikeway improvements as part of the paving project.

### Allocate additional funding for projects in marginalized areas

When conducting cost estimates, for priority projects in neighborhoods that have a history of disinvestment, redlining, or neglect by public agencies, assume additional budget will be needed to address pedestrian safety and general maintenance needs. Don't let these associated costs hinder bike network expansion in areas with a history of disinvestment; instead be sure to find funding for other safety and maintenance improvements during the early stages of the project. Equitable project implementation requires addressing critical safety issues and meeting long standing needs. Addressing related transportation needs builds trust and stewardship as projects advance.

Cities and states have a specific history of disinvesting in Black, Latine/x, Indigenous, immigrant and other marginalized communities. Displacement is a concern to be addressed, but avoiding needed investment only perpetuates past harm. Focus on safety and connection as the goals, rather than proposing specific facility types, and build a practice of collaborative design. Creating the conditions for citywide biking includes street resurfacing, speed limit reductions, sidewalk replacement or infill, transit service connections, neighborhood lighting and landscaping, and much more. These improvements help address longstanding disinvestment while also improving safety for all modes including people biking. Don't shy away from much needed improvements, instead, lead with transparency, make time to rebuild trust, and listen to new information or ideas that might address concerns.

### Communicate how and why projects are and aren't selected.

Share the methods used for prioritizing projects, the decision-making process, and any other constraints with agency and community stakeholders. Ask for feedback and minimize the potential for unexpected pushback from elected officials and other stakeholders. See Addressing Opposition from Different Communities Requires a Nuanced Approach on page 12 in the companion working paper: *Moving Together: Collaborating with Communities for More Equitable Outcomes.*

Transparency about decision-making, roles, and timelines can build trust; sharing a multi-year implementation strategy can manage fears that projects will languish over time. Refer back to the citywide bike plan and emphasize the city's commitment to complete the plan so communities not included in this phase of work will know when they'll see investment.

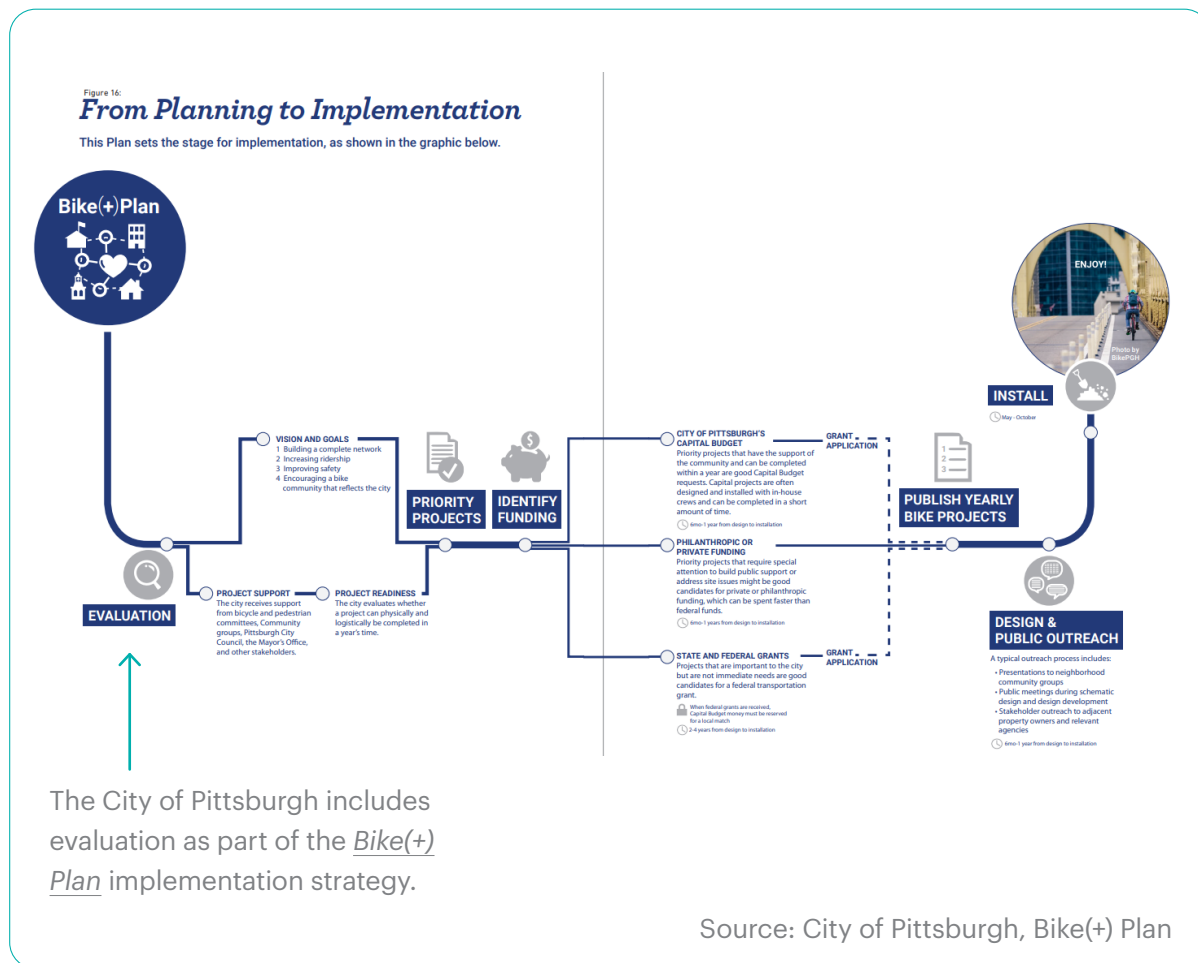






## Evaluating and adjusting for progress

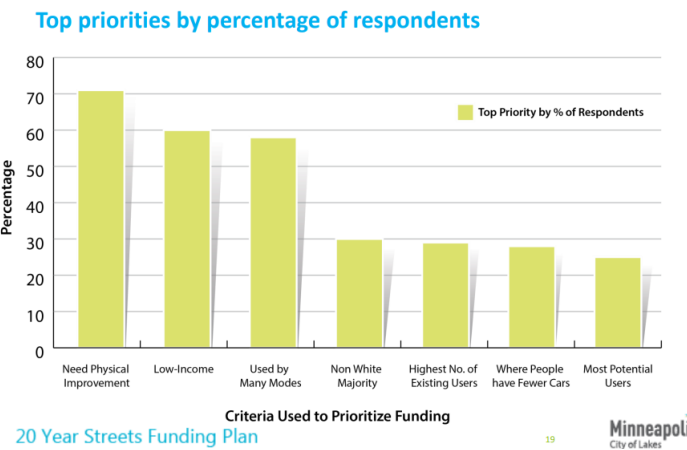
Sharing project and program evaluation can lead to improved outcomes and deeper stewardship. Develop a robust, clear communications plan that includes annual or biannual progress reports on implementation to provide updates to communities, track performance, publicly acknowledge any challenges, and celebrate successes. Present reports publicly to stakeholders to create opportunities for focused feedback on the implementation strategy.



## Adjust process based on feedback

Project prioritization frameworks can be adjusted to better align with community values. The City of Minneapolis conducted a large-scale engagement effort during the development of the capital improvement plan to create a project prioritization framework that directly reflected community priorities. For smaller bike program efforts, a citywide engagement effort may be out of reach, but collecting input from stakeholders can help inform future action plan development.

## Incorporating new data



## Keep building to demonstrate commitment

As projects are delivered, evaluate progress on city goals and make improvements to the process. These adjustments can improve equitable outcomes and prevent small oversights from adding up and intensifying over time to result in unfavorable and inequitable outcomes.

After making adjustments, convey those adjustments to communities and stakeholders and keep implementing. Making measurable progress on completing a citywide bike network requires an equitable, incremental approach. Cities need to make progress in addressing these long standing inequities, but there is no single set of projects to prioritize that will immediately achieve equity. Instead, cities need to set equitable goals (like building a citywide bike network), build frameworks for equitable decision making (like project prioritization), monitor progress, acknowledge mistakes, and adjust the process to better address equitable goals.

In addition to equitable project prioritization, implementing an equitable bike network requires dedicated political support to allocate funding and resources for continued implementation, equitable project development, and collaborative engagement. With a programmatic investment in equitably expanding the bike network, cities will make measurable progress on equitable climate, safety, and mobility goals. After making significant progress in implementing a bike plan, cities will need to next develop a version of the bike plan to re-evaluate equitable network needs and to extend the network.

## References

### City Bike Plans

- City of Boston. “Everyone Deserves Safer Streets.” September 6, 2022. <https://storymaps.arcgis.com/stories/a90bff933db94496b6c4214caf17c706>
- City of Houston. “Houston Bike Plan.” 2022. <https://houstonbikeplan.org/>
- City of Oakland. “Let’s Bike Oakland: 2019 Oakland Bike Plan.” 2019. <https://www.oaklandca.gov/resources/bicycle-plan>
- City of Pittsburgh. “Bike (+) Plan.” 2020. <https://pittsburghpa.gov/domi/bikeplan>
- City of Montréal. “The REV : An Express Bike Network.” June 2, 2022. <https://montreal.ca/en/articles/rev-express-bike-network-4666>
- City of New Orleans. “Moving New Orleans: Bikes.” 2019. <https://nola.gov/transportation/moving-new-orleans-bikes/>
- City of Toronto. “Cycling Network Plan.” City of Toronto, 2019. <https://www.toronto.ca/services-payments/streets-parking-transportation/cycling-in-toronto/cycling-pedestrian-projects/cycling-network-plan/>
- Chicago Department of Transportation. “Chicago Community Cycling Network Update.” City of Chicago. September 2021. [https://www.chicago.gov/content/dam/city/depts/cdot/bike/2021/Chicago%20Community%20Cycling\\_2021-09-21.pdf](https://www.chicago.gov/content/dam/city/depts/cdot/bike/2021/Chicago%20Community%20Cycling_2021-09-21.pdf)
- New York City Department of Transportation. “Green Wave: A Plan for Cycling in New York City.” July 2019. <https://www1.nyc.gov/html/dot/downloads/pdf/bike-safety-plan.pdf>

### Other City Resources

- City of Atlanta. Renew Atlanta Bond/TSPLOST Program. City Council Transportation Committee Update. February 2019. <https://citycouncil.atlantaga.gov/home/showpublisheddocument/1563/636856541978030000>
- City of Edmonton. “Crash and Equity Analyses Technical Report: Safe Mobility Strategy 2021-2025.” 2020. [https://www.edmonton.ca/sites/default/files/public-files/assets/SMS\\_Crash-Equity-Technical-Analysis.pdf](https://www.edmonton.ca/sites/default/files/public-files/assets/SMS_Crash-Equity-Technical-Analysis.pdf)
- City of Kirkland. “Active Transportation Plan Update.” City of Kirkland, Department of Public Works, March 19, 2021 [https://www.kirklandwa.gov/files/sharedassets/public/boards-and-commissions/transportation-commission/2021/03\\_march-24-meeting/active-transportation-plan-update.pdf](https://www.kirklandwa.gov/files/sharedassets/public/boards-and-commissions/transportation-commission/2021/03_march-24-meeting/active-transportation-plan-update.pdf)

City of Minneapolis. “20 Year Streets Funding Plan: Prioritizing Projects with the Most Impact in Minneapolis”. Presentation at NACTO Designing Cities Conference, Los Angeles. October 3, 2018. <https://nacto.org/wp-content/uploads/2018/08/Minneapolis-20-Year-Streets-Funding-Plan.pdf>

City of Oakland. “2019 Paving Plan.” Oakland Department of Transportation. <https://www.oaklandca.gov/topics/paving>

### Guidance

- Federal Highway Administration. “Bikeway Selection Guide.” U.S. Department of Transportation, Federal Highway Administration. U.S. Department of Transportation, February 2019. [https://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/docs/fhwas18077.pdf](https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwas18077.pdf)
- Massachusetts Department of Transportation. “Separated Bike Lane Planning & Design Guide.” Mass.gov, 2015. <https://www.mass.gov/lists/separated-bike-lane-planning-design-guide>
- National Association of City Transportation Officials. “Designing for All Ages & Abilities.” Urban Bikeway Design Guide. NACTO. 2nd ed.2014. <https://nacto.org/publication/urban-bikeway-design-guide/designing-ages-abilities-new>
- National Association of City Transportation Officials. “Don’t Give up at the Intersection: Designing All Ages and Abilities Bicycle Crossings.” May 23, 2019. <https://nacto.org/publication/dont-give-up-at-the-intersection>

### Research

- Cambridge Cycling Campaign, Robin Heydon, and Martin Lucas-Smith. “Making Space for Cycling: A Guide for New Developments and Street Renewals.” 2014. <https://www.makingspaceforcycling.org/MakingSpaceForCycling.pdf>.
- Central MeetBike. “Fact Sheet H-01 - Developing a Cycling Network and General Design Standards for Bicycle Infrastructure.” Sustainable Urban Transport Project, n.d. [https://tu-dresden.de/bu/verkehr/ivs/ressourcen/dateien/meetbike/dateien/meetbike\\_factsheets/h01\\_developing\\_cycling\\_network\\_and\\_general\\_design\\_standards](https://tu-dresden.de/bu/verkehr/ivs/ressourcen/dateien/meetbike/dateien/meetbike_factsheets/h01_developing_cycling_network_and_general_design_standards)
- Dufour, Dirk. “Presto Cycling Policy Guide: Cycling Infrastructure.” Presto-Cycling.eu. Intelligent Energy, February 2010. [https://bicycleinfrastructuremanuals.com/wp-content/uploads/2019/02/presto\\_policy\\_guide\\_cycling\\_infrastructure\\_en\\_European-Union.pdf](https://bicycleinfrastructuremanuals.com/wp-content/uploads/2019/02/presto_policy_guide_cycling_infrastructure_en_European-Union.pdf)
- Dill, Jennifer. “Measuring Network Connectivity for Bicycling and Walking.” Reconnecting America. Portland State University, School of Urban Studies and Planning, 2004. <http://reconnectingamerica.org/assets/Uploads/TRB2004-001550.pdf>



- Ezike, Richard, Peter Tatian, and Gabriella Velasco. "Defining 'Communities of Concern' in Transportation Planning: A Review of How Planners Identify Underserved Communities." Urban Institute. Washington, D.C.: Urban Institute, August 2020. [https://www.urban.org/sites/default/files/publication/102746/defining-communities-of-concern-in-transportation-planning\\_1.pdf](https://www.urban.org/sites/default/files/publication/102746/defining-communities-of-concern-in-transportation-planning_1.pdf)
- Furth, Peter. "Level of Traffic Stress." Northeastern University, 2017. <https://peterfurth.sites.northeastern.edu/2014/05/21/criteria-for-level-of-traffic-stress>
- Gallagher, Rob, and John Parkin. "Planning for Cycling." Ciht.org.uk. London: Chartered Institution of Highways and Transportation, October 2014. [https://www.ciht.org.uk/media/4461/ciht\\_-\\_planning\\_for\\_cycling\\_proof\\_v2\\_singles.pdf](https://www.ciht.org.uk/media/4461/ciht_-_planning_for_cycling_proof_v2_singles.pdf)
- Gualdi, Mario, and Pascal van den Noort. "Enabling Cycling Cities: Ingredients for Success." Civitas Mimosa, April 2013. <http://www.pas-port.info/charpters/CyclingCities.pdf>
- Herbert, Kiran. "New Orleans' Bicycle Equity Index." People for Bikes. November 10, 2021. <https://www.peopleforbikes.org/news/new-orleans-bicycle-equity-index>
- The League of American Bicyclists. "Benchmarking Bike Networks." Accessed June 9, 2022. <https://bikeleague.org/sites/default/files/Benchmarking-Bike-Networks-Report-final.pdf>
- National Association of City Transportation Officials. "Equitable Bike Share Means Building Better Places for People to Ride." July 2016. [https://nacto.org/wp-content/uploads/2016/07/NACTO\\_Equitable\\_Bikeshare\\_Means\\_Bike\\_Lanes.pdf](https://nacto.org/wp-content/uploads/2016/07/NACTO_Equitable_Bikeshare_Means_Bike_Lanes.pdf)
- National Association of City Transportation Officials. "Making Bikes Count: Effective Data Collection, Metrics, & Storytelling." March 2020. [https://nacto.org/wp-content/uploads/2022/03/Making\\_Bikes\\_Count\\_FINAL\\_March31-2022.pdf](https://nacto.org/wp-content/uploads/2022/03/Making_Bikes_Count_FINAL_March31-2022.pdf)
- People for Bikes. "People For Bikes Bicycle Network Analysis." 2022. <https://bna.peopleforbikes.org>
- Sandt, Laura, Tabitha Combs, and Jesse Cohn. "White Paper Series: Pursuing Equity in Pedestrian and Bicycle Planning." Pedestrian and Bicycle Information Center, March 2016. [https://www.pedbikeinfo.org/cms/downloads/PBIC\\_WhitePaper\\_Equity.pdf](https://www.pedbikeinfo.org/cms/downloads/PBIC_WhitePaper_Equity.pdf)
- Thompson, Cipriana, Kristof Devastey, Andy Clarke, and Lindsay Welsch Sveen. "Engineering for Equity: Asking the Right Questions." *Ite Journal*, April 2022, pp. 26-29. <https://ite.ygsclibook.com/pubs/itejournal/2022/april-2022/live/index.html>
- Toole Design. "Ensuring an Equitable Approach to Rebalancing Streets: 14 Strategies to Manage Change with Ethics, Equity, and Empathy." February 2021. <https://tooledesign.com/wp-content/uploads/2021/02/Ensuring-an-Equitable-Approach-to-Rebalancing-Streets.pdf>
- U.S. Department of Transportation. "Promoting Connectivity." August 24, 2015. <https://www.transportation.gov/mission/health/promoting-connectivity>