FROM POLICY TO PRACTICE

A Guide to Measuring Complete Streets Progress

Smart Growth America
Improving lives by improving communities

Who we are

Smart Growth America envisions a country where no matter where you live, or who you are, you can enjoy living in a place that is healthy, prosperous, and resilient. We empower communities through technical assistance, advocacy, and thought leadership to realize our vision of livable places, healthy people, and shared prosperity. Learn more at www.smartgrowthamerica.org.

The National Complete Streets Coalition, a program of Smart Growth America, is a non-profit, non-partisan alliance of public interest organizations and transportation professionals committed to the development and implementation of Complete Streets policies and practices. A nationwide movement launched by the Coalition in 2004, Complete Streets is the integration of people and place in the planning, design, construction, operation, and maintenance of transportation networks. Learn more at www.completestreets.org.

Project Team

Acknowledgments

Cover Image: Workers striping new bike lane in Waterbury, Connecticut

Letter from Beth Osborne

Director, Transportation for America

Smart Growth America often gets asked: How will my community benefit if we pass and implement a strong Complete Streets policy? These are fair questions to ask. As communities undertake an effort to replace decades of the status quo approach to embrace a new way of doing things, they need to show how that tough work is paying off in terms of improvements to health, safety, economic strength, and equitable access to opportunity.

So often, we point to the macro benefits of Complete Streets, whether it's reducing traffic fatalities, addressing health disparities, increasing physical activity, strengthening economic resilience, or tackling the increasing challenges of climate change. But this does not get at the heart of the specific question above, which is about the benefits of a specific community's Complete Streets approach.

This report attempts to answer that question and help a community determine ways to monitor the impacts of a Complete Streets approach as the policy is implemented. To identify the practices, systems, and metrics for implementing a Complete Streets policy, we convened an advisory committee from partner organizations and hosted discussion groups with representatives from 14 communities with the best Complete Streets policies to learn more about **what happens after a Complete Streets policy is passed and how they measure whether or not it's having the right impact**.

We developed and intended this resource to serve as a practitioner's handbook, something to reference frequently. It can also be used as a guide for conversations about Complete Streets and what changes communities are seeing as a result of policy adoption. We hope that you will use this resource to define and demonstrate the impacts and benefits in your community of adopting and implementing a strong Complete Streets policy.

Beth Osborne

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About this report

This report examines what policy implementers and practitioners at a local agency (city, county, MPO staff or advocates/community partners) can measure to support Complete Streets policy implementation, discusses the end goal of these performance measures and provides guidance on how to choose the metric categories and measures that will support the community's vision and goals—while keeping staff and resource capacity in mind.
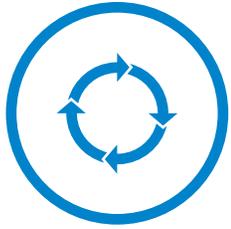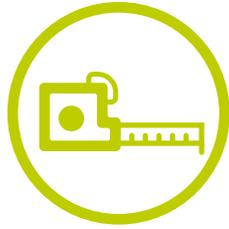
PROCESS   **IMPLEMENTATION**   **IMPACT**

We present a "menu" of 100+ measures under three main categories of metrics: Process, implementation and impact. These categories were created to reinforce that passing a Complete Streets policy is not the end but the beginning of a community's commitment to do all the work needed to make their streets safer for all transportation modes. We explain each of these three metric categories in detail and their importance in section II and provide a "menu" of measures applicable to each of the categories. Further, section III discusses some common questions to aid communities in being holistic in their data collection, data communication and recurring reporting practices alongside case studies from three communities. Finally, section IV highlights some ways that communities can leverage the data gathered to create feedback loops that can help improve their local systems and guides as well as regional, state and federal standards.

Methodology

The report followed these key stages as part of the methodology: Policy review, partner inputs and community discussion groups.

Smart Growth America used the research and analysis in our Best Complete Streets Policies report to provide a basis for the policy landscape in the U.S. which evaluates and reports on the standards of Complete Streets policies being passed across the country. To evaluate these policies, a 10 element Complete Streets Policy Framework is used. In order to develop this report, SGA staff conducted and extensive review of the top 30 high-scoring policies, specifically under Element #8 i.e. Measures Progress which were passed between 2018-2022.

The deep dive into the policies included looking closely at the specific measures adopted by these communities and sorting them under various metric categories such as funding, safety, access, network creation etc. to build the "menu" of measures discussed in Section II of the report. It should be noted that *this is not an exhaustive list,* and there may be other categories of metrics and specific measures that are suitable to your community's needs and challenges, which should be given equal weight when making decisions on what to track and report on.

In addition to the measures themselves, the policy framework emphasizes the importance of institutionalizing a process to measure and report the data. To understand how that translated for the 30 communities included in policy review, SGA staff also noted items about data collection, data reporting, disaggregation approach, report publication timelines etc. These are crucial pieces to make the data usable and valuable for communities that are further discussed in Section III of the report.

In order to get to the final list of measures included in this report, the SGA team convened an advisory committee from partner organizations to help refine the metric categories and the list of measures and hosted two open-ended discussion groups with representatives from 14 of the top 30 high-scoring policies for measuring progress to understand if these communities are measuring what they committed to in their policies and get insights on the implementation, value, challenges, and barriers to reporting experienced by them.

Note: SGA's past report, Evaluating Complete Streets Projects: A Guide for Practitioners, published in 2015, explored a topic similar to this report and is used as a reference by the authors of this report. While there is some overlap between the contents of the two reports, this report is not intended to be an update or next edition of that report.

Walkable Neighborhood

I. How do you know if your Complete Streets policy is working? Measure it.

Since the beginning of the Complete Streets movement in the early 2000s, Smart Growth America has tracked over 1,700 Complete Streets policies adopted in communities of all sizes and contexts across the United States. Adopting a Complete Streets policy is a crucial first step to reducing traffic fatalities and transportation barriers, improving health outcomes and equity, responding to the climate crisis, and rectifying a long history of inequitable transportation practices. The National Complete Streets Coalition evaluates and identifies the strongest policies through its Complete Streets Policy Framework. The framework has 10 key elements that require accountability to ensure that a policy produces tangible changes and prioritizes the needs of the most vulnerable users. The coalition scores new policies against that framework and identifies the strongest in the Best Complete Streets report (see the latest version here).

METRICS AND MEASURES

The terms "metrics" and "measures" are often used interchangeably, but for the purpose of the report, we use "metrics" to refer to the three main categories (Process, Implementation, Impact) as well as subcategories under them. The term "measures" is used to refer to the 100+ individual items in the menu, which are further discussed in Section II.

METRICS | **MEASURES**

PROCESS
IMPLEMENTATION
IMPACT

Quick Build Project in Wenatchee, Washington

ELEMENT 8.

The eighth element of a strong Complete Streets policy requires tracking performance measures across a range of categories—including internal processes, implementation and impacts—and holds someone responsible for doing the data collection and producing regular public reports. Measuring performance in transportation is not new. But historically, transportation measures have focused on motor vehicles in limited ways, using measures like vehicle speed, delay, and congestion. Adopting a strong Complete Streets policy represents a shift to a different approach, which means committing to new performance measures that reflect the policy's vision and motivation (Element #1). This includes identifying metrics and measures to track policy process, implementation, and impact while centering equity.

The jurisdictions with the strongest Complete Streets policies take four clear, concrete steps in their commitment to measuring progress:

- Establish specific performance measures across a range of categories, including implementation and equity
- Set a timeline for the recurring collection of performance measures
- Require performance measures to be publicly shared
- Assign responsibility for collecting and publicizing performance measures

Performance measures provide a quantitative and/or qualitative indicator of the performance of a specific street, corridor, or of the whole transportation network in a community. This information helps implementing partners better understand the impact of their Complete Streets policy and take corrective actions as needed.

It's not a one-size-fits-all approach

As far as the specific measures are concerned, it is important for a community to define what success and impact mean for them and choose the right measures accordingly. As a community embarks on this journey, it is important to keep several things in mind:

1. **Adopt performance measures that reflect your community's priorities**, and reflect the overall vision and motivations stated in the Complete Streets policy itself. Find ways to engage with diverse community members in the process.

2. **Measures should cover a wide range of categories**. We define three big metric categories (with sub-categories under each) in this report—process, implementation, and impact—and encourage communities to have measures from each category to ensure a holistic evaluation of the system internally (e.g., how things are done within agencies and departments) and the impacts on the transportation network externally.

3. **Equity is a cross-cutting principle**. Equity is not a single metric category or measure and should instead be embedded within all performance measures across each category. Measuring equity through things such as income, race/ethnicity, car ownership, etc. can help jurisdictions evaluate whether disparities are being exacerbated or mitigated.

4. **Scale matters**. Within the range of opportunities to align planning and design decisions, measures should be chosen thoughtfully and applied at different scales: an intersection → a street segment → a corridor (including multiple intersections and some intersecting street segments) → a regional network → and as part of a state or interstate system. It is important to apply the right performance measures for the scale of the decision.

Publicly available data is crucial for transparency, capacity building and accountability

1. **Publicly available performance measures can help ensure policies support the people they are designed for**. Providing the general public and champions with information they can use to hold their government accountable to the vision and priorities set out in the Complete Streets policy can help build capacity for the whole system.

2. **Regular reporting illustrates to the community that the policy is grounded in its true intentions of improving multimodal access, traffic safety, and supporting activity-friendly communities**. Sharing data and being transparent about the progress (or lack of it) of the policy helps the community build trust in the continued efforts undertaken by their government agencies and work together as partners in achieving the stated goals.

3. **Staff and committees tasked with implementing the policy are able to do their jobs better**. With more information on the current performance of the transportation network, staff are able to make more informed decisions on project design, planning, maintenance, and operations.

4. **Elected officials can better communicate with the public and build broader support for Complete Streets**. By tracking progress on the Complete Streets policy, elected officials and other policymakers have information that helps them better communicate the status of transportation improvements in their community. Information on the impact of transportation investments can also help elected officials build broader support for Complete Streets.

5. **Measuring data on a regular basis will show trends and efforts that can help secure grant funding**. Funding is often a challenge to maintain the momentum and implement projects, especially in smaller communities with limited resources. Finding a way to regularly publish performance measures that show ongoing efforts and impact can help communities apply for grant funding which will allow for more work to happen.

II. Measure the full circle: Process, implementation and impact
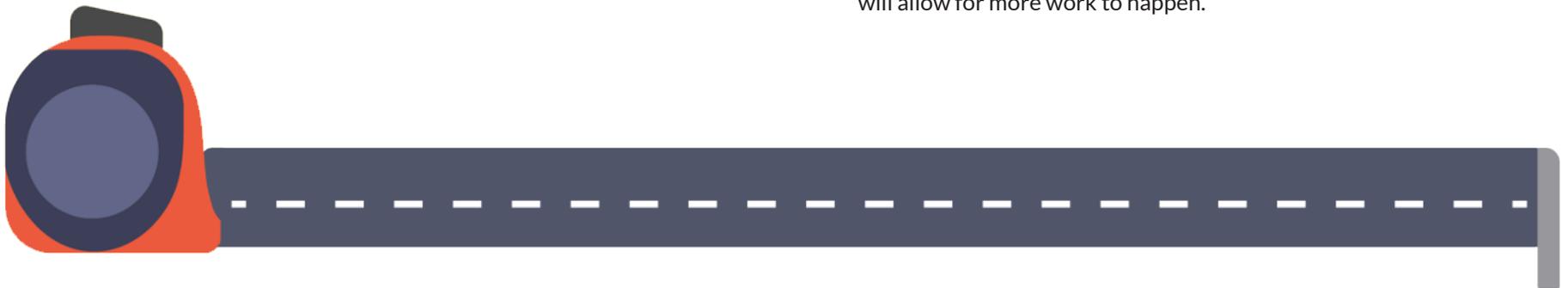
This report organizes measures into three main categories:
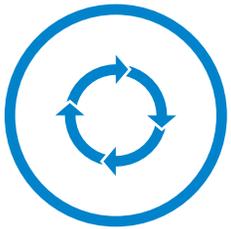
PROCESS

How are decisions made and capacity improved? These would include many internal agency measures such as complete streets funding mechanisms, who is involved and when, internal staff trainings conducted, etc.

IMPLEMENTATION

What actions are taken? These measures often involve tangible steps, including construction of new and maintenance of existing infrastructure such as miles of sidewalks and bike lanes, ADA ramps constructed and repaired, number of benches installed, etc.
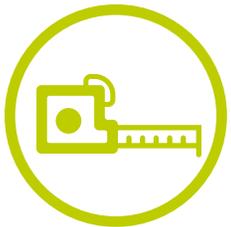
IMPACT

What are the short-term and long-term effects of the actions taken and/or the policy overall? These measures help identify what came about because of the policy such as changes in the way people move around, access to multi-modal transportation options, overall health benefits, economic improvements, etc.

While this report does not prescribe which measures should be adopted, we strongly recommend a balanced approach that includes measures covering process, implementation, and impact with an equity lens. Focusing on only one category of metrics can lead to skewed and suboptimal data and results, limiting the ability to influence change on a systems level. For example, some agencies record only information about implementation metrics of Complete Streets policies because it is tangible and relatively easy to record, such as miles of sidewalks and bike lanes.

However, if there are no measures about the process, the agency may fail to collect information that conveys how the policy was imposed and its capacity to implement the policy. Such measures are particularly valuable when policies fail or underperform because they can inform agencies on where improvements can be made and help staff improve their own performance. For example, if street improvements were not made in an efficient, consistent and fair manner (i.e. based on needs such as high-crash rates and community input) then the policy may not be benefiting the people who need it most and in the ways the community intended. Similarly, without measures about impact, the agency will not know what the effects of the policy are on the community. Examples of this may include if people can more easily meet their transportation needs as a result of these improvements; if these improvements can be used to leverage increased transit service; or if there were any unintended consequences of their investments. Thus, it is important to include measures from all three metric categories and consider both internal (e.g., funding and decision-making within agencies) and external parameters (e.g., what gets built) linked to the implementation of Complete Streets.

SELECTING MEASURES:
How many measures do you need?

The 100+ measures in this report are a *menu* of options for measuring Complete Streets policies, not a *prescription*. Unfortunately, there is not a magic number of measures that apply to all agencies, and there are risks involved in over or under-measuring. If agencies record only a few measures which are not in varying metric categories, they will miss potentially valuable and useful data. On the other hand, too many measures can be cost-prohibitive and detrimental to other priorities, cumbersome for staff to collect and interpret, and overwhelming for the public to interpret. As with everything Complete Streets, in order for performance measurement and reporting to be successful, they should be based on the community's needs and goals, but a general starting rule of thumb can be starting by naming 3–5 metric categories and picking 2–3 measures to monitor and determine whether you are making progress towards them. Reviewing this list to include new measures or modify existing ones over the years is recommended to ensure that they continue to be reflective of the needs of the community and the vision of the policy.

The process of selecting these metric categories and measures within them is both a little bit of an art as well as a science. When going through the selection process, there are three things every agency should reflect upon:

1. **Which metric categories and measures help evaluate the goals of the Complete Streets policy in a relatively easy and consistent manner?** That is, selected metrics should accurately portray the agency's progress (or lack thereof) towards its goals and should be easy to collect on a regular cycle i.e., every six months, one year or every two years to be able to report on trends. For example, if an agency has five stated goals they might have 2–3 measures related to each for a total of 10–15 individual items that they can continually measure.

2. **What is the capacity to measure the selections consistently?** It is crucial to understand long-term trends of a Complete Streets policy, which requires agencies to analyze and report on the selected measures on a set cycle i.e. every six months, one year or every two years.

3. **Apart from reporting, how will these measures be used to change internal processes and take corrective actions to improve transportation access in the community?** In order for these measures to be truly valuable, agencies should be proactive in using the data to improve internal decision-making processes and systems such as funding, staff capacity, project prioritization, and community engagement.

The 100+ measures in this report are a *menu* of options for *measuring* Complete Streets policies, not a prescription.

SELECTING MEASURES:
Are all measures equally important?

All measures that an agency chooses are important by definition of being chosen (otherwise, they should not waste time measuring them), and they should all be reported to the public on a regular basis. However, in terms of decision-making and project prioritization, some system of weighting is necessary. The exact system adopted will vary depending on the values and priorities of each agency and the communities they serve. Smart Growth America encourages policies and actions that prioritize vulnerable users and the creation of a complete, connected multimodal transportation network. This is an important opportunity to include community engagement. Refer to Westwood KS's case study on page 17 for an example of how community members can be involved in selecting and prioritizing measures.

> "...we developed a *project criteria scoring sheet* that looked at specific neighborhoods, income of the neighborhood, proximity to pedestrian generators, historically disadvantaged communities, and then access to opportunity for individuals who have some sort of specific needs requiring extra support. So each of those things actually held a different weighted criteria."
> — Brooklyn Holton, consultant for Moses Lake in discussion group

FOCUS ON EQUITY

All people should have a transportation network that supports options for getting around that are safe, convenient, reliable, affordable, accessible, and timely regardless of race, ethnicity, religion, income, gender identity, immigration status, age, ability, languages spoken, or level of access to a personal vehicle. A successful transportation network aligns with Smart Growth America's vision that no matter where you live, or who you are, you should enjoy living in a place that is healthy, prosperous, and resilient. In order to build this network, a jurisdiction needs to allocate its often limited resources most efficiently and equitably: by first focusing on the harms and disparities resulting from systematic under-investment and discrimination.

Equity is not captured in a single measurement or a single metric category. Instead, it should be a universal principle that is considered in ALL areas of measurement, including process, implementation, and impact. For each relevant measure, a sub-analysis of who is involved or impacted should be conducted. For example, if a community meeting is being held, the location and demographics of all attendees can be recorded to determine who is attending and if other means need to occur to reach community members. Similarly, impacts such as health improvements or harms should be disaggregated along relevant categories such as race, class, gender, disability, and more. Tucson, AZ's Complete Streets policy lists out specific measures through an equity lens while also discussing how equity is incorporated throughout the process and implementation of Complete Streets.

Community meeting | Source: Antenna, Unsplash

SELECTING MEASURES:
Can we just copy another jurisdiction's list?

The short answer is no; a community should not directly copy another jurisdiction's measures, although learning from the experiences of other peer communities is highly encouraged and can be valuable. All of the 100+ measures in this report can have value to communities that are looking to create a transportation system where all users are safe, but each community will have to decide which metrics and measures are the right ones for them. Communities cannot and should not use all of these for two main reasons:

1 **First**, each community is unique and is home to diverse community members with a range of transportation needs and challenges that their Complete Streets policy should be serving. Element #1 of our Complete Streets Policy Framework requires communities to establish their tailored and binding commitment and vision statement as a first step to policy adoption which should be grounding ideals for selection of measures as well. For example, Tucson, Arizona's Complete Streets policy requires that the city's tree canopy be tracked because, as the southwest city deals with worsening extreme heat events, any street without shade is incomplete and unsafe for people outside of vehicles. Jurisdictions, where extreme heat is less of a concern, may not find these measures necessary to collect in this manner and may instead benefit from collecting data on measures based on the needs and realities they face. However, jurisdictions can learn from similarly situated communities who are successfully collecting and reporting measures elsewhere.

2 **Second**, when public sector capacity is limited, devoting resources strategically is essential but selecting the right set of measures is a crucial decision, and may not be as easy to find the right balance between the two. Partnerships with community champions may come in handy in this process as this can be an opportunity to develop indicators with the involvement of community members. This process can also help strengthen legitimacy, trust, and buy-in with the community, which can in turn help with implementation of the policy overall.

MEASURING IMPACT DOESN'T HAVE TO BE RESOURCE-INTENSIVE

Even communities with limited resources, such as staff capacity, funding, etc., can collect data on measures. Neptune Beach, FL, which has a top scoring policy, is home to less than 10,000 people and may lack the resources of major metropolitan areas. Colin Moore, Deputy Director of the Department of Public Works, provides recommendations for how they managed to do a lot with a little.

1. **Share resources**. Neptune Beach borrowed a bike and pedestrian traffic counter from the City of Jacksonville and installed it on First Street—the city's north/south street closest to the actual beach—and opted for manual collection instead of deploying additional hardware.

2. **Align measurements with infrastructure investments**. First Street is not only part of the East Coast Greenway (a walking/biking route from Florida to Maine), but its infrastructure reflects that designation. The street has four-way stops on every block, as well as periodic modal filters that limit the utility of thru traffic by cars. This increases the likelihood that the traffic counters would capture significant usage by people walking and rolling.

3. **Make sure to measure on busy days of the year**. By ensuring the counter was up and running on days like the 4th of July, when First Street is closed to vehicle traffic, Neptune Beach was able to accurately capture the potential of this policy choice. With over 18,000 people counted in a city of just over 7,000 people, Neptune Beach was able to capture data that helped make a case for the need and impact of Complete Streets.

4. **Have a goal in mind**. As the city looked to get funding from the Florida Departments of Environmental Protection and of Transportation, as well as getting their projects into the list of priority projects for the North Florida Transportation Planning Organization, staff and leaders knew they needed data. It used these counts as part of its case, ensuring that the limited resources were used strategically to make the most of it.

Exploring real-world measures

This section presents a list of process, implementation, and impact measures grouped under various metric categories that are currently being used by government agencies in American cities and towns with strong Complete Streets policies, along with input from the advisory committee of the report (Refer to the Methodology section ⬆ for further information). **This list is not exhaustive**, and there are certainly others that can be used effectively. And again, **this is a menu of options from which an agency can select, not a prescription**.
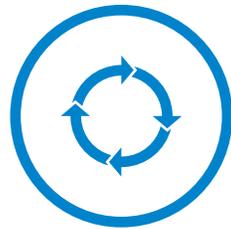
PROCESS

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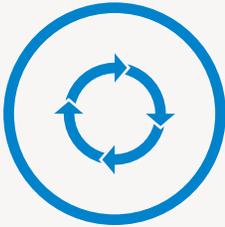
PROCESS METRICS

Institutionalizing a Complete Streets approach (often internal)

Although process metrics generally describe internal actions (e.g., government decision-making processes), they are crucial for making sure that Complete Streets are created in an efficient, equitable, and sustainable manner. If the processes related to Complete Streets are comprehensive, the results will most likely be positive. Furthermore, these metric categories measure actions that will help ensure Complete Streets will become deeply embedded within standard operating procedures and will last over time rather than receiving attention under one administration or leader, then fading when those people are no longer in power.

FUNDING MEASURES

ACCOUNTABILITY

COMMUNITY ENGAGEMENT

$ FUNDING MEASURES
How money is budgeted and spent on Complete Streets

Percent of active transportation funding allocated to underserved communities

Percent of funding allocated to systemic/risk-based safety efforts

Percent of maintenance funding devoted to maintaining bike, pedestrian, and transit infrastructure

Percent of publicly funded building projects that included an improvement for biking, walking, and/or transit (e.g. new/rebuilt schools, parks, or other capital projects that involve a publicly funded/owned site contribute to improvements)

Percent of transportation funding allocated to high-injury networks

Percent of transportation funding allocated to Safe Routes to Schools

Percent of transportation funding allocated to sidewalks and bike lanes for transportation versus recreation

ACCOUNTABILITY
Efficiency and transparency of internal processes related to Complete Streets

Level of coordination/collaboration among relevant departments (transportation, land use/zoning, housing, economic development, public health etc.)

Number and nature of approved and denied exceptions

Number of existing plans/policies updated to comply with the Complete Streets policy (including plans/policies for other departments such as school site policies, policies for locating community services, etc.)

Number of new staff hired or existing staff/full-time equivalents focused on Complete Streets policy implementation

Number of publicly available progress reports and/or dashboards with pertinent performance measures

(Note: A dashboard would be an important milestone which, once created, would show other measures found throughout this report.)

Number of public requests for Complete Streets projects/improvements and their fulfillment rate

COMMUNITY ENGAGEMENT
The extent to which the public is able to understand and participate in processes and projects related to complete streets

Number of authentic and creative public engagement events and actions such as "pop-up" demonstrations, walk audits, community bike/walk events etc., and number of people engaged in them (disaggregated by demographics)

Number of community members and community organizations involved in project development and representation by underserved/vulnerable groups

Number of meetings held by Complete Streets committee that includes both internal and external stakeholders (and representation of underinvested and vulnerable communities)

Number of participatory budgeting events related to Complete Streets

Number of suggestions/proposals from community engagement processes that are incorporated into decisions and plans

Note that some measures may not be feasible for all agencies. For example, current government accounting systems may make it difficult to calculate and record certain measures.

$ FUNDING MEASURES
How money is budgeted and spent on Complete Streets

Cost saving by combining efforts/ funds leveraged between agencies (e.g. transportation+public works/health/parks departments)

Transportation funding (Total and percent) allocated to projects that improve pedestrian, bicycle, and/or transit level of service

ACCOUNTABILITY
Efficiency and transparency of internal processes related to Complete Streets

Number/percentage of staff who received training on Complete Streets per year (disaggregated by tenure, role, etc)

Number of uses of Complete Streets checklists in planning and implementation projects

Use of performance measures to inform project selection and prioritization

For example:

- Have traffic crash hot spots (high-injury networks) been identified and prioritized?
- Have "communities of concern" been identified and prioritized?
- Have systemic/risk-based areas and corridors been identified and prioritized?

COMMUNITY ENGAGEMENT
The extent to which the public is able to understand and participate in processes and projects related to complete streets

As mentioned, it is imperative to view measures through an equity lens. Wherever possible, the measures above should be disaggregated according to relevant characteristics such as geography, race/ethnicity, income, age, and gender. This will help understand and hopefully improve some of the negative impacts of historic inequitable development and ensure that the benefits of Complete Streets are enjoyed by all.

Monroe, Louisiana Workshop
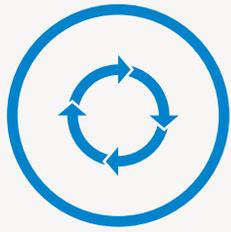
Westwood's collaborative approach to defining measures that matter

The City of Westwood, Kansas, adopted a Complete Streets policy in 2020. In order to make sure the performance measures and metrics were robust and representative of the true needs of their city, a task force was formed to oversee implementation. This task force included a diverse group of stakeholders, including a member of the City Planning Commission and City Council, as well as residents, a youth representative, and education professionals. The group met six times in 2021 and devised a list of 27 measures centered around safety, complete connections, and community.
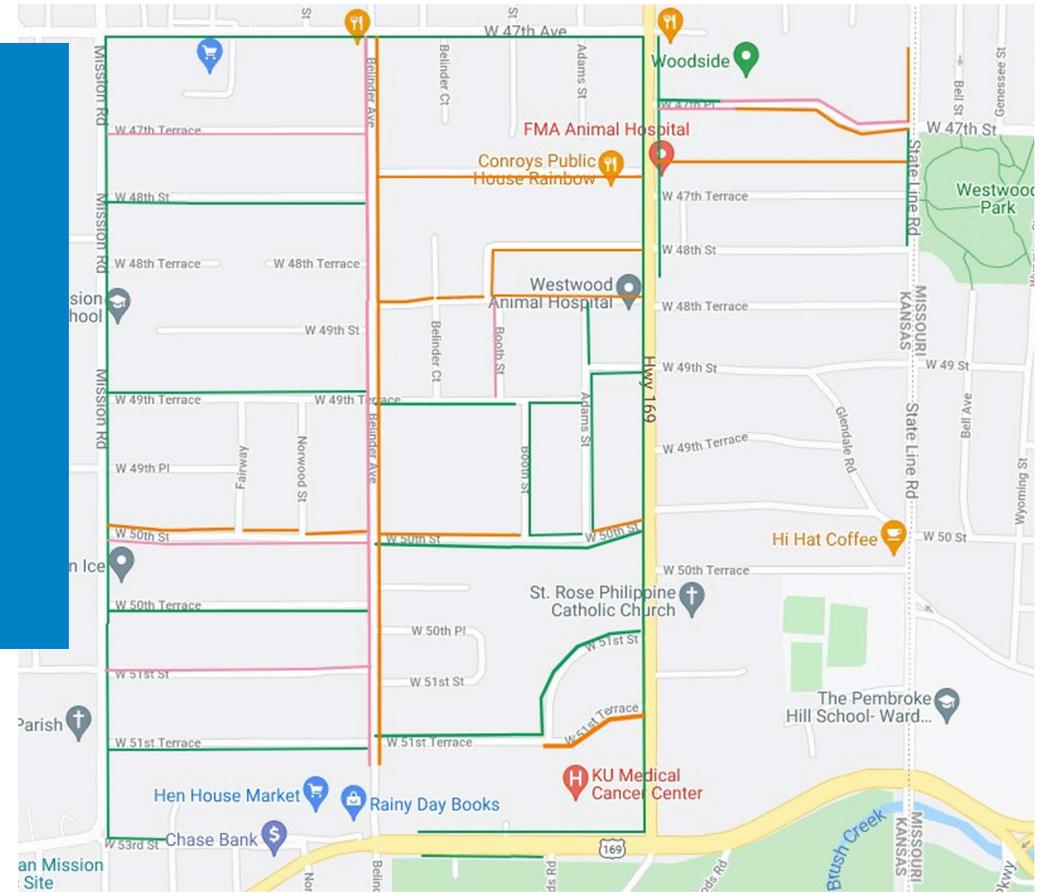
Westwood

KANSAS

🟢 Existing sidewalk (5' wide)   🟣 Existing sidewalk (4' wide)   🟠 Planned sidewalk*

Source: City of Westwood, Kansas Complete Streets Policy

MARYLAND
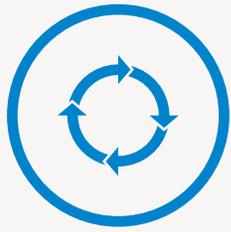
Howard County

Howard County's focus on training

Howard County, Maryland, which received a perfect score for their Complete Streets policy adopted in 2019 under our Complete Streets Policy Framework, has taken steps to make sure the policy will be firmly centered in their day-to-day operations going forward. In 2022, the county updated and adopted a design manual that incorporates the Complete Streets policy. In addition, they created a series of training modules to inform staff (and anyone interested) about the updated manual and Complete Streets in Howard County. Tracking the progress on these items was critical process metrics to demonstrate follow-through and garner community trust around the policy.

During a discussion group, Chris Eatough, Bicycle and Pedestrian Coordinator, described the process as follows:

> *"We made significant changes both policy-wise, and with our design guidance. We made a pretty good effort, and have been successful with training. We did in-person, and online meetings to go over all the new materials for existing staff. We also produced videos, basically PowerPoint style, but with narration, for all the new materials, divided into modules so they're in reasonable, bite-sized pieces. We did that with the existing staff, and were even more successful with the new staff. It seems a little easier to get those messages through to new fresh minds, especially because we have those video modules. That's an easy thing for a new employee orientation to be directed towards. So we do that for all our transportation-related employees, DPW engineer types, but also our planners in our planning and zoning department…"*

Complete Streets Implementation

HOWARD COUNTY DESIGN M

Pavement Markings at Driveways   Section 2.5.l

NOT TO SCALE
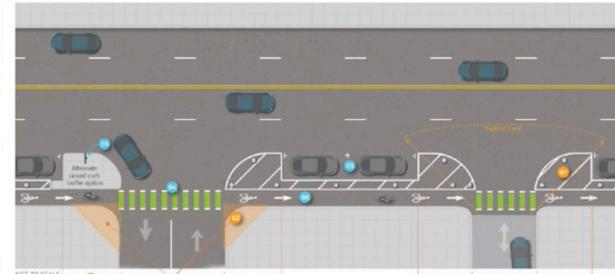
Source: FHWA "Separated Bike Lane Planning and Design Guide" (Ref. 13)

HC   HOWARD COUNTY DESIGN MANUAL VOLUME III UPDATES   WRA

Source: Howard County's Training Modules

IMPLEMENTATION METRICS

IMPLEMENTATION METRICS
From Plans to Projects (often external)

Implementation is where plans become reality, where shovels hit dirt. These measures often refer to more tangible things such as new street installations or infrastructure improvements. It is obviously important to measure implementation because if nothing actually gets built or improved, then processes are futile, and impacts are unlikely. It is also the way that community members can most clearly observe actions toward Complete Streets. As with process metrics, it is important to consider equity wherever possible within these measures. For example, are all neighborhoods receiving resources and amenities according to their needs? Are certain social groups disproportionately benefiting or harmed by Complete Streets interventions?

INFRASTRUCTURE PROJECTS   **PLACES AND DESTINATIONS**

NETWORK CREATION   **PARKING**

INFRASTRUCTURE PROJECTS
(built/repaired/upgraded/removed): Physical alterations to streets and surrounding areas

- Percent of ADA-accessible sidewalks and intersections (curb ramps, audio signals, tactile pavement etc.)

- Percent of repaving miles that included a change/improvement for biking, walking, and/or transit; or safety improvements such as traffic calming, intersection improvements etc.

- Accessible signage and information (existing and new additions) for all users (pedestrians, bicyclists, transit riders, etc.)

- Coverage of streets with lighting, especially at intersections, that is pedestrian-scaled, dark sky friendly, etc.

- Miles of bike lanes: new, repaired, and total (for condition/quality/context—can refer to the Level of Traffic Stress and/or the League of American Bicyclists Bicycle Friendly Community program, width, striped, protected, shaded etc.)

NETWORK CREATION: *Projects to ensure a complete, multimodal transportation network*

- Percent of bike plan/walk plan/ Vision Zero network completed

- Average block length

- Conflicts (or absence thereof) between local and state or federal standards

- Distance between intersections/ changes in intersection density

- Measures of directness of implemented cycling and pedestrian projects from key origins and destinations throughout the network. (Can use FHWA guidance)

- Number of interventions/projects (quick build or permanent) to close gaps in pedestrian/bicycle/transit network and create connections to important destinations for non-driving (e.g., employment, food, healthcare)

- Number of projects focused on creating first mile/last mile transit-access connections for non-drivers

PLACES AND DESTINATIONS:
Placemaking and other actions to create more livable and healthy communities

- Amount of usable public space (e.g., number of spaces and square feet)

- Number and type of changes to zoning ordinance to promote Complete Streets (for e.g. sidewalks in residential zones and pedestrian amenities like benches, lighting, and trees in commercial zones)

- Percent of land area with exclusionary zoning (e.g., land area reserved only for large single-family houses)

- Increase in mixed-use zones/ coverage (in sustainable and equitable ways)

- Increase in residential density (in sustainable and equitable ways)

- New and existing outdoor seating spaces added/repaired/replaced

P PARKING: *Actions to right-size parking policies and requirements*

- Percent of paid vs. unpaid parking

- Number of off-street surface parking spaces

- Number of on-street parking spaces added/removed, paid/unpaid

- Parking ratio in commercial office buildings: parking spaces per 100k sq ft of space

- Removal/reduction of parking minimum requirements and regulations *(Note: This is an important milestone which will have downstream impacts on other measures in this category.)*

- Residential multifamily parking: number of spaces per unit in new buildings

INFRASTRUCTURE PROJECTS *(built/repaired/upgraded/removed): Physical alterations to streets and surrounding areas*

> Miles of sidewalk: new/repaired /total (condition/quality, width, shaded, accessible etc.)

> Number of bike racks, bike parking spaces, bike maintenance stations, and other supportive infrastructure, and their location in relation to need

> Number of beautification/art/ cultural projects (street trees, murals, façade improvements, painted crosswalks, collaboration with local artists etc.)

> Number of intersection improvements to facilitate multimodal access (crosswalks, new/adjusted signal timing, stop signs, circular intersections, bollards, bike signals etc.)

> Number of midblock crosswalks (and details such as striped, raised, improved signal, signage, distance to nearest transit stop or intersection, etc.)

NETWORK CREATION: *Projects to ensure a complete, multimodal transportation network*

PLACES AND DESTINATIONS: *Placemaking and other actions to create more livable and healthy communities*

> Number of new placemaking amenities that naturally invite walking, rolling, sitting, dancing, eating/drinking, socializing, waiting for transit, seeking shade, playing, learning, etc.

> Number of outdoor dining space permits issued (without encroachment on sidewalk/ clearance)

P **PARKING:** *Actions to right-size parking policies and requirements*

INFRASTRUCTURE PROJECTS (built/repaired/upgraded/removed): *Physical alterations to streets and surrounding areas*

NETWORK CREATION: *Projects to ensure a complete, multimodal transportation network*

PLACES AND DESTINATIONS: *Placemaking and other actions to create more livable and healthy communities*

P **PARKING:** *Actions to right-size parking policies and requirements*

Total amount (e.g., miles, sq ft) of auto-only infrastructure repurposed for bicycle, pedestrian movement, or placemaking

Use of reflective surfaces such as cool roofs and cool pavements to reduce heat islands and increase visibility

As mentioned, it is imperative to view measures through an equity lens. Wherever possible, the measures above should be disaggregated according to relevant characteristics such as geography, race/ethnicity, income, age, and gender. This will help understand and hopefully improve some of the negative impacts of historic inequitable development and ensure that the benefits of Complete Streets are enjoyed by all.

Quick Build Project in Airway Heights, Washington

IMPACT METRICS

IMPACT METRICS
Evaluation of the results (internal and external)

Complete Streets are not only a transportation solution, they can also have significant positive impacts on a wide range of issues, including economics, public health, sense of place, and more. This category of metrics is crucial for helping agencies understand what happened as a result of interventions. Were there benefits? Were there harms or unexpected consequences? As we have recommended throughout this report, equity must be considered in these measures as well.

The most common (and recommended whenever possible) approach to measuring impacts is to compare data from before (baseline) and after (endline) implementation. Measurements should be done at an appropriate length of time before and after in order to show impacts. The timing required varies depending on the project and impact being measured. For example, changes in driving speeds or use of new infrastructure can be measured within months of implementation. Others, however, such as trends of injuries/crashes or improvements to population health, require much longer timelines for effective measurement—a lack of immediate change is not necessarily a sign that something is not working. Measurements should also be continued on a regular basis to gauge progress over time.

ACCESS

USAGE

ECONOMY

PUBLIC PERCEPTION

SAFETY & PUBLIC HEALTH

ACCESS: *Improvements to the multimodal transportation system that give users options for safely reaching important destinations*

Percent of population and jobs near high-quality transit (e.g., high-frequency service seven days a week. <½ mile for rail or <¼ mile for bus)

Percent of population burdened by transportation and housing combined (spending more than 45% of annual income on transportation and housing combined)

Percent of population burdened by transportation costs (spending more than 15% of annual income on transportation)

Percent of population for whom lack of transportation kept them from/resulted in being late to important destinations such as:
- work
- medical appointments
- education
- social engagements

ECONOMY: *Effects of Complete Streets interventions on local economies*

Amount of affordable and attainable housing near important destinations

Amount of private investment in adjacent properties

Changes in property values, vacancy rates, retail sales, number of jobs and local businesses, tax yield per acre

Employment rates in nearby census tracts

Number of private sector-led projects or public-private collaborations

Number of visitors to area (total and by travel mode) and changes over time

SAFETY & PUBLIC HEALTH: *Benefits of Complete Streets interventions such as reducing crashes and rates of chronic illness*

Percent of streets with stormwater facilities/xeriscape/rain gardens

Average emergency vehicle response times (e.g. Percentage of emergency calls for which the first arriving unit was <4 minutes)

Changes in air quality (e.g. Air Quality Index or carbon emissions)

Rates of chronic illnesses by race/age/income

Changes in corridor and impact area noise levels (e.g., chronic exposure to noise levels > 45 dB)

Changes in crash fatalities by demographics, location, and conditions

USAGE: *Changes in the ways people move around and occupy space*

Average number of minutes users spend in places at different times of day, days of week, and times of year

Number of people congregating at different times of day, days of week, and times of year in an impact area (disaggregated by demographics such as age, gender, ability, race/ethnicity)

Number of users on existing and new infrastructure as well as quick build/demonstration projects

Parking utilization for cars and bicyclists

Transit ridership

PUBLIC PERCEPTION: *The opinions and perspectives of the public, business owners, and other stakeholders related to implemented Complete Streets interventions*

Changes in perceived quality of life of residents in neighborhoods adjacent to implemented projects (compared with residents not adjacent to implemented projects)

Changes in the perceived safety of residents in neighborhoods adjacent to implemented projects (compared with residents not adjacent to implemented projects) measured through surveys

Changes in trust in government among residents in neighborhoods adjacent to implemented projects compared with residents of "control" neighborhoods (e.g., participation in community engagement events, surveys, etc)

ACCESS: *Improvements to the multimodal transportation system that give users options for safely reaching important destinations*

- Percent of population with direct access to a low-stress bike network/sidewalks

- Percent of students traveling to school via active transportation modes (e.g., walking, biking)

- Percent of transit stops that are ADA accessible and with amenities (e.g., sidewalk, curb-cut/ramp access, shelters, seating, lighting)

- Percent of transit stops with marked crosswalks within 50 feet

- Changes in mode split and vehicle miles traveled (VMT) and/or single occupancy auto commute trips over time

ECONOMY: *Effects of Complete Streets interventions on local economies*

- Permanent maintenance jobs created (or FTE dedicated) and hiring from local communities

- Surrounding rehabilitation construction permits

- Sales tax revenue

- Temporary construction jobs created (or FTE dedicated) and use of local workforce

SAFETY & PUBLIC HEALTH: *Benefits of Complete Streets interventions such as reducing crashes and rates of chronic illness*

- Changes in crash injuries by demographics, location, and conditions

- Changes in motor vehicle operating speeds/speed limit compliance

- Changes in shade canopy coverage to mitigate urban heat island effect and heat stress on vulnerable populations (measured via ambient temperatures)

- Changes in water pollution from runoff

- Rates of meeting physical activity guidelines by race/age/income

USAGE: *Changes in the ways people move around and occupy space*

PUBLIC PERCEPTION: *The opinions and perspectives of the public, business owners, and other stakeholders related to implemented Complete Streets interventions*

- Perceptions of mobility among business owners and customers

- Perception of social cohesion/connectedness/community

- Perceptions of transportation needs: "are your transportation needs being met?"

- Satisfaction with public places (Can be measured with simple happy/sad face buttons like in airports)

ACCESS: *Improvements to the multimodal transportation system that give users options for safely reaching important destinations*

ECONOMY: *Effects of Complete Streets interventions on local economies*

SAFETY & PUBLIC HEALTH: *Benefits of Complete Streets interventions such as reducing crashes and rates of chronic illness*

USAGE: *Changes in the ways people move around and occupy space*

PUBLIC PERCEPTION: *The opinions and perspectives of the public, business owners, and other stakeholders related to implemented Complete Streets interventions*

Commute times by travel mode. For example, the number of people that can reach jobs within 30, 45, & 60 mins via transit, biking, walking, and driving

Improvements to transit service quality (frequency, coverage, span, reliability, safety, etc.) including

- On-time performance
- Number of transit-only lanes added/removed
- Number of intersections with transit signal priority
- Change in transit connectivity and coverage (transit to transit and geographical span and reach, timing coordination)
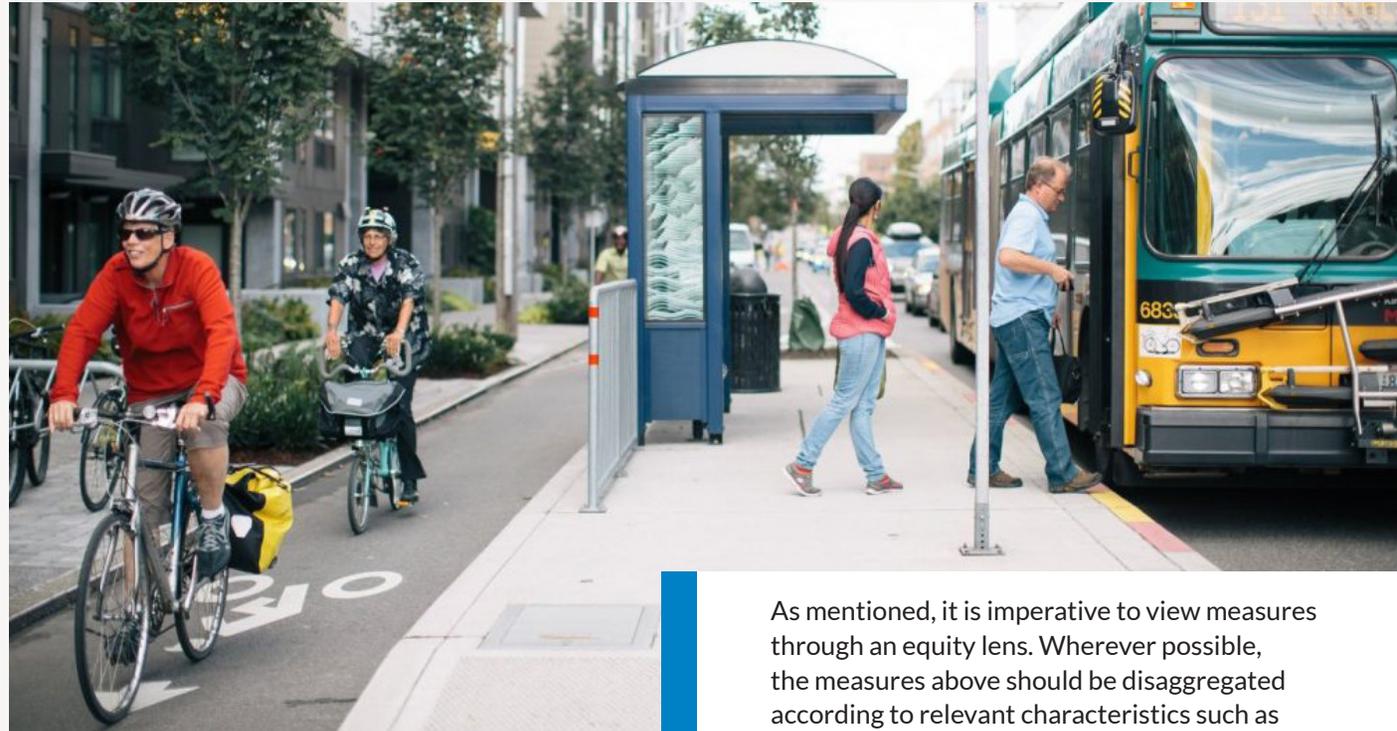
As mentioned, it is imperative to view measures through an equity lens. Wherever possible, the measures above should be disaggregated according to relevant characteristics such as geography, race/ethnicity, income, age, and gender. This will help understand and hopefully improve some of the negative impacts of historic inequitable development and ensure that the benefits of Complete Streets are enjoyed by all.

Seattle Multimodal Network | Source: Adam Coppola

III. Tools and techniques: Experiences of real-world communities

The metric categories and measures we have laid out in this report are a robust menu for champions, policy implementers and practitioners at agencies to choose from based on the specific context of their communities. Selecting which metrics will be used to measure the progress of your community's Complete Streets Policy, collecting those data, and measuring equity-related disparities is only half the battle.

In order to receive full points in our Complete Streets Policy Framework for measuring progress, communities must also specify a time frame for the recurring collection of performance measures, release them publicly, and assign responsibility for collection and publishing these data to a specific individual, agency, or committee. This public reporting of measures encourages accountability and engagement, thereby making Complete Streets policies more effective and politically sustainable.

In this section, we discuss these elements and questions that communities should ask to be holistic in their data collection and recurring reporting. We also dig deeper into when and how three communities—Howard County, Maryland; Baltimore, Maryland; and Milwaukee, Wisconsin—regularly publish their performance measures and highlight practices they've adopted, along with some special mentions for other communities as relevant. All of which can serve as an inspiration for how your community could consider tracking and publishing your own selected measures. As reflected in the overview graphics of the three communities below, it is essential to remember that adopting a Complete Streets Policy is not about individual projects but is an effort to institutionalize processes that help bring systemic change to conventional transportation planning decision-making to be inclusive of all modes of transportation.

8 key steps to implementing Complete Streets policies

Establishing and regularly reporting on new performance measures is one of the 8 key implementation steps after a community adopts a policy as shown in the graphic below.

1
Change procedures and processes

2
Review and revise design guidance

3
Training agency staff and community members

4
Establish and regularly report on new performance measures

5
Begin transforming the project selection process

6
Create a committee to oversee implementation

7
Create an inclusive community engagement plan

8
Build Complete Streets projects

A high-level timeline of steps that the three case study communities have taken are shown below. Follow the links to learn more about Baltimore's and Milwaukee's approach to Complete Streets implementation, why they believe their Complete Streets policy mattered and the lessons learned along the way.

Howard County

Baltimore

Baltimore, Maryland
(Policy passed: 2018)

Complete Streets Resolution	Complete Streets Ordinance 18-197 adopted	Legislation 19-303 revised timelines	Complete Streets Manual released *First Complete Streets Manual released*	*Second Complete Streets Manual released*
2010	**2018**	**2019**	**2021**	**2022**

Howard County, Maryland
(Policy passed: 2018)

2016	**2019**	**2022**
Bicycle Master Plan adopted	Complete Streets Resolution 120-2019 adopted	Complete Streets Design Manual adopted

Milwaukee, Wisconsin
(Policy passed: 2018)

	Wisconsin repealed state-level Complete Streets Policy	Complete Streets Resolution #180922 adopted	Dedicated funding for multimodal improvements *Second Complete Streets Health and Equity Report released*	*Fourth Complete Streets Health and Equity Report released*
	2015	**2018**	**2020**	**2022**

Revision of the 1993 Bike Plan		**2019** Pedestrian Plan and Racial Equity Resolution adopted *First Complete Streets Health and Equity Report released*	**2021** *Third Complete Streets Health and Equity Report released*	**2023** Complete Streets Handbook released

Milwaukee

Walk Audit in Wheeling, West Virginia

As communities embark on their journeys of evaluating and reporting on the success (or not) of their Complete Streets efforts, many questions may come up with regards to data collection, reporting and more. (Refer to section "Measure the full circle" on page 9 ⬆ for discussion on questions relating to selection of measures).

The following pages include a discussion on some of those commonly raised questions to help communities lay out their data collection and reporting approach:

REPORTING

When and how do we report the data? Does visual presentation matter?

Pages 30–32

DATA COLLECTION

How do we get and disaggregate the data?

Pages 33–34

DATA COMMUNICATION

How do we talk about the data? How detailed do we get?

Pages 35–38

DATA LIMITATIONS

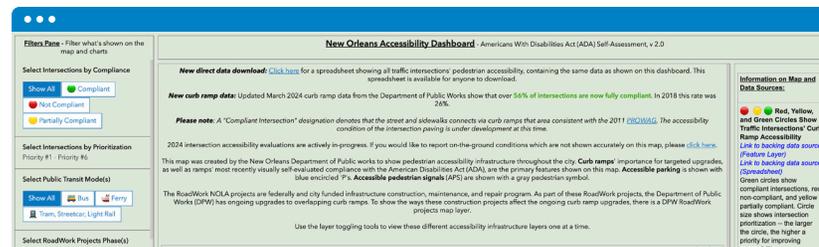What about the streets that aren't ours?

Page 39

REPORTING:
When and how do we report the data?
Does visual presentation matter?

The first thing that may be valuable to answer for agencies is the capacity—financial and personnel—to develop and publish reports on selected measures consistently and assigning the responsibility of doing so to a specific individual, agency or committee. A realistic answer to this question will influence many of the forthcoming questions, such as number of measures to evaluate, frequency of publishing the reports, the presentation style of the reports, training or hiring of staff with necessary skills to track, evaluate and report on the data. Keeping all these factors in mind, the way an agency chooses to report the data can vary significantly and it is important to remember that there is not one right prescribed way to go about it.

While the most commonly seen approach is to report on selected measures annually, some agencies do biannual reports (i.e. twice in a year) or in some cases even once in two years. Agencies may also report only on top priorities in every report while staggering information on other items that may require more capacity to measure or only show periodic changes. These sorts of carefully considered decisions can help an agency be strategic about staff capacity while delivering a consistent subset of information to the public.

Public-facing reports from government agencies are often difficult for the general public to understand. If your agency does an amazing job collecting data on a smart range of measures but fails to produce it in a form that the public can easily follow and understand, you will have wasted a lot of time. If it is not within your agency's capacity to translate findings for the general public, consider bringing in other partners and community champions to help you translate key messages from your reports. Depending on the amount of data collected, data reports can be lengthy documents filled with text and numbers. Visualizations can provide supplementary context but also break down information to support the data provided. Visualizations provide readers with another method of making meaning of their jurisdictions' Complete Streets progress. Remember your audience and give them things they can understand in language that is tailored to them, not just people in your department.

These visualizations also don't always need to be part of larger undertakings. New Orleans's safety and accessibility dashboards are not part of polished reports with paragraphs of text explaining their meaning. But, they both provide powerful information for champions and create an expectation that the city government can provide this information. If communities are to keep shaping their Complete Streets vision, they need not just the raw information, but the context necessary to do so.

Source: New Orleans Safety and Accessibility Dashboards

Note: The table below (and in the following sections) provides information on the approach three communities have taken in terms of their measures and progress reporting practices. Readers are highly encouraged to refer to the links in the titles to see the reports being discussed and referred to.

	Baltimore, Maryland (Policy passed: 2018)	Howard County, Maryland (Policy passed: 2019)	Milwaukee, Wisconsin (Policy passed: 2018)
Report location	Baltimore City Department of Transportation's Complete Streets Webpage	Howard County's Complete Streets Webpage	Milwaukee Department of Public Works' Complete Streets Webpage
Reporting timeline and frequency	Annual *Reports published: 2*	Bi-annual (twice in a year) *Reports published: 7*	Annual *Reports published: 4*
Staggered reporting of measures	None apparent. Both reports include the same measures and categories of information.	Yes. All reports include a breakdown of the county's capital budget for street improvements, key procedural accomplishments, and qualitative information about Complete Streets education and training. In the summer editions of these reports, the county's Office of Transportation restates the performance measures mandated by the Complete Streets Policy and details the quantitative progress towards these goals.	Yes. Milwaukee distinguishes between the "abbreviated reports" that it publishes most years and the "full version" of its reports that it publishes every four years. The full reports contain an additional section overviewing changes to internal processes, as well as case studies of individual projects, citywide programs, and planning processes that relate to Complete Streets.
Format of reporting	Designed for a non-technical audience and prioritizes data visuals to make it easy to digest for readers with varying levels of understanding and expertise.	Designed as internal memos for a technical audience with limited visuals that make it tougher to digest for readers who are not experts.	Designed for a non-technical audience and prioritizes data visuals to make it easy to digest for readers with varying levels of understanding and expertise.
Visual presentation example	Every single performance measure is displayed as data overlaid on a city map. These maps were shaded to reflect a census tract's equity prioritization based on an index developed by their Complete Streets Advisory Committee. *Source: Baltimore Complete Streets, March 2021*	While the reports themselves are text-heavy with some maps, Howard County did publish a video discussing their work in the county.	Includes maps that show a number of data points, including the low-stress bikeshare network, transit user counts, and crashes that caused deaths or life-changing injuries. *Source: Milwaukee Complete Streets Health & Equity Report 2022*

Milwaukee measures and reports!

One city that has taken performance measures reporting seriously is Milwaukee, Wisconsin. The city publishes annual reports about Complete Streets. They provide citywide data as well as information about specific Complete Streets projects. Additionally, the city collaborated with researchers from the Medical College of Wisconsin and others to conduct Safe and Healthy Street Surveys to gauge residents' perceptions of the city's streets. The surveys, distributed through the mail and online, included both quantitative and qualitative questions and produced user-friendly data based on some of the impact metrics listed in this section. The reports disaggregate data by income using the US Department of Housing and Urban Development (HUD) definition of Neighborhood Revitalization Strategy Areas (NRSAs).

Transit Passenger Counts			
		Citywide	NRSAs
Bus passenger counts*	2021	10,195,868	5,828,914
	2020	11,869,973	6,837,069
	2019	18,759,457	10,480,485
Bike on bus counts*	2021	8,968	4,758
	2020	9,852	5,000
	2019	87,318	46,762
Streetcar passenger count+	2021	301,170	N/A
	2020	261,303	N/A
	2019	760,321	N/A

*Data sources: *MCTS, +DPW*

43% of respondents enjoy bicycling

more than 100 respondents mentioned neighborhood friendliness in their open-ended comments

35.4% of respondents felt bicycling was unsafe due to traffic safety problems

23.9% of respondents felt bicycling was personally unsafe

"good neigborhood, bad traffic."
- Female, Age 60, Alder Distric 1
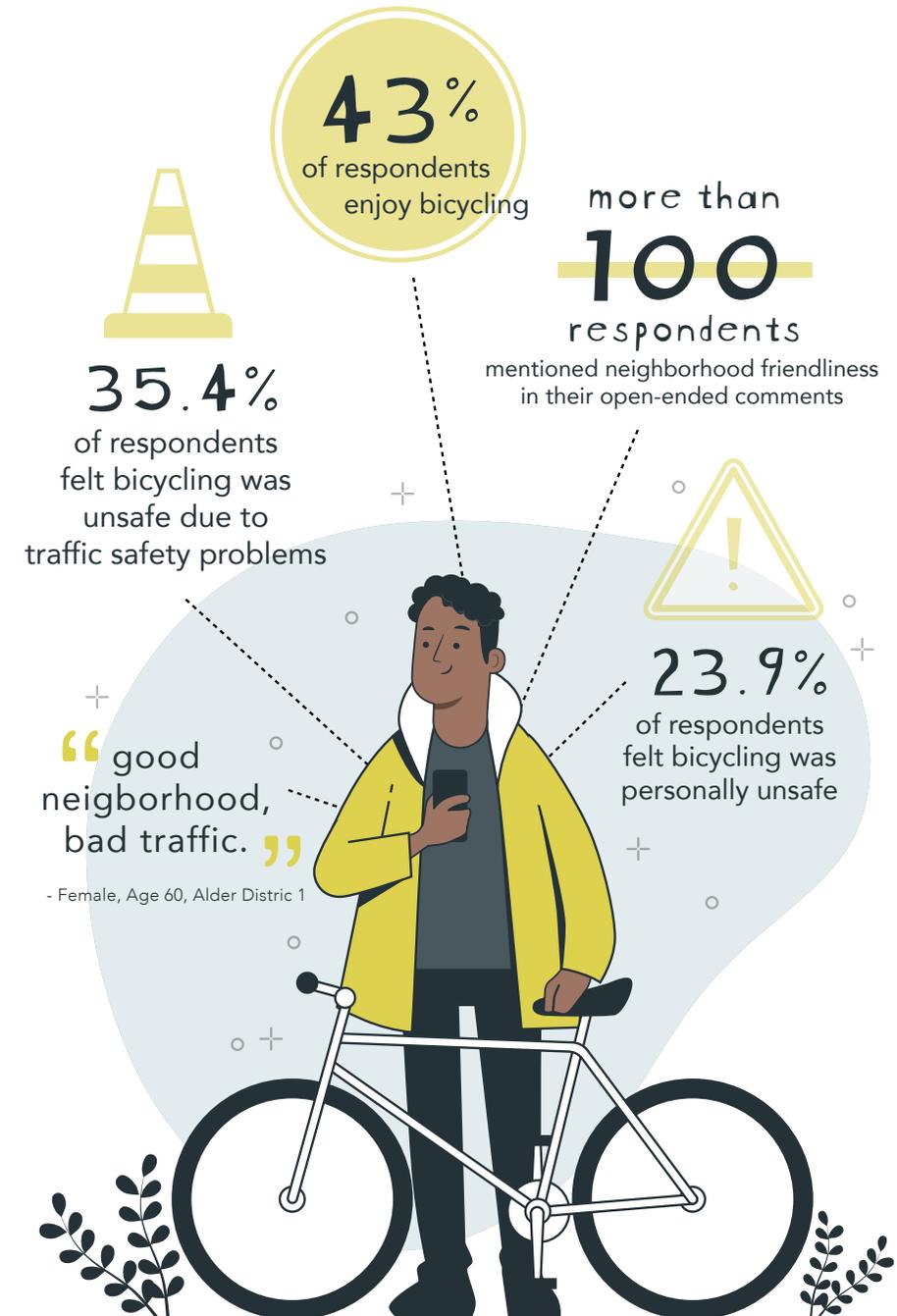
Source: Milwaukee's Safe and Healthy Streets Survey Executive Summary Report

DATA COLLECTION:
How do we get and disaggregate the data?

The first thing that may be valuable to answer for agencies is the capacity—financial and personnel—to develop and publish reports on selected measures, consistently and assigning the responsibility of doing so to a specific individual, agency or committee. A realistic answer to this question will influence many of the forthcoming questions such as number of measures to evaluate, frequency of publishing the reports, the presentation style of the reports, training or hiring of staff with necessary skills to track, evaluate and report on the data. Keeping all these factors in mind, the way an agency chooses to report the data can vary significantly and it is important to remember that there is not one right prescribed way to go about it.

While the most commonly seen approach is to report on selected measures annually, some agencies do biannual reports (i.e. twice in a year) or in some cases even once in two years. Agencies may also report only on top priorities in every report while staggering information on other items that may require more capacity to measure or only show periodic changes. These sorts of carefully considered decisions can help an agency be strategic about staff capacity while delivering a consistent subset of information to the public.

Public facing reports from government agencies are often difficult for the general public to understand. If your agency does an amazing job collecting data on a smart range of measures but fails to produce it in a form that the public can easily follow and understand, you will have wasted a lot of time. If it is not within your agency's capacity to translate findings for the general public, consider bringing in other partners and community champions to help you translate key messages from your reports. Depending on the amount of data collected, data reports can be lengthy documents filled with text and numbers. Visualizations can provide supplementary context, but also break down information to support the data provided. Visualizations provide readers with another method of making meaning of their jurisdictions' Complete Streets progress. Remember your audience and give them things they can understand in language that is tailored to them, not just people in your department.

Baltimore, MD | Source: Rihards Sergis, Unsplash

	Baltimore, Maryland	Howard County, Maryland	Milwaukee, Wisconsin
Data sources / Cross-agency data utilized	Yes. Utilizes data from the city DOT, Department of Public Works, Baltimore Development Corporation (BDC), Maryland State Highway Administration (MDOT SHA), Social Explorer, American Community Survey, Tree Baltimore, Maryland Transit Administration (MDOT MTA).	Yes. Utilizes data from Maryland DOT, Regional Transportation Agency of Central Maryland, Department of Public Works, Maryland Transit Administration and more.	Yes. Utilizes data from the Department of Public Works, Milwaukee County Transit System, WisDOT, Bublr Bikes and American Community Survey.
Qualitative data collection methods	None apparent.	None apparent.	Yes. Safe and Healthy Street Surveys conducted and will be conducted every 4 years.
Equity measures	Equity reporting section is included with each indicator which provides a breakdown of each measure by above average people of color, low-income population and no car households.	The number of new projects and repairs are considered in relation to community characteristics such as rates of poverty, ethnicity, English speaking households, disability, age, and car ownership.	Each indicator is reported citywide and for Neighborhood Revitalization Strategy Areas (NRSAs). NRSAs are contiguous Census tracts where at least 70% of the population earns 80% or less of the City's median income.
Recommendation to data collection methods for future	Suggestions on data collection/analysis considerations are included for future reports under the methodology section of measures wherever relevant.	None apparent.	None apparent.
Section on changes to internal processes?	Not at this time. But the 2022 report states this as a lesson for future reports: "track agency management/ prioritization of complete streets initiatives. Staff hired, internal processes implemented, staff trained, etc."	Yes. Reports contain some details about internal processes (e.g. functions of the Implementation Team and updates to the Equity Emphasis Map).	Yes. Included every 4 years.

DATA COMMUNICATION:
How do we talk about the data?
How detailed do we get?

Community members need to be able to understand, respond to, applaud and critique choices being made by practitioners and easily contribute their lived experience. Unfortunately, the language and structures of professional urban planning and traffic engineering are often inaccessible to most people. Decoding industry jargon when reporting the performance of a Complete Streets policy can empower community members and partners to fully understand what is being done and give them the tools to share informed feedback about what's working and what isn't.

One way to do this is by clearly explaining the data you use in your measures. These explanations can range from a few sentences to a few paragraphs and can serve many purposes. They can include data sources, methods such as how internal data (for example, intersection user counts) are collected, describe why certain types of data (such as speeding) are important, and explain shortcomings of the data (refer to the callout box on limitations of crash data below on page 36 ↓). If, in some reporting cycles, certain measures have to be omitted, it is valuable to explicitly state and explain why the agency was unable to measure them at the time.

Also, consider pairing information about individual projects that are under the purview of the Complete Streets policy. Details, images, level of public engagement, any barriers faced, and other relevant information on individual projects can help provide insights such as what the projects look like on the ground, the processes followed to implement them, and the geographical locations of the projects. This may also be crucial to share to support transparency around what the agency deems a Complete Streets project given there are examples of projects that claim to be Complete Streets when on-the-ground evidence shows there's nothing complete about them. It is recognized that the level of detail that jurisdictions can provide may also be a factor of staff capacity and in those cases (and even otherwise), this might be an opportunity to lean on community champions and partners for support.

Community Meeting | Source: Saulo Leite, Pexels

The absence of crashes does not equal the presence of safety

Police-reported crashes are the most common data source for assessing the safety performance of states' and municipalities' transportation systems. But safety is not simply the absence of crashes. Road safety is everyone traveling from place to place using their preferred travel modes and routes without the fear, potential, or reality of motor vehicle traffic harming them or their loved ones.

Unfortunately, reported crashes—especially those involving pedestrians and bicyclists—only tell us a small part of the safety story. Here are a handful of reasons the absence of police-reported crashes is not the same as the presence of safety for road users.

— Seth LaJeunesse
  Senior Research Associate, UNC Highway Safety Research Center

  Seth used to be a school psychologist where he realized the staggering role car-dominated landscapes play in the alienation of young people considered "at-risk." This realization brought him back to graduate school and the Highway Safety Research Center, where he applies his knowledge of social and systems sciences to improving safe, equitable access to community life for those who ambulate outside of motor vehicles.

[1] Stutts, J. C., Stewart, J. R., & Martell, C. (1998). Cognitive test performance and crash risk in an older driver population. *Accident Analysis & Prevention*, 30(3), 337-346.

[2] Sandt, L. S., Proescholdbell, S. K., Evenson, K. R., Robinson, W. R., Rodriguez, D. A., Harmon, K. J., & Marshall, S. W. (2020). Comparative analysis of pedestrian injuries using police, emergency department, and death certificate data sources in North Carolina, US, 2007–2012. *Transportation Research Record*, 2674(9), 687-700.

[3] Lombardi, L. R., Pfeiffer, M. R., Metzger, K. B., Myers, R. K., & Curry, A. E. (2022). Improving identification of crash injuries: Statewide integration of hospital discharge and crash report data. *Traffic injury prevention*, 23(sup1), S130-S136.

[4] Harmon, K. J., Sandt, L., Hancock, K., Rodgman, E., & Thomas, L. (2021). *Using Integrated Data to Examine Characteristics Related to Pedestrian Injuries* (No. CSCRS-R22). Collaborative Sciences Center for Road Safety.

[5] Tefft, B. C. (2013). Impact speed and a pedestrian's risk of severe injury or death. *Accident Analysis & Prevention*, 50, 871-878.

[6] Hauer, E., & Hakkert, A. S. (1988). Extent and some implications of incomplete accident reporting. *Transportation Research Record*, 1185(1-10), 17.

1 First, at least half of all pedestrian and bicyclist crashes are not reported to police.[1,2] And this underreporting is not equitably distributed across socioeconomic and racial/ethnic lines.[3]

"Not all crashes are reported, and probably inequitably depending on location. Another reason to not exclusively rely on crashes."
—*Discussion group participant, Baltimore, MD*

2 Even when police respond to crashes, reporting officers often misdiagnose injury severities. For example, a bicyclist may not appear injured at the scene of the crash, thus, no police report is filed. However, later, the injured bicyclist may decide to go to the emergency room, whereby the event is only captured in the emergency department data.[4]

3 Not only that, crash statistics tell us nothing about the "suppressed activity" auto-oriented infrastructure imposes upon people. Roads and intersections that present greater injury risks to pedestrians and bicyclists—those with multiple lanes of high-speed traffic and wide intersections that invite fast-turning motor vehicles—tend to be places people avoid at all costs. Concluding "there is no safety problem here" when there are no police-reported crashes in an area is simply wrong. If motor vehicles are traveling above 25 mph; if there are large SUVs and heavy trucks going faster than 20 mph; if there are poor sight lines around curves or at intersections; etc., there IS a safety problem.

"Bike crashes were reported on new streets where new facilities are installed, so there weren't crashes before but that could be because people avoided those streets and now that facilities are installed there are more users."
—*Discussion group participant, Rolling Meadows, IL*

4 Moreover, simple statistics on the number of crashes on the network obscure the fact that crash injury outcomes are not the same for everyone. For example, 70-year-olds are roughly five times more likely to die when struck by a driver going 20 mph than are 20-year-olds.[5]

5 Finally, when road safety is evaluated based on data other than the actual injuries that occurred, there is a tendency to mistake trends in crash reporting with trends in traffic safety.[6]

	Baltimore, Maryland	Howard County, Maryland	Milwaukee, Wisconsin
Clearly explain the data used for the measures	Yes. Mentions data source along with each of the measures reported.	Yes. Mentions data source along with each of the measures reported.	Yes. Mentions data source along with each of the measures reported.
Provides reasons for omission of measures (if applicable)	Not applicable. The two reports so far have included a similar list of measures.	Yes. Howard County periodically omits data for some performance measures, and it explicitly states and explains why it is unable to measure them at this time.	Yes, to a certain extent. The reports clarify when abbreviated/brief versus full reports will be published and the differences between the two. Reasons were not apparent for changes/omission of the specific measures themselves.
Information about individual projects	Yes. Includes a list of all on-going projects in a separate appendix pdf published along with the report. But the 2022 report states a lesson for future reports to "report on specific complete streets projects and their measurable impacts."	Reports contain information about projects and actions taken by the department.	The 2020 report includes information on select new and rapid implementation projects. The 2022 report includes a full list of all the projects (including rapid implementation) that were delivered and Complete Streets elements included in each. It was not apparent if this will be included in reports going forward.
Information about public engagements conducted for projects	Not at this time. But, the 2022 report states this as a lesson for future reports: "evaluate community outreach as a performance measure" and "conduct public outreach to determine performance measures that are of greatest concern to Baltimore City residents, particularly those in disadvantaged communities."	Yes. Reports frequently refer to previous or planned public engagement for projects.	Yes. This information is included in the full reports published every 4 years.

Des Moines's approach to Complete Streets reporting

Des Moines's 2022 Complete Streets Report includes a list of projects completed by the city. Although some projects generalize by stating "reconstructed to improve safety," "setting up safe and successful economic development opportunities," or "better organized parking," many others give specific improvements. These include building fewer general vehicle traffic lanes than required, adding sidepath and sidewalk (with specific widths and amounts), putting in a raised protected bike lane, and tighter curb radii. The effects of these projects still need to be borne out by impact metrics, but listing these specific improvements lets readers know how implementers are trying to achieve Complete Streets policy goals.

Des Moines

IOWA

Des Moines, Iowa | Source: Rihards Sergis, Unsplash
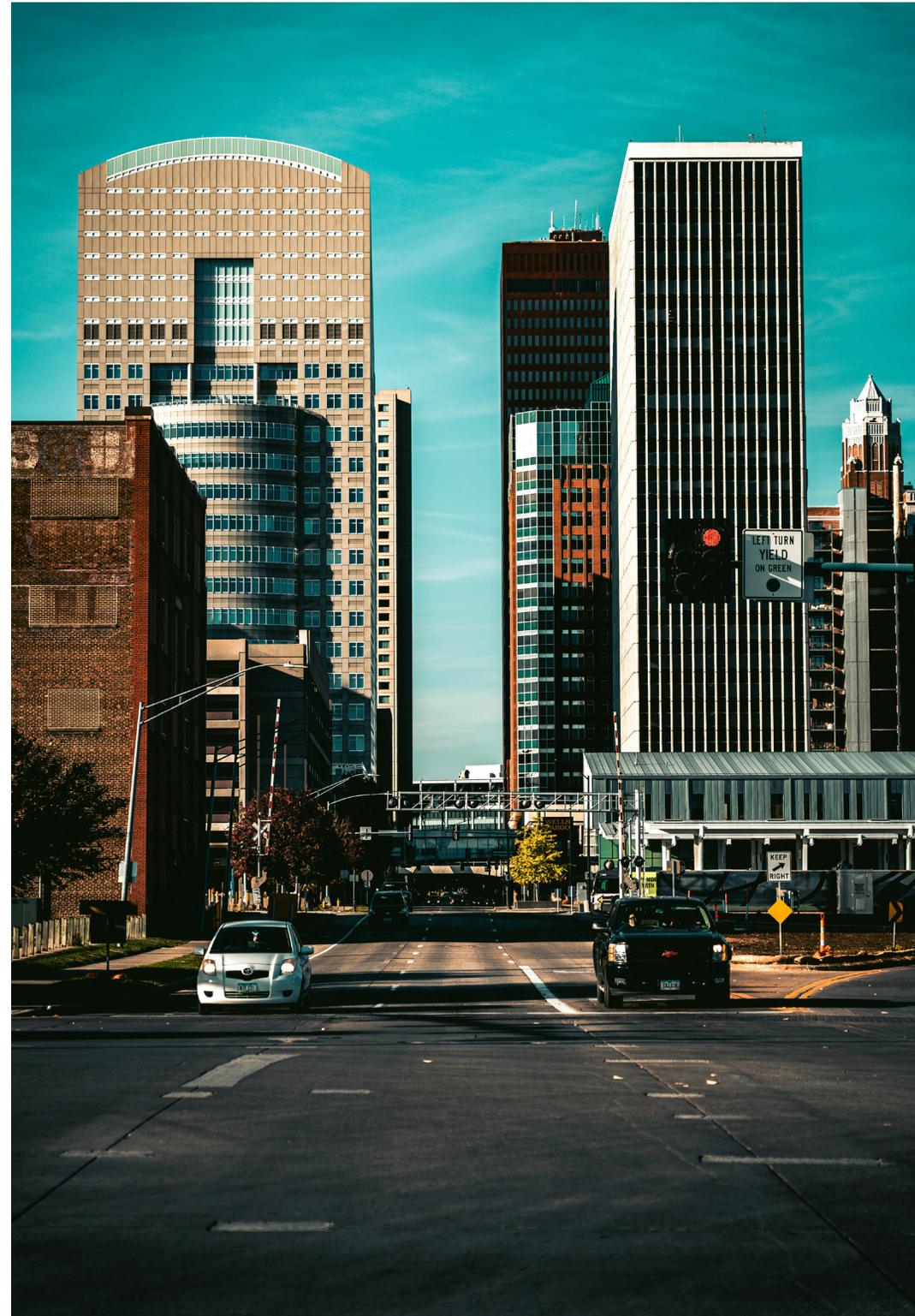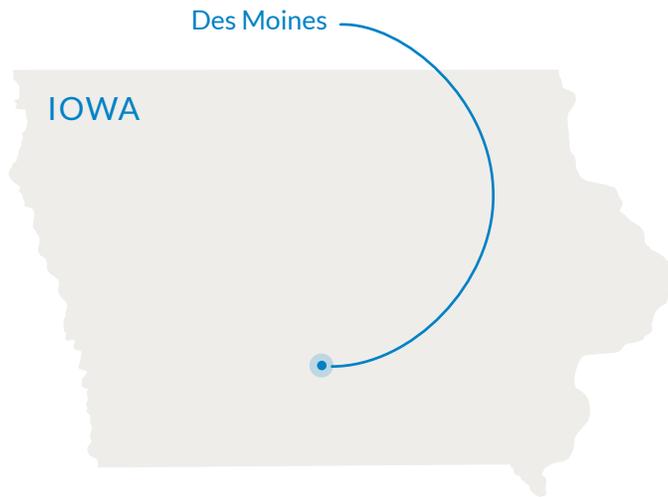
DATA LIMITATIONS:
What about the streets that aren't ours?

Another important way to provide context on the efficacy of a Complete Streets policy is by explicitly stating where the impact of local government ends.

Even the most comprehensive local Complete Streets policies will have little impact on the state-owned or controlled roads that are still designed for speed over safety. But, nearly two-thirds of all traffic fatalities in urban areas occur on state-owned arterial roads and not being able to collect, share, and analyze data to understand this further locally can be a roadblock for an agency to comprehensively evaluate the entire street network in their community. Local and regional efforts need support from their state departments of transportation to help implement Complete Streets policies. For example, Massachusetts, through its Complete Streets Funding program, incentivizes jurisdictions to adopt and implement Complete Streets policies, and Washington, through legislation passed in 2022, requires Complete Streets consideration for all projects over $500,000 within urbanized areas, altering fundamental DOT practices.

Further, this support needs to also be extended to help collect or share data on measures consistently across communities within the state. But, communities have expressed challenges when it comes to working alongside their state counterparts such as facing challenges with getting data to include in the annual reports. Here we provide examples of some of the conflicts expressed in the annual reports of the case studies. This information is useful for community members to get clarity on jurisdiction but also can be valuable for state counterparts who are interested and actively working towards helping resolve the barriers.

	Baltimore, Maryland	Howard County, Maryland	Milwaukee, Wisconsin
Conflicts between state/federal standards and local requirements	The annual report is required to include a list of all instances in which the local standards set forth in the policy or in the Complete Streets Manual were or are planned to be superseded by state or federal standards, as well as citations and causes for the local standard being superseded.	States that it can't measure one of its measures yet, citing lack of data-sharing from Maryland DOT as the reason.	Milwaukee's 2020 report has a section discussing their coordination with WisDOT. The report also states, "Some of the most dangerous streets for people walking, biking, and driving in the City of Milwaukee are major arterial streets… partially or fully under the jurisdiction of the Wisconsin Department of Transportation (WisDOT)."

IV. You have the data, now what?

Establishing specific performance measures that match the goals of the broader vision of the Complete Streets policy and incorporating equity considerations, and then regularly reporting that data to the public in a digestible format is a huge success in itself.

But, it would be a lost opportunity if that data did not feed back into a process to improve Complete Streets implementation. As mentioned before, in order for these measures to be truly valuable, agencies should be proactive in using the data to improve internal decision-making processes and systems such as funding, staff capacity, project prioritization, and community engagement.

We also highlighted the value of publicly available data at the beginning of this report and its importance for transparency, capacity building, and accountability. To ensure that these goals are achieved, communities should leverage all the data gathered to create feedback loops that help improve their local systems and guides as well as regional, state and federal standards. There are a couple of things that implementers could do with the information collected that are discussed in this section.

Minneapolis, MN | Source: Eastman Childs, Unsplash
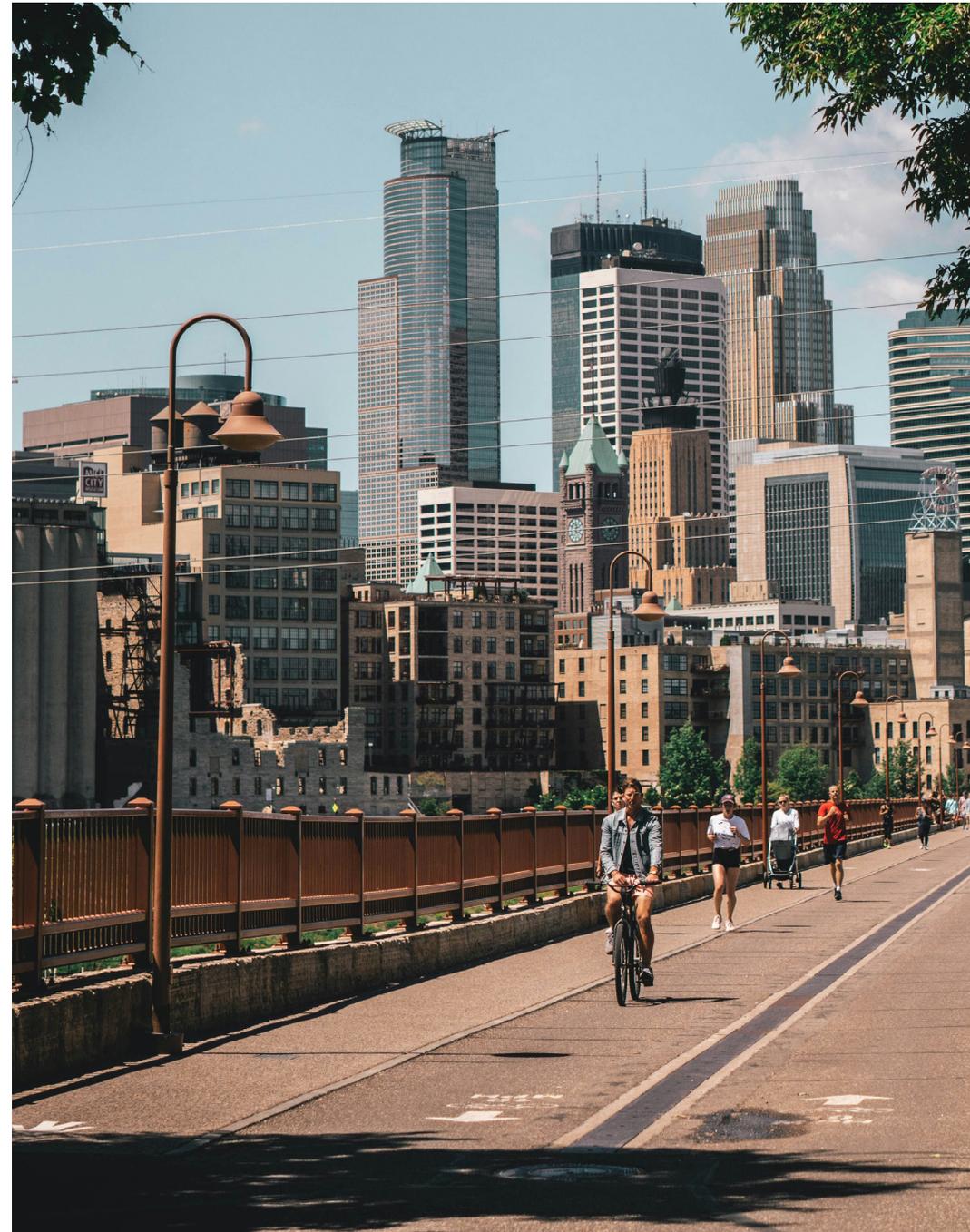
Review your project prioritization approach

Every local community, region, and state has a process by which they choose which transportation projects to fund and build. A strong and comprehensive Complete Streets policy ideally changes that process by adding new or updated criteria that give extra weight to projects that advance Complete Streets and improve the transportation network as discussed in element #9 of our Complete Streets Policy Framework.

In order to achieve a connected transportation network, a jurisdiction also needs to allocate its often limited resources efficiently and equitably by first focusing on gaps. The gaps are likely to be places that have been systematically underinvested due to different policies and systems that historically discriminated against communities due to factors such as race, income, and immigration status. The strongest Complete Streets policies therefore prioritize first funding and addressing these gaps in the network to better meet their community's transportation safety and health needs. They can also support fairness in mobility and accessibility of community members by ensuring lack of car ownership does not mean people are unable to safely and reliably access everyday destinations such as health care facilities and schools. Element #2 of our framework requires

policies to define priority groups or places and "prioritize" underinvested in and under-resourced communities. This can and will mean different things for different communities, but it's important to be specific and qualitatively or quantitatively define which groups are included in the definition of underinvested and underserved communities.

Communities like Tucson, Arizona, demonstrate how the data from performance measures can inform these internal decisions around project prioritization. The city has used demographic data to do vulnerability mapping, which will be a primary driver for choosing which projects to prioritize. Jurisdictions around the country can experiment with similar approaches to inform which of their projects they prioritize as well.

ELEMENT 2.
Prioritizes underinvested and underserved communities

The Complete Streets Policy Framework | Requires jurisdictions to define who are their most underinvested and underserved communities and prioritize them throughout.

ELEMENT 9.
Sets criteria for choosing projects

The Complete Streets Policy Framework | Creates or updates the criteria for choosing transportation projects so that Complete Streets projects are prioritized.

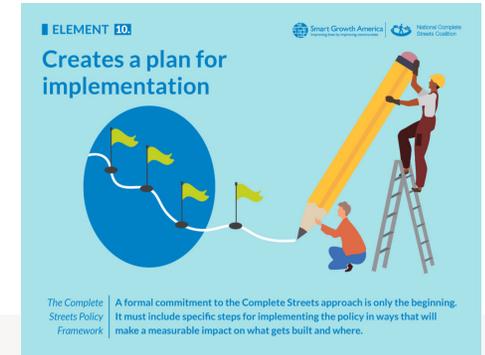|	Baltimore, Maryland	Howard County, Maryland	Milwaukee, Wisconsin
Do their reports inform their project selection and prioritization?	Yes. The Complete Streets Manual outlines a project prioritization process for —1. Sidewalks, 2. Roadway Resurfacing, 3. Capital Improvement Projects. Although, limited reporting on project prioritization is provided in existing reports. The 2022 report states "track prioritization of complete streets initiatives" as a lesson for future reports.	Yes. Howard County uses a Vulnerable Population Index and a Transportation Improvement Prioritization System, which evaluates projects based on certain criteria including safety, access, and equity. The reports include details of these systems as well as updates over time.	Yes. The Complete Streets Handbook outlines a "project Identification and selection process that lays out how DPW will invest equitably and prioritize available funding for projects. *The handbook was released in September 2023 and enough time has not passed to observe and report on the implementation of the approach.*

Make sure your documents are up to date

Documents and processes are inextricably linked to a vision for Complete Streets. To bring a Complete Streets policy to life, engineers need to know how to go about designing these streets in very clear, concrete terms. That's why element #6 and element #10 of our framework both require procedural documents, including design guides, that are related to Complete Streets to be updated to support a community's policy. Even the policies that were scored well against our framework have failed to produce the desired impact because there was no plan, checklist, or entity in charge of institutionalizing the policy and putting it into practice. (If everyone is responsible, then no one is responsible.) These missing components make it difficult (or impossible) to ensure professional staff is trained, stakeholders are held accountable, processes are updated, and the public is equitably engaged.

Although the framework only requires initial updates, data from these performance reports would ideally be incorporated into future edits of these documents. Do measures show that certain community engagement strategies work better than others? Community engagement documents can be updated to reflect this and other lessons to facilitate future efforts. Do certain design treatments reduce crashes more than other design treatments? Design guidance can be improved if this type of information is taken into account.

ELEMENT 6.
Adopts excellent design guidance
The Complete Streets Policy Framework Directs agencies to use the latest and best design criteria and guidelines, and sets a time frame for implementing this guidance.

ELEMENT 10.
Creates a plan for implementation
The Complete Streets Policy Framework A formal commitment to the Complete Streets approach is only the beginning. It must include specific steps for implementing the policy in ways that will make a measurable impact on what gets built and where.

	Baltimore, Maryland	Howard County, Maryland	Milwaukee, Wisconsin
Were any documents updated/ created?	Yes. Baltimore developed and adopted a Complete Streets Manual in 2021 which includes information on design standards, modal hierarchy, project prioritization, and community engagement policies.	Yes. Howard County updated its design manual in 2022 to ensure these policies were more systematically reflected in how their streets were designed.	Yes. Milwaukee DPW created a Complete Streets Handbook that enumerates policies for selecting, designing, and delivering projects and maintaining investments. A Complete Streets Workbook was also released along with it to walk DPW project managers through the project development process.

Coordinate with other departments and community-based organizations

The impact of Complete Streets extends far beyond transportation alone. Streets are tools that we use to connect us to destinations, and they are inextricably connected to the buildings, sidewalks, spaces, homes, businesses, and everything else under and around them that they serve.

This means that working in a vacuum is not going to get us anywhere unless transportation agencies coordinate with housing, land use, public health, public works, sanitation, and departments that deal with these issues in local governments. Element #5 and Element #7 of our framework requires proactive and supportive land-use planning and coordination with all of these parties. Coordination with these departments can improve the effectiveness of a Complete Streets policy by ensuring streets better interface with the other functions of government.
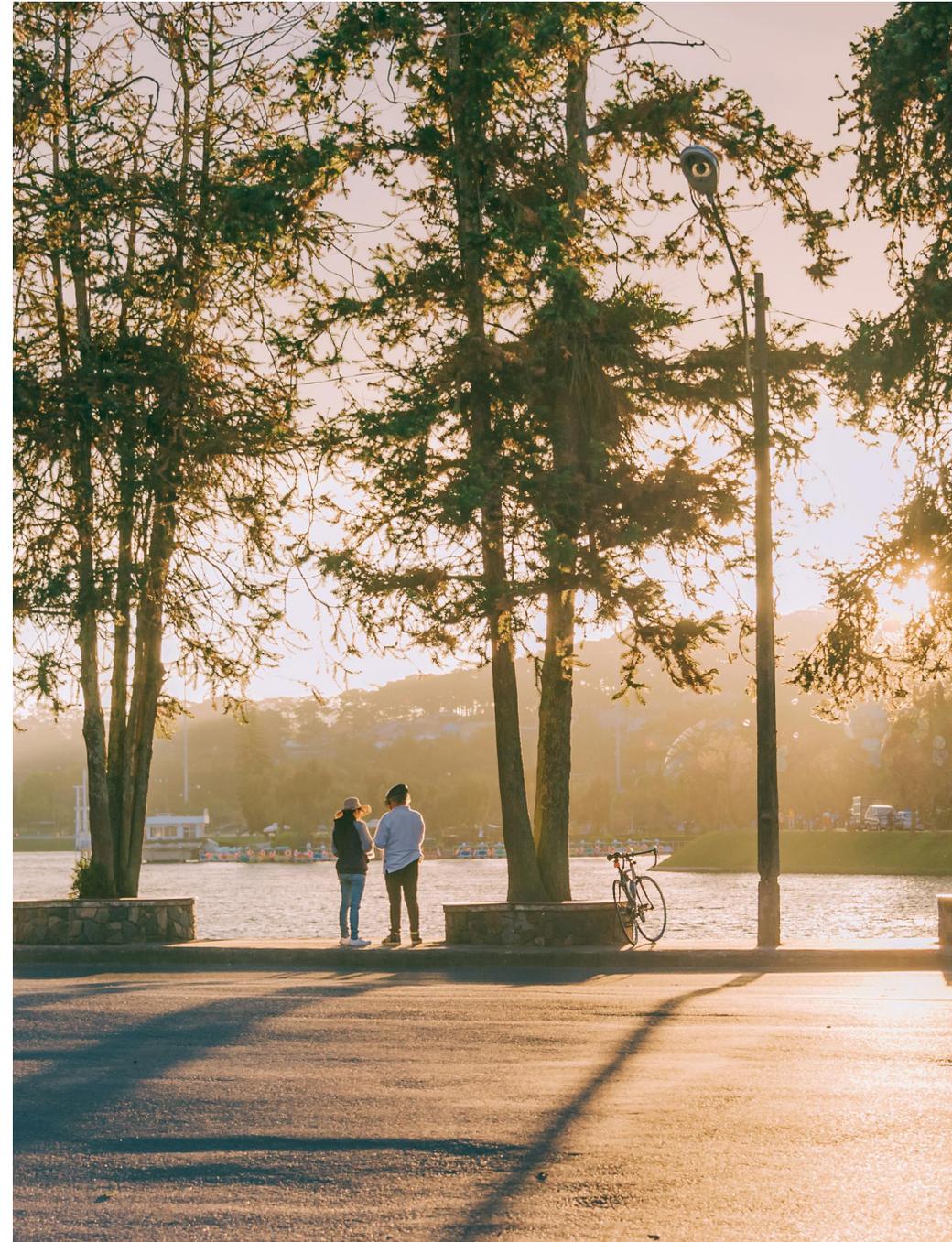
The data collected in order to measure the performance of a Complete Streets policy is one opportunity to start this coordination. The same way that performance measures help the direct implementers of a Complete Streets policy, it can also benefit partners. Therefore, sharing the data, lessons and observations from these reports with partners can aid all parties involved in better implementation and coordination. As discussed before, this logic also extends to state counterparts. As states often own the most dangerous streets in the country, any community adding Complete Streets treatments to the streets they control can be better supported in this work by building relationships and actively communicating with their state DOTs.

ELEMENT **5.**

Mandates coordination

The Complete Streets Policy Framework | Requires private developers to comply, and interagency coordination between government departments and partner agencies.

ELEMENT **7.**

Requires proactive land-use planning

The Complete Streets Policy Framework | Considers every project's greater context, as well as the surrounding community's current and expected land-use and transportation needs.

V. Conclusion

Building all the policy, procedural, and technical knowledge on how to bring Complete Streets policies from paper to practice is crucial but it is important to remember that Complete Streets policies are not technical policies at the end of the day. They are statements of value: who should get to safely, comfortably, and efficiently travel on our streets, and where and by which modes of transportation? And there is no one right way to do it.

Implementers of the policy who help make any of the choices outlined in this report have power over how these values translate into everyday experiences of community members. From the design of an intersection to the phrasing of a report, implementers and supporting partners can have an impact on how elected officials, local champions, and all residents interpret Complete Streets and how it can improve their trips to the work, grocery store, doctor's offices, and the houses of loved ones.

We hope that as implementers of the policy, you are able to communicate and prioritize the end goal of these efforts i.e. to provide people of all ages and abilities the choice and access to safe, comfortable, affordable, and efficient modes of travel. And we hope that the information contained in this report aids you in this effort.

Source: Min An, Pexels