



CITY OF
ORLANDO

QUICK BUILD GUIDE

JUNE
2023



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Special thanks to all members of the project team, including those who participated in peer agency interviews, internal workshops, meetings, and online discussion. Your participation and input was essential to the development of this guide.

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Broward Metropolitan Planning Organization
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City of Fayetteville, AR
Minnesota Department of Transportation
San Francisco Municipal Transportation Agency

FROM THE MAYOR



As Mayor of the City of Orlando, one of my top priorities is ensuring the work that makes it convenient and safe for residents to move throughout our community continues. It's especially important for us to help people navigate Orlando without relying on cars.

This is why I'm excited that our City of Orlando Transportation Department has developed a Quick Build Guide to help deliver transportation safety enhancements at an accelerated pace. The guide is designed to empower our staff and community and neighborhood organizations to initiate and implement projects that make it easier to walk, bike, roll and skate in Orlando, strengthening our city's already powerful culture of collaboration.

We believe that this guide has the potential to transform how we focus on transportation. Instead of relying solely on traditional infrastructure projects that can take years to plan and execute, we can utilize the Quick Build Guide to develop meaningful results in a shorter amount of time. The guide is based on best practices from other cities and lessons learned from similar projects implemented in Orlando and communities near and far. Projects in the guide will add to our Vision Zero efforts to eliminate traffic fatalities and serious injuries by 2040.

I look forward to seeing the safety projects that result from the Quick Build Guide and I thank you for playing a role in creating a safer, more equitable and resilient Orlando for all.

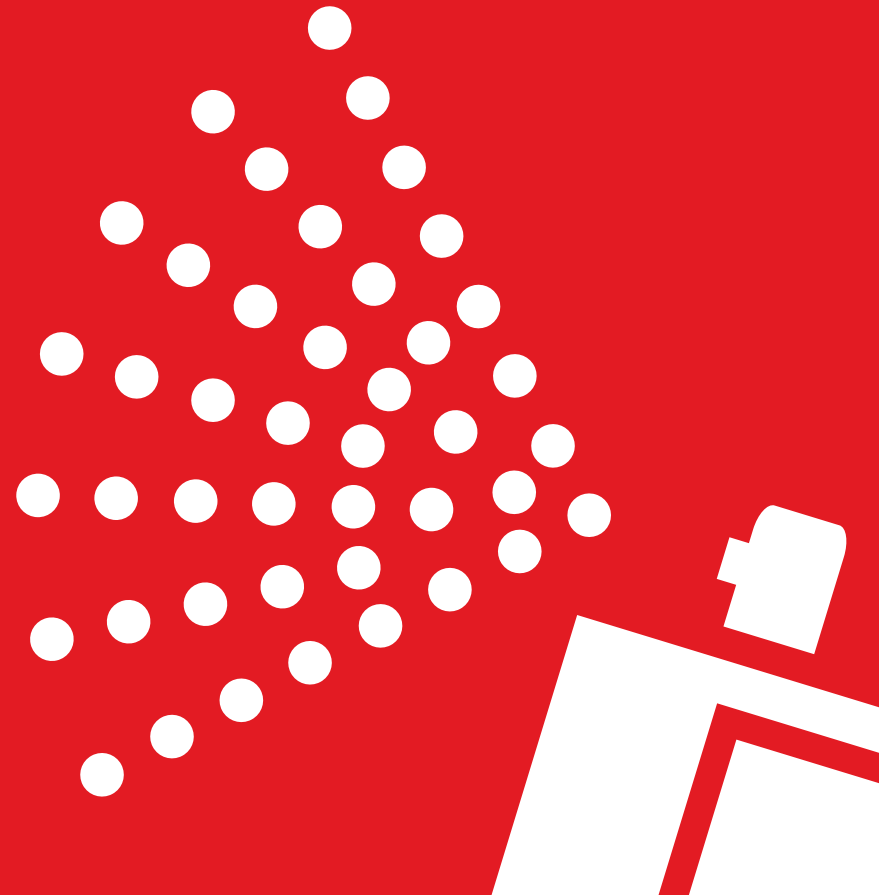
Sincerely,

A handwritten signature in blue ink that reads "Buddy Dyer".

Buddy Dyer
Mayor

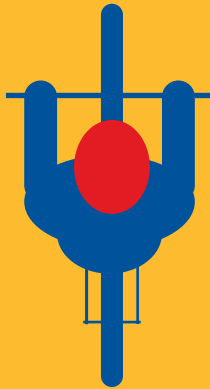
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WHAT IS
**QUICK
BUILD?**



Quick builds are **flexible**, **temporary** projects that let people test drive infrastructure changes that could create safer, more livable public spaces.

From crosswalks to bike lanes to parklets, quick-build projects help communities show the positive impacts of new ideas.

QUICK-BUILD PROJECTS ARE FLEXIBLE, LOW-COST INSTALLATIONS MEANT TO ADVANCE LONG-TERM COMMUNITY GOALS FOR SAFER, MORE INVITING PUBLIC SPACES.

Making the streets where people live, work and play safer and more livable is an increasing concern for communities. People want streets that are safe to walk and bike along, offer places to meet people, link neighborhoods and have a vibrant mix of uses to promote convenience and accessibility.

Traditional capital projects can be resource and time intensive, often resulting in delays. The quick-build method lets cities and communities test and implement improvements on a faster timeline with less effort and at a lower cost.

Quick-build interventions, also known as “tactical urbanism,” help demonstrate the positive impacts and potential of new ideas. These 'proof-of-concept' projects have been used across the country to gauge support from residents and the general public for a longer-term project or city policy.

They also send a message that change is possible by unleashing creativity to meet community desires and needs.



WHAT CAN A QUICK-BUILD PROJECT DO?

- Fill gaps in the walking or biking network before implementing a permanent capital improvement project
- Build support in communities for new or unfamiliar projects
- Provide data on project outcomes to help shape future policy and improve street design
- Increase collaboration between communities, internal departments and other partners
- Allow experimentation with safety designs, project types and materials prior to further investment
- Increase understanding of active transportation needs in the community



San Francisco, CA ([Wikimedia Commons](#), Fabrice Florin from Mill Valley, USA, CC BY-SA 2.0)

PROGRAM GOALS

The City of Orlando has developed this guide to provide information on how, where, when and why to implement quick-build projects. By making it easier for the city to implement safety improvements and for communities to recommend changes to their streets, this guide supports the city's commitment to [Vision Zero](#) and increasing choice and comfort for all people.

The quick-build process allows community members and decision-makers to experience new and unfamiliar designs that might sound too confusing, too radical or too disruptive to existing traffic patterns, before committing to making them permanent.

Quick-build projects address unique needs for each community based on its roadway and land use context, who lives and works in the area and how people move around. Regardless of these existing factors, all quick-build projects should fulfill at least one of the goals below.

1

Increase safety by slowing speeds, calming traffic or reducing conflicts between users at intersections. Make our streets safer for all users.

2

Invite public use by increasing green or public space, adding plantings or landscaping, introducing public art or providing seating or shade. Enhance community aesthetics and sense of place for a stronger local identity.

3

Improve business by increasing local foot traffic, enabling biking and walking connections or providing additional seating. Support a stronger local economy within our city.

4

Improve travel options by increasing access to transit or providing new safe and comfortable walking and biking routes. Balance mobility and access to ensure convenient choices for everyone.

Each step in the quick-build process should tie back to these goals, from selecting project type and location to choosing evaluation and outreach methods.

As you read on, consider the neighborhood where you live or work, or where you focus your efforts as a city employee. Think about which of these goals you'd like to accomplish and how quick build could help you get there.

PROJECT LEVEL

Demonstration Project

1 day – 1 week



Pilot Project

3 months – 1 year



RAPID Project

Open ended



Standard Capital Project

Open ended



DEMONSTRATION

Demonstration projects are temporary, very low-cost projects designed to be installed and removed quickly and easily—typically within a few days. Also called “pop-up” projects, demonstration projects may precede a longer pilot project and are most effective for educating the community about a project type or testing a new material or design. Inviting emergency services, school buses and transit vehicles to interact with the demonstration may result in critical tweaks to the design or materials before a longer-term implementation. Demonstrations can also be useful to prepare a community for an upcoming change in travel pattern, such as a roundabout. Unlike a longer-term pilot, a demonstration may act like an outreach event to solicit real-time feedback and educate people on-site about how they should navigate the new facility.



A demonstration path was installed on Corrine Drive to celebrate National Bike & Roll to School Day 2022

LIFESPAN:

1 day – 1 week.

PLANNING TIMELINE:

2 – 3 months.

BUDGET:

\$

FUNDING:

Community organizations, small grants, in-kind donations, city programs (such as safety funds, bike plan implementation, or economic development funds).

PUBLIC ENGAGEMENT:

Before, during and after implementation. Community input on design is expedited. No formal comment period.

APPROVALS:

Transportation Director or Designee.

PERMITTING:

Engineering Permit not required. For street closures, including for installation, coordinate with Traffic Management Division in lieu of Special Events Permit.

MATERIALS:

Temporary, easy to install and remove.

PILOT

Pilot projects are short-term, relatively low-cost projects with a lifespan of weeks or months rather than years. Like demonstration projects, a pilot is designed with temporary materials, although durable enough to last months and may expect some adjustments to improve form and function. A pilot may require maintenance and should be accompanied by performance evaluations to provide the city with data for future decision making. Although not required, pilots may be preceded by a demonstration and/or followed by a permanent capital project. Pilots are useful for quickly targeting safety concerns, such as a gap in the sidewalk or bike network, before a permanent solution can be developed or implemented; for testing the durability and maintenance needs of new materials; for gathering data and contributing to a knowledge base of citywide use-cases; as a proof of concept; or for developing partnerships and support within the community.



Amelia Street Bike Lane Bus Boarding Platform (City of Orlando)

LIFESPAN:

3 months – 1 year.

PLANNING TIMELINE:

2 – 6 months.

BUDGET:

\$\$

FUNDING:

Community organizations, small grants, in-kind donations, city programs (such as safety funds, bike plan implementation, or economic development funds).

PUBLIC ENGAGEMENT:

Before, during and after implementation. Community input on design is expedited. No formal comment period.

APPROVALS:

Transportation Director or Designee, Appearance Review Board or Historic Preservation Board (if applicable).

PERMITTING:

Engineering Permit not required. For street closures, including for installation, coordinate with Traffic Management Division in lieu of Special Events Permit.

MATERIALS:

Temporary, easy to install but more durable or installed differently than demonstration materials.

RAPID

RAPID (Resourceful and Prompt Infrastructure Design) projects use quick-build project types and materials but are intentionally longer-term with an open-ended implementation timeframe. RAPID projects make use of the efficiencies of the quick-build process to quickly deliver on project goals. Like a pilot project, a RAPID project may require maintenance over its lifetime and should be accompanied by performance evaluations. While these projects can certainly be followed by a more robust capital project down the line, they are meant to be long-lasting and to deliver results on their own. RAPID projects are useful for providing more separation and comfort in the biking and walking network, increasing safety at intersections and for gathering data on user behavior and activity.



Cayman Way and East Michigan Street (City of Orlando)

LIFESPAN:

Open ended.

PLANNING TIMELINE:

2 – 6 months.

BUDGET:

\$\$

FUNDING:

City Programs (such as safety funds, bike plan implementation or economic development funds).

PUBLIC ENGAGEMENT:

Before, during and after implementation. Streamlined engagement and condensed input opportunities.

APPROVALS:

Transportation Engineering, Public Works, Transportation Director or Designee, Appearance Review Board or Historic Preservation Board (if applicable). For projects that modify traffic flow such as lane repurposing, engineering approval required. City Council for funding, if required by procurement or grants processes.

PERMITTING:

Engineering Permit not required. For street closures, including for installation, coordinate with Traffic Management Division in lieu of Special Events Permit.

MATERIALS:

Similar materials as pilot and demonstration projects, but more durable or installed differently to be longer-lasting.

STANDARD CAPITAL

Standard capital projects are not quick build and not directly covered in this guide. Capital projects are programmed, designed and delivered using standard project delivery methods. While these projects often require longer planning timelines, more resources and higher investment, they result in permanent infrastructure implementation that has been thoroughly analyzed and vetted. Because of their permanent nature, capital projects are fixed facilities that do not allow for as much flexibility or experimentation as quick-build projects and the materials used are extremely durable and long-lasting. Depending on the proposed changes, the context or the scale, there are times when a capital project may be more suitable than a quick-build one.



Downtown Loop Trail (Kittelsohn & Associates, Inc.)

LIFESPAN:

Open-ended.

PLANNING TIMELINE:

2+ years.

BUDGET:

\$\$\$ - \$\$\$\$

FUNDING:

City Programs, Capital Improvements Fund, Bond Packages, State and Federal Grants.

PUBLIC ENGAGEMENT:

Before, during and after implementation. Lengthy and formal public engagement process.

APPROVALS:

Transportation Director or Designee, Appearance Review Board or Historic Preservation Board (if applicable), FDOT (if applicable), Orange County (if applicable).

PERMITTING:

Construction Permit required.

MATERIALS:

Permanent or hardscape.

PROJECT LIFE CYCLE

1

IMAGINE



- Develop the project idea
- Submit [Interest Form](#) (see p. 108)
- Attend strategy session



- City assesses project readiness
- City determines next steps and responsible parties



OR



OR

REFERRED TO OTHER PROGRAM



2

PLAN



- Develop the project package, including Evaluation Plan, Outreach Plan and Installation Plan
- Community stakeholders review and approve

3

BUILD



- Install the project
- Hold project opening
- Maintain the project
- Keep reaching out to the community

4

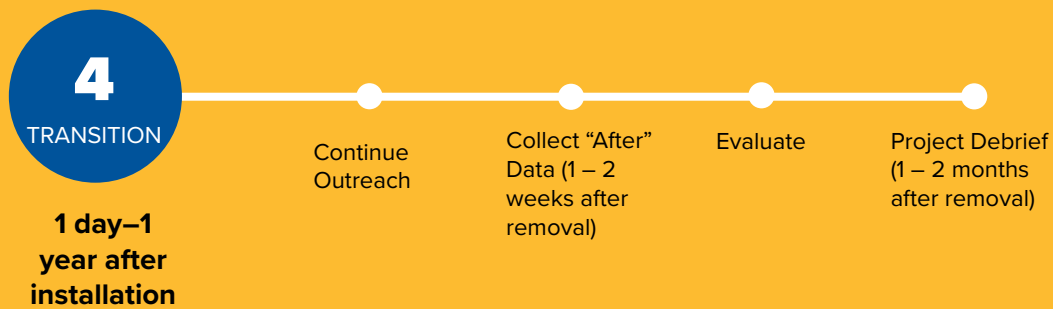
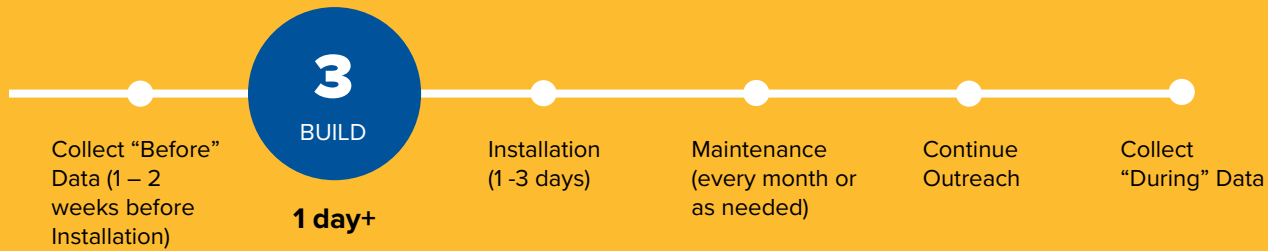
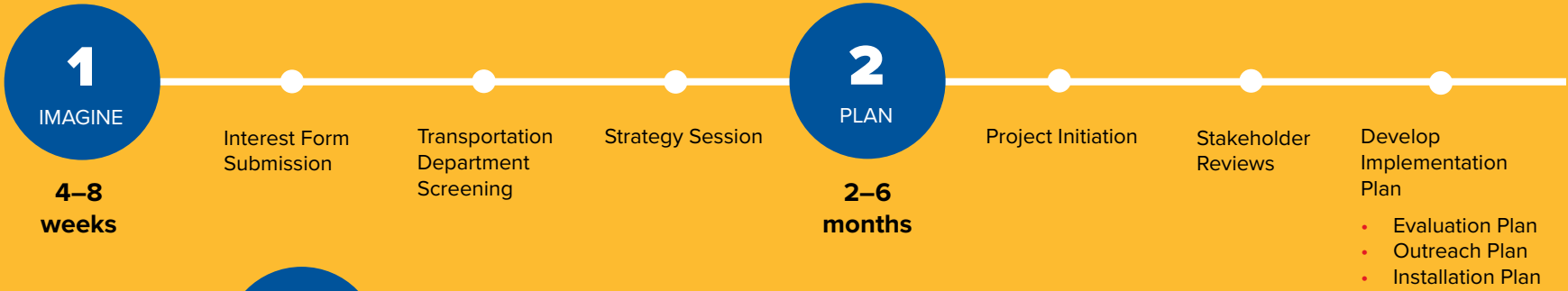
TRANSITION

- Remove or transition to RAPID or capital project
- Debrief



Who can submit a quick-build project idea? See p. 20

THE COUNTDOWN



GETTING **STARTED**



**Is there a need in your community
that is ready to be sparked into action?**

Read on to learn the keys to quick-build success!



ONCE YOU **HAVE AN IDEA** AND **IDENTIFY A PROJECT SITE**, FILL OUT THE **INTEREST FORM**. ALL PROJECTS WILL UNDERGO A SCREENING BY THE TRANSPORTATION DEPARTMENT TO DECIDE IF THE IDEA SUITS THE QUICK BUILD PROGRAM OR ANOTHER CITY PROGRAM. ONCE A PROJECT IS SCREENED, A STRATEGY SESSION WILL BE SCHEDULED TO DISCUSS NEXT STEPS.



STEP 1: IMAGINE

DEVELOP YOUR PROJECT IDEA

Start by asking yourself the eligibility questions below and identifying a project site. If your project sounds like a match for the city's quick-build program, fill out our [Interest Form](#).

CAN I SPONSOR A QUICK-BUILD PROJECT?

Quick-build project ideas can be submitted by the following groups:

Transportation Department or other city departments

Neighborhood groups or organizations

Micromobility companies, including bike and scooter share

Local businesses or organized business associations

Community-based organizations

Regional and statewide planning and transportation groups

Transit agencies

Community event organizers

Non-profits or advocacy organizations

Schools or school districts





IS MY PROJECT A GOOD CANDIDATE FOR THE QUICK-BUILD PROGRAM?

If your project site features some or all of the following characteristics, it is likely a good candidate for the quick-build program:

- In a residential neighborhood, downtown business district, main street or other area with a posted speed of 35 mph or less
- Has high walking, biking and/or transit activity or potential for these
- Is close to community amenities or destinations including schools
- Uncomfortable for people walking or on bikes
- Has wiggle room or excess right-of-way currently being used for on-street parking, street shoulders, wide travel lanes, existing bicycle infrastructure and/or green space that allow for some repurposing without encroaching on private property
- A quick-build project would not substantially interfere with existing driveways, transit routes, emergency access or ongoing construction projects
- Also used for existing celebrations or events
- Might benefit from aesthetically pleasing designs or artistic elements

DOES MY PROJECT MEET A NEED AND IS THERE DATA TO SUPPORT THIS?

To understand if your project will support the goals of the quick-build program, consider doing the following:

- Make site observations at different times of day (commuting hours, drop-off/pickup time at school, weekends, etc.) or review/conduct formal traffic counts if possible
- Talk to neighbors, business owners, the local crossing guard and others who are familiar with the site
- Look for publicly available data, news articles or information on the City of Orlando website or other trusted sources
- Consider surveying the experiences and perceptions of people living, working and traveling through the area

WHO ARE MY PROJECT PARTNERS?

Successful quick-build projects often feature strong partnerships. When proposing a project, consider including the following:

- Those who can provide resources—whether it be community insight, access to volunteers, financial sponsorship, public support, in-kind donations, labor, expertise or other
- Champions, leaders and advocates who have the community's pulse and trust to facilitate the necessary buy-in that ensures a project's success



DOES MY PROJECT ALLOW FOR EMERGENCY AND UTILITY ACCESS?

Projects must maintain access to public utilities and fire hydrants. Projects that modify turning radii or road width shall be reviewed by the Fire Department to ensure proper building access and emergency response needs. Projects in the vicinity of parks must accommodate load-in needs for events, either by using removable barriers or positioning barriers so they do not block loading areas.

DOES MY PROJECT COMPLY WITH EXISTING GUIDANCE?

Quick-build projects in the City of Orlando, including those that may use federal funding, should follow the street and roadway design guidance included in the National Association of City Transportation Officials (NACTO) [Urban Street Design Guide](#) and [Urban Bikeway Design Guide](#). The information in this guide is intended to supplement the design guidance provided there.

NACTO standards are compliant with, but not a substitute for, the [Manual on Uniform Traffic Control Devices for Streets and Highways \(MUTCD\)](#). All projects should consider how ADA accessibility can be maintained throughout project installation, as part of the project design and across outreach activities. The project manager assigned by the city will review and certify that design is consistent with the above guidance.

ADDITIONAL RESOURCES

There are numerous resources available that describe best practices for quick-build design, traffic calming and placemaking. Project sponsors may use these to inform their proposals:

- [The City of Orlando 2020 Bicycle Plan Update](#)
- [Quick-Build Guide: How to Build Safer Streets Quickly and Affordably](#) (CalBike and Alta Planning + Design, 2020)
- [Capitol Region Guide to Community Quick builds for Complete Streets](#)
- [Quick Build Design + Materials Standards – Burlington Public Works](#)
- [Tactical Urbanism Guide – City of Atlanta](#)
- [Demonstration Project Implementation Guide – Minnesota Department of Transportation](#)
- [Tactical Urbanism: Permitting Process, Application, & Materials Guide – City of Fayetteville, Arkansas](#)

TRANSPORTATION SCREENING

The Transportation Department staff will screen responses to the [interest form](#) to assess project readiness based on the following factors:

- Near schools, parks, or other community destinations
- Close to businesses, public amenities or a [Main Streets](#) district
- Close to a transit stop(s)
- Observed speeding
- History of crashes
- Underutilized on-street parking

- High volumes of people walking or biking
- Relation to existing planning processes, including the Orlando Bicycle Plan
- Opportunities for partnership with local organizations
- Opportunities to increase transportation equity
- Opportunities for scaling project up or making it permanent over time
- Project Risk

STRATEGY SESSION

A Transportation Department representative will reach out to schedule a strategy session, during which you'll discuss your project's goals and vision. At the end of this meeting, the Transportation Department representative will either:

- Accept your project idea, determine next steps and assign responsible parties;
- Refer you to another existing city program; or
- Determine the project does not qualify for the quick-build program.

STEP 2: PLAN

Once a quick-build project idea is accepted, it moves into the planning phase under the guidance and direction of a city project manager. The project sponsor will work in partnership with the city project manager to bring the project to fruition in a collaborative and positive way.

INITIATE THE PROJECT

At this stage, the city project manager will assemble a project team made up of city staff, stakeholders and community representatives to guide the project through the planning, build-out and transition phases.

A key member of this team will be the community champion: a person from the project area who can represent the community; advocate for the community's needs and for the best solutions to those needs; and report project updates back to the broader community.

Often, the community champion will be affiliated with the original project sponsor. For projects initiated by the Transportation Department, the project manager will identify a community champion at this stage.

PROJECT PACKAGE

Together, this project team will produce a project package including the following details:

- Concept design, including plan/details, location and [project type](#)
- Duration
- Types and quantities of [materials](#)



Source: Kittelson & Associates, Inc.

REQUEST STAKEHOLDER REVIEWS AND APPROVALS

While developing the implementation plan, the city project manager will circulate the project package to stakeholders identified in the checklist for review and approval (when needed).

STAKEHOLDER CHECKLIST

At this stage, the city project manager will also identify stakeholders that should be brought into the planning process. This list of stakeholder types and their potential involvement and/or required approvals should be reviewed for each project:

STAKEHOLDER INVOLVEMENT:

- ❑ **Community Groups**
 - ❑ Outreach plan
 - ❑ Installation plan: Volunteer coordination
 - ❑ Maintenance
 - ❑ **Public Works Department**
 - ❑ Street sweeping ([Streets and Stormwater Division](#))
 - ❑ Temporary signs (Sign and Signal Shop)
 - ❑ **Office of Communications and Neighborhood Relations**
 - ❑ Outreach plan
 - ❑ **Families, Parks and Recreation**
 - ❑ Outreach plan
 - ❑ Installation Plan
 - ❑ Maintenance
 - ❑ **Risk Management Division**
 - ❑ Insurance
 - ❑ **Procurement and Contracts Division**
 - ❑ Installation plan
 - ❑ Materials
 - ❑ **LYNX**
 - ❑ Concept design
 - ❑ Outreach plan
 - ❑ Installation plan
- STAKEHOLDER APPROVALS:
- ❑ **Orlando Fire Department**
 - ❑ Access to existing structures, utilities and fire hydrants
 - ❑ Emergency response vehicle access and fire access roads
 - ❑ **Parking Division**
 - ❑ Temporary parking restrictions
 - ❑ Parking reservations
 - ❑ **Economic Development Department**
 - ❑ Citizen Advisory Board review may be required depending on project location
 - ❑ **Downtown Development Board**
 - ❑ **Appearance Review Board (ARB)**
 - ❑ **Historic Preservation Board (HPB)**
 - ❑ [Orlando Main Streets](#)
 - ❑ [Permitting Services Division](#)
 - ❑ **Transportation Engineering**
 - ❑ [Temporary Traffic Control](#) Plan for installation and/or project-related event
 - ❑ **Maintenance of traffic plan (MOT) may be required**
 - ❑ **May also require coordination with Orlando Police Department**
 - ❑ Closure notices
 - ❑ Changes to traffic signals (If necessary)
 - ❑ Engineering approval may be required for projects that modify traffic flow

DEVELOP THE IMPLEMENTATION PLAN

After finalizing the project type, location and duration, the project team will begin to prepare for installation by developing an evaluation plan and outreach plan.

EVALUATION PLAN

- ❑ Select appropriate evaluation objectives and performance metrics based on project goals, context and timeline
- ❑ Collect before data
- ❑ Project installation
- ❑ Collect during and/or after data
- ❑ Evaluate
- ❑ Share lessons learned

How will you know if your project was a success? With so much data available, it can be tempting to try collecting it all, but this can be counterproductive. Too much data generates noise that can obscure the answers to your key research question. A good evaluation plan driven by the project goals will help you focus your data collection on what you need to know.

Some important questions an effective evaluation plan can help you answer include:

- How well did the project meet [program goals](#)?
- How effective were the design, project type and materials? Should they be used in future development?
- What did you learn? What successes can be shared with community partners and the general public?

While measurable quantitative data is critical, remember that qualitative data can be just as useful, especially in identifying changes in perceived conditions. For example, what does the community perceive as a safety issue and what story does the data tell? How does the community feel about the comfort of a facility after quick-build improvements are implemented?

Below are some of the most common objectives related to each of the program's central goals along with metrics that might be used to measure how well a project serves that goal. These metrics are not all-inclusive; every project is unique and will require context-specific data points.

Together, the project sponsor and the city project manager can use these suggestions to develop an evaluation plan specific to the location and scale of their particular quick-build project.

EVALUATION OBJECTIVES AND PERFORMANCE METRICS

INCREASE SAFETY

ACTION	PERFORMANCE MEASURE	METRIC
Reduce percentage of vehicles traveling over the speed limit	Percentage of vehicles speeding	Percentage of vehicles traveling above the speed limit; based on 24-hour data with off-peak hours showing similar trends
Adhere to posted/target speed	Vehicle speeds	Average and 85th percentile vehicle speeds along corridors; turning speed observations at intersections
Reduce number of crashes	Crashes resulting in serious injuries or fatalities	Total number and frequency of crashes resulting in serious injuries or fatalities over at least one year, with particular attention to those involving non-motorists (only applicable for Pilot or RAPID quick-build projects)
Reduce close calls	Observed close calls between motorists, people biking and/or people walking.	Total number and frequency of close calls during a set observation period
Increase number of drivers yielding to pedestrians	Driver yielding behavior	Proportion of drivers yielding at intersection or mid-block crossings or in mixing zones
Increase user safety	Vehicle or bicyclist compliance	Observations of compliance with signals or stop signs
Decrease vehicle blockage of bicycle lanes	Vehicles blocking bicycle lanes	Observations of where and how often vehicles obstruct bicycle facilities for parking, pickup/drop-off, or commercial loading/unloading
Increase perceived safety	Public perception of safety	Survey of neighborhood or businesses in project vicinity; direct feedback from community

INVITE PUBLIC USE

ACTION	PERFORMANCE MEASURE	METRIC
Increase sense of place and user comfort; boost attractiveness of area	Availability of public art	Number of art installations as part of the project or inspired by the project
	Streetscape elements	Additional landscaping, signs, or other elements that increase sense of place and user comfort
Increase perception of pleasing aesthetics	Public perception of community aesthetics	Survey of neighborhood or businesses in project vicinity; direct feedback from community

IMPROVE BUSINESS

ACTION	PERFORMANCE MEASURE	METRIC
Increase vibrancy of commercial districts; increase success of local businesses	Parking utilization	Vehicle, bicycle and micromobility parking utilization (ratio of parking availability to use over the course of a 24-hour period during the life of the project)
	Curb use	Observations of curb utilization and potential conflicts related to curb use by delivery vehicles, Transportation Network Companies (TNCs, such as Uber or Lyft), other passenger vehicles, or outdoor dining areas
	Commercial vibrancy	Commercial sales at businesses directly adjacent to project or in project vicinity; customer satisfaction
	Resident engagement	Frequency of community events or programmed activities in the project vicinity
Increase perceived business success	Public perception of business improvement	Survey of neighborhood or businesses in project vicinity; direct feedback from community

IMPROVE TRAVEL OPTIONS

ACTION	PERFORMANCE MEASURE	METRIC
Increase availability of and access to bicycle facilities	Miles of bicycle facilities	Miles of new biking facilities
Increase availability of and access to pedestrian facilities	Miles of pedestrian facilities	Miles of new pedestrian facilities or total miles of connectivity achieved
Increase access to community amenities	Access to community destinations	Proportion of households within a quarter mile walking distance of a comfortable walking or biking facility
Increase walking and biking trips in the community	Pedestrian and bicyclist volumes	Pedestrian and bicyclist volumes for one or more peak periods; Walking and biking trips as a portion of total trips along the project corridor or through the project site
Safer positioning of bicyclists; reduced conflicts with motor vehicles and pedestrians	Bicyclist positioning	Observations of location of bicyclists within the street—such as in a bike facility, in a vehicle lane, or on the sidewalk—or at intersections, such as within bike boxes or two-stage left-turn boxes
Decrease or maintain vehicle volumes	Vehicle volumes	Vehicle volumes (passenger and freight) for one or more peak periods or for a full 24-hour period to calculate Average Daily Traffic (ADT)
Increase pedestrian access and comfort	Presence of enhanced crossings	Number of enhanced pedestrian crossings
Increase transit speed and reliability to improve transit rider experience and encourage transit use	Transit speed and reliability	Changes in headway or travel time along a corridor
Increase perceived accessibility	Public perception of multimodal access	Survey of neighborhood or businesses in project vicinity; direct feedback from community

Adapted from [SFMTA's Safe Streets Evaluation Handbook](#)

EVALUATION BEST PRACTICES

Data should be collected both before and after project installation. This allows a direct comparison between pre-project conditions and the conditions created by the project. To ensure that data collected after the project can easily be compared to the baseline (before-project data) and doesn't reflect outlier conditions, consider the following:

- Many data points require analysis of peak periods, which are often the morning and early evening rush hours. Plan data collection accordingly.
- Avoid collecting data during special events, holidays, construction, or other events that may impact typical travel

behavior. For recurring events that may influence the use of the project space (such as farmer's markets), it may be useful to collect data both during events and on non-event days. Ensure data is collected for each scenario during pre-project and project implementation conditions.

- Be aware of nearby school schedules, as arrival and dismissal times can have a significant influence on travel patterns.
- Be consistent! Data should be gathered at the same location, on the same day of the week and at the same time (e.g., peak hour) when possible. Standard practice is to take traffic counts on a "normal weekday" (a Tuesday, Wednesday, or Thursday).



Source: Kittelson & Associates, Inc.

OUTREACH PLAN

- ❑ Ensure everyone is at the “table” (see [Stakeholder Checklist](#))
- ❑ Establish weekly project team coordination meetings
- ❑ Establish project expectations, determine project team responsibilities and seek feedback early and often
- ❑ Determine outreach methods, timeline and messaging for communicating project information through the project’s span
- ❑ Plan project programming (optional)

Early and frequent communication are the bedrock of a successful community partnership and project delivery. Outreach helps the project team communicate about the quick-build program and its goals to community, agency and internal stakeholders.

Outreach should begin at the earliest stages of the quick-build process and continue throughout the project life cycle. At each

stage, it is important to consider who needs to be at the table driving decision-making and who is a key stakeholder for on-the-ground operations. The “table” may include, at any time, an interdepartmental team of city staff and key community stakeholders, including the community champion.

For all stages of outreach, consider strategies to mitigate real or perceived barriers to entry or obstacles for communities of concern. These communities may face additional barriers in sponsoring a project due to a lack of access to information, strains on human capital, or other hurdles. In addition, these communities may not respond to or have access to traditional outreach methods. Therefore, outreach must be tailored in such a way that information on all aspects of the quick-build process reaches these communities appropriately.

When developing an outreach plan, consider the key outreach activities for each stage in the quick-build project lifecycle.



PROJECT PLANNING OUTREACH

As a project moves on to the planning stage, outreach will shift from understanding a community's basic needs for a quick-build intervention, to planning a project that can address those needs.

A collaborative quick-build process between the city and community members is going to be most successful when communication and trust is meaningful and strong. To improve communication and reduce frustration, it's important to ensure that everyone is speaking the same planning and design language. Take the time to define terms and educate stakeholders on the costs and benefits of different approaches to addressing needs—from project types to material selection.

Establishing a weekly recurring meeting between the city project manager, community champion and other stakeholders may help develop these plans. The key outreach activities listed below can be used as a rough agenda for your weekly meetings.

Key Outreach Activities During Project Planning

- Establish expectations for timeline and budget.
- Determine community responsibility related to installation (volunteers), maintenance, or evaluation.
- Share if there is another project or projects planned that will permanently bridge the gap the quick-build project addresses (e.g., if the pilot/demonstration is preceding a programmed capital project).
- Establish realistic aesthetic expectations. Quick-build safety projects whose goals are not fundamentally placemaking often use low-cost, flexible materials which are not designed to be permanent community fixtures. Some materials, however, can be beautified with a little creativity.
- If necessary, seek feedback directly from stakeholders or the community pre-implementation via a survey. This can provide a baseline with which to compare future feedback (see evaluation).

Outreach Methods

There are many ways to conduct outreach. Each quick-build project will likely require a unique combination of outreach methods.

Communication

Many avenues of communication can be used to share quick-build project information and updates. When choosing how to communicate with project partners, community members, business owners and other members of the public, consider the scale and duration of the project. Common communication methods include:

- Project website: Identify a point of contact that is actively monitoring for questions, feedback, or concerns; ArcGIS StoryMaps can be a dynamic and engaging online resource
- Laminated signs (posters, lawn signs)
- Aluminum signs
- Door hangers and flyers
- Postcards
- Business cards
- Brochures
- Press releases
- Social media posts
- Distribution through an existing newsletter or mailing list
- Packaged promotional or engagement kits (may include engagement materials to help partners solicit input or crowdsourced media—photos or videos of the existing or project conditions, survey responses, etc.)
- Surveys

Consider outreach methods that encourage crowd-sourced photos of how people are using the project or real-time feedback, such as QR codes that link to submission platforms, hashtags, or interactive maps. These photos or quotes can be featured on a live story map or in post-project reports. Even photos of violations, such as trash bins in a bike lane, can also help inform the city of necessary project design tweaks.

PROGRAMMING

In-person and virtual programming is also a powerful outreach tool since it can introduce an element of fun and community. Programming options include:

- Project opening or inauguration event to celebrate or invite community members to assist with project installation
- Block party
- Recurring "office hours" held by the community champion or other members of the project team at a central neighborhood location
- Demonstration event (ahead of pilot project)



Source: [Wikimedia Commons/Bournemouth Events](https://commons.wikimedia.org/wiki/File:Bournemouth_Events), CC BY-SA 2.0

INSTALLATION PLAN

- ❑ Obtain necessary approvals, assign responsibilities, prepare site for installation and gather materials prior to installation day
- ❑ On installation day, focus attention on the following:
 - ❑ Safety
 - ❑ Site preparation and installation plan
 - ❑ Documentation
 - ❑ Communication
 - ❑ Project opening/Inauguration event (optional)

BEFORE INSTALLATION DAY

- Ensure necessary permits and approvals have been obtained (see [Stakeholder Checklist](#))
- Develop a detailed installation plan, including roles and responsibilities for volunteers and other participants, necessary site preparation activities and a project schedule or order-of-operations for installation activities during installation day(s).
 - Note, some projects may benefit from beginning work over the weekend, early in the morning, or late at night depending on local traffic patterns and context, weather conditions, or other factors.
 - Installation activities should generally avoid peak travel times, such as during morning or afternoon rush hours.
 - Striping and surface materials will often need to be installed prior to vertical barriers. Consider the length of time needed for application, curing or setting and reapplication, if needed, in the development of the installation plan.
- Coordinate with Streets and Stormwater staff to arrange for street sweeping or pressure washing as debris can hinder the ability to apply surface materials or adhere vertical barriers.
- Coordinate with Parking staff to arrange for temporary parking restrictions and/or to reserve parking spots to avoid conflicts with parked cars and towing away vehicles during installation.
- Coordinate with the Orlando Police Department to execute the maintenance of traffic (MOT) plans if traffic control is needed.
- Arrange for any necessary equipment rentals or delivery of materials during installation.
- Confirm availability of any necessary vehicles or transportation.
- Arrange for the temporary storage and/or staging of project materials on site during installation.
- Ensure neighbors are notified about project timeline and installation schedule (see [Outreach](#))
- Ensure there is a volunteer management plan in place. Communicate with volunteers and confirm installation date, time and location, as well as appropriate dress attire, required equipment and safety information.
- Develop a briefing sheet with key messaging and answers to FAQs about the project.
- Check the weather forecast, special events calendar and school calendars to avoid circumstances that may make installation difficult or impossible.



Source: [Wikimedia Commons/Bournemouth Events](https://commons.wikimedia.org/wiki/File:Bournemouth_Events), CC BY-SA 2.0

ON INSTALLATION DAY

Installation day rarely goes exactly as planned, so it is important to be flexible and adaptable. Have backup plans in place and be prepared to make adjustments on the fly.

Safety

- Conduct a safety briefing for all volunteers and participants. Safety should always be the top priority on installation day. Ensure that all volunteers and participants are aware of any potential hazards, such as traffic or uneven ground and take measures to minimize risks.
- Make safety equipment available to volunteers and staff as needed, such as reflective vests, work gloves, hard hats, face masks, or eye protection.
- Set up temporary traffic control devices or temporary barricades first so that installation crews can safely work within the project area.
- Address any safety concerns that arise.

Site Preparation

- Set up workstations and organize tools and materials.
- Set up a sign-in table for volunteers.
- Execute installation activities according to the installation plan.
- Monitor progress and adjust plans as necessary.
- Conduct a final inspection of the installation site to ensure safety and cleanliness.
- Conduct any necessary post-installation cleanup and removal of equipment, tools, or trash from the site.
- Return any rented equipment or vehicles.

Documentation

- Assign volunteers or staff who will be responsible for taking pictures and video of the installation process. Having before/after pictures will be very helpful in telling the story.
- Ask volunteers to post on social media during their time on site to build community interest and excitement for the big reveal.

Communication

- Make sure that all volunteers and participants know their roles and responsibilities during installation activities.
- Conduct ongoing communication with volunteers and participants during the installation day(s).
- Identify a Communications Lead to distribute the briefing sheet to all volunteers and make it available to passersby. Media outlets may also show up to cover the story, in which case the Communications Lead can be the main point of contact.
- Debrief with volunteers and participants to gather feedback for future projects.
- Celebrate the completion of the project and thank all participants and volunteers.

Project Opening/Inauguration Event

- A proper promotional campaign/strategy should be in place to drive attendance to the event
- A lead person should be responsible for coordinating with any vendors/performers and their operational requirements
- If AV and sound is required for the event a proper tech check needs to be scheduled with all parties onsite a few hours before the event
- If any street closure is planned for the event, ensure permit status and confirm that all is in good standing for the event
- Events are a good opportunity to conduct surveys with community members and gather their input/reactions about the project. Make sure there are team members responsible to administer surveys.
- If there are any power requirements to run the event, ensure that power needs are met and/or that vendors provide their own source of power.
- Events and crowds generate trash; ensure there is a plan in place to provide additional trash receptacles (recyclable boxes/ bins) on site and a programmed schedule to pick up trash during and after the event.



Source: [Wikimedia Commons/Eric Sehr](#), CC BY-SA 4.0

STEP 3: BUILD

Time to get the project off the ground! At this stage, the [installation plan](#) will be followed to install the project elements. If desired, a [project opening or inauguration event](#) can be planned for the day or week of installation.

1. MAINTAIN THE PROJECT

- ❑ Consider ways to prevent vandalism or theft during installation
- ❑ Determine maintenance partners and methods for communicating maintenance needs
- ❑ Perform routine maintenance checks at least once a month and especially after weather events such as high heat and/or significant rain
- ❑ Replace barriers or refresh markings as needed throughout the lifespan of the project

Due to the nature of the materials used, quick-build projects often require more frequent maintenance than typical capital projects. Pilot project sites should be assessed for any routine maintenance needs at least once a month. Particular attention should be paid to areas frequently traversed by vehicle tires, the stability of vertical barriers separating people walking and biking from vehicles and plantings.

During the summer months, more frequent upkeep and maintenance may be required as consistent heat and rain can affect the integrity of many materials. For projects that include street furniture or other placemaking elements, consider ways to anchor or lock items in place to avoid vandalism or theft.

Coordinating some of the maintenance responsibilities with adjacent businesses or partnering association should be explored.

While the city will be responsible for replacing damaged materials, refreshing pavement markings and regular street sweeping, it is expected that community partners bear some responsibility for monitoring the project site, maintaining any plantings or artistic elements and communicating additional maintenance needs to the city.



Source: [Flickr/Washington State Department of Transportation](#)

2. CONTINUE OUTREACH

Outreach immediately leading up to and during project implementation will ensure a smooth transition for the neighboring community, successful project upkeep and the ability to quickly identify and respond to concerns.

To maintain a healthy partnership between the city and the community, outreach at this time should be coordinated and shared with the community champion. This will also ensure a better chance at reaching more stakeholders and develop a sense of ownership by community members.

The day or days following installation can serve as an opportunity to host an outreach-focused event, such as a project opening or inauguration. This provides an opportunity for the city to communicate directly with the users of the project space and to explain project elements in real time and space.

For pedestrians with visual or mobility impairments, this event can also serve as a touchpoint for learning how to navigate the new installation safely. Communication around this event, if such an event is to be held, must begin prior to installation, ideally with one to three weeks' notice.

KEY OUTREACH ACTIVITIES DURING PROJECT BUILD OUT

- Communicate early (at least one week ahead of installation) with people who live in and move through the project area that changes are coming which will affect the way they use the street, sidewalk, or bicycle lane.
- Notify nearby businesses or property owners, transit agencies, schools, emergency services, waste disposal services and postal service of the upcoming project.
- Consider posting materials along roadways leading up to the project area as well as at the proposed project site. For more complex projects which may significantly change the use of the space, such as a temporary roundabout, consider hosting a demonstration project first to actively educate people or allow key stakeholders, such as emergency services, to test the design.
- Advertise temporary closures, detours, or traffic control (during project installation and/or the lifetime of the project).
- Develop a project website or flyer including a description of the project benefits, extents, frequently asked questions (FAQ) and timeline as well as a point of contact at the city and in the community for questions or concerns.
- Educate users on how to use the new facility (if applicable) and how they are intended to interact in the project space.
- If necessary, seek feedback directly from stakeholders or via a survey following project implementation to compare against earlier data points. Online surveys have proven to be very effective but surveys can also be conducted in-person. (see [evaluation](#)).

STEP 4: TRANSITION

- ❑ Communicate the upcoming project removal or next steps to relevant stakeholders and neighbors
- ❑ Remove project elements and restore site to previous state or maintain project if remaining as [RAPID installation](#)
- ❑ Complete [evaluation](#) by reviewing and comparing before and after data
- ❑ Reflect on and record lessons learned

Once a project has reached its intended duration, it will typically be removed and the project site will be returned to its former condition. The city will conduct a project debrief to consider lessons learned and the potential for the project to transition to either a RAPID or long-term capital project.

CONTINUE OUTREACH

Preparing for project transition requires the continuation of outreach and communication to key stakeholders. Depending on the next steps for the project, this could include communicating how the project site will change after the project is removed or how the project will evolve in the future.

Following project removal and the evaluation period, publicize the results of key lessons learned and insights from data collection within city departments as well as with stakeholders and elected officials. Even if a project does not go exactly as planned, lessons learned are critical to improving future efforts and sustaining an effective quick-build program. Sharing these insights within one to two months of project removal is most effective.



Source: [Wikimedia Commons/Michael Barera](#), CC BY-SA 4.0

KEY OUTREACH ACTIVITIES DURING PROJECT TRANSITION

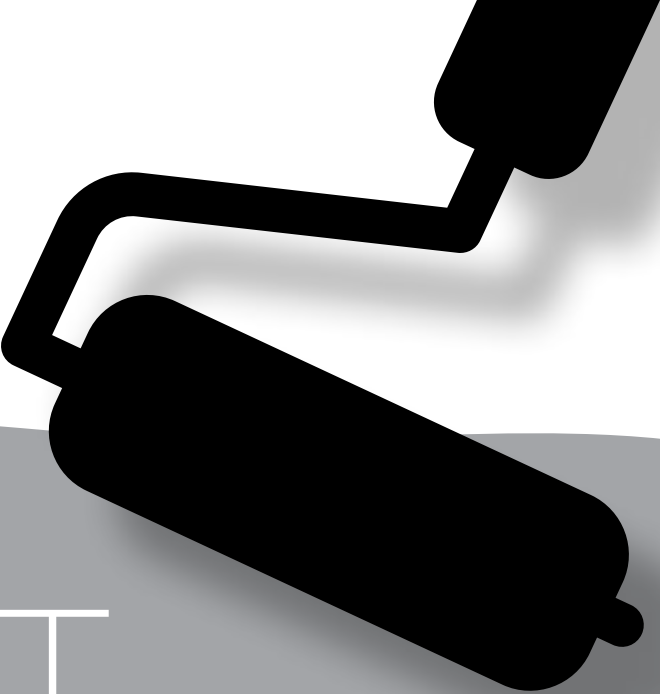
- Advertise temporary closures, detours, or traffic control (during project removal).
- Communicate how the removal of the project will change how users interact in the space.
- Explain what's next. What, if any, permanent project may be coming behind the project removal?
- Solicit feedback from project partners including the community champion, other project team members and community members.
- Recap the project highlights with photos, reflections, summarized feedback, or lessons learned.
- Share [evaluation](#) insights and lessons learned

LEARN FROM EVALUATION

Conducting evaluation is one of the best ways to learn key lessons from quick-build implementation. Once before and after data has been collected, it is important to take the time to analyze the results and begin to find and interpret patterns or changes. While there is always the potential for outside influences to affect some data points, important conclusions about the impacts of quick-builds project can be drawn by comparing across several metrics. These conclusions and lessons learned can then be used to inform the design and implementation of future quick-build projects.

TAKE TIME TO REFLECT

Following the conclusion of a project, the project manager will host a project debrief meeting with the team. This is an opportunity for the project team to share feedback on the project, discuss lessons learned, review evaluation results and determine next steps for the project. A summary of the debrief meeting and outcomes should be added to the project package for record keeping.



PROJECT **TYPES**

PROJECT TYPES

The following toolbox is intended to be used by city staff and community members to determine the most appropriate project to address local needs and quick-build program goals.

The project types catalogued here are associated with [program goals](#) to help stakeholders quickly identify the most relevant design elements for their needs.

There may be many project types that address a safety need; the challenges and opportunities of local contexts should guide the ultimate selection of a design element and project implementation.



INTERSECTION IMPROVEMENTS



TRAFFIC CALMING



MULTIMODAL



CREATIVE/ART

INTERSECTION IMPROVEMENTS

CURB EXTENSION

A curb extension, also known as a bulb-out, provides additional pedestrian space in the roadway beyond the existing curb at a crossing location. Curb extensions can shorten crossing distances, reduce vehicle turning speeds, improve sight lines between people walking and driving and calm traffic. They are typically delineated by striping, flex posts or other vertical barriers and/or other artistic elements.



Washington, D.C. ([DDOT](#))

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian)
- Invite public use

TYPICAL APPLICATIONS

- 1-4 lane roadway with existing on-street parking, bike lanes on at least one side, or wide turning radii



Kasson, MN ([MNDOT](#))

CURB EXTENSION (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
[Traffic cones](#)
[Traffic barrels](#)
[Freestanding delineators](#)
[Flex post](#)
[K71 flex posts](#)
[Wave delineators](#)
[Low-profile traffic separators](#)
[Planters](#)
[Plastic jersey barriers](#)
[Ceramic markers](#)
[Parking stops](#)
- **Pilot or RAPID**
[Flex post](#)
[K71 flex posts](#)

- [Wave delineators](#)
- [Low-profile traffic separators](#)
- [Planters](#)
- [Plastic jersey barriers](#)
- [Concrete jersey barriers](#)
- [Ceramic markers](#)
- [Parking stops](#)

DESIGN CONSIDERATIONS

- Maintain proper drainage and ability to access for street sweeping.
- Maintain truck, bus and fire truck turning ability.
- Where applicable, maintain bicycle lane access through curb extension and use elements to help reduce conflicts between people walking and biking.
- Continue to mark the crosswalk through to the physical curb unless the detectable surface has been relocated to the edge of the curb extension.
- Where pedestrians will be able to and/or encouraged to wait within the curb extension, consider crashworthy barriers such as jersey barriers.

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility of the sidewalks, curb ramps and extension itself, particularly for pedestrians with visual impairments

OTHER RESOURCES

- City of Orlando Intersection Curbside Island Detail
- [NACTO Urban Street Design Guide: Curb Extensions](#)

MINI ROUNDABOUT/NEIGHBORHOOD TRAFFIC CIRCLE

Mini roundabouts and neighborhood traffic circles can be installed at unsignalized intersections of local streets to calm traffic and reduce speeds. Mini roundabouts may be installed using simple pavement markings, a combination of markings and vertical delineators, or temporary islands. They create opportunities for plantings or artistic elements that help beautify the street and the surrounding neighborhood. Careful attention should be paid to the available lane width and turning radius around the traffic circle.

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (speed management)
- Invite public use

TYPICAL APPLICATIONS

- At unsignalized intersections of residential streets



British Columbia, Canada ([Wikimedia Commons](#), Richard Drdul, CC BY-SA 2.0)



San Francisco, CA (Kittelsohn & Associates, Inc.)

MINI ROUNDABOUT/ NEIGHBORHOOD TRAFFIC CIRCLE (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
[Traffic cones](#)
[Traffic barrels](#)
[Freestanding delineators](#)
[Flex post](#)
[K71 flex posts](#)
[Wave delineators](#)
[Low-profile traffic separators](#)
[Planters](#)
[Ceramic markers](#)
[Parking stops](#)

- **Pilot or RAPID**
[Flex post](#)
[K71 flex posts](#)
[Low-profile traffic separators](#)
[Planters](#)
[Ceramic markers](#)
[Parking stops](#)

DESIGN CONSIDERATIONS

- Where applicable, maintain shared lane markings or intersection crossing markings to guide bicyclists through the intersection.
- Where a bicycle boulevard turns at a minor intersection, use bicycle wayfinding route markings and reinforce route direction using shared lane markings.
- Provide approximately 15 feet of clearance between the circle and the edge of the roadway
- Maintain truck, bus and fire truck turning ability

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility of the sidewalks, curb ramps and extension itself, particularly for pedestrians with visual impairments

OTHER RESOURCES

- City of Orlando Mini Roundabout Detail
- [NACTO Urban Street Design Guide: Mini Roundabout](#)

LEFT-TURN HARDENING & SLOW-TURN WEDGES

Left-turn hardening refers to the use of striping, surface materials and vertical delineators at intersections to reduce left-turning speeds and to prevent “corner cutting.” Common types of left-turn hardening include centerline hardening, where modular curbs or barriers are placed where the centerline meets the intersection, or slow turn wedges, where striping and barriers are placed at corners to slow turning vehicles. This infrastructure is often installed at intersections where a minor street intersects with a major street and is especially useful at intersections with high volumes of pedestrians where speeds of left-turning vehicles are an issue.

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (speed management)

TYPICAL APPLICATIONS

- Centerline hardening is often installed at intersections where a minor street intersects with a major street.
- Slow turn wedges are often installed at intersections of two one-way streets



Boston, MA ([City of Boston](#))



New York, NY ([NYC DOT](#))

LEFT-TURN HARDENING & SLOW-TURN WEDGES (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
[Traffic cones](#)
[Traffic barrels](#)
[Freestanding delineators](#)
[Flex post](#)
[K71 flex posts](#)
[Low-profile traffic separators](#)
[Planters](#)
[Ceramic markers](#)
[Parking stops](#)

- **Pilot or RAPID**
[Flex post](#)
[K71 flex posts](#)
[Low-profile traffic separators](#)
[Planters](#)
[Ceramic markers](#)
[Parking stops](#)

DESIGN CONSIDERATIONS

- Maintain truck, bus and fire truck turning ability and make elements mountable if needed

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility of the sidewalks, curb ramps and turn-wedge if intended to serve as a curb extension, particularly for pedestrians with visual impairments

OTHER RESOURCES

- [VDOT: Left-Turn Hardening](#)
- [NACTO Don't Give Up at the Intersection: Minor Street Crossings](#)

DAYLIGHTING

Daylighting refers to the marking or otherwise blocking off of space ahead of a crosswalk or intersection to increase visibility between people walking and driving and to shorten crossing distances. Daylighting simply formalizes where parking is already prohibited adjacent to crossing locations and can be installed at both intersection and midblock locations.

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian)
- Invite public use

TYPICAL APPLICATIONS

- Intersections with high pedestrian activity and low visibility and sight distance
- Intersection design should facilitate eye contact between street users



Tampa, FL (Kittelson & Associates, Inc.)



Boston, MA (Kittelson & Associates, Inc.)

DAYLIGHTING (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)

- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
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- **Pilot or RAPID**
[Flex post](#)
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[Wave delineators](#)
[Low-profile traffic separators](#)
[Planters](#)
[Plastic jersey barriers](#)
[Concrete jersey barriers](#)
[Ceramic markers](#)
[Parking stops](#)

DESIGN CONSIDERATIONS

- Fixed objects, such as trees, signs and street furniture, deemed to inhibit the visibility of a given intersection and create safety concerns, should not be removed without the prior consideration of alternative safety mitigation measures, including a reduction in traffic speeds, an increase in visibility through curb extensions or geometric design, or the addition of supplementary warning signs.

NOTE: Usually, objects less than 24" tall do not inhibit visibility within 20' of an intersection

- Daylight intersections by removing parking within 20-25 feet of the intersection, or about one parking spot.
- Bicycle parking, curb extensions, or bioswales can be integrated into daylighting areas.

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility of the sidewalks, curb ramps and extension itself, particularly for pedestrians with visual impairments

OTHER RESOURCES

- [NACTO Urban Street Design Guide: Visibility/Sight Distance](#)

TRAFFIC CALMING

CHICANE

A chicane refers to offset curbs, curb extensions, parking lanes or other forms of horizontal deflection which create a “slalom effect” that can help to reduce speeding along roadways. In addition to calming traffic, chicanes can provide additional public space that can be activated further by seating, landscaping, bicycle parking, or public art.

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (speed management)
- Invite public use

TYPICAL APPLICATIONS

- 1-2 lane residential or urban center roadway



New York, NY ([NY Street Design Manual](#))



New York, NY ([Wikimedia Commons](#), By RoySmith - Own work, CC BY-SA 4.0)

CHICANE (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
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 - [Low-profile traffic separators](#)

- [Planters](#)
- [Plastic jersey barriers](#)
- [Concrete jersey barriers](#)
- [Ceramic markers](#)
- [Parking stops](#)

DESIGN CONSIDERATIONS

- Maintain proper drainage and ability to access for street sweeping
- Where applicable, maintain bicycle lane access around or through chicanes
- Provide an appropriate taper or transition zone between offset elements based on target speed and street geometry (see [MUTCD](#)).
- Maintain truck, bus and fire truck turning ability and make elements mountable if needed.
- Where pedestrians will be able to and/or encouraged to wait, walk, or spend time within the chicane, consider crashworthy barriers such as jersey barriers.

OTHER CONSIDERATIONS

- Chicanes should not obstruct access to driveways or fire hydrants
- Opportunity to include artistic elements and/or parklets
- If used as public space, consider ADA accessibility, particularly for pedestrians with visual impairments
- If designed on transit routes, consider the impacts of vertical deflection

OTHER RESOURCES

- City of Orlando Mid-Block Curbside Island Detail
- [NACTO Urban Street Design Guide: Chicane](#)
- [Streetfilm Stop Animation Video](#)

MEDIAN OR PEDESTRIAN/ BICYCLE REFUGE ISLAND

A median is a demarcated linear space in the center of the street, typically placed between the two directions of vehicle travel. Medians can calm traffic and reduce speeds by narrowing the roadway and providing deflection. Where wide enough, they can be used as refuge islands for people walking or biking to facilitate safer and more comfortable crossings. They are typically delineated by striping, flex posts or other vertical barriers and/or other artistic elements.



Oakland, CA (Kittelson & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian and bicycle)
- Improve travel options

TYPICAL APPLICATIONS

- Along sections of a 2-4 lane roadway
- On the approaches to intersections between 2 lane roadways



Madison, MN ([MNDOT](#))

MEDIAN OR PEDESTRIAN/ BICYCLE REFUGE ISLAND (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
 - [Traffic cones](#)
 - [Traffic barrels](#)
 - [Freestanding delineators](#)
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Concrete jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

DESIGN CONSIDERATIONS

- Maintain proper drainage and ability to access for street sweeping
- Maintain truck, bus and fire truck turning ability
- If meant to serve as a refuge island, must be at least 6' wide
- Determine appropriate taper length based on target speed and existing geometry (see [MUTCD](#) for more information)

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility if serving as a refuge island, particularly for pedestrians with visual impairments
- Consider a refuge with offsets (a “staggered crosswalk”) for midblock crossings. These crossings are often supported with RRFBs

OTHER RESOURCES

- City of Orlando Raised Island Detail
- [FHWA: Evaluating Pedestrian Countermeasures](#)
- [NACTO Urban Bikeway Design Guide: Median Refuge Island](#)
- [NACTO Urban Bikeway Design Guide: Pedestrian Safety Islands](#)

SHARED STREET/SLOW STREET

A shared street or slow street is a low-volume residential street on which space is shared by all users, with priority given to people walking and biking. Key characteristics include physical barriers at entry points, traffic calming treatments and informative signs to communicate that vehicles are guests in these spaces. To maintain low speeds and volumes, it may be necessary to restrict to local traffic only.

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian and bicycle, speed management)
- Invite public use
- Improve travel options

TYPICAL APPLICATIONS

- 1-2 lane residential roadway
- Existing posted speed of 25 mph or below
- Roadway is not a bus route



San Francisco, CA ([SFMTA](#))



Vancouver, Canada ([Wikimedia Commons](#), Wpcpey, CC BY-SA 4.0)



SHARED STREET/SLOW STREET (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
[Traffic cones](#)
[Traffic barrels](#)
[Freestanding delineators](#)
[Planters](#)
[Plastic jersey barriers](#)
[Type III barricades](#)
[Parking stops](#)
- **Pilot or RAPID**
[Planters](#)
[Plastic jersey barriers](#)
[Concrete jersey barriers](#)
[Type III barricades](#)
[Parking stops](#)

DESIGN CONSIDERATIONS

- Maintain proper drainage and ability to access for street sweeping
- Place barricade at each block end, at the least
- Where local traffic is permitted:
 - On streets with on-street parking, place barricade in the center of the roadway
 - On streets without on-street parking, place barricade on the right side of the roadway
- Consider emergency vehicle access and turning ability
- Temporary stencil markings and laminated or aluminum signs can be used to relay the street's proper use and directionality to users
- Can be combined with other quick-build traffic calming or intersection improvements to encourage slow speeds

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility particularly for pedestrians with visual or mobility impairments
- Required notices

OTHER RESOURCES

- [NACTO Urban Street Design Guide: Residential Shared Street](#)
- [Low Traffic Neighbourhood \(London\) Report](#)

SPEED HUMP OR SPEED CUSHION

A speed hump or speed cushion is a raised section of pavement that calms traffic and slows speeds by providing vertical deflection. A speed cushion is the same as a speed hump, but it provides cutouts that allow emergency vehicles and bikes to pass unaffected.



San Francisco, CA (Kittelsohn & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (speed management)

TYPICAL APPLICATIONS

- 1-2 lane residential roadway, spaced 150' to 200' apart



British Columbia, Canada ([Wikimedia Commons](#), Richard Drdul, CC BY-SA 2.0)

SPEED HUMP OR SPEED CUSHION (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

OTHER

- **Demonstration, Pilot, or RAPID**
[Temporary rubber speed humps or cushions](#)

DESIGN CONSIDERATIONS

- Warning pavement markings and/or signs are typically placed in advance of a speed hump or cushion
- Do not place in front of driveways or other major access points
- Maintain proper drainage and ability to access for street sweeping
- Where applicable, maintain bicycle lane access around or through speed humps

OTHER CONSIDERATIONS

- [City of Orlando: Report Speeding in Your Neighborhood](#)
- [City of Orlando: Steps of a Traffic Calming Study](#)

OTHER RESOURCES

- City of Orlando Speed Hump Detail
- City of Orlando Speed Cushion Detail
- [NACTO Urban Street Design Guide: Speed Hump](#)
- [NACTO Urban Street Design Guide: Speed Cushion](#)

MULTIMODAL

DEMONSTRATION PATH

A demonstration path is a designated pathway installed on a temporary basis within the roadway for people walking, biking, or rolling. A demonstration path can be installed for a special event, to temporarily fill gaps in the bicycle network, or as a proof-of-concept and it may be one-way, two-way, or contraflow.



Orlando, FL (City of Orlando)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian and bike)
- Improve travel options

TYPICAL APPLICATIONS

- 1-4 lane residential or urban center roadway
- Within an existing on-street parking lane
- Within a travel lane on a roadway with at least two travel lanes in each direction



Massachusetts ([MassDOT](#))

DEMONSTRATION PATH (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
 - [Traffic cones](#)
 - [Traffic barrels](#)
 - [Freestanding delineators](#)
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)
- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)

- [Wave delineators](#)
- [Low-profile traffic separators](#)
- [Planters](#)
- [Plastic jersey barriers](#)
- [Concrete jersey barriers](#)
- [Ceramic markers](#)
- [Parking stops](#)

DESIGN CONSIDERATIONS

- One-way paths must be a minimum of 4', while two-way require at least 10'
- Where possible, provide a minimum 2' buffer between the path and vehicle travel lanes. If a buffer cannot be accommodated, include vertical barriers in the design.
- Where paths must traverse driveways or navigate intersections, provide accommodations such as bike cross markings, green conflict striping, bike boxes, or curb extensions
- Maintain truck, bus and fire truck turning ability
- Temporary stencil markings and laminated or aluminum signs can be used to relay the path's proper use and directionality to users
- Where bike lanes already exist, demonstration projects may include the addition of a horizontal or vertical buffer
- Provide accessible ramps to and from the sidewalk and detectable warning surfaces at entry and exist points
- Consider path termini and safe transitions between varying cross sections

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility, particularly for pedestrians with visual impairments

BICYCLE LANE

A bicycle lane is a designated facility running along the curb, shoulder, or on-street parking lane for people biking. Bicycle lanes are traditionally one-way facilities running in the same direction as motor vehicle traffic, but they may be two-way or contraflow in some contexts. In contrast to a demonstration path, a quick-build bike lane is typically installed for a longer duration to fill an important gap in the bicycle network. Bicycle lanes may be delineated by simple striping, by a striped buffer and/or vertical barriers.



San Francisco, CA (Kittelson & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (bicycle)
- Improve travel options

TYPICAL APPLICATIONS

- 1-4 lane residential or urban center roadway
- On roadways which represent a current gap in the bicycle network
- Within an existing on-street parking lane
- Within a travel lane on a roadway with at least two travel lanes in each direction



Cambridge, MA (Kittelson & Associates, Inc.)

BICYCLE LANE (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Concrete jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

DESIGN CONSIDERATIONS

- One-way paths must be a minimum of 4', while two-way require at least 10'
- Where possible, provide a minimum 2' buffer between the bike lane and vehicle travel lanes. If a buffer cannot be accommodated, include vertical barriers in the design.
- Where paths must traverse driveways or navigate intersections, provide accommodations such as bike cross markings, green conflict striping, bike boxes, or curb extensions
- Maintain truck, bus and fire truck turning ability
- Dash striping on approaches to and through transit stops
- Temporary stencil markings and aluminum signs can be used to relay the path's proper use and directionality to users

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility, particularly for pedestrians with visual impairments

OTHER RESOURCES

- [NACTO Urban Bikeway Design Guide: Conventional Bike Lanes](#)
- [AASHTO Guide for the Development of Bike Facilities](#)

TWO-STAGE LEFT-TURN (TSLT) BOX & BIKE BOX (ADVANCE STOP BAR)

Bike boxes increase the visibility of people biking at an intersection and improve safety for cyclists making left turns at signalized or complex intersections. A bike box (also known as “advance stop bar”) is a designated area in front of the traffic lane at a signalized intersection which provides bicyclists with a safe and visible space to get ahead of vehicle queues and clear the intersection quickly upon a green light. A two-stage left turn (TSLT) queue box provides people biking with a safer and more comfortable way to make left turns, particularly at high volume, higher speed, or multilane intersections.



San Diego, CA (Kittelson & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (bicycle)
- Improve travel options

TYPICAL APPLICATIONS

- Signalized, multilane intersection with designated bike lanes (TSLT)
- Unsignalized intersections or mid-block crossings (TSLT)
- Roadways with high cyclist or vehicle volumes/speeds
- Along cycle tracks
- Where bicycle facilities cross streetcar tracks
- On corridors with frequent vehicular right turning movements or bicycle left turns
- Where dominant vehicle traffic flows right and bicycle traffic goes through (e.g., Y intersection or access ramp) (Bike Box)



Washington, D.C. (Kittelson & Associates, Inc.)

TSLT (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

DESIGN CONSIDERATIONS

- Use solid green paint or durable pavement to increase visibility
- Pavement markings should include bicycle stencil and turn arrow to indicate bicycle turning direction
- TSLT box should be located in a protected area e.g., one or all of the above:
 - Outside the path of through vehicle traffic
 - Between the bicycle lane and pedestrian crossing
 - Within an on-street parking lane
- In constrained locations, a bike box may double as a TSLT box
- A bike box is typically 10-16 ft deep
- Requires formal request and approval from FHWA to use under current interim approval

OTHER CONSIDERATIONS

- Consider using a TSLT box to help cyclists transition between one-way and two-way bike facilities or other complex movements (such as midblock crossings from the right lane)
- Install “Stop Here on Red” (R10-6) signs to denote location of relocated stop bar
- Install “No Turn on Red” (R10-11) signs and “Except Bicycles” plaques to prevent vehicles from encroaching on the bike box area
- Provide bicycle crossing markings through intersection to define bicycle path to the box
- Bicycle signals with a leading interval may be installed in conjunction with TSLT box
- Green pavement markings may require more frequent maintenance or reapplication
- Two stage turns may increase comfort as well as delay as the cyclist needs two green cycles (one for the through street and one for the cross street) to complete the turn
- Does not benefit cyclists approaching intersection on a green signal

OTHER RESOURCES

- [Interim Approval for Optional Use of an Intersection Bicycle Box](#)
- [Interim Approval for Optional Use of Two-Stage Bicycle Turn Boxes](#)
- [NACTO Urban Bikeway Design Guide: Two Stage Turn Queue Boxes](#)
- [NACTO Urban Bikeway Design Guide: Bike Boxes](#)

TRANSIT STOP IMPROVEMENTS

Transit stop improvements can encompass a range of installations to improve comfort for transit riders, increase the speed and reliability of transit routes and/or reduce conflicts between transit riders, people biking and vehicles. Common quick-build transit stop improvements include modular bus boarding platforms, temporary transit shelters or street furniture, or transit stop beautification. A bus boarding platform refers to when the bus stop waiting area is separated from the sidewalk by a bicycle lane. These installations can make both bus and bike movements more comfortable and efficient by eliminating merging conflicts between the bus and bikes and reducing the need for buses to pull off the roadway at the stop. Conflicts between people getting on and off the bus and cyclists passing through do occur at bus boarding platforms and should be considered in the treatment's ultimate design, visibility and communication.



Washington, D.C. (Kittelson & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian and bicycle)
- Invite public use
- Improve business
- Improve travel options

TYPICAL APPLICATIONS

- Bus stops on roadways with existing bicycle facilities and/or existing on-street parking
- Bus stops that currently lack basic amenities such as shelter or seating



Orlando, FL (City of Orlando)

TRANSIT STOP IMPROVEMENTS (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

VERTICAL BARRIERS

- **Pilot or RAPID**
[Bus Island](#)
[Flex post](#)
[K71 flex posts](#)
[Low-profile traffic separators](#)
[Planters](#)
[Ceramic markers](#)
[Parking stops](#)

DESIGN CONSIDERATIONS

- For bus boarding platforms, provide accessible ramps leading to the platform and adequate space for transit riders to wait, board and alight.
- Raising the bike lane through the bus stop, additional signs and other markings can help reduce bicyclist speeds and encourage yielding to crossing pedestrians
- Ensure temporary shelter or furniture is accessible to pedestrians with mobility impairments
- Accessible boarding areas are typically 8 feet by 5 feet wide

- Bicycle lanes adjacent to the bus boarding platform may be narrowed (to a min. of 5 feet) to slow bicycle traffic and reduce conflicts
- Extend length of bus boarding platform if articulated buses use stop

OTHER CONSIDERATIONS

- Opportunity for placemaking via a “stoplet” (multipurpose parklet)
- Accessibility of the sidewalks, curb ramps and the platform, particularly for pedestrians with visual impairments
- Coordination with LYNX

OTHER RESOURCES

- [Fast Tracked: A Tactical Transit Study](#)
- [NACTO Transit Street Design Guide](#)
- [NACTO Transit Street Design Guide: Side Boarding Island Stop](#)

BIKE PARKING

Amenities like dedicated bike parking supplement the broader bicycle network, by providing cyclists with a way to confidently plan bicycle trips and comfortably spend time in places. Bike parking can enable more multimodal trips by providing space for people to secure their bikes at transit stations and can expand the impact area of a transit system or nearby bike facility. Always consider the location, quantity and security of the bike parking demanded by site context.



Orlando ([Orlando Bike Plan Update](#))

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use
- Improve business
- Improve travel options

TYPICAL APPLICATIONS

- **Short Term (trips <2 hours):** Bicycle racks installed on sidewalks or in plazas; bicycle valet programs, which operate like coat checks (usually for events).
- **Long Term (2-24hrs):** Access-controlled spaces which provide security from theft and protection from the elements, often located near transit hubs or key walking and biking generators. These systems range from free (but registration required) to subscription-based.



Berlin, Germany ([Wikimedia Commons](#), gislars, CC0)

BIKE PARKING (CONT'D)

MATERIAL OPTIONS

- **Short Term:** U Racks, post and ring, wheel well-secure racks
 - For bicycle valet programs, saw horses or other crowd-control barricades work well as temporary bicycle racks, but they should be confined within a defined and secure perimeter, such as a large room, fencing, or other barriers.
- **Mid-Term:** Short-term options with shelter
- **Long Term:** Bike lockers, Bike cages

DESIGN CONSIDERATIONS

- Designs should consider ability to accommodate standard U-locks and provide at least two points of contact to provide functionality and security.
- Materials should be securely fastened to the ground and not easily cut or detached by common hand tools (bolt cutters, wrenches, pry bars)
- Provide adequate space between adjacent racks such that bicycles can be parked on either side. Racks should leave enough room between adjacent parked vehicles (e.g., for U racks, minimum 15 inches should be left between racks)
- Bike parking should not encroach on the walkway where it (empty or full) would pose a tripping hazard

OTHER CONSIDERATIONS

- Bike racks, lockers, secure bike cages, or bike corrals may be considered as in-street options, particularly in repurposed parking spaces near a low-volume intersection. This keeps the sidewalk clear for pedestrians and “daylights” the crossings for turning vehicles which may have otherwise had a parked car in their blind spot.
- Consider providing shelter for bike parking
- Consider not only the volume of anticipated bike parking demand but the type of bikes, including cargo and e-bikes, which typically have bigger footprints
- If a non-traditional or artistic design is used to increase community character, ensure the blueprint meets design standards. Cyclists will not use a bike rack which they cannot confidently secure their bike to.

OTHER RESOURCES

- [City of Orlando Bicycle Plan Update \(2020\)](#)
- [San Diego Bicycle Design Guidelines Appendix B](#)
- [Essentials of Bike Parking \(APBP\)](#)

SHARED MICROMOBILITY/ BIKE CORRAL

A “corral” typically transforms an on-street vehicle parking space or spaces into parking for bikes or shared micromobility devices, such as e-scooters. Providing dedicated in-street space for these devices has several benefits including (1) reducing sidewalk “clutter” by providing clearly marked parking for micromobility devices, (2) “daylighting” intersections to improve pedestrian visibility and illegal car parking (which creates blind spots) too close to the crossing and (3) providing more space than a typical section of the sidewalk might allow for parking a larger number of devices.



Orlando (City of Orlando)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use
- Improve business
- Improve travel options

TYPICAL APPLICATIONS

- On roadways with on-street parking
- Commercial districts
- Areas with high pedestrian activity or where sidewalks are too narrow to practically accommodate bike parking



Philadelphia, PA (City of Orlando)

SHARED MICROMOBILITY/ BIKE CORRAL (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
 - [Traffic cones](#)
 - [Traffic barrels](#)
 - [Freestanding delineators](#)
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Concrete jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

DESIGN CONSIDERATIONS

- On-street design: typically replace approximately 1-2 vehicle parking spaces (depending on roadway context and design details).
- Sidewalk design: typically in “furniture zone”
- A stencil or symbol should clearly indicate the intended use of the corral (e.g., of a scooter and/or bike), particularly if the corral is intended only for self-locking micromobility devices which do not require docks or racks.

OTHER CONSIDERATIONS

- If devices are improperly parked or tip over into the curb or sidewalk, they could create hazards for cyclists or pedestrians.
- In-street murals to demarcate corrals have the added benefit of increasing the visibility and placemaking of the space
- If removing vehicle parking spaces, proactively communicate with adjacent businesses.

CROSSWALK

A crosswalk serves as a designated location for people walking to cross from one side of a street to another. Crosswalks are often located at intersections but can also be located mid-block where block lengths are longer or there are pedestrian generators. Quick-build crosswalk projects can include striping a new crosswalk, updating an existing crosswalk to be higher-visibility, or adding artistic elements to an existing crosswalk (see crosswalk art). Crosswalks on their own do not inherently create a safe or comfortable environment, but together with other traffic calming treatments can support a walkable environment.



British Columbia, Canada ([Wikimedia Commons](#), Bill Henry, CC BY 4.0)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian)
- Improve travel options

TYPICAL APPLICATIONS

- On roadways with higher volumes (>3,000 ADT), speeds greater than 20 mph, or more than two lanes
- Near schools, parks, plazas, senior centers, transit stops, hospitals, campuses, major public buildings and other areas with high pedestrian activity



Kasson, MN ([MNDOT](#))

CROSSWALK (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)
 - [Ramps](#)

DESIGN CONSIDERATIONS

- Quick-build crosswalks are at-grade and should be aligned between two pedestrian zones, typically sidewalks
- Crossing distances should be reduced where possible using tighter corner radii, curb extensions and medians
- High-visibility ladder crosswalk markings are preferable to standard parallel or dashed pavement markings.
- Advance stop bars, yield markings and/or additional warning signs can help encourage driver yielding rates

OTHER CONSIDERATIONS

- Opportunity to include artistic elements and/or coordinate with a larger intersection mural project
- ADA accessibility of the sidewalks and curb ramps to which the crosswalk is connecting
- Presence of a crosswalk alone does not render a safe street. Roadway context may necessitate additional safety considerations such as pedestrian refuges, pedestrian signals or beacons, or other traffic calming elements.
- In areas where there is common nighttime activity, consider street lighting to increase the visibility and comfort of people walking.

OTHER RESOURCES

- [NACTO Urban Street Design Guide: Crosswalks and Crossings](#)
- [NACTO Urban Street Design Guide: Interim Design Strategies](#)

CREATIVE & ARTISTIC

PARKLET

A parklet serves as a sidewalk extension onto the roadway that adds space and amenities for people to access and use. Parklets usually extend out at sidewalk level using a raised platform but may be installed at street-level for demonstration projects. They typically take up the entire width of a parking lane and the length of at least one vehicle parking spot. Parklets may include furniture items such as tables, chairs and benches, in addition to planters, lighting and bike racks. They might also include canopies to shelter people from the elements. Built with diverse materials, parklets are usually tailored to their unique use.



Łódź, Poland ([Wikimedia Commons, Zorro2212, CC BY-SA 4.0](#))

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use
- Improve business

TYPICAL APPLICATIONS

- Along commercial streets or neighborhood retail corridors where there is moderate to heavy foot traffic and the need for public space is greater than the need for car parking.
- At schools to add space for outdoor learning, seating, bike parking, or waiting for the bus.
- As a pedestrian buffer, where there is a lack of separation between the sidewalk space and the roadway.
- As a sidewalk extension, where there is a need for more outdoor public space along the sidewalk.



San Francisco, CA ([Wikimedia Commons/Mark Hogan, CC BY-SA 2.0](#))

PARKLET (CONT'D)

MATERIAL OPTIONS

STRUCTURAL MATERIALS

- Metal
- Wood
- Plastic
- Concrete

VERTICAL BARRIERS

- **Demonstration**
 - [Traffic cones](#)
 - [Traffic barrels](#)
 - [Freestanding delineators](#)
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Type III barricades](#)
 - [Parking stops](#)
- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Concrete jersey barriers](#)
 - [Parking stops](#)

FURNITURE AND AESTHETIC MATERIALS

- Artificial turf
- Plant material / landscaping

- Wooden or metal decks, pillars and canopies
- Wooden, metal and/or plastic street furnishings (benches, chairs, tables)

DESIGN CONSIDERATIONS

- Parklets are for public access and need to be designed accordingly. Use strong materials that will withstand the natural elements and the number of people that will use the parklet.
- Consider the speed at which vehicles travel adjacent to the parklet and what type of buffer will be needed.
- Consider stormwater runoff and how the existing curb configurations will work with the new raised platform installation.
- Consider ADA access on and off the parklet for wheelchairs, strollers and other devices.
- Consider installing wheel stops at least four feet away from parklet to separate parklet from adjacent parking spots.
- Minimum desired parklet width is six feet.
- Minimum desired buffer space between parklet and travel way is two feet.
- Consider crashworthy barriers such as jersey barriers.

OTHER CONSIDERATIONS

- Consider coordinating with adjacent businesses on placement and design.
- Consider the effects on the parking supply the parklet will be replacing.
- Consider combining a parklet with a curb extension, if near an intersection.

OTHER RESOURCES

- [Downtown Orlando Parklet Program](#)

TEMPORARY PLAZA

Temporary plazas, or pop-up plazas, are projects that improve roadway safety and increase accessible public space in commercial districts or residential areas. Temporary plazas claim unused or over-built vehicular roadway space such as slip lanes or irregular intersections to create additional space for street furnishings, plantings and other neighborhood amenities that increase neighborhood interaction, health and well-being. Temporary plazas might also provide physical space for outdoor gyms, community events, food vendors and new street murals.



New York, NY ([Wikimedia Commons](#), Tdorante10, CC BY-SA 4.0)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use
- Improve business

TYPICAL APPLICATIONS

- To reconfigure irregular and unsafe street geometries to simplify vehicular movements and increase roadway safety.
- Where the roadway configuration seems redundant or over-built and underutilized, such as corners where there are right-turn channels or excessive turn radii. These are mostly installed in downtown areas or along commercial corridors where foot traffic is moderate or high, or at neighborhood streets where there is a strong need for new and/or enhanced public space.



New York, NY ([Wikimedia Commons](#), Tdorante10, CC BY-SA 4.0)

TEMPORARY PLAZA (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
 - [Sidewalk chalk](#)
 - [Cornstarch paint](#)
 - [Traffic tape](#)
 - [Tempera paint](#)
 - [Spray chalk](#)
 - [Spray paint](#)
- **Pilot or RAPID**
 - [Acrylic traffic paint](#)
 - [DLPM](#)
 - [Epoxy Gravel](#)
 - [Thermoplastic](#)

VERTICAL BARRIERS

- **Demonstration**
 - [Traffic cones](#)
 - [Traffic barrels](#)
 - [Freestanding delineators](#)
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

- **Pilot or RAPID**
 - [Flex post](#)
 - [K71 flex posts](#)
 - [Wave delineators](#)
 - [Low-profile traffic separators](#)
 - [Planters](#)
 - [Plastic jersey barriers](#)
 - [Concrete jersey barriers](#)
 - [Ceramic markers](#)
 - [Parking stops](#)

OTHER

- Temporary accessible ramp
- Street furniture
- Bike parking
- Shade

DESIGN CONSIDERATIONS

- Delineate clear and legible plaza outlines and perimeters for both plaza users and vehicle drivers.
- Consider traffic speeds and volumes surrounding the temporary plaza and how those will impact pedestrian accessibility from the adjacent sidewalks.
- Consider street geometry and stormwater runoff when placing furniture items and planters.
- Consider using wheel stops for adjacent parking lanes where needed. Parking shouldn't be allowed anywhere inside the temporary plaza.
- Maintain truck, bus and fire truck turning ability.

TEMPORARY PLAZA (CONT'D)

- Temporary plazas are usually best implemented along with other placemaking and safety applications such as curb extensions, parklets, crosswalk art and intersection murals.
- Consider crashworthy barriers such as jersey barriers.

OTHER CONSIDERATIONS

- Power washing the intersection, without interfering with existing markings, before installing the plaza may help increase the longevity of the art.
- ADA accessibility of the sidewalks, curb ramps and plaza itself, particularly for pedestrians with visual impairments
- Consider the time of year for outdoor public use. Periods with nicer weather and less rain will attract more users.
- Consider adjacent land uses and how those will impact the plaza's success.
- For best results, install plaza right after a roadway resurfacing project.
- Consider contacting local artists and local businesses for plaza and artwork design.
- Consider developing programming that caters to a diverse audience to activate the space at different times (weekends, evenings, etc.)
- Develop a plaza removal strategy and consider having an agreement with agency partners.

OTHER RESOURCES

- [NACTO Urban Streets Design Guide: Interim Public Plazas](#)

CROSSWALK ART

Crosswalk art can help improve crosswalk and pedestrian visibility, as well as reinforce the community's character through a public art installation. Though not considered a traffic control device, crosswalk art installations may reduce vehicle speeds and improve drivers' attention. Crosswalk art installations are installed fully within the already-delineated white crosswalk markings.



Tampa, FL (Kittelson & Associates, Inc.)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use
- Improve business

TYPICAL APPLICATIONS

- At busy or distinguished downtown crosswalks, at crosswalks that need further enhancement and improved visibility and at crosswalks where the community has expressed a desire and need for aesthetic enhancements.
- At intersections where there are existing pedestrian crossing markings (ladder striping)



Seattle, WA ([Wikimedia Commons](#), Mrkent5780, CC BY-SA 4.0)

CROSSWALK ART (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)

DESIGN CONSIDERATIONS

- Art must never encroach onto the existing white traffic stripes.
- Paint must be non-reflective and abide by the Federal Highway Administration's crosswalk art color palette.
- Crosswalk art is not a traffic control device and should be designed to avoid confusion with any MUTCD traffic control device.
- Must not contain words, text, pictographs, advertisements, or logos and must not mislead drivers to wrongfully interpret any MUTCD traffic control device.
- Art should be designed in consistent, repetitive and uniform patterns.
- Consider the pavement's existing conditions and materials and how those will interact with the intended artwork.

OTHER CONSIDERATIONS

- Power washing the crosswalk, without interfering with the white paint, before installing the mural may help increase the longevity of the art.
- Consider reaching out to local community artists.
- For best results, install mural right after a roadway resurfacing project.
- Develop a crosswalk art removal strategy and consider having an agreement with agency partners.

OTHER RESOURCES

- [Asphalt Art Guide – Bloomberg Associates](#)

INTERSECTION MURALS

Intersection murals are artistic installations painted within an intersection. Intersection murals are typically painted by community artists to add character and beauty to their neighborhood. These murals are not traffic control devices even though they might help reduce vehicle speeds and increase driver attention. Intersection murals are usually installed along with other safety or placemaking projects, such as curb extensions and temporary plazas.



Hillsborough, FL ([Vision Zero Hillsborough](#))

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Increase safety (pedestrian)
- Invite public use

TYPICAL APPLICATIONS

- Painted directly on the roadway's pavement and completely within the intersection box, avoiding encroachment onto painted crosswalks, other roadway striping, curbs and sidewalks.
- At key intersections in low-speed zones in downtown areas, near schools, along commercial streets, or along neighborhood streets at key community destinations.
- Usually avoided at large and very busy intersections.



Eugene, Oregon ([Wikimedia Commons](#), Rick Obst from Eugene, United States, CC BY 2.0)

INTERSECTION MURALS (CONT'D)

MATERIAL OPTIONS

STRIPING AND SURFACE TREATMENTS

- **Demonstration**
[Sidewalk chalk](#)
[Cornstarch paint](#)
[Traffic tape](#)
[Tempera paint](#)
[Spray chalk](#)
[Spray paint](#)
- **Pilot or RAPID**
[Acrylic traffic paint](#)
[DLPM](#)
[Epoxy Gravel](#)
[Thermoplastic](#)

DESIGN CONSIDERATIONS

- The intersection mural should not be confused with any MUTCD traffic control device's color or shape.
- Intersection murals are usually best implemented along with other placemaking and safety applications such as curb extensions, parklets, crosswalk art and temporary plazas.

OTHER CONSIDERATIONS

- Power washing the intersection, without interfering with existing markings, before installing the mural may help increase the longevity of the art.
- For best results, install mural right after a roadway resurfacing project.
- Consider contacting local artists and local businesses for mural design.
- Consider developing programming that caters to a diverse audience to activate the space at different times (weekends, evenings, etc.)
- Develop a mural removal strategy and consider having an agreement with agency partners.

OTHER RESOURCES

- [Asphalt Art Guide – Bloomberg Associates](#)



Orlando, FL (City of Orlando)

TRAFFIC SIGNAL BOX ART

The City of Orlando has an established traffic signal box art program. See [here](#) for more information.

QUICK-BUILD SHADE

Temporary or quick-build shade is typically installed at placemaking projects in hot and sunny climates to protect people from the elements. Temporary or quick-build shade can be added to projects using trees, tents, umbrellas or temporary canopies or pergolas. Temporary shade structures can be installed at parklets, temporary plazas, intersection murals, or curb extensions. to make them more inviting and comfortable for people using tables, chairs, benches and any other plaza amenities. Temporary shade structures can also be installed as part of transit stop improvements to demonstrate the need for long-term improvements at high-ridership stops.



Washington, D.C. ([Wikimedia Commons](#), Elvert Barnes, CC BY-SA 2.0)

PROGRAM GOALS THIS PROJECT TYPE MEETS

- Invite public use

TYPICAL APPLICATIONS

- At bus stops along with bus stop benches, raised platforms and other transit stop improvements that address bus speeds, comfort and service reliability.
- Added to placemaking projects, such as parklets and temporary plazas



New York, NY ([Wikimedia Commons](#), Kamel15, CC BY-SA 3.0)

QUICK-BUILD SHADE (CONT'D)

MATERIAL OPTIONS

DEMONSTRATION, PILOT, OR LONG-TERM EXPEDITED

- Metal bus stop shelters provided by industry-approved suppliers.
- Trees
- Tents
- Umbrellas
- Temporary metal or wooden pergolas with acrylic roofing sheets or fabrics

DESIGN CONSIDERATIONS

- Consider the placement of shade structures based on sun angles and seating furniture layouts to maximize usability.
- Consider the type of shade structure based on the longevity and primary objectives of the temporary project.
 - Trees on planters are most suitable for temporary plazas intended to beautify the neighborhood.
 - Tents and umbrellas are most suitable for demonstration projects or for pilot projects where staff/businesses can move and store these items.
 - Temporary pergolas and other shade structures are most suitable for pilot projects.

OTHER CONSIDERATIONS

- Consider partnering with industry-approved temporary bus stop shelter providers.
- Consider partnering with nearby local businesses to provide their own shade structures, such as tents and umbrellas.
- Consider tropical storm and hurricane protocol

OTHER RESOURCES

- [Tactical Urbanist's Guide to Materials and Design](#)

WHAT ARE MY MATERIALS?



MATERIALS

This section provides guidance on the recommended materials to be used for quick-build projects, including striping and surface treatments, options for vertical barriers and signs. Note, these material recommendations may differ from those on the [FDOT Approved Products List](#) (APL) due to the often temporary nature of quick-build projects. Nevertheless, all materials recommended within this guide have been widely used and tested by agencies across the country. As quick-build implementations are transitioned to more permanent installations, more coordination with the APL and Innovative Product List (IPL) will become necessary.

Materials may be sourced in a variety of ways, including via term or rapid response contracts, city purchase cards, as an in-kind donation, or through consultant reimbursement. Sourcing will depend on the scale of the project and the overall material cost. When possible, project managers should seek opportunities to reuse materials between quick-build projects.



Baltimore, MD (Kittelsohn & Associates, Inc.)

STRIPING AND SURFACE TREATMENTS

There are a variety of options for installing striping and surface treatments as part of quick-build projects. It is important to consider the following factors when selecting a surface treatment for a specific installation:

INSTALLATION

Consider ease of installation and installation requirements, including equipment or roadway conditions.

MAINTENANCE

Some surface treatments require more frequent reapplication.

LIFESPAN

Some surface treatments have a longer lifespan than others.

REMOVABILITY

Following the conclusion of a project, it may be necessary to remove surface treatments.

REFLECTIVITY AND/OR NON-SLIP PROPERTIES

Some surface materials feature reflective or non-slip properties or can be altered to be more reflective or non-slip.

COST & AVAILABILITY

Materials are not always available or within a given project's budget.

SIDEWALK CHALK

Cost: \$

Sidewalk chalk is a low-cost material that can be used to stripe very short-term demonstration project elements when fast removal is a concern. Use large chalk sticks to fill in a stencil or stripe a small area. Then, after fanning away excess chalk dust, apply hairspray and let dry for 3-4 minutes to seal the chalk. Chalk can also be used to communicate to users of the pop-up facilities by writing messages.



Source: [Streetsblog USA/Steve, CC](https://www.streetsblogusa.com/2015/07/14/steve-cc/)

CORNSTARCH PAINT

Cost: \$

Cornstarch paint is a low-cost material that can be used to stripe very short-term demonstration project elements when fast removal is a concern. Cornstarch paint is made by mixing store-bought cornstarch with water and pigments (optional).



Orlando, FL (City of Orlando)

TRAFFIC TAPE

Cost: \$

Traffic tape can be used to delineate the edge of curb extensions, bike lanes, or other demonstration project elements. When possible, use foil-backed reflective traffic tape to increase the visibility and durability of striping. Traffic tape is recommended for demonstration projects only, as it is low-cost and easily applied, but not long-lasting.

See FDOT Approved Products List: Removal Tape ([Black](#), [White](#), [Yellow](#))



Orlando, FL (City of Orlando)

TEMPERA PAINT

Cost: \$

Tempera paint is a low-cost material that can be used to stripe very short-term demonstration project elements when fast removal is a concern. Tempera paint can be combined with cornstarch paint as a pigment or to extend its range.



San Francisco, CA ([Wikimedia Commons](#), Fabrice Florin from Mill Valley, USA, CC BY-SA 2.0)

SPRAY CHALK

Cost: \$

Spray chalk can be used to delineate the edge of curb extensions, bike lanes, or other demonstration project elements. It may also be used to fill in smaller areas, such as bike lane conflict markings, stencils, or bike boxes. Spray chalk is recommended for demonstration projects and can last up to one week. The lifespan of spray chalk can be extended by sealing the surface with a spray varnish. If quick removal is a concern, opt for traffic tape or other adhesive materials.



Orlando, FL (City of Orlando)

SPRAY PAINT

Cost: \$

Spray paint can be used to delineate the edge of curb extensions, bike lanes, or other pilot project elements. It may also be used to fill in smaller areas, such as bike lane conflict markings, stencils, or bike boxes. While spray paint is longer lasting than spray chalk, power washing can be used to manually remove spray paint on a shorter timeline.



Bournemouth, UK ([Wikimedia Commons](#), by Bournemouth Events)

ACRYLIC TRAFFIC PAINT

Cost: \$\$

Acrylic traffic paint can be used to delineate the edge of curb extensions, bike lanes, or other pilot project elements. It may also be used to fill in areas, such as bike lane conflict markings, stencils, or bike boxes. Reflective glass beads can be added for longer-term applications to increase retro reflectivity and skid resistance. While it may require reapplication, acrylic traffic paint is expected to last 1 – 3 years.



Tampa, FL (Kittelson & Associates, Inc.)

DURABLE LIQUID PAVEMENT MARKINGS (DLPM)

Cost: \$\$

Durable Liquid Pavement Markings (DLPM) refer to both epoxies and Methyl Methacrylate (MMA) and can be used to delineate the edge of pilot project elements or to fill in project areas. Epoxies may be applied as a paint or a spray but can be sensitive to temperature or moisture, so it is important to allow for long application and drying times. MMA is more resistant to temperature and dries more quickly but can be more expensive. Due to their long-lasting nature, it is recommended that DLPM be reserved for high-traffic areas or quick-build projects that are intended to remain for a longer-term period.



Seattle, WA ([Wikimedia Commons](#), Ntowle98, CC BY-SA 4.0)

EPOXY GRAVEL

Cost: \$\$

Epoxy gravel can be used to fill in areas of quick-build projects such as curb extensions, bike lane conflict markings, crosswalks, or medians. As a composite of various textured aggregates and epoxy, it has non-slip and reflective properties. Epoxy gravel typically comes in a tan color, which can be preferred to more colorful installations in some locations.



Somerville, MA (Kittelson & Associates, Inc.)

THERMOPLASTIC

Cost: \$\$\$

Thermoplastic can be used to delineate the edge of project elements or to fill in smaller project areas, such as stencils. Due to its long-lasting nature, it is recommended that it be reserved for high-traffic areas or quick-build projects that are intended to remain for a longer-term period. Thermoplastic comes as a liquid application or preformed sheets. Both require professional installation.

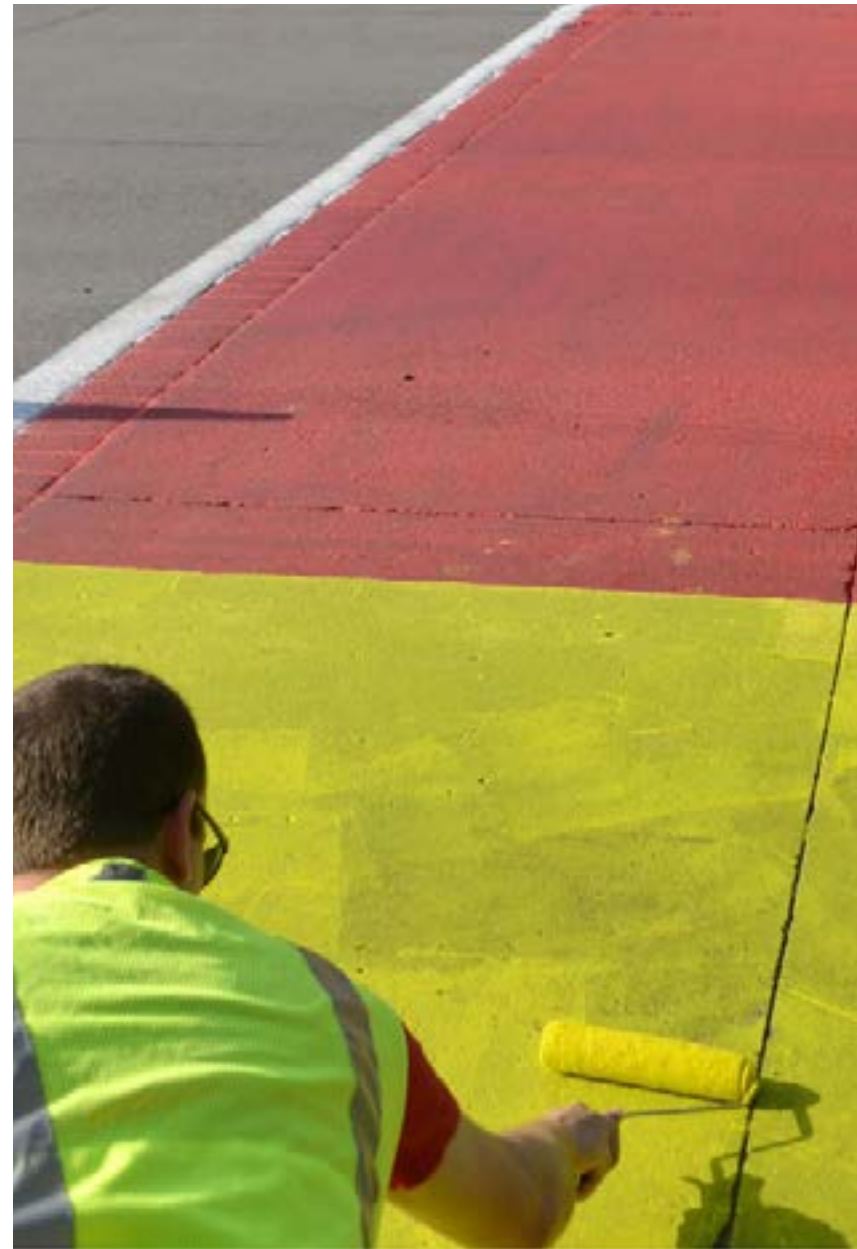


Source: [Wikimedia Commons/Judgefloro](#) - Own work, CC0.

Striping and Surface Treatments Lifespans and Relative Cost

TREATMENT	LIFESPAN*	COST
Sidewalk Chalk	1 day	\$
Cornstarch Paint	1 day	\$
Tempera Paint	1 day	\$
Traffic Tape	1 week	\$
Spray Chalk	1 week	\$
Spray Paint	1–3 months	\$
Acrylic Traffic Paint	1–2 years	\$\$
Epoxies	3–5 years	\$\$
MMA	3–5 years	\$\$
Epoxy Gravel	3–5 years	\$\$
Thermoplastic	5+ years	\$\$\$

*Areas that will be frequently traversed by vehicle tires, will require more frequent reapplication.



Source: [Streetsblog USA/North Dakota Department of Transportation, CC](https://www.streetsblogusa.com/2015/05/20/north-dakota-department-of-transportation-cc/)

VERTICAL BARRIERS

While many vertical barriers can be used for the same project types, it is important to consider the following factors when selecting a vertical barrier for a specific installation:

INSTALLATION & MAINTENANCE

Consider ease of installation and potential long-term impacts. Some barriers require more maintenance or upkeep than others.

ACCESSIBILITY FOR PEOPLE & MAINTENANCE & EMERGENCY VEHICLES

A barrier that works for one project may not work for another depending on the local context.

AESTHETICS & DURABILITY

Some projects may benefit from or desire more aesthetically pleasing or durable barriers than others.

LEVEL OF COMFORT

Some barriers make people walking and biking feel better protected from people driving.

TRAFFIC CALMING

Barriers that provide more vertical deflection are typically more successful at calming traffic and reducing speeds.

COST & AVAILABILITY

Materials are not always available or within a given project's budget.

TRAFFIC CONE

Typical Dimensions: 36" – 48" H (Base: 10.5"L, 10.5"W, 1"H)

Cost: \$

A traffic cone can be used to separate the roadway from spaces for people walking or biking, to temporarily block off space, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Traffic cones are recommended for demonstration projects only as they are easily transported and moved, but also easily knocked down or stolen.

See FDOT Approved Products List: [Cone](#)



Source: Oregon Department of Transportation

TRAFFIC BARREL

Typical Dimensions: 40"H, diameter varies

Cost: \$

A traffic barrel one can be used separate the roadway from spaces for people walking or biking, to temporarily block off space, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Traffic barrels are recommended for demonstration projects only.

See FDOT Approved Products List: [Plastic Drum](#)



Boston, MA ([City of Boston](#))

FREESTANDING DELINEATOR

Typical Dimensions: 8"W, 49"H (Base: 20"L, 18"W)

Cost: \$

A freestanding delineator can be used to separate the roadway from spaces for people walking or biking, to temporarily block off space, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Free standing delineators are recommended for demonstration projects only as they are easily transported and moved, but also easily knocked down.



Foxborough, MA (Kittelson & Associates, Inc.)

FLEX POST

Typical Dimensions: 8" W, 36" H (Modular curb: 40"L, 12"W, 3"H)

Cost: \$

Flex posts, also known as delineator posts, can be used to separate the roadway from spaces for people walking or biking, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Flex posts can be installed on their own, or on a modular curb base, also called a raised lane separator. For demonstration projects, flex posts can be adhered to the roadway using adhesive butyl pads. For pilot projects, it is recommended that they be bolted into the roadway.

See FDOT Approved Products List: [Tubular Marker, Temporary; Lane Separator, MASH-16](#); [Lane Separator, NCHRP-350](#)



Tampa, FL (Kittelson & Associates, Inc.)

K71 FLEX POST

Typical Dimensions: 8" diameter, 24"H

Cost: \$\$

K71 flex posts can be used to separate the roadway from spaces for people walking or biking, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Flex posts can be installed on their own, or on a modular curb base and are re-erecting if hit by vehicles or other road users. For demonstration projects, K71 flex posts can be adhered to the roadway using adhesive butyl pads. For pilot projects, it is recommended that they be bolted into the roadway.



Orlando, FL (City of Orlando)

WAVE DELINEATOR

Typical Dimensions: 93"L, 5"W, 27"H

Cost: \$\$

Wave delineators can be used to separate the roadway from spaces for people walking or biking. Their collapsible nature allows for easy transportation and application. For demonstration projects, wave delineators can be adhered to the roadway using adhesive butyl pads. For pilot projects, it is recommended that they be bolted into the roadway.



Orlando, FL (City of Orlando)

LOW-PROFILE TRAFFIC SEPARATOR

Typical Dimensions: Various

Cost: \$\$

Low-profile traffic separators are a family of low-profile, reflective vertical barriers that can be used to separate the roadway from spaces for people walking or biking, or to delineate traffic calming treatments, parking corrals, or intersection improvements. They can be orientated and spaced differently depending on the context of each facility. Low-profile traffic separators are mountable so do not obstruct access for emergency or maintenance vehicles. They may be combined with other vertical barriers, such as flex posts to increase the level of comfort for people walking or biking or to further reduce speeds.



London, England ([Wikimedia Commons](#), sludgegulper, CC BY-SA 2.0)

PLANTER

Typical Dimensions: Various

Cost: \$-\$\$\$

Planters can be used to separate the roadway from spaces for people walking or biking, to temporarily block off space, or to delineate traffic calming treatments, parking corrals, or intersection improvements. They have the added benefit of beautifying the implementation site. Planters can be made of different materials, including plastic, fiber glass, concrete, galvanized steel and cast stone and therefore, can have varying weights and levels of durability. Typically, plastic or fiberglass planters are most suitable for demonstration projects, while concrete or cast stone planters are better for pilot projects. Some planters are “self-watering” which can reduce maintenance needs and costs.



Foxborough, MA (Kittelson & Associates, Inc.)

PLASTIC JERSEY BARRIER

Typical Dimensions: 74”L, 18”W, 32”H

Cost: \$\$\$

Plastic jersey barriers can be used to separate the roadway from spaces for people walking and biking or to temporarily block off space. To enhance stability, plastic barriers can be filled with water (better for shorter-term installations) or sand (better for longer-term installations) after being moved into place. When planning for installation, consider transport and storage needs.

See FDOT Approved Products List: [Temporary Barrier, Water-Filled NCHRP-350](#)



Portland, OR. Source: Oregon Department of Transportation

CONCRETE JERSEY BARRIER

Typical Dimensions: 120”-144”L, 24”W, 32”H

Cost: \$\$\$

Concrete jersey barriers can be used to separate the roadway from spaces for people walking and biking or to block off space. Concrete barriers are recommended for longer-term installations as they are not easily moved. To increase aesthetics, concrete barriers may be painted or combined with planters. When planning for installation, consider transport and storage needs.

See FDOT Approved Products List: [Temporary Barrier, Concrete MASH-16](#); [Temporary Barrier, Concrete NCHRP-350](#)



New York, NY. Source: NYC Department of Transportation

TYPE III BARRICADE

Typical Dimensions: 72"-96"L, 63"H

Cost: \$\$

A Type III Barricade can be used to temporarily block off space or redirect traffic, particularly at entry points. Signs can be mounted on the barricade to direct traffic or provide more information to users. When planning for installation, consider transport and storage needs.

See FDOT Approved Products List: [Barricade Type III MASH-16;](#)
[Barricade Type III NCHRP-350](#)



San Francisco, CA ([SFMTA](#))

CERAMIC MARKER

Typical Dimensions: 4"-8" diameter

Cost: \$

A ceramic marker can be used to delineate traffic calming treatments, parking corrals, or intersection improvements. Ceramic markers are typically adhered to the roadway using adhesive butyl pads and can be used in combination with other barriers.



Redwood City, CA ([Wikimedia Commons](#), Coolcaesar at the English-language Wikipedia, CC BY-SA 3.0)

PARKING STOP

Typical Dimensions: Length varies, 6”W, 4”H

Cost: \$

Parking stops can be used to separate the roadway from spaces for people walking or biking, or to delineate traffic calming treatments, parking corrals, or intersection improvements. Parking stops can be made of different materials, including plastic, rubber, or concrete. For demonstration projects, plastic parking stops can be adhered to the roadway using adhesive butyl pads. For pilot projects, it is recommended that rubber, or concrete parking stops be bolted into the roadway. Consider the color or reflectivity to reduce tripping hazards or the potential for vehicles running parking stops over.



Tampa, FL (Kittelson & Associates, Inc.)

ROUNDBABOUT ISLAND

Typical Dimensions: 120” diameter

Cost: \$\$\$\$

A roundabout island is a rubber circle that can be mounted in an intersection to create a temporary miniroundabout or neighborhood traffic circle. Roundabout islands can be mounted, if required by emergency vehicles or large trucks and are typically bolted into the roadway.



San Francisco, CA (Kittelson & Associates, Inc.)

BUS BOARDING PLATFORM

Typical Dimension: 7”H, L and W varies

Cost: \$\$\$\$

A bus boarding platform is a platform that is installed at transit stops with existing curbside bicycle lanes. Bus boarding platforms reduce conflicts between transit riders and people biking, improve bus efficiency by reducing the need for buses to pull in and out of the travel lane and maintain a direct path for people biking in the bicycle lane. Quick-build boarding platforms are modular in nature and can include ramps up and down from the bicycle lane to the designated pedestrian crossing. When planning for installation, consider transport and storage needs.



Washington, DC (Kittelson & Associates, Inc.)

TEMPORARY SPEED HUMP OR SPEED CUSHION

Typical Dimensions: Hump: 144”-168”L, Width varies, 4”H;
Cushion: 84”L, 72”W, 4”H

Cost: \$\$\$

A speed hump or cushion can be used to calm traffic or slow speeds. Temporary speed humps and cushions can be made of asphalt or rubber and are typically bolted into the roadway. A speed cushion may be more appropriate on roadways requiring frequent access by emergency vehicles.



San Francisco, CA (Kittelson & Associates, Inc.)

Recommended Vertical Barriers by Project Type

VERTICAL TREATMENT	Curb Extension	Mini roundabout/Neighborhood Traffic Circle	Left-Turn Hardening & Slow-Turn Wedges	Daylighting	Chicane	Median or Pedestrian/Bicycle Refuge Island	Shared Street / Slow Street	Demonstration Path	Bicycle Lane	Shared Micromobility Corral	Parklet	Temporary Plaza
Traffic Cone	●	●	●	●	●	●	●	●	●	●	●	●
Traffic Barrel	●	●	●	●	●	●	●	●		●	●	●
Free Standing Delineator	●	●	●	●	●	●	●	●		●	●	●
Flex Post	●	●	●	●	●	●		●	●	●	●	●
K71 Flex Post	●	●		●		●		●	●			●
Wave Delineator	●			●	●				●	●	●	●
Low-profile traffic separator	●	●	●	●	●	●		●	●	●	●	●
Planter	●	●	●	●	●	●	●	●	●	●	●	●
Plastic Jersey Barrier	●			●	●	●	●	●	●	●	●	●
Concrete Jersey Barrier	●			●	●	●	●	●	●	●	●	●
Type III Barricade							●				●	●
Ceramic Marker	●	●	●	●	●					●		●
Parking Stop			●	●	●		●	●	●	●	●	

SIGNAGE

LAMINATED SIGNS

Cost: \$

Laminated signs can be used to communicate information about a project, including a description of the project benefits, extents and timeline. Laminated signs should be posted at least two weeks in advance of installation. For demonstration projects, informational laminated signs can remain up for the duration of the project and can also be used in place of aluminum signs to communicate the expected use and regulations. Laminated signs can be made in-house and can be designed as lawn signs or posters which can be attached or adhered to posts or buildings.



Orlando, FL (City of Orlando)

ALUMINUM SIGNS

Cost: \$

Aluminum signs can be used to communicate the expected use of a quick-build installation, to direct temporary traffic control, to communicate a temporary restriction of access, or to regulate use. Consult the [MUTCD](#) for details on official regulatory or warning signs. Aluminum signs can be made in-house.

See FDOT Approved Products List: [Sign Stand, Portable, MASH-16](#); [Sign Stand, Portable, NCHRP-350](#)



Orlando, FL (City of Orlando)

DOOR HANGERS & FLYERS

Cost: \$

Door hangers and flyers are used to communicate project details to nearby neighbors and businesses and should be distributed at least two weeks in advance of project installation. Door hangers and flyers will often include a description of the project, the extents, the expected benefits and timeline. In addition, they should also include information about the project sponsor and a point of contact for further questions. Door hangers and flyers can be made in-house.



Orlando, FL (City of Orlando)

OTHER MATERIALS

TEMPORARY ACCESSIBLE RAMP

Dimensions: vary

Cost: \$\$

Temporary accessible ramps can be used to ensure the ADA accessibility of quick-build installations, such as plazas, parklets, or demonstration paths. It is important that all users, including those with mobility impairments, can use and benefit from quick-build projects. Therefore, a temporary accessible ramp can be used to provide an accessible connection between curbs and project areas.



Hyannis, MA (Kittelson & Associates, Inc.)

DETECTABLE WARNING SURFACE

Dimensions: L varies (should extend across ramp or width of crossing), 2'W

Cost: \$\$

A detectable warning surface communicates to people with visual impairments that they are entering or exiting a dedicated pedestrian space. Additional detectable warning surfaces can be used within quick-build project areas to communicate new or relocated crossing locations, changes in street access, or other transitions between pedestrian-only spaces.



New York City ([Wikimedia Commons](#), Ryxhd123, CC BY 3.0)

STENCILS

Dimensions: see [MUTCD](#)

Cost: \$-\$\$

Stencils create guidelines for applying surface treatments, particularly for shared lane, bike lane, or pedestrian markings. Stencils may be handmade out of spare cardboard or plastic sheets or they can be borrowed from. Consult the [MUTCD](#) for specific dimensions and placement guidelines for markings.



Baltimore, MD (Kittelson & Associates, Inc.)

STREET FURNITURE

Dimensions:

Cost: \$\$\$

Street furniture can be used with some quick-build project types to liven up the space and encourage users to linger. Street furniture often includes tables, chairs, benches, or umbrellas. When selecting furniture, consider the ease of transport, durability, aesthetics and maintenance or cleaning needs.



New York, NY ([Wikimedia Commons](#), Tdorante10, CC BY-SA 4.0)

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