
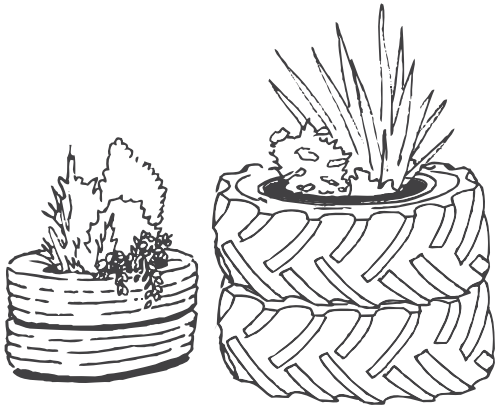
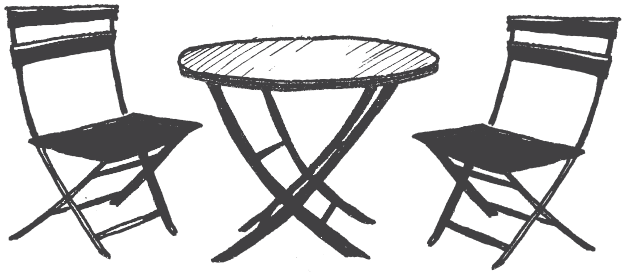

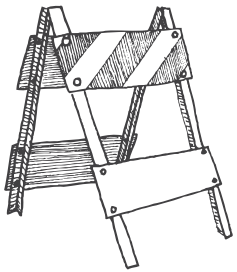
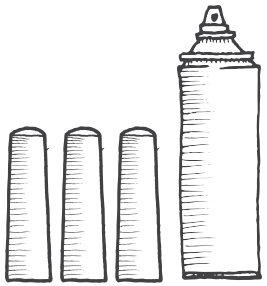
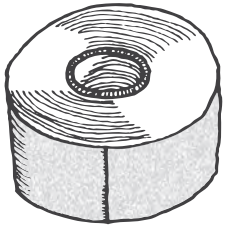
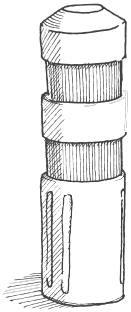

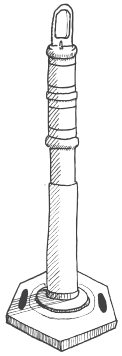
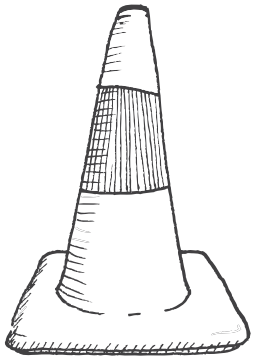

TACTICAL URBANIST'S GUIDE TO MATERIALS AND DESIGN VERSION 1.0

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Bates College students install a protected bikeway demonstration project in Lewiston, ME (Street Plans).

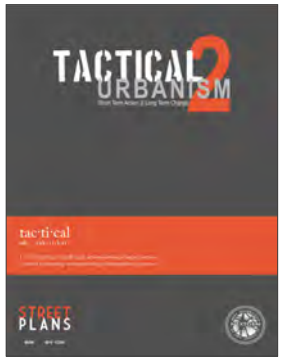
Thanks to funding from the John S. and James L. Knight Foundation and review support from NACTO, the Vision Zero Network, and other partners we are proud to present the Tactical Urbanist's Guide to Materials and Design.

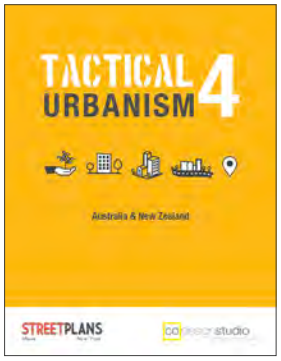
This Guide is a document for:

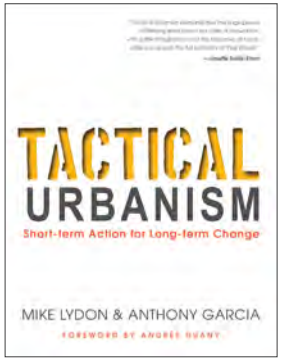
- ☑ Neighborhood groups
- ☑ Advocacy organizations
- ☑ Professional planners
- ☑ Transport engineers
- ☑ Elected officials

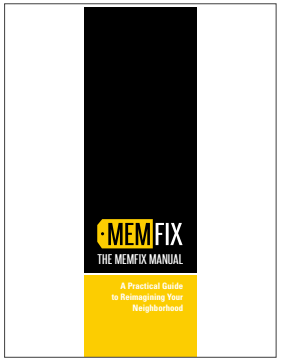
This Guide can be read in any order. If you are familiar with Tactical Urbanism and want to dive right into materials, you may wish to flip directly to Chapters 2 and 3. For more information and details about project planning, please refer to our forthcoming companion document, *The Tactical Urbanist's Guide to Project Planning*.

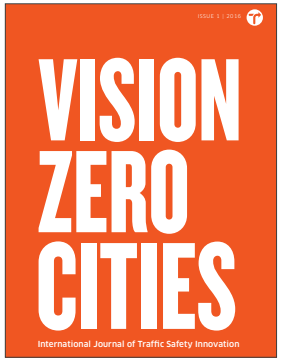
AN URBAN TACTICIANS LIBRARY

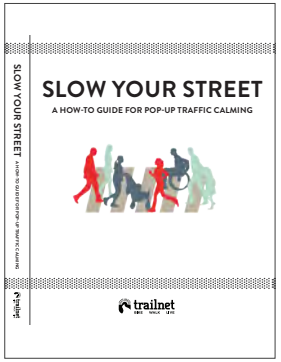












Tactical Urbanism, Vol. 1 (Street Plans, 2011); Tactical Urbanism, Vol. 2 (Street Plans, 2012); Tactical Urbanism, Vol. 3 (Ciudad Emergente, Street Plans, 2013), Tactical Urbanism, Vol. 4 (Codesign Studio, Street Plans, 2014); Tactical Urbanism: Short-term Action for Long-term Change (Lydon, Garcia, Island Press, 2015); Tactical Urbanism, Vol. 5 (TaMaLaCà, Street Plans (Forthcoming); The Planner's Guide to Tactical Urbanism (Pfeifer, 2013); NACTO Urban Street Design Guide (NACTO, Island Press, 2013); The Memfix Manual: A Practical Guide to Reimagining Your Neighborhood (Livable Memphis, 2014); People St Kit of Parts (Los Angeles DOT, 2015); Vision Zero Cities (Transportation Alternatives, 2016); Public Space Stewardship Guide: A Toolkit for Funding, Programming, and Maintenance (City of San Francisco, Street Plans, MJMMG, 2016; Quick Builds for Better Streets: A New Project Delivery Model for U.S. Cities (PeopleForBikes, 2016); Slow Your Street: A How-To Guide for Pop-Up Traffic Calming (Trailnet, 2016); Planning By Doing: How Small Citizen-Powered Projects Inform Large Planning Decisions (Gehl Studio, 2016), and the San Francisco Plaza Materials Catalog (San Francisco Planning, 2016).

Dear Reader:

Over the past decade Tactical Urbanism has become an international movement, bringing about a profound shift in how communities think about project development and delivery.

Government agencies and advocacy organizations have produced many useful documents exploring case studies or providing guidance about how an iterative approach can be applied to planning and design projects. (See some of our favorites on the previous page!) Highlights include:

» The *NACTO Urban Street Design Guide*, which provides high-level recommendations about interim street designs, which can be used to quickly address street safety concerns and deliver public space benefits.

» The 2016 PeopleForBikes publication *Quick Builds for Better Streets*, which outlines nine key ingredients for a successful quick-build projects.

» Guides created at the local level, to create a structure for livable streets programs enabling cities to work with partner organizations to create new types of public spaces, such as pedestrian plazas, parklets, and more.

» Toolkits for creating short-term demonstration projects, such as Trailnet's Pop-up Traffic Calming How-to Guide and the MemFIX Manual, with practical tools for re-imagining neighborhood street and public space design.

As Tactical Urbanism researchers and practitioners, we've heard time and again that what is needed now is more guidance about design, materials, and process for both citizen *and* city-led projects. Our book *Tactical Urbanism: Short-term Action for Long-term Change* (2015, Island Press) includes a "How-to" chapter with high level guidance on how to approach a Tactical Urbanism project. But, we often receive questions about the nitty gritty: tricks for creating easily removable pavement markings for demonstration projects, when to pick traffic tape over spray chalk or paint. Of course, project location, context, and budget are major variables in determining the best approach to materials / design, and creativity should be encouraged. Indeed, the absence of formalized design guidelines for Tactical Urbanism projects (especially at the 1 day - 1 month time interval) has contributed to an exciting level of materials experimentation. We've undertaken this research project to share more details about the best of what we and others have learned through real-world testing. We hope that this guide provides a snapshot of innovation to date, and encourages more!

Sincerely,

The Street Plans Collaborative Team

The images on the facing page are examples of our work, and the work we've found most helpful from other leaders in the fast-growing, Tactical Urbanism movement. For additional background resources, visit: tacticalurbanismguide.com

03 APPLYING THE PALETTE: PROJECT APPLICATION CASE STUDIES

Market Street, San Francisco, CA (Street Plans).

INTRODUCTION

SHORT-TERM ACTION ▸ LONG-TERM CHANGE

Pedestrian Plazas. Parklets. Pilot Complete Streets Upgrades. Pop-up Bike Lanes. Whether you live in a community large or small, you've likely seen it for yourself. Cities around the world are using flexible and short-term projects to advance long-term goals related to street safety, public space, and more.

Examples include highly-visible and formalized efforts, such as New York's Pavement to Plazas program, or San Francisco's parklet program, both of which have been replicated in dozens of cities across North America. Examples may also be seen in rapid implementation of small projects to advance Vision Zero goals, such as with San Francisco MTA's commitment to complete at least 24 traffic safety improvements within 24 months of adopting the Vision Zero framework.

At the same time, governments, non-profits and grassroots groups are undertaking small-scale "demonstration projects" (typically lasting 1 to 7 days) to experiment with and gather input on potential street design changes. At this time interval, projects may come in the form of pop-up crosswalks or curb extensions created by frustrated residents or activists in the middle of the night. Or, they may be sponsored by departments of transportation or public works, as part of public outreach for a corridor or master planning process. Whether officially sponsored or not, demonstration projects are typically heavy on volunteers and collaboration and light on budget.

Whatever the time interval, this approach is all about action. Also known as DIY Urbanism, Planning-by-doing, urban acupuncture, or Urban Prototyping - call it whatever resonates in your community - **Tactical Urbanism** refers to a city, organizational, and/or citizen-led approach to neighborhood building using short-term, low-cost, and scalable interventions to catalyze long-term change.

Tactical Urbanism is an approach to neighborhood building that uses short-term, low-cost, and scalable interventions and policies to catalyze long term change.

From left to right, Wikimedia Commons; Nina Muntenau; Dave Schlabowske; Street Plans

WHY USE THIS APPROACH?

Tactical Urbanism is used by a range of actors, including governments, businesses and nonprofits, citizen groups, and individuals.

Taking on a range of project types, municipal authorities, organizations, developers, and everyday citizens use short-term projects as a tool to accomplish any of the following outcomes.

Inspire action and expedite project implementation (City of Austin).

Islington, Street, Portsmouth, NH (Street Plans)

Draw attention to perceived shortcomings in policy and physical design, and allow people to *physically experience* alternative options.

Monterey Road, Morgan Hill, CA (Street Plans)

Widen public engagement. As noted in *Planning by Doing* by Gehl Studio, Tactical Urbanism projects allow for feedback to be expressed through *use* and *demonstrated* preferences, rather than *stated* preferences alone.

Business Circle, San Jose, CA (Street Plans)

Deepen understanding of local user's needs at the neighborhood, block or building scale.

Great Streets LA Flickr page

Gather data from the real-world use of streets and other public spaces.

Pine Street, Burlington, VT (Street Plans)

Encourage people to work together in new ways, strengthening relationships between residents, non-profits, local businesses, and government agencies.

North Union Street, Burlington, VT (Street Plans)

Test aspects of a program, project or plan before making large political or financial investments. Iterative design is welcome as part of the process.

PURPOSE OF THIS GUIDE

1

In 2015, more than 35,000 people died in U.S. traffic crashes and millions more were injuried.* Of these fatalities, a disproportionate amount were sustained by children and people of color. Today, you are 3x more likely to die in a traffic collision than by a firearm.**

This is totally unacceptable.

We need to be able to act faster to create streets and public spaces that are safe and accessible for everyone. Tactical Urbanism helps advance many kinds of projects, but the purpose of this guide is to provide materials and design guidance for projects that advance street safety and enhance placemaking efforts in both the short- and long-term. To do so, this guide recommends breaking down the conventional, often drawn-out project delivery process into discrete, incremental time intervals. This allows for faster implementation, broader public engagement, and more flexibility in project duration and level of investment so that safer streets and public spaces can be created now!

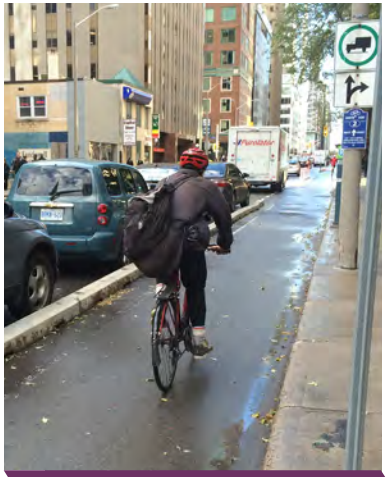
35,092*

*National Highway Traffic Safety Administration

**National Center for Health Statistics

ITERATIVE PROJECT DELIVERY

This chart illustrates the progression of an iterative approach to project delivery. Though not all projects need to follow this exact model, it can be helpful to see how each project phase builds towards the next, using incremental steps to deliver a capital project intended to create lasting change.



Project Type (time interval · relative cost)	DEMONSTRATION (1 day - 1 month · $)	PILOT (1 month- 1 year · $$)	INTERIM DESIGN (1 year - 5 years · $$$)	LONG-TERM/CAPITAL (5 years - 50 years · $$$$)
Project Leaders	Can be led by anyone (city, citizen group, or both!)	Government / organizational leadership + involvement required	Government / organizational leadership + involvement required	Government / organizational leadership + involvement required
Permission Status	Sanctioned or unsanctioned	Always sanctioned	Always sanctioned	Always sanctioned
Materials	Low-cost, typically low-durability. Can be borrowed or easily made	Relatively low-cost, but semi-durable materials	Low-moderate cost materials, designed to balance flexibility with maintenance needs	High-cost permanent materials that cannot easily be adjusted
Public Involvement	Public input + public action	Public input, champion engagment, government / organizational stewardship	Public input, government / organizational stewardship	Public input, government / organizational stewardship
Flexibility of Design	High: organizers expect project to be adjusted and removed.	High: organizers expect project to be adjusted; it *may* be re-moved if it does not meet goals	Moderate: organizers expect project to be adjusted, but it is intended to remain in place until capital upgrades are possible	Low: project is considered a permanent capital upgrade that is unlikely to be adjusted signifi-cantly once installed
Collect data to refine approach for current or future projects?	Recommended	Always	Always	Always - project performance can inform future investments

Terms and diagram format based on PeopleForBike's "Quick Builds for Better Streets," which defines the pilot / interim time intervals above as "quick build" projects. To access Quick Builds for Better Streets, visit: bit.ly/QuickBuildsReport (Images: Street Plans).

A CLIMATE TO SUPPORT CHANGE

Developing a new collaboration or trying an unfamiliar project approach for a sanctioned Tactical Urbanism project is not easy. But as the parklet and plaza programs popping up across the country illustrate, many cities are finding a way to get there. Interviews of leading cities (such as San Francisco, Los Angeles, and Philadelphia) suggest the following as conditions that support innovation in the project delivery process.

COMMUNITY/ POLITICAL SUPPORT

Whether from a Mayoral campaign promise or requests from neighbors and city councilors, the origin story of most Tactical Urbanism programs involves community and/ or political support. In launching the People St program, for example, the Los Angeles Department of Transportation had political support at multiple levels. "We had the full support of Mayor Eric Garcetti," said Valerie Watson of LADOT. "The People St program supported the goals he set for creating livable streets in Los Angeles, and tied in closely with this Great Streets Initiative." At the neighborhood level, the Los Angeles City Council issued directive to LADOT, asking the agency to examine the feasibility of creating pilot parklets as early as 2006. In 2008 the City Council directed the agency to create a road map for formalizing a citywide program to enable community groups to partner with the City to bring plazas, parklets and bicycle corrals to their neighborhoods. This support at the Mayoral and neighborhood level was a key driver in the creation of the People St program.

AGENCY LEADER SUPPORT

Support from high-ranking agency officials is an essential parallel to community/political support — and often the result of it. In discussing Seattle's Community Crosswalk Program, Civil Engineer Howard Wu noted the importance of support at the Mayoral *and* department head level. "Seattle Mayor Ed Murray and SDOT Department Director Scott Kubly both encourage innovation in our approach to projects. Looking to peer cities such as New York, they've encouraged a nimble culture, supporting use of rapid implementation tactics to rapidly deliver projects and test ideas."

COLLABORATIVE PROCESS

To embrace an iterative approach to project delivery, you'll need buy-in from everyone who is impacted by the new processes or materials being introduced. The best way to do this is to pro-actively engage stakeholders as early as possible — from the community groups involved as stewardship partners to the crews installing new materials in the street. Discussing his recent work developing a streamlined catalogue of materials for pedestrian plazas in partnership with three agencies, Robin Abad of the SF Planning Department outlined the following key steps:

- Catalogue what you're doing now. Depending on the project / process change you're trying to bring about, this could be lists of materials you're using, event permit structures you have in place, existing vendor relationships, liability arrangements etc.
- Engage all stakeholders in a critique of the status quo, as well as potential new materials and / or processes. For example: this might be an inter-agency critique of how quick-build materials used to date are performing across a number of relevant categories (aesthetics, maintenance, ease of use, etc.).
- Investigate what others are doing. Look to peer cities and established how-to guides (like this one!) to learn from what others are doing well, or not.
- Use what you learn to develop a new process / approach that can be tested and evaluated. Start small and check in with stakeholders as you go, so that lessons learned can be integrated before the process / approach is scaled city or regionwide..

A CHANCE TO "START SMALL"

Even if you've done your homework, there is a moment where you'll have to dive in and try a new materials or permitting approach that no one is totally sure about, yet. Many cities interviewed for this Guide shared that the key is starting small and expecting the first try to be a "test drive" that can be improved with feedback:

» The first parklets created in Los Angeles were put in place on a pilot basis, before the People St program was formalized. LADOT and neighborhood partners launched these early parklets to test the new project type and process before it was scaled up and formalized into today's People St program.

» Local Motion and The Department of Public Works (DPW) in Burlington, VT sponsored a series of pop-up demonstration projects as part of the city's first walk / bike master planning process. After permitting short-term interventions in public rights of way for the first time as part of a city-led project, DPW codified the process, creating a new permit structure to allow community members to lead their own demonstration projects. The draft permit will be further tested by community groups in 2017 so it can be refined before it is finalized.

» The Austin Department of Transportation (ADT) has used small-scale projects to test materials before scaling up to larger, corridor-wide projects. For example, ADT has tested flexible delineators vs. concrete buttons as barrier elements at curb extensions at 6th and Waller Streets, evaluating how these materials perform in a small area to determine if they would be appropriate for use as protected bike lane barriers.

EXPECTATION THAT THE PROJECT CAN BE REFINED BASED ON PERFORMANCE

Even after "test driving" a process or material on a small way, additional adjustments may be needed even after the change has been institutionalized. Most cities with parklet or plaza programs have iterated on their process and materials guidelines, as evidenced by nearly annual updates to their publicly available toolkits and guides. Examples include the Philadelphia Pedestrian Plaza Program, LADOT's People St program, and San Francisco's Pavement to Parks program. The key is to recognize that pilot *processes* needs maintenance as much as the *projects* do!

Most cities with parklet or plaza programs have iterated on their process and materials guidelines, as evidenced by nearly annual updates to their publicly available toolkits and guides. Examples include the Philadelphia Pedestrian Plaza Program, LADOT's People St program (pictured above).

INGREDIENTS FOR SUCCESS

In Quick Builds for Better Streets, PeopleForBikes outlines nine ingredients for integrating the "quick build" approach into a city's project delivery process, highlighting *bureaucratic* innovations your city can use to enable *infrastructural* innovations. The ingredients listed here build on content from this document, with a few additions. To read the Quick Builds for Better Streets document, visit: bit.ly/QuickBuildsReport

AN UNDERSTANDING OF CONTEXT/ NEED

Successful projects are typically very collaborative and context sensitive - design treatments and evaluation metrics should be calibrated to directly respond to needs and/or challenges at the focus location. The needs may stem from community desires, data (such as crash data at an intersection), or the vision set forth in a planning document. Most of the case studies highlighted in this guide arose from a foundation of community support, based on a localized understanding of context and need.

CONSTRAINTS

What non-negotiable constraints exist as perimeters around your project? This could be a specific do-or-die time frame, or an installation restriction you can't bend. Outlining parameters at the outset, and clearly communicating them to stakeholders, will help get everyone on the same team. Embrace constraints, they are a key ingredient for project success and often bring out unexpected solutions! *Quick Builds for Better Streets* notes that installation deadlines, in particular, are "mandatory, whether dictated by the first big snowfall of winter, by a repaving schedule or by a mayoral pledge."

GOALS

Your Tactical Urbanism project should be designed around a clear project goal (or set of goals) - the goal should stem from an understanding of context and need, and be developed in collaboration with stakeholders and project team members. Goals are essential for developing the project design, establishing a threshold for project adjustments, and measuring success. (See Measurement for more info.)

A TEAM

Whether you're planning a day-long pop-up bike lane or a more formalized 6-month pilot, you'll need a team to make any sanctioned Tactical Urbanism project happen. At any time interval, the Tactical Urbanism approach is requires a high degree of collaboration from partners across a range of disciplines and skill sets. As noted in the previous pages, support and participation from the following key stakeholders is critical: agency leaders, local politicians, residents, advocacy groups, and the city staff that will be involved in project implementation. For city-led projects, *Quick Builds for Better Streets* recommends cities designate a specialist to be involved in every pilot or interim-design project.

A COLLABORATIVE DESIGN PROCESS

Mapping out design and programming elements for Tactical Urbanism projects typically involves a high degree of collaboration and communication. Whether at the demonstration or interim-design time interval, projects may require collaborations between city staff and stakeholder agencies, neighborhood groups, business organizations, advocacy organizations, and local artists. Such partnerships are important for procurement of materials, creating a plan for programming/activation, and creating a plan for ongoing stewardship once the project is built.

A CREATIVE PATH FOR PROCUREMENT

For Tactical Urbanism projects, procurement of materials often involves creativity and collaboration. Rather than relying solely on purchased materials, leverage partnerships to access existing materials wherever possible. Items such as tape, paint, delineators, granite blocks, or benches can commonly be found in existing City supply inventories and re-used for pilot or interim-design projects. Non-profit community partners may be able to help source in-kind donations from local businesses. Artists or fabricators on your team may have access to tools or raw materials. For very short term projects, you may be able to borrow or rent key materials instead of buying them (plants, shade elements, etc.)

In terms of professional services, *Quick Builds for Better Streets* notes that quick build projects are "rarely compatible with traditional bidding processes. Cities need either on-call contracts or in-house crews. On-call contracts...are probably the only form of formal government project procurement compatible with quick-build projects."

Wherever possible, look to integrate volunteers into the work plan. Demonstration projects typically rely on volunteers for project outreach and installation. But, volunteers can be a major asset in pilot and interim-design projects as well. While the city may lead in installing traffic control elements or surface treatments, community members can be engaged in other aspects of a project, such as decorating benches or planters, planting greenery, or posting wayfinding signs. Engaging volunteers in creating the project not only provides valuable person-power, it also builds long-term community ownership of the project. To recruit volunteers, try to leverage collaborations with existing organizations such as schools, churches, service groups, neighborhood associations and advocacy groups.

A FLEXIBLE IMPLEMENTATION PLAN

In most communities, Tactical Urbanism projects rarely fit the typical mold for permitting or installation, so you should expect to have to troubleshoot and be creative in this aspect of your project planning. Whether you're a resident trying to lead a demonstration project or a city staffer trying your first interim design project, you will likely hit stumbling blocks. This is normal. Don't be discouraged. Cities around the country have found a variety of ways to "get to yes" for unusual projects, and many examples are described in the Case Studies in Chapter 3 (temporary traffic control plans, block party ordinances, temporary occupancy permits etc.) Thus, you don't have to have a water tight pilot project delivery program in place before you try something new. In fact, testing the project and the process will help your city develop a better program, allowing you to try out options and gather feedback to learn what works and what does not before you make something available citywide. Think of it as piloting your pilots!

As you look to scale up your process, aim to identify what *Quick Builds for Better Streets* calls "a system for seizing opportunity." For many cities, this involves creating a new program structure that is designed to enable community-led projects (such as Burlington, VT's Demonstration Project Policy, Portland's Intersection Repair program, or the MemFIX framework in Memphis, TN). It may also involve blending longer-range planning efforts with community requests (such as the City of Denver's collaboration with BikeDenver, the local bike coalition, to collaborate on an annual demonstration project of mutual interest.

For Tactical Urbanism projects, procurement of materials often involves creativity and collaboration. Rather than relying solely on purchased materials, leverage partnerships to access existing materials wherever possible.

Above: Non-profit community partner Local Motion helped purchase materials for a demonstration project created in partnership with the Burlington, VT Department of Public Works (Street Plans). Below: a local landscape company drops off plants for a neighborhood traffic circle demonstration in Long Beach, CA (Street Plans).

A COMMUNICATIONS PLAN

Tactical Urbanism projects are meant to be adjusted in response to feedback and evaluation. The project comes in the middle of the public outreach process, not at the end of it. *Quick Builds for Better Streets* notes that this iterative approach typically brings challenges from two sides:

» Not realizing the project design and materials are flexible, some people will worry the project is moving too fast, not allowing for adequate public input.

» Other people will worry that rapid-implementation of projects with low-cost materials is an excuse for not investing in robust capital upgrades.

As such, it is important to create a plan for marketing and outreach that clearly communicates:

» What need/challenge the project aims to address;

» How long a project will be in place;

» How the project will be evaluated; and

» To what degree it can be adjusted (or removed) in response to community feedback.

The communications plan should be executed with support from stakeholder groups, local politicians, and nearby property owners (residents, business owners, etc.). Helpful tactics include creating an attractive logo or brand for the project, as well as a "promo kit" to outline key talking points, making it easy for partners to share information.

FUNDING

State and federal grants don't often prove practical for funding pilot and interim design projects. Many of the cities highlighted in this Guide use existing planning, operational, or capital budgets to implement Tactical Urbanism projects. Many agencies also work in partnership with community or business groups (such as special assessment districts / business improvement districts) to identify a reliable funding source for project design, build-out, and stewardship. Where cash is the only answer, non-profit community groups may be able to secure additional resources through crowdfunding organizations like ioby. Local, regional, and national foundations have also been instrumental in funding many early projects.

MEASUREMENT + EVALUATION

Based on the goals outlined at the outset, ongoing evaluation will help you track project performance. Expect that the project design might need to be tweaked once installed — with flexible materials, adjustments in the field are part of the design process! Evaluation should include qualitative and quantitative metrics, often involving surveys or observational data collection at the project site. In *Planning by Doing*, Gehl Architects notes that the prototyping approach allows public input to be gathered not just through argument or *stated* preferences, but through use of the redesigned space and *demonstrated* preferences. For robust evaluation efforts, partnerships with universities are often helpful.

STEWARDSHIP / MAINTENANCE PLAN

Building a new project is politically sexier than maintaining an existing one. But, without a maintenance plan in place, a shiny new project can quickly become an eyesore, sucking away community support for long-term change. *Quick Builds for Better Streets* notes that while Tactical Urbanism projects can deliver benefits fast, "low-cost, flexible materials require more frequent maintenance — replacing posts, refreshing paint — so the on-going costs can add up." There is of course a tipping point to watch for: when maintenance costs of quick build materials begin to get too high, it makes sense to look at more robust treatments, using data from the quick build project to make the case for capital funding.

When a community partner is involved in project stewardship, cities should provide a clear maintenance agreement outlining responsibilities for all parties involved. Many examples exist in the plaza and parklet programs that have proliferated across the country in the last 5 - 10 years, and the exact agreement structure appropriate for your community will depend on your program and permit process and approach to liability.

FOLLOW-UP

Shout outs matter! Your project likely benefited from support and effort from a diverse range of stakeholders. Thank them and report back with relevant data to make sure they know that their efforts made a difference!

North Winooski Avenue materials, Burlington, VT (Street Plans).

MATERIALS PALETTE

A FLEXIBLE PALETTE OF MATERIALS

This chapter presents a palette of materials — a toolbox that can be used for rapidly deploying projects and testing ideas in your city's streets. We've grouped materials by their function, providing ideas for:

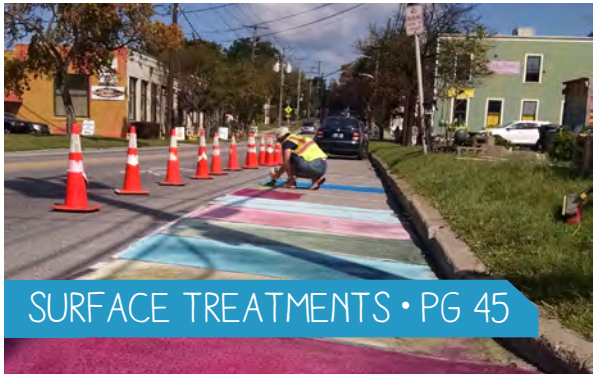
- Barrier Elements
- Surface Treatments
- Street Furniture
- Landscaping Elements
- Signs
- Programming

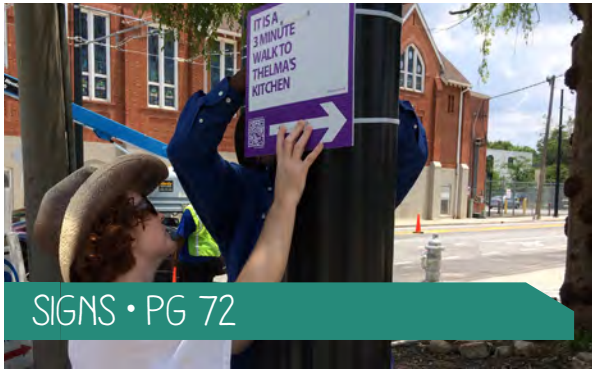
Grouping materials by function is intended to embrace the resourcefulness and creativity that is inherent to Tactical Urbanism projects while also providing engineering level criteria for practitioners. Unique, locally sourced materials may be available to fill the same functions as the commonly-used items listed here. Where that is the case, opt for locally sourced materials that reflect your community!

Within each function category in this chapter, materials are presented as material spec sheets, arranged from the least to most durable, across the following time intervals:

- Demonstration project (lasting 1 day - 1 month)
- Pilot project (1 month - 1 year)
- Interim design project (1 year - 5 years)

For more detailed definitions of each of these project phase time intervals, turn back to page 14.





Top left: By NYCDOT, all other images by Street Plans.

A People First on Michigan Avenue workshop, Detroit, MI (Street Plans).

Psst! Need inspiration?

For case studies of how the materials in this chapter can be applied, flip to page 86, or visit tacticalurbanismguide.com

Each material spec sheet includes a material sketch, typical material dimensions, estimated cost (note: cost info does *not* include installation costs, which can vary greatly), an overview of the material, recommended applications, tips and considerations, and potential places where the material may be sourced.

The spec sheets may be printed, cut, and mixed and matched to help you and your project partners develop an appropriate palette of materials that suits your project context, budget, and anticipated project delivery timeline. Before we get into the details, we would first like to call your attention to three key project principles and a quick overview of some of the common tools used to install project materials.

Happy building!

THREE PRINCIPLES

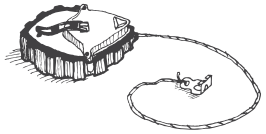
1. Safety First! Remember that safety should be the first priority with any project involving changes to a public right of way. All of the project types outlined in this guide have been included because they enhance street safety. Thus, the last thing anyone would want would be for someone to be hurt implementing or enjoying the project. Complex, sanctioned Tactical Urbanism projects will require advice and implementation guidance from a licensed engineering, planning, and /or achitecture professional, and may need to be designed to comply with Manual of Uniform Traffic Control Devices (MUTCD) and/or FHWA guidance. Moreover, simple liability waivers may be required for volunteer participation. That said, as far as we know, nobody has been hurt while installing or using a Tactical Urbanism project and we would all like to keep it that way!

2. Curves Ahead. Tactical Urbanism projects involve change: change to physical design of our streets, change in opinion about how streets can be used, and / or change in the way people and organizations work together. Change takes time! Project development and materials selection will likely involve some level of trial and error before you arrive at the optimal design for your project's unique context. Embrace the windy road — it typically leads to a more durable and effective long-term capital project!

3. Don't stop innovating. The absence of formalized design guidelines has contributed to a high level of innovation around materials for Tactical Urbanism projects, making use of local materials and/or existing contracting relationships. This chapter is intended to share innovative ideas, not stifle them. If you have additional ideas for materials that are more appropriate to your local context and/or easier to source, use them (and, if you want to share your ideas with others, contact us at: info@streetplans.org).

PROJECT TOOLBOX

The focus of this document is materials and design. However, most designs and the materials used to implement them are useless without an appropriate set of tools. The following two pages provide a brief summary of 8 common tools used for a variety of project types included in this guide. Note, this collection is by no means exhaustive, as project tools will vary greatly by project type. However, those highlighted here are especially appropriate for community-led demonstration projects.



CHALK LINE

What it does: Helps you create straight guide lines for any / all project striping / markings.

What it costs: $6 - $20 (powdered chalk usually sold separately, ~$8).

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Fill chalk line with powdered chalk. Shake. Pull string out to desired distance. Pull gently until taught. Lift string off the ground and release on desired surface.

Pro tips:

- Be cautious pulling the line out for the first time, line may snap if you are not gentle.
- Requires at least two people, three if snapping distances more than ~ 20 ft.
- Wear work gloves to avoid chalk-stained hands!

UTILITY KNIFE

What it does: Great for making pavement marking stencils, opening material packages, snipping zip ties, or cutting construction grade traffic tape.

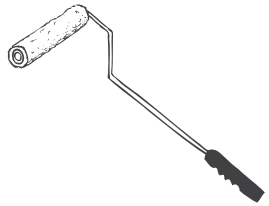
What it costs: $5 - $30 (extra blades sold separately, cost varies).

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Make sure blade is secured tightly, then extend blade and press firmly to cut desired item.

Pro tips:

- Place another layer of cardboard or plywood below cardboard stencil template to avoid dulling your blade.
- Draw the knife away from you when using to open packages, snip zip ties etc.
- Align blade against a straight edge to get clean stencil lines.
- Replace the blade often for best results.



PAINT ROLLER

What it does: Efficiently applies paint to asphalt, concrete or other surfaces.

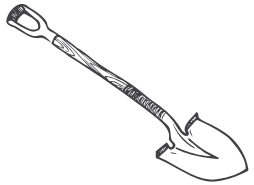
What it costs: $7 - $25 (roller covers and tray sold separately).

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Fill tray with paint, dip roller brush into tray and roll until paint is evenly distributed on roller brush. Apply paint evenly to surface.

Pro tips:

- Use extendable rollers for street surface projects so that you may apply while standing (rather than a hand roller).
- Use duct tape or clean-cut cardboard or contractor stencils to guide the application of pavement markings.
- For best results develop a consistent stroke / application method so the paint appears to be evenly distributed.



SHOVEL

What it does: Supports most types of landscaping projects.

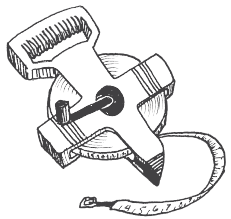
What it costs: $10 - $40

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Use shovel to pick up / distibute soil to desired location.

Pro tips:

- Where work gloves to avoid blisters.
- Find a lighter but durable shovel for extensive landscaping projects.



TAPE MEASURE

What it does: Assists with laying out all measurements for various project elements (striping distances, marking locations, barrier spacing, height adjustments etc.).

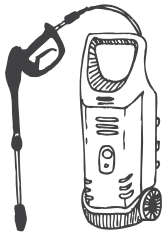
What it costs: $10 - $30

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Pull tape to desired distance to help apply project element / marking, roll back with crank arm.

Pro tips:

- Open wheel tape measures provides more utility than conventional metal tape measure and more accuracy than a measuring wheel. However, it does require a partner to makes sure tape is taught.
- Won't be damaged if car drives over the tape, which is especially useful when measuring across active vehicular lanes.



PRESSURE WASHER

What it does: Cleans streets and public spaces for the best application of spray chalk / paint, traffic tape etc. Also helps remove temporary paint / pavement markings from certain types of demonstration or pilot projects.

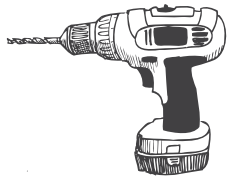
What it costs: $75 - $300

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Hook up to water source. Select appropriate setting. Spray.

Pro tips:

- Seek other options in locations where drought conditions are a concern.
- Test the pressure setting and spray pattern before using.
- Use non-toxic soap to help remove any / all temporary pavement markings.



POWER DRILL

What it does: Essential for building pallet furniture, drilling holes to anchor protected bike lane elements (armadillos, delineator posts), or various other project tasks.

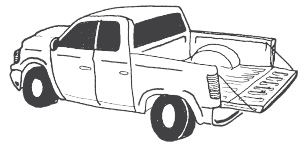
What it costs: $20 - $80

Where to get one: Use your own, borrow, or purchase from a local hardware store.

How to use it: Use drill bit to

Pro tips:

- Make sure the battery is fully charged before the build day.
- Always use safety glasses and other appropriate safety gear as specified by the drill manufacturer.



UTILITY VEHICLE

What it does: Transports most project materials, tools, and supplies.

What it costs: $20 - $75 / day rental.

Where to get one: Use your own vehicle, borrow from a friend or family member, or rent if need be.

How to use it: Be thoughtful in how you load the vehicle; organize materials, tools, and supplies in the order that they will be needed / used. For very short-term projects you can use the vehicle to store project materials / tools that shouldn't be left out overnight.

Pro tips:

- Vans, pickup trucks, Uhauls etc. are crucial tools for moving, picking up, and even storing project materials, tools, and supplies.
- Make sure you have enough capacity to transport project items. This will limit the number of trips and help your team focus its energy on implementation.

BARRIER ELEMENTS




Photos left to right: A Berkeley, CA Protected bikeway demonstration project using cardboard cylinders and a galvanized steel planters (East Bay Bike Coalition - see pages 29 and 39 for more info); A New York City parklet (Street Plans); A pilot curb extension with wooden planters in Aspen, CO (Charlie Simpson); Interim design protected bikeway in Long Beach, CA (Street Plans).

A NOTE ON BARRIERS

Everyday, cities around the country are testing out new materials to create physical and / or visual barriers between motor vehicles and people who are walking, biking or socializing in newly reclaimed asphalt space.

The appropriate barrier element will depend on your project type, time interval, and goals — the chart to the right provides a high-level list of criteria to consider when choosing a barrier. For more detailed guidance on comparing barrier elements, as well as tools to help you evaluate and field test barrier options.

BARRIER SELECTION CRITERIA

Safety

- **Safety for All Street Users** (walking, cycling, driving, wheeling etc.)
- **Enhances Safety/Comfort for People of All Ages and Abilities**
- **Traffic Calming** (Will help slow motor vehicles)
- **Reflectivity**

Planning + Design

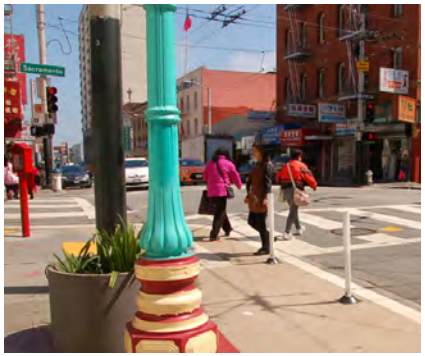
- **Dimensions** (Meets project requirements)
- **Aesthetics** (Considering local context, potential damage over project duration)
- **Availability / Ease of Procurement**
- **Accessibility** (ADA compliance, transit, trash collection, street sweeping, snow removal, emergency vehicle access etc.)
- **Cost**
- **Construction Impacts / Ease of Installation**

Maintenance

- **Storm Water Impacts**
- **Stewardship Partner(s)** (Example: an organization to water planters)
- **Durability**

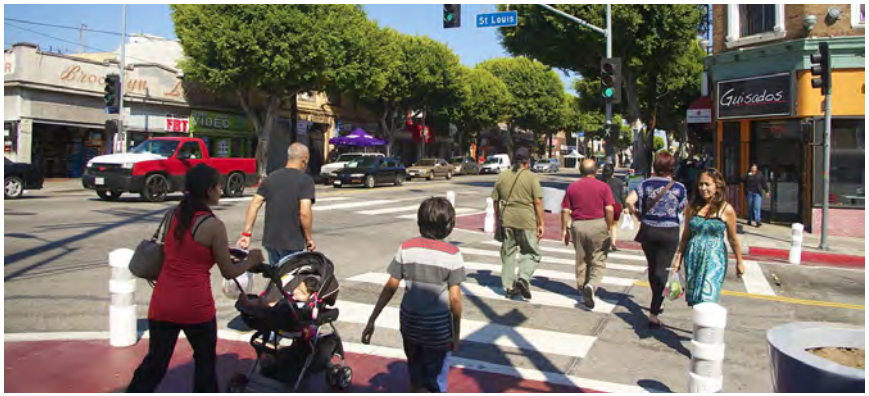
Free-standing delineators - see page 27 - protect children cycling (Connect Whitefish).

Flexible delineator - see page 28 - at the North Minneapolis Greenway pilot project (Carrie Christensen).



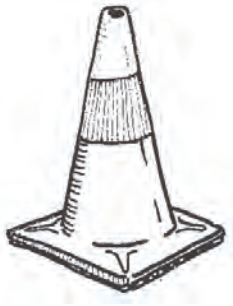
SFMTA's low-cost materials create a curb extension (Aaron Bialick, StreetsBlogSF).

Calgary uses plastic delineators to create an interim design bike lane (City of Calgary).



As part of the Vision Zero initiative, LADOT uses simple materials like striping, k-71 delineators (see page 31), and surface colorization (see 53 - 57) as an interim measure to tighten intersections, slowing turning vehicles and improving safety for people walking (LADOT/ Jim Simmons).

TRAFFIC CONES



Typical Dimensions: Varied. Standard traffic cones are 36 in. or 48 in. high.

Estimated Cost: $22 / unit. May be able to be available for loan from the city or traffic control provider.

Overview: Standard traffic cones available in various sizes. Highly flexible in terms of use for traffic control during project installation and/or as a barrier element for short-term demonstration projects.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place along edge of bike lane every 8 - 20 ft. to create barrier, depending on the thoroughfare's design speed / bikeway configuration.
- ▶ **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ▶ **Curb Extensions/Plazas:** Place along edge of plaza or curb extension, approximately 1 post every 8 - 10 ft.
- ▶ **Roundabouts:** May be placed every 2 - 3 ft. around the circumference to demarcate roundabout area, in conjunction with signs and other visual elements.

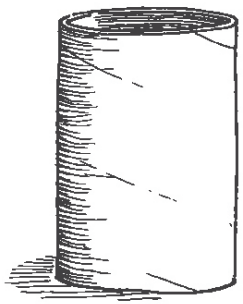
Tips and Considerations

- » Re-usable, and easy to source but only appropriate for very short-term projects.
- » Easily knocked down — require monitoring when used as barrier element.
- » Opt for reflective cones for use during the evening or overnight.
- » Decorate cones with flowers, pinwheels, paint etc. to make your project more unique.

Potential Sources

- » Borrow from city public works or transportation department
- » Buy / rent from traffic control equipment suppliers or construction companies.

CARDBOARD CYLINDERS



Typical Dimensions: 1 - 2 ft. diameter, 3 - 4 ft. in height.

Estimated Cost: $1.50 / unit, or free if cardboard can be sourced by donation.

Overview: Affordable option for short-term column-style barriers that can be decorated/painted by volunteers. Must be combined with traffic cones or some other vertical element for stability.

► Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ►**Bikeways:** Bike East Bay created simple, attractive barriers by flattening cardboard boxes, rolling them into cylinders with binder clips at the top and bottom and setting them on top of standard orange traffic cones for stabilization. Depending on thoroughfare's design speed, cylinders should be placed along the edge of bike lane every 8 - 20 ft. to create barrier, depending on the thoroughfare's design speed / bikeway configuration.
- ►**Median Islands:** Place approx. 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk / pedestrian accessibility.
- ►**Curb Extensions/Plazas:** Place along edge of plaza or curb extension, approximately 1 post every 8 - 10 ft.

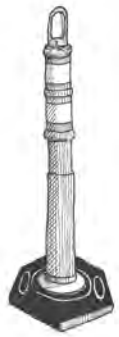
Tips and Considerations

» Avoid using if rain is likely during demonstration event.
» Work with local artists and volunteers to decorate the cylinders if possible.
» Lightweight, collapsible, and easily moved / removed.
» Only appropriate for very short-term projects.

Potential Sources

» Borrow boxes from residents / retail business owners
» Purchase from moving or office supply store

FREE-STANDING DELINEATORS



Typical Dimensions: Varied. Typically stocked at 36 in. or 48 in. high, with 12 lb. rubber base.

Estimated Cost: $26 - 34 / unit, depending on the quantity ordered.

Overview: Construction grade delineator posts with sturdy rubber base can be used to create short-term post-style barriers.

► Demo (1 day - 1 month | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ►**Bikeways:** Place along the edge of bike lane every 8 - 20 ft. to create barrier, depending on the thoroughfare's design speed / bikeway configuration.
- ►**Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ►**Curb Extensions/Plazas:** Place along edge of plaza or curb extension, approximately 1 post every 8 - 10 ft.
- ►**Roundabouts:** May be placed every 2 - 3 feet around the circumference of the roundabout area, in conjunction with signs and other visual cues.

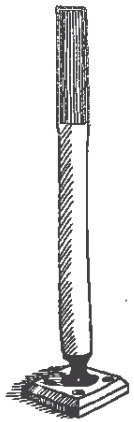
Tips and Considerations

» Use delineators with heavy rubberized base, 12lbs or heavier.
» Not bolted to roadway, so can be knocked down. May require monitoring.
» Easy to move / remove.
» Opt for reflective delineators for night use.
» Cannot be "nested" (like cones) and may require more space to transport.

Potential Sources

» Borrow from city public works or transportation department.
» Buy / rent from traffic control equipment suppliers.

FLEXIBLE DELINEATOR POST



Typical Dimensions: 27 in. - 36 in. high.

Estimated Cost: $20 - $25 / post (including base).

Overview: Standard reflective delineator post, available in multiple colors.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Center delineator within the buffer zone along the edge of the bikeway. Typical spacing is every 8 - 20 ft., depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 1.5 ft. clear width for installation.
- ▶ **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 post every 8 - 10 ft.
- ▶ **Plazas:** Place along edge of plaza area, approximately 1 post every 8 - 10 ft.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

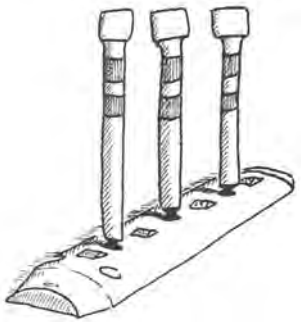
Tips and Considerations

- » Easily installed / removed: use adhesive for short-term projects, bolts for long-term projects; Make sure selected delineator is rated as "crashworthy."
- » Minimal / no stormwater obstruction.
- » Cities such as Chicago and Seattle use 27 in. model to reduce the chances of interfering with bicycle handlebars.
- » May be removed in winter to facilitate snow removal.
- » High visibility but durability / aesthetic quality can present challenges for longer-term pilot and interim design projects.

Potential Sources

- » Purchase from traffic control or construction equipment suppliers.

RAISED LANE SEPARATOR



Typical Dimensions: 40 in. long, 12 in. wide, 3 in. high (curb, not including posts, as shown at left).

Estimated Cost: Cost varies by retailer (Approx. $105 - $150 per segment + $65 for 18 in. end cap).

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** May be used to create a curb line or barrier along bikeway edge or centered within the buffer zone. Place curb segments end to end or space each 2 - 3 ft. apart. Requires minimum 12 in. horizontal width to install.
- ▶ **Roundabouts:** Place end to end in circular formation to create roundabout.
- ▶ **Parks/Trails:** If trail passes through roadway, may be used to create a curb line or barrier at edge to separate trail users from motor vehicles.

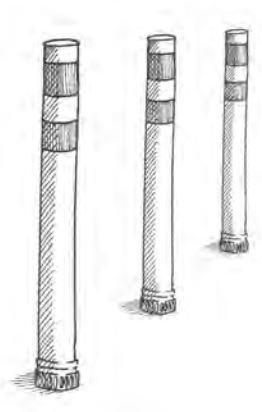
Tips and Considerations

- » Requires construction tools including rotary hammer, impact wrench, carbide tipped drill bit, and socket.
- » Section spacing can be customized for local conditions to maintain natural water drainage.
- » When used alongside bikeways, consider 27 in. posts to reduce the chances of interfering with bicycle handlebars.
- » Lightweight and easy to install, with only two connection points to the pavement, resulting in reduced labor and enhanced installation times.
- » May need to be removed seasonally to facilitate snow plowing.

Potential Sources

- » Purchase from traffic control or construction equipment suppliers.

HIGH PERFORMANCE DELINEATOR POST



Typical Dimensions: 27 in. - 36 in. high.

Estimated Cost: $84 - 90$ / per delineator.

Overview: A high-performance delineator that remains flexible and continues to fully rebound even after 100 hits at 60mph.

Demo (1 day - 1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Center delineator within the buffer zone along the edge of the bikeway. Typical spacing is every 8 - 20 ft., depending on the thoroughfare's design speed / bikeway configuration.. Delineators can also be placed to one side or the other as site conditions dictate (such as street sweeper width or vehicle door opening). Allow a minimum of 1.5 ft. clear width for installation.
- ▶ **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 post every 8 - 10 ft.
- ▶ **Plazas:** Place along edge of plaza area, approximately 1 post every 8 - 10 ft.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

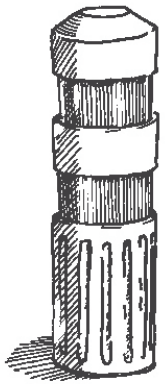
Tips and Considerations

- » Very high performance and durable delineator. Remains flexible and continues to fully rebound even after 100 hits at 60mph. Withstands slow crushing from heavy vehicles (trucks, buses, etc.).
- » When used alongside bikeways, consider 27 in. posts to reduce the chances of interfering with bicycle handlebars.

Potential Sources

- » Purchase from traffic control or construction equipment supplier: Pexco is one potential source. http://www.pexco.com/markets/industrial/traffic/bollards-and-channelizer-posts/city-post/

K-71 DELINEATOR POST



Typical Dimensions: 22 in. circumference, 33 in. high

Estimated Cost: $91.25 / unit (including bolts). Price may decrease by ordering in bulk. Installation tools sold separately.

Overview: Large durable delineator posts that pop back up after being hit by vehicles up to 65 mph.

Demo (1 day - 1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

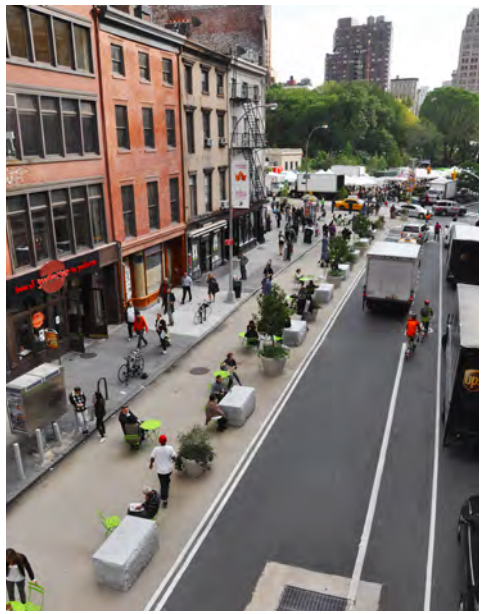
- ▶ **Bikeways:** Center delineator within the buffer zone along the edge of the bikeway. Typical spacing is every 8 - 20 ft., depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 2 ft. clear width for installation.
- ▶ **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 post every 8 - 10 ft.
- ▶ **Plazas:** Place along edge of plaza area, approximately 1 post every 8 - 10 ft.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

Tips and Considerations

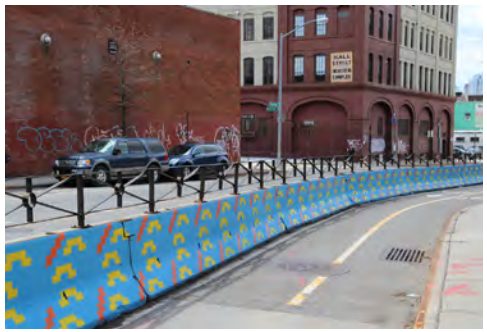
- » Requires drilling and adhesive. Materials for installation include: T-Bar; Metal Pavement Sleeves; metal reinforcement screen; adhesive; manual pump gun; and nozzles.
- » Request NTPEP certifications to ensure safety / durability.
- » May be combined with rubber curbing as barrier element.
- » Large size can help reinforce design intent and enhance cyclist comfort.
- » May need to be removed seasonal to facilitate snow plowing.
- » Available in a variety of colors;

Potential Sources

- » Purchase from traffic control or construction equipment suppliers.



Top: Traffic Control Barricades demarcate the start of an activated alley demonstration project in San Jose, CA (Street Plans). Left: NYCDOT uses recycled granite blocks to define a linear plaza / expanded sidewalk (NYC DOT). The blocks also double as seating (see page 34 for more info).



Above: Since spring of 2010, the New York City Department of Transportation (NYC DOT) has partnered with the Mayor's Community Affairs Unit and New York Cares to create temporary murals on concrete jersey barriers around the City. NYCDOT solicits artists for the program through an RFP process. Selected artists are assigned a site, and are responsible for producing stencils, translating the design for installation and overseeing painting. Barriers are primed in advance, and NY Cares volunteers assist selected artists with mural installation. (Source: 2016 Barrier Beautification RFP; Photos by NYCDOT). See page 34 and 35 for more info.

TRAFFIC CONTROL BARRICADES

Typical Dimensions: Varies by barrier type.

Estimated Cost: $45 / unit. May be available via donation/borrowing.

Overview: A commonly-used traffic control barrier, these barriers can be used for temporary street closures or to post temporary signs.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Use at start or finish of lane to support signs as needed. Not recommended for use as barrier along the edge of a bikeway.
- ▶ **Activated Alleys:** Use to create temporary street closure, according to traffic control plan.
- ▶ **Roundabout:** May be used to hold signs to demarcate roundabout area, in conjunction with signs and other visual cues.

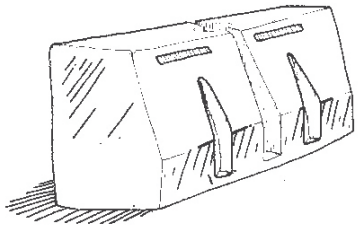
Tips and Considerations

- » Consider staging / storage options, as barriers may need to be delivered before project installation. A-frame barriers are easy to fold, stack, and store.

Potential Sources

- » Borrow from city public works or transportation department
- » Buy or rent from traffic control equipment supplier.

PLASTIC BARRIERS



Typical Dimensions: 42 in. x 72 in. x 24 in.

Estimated Cost: $258 / 100 lb.; $375 / 130 lb.; or $475 / 170 lb.

Overview: Large, modular, interlocking plastic barriers that can be filled with water or sand to create a barrier.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month -1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place in continuous line along edge of lane to create barrier.
- ▶ **Plazas:** May be combined with planters and other barrier elements to define the edge of a plaza. Place barriers end to end along edge of plaza area, in strategic locations as needed. Not recommended as sole/primary barrier element, due to lack of visual permeability, and aesthetic concerns.

Tips and Considerations

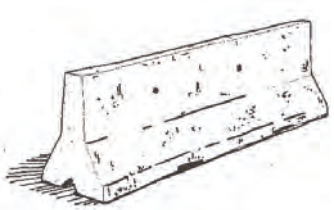
- » Large item that requires a truck or other large vehicle to transport.
- » Hollow design makes loading/unloading easier, when compared to concrete jersey barriers.
- » Water needs may make these barriers inappropriate for drought climates or short-term demonstrations.
- » May need to space barriers intermittenly to allow curbside access for emergency vehicles curbside access

Potential Sources

- » Borrow from city public works or parks department
- » Buy or rent from traffic control equipment suppliers

Plastic barriers are relatively lightweight / movable but once filled with water onsite create a heavy and durable wall of physical separation. Aesthetics are often a challenge with water barriers, however the above images from Auckland's Wynyard Quarter illustrate creative adaptations of these barriers, allowing them to act not just as barriers, but also as public art and multi-purpose street furniture. (*Street Plans*)

CONCRETE JERSEY BARRIER



Typical Dimensions: Varies. 8 / 10 / 12 ft. long x 27 in. wide x 32 in. high.

Estimated Cost: $721 / 8 ft.; $1,084 / 12 ft.

Overview: Large, concrete barriers that can be used to create a wall-style barrier.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place in continuous line along edge of lane to create barrier. At T-intersection, provide break for bikeway access from intersecting street.
- ▶ **Plazas:** May be combined with planters and other barrier elements to define the edge of a plaza. Place barriers end to end along edge of plaza area, in strategic locations as needed. Not recommended as sole/primary barrier element, due to weight, lack of visual permeability, and potential aesthetic concerns.

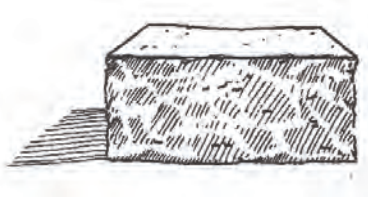
Tips and Considerations

- » Highly durable and long-lasting.
- » Can be decorated to integrate public art — New York City DOT has used concrete jersey barriers to create protected bicycle lanes, turning the barriers into a canvas for local artists (see page 32 for more info).
- » Extremely heavy, requires trained staff and special equipment to transport.
- » Can pose challenges for emergency vehicle access, trash collection, and other curbside services.

Potential Sources

- » Loan from city public works or transportation department.
- » Buy or rent from traffic control equipment suppliers or construction companies

GRANITE BLOCKS



Typical Dimensions: 36 in. long x 18 in. high, x 1.5 ft. wide.

Estimated Cost: Varies — typically sourced from existing city inventory (reused).

Overview: Large, granite blocks can be used as a barrier element and have the added benefit of doubling as seating, depending on use / placement.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Plazas:** Place along edge plaza area to visually define the plaza space. Strong case study example of this is NYCDOT's use of granite blocks (along with planters) in and around plaza spaces to create a sense of enclosure and to buffer the plaza from motor vehicle traffic (see page 32 for more info). Blocks have also been used in Philadelphia for this purpose.

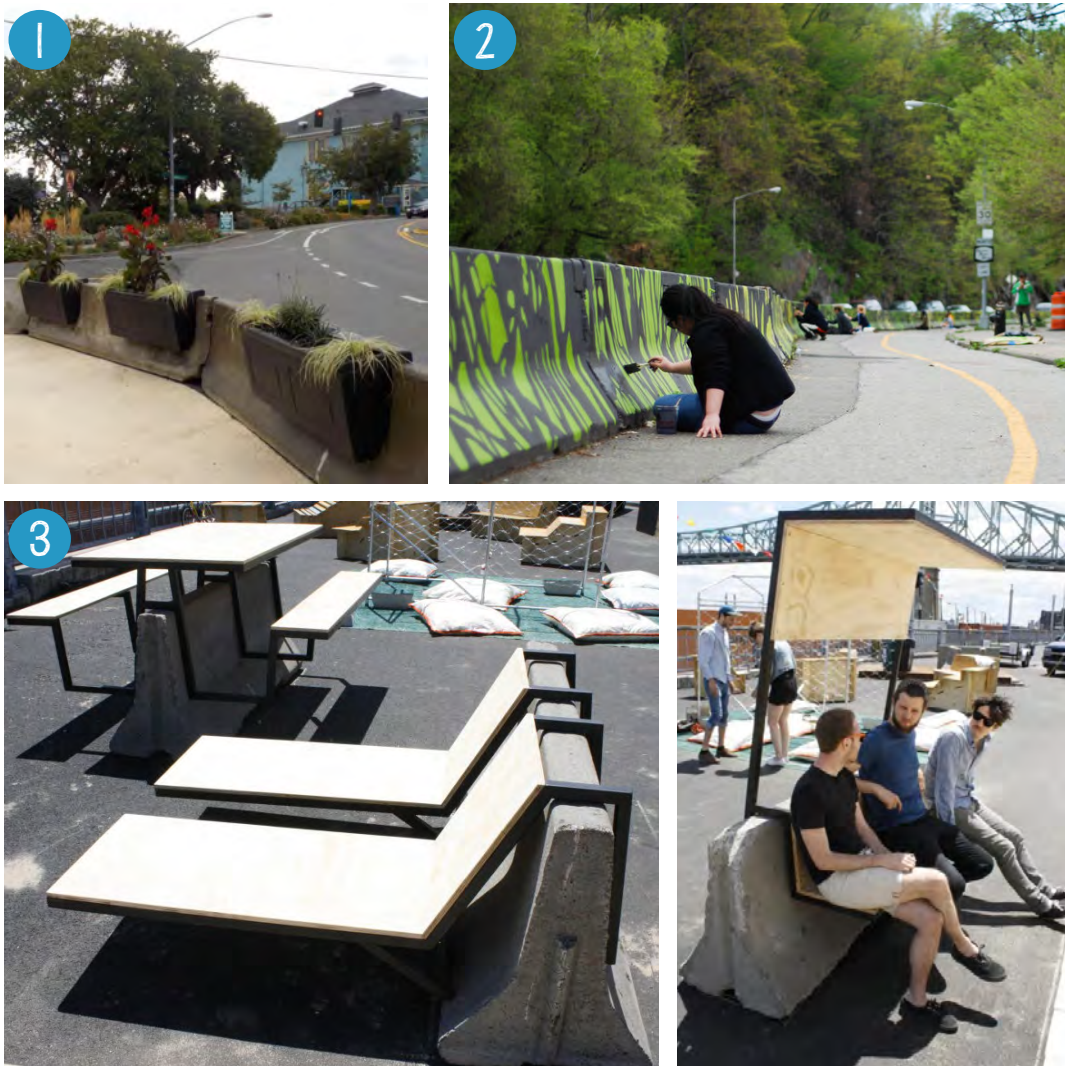
Tips and Considerations

- » Highly durable and long-lasting.
- » Use regionally-appropriate, locally sourced blocks whenever possible.
- » Extremely heavy, requires trained staff and special equipment to transport.
- » Concrete blocks are a good alternative.

Potential Sources

- » Borrow from city public works or parks department.
- » Purchase from local stone quarry or landscape vendor.

PRO TIP: HACKING THE JERSEY BARRIER



Top left: Sybertech self-watering planters used at a 2015 Pavement to Parks project at Phinney Avenue North at North 67th Street in Seattle (Sybertech). Top right: NYC DOT Barrier Beautification Program (NYC DOT). Bottom: Jersey barrier turned bench (lepamphlet.com).

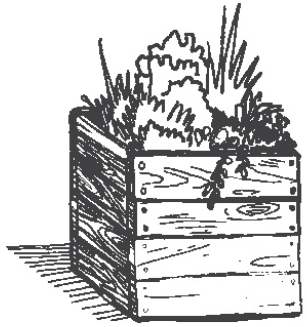
Concrete jersey barriers are a common material for interim design public space, bikeway, or other street safety projects. To softening the harsh concrete look of a raw barrier, try to:

1. Add planters specially designed to sit on top of a concrete jersey barrier (see page 40 for more info).
2. Add public art. NYC DOT has successfully used jersey barriers as a canvas to integrate public art into interim-design bikeway projects
3. Create a seat, table, or shade canopy!

The Minneapolis Bicycle Coalition created 15 plywood planters and set them up to create pop-up protected bicycle lanes at each of the city's summertime Open Streets events. (Kristina Perkins, BikewaysForEveryone. For more information visit: bit.ly/MPLS_StealThisIdea). Due to their weight, the organization has since created lightweight, collapsible planters that are easier to transport

The East Bay Bike Coalition used galvanized steel planters to create a demonstration bike lane on Telegraph Avenue. A manual with details about this project is available at: bit.ly/EastBay-TelegraphManual (East Bay Bicycle Coalition).

WOODEN CRATE



Typical Dimensions: 21" long x 14.5" wide x 9" high.

Estimated Cost: $9 - 15 / unit.

Overview: Lightweight, stackable wooden crate of various sizes which can be used as a planter.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Center wooden crates within the buffer zone along the edge of the bikeway. Typical spacing should be 8 - 20 ft. between crates, depending on the thoroughfare's configuration / design speed. Allow a minimum of 1.5 ft. clear width for installation.
- ▶ **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk / pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 crate every 5 ft.
- ▶ **Plazas/ Activated Alleys:** Place planters along edge, every 8 - 10 ft. May also be used as landscaping / greenery throughout the area.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

Tips and Considerations

- » Light and reusable, but appropriate for only very short-term project use.
- » Easy to ship, but come in large cardboard boxes so make sure you have plenty of storage space.
- » Can be easily branded (see page 37 for more information).

Potential Sources

- » Buy from hardware, department, or craft stores (Purchase online for large quantities)
- » Construct from reclaimed shipping pallets or other wood sources.

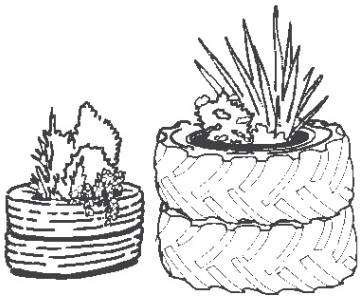
PRO TIP: BARRIERS AS A CANVAS

Above: A volunteer spray paints sponsor logos on the side of the wooden crate (Atlanta Regional Commission). Below: Planters branded with project sponsor logos were then used to create a barrier between people driving and people cycling in Atlanta, GA (Street Plans).

Whether you're using wooden crates for a pop-up or jersey barriers for interim design projects, barrier elements can be used as a canvas allowing you to share a message, thank sponsors, or integrate public art into the project.

The four images to the left illustrate how wooden crates (see spec sheet on page 36) were used to not only protect people bicycling, but to also thank project sponsors by spray painting their logos onto the planters with a stencil.

TIRE PLANTERS



Typical Dimensions: 15 / 17 in. diameter x 6 / 8 in. height (per tire).

Estimated Cost: Donated / borrowed / reclaimed.

Overview: Used tires can be stacked and planted to create planters or other barrier elements.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Median Islands:** May be used to demarcate median area where width permits. Place approximately 2 - 3 ft. apart. Provide a minimum 6 ft. break for crosswalk / pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 planter every 8 - 10 ft.
- ▶ **Plazas/ Activated Alleys:** Place planters along edge to define edge, every 8 - 10 feet. May also be used as landscaping/greenery throughout the area. Tires may also be used as seating for a public plaza or park context.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other visual cues.

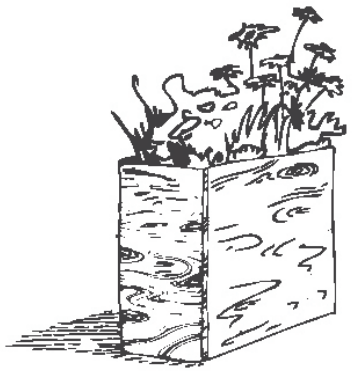
Tips and Considerations

- » Pile at least 2 tires high to give physical sense of barrier / protection from traffic.
- » Paint to improve aesthetics.
- » Easy to source: Low-cost, recycled tires can be found for donation.
- » Relatively easy to stack / store and move (just roll them in place!)

Potential Sources

- » Borrow/reclaim from auto-repair shop, filling station, junk yard etc.

CUSTOM WOOD PLANTERS



Typical Dimensions: 36 in. high x 15 in. wide x 4 ft. long.

Estimated Cost: $40 / unit.

Overview: Large home made planters designed to create a barrier for protected bike lanes, plazas, median islands, and more!

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Center wood planters within the buffer zone along the edge of the bikeway. Typical spacing should be 8 - 20 ft. between crates, depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 1.5 ft. clear width for installation.
- ▶ **Median Islands:** May be used to demarcate median area where width permits. Place approximately 2 - 3 ft. apart. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- ▶ **Curb Extensions:** Place along edge, approximately 1 planter every 6 - 8 ft., can be used to buffer mid-block curb extensions from parallel parked cars
- ▶ **Plazas/ Activated Alleys:** Use planters to define edge, every 8 - 10 ft. May also be used to provide landscaping/greenery throughout the area.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

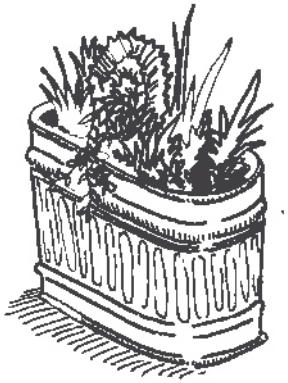
Tips and Considerations

- » Cheap and easy to build
- » Assemble on site - use potted plants to set in false bottom
- » Can be heavy/difficult to lift and transport

Potential Sources

- » Purchase supplies from local hardware store and create
- » Reclaim and repurpose shipping pallets

GALVANIZED STEEL PLANTERS



Typical Dimensions: 42 in. x 72 in. x 24 in.

Estimated Cost: Varies. $90 / 4 ft. ; $150 / 6 ft.

Overview: Large, galvanized steel planter filled with soil and plants.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month -1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Center steel planters within the buffer zone along the edge of the bikeway. Typical spacing should be 8 - 20 ft. between planters, depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 3 ft. clear width for installation.
- ▶ **Curb Extensions:** Place along edge, approximately 1 planter every 8 - 10 ft.
- ▶ **Plazas/ Activated Alleys:** Use planters to define edge, every 8 - 10 feet. May also be used as landscaping/greenery throughout the area.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

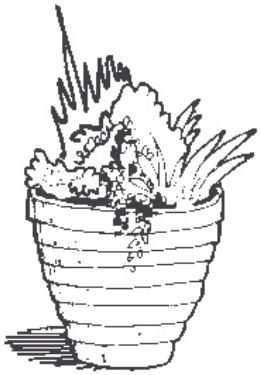
Tips and Considerations

- » Large item that requires a truck or other large vehicle to transport.
- » Easy to source/order online
- » Need soil and filler
- » For pilot projects, select a deeper planter so that watering is required less frequently.

Potential Sources

- » Purchase from landscaping, feed, or hardware store

LARGE POLYMER PLASTIC PLANTERS



Typical Dimensions: Varied. 34 in. diameter x 27 in. tall or 42 in. diameter x 33 in. tall.

Estimated Cost: $441 / 34 in. x 27 in. unit; $785 / 42 in. x 33 in. unit. A discount may be available when ordering 10 or more units at time.

Overview: Large, heavy-duty polymer plastic planters used to create a barrier and beautify the streetscape.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place along edge of lane every 8 - 20 ft., depending on the thoroughfare's design speed / bikeway configuration. Planters can be placed in the middle of the buffer area or to one side or the other as site conditions dictate. Allow for min. 4 ft. buffer width for installation.
- ▶ **Curb Extensions:** Place along edge, approximately 1 planter every 8 - 10 ft.
- ▶ **Plazas/ Activated Alleys:** Place planters along edge to define plaza, every 8 - 10 ft. May also be used as landscaping / greenery throughout the area.
- ▶ **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

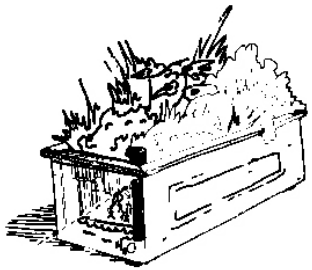
Tips and Considerations

- » Large item that requires a truck or other large vehicle to transport.
- » Available in many colors
- » NYCDOT places planters and granite blocks in and around the public space to create a sense of enclosure and to buffer it from motor vehicle traffic.
- » NYCDOT also applies epoxy gravel or paint to distinguish it visually from the adjacent roadway.
- » LADOT requires planters to be light in color and weigh at least 700 lbs. when filled with soil and plants

Potential Sources

- » Buy from Terra Products (http://www.terracastproducts.com/) or another landscaping/ street furniture supply company.

SELF-WATERING PLANTERS



Typical Dimensions: Varies by planter type. The rectangular planter shown here measures 26 in. wide x 20 in. high x 54 in. long.

Estimated Cost: Price varies by planter type, color and quantity ordered. A quantity of 25 - 49, 54 in. long (shown here) rectangular planters with a solid color costs approximately $295 / planter.

Overview: Sybertech Millennium Series self-watering reservoir planters are available in a variety of designs and sizes.

The company Sybertech offers a series of self-watering reservoir planters, called the Millennium Series. Planters are available in a variety of shapes, sizes, and finishes, including a new Divider Planter designed to sit on top of a concrete jersey barrier. Top left: planters used to protect a downtowm bikeway in Seattle, WA (Craig MacPherson for Sybertech). Top right: Sybertech planter detail in Vancouver, BC (Street Plans). Planters arranged to calm traffic at a pedestrian crossing (Craig MacPherson / Sybertech).

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place planters along edge of bikeway. May be placed end to end to form continuous barrier or up to 20 ft. apart, depending on the thoroughfare's design speed / bikeway design (see Seattle image at right).
- ▶ **Curb Extensions:** Place along edge, approximately 1 planter every 8 - 10 ft.
- ▶ **Plazas/ Activated Alleys:** Place planters along edge to define edge, every 8 - 10 ft. May also be used as landscaping/greenery throughout the area.

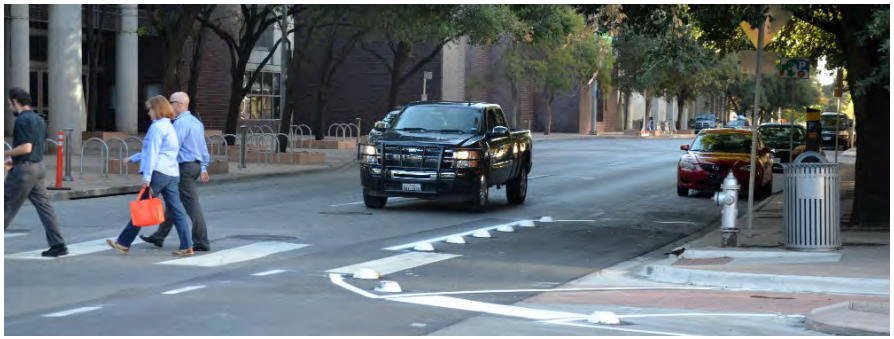
Tips and Considerations

- » These self-watering planters feature a reservoir at the base of the plante, which can reduce maintenance burdens and help conserve water.
- » Sybertech offers a variety of self-watering planter types and finishes.
- » Alll Sybertech self-watering planters have forklift slots built into the base of the planter so they can be easily moved if required. This includes for seasonal snow removal if required, although they will withstand winter weather if left outside.

Potential Sources

- » Sybertech: www.swrl.com. For questions and more information, contact supplier: Craig MacPherson, at cmacpherson@swrl.com

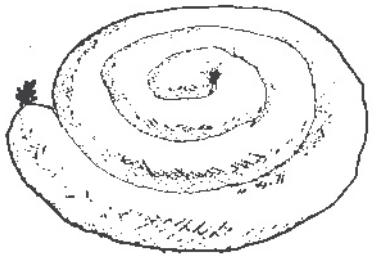
As part of the Better Block Philly demonstration projects in Philadelphia, straw wattle curbing was used to create curb extensions and expanded sidewalk space (Better Block Philly).



The Austin Transportation Department has used concrete buttons to create a less visually intrusive curb extension barrier. (Michael Andersen, bikeportland.org).

Hard plastic "armadillos" provide a low-lying and durable bike lane barrier. Left: Rogers, AR protected bikeway (Street Plans); Right: Washington, D.C. (Street Plans) Note: Washington D.C.'s Department of Transportation removed armadillos — spaced 15 ft. apart instead of 8 ft. or less. — because they failed to prevent u-turning in the bike lane as intended. They were replaced by the parking stops pictured above.

STRAW WATTLE



Typical Dimensions: Varied. Typically sold in 25 ft. long, 9 in. diameter rolls.

Estimated Cost: $4 / linear ft.

Overview: Lightweight and easily shaped into various configurations.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place straw wattle along edge of the bike lane to create continuous curb or use to create protected intersection demonstrations.
- ▶ **Median Islands/Curb Extensions:** May be placed along edge of median island or curb extension to create a temporary curb. Provide a minimum 6 ft. break for crosswalk / pedestrian accessibility.
- ▶ **Plazas:** Place along edge of plaza area to create curbing as desired.
- ▶ **Roundabouts:** May be used to demarcate roundabout area or splitter islands, in conjunction with signs and other design elements.

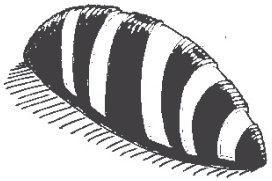
Tips and Considerations

- » Low profile, combine with reflective materials (cones, free-standing delineators etc. if left out overnight.
- » Only appropriate for very short-term demonstration projects.

Potential Sources

- » Borrow from city public works or parks department
- » Purchase from landscaping or hardware store

ARMADILLOS



Typical Dimensions: 32 in. long x 8.5 in. wide x 5 in. tall. Requires min. of 1.5 ft. of buffer area width (must be placed diagonally).

Estimated Cost: $40 / 3" unit; $50 / 5" unit, depending on size and quantity ordered.

Overview: Low, mountable and durable, this plastic bump that can be used to achieve a curb-like barrier effect.

Demo (1 day - 1 month) | ▶ Pilot (1 month -1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Bikeways:** Place along edge of lane, 1 every 5 - 8 ft. Note that given the low and mountable profile, spacing beyond 8 ft. apart may not be effective in deterring vehicles from entering the bike lane. Installation does not require specialized equipment. Simply drill holes in the asphalt / concrete and install. A team of three people can install approximately 100 meters in 8 hours. The product's pre-sunk bolt holes can accommodate anchors of various sizes.

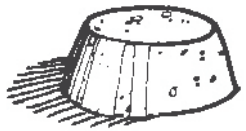
Tips and Considerations

» Easily Installed and removed.
» Durable and meant to last several years.
» Mountable, allowing emergency and, city service vehicles access.
» Minimal / no stormwater obstruction.
» Set armadillos at an angle to allow cyclists to cross between barriers as necessary.
» Low visual profile may lead to a decreased safety perception of safety for people walking or biking (compared to vertical delineators, posts etc.).
» Manufacturer recommends using mechanical anchors with chemical adhesives. Plastic mechanical anchors are not recommended.

Potential Sources

» Purchase from traffic control or construction equipment suppliers.

CONCRETE BUTTONS



Typical Dimensions: Varies. Can be 3 in. or 5 in. high, and up to 1 ft. wide.

Estimated Cost: $12 / 3" unit; $15 / 6" unit (assumes bulk order).

Overview: Often used as barrier near light rail tracks, these low, mountable buttons can be used to achieve a curb-like barrier effect for curb extensions and plazas.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Curb Extensions and Plazas:** May be combined with planters or other barrier elements to define the edge of a plaza or curb extension. Affix to pavement using chemical adhesives such as epoxy.

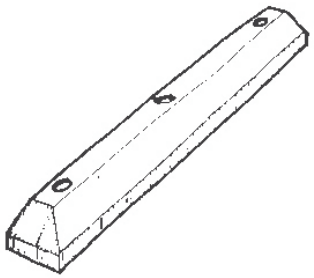
Tips and Considerations

» Note that installation / adhesive set time will be impacted by weather and temperature. Buttons should be allowed to fully set before sustaining any impact.
» Durable and mountable for emergency vehicles, city service vehicles, etc.
» Minimal / no stormwater obstruction.
» Low visual profile may lead to a decreased safety perception of safety for people walking or biking (compared to vertical delineators, posts etc.).

Potential Sources

» Purchase from traffic control or construction equipment suppliers.

PARKING STOPS



Typical Dimensions: Length varies. 3 / 4 / 6 / 8 ft. long x 5.75 in. wide x 4 in. tall.

Estimated Cost: $30 - $45 / unit.

Overview: Low, mountable plastic, rubber, or concrete curb that can be bolted to pavement and used as barrier element.

► Demo (1 day - 1 month) | ► Pilot (1 month - 1 year) | ► Interim (1 - 5 years)

Recommended Applications and Installation

- ► **Bikeways:** Center curb stops within the buffer zone along the edge of the bikeway. Typical spacing should be 8 - 20 ft. between stops, depending on the thoroughfare's design speed / bikeway configuration. Allow gaps for curbside pedestrian access or for cyclists to cross through the barrier.
- ► Allow a minimum of 1.5 ft. clear width for installation
- ► **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

Tips and Considerations

- » Easily installed and removed — bolted or adhered to street surface with epoxy.
- » Low profile may present a trip hazard; add reflective tape in areas with high pedestrian activity.
- » In most configurations, rubber curb stops will limit cyclist ability to cross over / through the barrier. Should only be used in places where this activity is not required.
- » Not designed to be driven over on a regular basis. Can pose challenges for trash collection and other curbside services.
- » Use plastic curb stops for demonstration projects, rubber or concrete for pilot or interim design projects.

Potential Sources

- » Existing city public works inventory.
- » Purchase from traffic control or construction equipment suppliers.

Hard plastic curb stops were used for this monthlong protected bikeway pilot project in Bella Vista, AR (Street Plans).

SURFACE TREATMENTS




A NOTE ON SURFACE TREATMENTS

Surface treatments, such as striping, and pavement markings, are a critical design element for many of the project types described in this guide. While many surface treatments are governed by established standards (such as pavement markings within bike lanes), other project types provide room to use surface treatments more creatively. Examples include artistic crosswalks, painted intersections, or street murals below people's feet in bike corrals, curb extensions, and pedestrian plazas. Colorful surface treatments can help define a space and enhance aesthetic appeal. However, removal and maintenance are important considerations — over time, paint and other colorful surface treatments will wear down and fade. In areas with frequent power-washing or plowing, degradation of materials can be a particular concern. The chart to the right provides a list of factors to consider when choosing surface treatments for striping, pavement markings, or defining a newly claimed area of excess asphalt with color treatments.

The Application Case Studies chapter (see page 86) provides more striping guidance. For community-led demonstration projects, striping can be a challenging element to install. Where volunteers are working in a live roadway, a traffic control plan may be needed to ensure the work area is safe. In some cases, cities have used their own professional in-house crews to apply lines / striping for projects, allowing volunteers to handle the placemaking and programming elements. The MemFIX program in Memphis, TN is a successful example of this city - citizen partnership approach.

SURFACE TREATMENT CRITERIA

Safety

- **Safety For All Street Users** (walking, cycling, driving, wheeling etc.)
- **Visibility / Reflectivity** (if appropriate)
- **Non-slip (**consider treatment condition when wet)

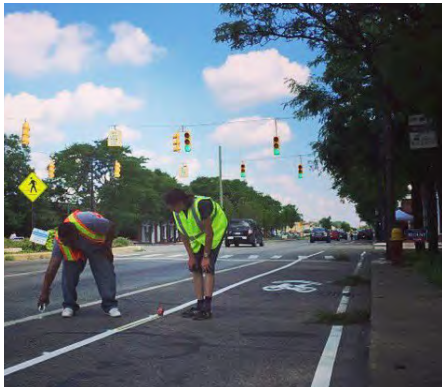
Planning + Design

- **Availability / Ease of Procurement**
- **Aesthetics** (Consider local context, wear and tear over anticipated project duration)
- **Cost** (Consider what treatment is most cost effective for the anticipated project interval)
- **Anticipated Duration**

Maintenance

- **Re-Surfacing Frequency**
- **Ease of installation** (may consider use by city crews, volunteers, or artists)
- **Removable** (if required)

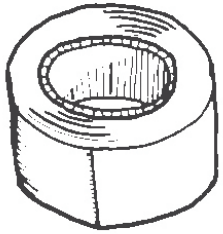
Photos left to right: The Islington Street Lab demonstration project, Portsmouth, NHJ (Street Plans); Tactical Urbanism Workshop in Great Falls, MT (Julia Moss, Great Falls Tribune); A N\ neighborhood greenway demonstration in progress, Burlington, VT (Street Plans) Colorful street mural below bike corral in San Francisco, CA (SFMTA).



Left: Volunteers create a demonstration protected bikeway in Detroit using spray chalk (Team Better Block). Right: Volunteers use white duct tape and white tempera paint to create a new crosswalk along Detroit's Michigan Avenue (Street Plans).

Foil-backed traffic tape is available in multiple colors, including yellow (seen here), which can be used for center line striping. Volunteers installed a very short-term splitter island with cones and yellow traffic tape to encourage people driving to navigate around a temporary mini-roundabout at the center of this Long Beach, CA intersection (Street Plans).

DUCT TAPE



Typical Dimensions: Use minimum of 4 in. width tape for striping.

Estimated Cost: $3 - $5 / 20 yard roll; $0.15-0.25/ ft.

Overview: For one-day projects, use standard white duct tape or other colors as needed.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Striping width recommended at 6 in. for outermost line, 4 in. for inner line (closest to curb). Recommended bike lane width is a minimum of 5 ft. Tape can also be used for intersection treatments or to stripe a bike lane buffer area, with diagonal chevron or cross hatch markings spaced every 8 - 10 ft. if buffer is 2 ft. or wider.
- ▶ **Pedestrian Crossings:** Tape can be used to create temporary crosswalks, which come in many varieties and colors. A traditional continental cross-walk should have stripes a min. of 12 in. wide, with 12 - 36 in. gaps between stripes.
- ▶ **Curb Extensions and Plazas:** Stripe outer boundary of curb extension with double white lines, 4 in. wide.
- ▶ **Roundabouts:** Use tape to stripe splitter islands and / or outer perimeter of the roundabout area using stripes at least 4 in. wide.

Tips and Considerations

- » Sweep or powerwash street to remove dust and debris before applying.
- » Provides a low-cost option that is easy to source and remove.
- » Not reflective makes it a poor candidate for overnight/ multi-day or week demonstration projects.
- » Can become slippery if wet.

Potential Sources

- » Buy from local hardware store or in bulk from: www.uline.com

BLACK FLOOR MATS

Typical Dimensions: Sold in rolls. Order custom dimensions to create rolls a minimum of 6 ft. wide, and long enough to span roadway.

Estimated Cost: $5 / sq. ft.

Overview: Paint white rectangles across floor mat, and quickly roll out a crosswalk!

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Crosswalks:** Choose a floor mat 6 - 10ft wide, and paint with white stripes 12 - 24 in. per stripe, with gaps of 12 - 36 in. Roll mat into place where croswalk demonstration is desired.
- ▶ **Bikeways:** East Bay Bike Coalition has similarly used heavy rubber floor mats to simulate green stretches of bike lane. For a bike lane, choose a mat at least 5 ft. wide, and up to 20 ft. long. Paint mat green, add bike lane markings (see page 48 for stencil types) and position in place as desired.

Tips and Considerations

- » Cheap, easy to create, and re-usable.
- » Mat material cuts easily with strong scissors, if needed.
- » Choose a heavy mat material that will not blow in the wind or be easily lifted by passing cars
- » Black tar paper provides a cheaper alternative.

Potential Sources

- » Purchase supplies from local hardware or office supply hardware.
- » Purchase online at: www.americanfloormats.com

TRAFFIC TAPE (FOIL BACKED)

Typical Dimensions: Recommend minimum of 4 in. Many roll length and width options are available.

Estimated Cost: $60 - $125 for 150 linear ft.

Overview: Standard foil-backed traffic tape is reflective, non-slip, and easy to apply. Available in standard white and yellow colors.

▶ Demo (1 day - 1 month) | Pilot (1 month -1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Striping width recommended at 6 in. for outermost line, 4 in. for inner line. Recommended bike lane width is a minimum of 5 ft. Tape can also be used for intersection treatments or to stripe a bike lane buffer area, with diagonal chevron or cross hatch markings spaced every 8 - 10 ft. if buffer is 2 ft. or wider.
- ▶ **Pedestrian Crossings:** Tape can be used to create temporary crosswalks, which come in many varieties and colors. A traditional continental cross-walk should have 12 ft. stripes a min. of 12 in. wide, with 12 - 36 in. gaps.
- ▶ **Curb Extensions and Plazas:** Stripe outer boundary of curb extension with double white lines, 4 in. wide.
- ▶ **Roundabouts:** Use tape to stripe outer line of roundabout area, using stripes at least 4 in. wide.

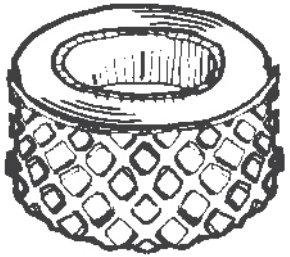
Tips and Considerations

- » Sweep or pressure wash street to remove dust and debris before applying.
- » Easily removable.
- » Some have had luck with re-using foil backed tape after one-day demonstration projects — East Bay Bike Coalition has found high-quality foil backed tape keeps its stickiness for up to 5 uses.
- » Not durable enough for interim design projects (1+ years).

Potential Sources

- » Purchase from traffic control or roadway construction supply retailer

TRAFFIC TAPE (CONTRACTOR GRADE)



Typical Dimensions: Recommend minimum of 4 in. Many roll length and width options are available.

Estimated Cost: $2.20 / linear ft. for 4 in. wide tape.

Overview: Contractor grade traffic tape is more robust and durable than foil backed traffic tape. Many roll length, width, and color options are available, including standard white and yellow.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Striping width recommended at 6 in. for outermost line, 4 in. for inner line. Recommended bike lane width is a minimum of 5 ft. Tape can also be used for intersection treatments or to stripe a bike lane buffer area, with diagonal chevron or cross hatch markings spaced every 8 - 10 ft. if buffer is 2 ft. or wider.
- ▶ **Pedestrian Crossings:** 12 in. wide tape can be used to create temporary stop bars and crosswalks. A traditional continental crosswalk should have minimum of 12 in. wide stripes, with 12 - 36 in. gaps between the stripes.
- ▶ **Curb Extensions and Plazas:** Stripe outer boundary of curb extension with double white lines, 4 in. wide.
- ▶ **Roundabouts:** Use tape to stripe outer boundary of the roundabout area or to create splitter island stripes. Stripes should be at least 4 in. wide.

Tips and Considerations

» Sweep or pressure wash street to remove roadway debris before applying.
» May last up to a year or more, depending on local conditions and application method.
» Higher cost than paint, but durable and easier to remove.

Potential Sources

» Purchase from traffic control or roadway construction supply retailer

Contractor grade traffic tape is used to demarcate the center line of a monthlong protected bikeway project in Bella Vista, AR (Street Plans).

Top: Tactical Urbanism Materials and Design Guide workshop participants apply spray chalk with a homemade stencil in Fayetteville, AR (Street Plans). Bottom: In Burlington, VT (left) and Portsmouth, NH (right) volunteers use city-owned stencils to create bikeway markings with tempera paint and spray chalk (Street Plans). Each material and approach has its own strengths / weaknesses, as noted in the spec sheets that follow.

SPRAY CHALK / SPRAY PAINT

Typical Dimensions: 15 oz. can may cover up to 600 - 800 linear ft. using a striper, or up to 25 square feet of space.

Estimated Cost: $5 - $15 per 15 oz. can

Overview: Temporary spray marking chalk that comes in a wide variety of colors.

▶ Demo (1 day - 1 month) ▶ Pilot (1 month - 1 year) Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Bikeways:** Consult the MUTCD and FHWA for exact pavement marking design and dimensions. Markings should be placed in the center of the bike lane. For shared lane markings, position sharrow a minimum of 4 ft. from the curb in areas with no parking, or a minimum of 11 ft. from the curb where curbside parking is present. To get long, consistent straight lines, use an athletic field striper to apply spray chalk (see page 50). May also be used for any / all other types of pavement markings (striping, colored surfaces etc.).

Tips and Considerations

» Will endure for days, weeks, or even several months, depending on quality of the chalk / paint and the climate / weather conditions during installation and post installation. Without regular precipitation, may require a pressure washer when removal is required. Opt for traffic tape if ease of removal is a true concern.

» If ordered online, rush orders are typically not available because cans are pressurized and must be ground shipped.

» The chalk color pigments will wash away faster on non-porous surfaces like glass or metal, but can be finished and sealed with spray varnish to create longer lasting effects.

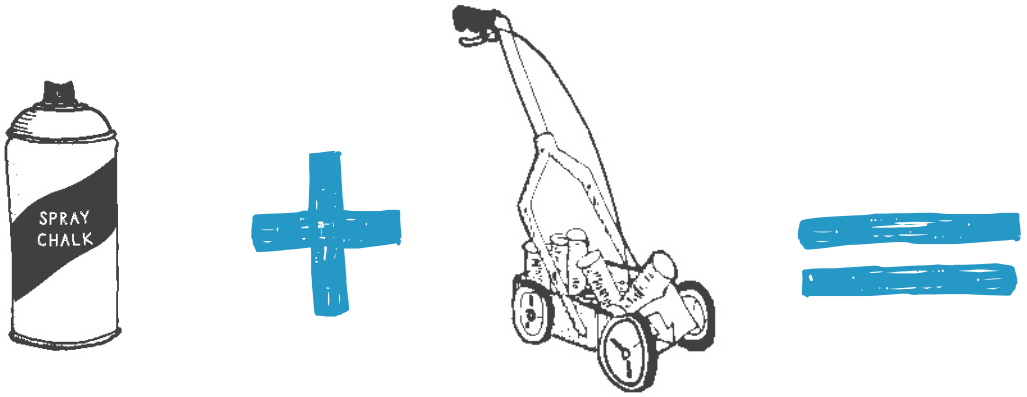
» Limit environmental impact by purchasing non-toxic, eco-friendly brands.

Potential Sources

» Purchase from local hardware, craft, or athletic supply stores.

PRO TIP: SPRAY CHALK / SPRAY PAINT APPLICATION

We talked to Jason Roberts, co-founder of The Better Block project and Project Manager Monica Diodati to get their advice on striping temporary bike lanes. To get long, consistent straight lines, Jason and his team recommend using an athletic field striper to apply spray chalk or spray paint. Some water-based paints may also be applied and be expected to last for a month or longer. Removal may require a pressure wash and cleaning with non-toxic soap.

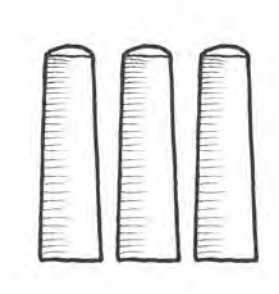


~$8-$10 PER
15 OZ. CAN

~$100 TO
BUY A STRIPER

A bikeway demonstration in Detroit, MI (Team Better Block).

SIDEWALK CHALK



Typical Dimensions: At least 10 chalk sticks per pavement marking.

Estimated Cost: $20 for a 72 pack.

Overview: Use white sidewalk chalk to color in pavement marking stencil and set with hair spray for best result.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

▶ **All projects:** Where white pavement markings are needed but fast removal is a requirement, consider using sidewalk chalk with hairspray. This technique often involves using a stencil to guide application, applying as heavily as possible, and then using hair spray to "set" the chalked area.

Tips and Considerations

» Appropriate for very short-term projects.
» Use large railroad chalk sticks — thin chalk sticks will not hold up to heavy drawing for road markings.
» Once chalk drawing is complete, fan the area to remove as much chalk dust as possible before applying hair spray.
» Not an ideal approach for large areas, but works well for sharrows or a handful of bike lane markings. With many hands, you can quickly color in your designs, set the chalk, and enjoy!

Potential Sources

» Buy from local supermarket, hardware, or art supply store.
» Use a handmade or borrowed stencil to guide chalk application.

PRO TIP: APPLYING SIDEWALK CHALK

Sidewalk chalk is a very dusty and short-term material. For best results:

▶ Use large "railroad" chalk sticks, and apply a thick layer of chalk.

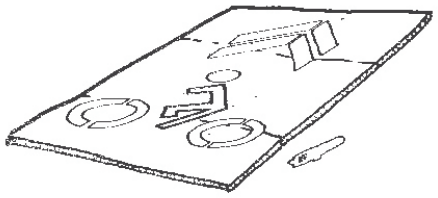
▶ Fan chalked area to remove dust when drawing is complete.

▶ Cover chalked area with hair spray to create a net and "set" the dust.

▶ Allow 3 - 4 minutes for hairspray to dry before removing stencil.

In San Jose, CA a volunteer applies hair spray to help set pavement marking created with sidewalk chalk. (Street Plans)

HOME MADE STENCIL



Typical Dimensions: Consult the MUTCD for official guidance on dimensions for the appropriate facility type marking (bike lane, shared lane, etc.).

Estimated Cost: Less than $100 for supplies and printing.

Overview: Cardboard stencil used to guide the application of various bikeway / pavement markings.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Shared Lane Markings:** Follow MUTCD guidelines to create a marking that measures 40 in wide. x 112 in. long (including chevron). Place sharrow marking in the center of the travel lane, a minimum of 11 ft. from curb where parking is present, or 4 ft. from the curb on streets with no curbside parking and apply spray paint, spay chalk, or sidewalk chalk.
- ▶ **Bike Lanes:** Follow MUTCD guidelines to create a marking that measures 40 in wide. x 112 in. long (including arrow).Place marking in center of bicycle lane, at a minimum twice per block (start and end of the lane). Increased frequency should be based on local judgment (design speed, length of block, number of driveways etc.).

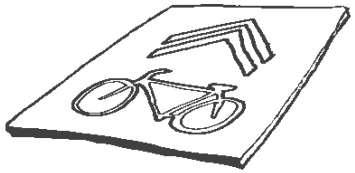
Tips and Considerations

- » Print marking to scale on paper and cut out. Place paper over cardboard and trace. Cut cardboard using utility knife or sharp scissors; Ask someone with keen arts / crafts skills to trace / cut.
- » Cheap and possibly reusable for future demonstration projects (wet spray paint / spray chalk will eventually compromise quality / stiffness of the cardboard.
- » Choose extra large moving boxes that when flattened can collapse further.

Potential Sources

- » Reclaim discarded cardboard boxes (extra large) or purchase from local hardware or moving supply store and create stencil.

GOVERNMENT / CONTRACTOR STENCIL



Typical Dimensions: Consult the MUTCD for official guidance on dimensions for the appropriate facility type marking (bike lane, shared lane, etc.).

Estimated Cost: Borrow / use city or contractor stencil.

Overview: Official pavement marking stencils can be had by your city government or the construction conractor they work with on the delivery of such markings.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Shared Lane:** Follow MUTCD guidelines to create a marking that measures 40 in wide. x 112 in. long (including chevron). Place sharrow marking in the center of the travel lane, a minimum of 11 ft. from curb where parking is present, or 4 ft. from the curb on streets with no curbside parking and apply spray paint, spay chalk, or sidewalk chalk.
- ▶ **Bike Lanes:** Follow MUTCD guidelines to create a marking that measures 40 in wide. x 112 in. long (including arrow). Place marking in center of bicycle lane, at a minimum twice per block (start and end of the lane). Increased frequency should be based on local judgment (design speed, length of block, number of driveways etc.).

Tips and Considerations

- » Use of official (over homemade) stencil often yields more professional looking and accurate results. It's also less time consuming.
- » Materials may vary (plastic, metal etc.) but most stencils are flexible and easy to transport.

Potential Sources

- » Source from transportation / public works department, or preferred pavement marking contractor should the city outsource this type of work.

Where fast removal is important, corn starch paint can be a great material for quickly adding a colorful base to a public space project. If you'd like your project to last longer, acrylic asphalt paint may be the material for you. Left: Poughkeepsie, NY Market Street Connect demonstration project (Street Plans). Right: Curb extension mural at the New York City Tenement Museum (Street Plans).

For pilot or interim-design projects, epoxy gravel can be an effective and attractive way to differentiate pedestrian space from vehicular space, as shown at the Fulton Landing pedestrian plaza, Brooklyn, NY (Street Plans).

CORN STARCH PAINT

Typical Dimensions: 16 oz. box standard in most supermarkets. Bucket size available at wholesale stores.

Estimated Cost: $18 / 24-pack of 16 oz. boxes.

Overview: Temporary paint made with corn starch, water, and pigment (either food coloring or tempera paint)

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Use corn starch paint in conjunction with stencil to create pavement markings, or other colored treatments (lanes, bike boxes, two-stage turn queues etc.).
- ▶ **Pedestrian Crossings:** Use corn starch paint to create artistic / decorative crosswalks.
- ▶ **Curb Extensions and Plazas:** Painted surfaces will enliven the new public space and clearly delineate pedestrian space from vehicle space.
- ▶ **Roundabouts / Activated Alleys:** Colorful mural surface treatments add beauty, space definition, and can help calm traffic.

Tips and Considerations

- » Sweep or pressure wash street to remove roadway debris before applying.
- » Easy to make and wash away, and it's non- toxic.
- » Mix equal parts corn starch and water, and add pigment using either tempera paint or food coloring.
- » Highly sensitive to weather conditions and will only be good until the next rain storm. Thus, it's only appropriate for very short-term demonstration project.

Potential Sources

- » Local supermarket or wholesale stores such as Costco.

TEMPERA PAINT

Typical Dimensions: Sold in bottles of varying sizes, up to 1 gallon.

Estimated Cost: $5 - $10 / pint; $10 - $12 / gallon.

Overview: Tempera paint is available in powder or liquid form. It can be applied straight from the bottle or thinned with a mixture of corn starch and water (1:1 ratio).

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Use paint to create green bike lane, bike boxes, two-stage turn queue boxes, or a green base for sharrows.
- ▶ **Pedestrian Crossings:** Use paint to create artistic / decorative crosswalks.
- ▶ **Curb Extensions / Plazas:** Create colored surfaces to enliven the public space and clearly differentiate pedestrian space from vehicle space.
- ▶ **Roundabouts / Activated Alleys:** Colorful mural surface treatments adds beauty, defines space, and helps calm traffic.

Tips and Considerations

- » Sweep or pressure wash street to remove roadway debris before applying.
- » Easy to make, non-toxic, and washes away easily.
- » Thin paint to spread it further with water and corn starch mixed in equal parts.
- » Like corn starch paint, tempera is highly sensitive to weather conditions and will wash away easily, especially if thinned. A straight tempera application may withstand one light rain event, but not much more.
- » Anyone can apply this paint!

Potential Sources

- » Purchase supplies from local art supply store.

ACRYLIC ASPHALT PAINT

Typical Dimensions: Usually sold in 5 gallon containers

Estimated Cost: $110 / unit

Overview: Acrylic water-based emulsion pavement color coating

Demo (1 day - 1 month) | ▶ Pilot (1 month -1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Curb Extensions / Plazas:** Create colored surfaces to enliven public space and clearly differentiate pedestrian space from vehicular space. Work with local artists to develop unique designs.

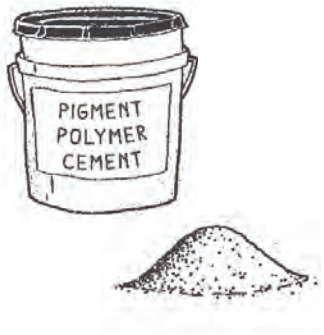
Tips and Considerations

- » Appropriate for applications, such as intersection repair or pilot plazas intended to last 1 - 3 years.
- » May require annual re-application, especially if pressure washed frequently as part of routine maintenance.
- » Paint available in white, yellow, blue, red, or black. Other colors may be obtained by mixing these colors.
- » Anyone can apply paint.

Potential Sources

- » SealMaster: www.sealmaster.net. (Search "ColorPave Product").

PIGMENT POLYMER CEMENT



Typical Dimensions: Varies: 4.5 in x 7 in. jars - 5 gallons bucket.

Estimated Cost: Approximately $3 / sq. ft.

Overview: Durable, colorful pigmented cement, also referred to as "Endurablend."

Demo (1 day - 1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Curb Extensions / Plazas:** Create colored surfaces to enliven the public space and clearly differentiate pedestrian space from vehiclular space. Work with local artists to develop unique designs.

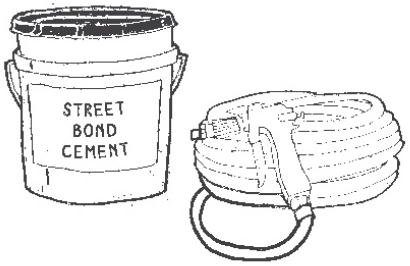
Tips and Considerations

- » Requires professional application.
- » Polymer cement is highly durable and thermally-compatible with asphalt, concrete, and cement surfaces.
- » Polymer cement will endure up to 15 years of power-washing maintenance without causing damage to the surface. Other applications for polymer cement include bridges, bicycle paths, and runway aprons.
- » Applied like a commercial paint job. The powder is mixed on site and sprayed directly onto the roadbed surface by certified installers. This is a non-toxic material that does not emit an unpleasant odor when applied.
- » High degree of flexibility in color and design, though installation cost will vary based on design complexity (stencil chosen, number of non-primary colors chosen, time required to install, etc.).

Potential Sources

- » Pavement surfacing retailers: www.pavementsurfacecoatings.com/products/

STREET BOND PAVEMENT COATING



Typical Dimensions: Sold in 5 gallon bucket that includes 3 key components that are mixed to create the coating: 1 unit of coloring element (pint), 1 unit of SB 150 (3 1/2 gallons), and 1 unit of actifier (quart).

Estimated Cost: $1.20 / sq. ft. (Note that multiple coats may be needed).

Overview: Pavement coating appropriate for interim design uses.

Demo (1 day-1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Pedestrian Crossings:** Can be applied to enhance crosswalk markings. A traditional continental crosswalk should have stripes a min. of 12 in. wide, with 12 - 36 in. gaps between stripes.
- ▶ **Curb Extensions / Plazas:** Colored surfaces will enliven the public space and clearly demarcate pedestrian space from vehicle space.
- ▶ **Roundabouts / Activated Alleys:** Colorful mural surface treatments add beauty and may help slow vehicular traffic.

Tips and Considerations

- » Requires professional application.
- » Developed for use over imprinted or flat asphalt, StreetBond® SB150 Pavement Coating bonds permanently to asphalt surfaces to provide both an enduring, aesthetic finish and a low maintenance surface that helps protect and extend the life of the pavement.
- » 5 gallon container includes 3 components which must be mixed together and then applied within 45 minutes of mixing.
- » Durable, environmentally responsible, chemical resistant, and color stable
- » Pedestrian plazas may require up to 3 coatings at a cost of roughly $200 - $215 per 200 sq ft. (Approx. $1.20 / sq. ft.).

Potential Sources

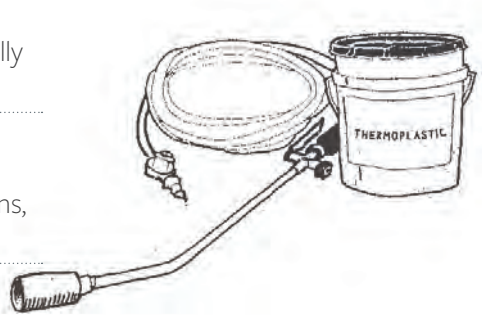
- » Purchase from traffic control or construction equipment suppliers.

(PREFORMED) THERMOPLASTIC

Typical Dimensions: Can be ordered in 5 gallon bucket or 55 gallon drum, preformed sheets size varies but usually come in 2 ft. x 2ft. sections.

Estimated Cost: $14 - $20 / sq. ft. for preform thermoplastic (installed, typically used for mural-like installations, such as decorative crosswalks).

Overview: A durable heat-applied material often used for pavement markings (bike lane markings, etc.).



Demo (1 day - 1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Use for bike lane or sharrow markings, per MUTCD standards.
- ▶ **Pedestrian Crossings:** Use retroreflective preformed thermoplastic strips for crosswalk striping and nonretroreflective colored sections for decorative crosswalks, as per FHWA guidance. Preformed thermoplastic decorative crosswalk materials shall be supplied in patterns and colors as per FHWA guidance. Preformed thermoplastic for decorative crosswalks shall contain anti-skid elements in the intermix and on the surface.
- ▶ **Plazas / Curb Extensions:** Use as a surface treatment for decorative plaza / public space element (not recommended for full surface coverage).

Tips and Considerations

- » Requires professional installation.
- » Sheets of interconnected preformed thermoplastic material are easily lifted and positioned onto an asphalt or concrete surface for application with propane heat torches or infrared heaters.
- » Heat application typically required to set; not easily removed.
- » Moderate degree of flexibility in color and design, though installation cost will vary based on design complexity (intricacy of design chosen, number of non-primary colors chosen, time required to install (etc.).

Potential Sources

- » Pavement product retailers, such as Ennis Flint: http://www.ennisflintamericas.com/

Artist Charles Bergen used Ennis-Flint's TrafficPatterns® Preformed Thermoplastic to create artistic crosswalk designs as part of the Washington, DC Chinatown Barnes Dance Public Art Project (ennisflintamericas.com).

EPOXY GRAVEL

Typical Dimensions: N/A

Estimated Cost: $2.50 / sq. ft.

Overview: Composite surface made of decomposed granite suspended in an epoxy resin (typically a mix of recycled porcelain, quartz, and granite).

Demo (1 day - 1 month) | Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years.)

Recommended Applications and Installation

- ▶ **Bikeways:** Can be used to increase visibility of bike lane at conflict points.
- ▶ **Pedestrian Crossings:** Can be used to increase visibility of crosswalk.
- ▶ **Curb Extensions / Plazas:** Use to create natural looking colored surface that clearly differentiates pedestrian space from vehicle space.

Tips and Considerations

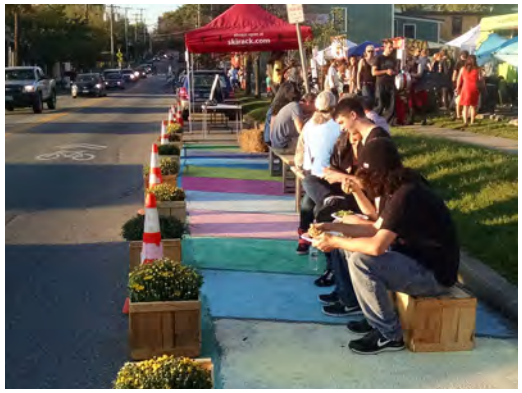
- » Creates reflective enhancing visibility at night.
- » Adds non-slip texture to the street, changing the look and feel.
- » Not ideal for colorful designs - cost will increase if any other color besides natural / tan is required.
- » Requires prior experience for proper installation.
- » Has not always proven durable where frequent power washing is needed.
- » Epoxy gravel may pick up dirt and trash over time.
- » Very attractive surface material; use in areas where aesthetic character / quality is a consistent concern (historic neighborhoods etc.).

Potential Sources

- » Pavement surfacing retailers: www.pavementsurfacecoatings.com/products/
- » Midwest Industrial Supply, Inc.: Resin Pave System

Top: Epoxy gravel used as a crosswalk surface treatment in London, England (Street Plans). Bottom: Epoxy gravel used in conjunction with flexible delineators to create a low-cost curb extension in Hoboken, NJ (City of Hoboken).

STREET FURNITURE



A NOTE ON STREET FURNITURE

Street furniture is an important element for any public space, providing the opportunity for people to sit, linger, and interact with each other and their environment. Depending on your project duration and budget, you may want to purchase ready-made street furniture or create your own from recycled or borrowed materials. Don't be afraid to keep it simple: a demonstration project on a lean budget may simply use hay bales to create a place for people to sit and rest.

To maximize user comfort, opt for movable chairs and tables — this provides the flexibility that allows people to reposition chairs to sit in the shade, or pull a few tables together to accommodate a large group.

Street furniture for pilot or interim design projects may be governed by established municipal street design guidelines. Where flexibility and time allow, look to collaborate with local artists or community groups to create street furniture that reflects neighborhood or block identity. The provision of street furniture provides an excellent opportunity to integrate beauty, creativity, and play into any public space.

Photos left to right: Hay bales and movable chairs and tables at a pop-up plaza in Poughkeepsie, NY (Street Plans); Cinder blocks and 2 x 10 in. boards and wooden crates provide seating for a 2-day demonstration in Burlington, VT (Street Plans); Simple, movable metal chairs provide seating at Proxy, an interim-design public space in San Francisco, CA (Street Plans); At the Market Street Prototyping Festival in San Francisco, CA, designers experiment with a whimsical rocking bench, injecting joy and social interaction into sidewalk seating (Street Plans).

STREET FURNITURE: CONSIDERATIONS

Safety

- **Access for people of all ages and physical abilities**
- **Physical comfort for all users**
- **Good State of Repair**

Planning + Design

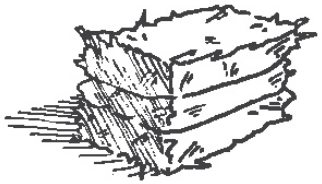
- **Availability / Ease of Procurement**
- **Dimensions** (May impact ease of transport, storage)
- **Aesthetics** (Considering local context)
- **Storm Water Impacts**
- **Cost**

Maintenance

- **Durability**
- **Stewardship** (For example, do chairs need to be locked together or taken inside each day?)
- **Access for City Services** (Public transit, trash collection, street sweeping, snow removal etc.)

Construction Impacts / Ease of Installation

BENCH - HAY BALE



Typical Dimensions: Common sized at 14 in. high x 18 in. wide x either 36 in. or 48 in. long.

Estimated Cost: $10 - $40 / unit

Overview: Cheap and relatively easy to transport, hay bales can be used as barriers and / or as seats for temporary public spaces.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** May be used to build a temporary barrier between vehicular travel lanes or a parking lane and the bike lane. Make sure to leave adequate space between hay bales for people exiting / accessing vehicles if used between a floating parking lane and the bike lane.
- ▶ **Pedestrian Crossings:** May be used to build temporary median island. Stack bales to create barrier in median area, leaving a flush passage for pedestrians to travel.
- ▶ **Curb Extensions / Plazas / Activated Alleys:** Use as a barrier or place wherever seating is desired.
- ▶ **Roundabout:** May be used to define and / or stage plants or other landscape elements within roundabout area.

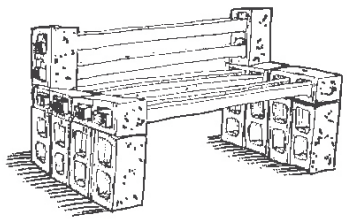
Tips and Considerations

- » Delicate, will shed and fall apart within 1 - 3 days of use.
- » Plan to have a broom on-site for cleaning.
- » Where work gloves and long sleeves when transporting/handling to avoid itchy arms!

Potential Sources

- » Purchase from a hardware, feed, or gardening supply store.

BENCH - CINDER BLOCK + WOOD



Typical Dimensions: Blocks typically sized at 16 in. long x 8 in. wide x 8 in. tall. Wood slats can be cut to desired size (shown here: 8 ft. slats of 2 in. x 4 in. board.

Estimated Cost: $1.25 / block, $5 - $10 / board.

Overview: Create simple and affordable benches using cinder blocks and wood.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Curb Extensions / Plazas / Activated Alleys:** Use wood and cinder blocks to create a bench for seating in temporary public spaces, including parklets, block length or large corner curb extensions, or wherever additional seating is needed (ex: bus stops). You can paint the wood and cinder blocks and even add soil and plants inside cinder blocks to enhance visual appeal.

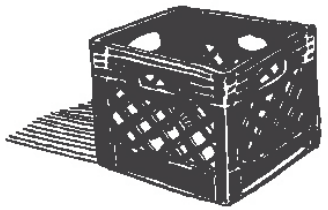
Tips and Considerations

- » Cinder blocks can be heavy, take caution in transporting.
- » Place blocks every 4 ft. for bench length for stability.
- » Due to low-cost, this bench type is commonly used for demonstration projects, but will last longer if need be.
- » Materials can be reused for other projects.

Potential Sources

- » Borrow or reclaim cinder blocks and use recycled wood if possible.
- » Supplies can be purchased from lumber yards and/or construction supply retailers.

MILK CRATES



Typical Dimensions: 13 in. long x 13 in. wide x 11 in. high (Square); or 18.75 in. long x 13 in. wide x 11 in. tall. (rectangular).

Estimated Cost: Can often be reclaimed from waste stream or received via donation.$4.75 (square) or $8.00 (rectangular) / unit.

Overview: Highly durable, light plastic containers that may be repurposed for a number of uses; easily movable and stackable (though not collapsible!).

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **All Projects:** Milk Crates can be used as a barrier elements or planters, and used just like the wooden planters described on page 36.
- ▶ **Curb Extensions / Plazas / Activated Alleys:** Milk crates are durable enough to sit on and cost less than foldable chairs.

Tips and Considerations

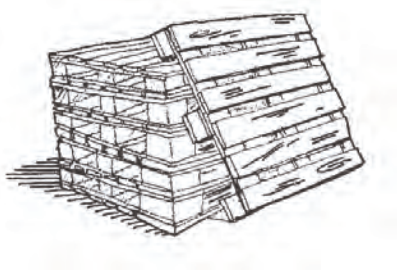
- » Consider aesthetics, as milk crates may not be ideal for all projects - though colorful crates can be used to make certain projects "pop!"
- » Note that while crates easily stack, they do not nest or fold, meaning storage and transport can be challenging if space is limited.

Potential Sources

- » Transport supply retailer, such as http://www.milkcratesdirect.com/ or www.uline.com

Milk crates are highly flexible and can be used/combined in a variety of contexts beyond the project types highlighted in this guide. Top: In Washington, DC, the Office of Planning used milk crate to create modular "shoplet" retail hubs for small / emerging businesses (Eric Shaw). Bottom: The 3x3 Project in Atlanta, GA uses milk creates to create movable, modular planters to grow food in unlikely places (3x3 Project).

SHIPPING PALLETS



Typical Dimensions: 48 in. x 40 in. is a common size, although pallets are available as small as 24 in. x 24 in. , 48 in. x 48 in. or larger.

Estimated Cost: Free if borrowed or reclaimed from waste stream. The purchase price is approximately $1.70/ pallet.

Overview: Shipping Pallets are wooden or plastic platforms that are relatively light, durable, and movable.

▶ Demo (1 day - 1 month) ▶ Pilot (1 month - 1 year) Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Curb Extensions / Plazas / Activated Alleys:** Use wood pallets to build street furniture such as benches, planters, bike parking, and more. May also be used to create gateway elements, public space barriers or parklets (see images to the right). Paint or stain the wood to enhance the visual appeal.

Tips and Considerations

» Look for opportunities to borrow or use recycled pallets from warehouses and/or big-box stores that sell nontoxic hard goods, which will increase your chance of finding clean and sturdy pallets.

» For some projects you will want pallets of a uniform size, so bring your tape measure or be prepared to find multiple pallet sources to meet your needs.

» For safety purposes, look for pallets with a "HT" (Heat treated) stamp on the side, not "MB" (chemically treated with methyl bromide)

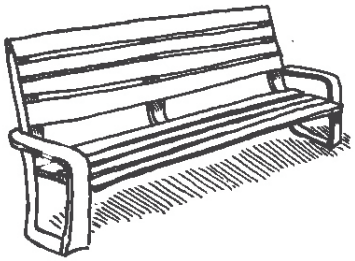
Potential Sources

» Reclaim from industrial parks, construction sites, or big box businesses

» For ideas and project instructions try 1001Pallets.com or instructables.com

Pallets are highly flexible and can be used in a variety of contexts beyond the project types highlighted in this guide. Above: Reclaimed pallets were used in Atlanta, GA to create bench seating and an edge barrier (reads "sweet") for demonstration plaza (Street Plans). Pallets were used to create a quick stage for musical programming at a three-day plaza demonstration in Somerville, MA (Street Plans).

CITY BENCH



Typical Dimensions: A common two-person bench dimension is 4 ft. long x 23 in. wide x 28 in. height.

Estimated Cost: $500 - $1,000.

Overview: Benches provide needed seating in parks, plazas, and along streets. They may be borrowed for demonstration projects or installed semi-permanently for pilot and interim design project.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Curb Extensions / Plazas / Activated Alleys:** Place wherever seating is desired / appropriate.

Tips and Considerations

» When selecting bench model, consider weight, maintenance, and impact on transport and storage.
» For pilot or interim design projects consider selecting a UV resistant paint finish.
» When locating consider regional and micro-climates (sun vs. shade, winter vs. summer etc.).

Potential Sources

» Borrow from existing city departments or local businesses.
» Purchase from outdoor furniture store or hardware store. Example: http://www.homedepot.com/p/Lasting-Impressions-4-ft-Park-Bench-460-225-0006/205114215

MOVABLE TABLES + CHAIRS

Typical Dimensions: Round table: 32 in. diameter x 29.5 in. high in solid steel; Folding chair: 32 in. high x 17 in. wide x 17 in. tall with steel slats and frame.

Estimated Cost: $15 - $120 per chair, $20 - $165 per table.

Overview: Folding tables and chairs may be found in steel, aluminum, or wood.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Plazas / Curb Extensions / Activated Alleys:** Place where seating is desired. When choosing colors, consider surface treatment colors, as well as the color of nearby plants and buildings.

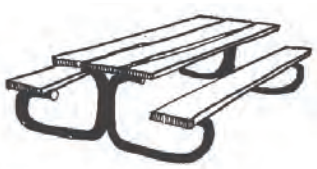
Tips and Considerations

» Models: 346 (table) and 314 (chair) from Emu (link below) represent standard models used in many plaza projects.
» If on a limited budget, substitute Emu chairs with Ikea's attractive TÄRNÖ table and chair set (one table and two chairs for $49.99).
» Many color options available.
» Movable tables and chairs are desirable because they allow flexible use of space, permitting people to move to a shady or sunny spot, or put tables together to accommodate large groups.
» Movable chairs may require a maintenance partner who is willing to be responsible for set-up and storage each day.

Potential Sources

» Outdoor furniture suppliers such as: www.emuamericas.com
» http://www.ikea.com/us/en/catalog/products/S69898415/

PICNIC TABLE



Typical Dimensions: 58 in. width x 30 in. height X 48 in. - 72 in. length

Estimated Cost: Varies by material type. $200-$2,000 for high quality polycite table

Overview: Wood, Plastic or Polycite tables create a place to sit and eat.

Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Curb Extensions / Plazas / Activated Alleys:** Place where large format seating is desired and appropriate.

Tips and Considerations

» ADA accessibility can be an issue of concern with picnic tables, purchase or build an ADA accessible table.
» Movable, but certain types may be heavy and challenging.
» May require a maintenance partner who is willing to be responsible for daily setup and storage.

Potential Sources

Outdoor furniture retailers, such as:
» www.landscapeforms.com
» www.globalindustrial.com

MOVABLE UMBRELLA

Typical Dimensions: 8.5 ft. tall with an 11 in. diameter (base).

Estimated Cost: Free if borrowed for demonstration projects; $300 for umbrella, $120 for base with wheels, $420 total.

Overview: Movable umbrella with base provides shade — a critical element in sunny public spaces.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

▶ **Plazas / Curb Extensions:** Place umbrellas in areas where seating is located, to provide shade. When choosing umbrella colors, consider surface treatment colors, as well as the color of nearby plants and buildings.

Tips and Considerations

» Additional anchoring may be necessary in windy locations.
» Movable, but certain types may be heavy and challenging to move longer distances.
» Due to cost, find a more permanent home for umbrella if used for a demonstration project only.
» For very short-term anchoring, use a bucket filled with rocks or Quickcrete.

Potential Sources

» May be able to borrow from a local business or property owner
» Outdoor furniture retailers, such as California Umbrella: http://www.californi-aumbrella.com/

LANDSCAPING ELEMENTS




A NOTE ON LANDSCAPING ELEMENTS

Plants and trees are lovely. People like them, and they really take the aesthetics of a project to the next level. Landscaping also brings environmental benefits, soaking up dangerous CO_2 emissions. Plants and trees have also been shown to have a traffic calming effect, reducing vehicle speeds along busy thoroughfares. Of course, stewardship and care of plants can be the largest challenge in integrating them into projects. Plants are delicate and can be challenging to move and store without harming them. Without care and attention, plants will quickly die and become an eyesore. Most pilot and interim-design projects involving plants require maintenance partnerships between city agencies and community groups willing to act as stewards.

Photos left to right: "Tactical Resilience" workshop participants depave the sidewalk and add plants to Norfolk's West Olney Road (Street Plans); A parklet in Los Angeles, CA integrates plants at the edge of benches (Jim Simmons); A lightweight landscape installation along Market Street brings beauty and a place to sit overlooking the Schuylkill River in Philadelphia, PA (Street Plans); Programming meets landscape along the interim design of Miami's Ludlam Trail (Street Plans).

LANDSCAPING CRITERIA

Safety

- **Safety For All Street Users** (walking, bicycling, driving, wheeling etc.)
- **Physical Comfort for All Users**
- **Clear Sightlines**

Planning + Design

- **Availability / Ease of Procurement**
- **Dimensions** (Meets height, width, depth requirements)
- **Aesthetics**
- **Local climate** (Depending on climate, you may need to look for drought resistance plants, or plants that are still beautiful in winter)
- **Storm Water Impacts** (Landscaping should improve stormwater management)
- **Cost**

Maintenance

- **Durability**
- **Stewardship**
- **Access for City Services** (Public transit, trash collection, street sweeping, snow removal, emergency response etc.)
- **Construction Impacts / Ease of installation**

The Powell Street Promenade in San Francisco, CA uses drought resistant plants to add beauty to the street (left: Union Square Business Improvement District, right: Kathleen Corey).

Self-watering planters, like those pictured in the two photos above by Sybertech, can help keep reduce the burden of watering plants. For more information, see spec sheet on page 40 (Sybertech).

PRO TIPS FROM A PROJECT IN PROCESS

We interviewed Rachael Bronson, Senior City Planner at the Denver Department of Public Works (DPW) Transportation & Mobility group. Denver is working on adding plants to an interim-design project in the city's downtown area. Though the process and final agreements are still in process, Rachael shared the following tips for getting planters into the ground on an official city-led project:

Step 1 - Partnerships: Denver DPW is working with a Business Improvement District (BID) on this project. The BID was a natural partner, because they already do work maintaining special greenery in the neighborhood in public spaces above the curb area.

Step 2 - Procurement and Design:

- Purchase the planters (DPW is planning to use Sybertech self-watering planters described on page 40).
- Identify a temporary storage location where planters can be delivered
- Select plants and boxes.*
- Purchase planters and plant material (plants and soil).
- Purchase supporting materials as required (curb stops, fertilizers, etc.).
- Identify water source at planter site to fill reservoirs.

Step 3 - Assembly:

- Identify a site where assembly can take place.
- Transport plants, planters and soil to assembly site.
- Plant the plants in soil, fertilize as needed.

Step 4 - Installation:

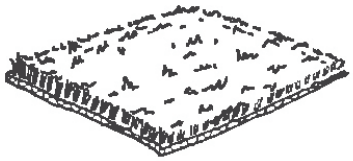
- Create a design drawing to guide installation.
- Transport planters to installation site.
- Install planters in street per construction documents.
- Fill reservoirs with water.

Step 5 - Ongoing Maintenance - anticipated duties include:

- Plant care - weeding and filling reservoirs with water; ongoing watering.
- Relocating planters and curb stops if they are hit/moved by cars.
- Replacing planters and curb stops if they are damaged/broken.
- Replanting plants that are damaged or overgrown.

**Consider sourcing local / native plants. The Materials Catalogue for San Francisco's Pavement to Parks Program provides guidance on local plant selection: pavementtoparks.org/plazas/*

ASTRO TURF



Typical Dimensions: Sold in rolls, can be cut to desired dimensions.

Estimated Cost: $25 - $35 for 4 ft. x 6 ft. astro turf segment (reusable).

Overview: Synthetic grass sold in rolls. Typically used to add greenery to a project.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Cut astro turf into strips wide enough to fill buffer area (typically min. 3 ft. wide), and use it to visually enhance the barrier. Typically used in conjunction with other barrier elements, such as planters.
- ▶ **Curb Extensions and Plazas:** Use to create a temporary visual green surface for curb extensions, or as a soft surface for parklets and plaza events.

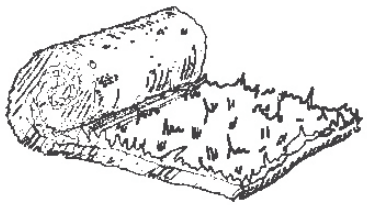
Tips and Considerations

- » Leaving unattended overnight may result in theft; Appropriate for very short-term (one-day) demonstrations unless a project has been identified to roll up and roll out the turf on a daily basis.
- » Beware of windy conditions, as turf does not adhere to roadway surface

Potential Sources

- » Purchase from gardening supply or hardware store.

SOD (LIVE GRASS)



Typical Dimensions: Varied. Purchase as rolls or pallets, with the smallest amount being 10 sq. ft.

Estimated Cost: $.25 / square foot of sod

Overview: Easy, cheap solution to creating a comfortable and visible green surface.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Plazas / Pocket Parks:** Use to create a natural, soft green surface for demonstration parklets, plazas, and pocket parks.

Tips and Considerations

- » Installation can be messy, bring a broom or other method of sweeping up loose soil.
- » Real grass is aesthetically pleasing and very inviting for users. It is an ideal material for projects that seek to invite people to lounge, play, and linger.
- » Sod is somewhat delicate and is not ideal for long-term use in areas with high levels of foot traffic.
- » Identify a steward to water the sod (fire department, neighbor, local busines, public works department, parks department etc.).

Potential Sources

- » Borrow or seek turf donations from local landscape vendors for very short-term demonstration projects.
- » Purchase from a local gardening supply, turf, or hardware store.

SMALL TREES

Typical Dimensions: Varies. Small trees range from 3 ft. to 15 ft. tall, within various sized pots.

Estimated Cost: May be available via donation / borrowing for short-term demonstration projects. Real cost depends on species, but ranges from $50 - $200.

Overview: Great option for short-term beautification and shade protection.

▶ Demo (1 day - month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Curb Extensions / Plazas:** Place where shade or visual barrier is desired, near other street furniture wherever possible. Tight spacing of trees and plants will give more lush appearance, and create a more intimate enclosure.
- ▶ **Roundabout:** May be used within center of roundabout to add visual beauty and enhance traffic calming effects.
- ▶ **Activated Alleys:** Place trees around perimeter of alley to enhance greening and beautify the space.

Tips and Considerations

- » Anchor trees during short-term demonstration projects, to prevent them from blowing over in windy conditions.
- » For demonstration projects, burlap-wrapped trees can be placed within planters to stabilize them and improve aesthetics.
- » Use in a planter as a street tree, especially for block-long curb extensions.
- » Make sure you have a maintenance / stewardship partner for pilot or interim design projects.

Potential Sources

- » Rent or borrow from plant nursery - offer event sponsorship to sweeten the donation deal!
- » Purchase from gardening supply store or nursery.

SMALL / MEDIUM PLANTS

Typical Dimensions: Varies. Minimum desired height typically 18 in. high.

Estimated Cost: May be available via donation / borrowing for short-term demonstration projects. $10 - $40 per plant.

Overview: Small / medium plants can be borrowed or purchased, and used as a greening or barrier element.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** Place along edge of bike lane every 10 ft. to create protective barrier.
- ▶ **Pedestrian Crossings:** May be used as landscaping for a median island. Align plants with the perimeter as a barrier element and / or cluster to center to provide lush island. Make sure not to obstruct clear accessible path.
- ▶ **Curb Extensions / Plazas:** Place along edge of curb extension area, or around parklet or plaza. Tighter spacing of plants will give more lush appearance, and create a more intimate enclosure.
- ▶ **Roundabout:** May be used within center of roundabout area to add visual beauty and enhance traffic calming effects.

Tips and Considerations

- » Can be delicate, be careful during transport and provide water for multi-day demonstration projects.
- » Use in a planter as a street tree, especially for block-long curb extensions.
- » If purchasing from a large chain retailer (such as Home Depot) look for discounted or sale plants – these may be available for less than $10 each.

Potential Sources

- » Rent or borrow from plant nursery - offer event sponsorship to sweeten the donation deal!
- » Purchase from gardening supply store or nursery.

RECIPE: EASY PLANTERS

For a pop-up demonstration project, try this easy recipe for creating planters:

- **Purchase wooden boxes** from your local supplier or a hardware / craft store.
- **Decorate boxes** or brand with spray painted partner logos as desired.
- **Borrow or purchase medium size plants.**
- **Drop plants right into planter box.** For larger boxes, create a "false bottom" to allow small / medium plants to be as visible as possible.
- **Place planters in desired location.** See the Barrier Elements section on page 27 for more details on placement within specific project type.

Top: Locally-made wooden crates in Burlington, VT (Street Plans); Bottom: store bought crates used to define the edge of a curb extension in Portsmouth, NH (Street Plans).

SIGNS

SIGNS MATTER. HERE'S WHY.

» **Signs may be required to meet safety or design requirements for your project.** This could range from required signs notifying people of a temporary change to parking configurations (typically posted 48 - 72 hours in advance), traffic control signs during a project install, wayfinding signs describing the proximity of nearby destinations, or signs governing the use of public space (for example, no smoking signs).

» **Signs will help people understand how to use a new public space type they may have never seen before.** In some neighborhoods or communities, new bike lane markings may be unfamiliar - let alone new types of infrastructure only in use recently, such as parking-protected bike lanes or parklets! Signs can be used to help people understand project goals and explain the purpose of new and potentially unfamiliar designs.

» **Signs can be used to create a cohesive "brand" for a public space program.** By tying parklets, plazas and other new types of public spaces together with a cohesive visual identity, cities can increase public understanding of new ideas in public space planning.

» **Signs are easy to come by!** Signs for your project signs may be home made, printed professionally, provided by a local government sign shop, or even purchased online.

Photos left to right: Playful project sign in Lewiston, ME (Street Plans); One year after installation, Walk [Your City] signs still directing pedestrians along Auburn Avenue in Atlanta, GA (Street Plans); A project wayfinding sign in Bentonville, AR (Street Plans); A protected bikeway demonstration project sign in Fargo, ND (Dakota Medical Foundation).

SIGN CRITERIA

Safety	**Safety for all**
Safety	**Legal requirements** (MUTCD compliance, traffic control, use of public spaces, etc.)
Planning + Design	**Installation**
Planning + Design	**Availability / Ease of Procurement**
Planning + Design	**Dimensions**
Planning + Design	**Method of posting / attachment**
Planning + Design	**Aesthetics**
Planning + Design	**Sponsor / Donor recognition**
Planning + Design	**Branding for Community Program or Initiative**
Planning + Design	**Public engagement/education**
Maintenance	**Cost**
Maintenance	**Durability**
Maintenance	**Construction Impacts / Ease of installation**
Maintenance	**Replacement** (relevant for longer pilot and interim design projects)

» **Signs are an important tool for advocacy.** The photo to the right shows how Vermont-based advocacy organization Local Motion used simple yard signs to collect input on a pop-up protected bike lane. People who followed the prompts on the sign were directed to a short survey that asked where they wanted to see protected bike lanes installed in the City. That survey garnered hundreds of responses and helped inform the planning process for the city's first walk and bike master plan.

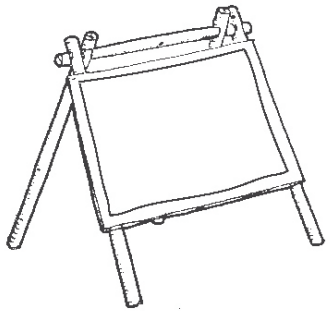
» **Signs can be used to help gather public input.** The City of Palo Alto created modular signs for a road safety pilot program. The top sign can be re-used for any pilot project the city undertakes. The bottom sign provides more information about the specific project in question - in this case the neighborhood traffic circle pictured at right.

» **Signs can be used to support larger livability goals.** For example, placing pedestrian wayfinding signs in an interim-design plaza can help support the larger goal of making a neighborhood or city a more inviting place to walk.

Left: Vermont-based advocacy organization Local Motion used simple yard signs to collect text-based input on a pop-up protected bike lane. Right: Downtown Denver Partnership used a sign to explain how to use a pop-up protected bike lane and generate buzz. (tacticalurbanismhere.com)

Left: An informational sign explaining a three-day "pop-up" plaza project in Somerville, MA (Street Plans). Pilot signs in Palo Alot, CA (Joshuah Mello, City of Palo Alto).

HOMEMADE SIGNS



Typical Dimensions: Varies

Estimated Cost: $10 - $100 for supplies, depending on quantity desired

Overview: Use materials on hand to create homemade signs.

▶ Demo (1 day - 1 month) | Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

▶ **All Projects:** Place signs at places of high visibilty and at key decision points. See section introduction for more information on what to include on your signs. Make sure to scale the text / graphics appropriately so that they may be seen by your intended audience (signs for drivers should be scaled very differently than those intended for people traveling by foot or by bicycle.

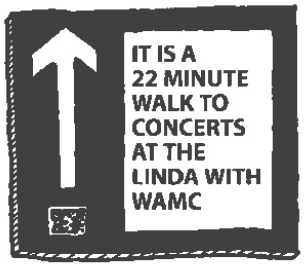
Tips and Considerations

» To attach lighweight, temporary signs to existing street furniture or other vertical elements, punch holes in signs and use zip ties or string for easy removal.
» If renting traffic barricades, consider posting signs on A-frames.
» Sandwich board signs are another affordable option and may be borrowed from local businesses who may support the project.

Potential Sources

» Create or print in house, or send to local printer for large format printing.

WALK [YOUR CITY] SIGNS



Typical Dimensions: 12 in. x 12 in.

Estimated Cost: $20 / per coroplast sign.

Overview: Coroplast wayfinding signs designed for easy application and removal for temporary projects.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | Interim (1 - 5 years)

Recommended Applications and Installation

▶ **All Projects:** Place signs at key decision points for those walking and bicycling.

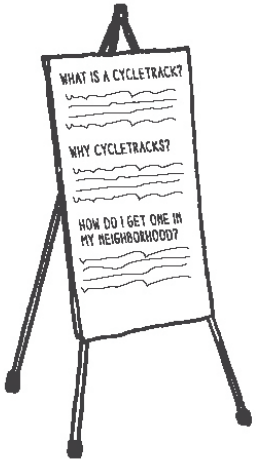
Tips and Considerations

» Use the Walk [Your City] custom sign builder to create simple signs that are colorful and easy to apply in any context.
» Signs ship with pre-drilled holes and zip ties for easy installation
» No minimums or maximums on the number of signs per order.
» Can be deployed last-minute: typical turnaround time to ship signs is two to four business days.
» Consider what other languages may be spoken in the neighborhood besides English - translate signs so all can read them.
» Some jurisdictions will require approval to place these signs, even on a temporary basis.

Potential Sources

» To order, visit the walk [Your City] website: https://walkyourcity.org/

INFORMATION SIGNS



Typical Dimensions: Varies.

Estimated Cost: Varies, depending on material and size. Options for almost any budget.

Overview: Signs intended to communicate important project information to users or casual passersby.

► Demo (1 day - 1 month) ► Pilot (1 month -1 year) ► Interim (1 - 5 years)

Recommended Applications and Installation

►**Relevant for all project types:** Informational signs can help communicate project goals or explain the benefits and purpose of unfamiliar infrastructure (ex: protected bike lane, roundabout, etc.

Tips and Considerations

» Use plain and friendly language to provide information - avoid professional jargon
» Consider what other languages may be spoken in the neighborhood besides English - translate signs so all can read them.
» May become interactive by integrating elements like QR Codes, weblinks, or phone numbers to text.

Potential Sources

» Create or print in house, or send to local printer for large format printing.

Workshop participants install a rain barrel during the Boxes, Barrels, and Brews "Tactical Resilience" workshop in Norfolk, VA (Street Plans).

OFFICIAL TRAFFIC SIGNS

Typical Dimensions: Varies by sign type.

Estimated Cost: $25 - $200.

Overview: Consult local guidelines for traffic control signs requirements, as well as signs associated with your project brand or program.

▶ Demo (1 day - 1 month) | ▶ Pilot (1 month - 1 year) | ▶ Pilot (1 - 5 years)

Recommended Applications and Installation

- ▶ **Relevant for all project types:** Signs may be required to meet safety or design requirements for your project.
- ▶ For demonstration projects, consider affixing signs to A-Frame traffic barricades, or movable metal post/base structures.

Tips and Considerations

- » Bundling sign rentals with traffic control services can help reduce costs. Consider asking your traffic control vendor to rent signs at a discounted rate to act as an in-kind project sponsor.
- » Try to find existing poles on which to mount signs
- » Should official metal signs be hard to source from the City, coroplast signs (the same material as the Walk-Your-City signs) works as a great, relatively low-cost alternative.

Potential Sources

- » Rent from traffic control vendor
- » Borrow from existing City or County inventory

Top: A city-approved traffic control plan in Burlington, VT required a number of advanced warning signs (Julie Campoli). Bottom left: An official pedestrian crossing sign is posted by a Public Works Department official for a four-day demonstration project in Portsmouth, NH (Street Plans). Bottom right: MUTCD signs printed on paper and taped to cardboard created a low-cost alternative for a one-day roundabout demonstration project in Long Beach, CA (Street Plans).

PRO TIP: DEVELOPING A SIGNING SYSTEM

We interviewed Ray Dang and Emily Morishita, two designers who developed the signature environmental graphics for the People St program in Los Angeles. People St is a program of LADOT and City of Los Angeles, which creates a "one stop shop" for community groups interested in helping transform city streets through projects such as parklets, bike corrals, and pedestrian plazas.

Tips on developing visual identity and environmental graphics:

» Consider your branding goals at the project outset, and take stock of requirements that will impact your design (for example, if you're creating an interim design plaza, do local regulations require you to post a no-smoking icon somewhere?).

» Collaboration is important; designers should be brought into the process as early as possible. The project of developing branding and environmental graphics for People St benefited from a high degree of collaboration from a multidisciplinary team that included architects, designers and others right from the start. "The design team was integrated into the development of the People St program in a meaningful way," said Emily. "We established the logo and branding early on while also diving into the signage, maps, and environmental graphics. We worked closely with Rob and Daveed on the intergration and placement of these elements and Ray visited the LADOT sign shop to understand their capabilities and process to factor into the design."

» The design team was really integrated into the development of the People St program in a meaningful way," said Emily. "Ray was able to go to the LADOT sign shop to get a better understanding of technical requirements before developing guidelines."

» Embrace standards with creativity. "Parklets, bike corrals, and plazas use streets in new and creative ways," said Ray. "We took inspiration from this and applied it to our use of materials. While we had a lot of standards we needed to follow from a street safety standpoint, we tried to be creative in meeting requirements. For example, the green vinyl stripe on the standard People St plaza sign serves as an accent color as well as safety measure, as it's made from retroreflective tape — car headlights shine on it and it glows at night.

» A friendly and welcoming tone is important. If local requirements compel you to list what is *not* permitted in the space (such as smoking or sleeping), consider also including messages about what *is* allowed, too. This will help people feel welcome using the new public space.

» Focus on user needs. For example, orient maps to the way a reader is facing, and place signs at strategic decision points. People St manuals require signs to be placed a minimum of 6 ft. from the edge of a plaza, but also recommend additional signs for larger public spaces.

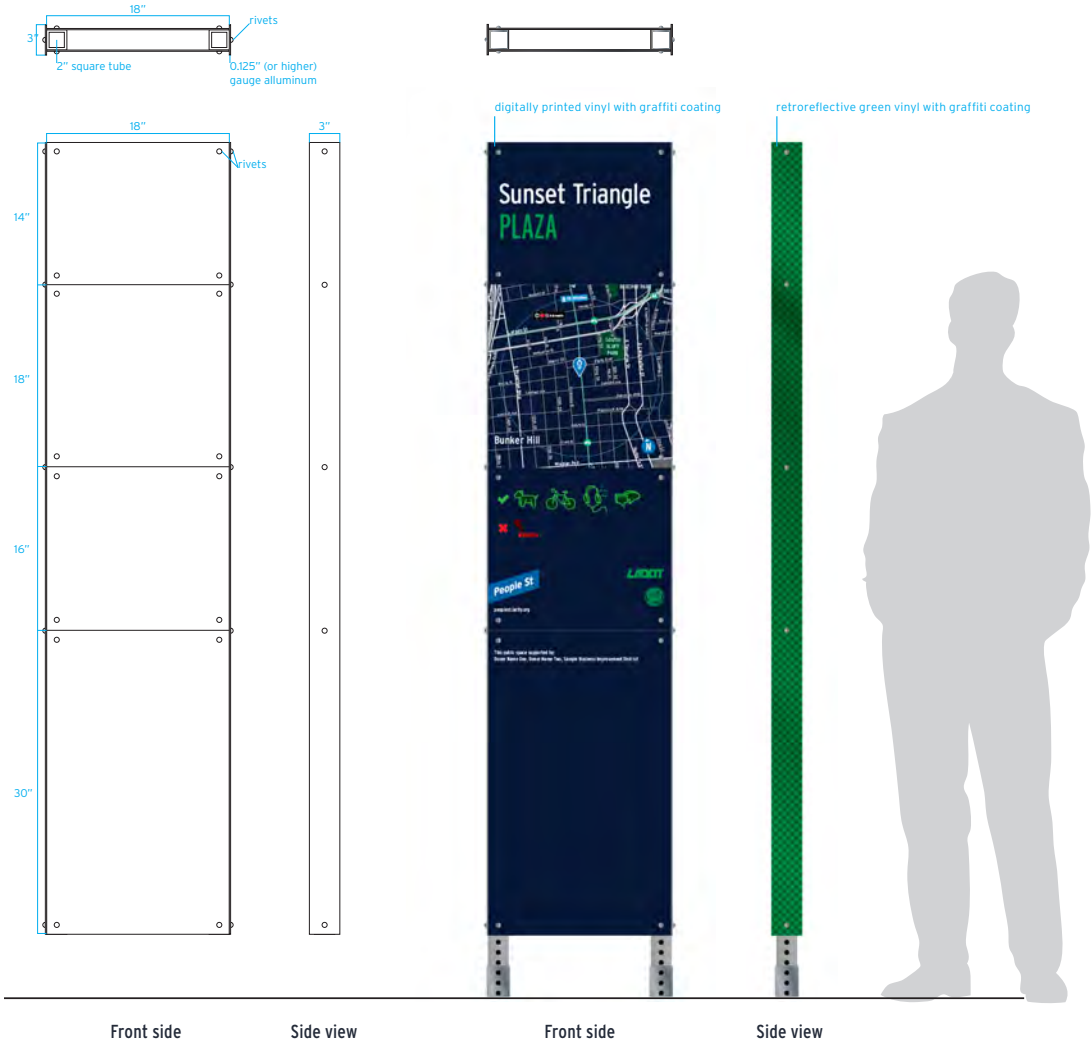
» Steal like an artist. "Best practices around sign design of new public spaces is changing fast," said Ray. "Cities should look to what has worked well in other places and adapt that to their local context and flavor."

Top: LA's signature People St signs and environmental graphics help tie the Bradley Avenue Plaza to the citywide public space program (LADOT / Jim Simmons). Bottom: The People St signs include icons of what is not permitted in plazas per local guidelines, but they also include information about what is permitted, establishing a friendly tone that welcomes people to use their new public space.

RECIPE: STANDARD SIGN

The exact design of your sign will depend on your project goals and context. When developing your design, consider including the following common elements:

- **Project name:** Connect this to any colors or branding elements you've developed for outreach materials.
- **Program branding:** Is the project part of a larger public space program or campaign? If so, be sure to make the visual tie in.
- **Maps:** What points of interest or landmarks existing within a 10-minute walking distance from your project? If including maps, orient them to the direction that is in front of the reader for easy use.
- **Guidance on use of the space:** This could come in the form of a placard reminding people that a parklet is public space (vs. a space that belongs to an adjacent business) or information about a new type of bicycle facility. You may also be required to post regulatory information about use of the public space (such as no smoking signs).
- **Partner information:** List logos for sponsoring agencies and community partners as appropriate.
- **A Contact Person or Pathway for Public Input:** Consider establishing a dedicated email or phone line to allow users to provide input on the project and/or report maintenance issues.
- **Translation:** Consider printing signs in multiple languages or using iconography for universal understanding.



People St signs are fabricated and installed by City staff. However, LADOT provides specs and standards in the Kit of Parts as a reference for plaza designers and community Groups. (People St Manual Technical Appendix 2014.).

MENU OF PROGRAMMING IDEAS




A NOTE ON PROGRAMMING

Programming is a critical element to enhancing community excitement about and ownership of new public spaces and infrastructure projects. A fun and festive atmosphere can attract a broad audience, expanding the circle of participants and allowing project leaders to reach people who may not be engaged in the typical planning process (i.e. those who may not be able to attend a public meeting in a community center on a weekday night!). Depending on the project time interval and goals, interactive activities to gather public input can be an important element of any event or activation.

Programming can also be closely related to stewardship: the partners who help create a short-term community event may be the same people or organizations involved in long-term stewardship and activation of neighborhood public spaces.

The possibilities for programming are endless, and offerings should respond to local needs and tastes. This section provides a short menu of ideas to get you started!

Planning + Logistics

PROGRAMMING CRITERIA

- **Neighborhood Demographics and Needs**
- **Capacity**
- **Partnerships with Local Businesses and Organizations**
- **Permitting** (Consider options for City agencies to reduce permit public programming) barriers for small-scale, free
- **Marketing and Outreach**
- **Budget**
- **AV / Power / Water Access** (If required)
- **Supporting Amenities** (Seating, shade, food, etc.)
- **Informational Signs**
- **Set-Up / Clean-Up Logistics**
- **Evaluation**

Photos left to right: A Yoga to The People class in Buena Vista Park, San Jose, CA (Street Plans); Children take to the Scott Street demonstration project, (Street Plans); Children work together to paint a mural in a San Jose, CA alleyway known for crime (Street Plans); A capoeira demonstration takes place at the Sweet Auburn "Living Beyond Expectations demonstration project in Atlanta, GA (Street Plans).

EXERCISE

Whether you've created a new bike lane or a neighborhood public spaces, exercise programming can help advance healthy living goals. Exercise can become accessible to everyone in the form of guided rides, outdoor classes, temporary events, or exercise equipment. When developing exercise programming, look to partner with nearby businesses and organizations: a local bike shop might want to feature a new bike lane on the shop's regular weekend rides; the nearby YMCA may be interested in using an interim-design plaza for community classes; a new yoga studio may want to host a class in public space as a marketing or community outreach tactic. Before investing in permanent equipment or committing to a year-long calendar of classes, try out options through pilot programming to learn what offerings would best serve community desires and needs.

Guided rides/tours: Advocates and local political leaders lead a guided group ride along the Ludlam Trail interim design project in Miami, FL (Street Plans).

► **Likely partners:** Bike shops, walk / bike advocacy groups.

Outdoor classes: Bradley Avenue Plaza in Los Angeles, CA is activated with regular exercise classes, such as zumba (LADOT / Jim Simmons).

► **Likely partners:** Community center or YMCA, local gym or fitness business.

Recurring outdoor classes: In the Proxy interim-design public space in San Francisco, CA, boxes provide a place for fitness equipment to be stored, and double as seats in the meantime (Street Plans).

► **Likely partners:** Personal trainers, local gyms

Exercise equipment: As pictured in the public space above from New York, NY, stationary exercise equipment can transform a mini park into an outdoor gym (Jill Fehrenbacher).

► **Likely partners:** Once purchased, equipment can be used as desired by community members, though partnerships with local YMCAs or gyms may increase use. Maintenance responsibility should be addressed in stewardship agreements governing the public space, as appropriate.

GAMES

Games and play equipment can help activate public spaces, making them a destination and attractive place to linger and socialize. When integrating games and play equipment, be sure to observe what is already going on in the neighborhood - what games are being played in existing public spaces? What age groups might need additional place to play? Before investing in permanent equipment such as stone chess tables, try out a few ideas through programming a temporary / movable options.

Cornhole: Activated Alley demonstration project in San Jose, CA (Street Plans).
Likely partners: BID, Parks Department, Open Streets program leaders.

Large format chess: Melboune, Australia (Eli Duke, Flickr).
► **Likely partners:** BID or neighborhood group, Parks Department.

Foosball: Los Angeles, CA (LADOT / Jim Simmons).
► **Likely partners:** BID, Parks Department, Open Streets program leaders.

► **Basketball:** Sunset Triangle plaza; Los Angeles, CA (LADOT / Jim Simmons).
► **Likely partners:** BID, Parks Department, Open Streets program leaders.

Shuffleboard: New York, NY (Downtown Alliance).
► **Likely partners:** BID, Parks Department, Open Streets program leaders.

Street Checkers: Atlanta, GA (Street Plans).
► **Likely partners:** Community centers, neighborhood groups, Parks Departmen, Local businesses.

ART

Public art, murals, and arts/crafts events can provide a huge boost to the aesthetics of a project and provide a space for people to be creative and express their desires and the unique aspects of their neighborhood culture. Wherever possible look to partner with local artists and/or arts organizations. Partnering with existing organizations or public institutions (such as schools, libraries, or museums) can be helpful in connecting with groups of artists or young people who want to get involved in creating art for the public space. Such partnerships then support long-term stewardship - people will feel more ownership of and excitement about a public space if they helped shape and design it!

Temporary Street Painting: Scott Street; San Jose, CA – for more information see corn starch paint recipe on page 53 (Street Plans).

► **Likely partners:** Schools, arts centers, arts non-profits.

Outdoor Art Classes: Art Jam Ireland; Dublin, Ireland (Art Jam Ireland).

► **Likely partners:** Schools, universities, arts centers, arts non-profits, senior living facilities.

Surface Treatment Mural: Brooklyn, NY (Street Plans).

► **Likely partners:** BID or neighborhood organization, schools, universities, arts centers, arts non-profits, individual artists.

Sculpture: Pearl Street Plaza; Brooklyn, NY (Street Plans).

► **Likely partners:** BID or neighborhood organization, arts centers, arts non-profits, individual artists.

MUSIC

Music brings people together, no matter where it is being played. Bringing live music to public space is a great way to attract crowds of people to enjoy the space. Look to partner with nearby businesses and organizations on music programming: a school may have student groups who want to lead an activity or perform for neighbors; a nearby instrument shop may be interested in providing classes to increase exposure and market to potential customers; a local theater may want to perform in public space to reach new audiences.

Outdoor Music: Plastic bucket percussion in Corona Plaza; Queens, NY (Make Music New York).

► **Likely partners:** Schools, arts centers, music/performance non-profits, musicians.

Outdoor Musical Performance: Leimert Park Village Plaza; Los Angeles, CA (LADOT / Jim Simmons).

► **Likely partners:** Schools, arts centers, music/performance non-profits, musicians.

Outdoor Music / Stage: Gray Area Foundation for the Arts Prototyping Festival in San Francisco, CA (Street Stage SF).

► **Likely partners:** BID or neighborhood organization, schools, universities, arts centers, music/performance non-profits, musicians

Public Pianos: New York, NY (Make Music New York / Dave Rudder).

► **Likely partners:** BID or neighborhood organization, schools, universities, arts centers, music/performance non-profits, musicians

Temporary curb extensions provide relief from crowded sidewalks during Burlington, VT's annual Art Hop (Street Plans).

APPLYING THE PALETTE

PROJECT APPLICATION CASE STUDIES

This chapter presents case studies to illustrate how the materials palette can be applied. Case studies are grouped by project type, presenting examples of applications for pedestrian crossings, bikeways, intersections, and other public spaces, like parks, plazas, and alleys.

Each project type sub-section features case studies arranged by time interval providing examples of applications for:

- Demonstration projects (1 week - 1 month)
- Pilot projects (1 month - 1 year)
- Interim design projects (1 year - 5 years)

For more detailed definitions of each of these project phase time intervals, see page 14. For more case studies and project types, visit our blog at: tacticalurbanismguide.com. Finally, all Design Considerations and the Typical Dimensions Cheat Sheets included in this chapter are sourced from NACTO's suite of design manuals; ITE's Walkable Urban Thoroughfares Manual; The Manual for Uniform Traffic Control (MUTCD); FHWA' Separated Bike Lane Planning and Design Guide, and FHWA's Roundabouts: An informational Guide. Please consult these documents for more details.

Photos left to right: Demonstration crossing treatments in Portsmouth, NH (Street Plans); A demonstration planter-protected bike lane in Atlanta, GA (Street Plans); Demonstration roundabout in Cudahy, CA (Street Plans); and Sunset Triangle Plaza, Los Angeles (Alyssa Walker).

PEDESTRIAN CROSSINGS

BIKEWAYS

INTERSECTIONS

OTHER PUBLIC SPACES

PEDESTRIAN CROSSINGS

CROSSWALKS & MEDIANS

Safe and frequent crossings are a basic ingredient of walkable streets. The NACTO Urban Street Design Guide notes that frequent crossings reinforce walkability and even have the potential to fuel greater demand for walking. This page provides high-level design considerations and materials categories for conventional crosswalks, mid-block crossings, and median refuge islands.

DESIGN CONSIDERATIONS

The NACTO Urban Street Design Guide provides detailed information about design considerations for crosswalks and crossings, including:

- Crosswalks
- Median refuge islands
- Mid-block crossings

When deciding if a crosswalk is needed consider the following Guidance from NACTO:

"Judgment on the application of a crosswalk should be based on multiple factors, including land uses, present and future demand, pedestrian compliance, speed, safety, and crash history. Volumes alone are not enough to determine whether or not a particular device should be used."

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:** Required striping (such as solid white lines or zebra stripes) serve to define the crosswalk. Colored treatments can also be added - art crosswalks integrate creative designs to calm traffic and reflect neighborhood identity.
2. **BARRIER ELEMENTS:** Median refuge islands feature a curb or barrier-protected area between travel lanes to provides people crossing the street with a safe place to wait mid-way through the crossing.
3. **LANDSCAPING ELEMENTS:** Medians may integrate landscaping to green and beautify the street. Planters can double as barriers.
4. **SIGNS:** The MUTCD provides detailed guidance on required signs, which may include "pedestrian crossing" signs, stop signs, or others.
5. **STREET FURNITURE:** Seating may be a desirable amenity for large medians in areas with high volumes of pedestrian activity.

Above: A median refuge made out of straw wattle, hay bales, and flowers improve the walking (and rolling!) experience in Ponderay, ID (Street Plans). Below: A new crosswalk and curb extension improved the visibility of people walking along Portsmouth, NH's Islington Street (Street Plans).

TYPICAL DIMENSIONS CHEAT SHEET

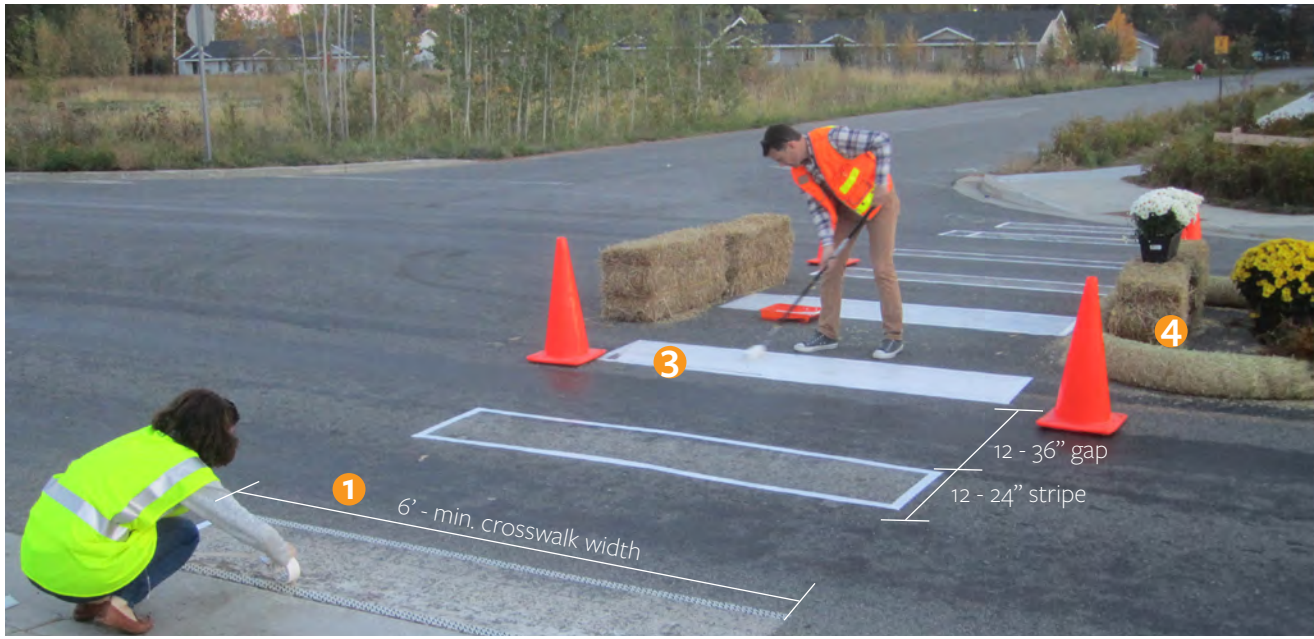
1. **CROSSWALK WIDTH:** Crosswalk should not measure less than 6 ft. wide.

2. **PARALLEL CROSSWALK LINES:** Parallel white boundary lines for crosswalks should measure greater than 6 in. and less than 24 in.

3. **CONTINENTAL CROSSWALK STRIPING:** Diagonal or longitudinal continental or "zebra" striping lines should be 12 - 24 in. wide and spaced 12 - 36 in. apart.

4. **MEDIAN REFUGE DIMENSIONS:**
   - ▶ **Width:** Desired width of median is 10 ft. or greater. (Absolute minimum is 6 ft.)
   - ▶ **Length:** Length of median refuge should be 6 ft. or greater.
   - ▶ **Height:** Median should be at curb level, approximately 4 in. - 6 in. high.

5. **BIKE-FRIENDLY MEDIANS:**
   - ▶ **Width:** Island should be wide enough to accommodate 2-way bicycle traffic.
   - ▶ **Length:** Length of median refuge should be 6ft or greater.
   - ▶ **Height:** If used exclusively for bicycles, it may be desirable to keep refuge area at street level.



Above: Refreshing a faded crosswalk in Ponderay, ID (Strong Towns). Below: 12 in. wide strips of traffic tape and green spray chalk are used to create a crosswalk and traffic diverter along SE A Street in Bentonville, AR (Megan Sebeck).

CASE STUDY: NEW HAVEN, CT

1 week **Demonstration Project ▶ Permanent**

Project Type: Guerrilla Mid-block Crossing

Sponsor Organization: Concerned Citizens

Agencies Involved: N/A - Unsanctioned Project

Materials Budget: < $100

Key Materials:

» **Surface Treatments:** Spray paint used to create continental crosswalk striping

About the Project:

In May of 2011, two concerned New Haven residents painted a guerrilla crosswalk across Whitney Avenue by Audobon Street. Just a few days later, the City of New Haven removed the crosswalk. The two residents then later sent in a formal project request asking that the crosswalk be added back. Two years later, in August of 2013, the City of New Haven made plans and has since constructed a permanent version of the crosswalk. What began as an unsanctioned crosswalk later turned into a raised intersection with three faux-brick crosswalks, curb extensions, pedestrian seating, LED lights, trees, delineators, and rapid flashing beacon crossing lights. One of the concerned residents involved in the unsanctioned project was Doug Hausladen. After he painted the guerrilla crosswalk and sent in the formal project request form, he was elected as a City Alderman. Just a few years later, Doug inow serves as the Director of Transportation, Traffic & Parking for the City of New Haven.

Above: An unsanctioned crosswalk highlighted a real need at the Whitney Avenue / Audobon Street Intersection (Thomas Macmillan, New Haven Independent). Below: Two years later the entire intersection was raised with new crossing treatments (Google).

CASE STUDY: FREMONT, CA

2 year+ **Interim Design**

Project Type: Uncontrolled intersction crossing

Sponsor Organizations: City of Fremont, Washington Hospital

Agencies Involved: City of Fremont Public Works

Materials Budget: $50,000

Key Materials:

» **Barrier Element:** Plastic planters, flexible delineator posts.

» **Surface Treatments:** Traffic paint to enhance striping

» **Landscaping:** Plastic planters with flowers

» **Signs:** Rectangular Rapid Flashing Beacon (RRFB) added to replace existing LED crosswalk signs

About the Project:

In response to 7 pedestrian-vehicle collisions, the City of Fremont made interim design safety improvements to an overly wide, unsignalized crossing on Civic Center Drive adjacent to Washington Hospital and a BART station. The design included narrowing travel lanes to 9 ft., buffering bike lanes, improving signs, adding high-visibility crossing markings, and creating a pedestrian refuge island and landscaped curb extensions with heavy plastic planters. This robust but relatively low-cost improvement was designed and implemented in 6 weeks and has since resulted in a dramatic increase of motorists yielding to pedestrians (from 20% to 90%), and reduced average speeds from 40mph to under 30mph. Finally, zero collisions have occured.

Surface Treatments
Traffic paint is used to add high-visibility crosswalk striping.

Barrier Elements & Landscaping
Flexible delineators provide low-cost visual and physical barrier to the curb extension and pedestrian refuge island. Heavy, water-filled Sybertech plastic planters are highly effective physical barriers. Flowers and greenery improve aesthetics and calm traffic.

Signs
MUTCD compliant Rectangular Rapid Flashing Beacons are added as an upgrade to the existing crosswalk signs.

The Civic Center Drive interim design crossing project in Fremont, CA has dramatically improved the likelihood of motorists to stop for people in the crosswalk (Bryan Jones).

CLOSER LOOK

COMMUNITY CROSSWALKS

Demonstration ▶ Interim Design

Project Type: Community Crosswalk

Location: Seattle, WA

Sponsor Organization: United Hood Movement

Agencies Involved: Seattle Department of Transportation (SDOT)

Seattle's, WA's United Hood Movement spray painted a number of existing crosswalks in Pan-African colors (Seattle Bike Blog).

CONTEXT

Honoring the black history and culture of Seattle's Central District, the Seattle Department of Transportation officially unveiled a community crosswalk painted with the Pan-African colors red, green, and black in February of 2016.

This creative Pan-African crosswalk was enabled by the Seattle Department of Transportation (SDOT) through the Community Crosswalks Program, an initiative that allows communities to design special painted crosswalks to represent their neighborhood. Community partners participating in the program are responsible for design and maintenance of any specialized crosswalk design. SDOT installs the crosswalk and continues to maintain the legally mandated portions of the crosswalks (the horizontal white bars) as part of normal operations.

UNSANCTIONED ▶ SANCTIONED

Like so many successful Tactical Urbanism projects, the Pan-African crosswalk began with a guerrilla act. Early on August 1, 2015, the United Hood Movement (UHM), a community organization supporting communities of color in marginalized neighborhoods, spray-painted four crosswalks the colors of the Pan-African flag — red, green, and black — in the Central District neighborhood. The unsanctioned project represented UHM's desire to celebrate the black history and culture of the Central District, a rapidly gentrifying neighborhood.

Though the guerrilla crosswalks caught city officials off guard, SDOT and the Mayor's office saw the situation as an opportunity to engage the community. Rather than remove the crosswalks, SDOT brought them in line with safety requirements, adding white reflective traffic tape to the community's painted designs. Then, SDOT moved quickly to finalize a Community Crosswalks Program that had been in development, providing communities with a framework to legally design their own crosswalks.

The Pan-African crosswalk design was refined through the new program, and the ribbon-cutting for the permanent version occurred five months later. The sanctioned project honors the original design, upgrading the spray painted lines with thermoplastic meant to last 3 - 5 years.

Based on community feedback, SDOT is refining the design of the Pan-African crosswalk, changing the layout of the colors. SDOT will also add ten more crosswalks throughout the Central District. Only a few short months after the official ribbon-cutting, the planned redesign shows the quick responsiveness of SDOT to community desires.





Rather than crack down on an unsanctioned crosswalk, the Seattle Department of Transportation used it as a springboard to finalize a Community Crosswalks Program that had been in development, providing communities with a framework to legally design their own art crosswalks. The original guerrilla crosswalk design was refined through the new program, and the ribbon-cutting for the permanent version occurred five months later. The sanctioned project honors the original design, upgrading the originally spray painted lines to preformed thermoplastic (see page 56 for spec sheet) meant to last 3 - 5 years (SDOT).

LESSONS LEARNED

First, this case study is an example of Seattle's ability to work quickly to respond to community desires and embed placemaking into the street design process. Howard Wu, a Transportation Civil Engineer with the city of Seattle, notes that strong, citywide leadership provided an important foundation: "SDOT's Department Director Scott Kubly has looked to peer cities that are leaders in innovative approaches to street design. He encourages a nimble culture and a use of rapid implementation tactics across the Department. Seattle's Mayor also embraces this approach, so staff have the support to do this type of work."

Second, SDOT's ability to quickly formalize the Community Crosswalk Program has allowed decorative crosswalks to scale up within neighborhoods across the city. In the Central District, for example, the city plans to iterate the design of the current crosswalk even further and add ten more around the neighborhood.

"DIRECTOR SCOTT KUBLY HAS LOOKED TO PEER CITIES THAT ARE LEADERS IN INNOVATIVE APPROACHES TO STREET DESIGN. HE ENCOURAGES A NIMBLE CULTURE AND A USE OF RAPID IMPLEMENTATION TACTICS ACROSS THE DEPARTMENT. SEATTLE'S MAYOR ALSO EMBRACES THIS APPROACH, SO STAFF HAVE THE SUPPORT TO DO THIS TYPE OF WORK."

- HOWARD WU

CURB EXTENSIONS

Curb extensions (sometimes called “bulb-outs” or “neckdowns”) expand sidewalk space into the parking lane to narrow the street and provide additional space for people walking or crossing intersections. They also increase pedestrian visibility, shorten crossing distances, slow turning vehicles, and visually narrow the street. Curb extensions may also integrate green infrastructure elements such as planters in the pilot / interim design time interval and rain gardens in the more permanent state. While still completely useable, special consideration / design details are advised in areas subject to heavy snowfall.

DESIGN CONSIDERATIONS

Curb extensions may be used at intersections or mid-block, on commercial or residential streets. The NACTO Urban Street Design Guide provides detailed information about design considerations for curb extensions in the following contexts:

- Gateways
- Pinch points
- Chicanes
- Bus bulbs

Curb extensions are often used in areas with high pedestrian volumes. Demonstration or pilot/interim design curb extensions will be easiest to implement on streets that have curbside parking, and at intersections that already have a crosswalk in place. The length of a curb extension should at least be equal to the width of the existing crosswalk. The curb extension should generally be 1 - 2 ft. narrower than the parking lane. Include barrier elements to demarcate the curb extension from the existing street.

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:** Required striping (such as double solid white lines) serve to separate the curb extension space from the existing roadbed. Colored treatments can also be added - painted pavement, murals, or other specialized surface treatments such as epoxy gravel can be used to further define the space.
2. **BARRIER ELEMENTS:** Physical barriers (such as flexible delineators, granite blocks, or planters) should be used to define the place as a pedestrian-only zone.
3. **LANDSCAPING ELEMENTS:** Curb extensions provide an opportunity to integrate greening elements into the streetscape. In some cases, planters can also function as barrier elements.
4. **SIGNS:** The MUTCD provides guidance on required signs, which may include “pedestrian crossing” signs or stop signs. (Not shown.)
5. **STREET FURNITURE:** For large curb extensions that double as plaza space, seating and umbrellas may be a desirable amenity. (Not shown.)
6. **PROGRAMMING:** For large curb extensions that double as plaza space, small scale programming can help activate the space. (Not shown.)

Photos illustrate the Baltimore Crossing project in Philadelphia, PA, led by the University City District For more info visit: universitycity.org

TYPICAL DIMENSIONS CHEAT SHEET

1. **CURB EXTENSION WIDTH:** NACTO guidelines recommend that curb extension be 1 - 2 ft. narrower than the parking lane, except where the parking lane is treated with materials that integrate it into the structure of the sidewalk.
2. **CURB EXTENSION LENGTH:** Curb extension width should be at least equal to the width of the crosswalk. If possible, extend the curb extension to the advanced stop bar.
3. **SPACING FROM CURB:** If impacts to drainage are a concern, the curb extension may be designed as an island offset from the curb with a 1 - 2 ft. gap (not shown).

Barrier Element
Standard flexible delineator post. See spec sheet page 30.

Surface Treatments
Double white 4 in. stripes with traffic paint. Colored surface treatment of epoxy gravel visually defines the space. See spec sheet page 57.

Signs
Appropriate intersection signage applied, as dictated by project context and MUTCD guidance.

An interim design curb extension shortens the crossing distance at an intersection in Hoboken, NJ (City of Hoboken).

CASE STUDY: PORTSMOUTH, NH

4 Day **Demonstration ▶ Pilot**

Project Type: Curb Extension

Sponsor Organization: Portsmouth Smart Growth for the 21st Century (PS21), West End Business Association

Agencies Involved: City of Portsmouth Public Works, Police, and Fire Departments

Materials Budget: $2,000

Key Materials:

» **Surface Treatments:** White striping using 4 in. white foil-backed traffic tape. Colored surface treatment using tempera paint.

» **Barrier Elements:** Orange traffic cones, and planters (wooden crates with plants inside)

About the Project:

Local Smart Growth organization PS21 hired Street Plans to lead the Islington Street Lab project. With the goal of engaging the community in brainstorming and creating a unique project in Portmouth's West End, Street Plans worked with PS21, 20+ volunteers, and various city departments to install 6 crosswalks; 2 curb extensions; pop-up landscaping using over 3 dozen plants; sharrow markings; one parklet and bike corral; and striping to define three new on-street parking spaces. Following a successful demonstration, the City decided to move forward with a 30-day pilot to test a number of the project's elements and are working with PS21 to develop a city-citizen demonstration project policy.

A generous curb extension reduces the turn radius and shortens the crossing distance by 20% (Street Plans).

Surface Treatments

4 in. foil-backed traffic tape defines the edge of the curb extension (spec sheet page 47). Tempera paint was used to further define the curb extension (spec sheet page 54).

Barrier Elements

Traffic cones and wooden crate planters were placed every 6 - 8 ft. to create a barrier and to further define the edge of the curb extension (spec sheet pages 28 and 36.

CASE STUDY: AUSTIN, TX

1-5 Years **Interim Design**

Project Type: Curb Extension

Sponsor Organization: City of Austin Transportation Department (ATD)

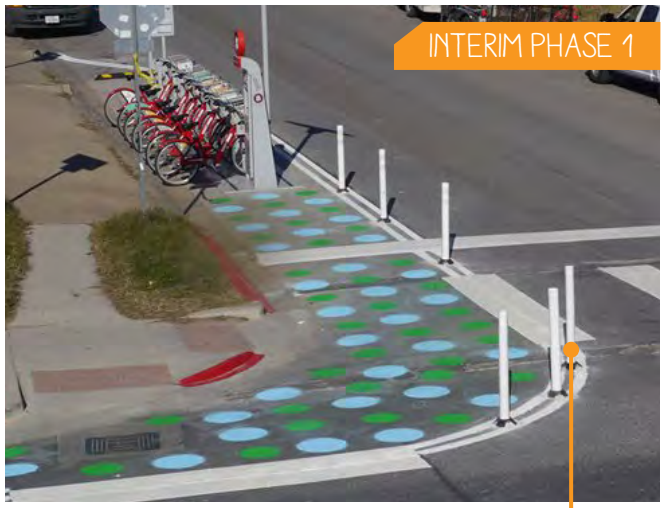
Agencies Involved: ATD

Materials Budget: N/A

Key Materials:

- **Surface Treatment:** Striping with traffic paint, colored dot treatment with thermoplastic
- **Barrier Element:** Flexible delineators (upgraded to concrete buttons)
- **Signs:** 4-way stop signs

About the Project: The Austin Transportation Department led a series of low-cost interim design safety improvements at the intersection of East 6th and Waller Street. Stop signs, continental crosswalks, curb extensions were added to each leg of the intersection. Colored dots highlight the pedestrian space of the curb extensions, while double white lines mark the perimeter. ATD initially used plastic delineators as the curb extension barriers, but quickly upgraded to mountable concrete buttons when the delineators were repeatedly knocked down. The project is intended to last until funds are available for capital construction. Materials testing at this site has helped inform Austin's approach to adding barriers to other rapid implementation projects, such as bike lanes.



The evolution of an interim design project (City of Austin).

Barrier Element

Flexible delineators were placed every 2 - 3ft. to define the curb extension space. Delineators were knocked down easily at this site and were replaced with mountable " buttons" (spec sheet page 30).

Barrier Element Upgraded

Within weeks of installation, ATD swapped delineator posts for concrete buttons, and field tested adhesives (such as epoxy) to see what worked best (spec sheet page 42).

CLOSER LOOK

LINCOLN HUB

Interim Design

Project Type: Curb Extensions / Plazas

Location: Chicago, IL

Sponsor Organization: Lakeview Chamber of Commerce / SSA 27

Agencies Involved: Chicago DOT

Lincoln Hub's Generous curb extensions / plazas reduce turn radii and shorten the crossing distance by 20% (Site Design Group).

CONTEXT

The Lakeview Chamber of Commerce is a neighborhood organization dedicated to supporting businesses in Chicago's Lakeview neighborhood. In 2011, the organization released the Lakeview Area Master Plan. The plan identified the need for pedestrian improvements and beautification along Lincoln Avenue, and in 2014 an additional public input process further prioritized enhancing public space and improving pedestrian safety and comfort around the six-way intersection at Wellington, Southport, and Lincoln Avenues. Through the Chicago Department of Transportation's (CDOT) Make Way for People Program, the Chamber was able to design and implement a high-impact project using low-cost materials, bringing benefits to the community quickly.

The Make Way for People Program aims to create public spaces that cultivate community and culture in Chicago's neighborhoods. From short-term events to pilot and interim design projects, the program supports innovation in the public right-of-way by opening Chicago's streets, parking spots, plazas, and alleys to new programming and market opportunities via public and private partnerships. Make Way for People incorporates four program areas:

- People Spots create curbside public spaces adjacent to the sidewalk (aka "parklets");
- People Streets convert excess roadway into hardscape public spaces using temporary measures like paint and street furniture;
- People Plazas activate existing CDOT malls, plazas, and triangles with new programming or retail; and
- People Alleys enable the use of alleys for artwalks, seating, and other small scale events that support placemaking and economic and community development.

Called "Lincoln Hub," the Chamber's project falls under the People Streets category of the program. As with all Make Way for People projects, Lincoln Hub was driven by the community. CDOT's role centered around design review, permitting, and evaluation.

DESIGN PROCESS

Knowing that CDOT was planning to undertake a larger streetscape and upgrade at the project site in a few years, both partners saw Lincoln Hub as an opportunity to use temporary materials to test out bold ideas and geometries, and gain insight for the permanent project.

The Chamber released a formal RFP and selected a design team. The final design featured generous curb extensions and plazas at each leg of the six-way intersection, which were to be created using paint, delineators, and planters. The curb extensions

shortened crossing distances by 34%, and created new public spaces, complete with round concrete seating units and cafe tables and chairs.

Though the project was initiated and funded by the Chamber through SSA 27, CDOT was highly involved in refining and evaluating the design. CDOT approved an initial design that re-allocated a significant amount of roadway space to create the curb extensions, with the understanding that the agency would observe the pilot closely upon installation, and adjust the geometry as needed.

"From CDOT's perspective, the entire purpose of using flexible materials was to allow us to try something bold and adjust," said Janet Attarian, CDOT's former Livable Streets Director. "After installing the project, we observed that one of the curb extensions was causing a back-up where drivers going straight through the intersection were queuing behind those waiting to make a right turn. The Chamber's contractor adjusted the geometry at this and a few other problem spots, removing paint and delineators to 'shave' the reclaimed space back a bit."

The interim design of Lincoln Hub has informed plans for the upcoming capital upgrade along the corridor. The current design calls for a slight reduction of the curb extension space reclaimed during the pilot.

LESSONS LEARNED

The Lincoln Hub design uses bright polka dots as a surface treatment to mark out the new curb extension space. The polka dots cover both sidewalk and street bed space, and fold over the curb line in some cases. In future designs, CDOT would avoid having the dots fold over the curb. Both CDOT and the Chamber viewed iteration / adjustment as part of the design process:

"FROM CDOT'S PERSPECTIVE, THE ENTIRE PURPOSE OF USING FLEXIBLE MATERIALS WAS TO ALLOW US TO TRY SOMETHING BOLD AND ADJUST."

- JANET ATTARIAN

Lee Crandell, the Executive Director of The Lakeview Chamber of Commerce, notes "The Lincoln Hub design was an opportunity to try bold ideas to set the stage for a successful capital project down the line. The project was always based on the assumption that the design could be adjusted, since it was only a matter of shifting paint and bollards." The Chamber's ability to work with a contractor and quickly adjust the design was key to the iteration process.

The project required a high degree of collaboration and partnership between the Chamber and CDOT. The Make Way for People program framework allowed the Chamber to lead the project. Close collaboration between engineering and placemaking staff at CDOT allowed for efficient design review and approvals.

Finally, the Lakeview Chamber of Commerce is an established community partner with strong organizational capacity and ability to fund the maintenance and contracting required for project design and upkeep. This high level of capacity has been an asset to the project.

Top: Lincoln Hub plaza (John Greenfield); middle: Lincoln Hub aerial (Sarah Jindra); and bottom: Lincoln Hub crossing (John Greenfield).

BIKEWAYS

BIKEWAYS

Bikeways come in many configurations, from conventional bike lanes created with nothing more than paint to protected bike lanes with planters or other barriers. NACTO's Urban Bikeway Design Guide and FHWA's new Separated Bikeway Planning and Design Guide provide detailed information about design considerations for a range of bicycle facility types, and PeopleForBikes Quick Builds guide outlines ways to quickly implement lower-cost projects that increase ridership and improve safety.

DESIGN CONSIDERATIONS

Bicycle facility design across the United States is evolving rapidly; many communities are using demonstration and pilot or interim design projects to experiment with new facility types. NACTO's Urban Bikeway Design Guide provides detailed information about design considerations for bicycle facilities including:

- **Shared Use Lanes (sharrows)**
- **Neighborhood Greenways**
- **Conventional bike lanes**
- **Buffered bike lanes**
- Contra-flow bike lanes
- Left-side bike lanes
- **Protected bike lanes**
- **Shared use paths / trails**

In the pages that follow we provide design guidance and project examples for these bikeway types highlighted in bold.

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:**
   - » **Striping:** Apply required striping based on facility type (examples include solid white lines to separate the motor vehicle lane from a conventional bike lane, or striping in a bike lane buffer).
   - » **Pavement Markings:** Requirements vary by facility type. Examples include the bicycle lane word and/or symbol and arrow markings, which define the bike lane and communicate preferential use for people biking.
   - » **Colored treatments:** Can be used to further define the bicycle lane, or emphasize visibility of the bicycle facility at conflict points. (not shown.)
2. **BARRIER ELEMENTS:** Physical barriers (such as flexible delineators, carboard cyclinders, or planters) can be used to create a protected bike lane. Protected bike lanes come in a number of configurations but always use a vertical element to differentiate cycling space from driving space.
3. **LANDSCAPING ELEMENTS:** Consider planters as barrier element. (See above.)
4. **SIGNS:** The MUTCD provides guidance on required signs, which may include "bike lane" or "bike route" signs (not shown).

Top: A neighborhood greenway demonstration project in Rogers, AR used high-visibilty sharrows to mark the route (Street Plans). Bottom: Protected bike lane demonstration project by East Bay Bike Coalition, Berkeley, CA (East Bay Bike Coalition).

TYPICAL DIMENSIONS CHEAT SHEET

1. » **STRIPING:** Solid white lines used to define conventional and buffered bike lanes are typically 6 - 8 in. wide. Diagonal lines within the bike lane buffer are common and are typically 4 - 8 in. wide stripes, placed at an angle of 30 - 45 degrees, every 10 ft.

2. » **BIKE LANE WIDTH:** Stripe bike lanes 5 - 7 ft. wide.

3. » **BIKE LANE MARKING PLACEMENT:** Place marking in center of lane, at beginning of lane and at periodic intervals based on engineering judgment (land use, vehicular speed etc.).

4. » **BIKE LANE BUFFER WIDTH:** Buffers must be defined by two white lines (typically 4 - 8 in. wide). Minimum buffer width is 18 in. If buffer is 3 ft. in width or wider, mark with diagonal striping.

5. » **PROTECTED BIKE LANES:** Place barrier at center of buffer area, which should be a minimum of 3 ft. wide. Non-contiguous barrier elements should be placed 8 - 20 ft. apart.

6. » **SHARED LANE MARKING**
   - » **Lateral Placement:** Where parking is present, the MUTCD recommends sharrow markings be placed 11ft from the curb. If on-street parking is not present, the markings should be placed far enough from the curb to direct bicyclists away from gutters and other hazards (approx. 4 ft). On roads with a posted speed of 25MPH or less, place sharrows in center of travel lane. (not shown.)
   - » **Spacing:** Marking frequency should respond to context (land use, vehicular speed etc.) Sharrows might be 250 ft. apart on low-traffic, but high-speed routes, or 50 - 100 ft. apart along busier, slower speed streets (not shown).

Cheat sheet information based on NACTO Urban Bikeway Design Guide. For more detail, visit: nacto.org.
Top: A demonstration planter-protected bike lane in Burlington, VT (Julie Campoli). (Note: For single-lane configurations, this design would require a barrier mountable by emergency service vehicles to be made permanent.)
Bottom: A two-day buffered bicycle lane demonstration, Morgan Hill, CA (Street Plans).

CASE STUDY: SAN JOSE, CA

2 day **Demonstration**

Project Type: Shared-use lane markings

Sponsor Organizations: Two lead non-profit organizations - Greenbelt Alliance and the Buena Vista Neighborhood Association (BVNA)

Agencies Involved: San Jose Department of Transportation, San Jose Police Department

Materials Budget: $1,000 (including cost of traffic control plan, supplies and flagger staffing)

Key Materials:

» **Surface Treatment:** Shared use lane marking created with sidewalk chalk, hairspray, and homemade stencil

About the Project:
In response to community desires for better biking conditions, BVNA and Greenbelt Alliance worked with Street Plans to create a 2-day demonstration project to add temporary sharrows to the Scott Street corridor in San Jose. In addition to chalk sharrows set with hairspray, the two-day project featured programming such as an energizer station and bike-themed block party. The sharrow installation was enabled through a standard traffic control plan approved by SJDOT, and the block party was permitted through a Block Party Permit. During the block party, BVNA and Greenbelt used a survey to gather input about desired complete streets upgrades from a wider group of neighborhood residents.

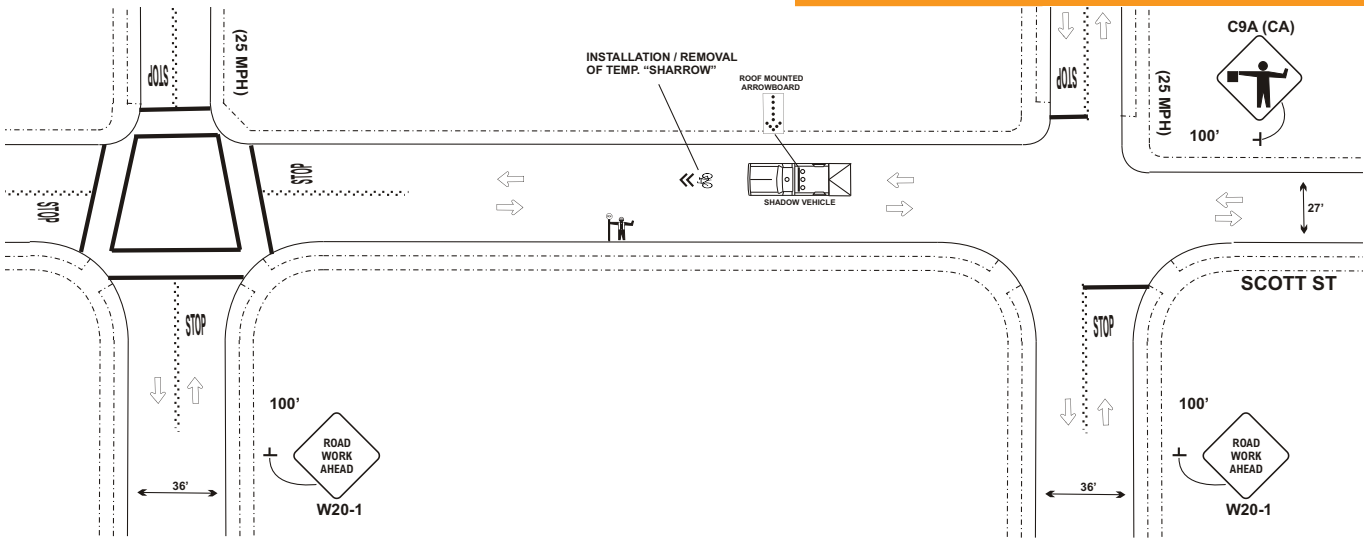
ANATOMY OF THE INSTALL

San Jose staff and volunteers get to work (Street Plans).

Surface Treatment: Pavement Markings
Sharrow stencil created to MUTCD standards (112 x 40 in.). Marking created using sidewalk chalk, with hairspray applied immediately after to set. Sharrow placed 11 ft. from curb.

Traffic Control Devices
Flagger, arrow truck, and traffic cones keep volunteers visible and safe while working in the street.

TRAFFIC CONTROL PLAN SNAPSHOT



CASE STUDY: BURLINGTON, VT

2 day **Demonstration**

Project Type: Parking-protected bike lane

Sponsor Organization: Burlington Public Works, Local Motion (Advocacy Organization)

Agencies Involved: Burlington Public Works, Police, and Fire Departments, as well as Chittenden County Transportation Authority

Materials Budget: $1,800

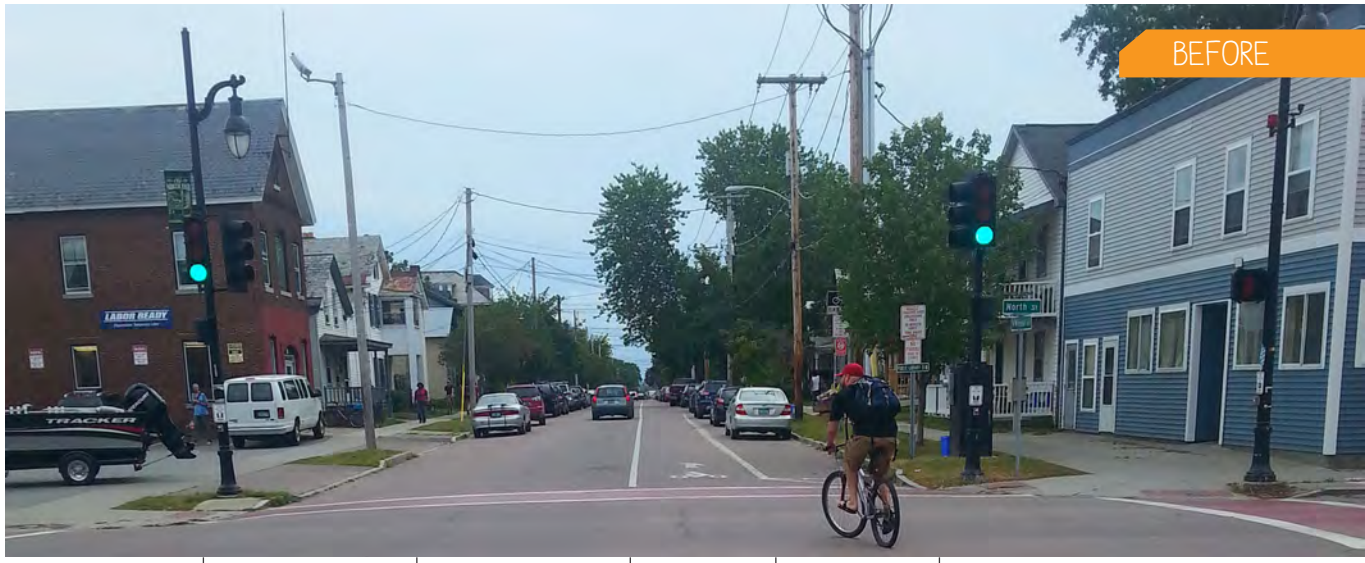
Key Materials:

» **Surface Treatment:** Striping with traffic tape. Lane marking with tempera paint using city-owned stencil

» **Barrier Element:** Parked cars

About the Project:

This multi-demonstration project was part of the outreach and design process for Burlington's first city-wide walk/bike master plan and used as a way to test a draft citizen-led demonstration project policy. Street Plans and partners created three bicycle demonstration projects linking downtown Burlington with the city's Open Streets route in the Old North End. The project required a curbside parking ban in advance of installation, followed by a "swapping" of existing bike and parking lanes, accomplished with the help of dozens of volunteers. The demonstration allowed Burlington residents to experience the first-ever parking protected lane in Vermont. After observing it in action, the removal of the parking lane and replacing it with a mountable curb with landscaping became the favored option included in the master plan.



Top: North Winooski Avenue's current configuration (Street Plans).
Bottom: For two days the street was transformed into a parking-protected bikeway (Julie Campoli).

CASE STUDY: ROGERS, AR

1 Month **Pilot Project**

Project Type: Protected bike lanes

Sponsor Organizations: Walton Family Foundatiom, Bicycle Coalition of the Ozarks.

Agencies Involved: Northwest Arkansas Regional Planning Council, City of Rogers

Materials Budget: $10,000

Key Materials:

» **Barrier Element:** Five types of bikeway barriers were tested: armadillos, flexible delineators, rubber cycle lane delineators, and parked cars. In addition, diverters made out of galvanized steel planters were used to limit through traffic along a portion of the project serving as a neighborhood greenway / bicycle boulevard.

» **Surface Treatments:** 4" White and Yellow traffic tape, white and green water-based paint.

About the Project:

The City of Rogers, Arkansas was one of three Northwest Arkansas cities that participated in in a monthlong series of pilot projects called Bike NWA. The project was sponsored by the Walton Family Foundation and led by Street Plans, the Bicycle Coalition of the Ozarks, and the Northwest Arkansas Regional Planning Council. Rogers is a town of just over 60,000, and the pilot project was designed to test a variety of barrier and design treatments along a nine-block segement linking the Lake Atalanta Trail system to the Rogers Activity Center. Five types of protective barriers were used, with an eye toward creating beautiful streets as well as addressing critical cycling connections.

Barrier

Flexible delineator posts are a low-cost option for pilot protected bike lanes but frequently need replacement, especially on streets with a high volume of traffic (spec sheet page 30).

Barrier

Armadillos are low profile, mountable, and very durable.. However, they also cost roughly twice as much as flexible delineators (spec sheet page 42).

Striping

Construction grade yellow traffic tape and spray chalk were used to create striping and pavement markings (spec sheet pages 48 - 49).

Top left: Flexible delineators were glued with Gorilla Glue on along 3rd Street (Street Plans); Top right: Armadillos are low profile and provide a great solution for locations where curbside emergency vehicle access is required. (Street Plans); Bottom: Cycle lane delineators are another low profile option for protective device, used here with a "floating" parking lane (TIm Conklin).

CASE STUDY: BURLINGTON, VT

1 year **Pilot**

Project Type: Protected bike lane and intersection treatments

Sponsor Organization: Burlington Public Works

Agencies Involved: Transit Operators, Burlington Police and Fire Departments

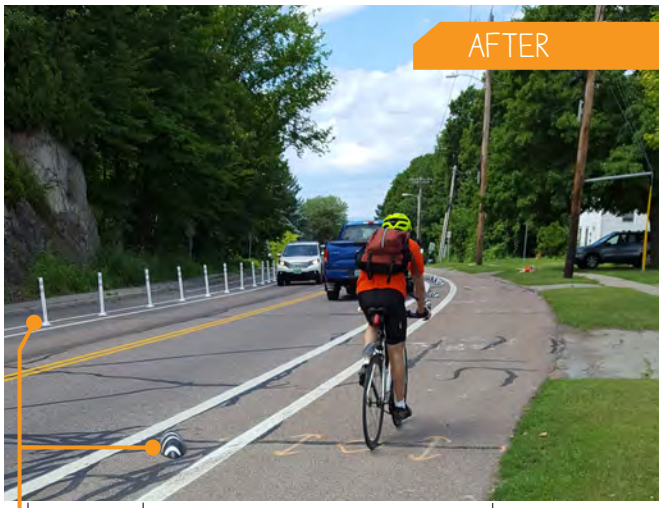
Materials Budget: $155,000

Key Materials:

» **Surface Treatments:** Lines/striping and pavement markings created using standard traffic striping paint.

» **Barrier Element:** Armadillos and Plastic Delineators

About the Project:
The North Avenue Pilot Project is a year long traffic calming effort led by Burlington Public Works. The project includes the addition of protected bike lanes and the improvement of various intersections with curb extensions and crosswalks. To install the pilot, city crews ground out existing lines and painted in the new striping configuration. The City is using both armadillos and delineators as barriers for the protected bike lanes, to test how the materials perform. Burlington Public Works plans to continually assess the pilot by hosting forums and public meetings, collecting data, and conducting surveys. Adjustments will be made if necessary throughout the duration of the pilot, which will run through the summer of 2017.



Testing Barrier Elements

Above: Testing flexible delineators and armadillos as a bikeway barrier element. Below: creating curb extensions using delineators and

Top left: North Avenue before the pilot configuration (Google). Top right and bottom: A one-year pilot project is testing a range of pedestrian abd bicycle designs / materials enhancements. (City of Burlington Public Works Department).

CASE STUDY: MIAMI, FL

3 Year **Demonstration ► Interim Design**

Project Type: Shared Use Path / Bike Trail

Sponsor Organizations: Florida East Coast Industries, Friends of Ludlam Trail

Agencies Involved: Miami-Dade County Parks Department

Materials Budget: $200,000 for trail, $20,000 programming

Key Materials:

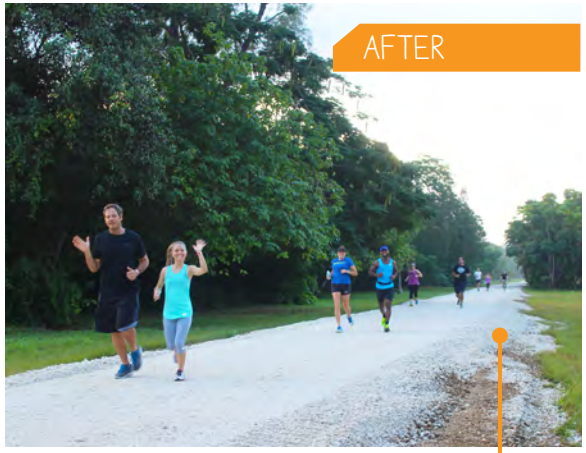
» **Surface Treatment:** Compacted fill and gravel

» **Park Furniture:** Branded umbrellas, signage

» **Programming:** Regular events throughout the demontstration and pilot phases.

About the Project:

Friends of Ludlam Trail launched a multiyear planning and programming effort for a 6-mile abandoned railway in Miami-Dade County. In 2012, Street Plans, launched the Friends of Ludlam Trail together with local running guru Frankie Ruiz with an eye toward implementation of the trail. Jursidictional and ownership challenges have prevented public access of the corridor for decades, but in 2014 Street Plans designed a temporary trail project for the Friends group which included monthly events on the trail, and the construction of a 4-mile interim trail facility to be enjoyed by the community before the permanent project is designed and delivered. The trail was constructed over the course of a month in 2014 with compacted gravel and since has been programmed by the Friends of Ludlam Trail. Permanant construction is not far off, a goal that has been accelerated thanks to the delivery of the interim project.



Surface Treatment

6 in. of Compacted grave was all it took to get people moving along the Ludlam Trail.

Programming

An inaugural bike ride + community celebration that included live music, bounce castle, and food trucks.

Park Furniture

Colorful umbrellas mounted in 5 gallon buckets were created at low cost to create this shaded seating area (spec sheet page 64).

Top left: Existing conditions, August, 2014 (Street Plans); Top right: Completed temporary gravel trail, November 2014 (Street Plans); Bottom: a bike ride, shaded seating area, and other programming elements comes together for the launch of the Ludlam Trail (Florida East Coast Industries).

CASE STUDY: PORTLAND, OR

1 - 5 Years **Interim Design**

Project Type: Protected bike lane (Tuff Curb)

Sponsor Organizations: Portland Bureau of Transportation (PBOT)

Agencies Involved: (same as above)

Materials Budget: $4,000

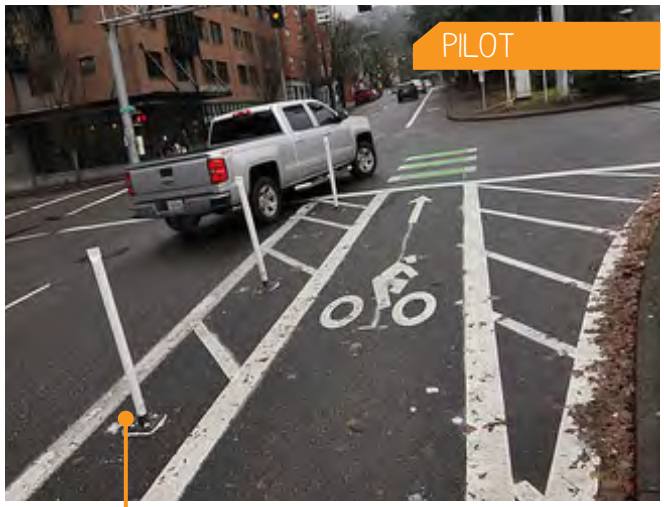
Key Materials:

» **Barrier Element:** Tuff Curb and delineators

» **Surface Treatment:** Striping and pavement markings created using standard traffic paint.

About the Project:

In December of 2015, to further protect cyclists from cars, the Portland Bureau of Transportation (PBOT) installed plastic delineators along the bike lane on SW 13th Avenue and Clay Street. Within just a few months, all of the delineators had been knocked over by cars. That initial project cost $2,000. In May of 2016, with a budget of $4,000, PBOT decided to upgrade the barrier protection by testing out "Tuff Curbs." These are durable, high performance materials with built in reflectors that provide visibility for use both during the day and at night. The product is inexpensive but the material is heavy duty and is intended to last for several years. Most importantly they create a physical separation between vehicular and bicycle lanes.



Flexible Delineators as Barrier Element

A low-cost option for pilot protected bike lanes but frequently need replacement, especially on streets with a high volume of traffic (spec sheet page 30).

Upgrading Materials: "Tuff Curb"

PBOT quickly added raised lane separators to allow for more durable protection (spec sheet page 30).

Top left: Flexible delineators proved ineffective at SW 13th Avenue and Clay Street (Jonathan Maus, Bike Portland); Top right: Raised lane separators provided a more robust barrier between people driving and people cycling (City of Portland Bureau of Transportation); Bottom: Raised lane separators are bolted into the asphalt (City of Portland Bureau of Transportation).

ARAPAHOE STREET BIKE LANE

Demonstration ▶ Interim Design

Project Type: Protected Bike Lane

Location: Denver, CO

Sponsor Organization: Bike Denver

Agencies Involved: Denver Public Works, Downtown Denver Partnership

Cyclists enjoy the Arapahoe Street demonstration project (Downtown Denver Partnership).

CONTEXT

Today, a protected bike lane runs along Arapahoe Street, a corridor now considered a key part of a plan to create a network of protected bikeways in Downtown Denver. The bike lane began as a one-day demonstration led by BikeDenver and was upgraded to a permanent facility only a year later. The Arapahoe project is one of several recent case studies illustrating how Denver Public Works uses Tactical Urbanism to iterate on street designs from demonstration projects to interim design.

The story begins with a guerrilla bike lane on Wynkoop Street in 2013, put in place under cover of darkness by the local bike advocacy group BikeDenver without city permission, just in time for Bike to Work Day. "BikeDenver and our bicycle community were frustrated by the lack of protected bike lanes in Denver. We wanted to educate and show Denver what was possible." says Ryan McCann, BikeDenver's former policy and outreach manager. Rather than responding with a fine or citation, the city encouraged BikeDenver to continue spearheading demonstration projects in other parts of the city, noting that the organization could work through official channels in the future by obtaining a Street Occupancy Permit. To facilitate that process, Denver Public Works began collaborating regularly with BikeDenver to identify opportunities for annual bike lane demonstrations. The meetings are conducted on an as-needed basis to kick off a large scale study or to gain community buy-in on a concept. Denver will use the meetings for project-specific purposes as well as to support external community organizations.

Arapahoe Street, a major downtown corridor with existing bikeways plans in place, emerged as a priority for the following year (2014). The project represented the first official demonstration project created through the new partnership between the city and community members.

DESIGN PROCESS

On June 25, 2014, BikeDenver worked with the Downtown Denver Partnership, a local business organization, to create a one-day protected bike lane along Arapahoe Street to celebrate Bike to Work Day. Materials included spray chalk, metal planters, portable trees, and traffic cones. A few short months after the demonstration, the Downtown Denver Partnership launched a crowdfunding campaign via ioby's online platform, which helped raise a significant portion of the money needed for design of an interim protected bike lane.

A protected bike facility along Arapahoe was already part of Denver's bicycle master plan, but the demonstration project built momentum and propelled the city to actually construct the interim design version only a year later (2015). Denver Public Works was able to rapidly implement the long-term project using materials such as paint, flexible delineators, and a few concrete pedestrian islands.

"BIKEDENVER AND OUR BICYCLE COMMUNITY WERE FRUSTRATED BY THE LACK OF PROTECTED BIKE LANES IN DENVER. WE WANTED TO EDUCATE AND SHOW DENVER WHAT WAS POSSIBLE."

- RYAN McCANN

LESSONS LEARNED

In terms of creating demonstration bike lanes, BikeDenver has learned a great deal about materials and process. For example, the organization has found that the metal planters are difficult to haul around; BikeDenver now recommends use of lighter, more moveable barrier elements.

The City has also learned a great deal about materials and maintenance at the pilot / interim design time interval. Though the City views the paint and delineators used to create the Arapahoe protected bike lane as a design solution that could be used for years to come, Denver Public Works will continue to evaluate the project on a yearly basis. Denver Public Works has also observed that the flexible delineators last about one year or less. They are expensive to replace, and snow contributes to their degradation. For these reasons, Denver Public Works is considering replacing the delineators with more durable materials such as concrete jersey barriers or flower planters. Winter maintenance is another consideration for the newly-created protected bike lanes and evolving design toolkit: during snowfall, the City plows the Arapahoe bike lane every hour or two using RIght of Way Enforcement Jeeps with plows attached. A protected bike lane specific snow plow has been ordered and will be used in Winter 2016 - 17.

The City has also learned a great deal about processes required to support community-led projects in the public right-of-way. To further include demonstration bike lanes into Denver's project delivery toolkit, the City is creating a formalized Tactical Urbanism policy that provides the framework to allow bike lane projects to evolve along an iterative timeline.

In the meantime, the City is continuing to use demonstrations and interim design approaches to implement bikeway projects where opportunities arise. True to the spirit of Tactical Urbanism, the city isn't waiting to complete the policy to start implementing the interim designs; they are learning as they go. One example is a recent protected bike lane project on Broadway in downtown Denver — this project began with a three-day demonstration, which the City will follow with an interim design intended to last up to 15 months.

Top left: Arapahoe Street demonstration project (BikeDenver); Bottom left and right: Robust interim design materials (Denver Urbanism).

INTERSECTIONS

MINI-ROUNDABOUTS

Mini-roundabouts or neighborhood traffic circles are an ideal treatment for minor, uncontrolled intersections. The roundabout configuration lowers speeds without fully stopping traffic. Check out NACTO's Urban Street Design Guide or FHWA's Roundabout: An Information Guide Design Guide for more details.

DESIGN CONSIDERATIONS

Mini-roundabouts can be created using raised islands and simple markings. Landscaping elements are an important component of the roundabout and should be explored even for a short-term demonstration.

The roundabout should be designed with careful consideration to lane width and turning radius for vehicles. A mini-roundabout on a residential street should provide approximately 15 ft. of clearance from the corner to the widest point on the circle. Crosswalks should be used to indicate where pedestrians should cross in advance of the roundabout. Shared lane markings (sharrows) should be used to guide people on bikes through the intersections, in conjunction with bicycle wayfinding route markings if appropriate.

Note: Becase roundabouts allow the slow, but free-flow movement of vehicular traffic through an intersection, education and outreach efforts geared towards bicyclists and pedestrians should be considered.

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:**
   - » **Striping:** Solid white or yellow lines can be used in conjunction with barrier element to demarcate the roundabout space. Other likely uses include crosswalk markings: solid lines to delineate cross-walk space and / or zebra striping.
   - » **Pavement Markings:** May include shared lane markings to guide bicyclists through the intersection and reinforce rights of use for people biking. (Not shown)
   - » **Colored treatments:** Colored pavement or other specialized surface treatments can be used to further define the roundabout space (not shown).
2. **BARRIER ELEMENTS:** Physical barriers (such as delineators or curbing) should be used to create a strong edge that sets the roundabout apart from the roadway.
3. **LANDSCAPING ELEMENTS:** Shrubs or trees contribute to traffic calming and add beauty.
4. **SIGNS:** Signs helps reinforce correct traffic flow and is particularly important in areas where roundabouts and traffic circles are unfamiliar. Consult the MUTCD for signs guidelines.

Guidance based on NACTO Urban Street Design Guide. For more detail, visit: nacto.org

Top: A 6-month pilot traffic circle in Palo Alto, CA (Joshuah Mello); Middle: Demonstration traffic circle in Livingston, MT (Melinda Barnes, Bike Walk Montana); Bottom: Pop-up MANGO demonstration project in Santa Monica, CA (City of Santa Monica).

TYPICAL DIMENSIONS CHEAT SHEET

1. **ROUNDABOUT SIZE:** The center of the roundabout should be as large as possible within intersection constraints - roundabout must allow for adequate vehicle circulation around the circle in all directions. Leave at least 15 ft. of space between the curb corner and inner curb defining the circle.

2. **SPLITTER ISLAND SIZE:** Recommended longitudinal dimension for a splitter island varies greatly, depending on design speed, roadway configuration and type of roundabout being designed.

3. **PEDESTRIAN CROSSINGS:** A true mini roundabout typically requires pushing pedestrian crossings back to accommodate vehicle circulation and preserve pedestrian safety - place relocated pedestrian crossings 20 - 25 ft. "upstream" of the roundabout entrance line.

4. **BIKE-FRIENDLY MINI-ROUNDABOUTS:** Vehicles typically travel through mini-roundabouts at 12 - 20 mph - similar to the speed of bicycle travel. Thus, people on bikes should navigate through a mini-roundabout as if they were a vehicle, in a shared lane condition. If bike lanes are present approaching a mini roundabout, they should be terminated prior to the intersection. Include signs to alert all users of merging. FHWA's mini-roundabout guidance suggests the following:

   "Terminate the bike lane at least 100 ft. upstream of the entrance line, provide a 50 ft. taper ending prior to the crosswalk at the roundabout entry, and use a dotted bike lane stripe for the last 50 to 200 ft. prior to the beginning of the taper."

Demonstration roundabout in Livingston, CA (Congress for the New Urbanism: California Chapter).

Surface Treatment
Temporary striping created with sidewalk chalk (spec sheet page 51).

Barrier Elements
Straw wattle acts as temporary curb – tree in center adds greenery. Cones and plants create a splitter island (spec sheet pages 28, 41, 69)

CASE STUDY: LONG BEACH, CA

1 Day **Demonstration**

Project Type: Mini-roundabout

Sponsor Organizations: City of Long Beach, Southern California Association of Governments

Agencies Involved: (same as above)

Materials Budget: ~$1,000

Key Materials:

- **Barrier Elements:** Plastic stanchions with sand-filled bases defined circle circumference, with plastic banners.
- **Landscaping Element:** Plants and trees borrowed from local nursery.
- **Signs:** MUTCD-compliant roundabout signs printed on large paper, pasted on cardboard, and affixed to A-frame barricades.
- **Programming:** Outreach booth with information about long-term project and city-wide bike plan.

About the Project:

The Southern California Association of Governments (SCAG) has initiated a region-wide safety and encouragement campaign called GoHuman. As part of the campaign, SCAG, Street Plans, Alta Planning + Design, and cities across Southern California are spearheading Tactical Urbanism demonstration projects. An October 2016 campaign event in Long Beach, CA featured the demonstration of a bicycle boulevard included in the City's bike plan. The street, which connected to the City's open streets route, featured a mini-roundabout made with homemad signs, landscaping, and plastic stanchions, as well as artistic crosswalks, and permanent sharrows marked by city officials.

Demonstration traffic circle in Long Beach, CA (Street Plans).

Programming
Outreach booth with information about long-term project and city-wide bike plan.

Signs
MUTCD-compliant roundabout signs printed on large paper, pasted on cardboard, and affixed to A-frame barricades.

Barrier and Landscaping Elements
Borrowed plants placed at center, surrounded by visual barrier created with plastic stanchions and project banners.

CASE STUDY: MINNEAPOLIS, MN

1 day **Demonstration**

Project Type: Protected intersection

Sponsor Organization: The Center for Prevention at Blue Cross and Blue Shield of Minnesota; Minneapolis Bicycle Coalition

Agencies Involved: Alta Planning + Design

Materials Budget: < $500

Key Materials:

» **Surface Treatments:** Black Roofing Paper; Spray Chalk; Astroturf

» **Barrier Element:** Insulation Panels; DIY Plywood Planters

About the Project: On June 8th, 2014, the Minneapolis Bicycle Coalition and Alta Planning + Design built a one day protected intersection for Open Streets Minneapolis. With the use of design elements such as corner refuge islands, protected intersections force turning cars to slow down, create fully protected right turns for bicyclists, and shorten crossing distances for both pedestrians and cyclists. The Center for Prevention at Blue Cross and Blue Shield of Minnesota helped fund this project as a part of an advocacy campaign called Bikeways for Everyone focusing on the construction of 30 miles of protected bike lanes in Minneapolis by 2020. The one day demo allowed residents to experience and learn about this type of intersection and has since helped create a movement to implemente them permanently.

Protected Bike Lane
Pop-up protected bike lane created with astro turf and homemade planters leads up to the intersection (spec sheet pages 68 - 69

Barrier Element
Insulation panels cut to the shape of medians and painted gray to look like concrete create low-cost barrier elements to define the protected intersection.

Surface Treatments
Chalk arrows direct people biking around the protected intersection, helping illustrate how it is used. Tar paper crosswalks demonstrate high visibility crosswalks (spec sheet pages 47 and 51).

Demonstration intersection in Minneapolis, MN (Alta Planning + Design).

CLOSER LOOK

PALO ALTO RESIDENTIAL TRAFFIC CIRCLE

Pilot

Project Type: Residential Traffic Circle

Location: Palo Alto, CA

Sponsor Organization/Agency:
City of Palo Alto Transportation Division

Pilot neighborhood traffic circle in Palo Alto, CA (Joshuah Mello).

CONTEXT

The City of Palo Alto Transportation Division installed a six-month pilot traffic circle at the intersection of Cowper Street and Coleridge Avenue, providing much needed traffic calming along two heavily used bike routes. Cowper Street is a city-designated bike route, and, in a city that has a 30 - 40% bicycle mode share for students traveling to school, Coleridge Avenue is a heavily used bike route.

DESIGN PROCESS

Designated as a 'Traffic Safety Pilot Project,' this temporary project was the first of its kind by the City of Palo Alto. The project arose as a response to community concerns about safety at the Cowper and Coleridge intersection. Parents in the neighborhood raised concerns that the intersection was unsafe for children biking to school. While Coleridge Avenue had a stop sign in place at each side of the intersection, Cowper Street allowed free flowing traffic. This condition led to concerns that students were not able to cross Cowper safely when traveling along Coleridge.

Parents and local neighbors originally requested stop signs at Cowper, but after the city's warrant analysis ruled out this option, the Transportation Division began searching for other solutions. The city identified a neighborhood traffic circle as one option for addressing community concerns. A small, neighborhood-level traffic calming project of this nature didn't warrant a full 1-year public outreach process, and the city felt that a pilot may be a more effective way to evaluate the concept and gather public input.

Joshuah Mello, the Chief Transportation Official with the City of Palo Alto, notes that testing the project through a pilot "helped people realize that while the neighborhood traffic circle had great potential to improve safety, it would not have a major impact on traffic circulation. If you talk about a traffic calming idea like this in a public meeting, people tend to think the project will be a lot more impactful in terms of vehicle mobility than it actually is."

An on-call traffic consultant created the design for the traffic circle using bolted down rubber curb stops that the city already had on hand, four type-1 barricades with traffic circle signs attached, and yellow traffic paint. The type 1 barricades were used to temporarily hold the traffic circle signs, but were quickly upgraded to delineators once available. A sign on the street corner also clearly states the name and duration of the pilot project and invites people to call or email with questions or concerns. While Safe Routes to School leaders of the nearby Walter Hays Elementary

Pilot neighborhood traffic circle signs in Palo Alto, CA (Joshuah Mello).

Local bike advocates evaluate the new intersection configuration (Joshuah Mello).

"IF YOU TALK ABOUT A TRAFFIC CALMING IDEA LIKE THIS IN A PUBLIC MEETING, PEOPLE TEND TO THINK THE PROJECT WILL BE A LOT MORE IMPACTFUL IN TERMS OF VEHICLE MOBILITY THAN IT ACTUALLY IS."

- JOSHUAH MELLO

School reported very positive feedback, the results were decidely mixed. The initial project design left the two existing stop signs in place, which according to Mello, caused some confusion and possibly influenced what local residents thought of the project.

Following a series of intercept survey of street users and residents located within proximity of the intersection, the city received 69 positive comments about the circle and 68 negative, with the the latter group asking for a four-way stop to be reconsidered. As of the writing of this case study, the City of Palo was engaged in another iteration of the pilot project. This time, they have removed the stop signs altogether and are letting traffic flow freely around the traffic circle for a period of 6 months. Another survey process will reveal whether the improvement will be made permanent or not.

LESSONS LEARNED

While the jury is still out on the Cowper / Coleridge intersection, the process of testing traffic safety projects has been a success for the City of Palo Alto. Indeed, at a small scale, it has helped the City gather community feedback, while reviewing the effectiveness of pilot project materials. Palo Alto will continue to look for other opportunities to use this iterative design approach as a way to quickly make streets safer and gain feedback from the community by allowing them to experience projects first hand. Indeed, this past October, the City worked with the Silicon Valley Bicycle Coalition to test out a parking-protected bikeway along Bryant Street for the 7th Annual Bike Palo event, which attracted 800 participants.

OTHER PUBLIC SPACES

PLAZAS + PARKS

Plazas and parks can be created from an underutilized street right-of-way or parking lot space into an area reserved exclusively for human activity. Temporary plazas and parks can enhance local economic and social vitality, pedestrian mobility, access to public transit, and safety for all street users. Like a parklet (not included in this guide due to abundance of existing materials and design information), plazas and parks depend on a successful partner can act as a steward of the public space.

DESIGN CONSIDERATIONS

Plazas or parks work best on lowly trafficked "stub" or "slip lane" street segments with low vehicle traffic volumes and active retail spaces that front the space. Look for a space where additional public space would be an amenity, or where high volumes of pedestrian traffic merit enhancing such street space available for walking, sitting, and other passive and active programming opportunities.

When designing a plaza or park, it is important to create a clear, strong edge to define the space using a combination of barrier elements, surface treatments, and landscaping elements (more on that to follow). Keep your public space compact so that activity is not spread too thin.

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:**
   - » **Striping:** Use min. 4 in. solid white lines to separate the plaza from the roadway.
   - » **Colored treatments:** Murals or other specialized surface treatments can be used to further define the plaza or park space.
2. **BARRIER ELEMENTS:** Physical barriers (such as flexible delineators or large granite blocks) should be used to create a strong edge and define the place as a pedestrian-only zone.
3. **LANDSCAPING ELEMENTS:** Plants, trees, and other landcape amenities go a long way in making the plaza an inviting space to linger and socialize.
4. **SIGNS:** For plaza branding and explanation. May also be required to communicate rules of public space use (no smoking, etc.).
5. **STREET FURNITURE:** Movable chairs and tables are preferable. Shade elements should also be added in sunny/hot climates.
6. **PROGRAMMING:** Activating plazas and parks with programming is key to success. Events and activities can include exercise classes, live music, food trucks, farmer's markets, etc.

Above: Somerville, MA pop-up plaza designed for the Davis Square "Somerville by Design" charrette (Dan Bartman). Below: Dewey Park in Burlington, VT was created by converting a low-volume, redundant street segment into an interim design plaza. The surface features a mural by a local artist, Abby Manock. Sybertech planters are are maintained by community volunteers. Street furniture includes movable seats that are made available during the weekly farmers market held in the plaza, as well as during other special events (Street Plans).

TYPICAL DIMENSIONS CHEAT SHEET

1. **STRIPING:** Use min. 4 in. solid white lines to separate the plaza from the roadway. Use a double white line along the edge of the plaza to legally prohibit vehicle entry.

2. **SPACING BARRIER ELEMENTS:** Barrier elements (such as granite blocks, planters, or flexible delinators) should be placed at least 12 in. from the inside of the white edge line. Barrier elements must provide a clear edge for the plaza or park. Planters or blocks should be large enough to create a sense of enclosure in the plaza space and create a buffer between people and cars, but not limit sight lines. Exact barrier placement will depend on context and the type of barrier used.

   If parking is permitted adjacent to the plaza or park, ensure all plaza elements (such as benches or planter boxes) are located at least 18 in. away from the curb so drivers and passengers can open doors of the parked vehicle.

Programming
Food trucks and pop-up vendor booths provide amenities.

Street Furniture
Moveable tables and chairs made from pallets (spec sheet page 62).

Barrier Elements
Pallet planters and flexible delineator posts create a buffer between vehicles and people in the plaza (spec sheet page 30).

Surface Treatment
Solid white line and colored surface treatment define the plaza area (spec sheet page 54).

In 2014, curb extensions, a plaza, and programming were installed during a MEMFix demonstration project in a Memphis neighborhood called The Edge. The curb extension and plaza remained as pilot treatments before being remade into an interim design using epoxy gravel and other barrier types in late 2016 (John Paul Shaffer, Livable Memphis).

CASE STUDY: BROOKLYN, NY

1 day **Demonstration ▶ Interim Design**

Project Type: Pedestrian Plaza

Sponsor Organizations: NYC DOT

Agencies Involved: Myrtle Avenue Business Improvement District, The Uni Project, Ridgewood Local Development Corporation

Materials Budget: < $500

Key Demonstration Materials:

» **Barrier Elements:** A-Frame Barricades
» **Street Furniture:** Tents, mobile library, moveable tables and chairs
» **Signs:** Banner
» **Programming:** Outreach booth with information about long-term project

About the Project:

The Myrtle Avenue BID and Ridgewood Local Development Corporation partnered with NYC DOT to bring a one day plaza to a dangerous six-way intersection on the border or Brooklyn and Queens. Two subway lines and six bus routes converge at this Wyckoff Avenue, Myrtle Avenue, and Palmetto Street intersection. Three pedestrians have been killed at this intersection since 2009, two of them by MTA bus drivers. Part of NYC DOT's One Day Plaza initiative, this temporary public space was used to gather community feedback for a more robust interim plaza. Normally proposed by community partners, this plaza was part of NYC DOT's Vision Zero initiative to make this intersection safer in the short term. NYC DOT added interim curb extensions at the intersection back in 2014, but after another pedestrian was killed, a plaza was proposed. The interim design plaza was implemented in Fall of 2016.

Programming
Programming the temporary plaza was key to this project's success. Live music, games, and a mobile library engaged people and activated the space. The mobile library is part of the Uni Project, a non-profit that activates public spaces in NYC.

Barrier
Plastic planters soften the space and provide a barrier to moving traffic (spec sheet page 39).

Street Furniture
Movable tables and chairs help make the space comfortable for people of all ages (spec sheet page 63).

Left: A one day demonstration plaza, in Bushwick, Brooklyn, NY (David Meyer). Right: Following a successful demonstration, an interim design plaza was implemented by the NYCDOT (David Meyer).

CASE STUDY: MIAMI, FL

1 Week + 1 month

Demonstration ► Pilot

Project Type: Park

Sponsor Organizations: Ralph Rosado, Miami Downtonw Development Authority (DDA)

Agencies Involved: Miami DDA, Florida Department of Transportation (FDOT)

Materials Budget: $10,000

Key Materials:

» **Street Furniture:** Bench seating, moveable bistro chairs, adirondack chairs, awnings

» **Surface Treatment:** Live Sod, Painted mural, artistic striping

» **Programming:** A variety of cultural and social events throughout the week, exercise equipment, and other park amenities.

About the Project:

In 2012, Street Plans, together with local planner, and civic leader Dr. Ralph Rosado, AICP, worked with the Downtown Development Authority, local businesses, and community members to quickly design and deliver a temporary public park. In the time since this first one week project was completed, a permanent design concept was developed, which included removing 4 lanes of traffic and re-allocating the space to a redesigned public realm along Biscayne Boulevard. In 2016, the DDA was awarded a $150,000 grant from the Knight Foundation, which is being used to develop a one month version of this project. The next iteration is called Biscayne Green and it will be operational throughout January 2017. Permanant improvements are being made to advance the final permanant project, including murals on the Metromover facilities, and on the surfaces of the two parking lots.

Street Furniture
Chairs formerly used for special events were purhased at discount on craigslist.

Park Furniture
Exercise Equipment was donated for the week by local park equipment vendors.

Surface Treatment
Live sod was donated for the week. It was watered daily and reused after the demonstration project (spec sheet page 68).

Top left: Existing Conditions (Ana Bickic / Street Plans); Top right: Bayftont Parkway project, 2013 (Ana Bickic, Street Plans); Bottom: Unscripted activity in the pop-up park (Street Plans).

CASE STUDY: PENRITH, AUSTRALIA

3 year+ **Pilot ▶ Interim Design ▶ Permanent**

Project Type: Plaza / Park

Sponsor Organizations: City of Penrith

Agencies Involved: Place Partners, Penrith City Council

Materials Budget: $40,000

Key Materials:

» **Barrier Elements:** Large concrete blocks

» **Landscaping Elements:** Trees, planters, grass

» **Street Furniture:** Bench seating

» **Surface Treatment:** Painted mural, artistic striping

» **Programming:** Periodic events throughout the pilot and interim design phases.

About the Project:

Street Plans and Sydney-based consultancy firm Place Partners, worked with Penrith Council, local businesses, and community members to quickly design and deliver a temporary public park that was to be evaluated over the course of one year. The independent consulting firm hired to assess the park used behavior mapping, business owner interviews, and traffic studies to understand how the park was succeeding / failing. Following the one year trial period, Penrith City Council decided in May 2015 to make a few tweaks to the design but to otherwise maintain the interim design until construction could begin. Permanent design concepts were vetted in 2016, and preferred design will be constructed in 2017.

Surface Treatment
A large colorful mural was used to clearly define the plaza space and beautify the area (spec sheet page 54).

Street Furniture
Sturdy concrete benches function as a barrier and provide seating. (spec sheet page 34).

Landscaping Element
Live sod and planters / landscaping treatments visually transformed the street into an inviting public space (spec sheet page 68).

Top left: Before - High Street, Penrith, Australia (Penrith Council); Top right: After - High Street Triangle Park pilot project (Penrith Council); Bottom left / right: paint, concrete blocks, and planters transformed this section of High Street into a plaza (Hames Sharley).

CASE STUDY: PHILADELPHIA, PA

1-5 Years **Interim Design ▶ Permanent**

Project Type: Pedestrian Plaza

Sponsor Organizations: University City District; City of Philadelphia Office of Transportation & Infrastructure Systems

Agencies Involved: Streets Department; SEPTA; Department of Commerce; University of the Sciences in Philadelphia; ThinkGreen

Materials Budget: $50,000

Key Materials:

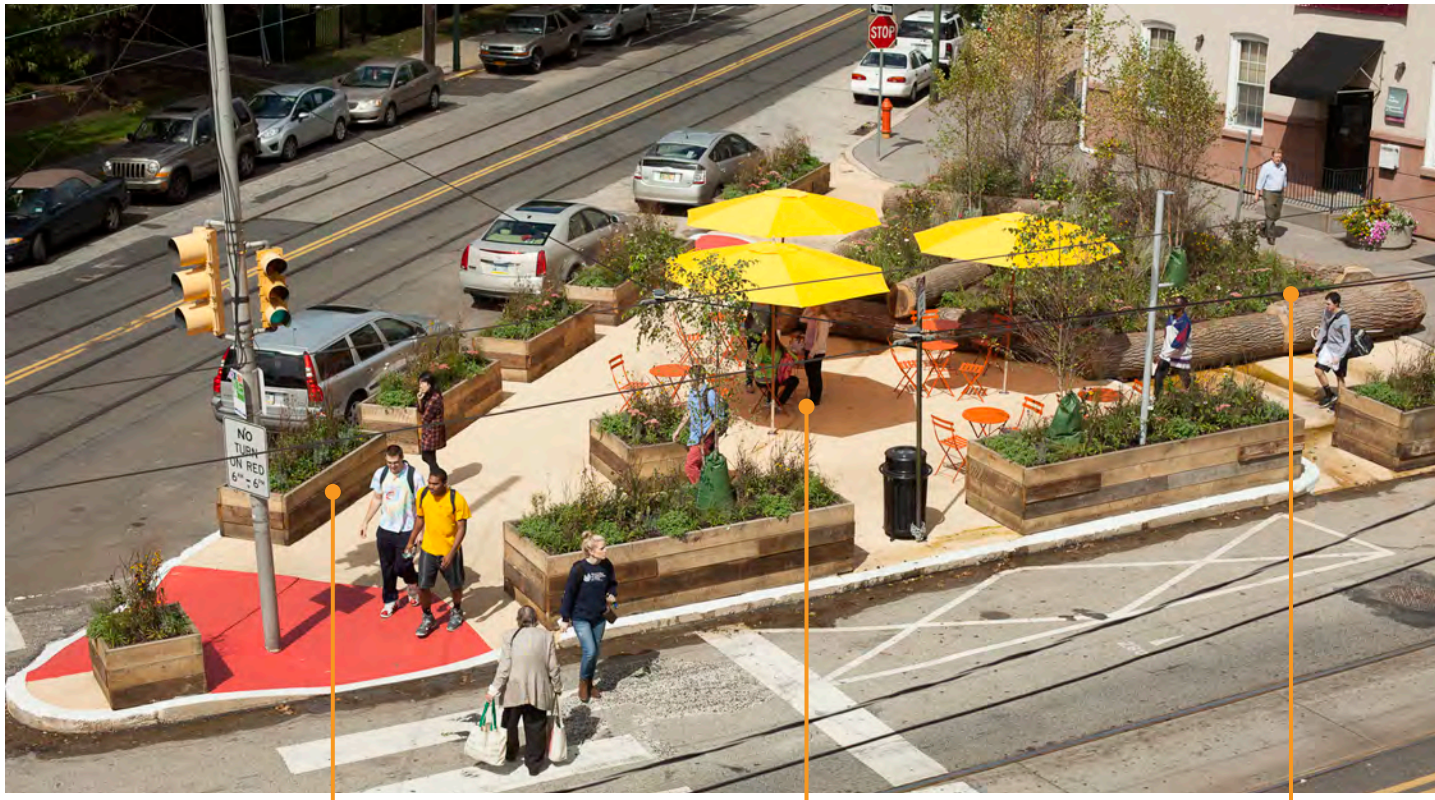
» **Barrier Element:** Wooden Planters

» **Landscaping Element:** Logs, birch trees, grasses, and herbs

» **Street Furniture:** Movable tables / chairs, log benches

» **Surface Treatment:** Acrylic traffic paint

About the Project:
University City District partnered with the City of Philadelphia's Office of Transportation & Infrastructure Systems to create a plaza through the city's Plaza Program. The plaza repurposed an underutilized concrete traffic island and a small slip lane on Woodland Avenue. Materials include locally sourced wooden planters and logs, trees, grasses, herbs, flowers, movable tables and chairs. Four years later, the plaza is in the process of being redesigned with permanent materials.



Barrier Element
Salvaged wood from neighborhood construction was used to build the large planters that act as barriers around the plaza's edge (spec sheet page 38).

Street Furniture
Large logs were used from fallen trees at the Woodlands Cemetery across the street from the plaza. The logs act as both seating and the perimeter to the landscaping. (spec sheet pags 63 - 64).

Landscaping Element
Special attention to landscaping made this plaza great for stormwater management. Native trees, grasses, herbs, and flowers attract people, wildlife, and created a beautiful space (spec sheet page 38).

Woodland Pedestrian Plaza (Ryan Collard for University City District).

BRADLEY AVENUE PLAZA

Demonstration ▶ Interim Design

Project Type: Pedestrian Plaza

Location: Los Angeles, CA

Sponsor Organization: Pacoima Beautiful

Agencies Involved: Los Angeles Department of Transportation (LADOT)

Photos: Joe Linton

Bradley Avenue Plaza in action (LADOT / James Simmons).

CONTEXT

Bradley Avenue Plaza is an interim public plaza in the Pacoima neighborhood of Los Angeles. The project transformed an underutilized dead end street into a pedestrian plaza, providing much needed public space and improving the connectivity between a previously isolated low-income housing development and the rest of the Pacoima neighborhood. Pacoima Beautiful, a local non-profit environmental justice organization, obtained permission to create the plaza through the Los Angeles Department of Transportation's (LADOT) People St Program.

The People St program allows eligible community partners to apply for approval to create projects that enhance the public realm. To streamline the approval process and bring community benefits faster, the program is focused on three pre-approved project types: parklets, bike corrals, or plazas. Community partners choose from a "Kit of Parts" of relatively low-cost materials, also pre-approved by the city. The program structure allows LADOT to work with community partners to quickly create interim public spaces, with the expectation that the interim designs will be evaluated every year until capital funds are available for permanent construction.

The cost and maintenance responsibilities for People St Plazas, like Bradley Avenue Plaza, are shared between the Community Partner and the City. The City pays for and installs the colorful surface treatment, identity and wayfinding signage, and perimeter planters. The City also makes any necessary adjustments to traffic striping and signals to effect the Plaza footprint. The Community Partner is responsible for funding and installing the plaza furnishings and maintaining / cleaning the plaza elements and planter plant materials. Community Partner is also responsible for programming activities.

DESIGN PROCESS

After submitting an initial application to the People St program, Pacoima Beautiful hosted a plaza demonstration. Enabled through a block-party permit, this one-day event accomplished two important goals: (1) it allowed residents to experience how their street could be transformed, building community support for the plaza, and (2) it allowed community members to become actively involved in designing the plaza. Attendees were invited to choose their preferred plaza elements from the pre-approved LADOT Kit of Parts, and Pacoima Beautiful worked with community organizations to program the space, illustrating how the plaza could be activated.

Less than a year after the pop-up, the People St plaza was constructed, using low-cost, interim design materials permitted in the Kit of Parts. The interim plaza reflects the community vision articulated at the demonstration project: the plaza includes lounge

"THE POP-UP DEMONSTRATION WAS IMPORTANT BECAUSE IT ALLOWED THE COMMUNITY TO IMAGINE HOW A DEAD END STREET COULD BECOME A PUBLIC SPACE."

- MAX PODEMSKI

seating, workout equipment, pin-wheel striped paint, planters, delineators, and wayfinding signs. The flexible nature of the interim design allows for ongoing iteration of the space in response to a deepened understanding of community needs. In early 2016, for example, a full six months after the ribbon cutting, Pacoima Beautiful added a community event board, additional trash cans, and a picnic table. After observing how many children were frequently playing in the plaza, the community also added play equipment.

The Bradley Avenue Plaza has even catalyzed a project adjacent to the plaza. Pacoima Beautiful has secured funding for a green alley that will be adjacent to the plaza which will strengthen the connection between San Fernando Gardens and the plaza. The alley will have a shared space design that will carry elements of the plaza into the alley.

Pacoima Beautiful will continue to make iterations to the space, ensuring that the eventual permanent plaza will align with user needs. The demonstration and pilot plazas also function to clearly illustrate a high level of community support for the project; so much so that LADOT and the local council office are currently working with Pacoima Beautiful to refine the design and make the plaza permanent.

LESSONS LEARNED

Max Podemski, the Planning Director at Pacoima Beautiful, notes that, "The pop-up demonstration was important because it allowed the community to imagine how a dead end street could become a public space."

Pacoima Beautiful and LADOT were able to continue improving the plaza by refining the design based on community needs and use of the space. In this way, Bradley Avenue Plaza illustrates how flexibility in the interim-design time interval can help the project leaders iterate to achieve a better long-term project.

Top: A Place It! workshop led by James Rojas occured during the one-day demonstration project (Max Podemski). Bottom left and right: From demonstration to interim design, a range of physical activities bring life to Bradley Avenue Plaza (LADOT / James Simmons).

ACTIVATED ALLEYS

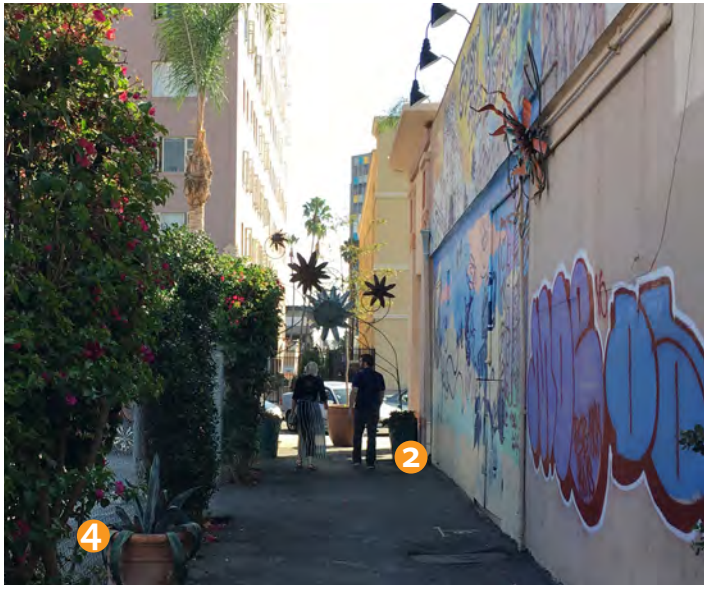
Cities around the globe are rethinking how they use alleyways. Using these narrow, pedestrian-scaled thoroughfares for trash collection alone is a huge waste - if activated and beautified, alleys can help communities enhance goals related to walkability, economic development, sustainability, health, and more.

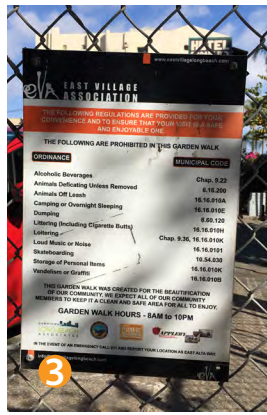
DESIGN CONSIDERATIONS

Small and intimate in scale, alleys have the "bones" to be welcoming pedestrian environments. Landscaping and design treatments can help enhance an alley's function as an enticing place to walk, bike, gather, and manage stormwater.

COMMON MATERIALS CATEGORIES

1. **SURFACE TREATMENTS:**
   - » **Pavement Markings:** Due to low traffic speeds, alleys can be ideal places for bicycle travel. The shared nature of the street can be communicated through signs or pavement markings. Careful attention must be paid to visibility at intersection crossings (not shown).
   - » **Colored treatments:** Can be used to further define the alley and simulate the effect of special pavers, which may be part of longer-term capital upgrade projects (not shown).
2. **BARRIER ELEMENTS:** Physical barriers (such as flexible delineators or planters) can be used to restrict access to alley if desired.
3. **SIGNS:** Can be used to help brand the alley and educate people about various design elements, such as rain gardens or street trees.
4. **LANDSCAPING ELEMENTS:** Planters can add greenery and improve drainage.
5. **PROGRAMMING:** Programming and / or commercial activity draws people into the alley and keeps them there. Allowing commercial businesses to open into the alley will make for a more active, interesting, and economically productive alley space (not shown).



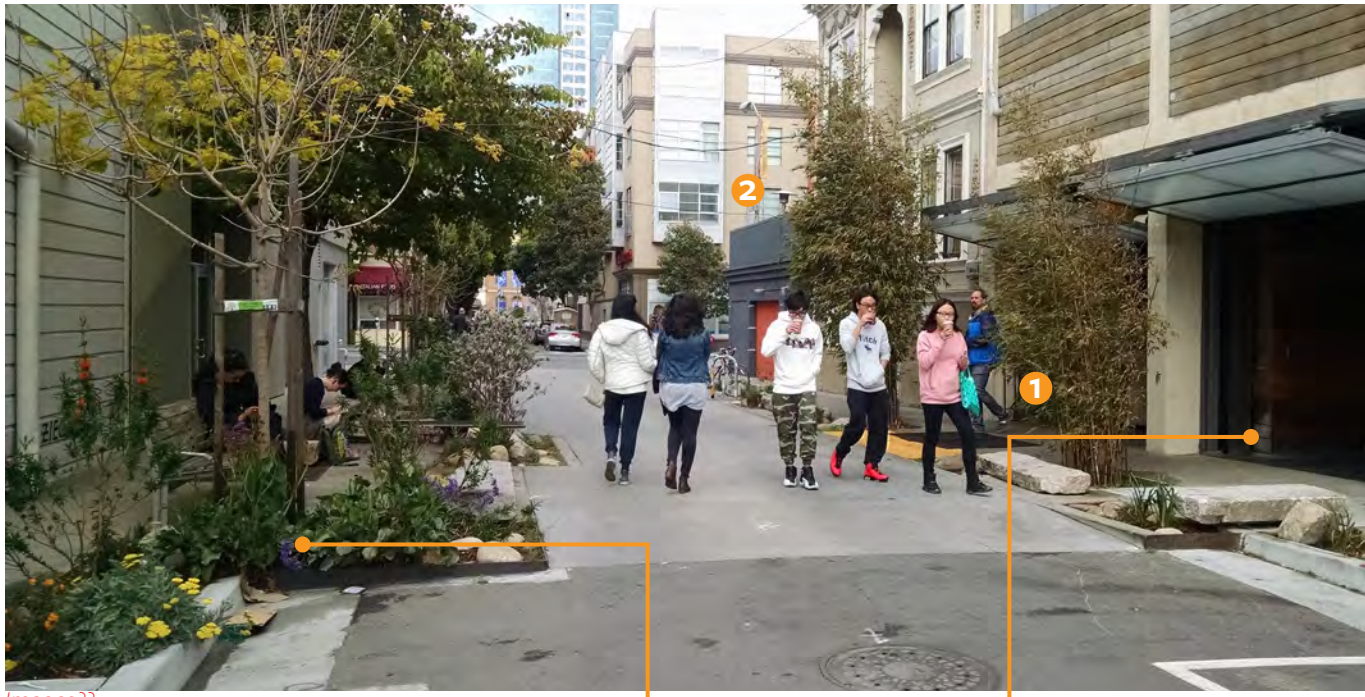


Above: Garden Walk alley in Long Beach, CA (Street Plans). Key features include public art, landscaping, and pedestrian-scaled lighting. Alley improvements were a collaborative effort between the City of Long Beach, the East Village Association, and local business sponsors.

TYPICAL DIMENSIONS CHEAT SHEET

1. **ALLEY WIDTH:** Alley scale depends on desired function. If used by vehicles, alley must allow a minimum 10 ft. horizontal clearance.

2. **VERTICAL ELEMENTS:** Vertical elements such as gateway treatments of lighting should be scaled for pedestrians - approximately 1-story high.



Images??

Landscaping Elements
Trees and rain gardens beautify the space and support effective drainage.

Programming
A coffee shop opens into the alley, drawing pedestrians in throughout the day.

Vertical Element
Pedestrian-scaled lighting improves safety and creates a more inviting atmosphere.

A colorful pedestrian alley in Huntsville, AL (Street Plans).

CASE STUDY: SAN JOSE, CA

1 day **Demonstration Project**

Project Type: Activated Alley

Sponsor Organizations: Greenbelt Alliance

Agencies Involved: Santa Clara Country District Attorney's Office, City of San Jose

Materials Budget: $2,000 (including permits)

Key Materials:

» **Barrier Element:** A-Frame Barricades

» **Surface Treatment:** Astroturf in select areas

» **Street Furniture:** Moveable tables / chairs, pop-up tents, large umbrellas

» **Signs:** Sponsor organization banners

» **Landscaping Elements:** Potted trees

» **Programming:** Games, art, food trucks, music

About the Project:
To bring ideas in the neighborhood planning process to life, Greenbelt Alliance spearheaded a temporary "makeover" of a long-neglected alley behind a local strip-mall shopping center in San Jose. The project transformed part of the often trash-filled alley into a welcoming community gathering place. The makeover included an unveiling of a newly-painted mural, as well as temporary elements such as pop-up public seating areas, landscaping, and programming. The project was intended to catalyze action in an otherwise overlooked part of the neighborhood, offering possibilities for how it could fulfill residents' and business owners' future visions for the area.

Programming
A mural was painted in the alleyway to make the space more attractive to pedestrians.

Street Furniture
Umbrellas, tents, tables, and chairs were used to provide shade and space for people to eat and sit. (spec sheet pages 63 - 64).

More Programming
Games, such as connect four, cornhole, and hoola hoops, helped to activate the space. Other programming elements included painting, and food trucks.

Landscape Element
Portable trees were donated and used to liven up the alleyway. (spec sheet page 69).

Alley activation at Business Circle in San Jose, CA (Street Plans).

CASE STUDY: SAN FRANCISCO, CA

1-5 Years **Interim Design**

Project Types: Activated Alle / Plaza

Sponsor Organizations: Yerba Buena Community Benefit District

Agencies Involved: SF Planning Department

Materials Budget: $150,000

Key Materials:

» **Barrier Element:** Concrete barrier at street edge.

» **Landscaping Elements:** Drought resistant hanging plants

» **Street Furniture:** Movable tables and chairs, stage, benches

» **Signs:** Placard with plaza name, reinforcing that the alley is a public space

» **Programming:** Rotating programming including lunchtime music, night performances, and more.

About the Project:

In the Yerba Buena Street Life Plan, The Yerba Buena Community Benefit District identified Annie Alley as a space that could be converted into a plaza and event space. YBCBD collaborated with SF Planning's Pavement to Parks program to activate the alley and transform it into an interim public plaza. Various day-long or weekend-long events were held in the plaza to test the programming of the space and gain the community's feedback for a more permanent plaza. Eventually an interim design with reversible materials was agreed upon and the plaza is open today. Programming has included musical performances, fitness classes, food trucks, and fashion events.

Street Furniture
Stationary concrete benches and movable tables/chairs (spec sheet pages 34 and 63).

Landscape Element
Drought-resistant hanging plants. (spec sheet page 69).

Programming
Regular performances and events.

Annie Alley in San Francisco, CA has been transformed into an active public space (SF Planning).

That’s it. For now!

STREETPLANS

Miami San Francisco New York