



POP-UP TRAFFIC CALMING GUIDE

A tool for Montana communities to implement lighter, quicker, and lower-cost complete streets projects

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Introduction

Pop-up traffic calming projects are community-based efforts to see how low-cost and temporary (7– 30 days) versions of street design elements affect the behavior and safety of **all people*** using local streets and roadways. Design treatments include curb extensions or bulb-outs, traffic circles, bicycle facilities, pedestrian islands, and crosswalks. Bike Walk Montana’s Pop-up Traffic Calming Trailer is outfitted with materials and supplies to do these projects and is available to communities across the state.

This guide is meant to help residents, community groups, and agency staff through the process of implementing pop-up projects. You’ll learn how to:

- (1) Gather a diverse team of project organizers
- (2) Conduct a walk audit to identify safety issues
- (3) Define a project goal and metrics for evaluation
- (4) Select and draft designs
- (5) Work with agencies (City/County/State/Tribal) to obtain necessary permission
- (6) Implement the project and collect data
- (7) Share results and look ahead toward next steps

To get the most out of this guide, click on hyperlinked text for more in-depth information. See the *Resources* and *Appendices* at the end of the guide for links to additional guidance, tools, and examples. This guide offers an overview of the traffic calming features, design considerations, and processes that are most relevant to Montana communities.

Why Pop-up Projects?

Speeding and safety issues can be addressed in communities through a combination of education and outreach, law enforcement, and some types of signs or signals. Another way to address these concerns is through the design of the street itself (see Traffic Calming FAQs in *Resources*). Pop-up projects are low-cost, low-risk ways for citizens and agencies to work together to collect data on, and demonstrate safer street designs for, all people using the street.

Despite their name, pop-up projects don’t just “pop up.” they take time, effort, and cooperation between stakeholders. Before diving in, identify the outcomes that you would like to accomplish with a



A note on safer streets for “all people”

When we talk about “improving safety for **all people**,” we are acknowledging the diversity in types of people who want and need to use streets and roadways. When designing accessible, inclusive environments, everyone benefits.

“**All people**” means individuals using any mode of transportation: drivers, public transportation users, bicyclists, and pedestrians.

Depending on people’s preferences and opportunities, the *type* of device used within various modes of transportation may differ. For example, drivers may use small and large vehicles, motorcycles, mopeds or scooters. Public transportation users may ride standard routes or may ride paratransit routes. Bicyclists as a broad term could include individuals with traditional bikes, e-bikes, cargo bikes, bikes with trailers, tandems and adaptive bikes-- including recumbant bikes and hand cycles. Pedestrians include individuals moving through the community as they might in their home, workplace or indoor spaces; they may sometimes use mobility devices such as a cane, crutches, or a walker as well as a manual wheelchair or motorized wheelchair or scooter.

In addition to the diversity of people using different modes of transportation, we mean to include people of all ages, disabilities, races, ethnicities, incomes, and educational levels.

Any of these individuals may have preferences for how information is provided through the built environment. For example, people who are blind or have low vision have preferences for auditory and tactile signals and information, while people who are deaf or hard-of-hearing prefer visual information.

All people benefit when these diverse life experiences are considered in the planning and implementation of pop-up projects.

pop-up project. Consider these three project types to help you focus the effort on a specific location and realistic scale:

- 1. Address a specific safety issue** near a school, community center, or during an event
 - Shorter duration (1-2 weeks)
 - Focused on building community support for longer-term solutions
- 2. Collect data and public input** to inform street design policy decisions and planning efforts
 - Longer duration (1-3 months)
 - Focused on engaging the public with planners and policy makers to inform local or regional transportation plans and policies
- 3. Pilot or test a street design** before an upcoming opportunity for permanent installation
 - Longer duration (1-3+ months depending on the context)
 - Focused on collecting data and public input on a specific design that may be implemented permanently in a scheduled or proposed development or reconstruction project

Design ideas

Curb extensions move the curb line out into the parking lane which reduces the crossing distance for pedestrians and increases their overall visibility by positioning them out from behind parked cars. Curb extensions can be used to create **bulb-outs** at intersections to **slow turning movements** of vehicles, **pinch points at mid-block crossings** on multilane streets, and **chicanes** along low volume neighborhood streets.

Location considerations: Where on-street parking is present; where the speed limit is < 45 mph; in areas that transition from higher speed, higher volume roads, to low speed, lower volume streets.



Design considerations:

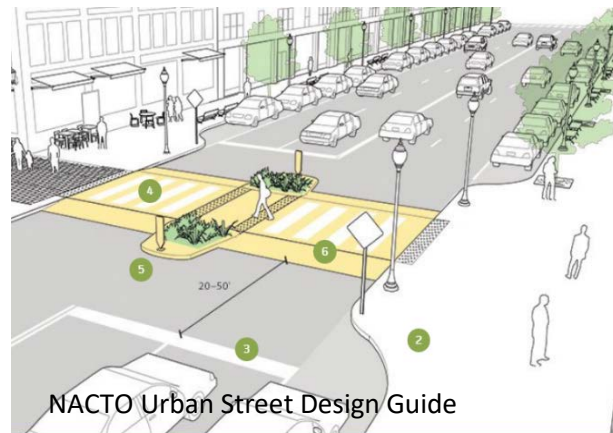
- Crosswalk markings should be clearly and continuously marked from the edge of the curb ramp at the sidewalk, through the curb extension.
- Curb extensions should generally be 1-2 feet narrower than the parking lane.

- Materials used for temporary curb extensions need to accommodate stormwater drainage. Permanent curb extensions can be designed to [drain and filter stormwater](#).
- Installing a curb extension may be coordinated with plans to build curb cuts and other elements supporting greater accessibility for persons with disabilities. Curb extensions with level and uncluttered space, create a comfortable and visible area for wheelchair users to await a time to cross the street.
- Pop-up curb extension projects may need to install ramps down to street level from sidewalks that don't have curb cuts already. This is also an opportunity to showcase [detectable warning](#) on the curb ramp. An internet search for ADA compliant truncated dome tiles will result in various products that could be integrated into a pop up project. See curb ramp examples in appendices.
- Curb extensions create additional public spaces along the street that can be used for [widening the sidewalk](#), bike parking, landscaping, snow storage in the winter, "[parklets](#)" etc.
- Where streets do not have curb and gutter, curb extensions can act as a divider between pedestrian and vehicle travel areas.
- Winter maintenance needs for curb extensions include reflective vertical elements, such as [reflective delineators](#), so that plow trucks and graders can locate curb lines.



[Pedestrian islands](#) bring more visibility to pedestrian crossings and minimize pedestrian exposure to vehicle traffic by offering mid-crossing protection.

Location considerations: Intersections or [midblock crossings](#) of streets with 3+ lanes; streets with wide lanes (>12').



Design considerations:

- Crosswalks that incorporate pedestrian islands should be at least 6' wide ([5' to meet ADA requirements](#)). The island itself is ideally about 40' long including the width of the crosswalk and the "nose" that extends past the crosswalk.
- Islands will require travel lanes to become narrower. Standard travel lane widths are generally 10-12' wide depending on the context of the street and the jurisdiction that maintains it. Wider lanes generally facilitate driving at higher speeds, so the context and desired outcomes are important. Be sure to check with the jurisdictional agency on lane width requirements.

- Detectable warning should be provided in the median, signaling to blind pedestrians when they are entering and leaving the island. See curb extension examples in appendices.
- Winter maintenance needs include reflective vertical elements, such as reflective delineator posts, so that plow trucks and graders can locate curb lines.

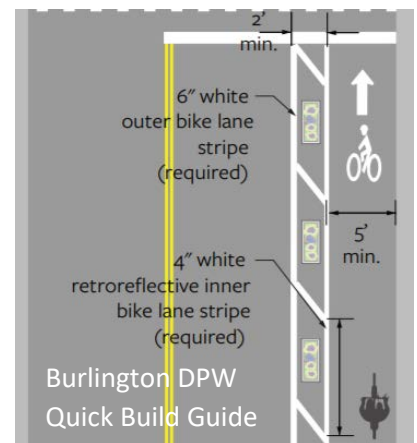


Protected bike lanes provide physical separation from vehicles for people on bikes by putting a barrier between the bike lane and traffic lane. On roads or streets without sidewalks, this strategy can also be used to create a pedestrian lane, or a shared bicycle and pedestrian path.

Location considerations: Along any street or road with speed limits > 25 mph, average daily traffic of > 3,000 vehicles, heavy truck traffic, or along streets with on-street parking.

Design considerations:

- On-street parking can be used as the physical barrier between bike lane and travel lane. This gets cyclists out of the drivers' side door zone and reduces conflict with on-street parking that has a high turnover rate.
- Carefully consider how the bike lane will continue through intersections if built out to the fullest extent/permanently.
- Demonstrating bike facilities with pop-up projects is a complex balance of design type, roadway context, bike network connectivity, and management of conflict areas such as intersections or driveways. The [Burlington Public Works Quick Build Design Guide – Safer Places to Bike](#) section can help you navigate site details and design.
- Winter maintenance needs for bike facilities are also an important conversation to have with the right jurisdictional agency. What is the time, staff, and equipment needed to keep your proposed facility clear of snow and other debris year-round?



Traffic circles help control right of way and reduce speeds at uncontrolled intersections in residential neighborhoods. Neighborhood traffic circles are different than roundabouts in that they do not have channelized lanes or medians to direct incoming lanes ([See FHWA Mini-Roundabouts: Section 1, paragraph 2](#)).

Location considerations: 4-way uncontrolled intersections on residential streets; streets with < 30 mph speed limit; intersections that are not offset (all 4 “legs” of the intersection meet at right angles, and the path of travel through the intersection does not require a change in course); little heavy truck or large vehicle traffic

Design considerations:

- 15’ minimum of clearance is needed between the edge of the traffic circle to the edge of the curb radius; if curb radii are small, this distance may need to be larger.
- Left hand turns for larger vehicles may be difficult; test emergency vehicle clearance during set-up; some larger vehicles with trailers may need to alter their route through a neighborhood or cut in front of the traffic circle to make a left turn.
- Pedestrian crossings should be clearly marked and [shared lane markings \(sharrows\)](#) for cyclists should be considered.
- Traffic circles offer great opportunities for public art and landscaping elements; ensure that plantings or art in the circle does not limit visibility of pedestrians at crossings or of oncoming traffic
- Winter maintenance needs include reflective vertical elements, such as reflective delineators. Traffic circles require more articulation of snow removal equipment.



WTI - Bozeman, 2018



NACTO Urban Street Design Guide



Lane Reductions or “road diets” convert 4+ lane roads to 3 lane roads by creating a shared center turn lane and one lane of traffic in each direction. They are a proven safety countermeasure by [FHWA](#) and have shown to reduce crashes while also increasing space for multimodal facilities and public gathering spaces.

Location considerations: Main streets, 4-lane roads with traffic volumes up to 25,000 vehicles per day

Design considerations:

- Re-striping for lane reductions frees up space to add curb extensions, bike lanes, and parklets, but be mindful of keeping the project scope realistic given timeline, resources, and community support.
- Lane reductions require close coordination with the Montana Department of Transportation (MDT) if the road or street falls under state jurisdiction. Be sure to verify the road jurisdiction early in the process.
- Signal timing and placement may need to be reconfigured. Transition areas from the area on either end of the lane reduction will also need special design consideration – consult your local agency!



The process

1. Gather a team (3+ months out) These projects are the product of diverse perspectives, skill sets, and efforts. *Who is your project intended to benefit?* They need to be a part of your planning team. Consider the following stakeholders:

- Neighborhood representatives
- Accessibility experts - individuals who have the lived experience of navigating with a disability, and/or professionals trained in accessible design
- Students, youth groups, school board members
- Members of community organizations focused on equity, mobility, access to jobs, health care, food, physical activity
- Representatives from local agencies (city/county/state)
- Local business owners
- Artists
- People with planning/design/engineering expertise





Communication with local agencies is essential right from the start. Is it possible to have a member of city engineering or county planning to be on your project planning team? Reach out to these agencies with your project idea and ask how each agency would like to be involved in project planning and their communication preferences. Whomever is the public “owner” of your project location must give their permission. This can be via an “encroachment permit” from a city, county, or state (MDT), an official endorsement at a city council or County Commission meeting, or letter of support from private property owners or homeowners’ association. No one should be surprised when the project goes up. A primary concern of any property owner is their liability for what happens on their property.

2. Conduct a walk audit (~3 months out) A one hour walk audit is an opportunity for the planning group, additional neighbors representing all people, and agency staff (city/county engineering + streets staff, MDT, local law enforcement, elected officials) to come together to collectively identify the need for improvement and observe site conditions in in the area. It is a good idea for the core planning group to go door to door and notify neighbors of the intent to do a project on their street, explain the purpose of the project, and invite them to the walk audit. Record their contact information and their preferred method of communication – remember that not all people use computers.

Walk audits to plan for pop-up projects generally focus on observed safety issues that can be addressed with a project. Pick a time when you are likely to observe some of these issues: rush hour, when school gets out, during a public event at a park, etc. If it is safe to do so, wear high visibility vests and bring a measuring device to collect measurements on lane width, sidewalk width, crosswalk width, etc. Take lots of photos of existing conditions and observe interactions between road users. Click here for a [guide to walk audits](#).



Prior to the audit, do your research! Find out what laws and regulations apply in that location, including speed limits and right of way yielding regulations. Research existing plans, such as upcoming reconstruction projects, long-range growth/transportation plans or bike/pedestrian specific plans. Find out if any recent MDT corridor or speed studies have been completed around the potential project location.

3. Define goals and metrics (ASAP after Walk Audit). What is the need for improvement that your group identified during the walk audit? What will be the primary purpose, or goal of your project (revisit 3 project types at top of page 3). Write down a goal for your project after getting a clear sense of the needs and challenges at the potential project site. What are the metrics you'll use to evaluate the project? Here are some examples of data you might want to collect:

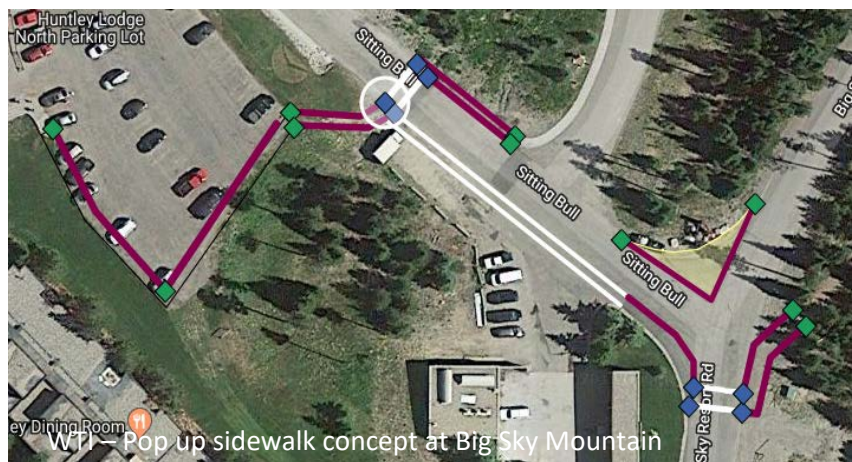
Quantitative	Qualitative
<ul style="list-style-type: none"> - Vehicle speed - Vehicle, bike, ped. counts - Public transportation data - Ped. use of marked or unmarked crossings - Yielding rates of vehicles for pedestrians - Parking availability and occupancy (don't forget ADA accessible spaces and bike parking!) 	<ul style="list-style-type: none"> - Intercept surveys of bikes/peds to capture the diversity of people in these categories - Online surveys with links posted on-site - Key stakeholder interviews: Identify individuals who are particularly affected by your project designs, such as those who are blind or low vision or living with other disabilities. Ask for their feedback directly!

Tools needed to collect data: Reach out to your agency partners such as city, county, MDT, and the Western Transportation Institute at Montana State University (WTI) about the availability of data collection tools such as pneumatic tube counters, radar counters, traffic cameras, etc. These agencies have the expertise in how to deploy these data collection measures and can help you collect the information you need.

4. Design your project (2.5 months out). Review the “Design Ideas” section of this guide, and consider your project goals, and desired long-term outcomes. Which design elements will address your project goals? Which ones might be feasibly implemented long-term as a part of a reconstruction project or new development?

Print out aerial images and street view images from google maps of your project location to draw on. Once your designs are refined, you can use “[Google My Maps](https://www.google.com/maps)” to make digital sketches of your project using lines and shapes.

For materials ideas and guidance, consult the [Tactical Urbanist’s Guide to Materials and Design](#). Begin making a materials inventory list now! What is already available in the community? What will you need to purchase? In the appendix at the end of this guide, you can see what is in both the Bike Walk Montana and WTI Pop Up Trailers.



5. Create and submit your proposal (2 months out). A project proposal should have a brief narrative (try for under 2 pages) of the following:

- 1) A description of the proposed interventions, street or intersection location, and materials used.

- 2) A description of the issues the project aims to address.
- 3) Identify which stakeholders are involved, and their role and knowledge of the project.
- 4) A project goal statement.
- 5) The proposed project duration.
- 6) The data that will be collected to evaluate whether the project meets the stated goal.
- 7) A demonstration of support from stakeholders involved (letter of support or list of names of the neighbors and/or business owners directly adjacent to the project).
- 8) Sketches of the proposed designs along with a materials list.

See the sample proposal in the Appendices. Consult with your contact at your local city/county/state agency about who to share your proposal with.

Take your time in working through the list of questions, concerns or changes suggested by your local agency. Your group may also need to fill out a permit application such as an encroachment permit or event permit.

6. Make a plan for installation day (1 month out). The more work you do ahead of time to clearly line out tasks for your volunteers and stage materials, the smoother installation day will go. Be flexible however, and ready to improvise! Here are some checklists to help you plan:

Safety/Traffic Control Checklist

- ✓ Coordinate with local law enforcement/city streets staff to divert traffic on installation day.
- ✓ Determine length of time you will be in the street/right of way.
- ✓ Gather information regarding detours to be shared through city/local communication channels.
- ✓ Designate area for staging materials, gathering volunteers for a meeting at the beginning of the day.
- ✓ Provide Personal Protection Equipment: High visibility vests? Gloves? Sunscreen and water?

Communication Checklist

- ✓ Post laminated/durable outdoor signs around the project site with purpose, sponsors/supporting agencies, contact info or a way to provide feedback (See appendix).
- ✓ Is your project site spread out down the length of a few blocks? Consider using radios, or at least provide volunteers with cell numbers for project coordinator and team leads.



- ✓ Contact local media to do a story about the project on installation day. Provide the press with public feedback methods (survey link or contact info for project organizer).

Volunteer Coordination Checklist

- ✓ Begin recruiting volunteers now! How many hands will you need?
- ✓ Are there jobs for all ages and abilities?
- ✓ Divide the group into teams to tackle individual tasks. Don't leave it up to your helpers to guess on dimensions or design. For example, offer cheat sheets with crosswalk designs and dimensions, or make sure to have all designs marked out and measured the day before.
- ✓ Tell volunteers where to meet when they arrive on site to talk about safety, communication, and divide up into task teams.

Again, avoid catching anyone by surprise when the project is installed. Notify neighbors that will be directly affected. These neighbors should have already heard about the project when they were invited to the walk audit. Reach out to them via their preferred mode of communication or knock on the doors of the folks who did not have phones or access to internet. In your communication with neighbors, include important details such as installation date, project duration, who they can contact for more information, and how they can offer their feedback (see sample neighborhood flyer in appendices).

Reach out to local organizations like senior centers, centers for independent living, and large employers to share information about the project. During the school year, you may partner with neighborhood schools to share information about the project in packets going home with students.

Create an online method for citizens to submit their questions and opinions (a general email, or online survey such as Survey Monkey or Google Forms) and offer a phone number and paper survey for those who do not use computers. Keep all pathways of communication open and respond appropriately when needed. Change is disruptive, expect some complaints and negativity as well as support from the public.



WTJ – Bozeman, 2019

7. Share results and look ahead (within 1 month of project installation). Reconvene the planning team to share what went well and what didn't. Make sure to thank all project volunteers, agency staff, and organizations that were involved in planning and set up. Within a week after project takedown, compile survey results, photos, video, interviews, and quantitative data into a brief project writeup to share with the general public, media, and other community stakeholders. Presentations to local agencies with data and neighborhood feedback will be important in communicating success and lessons learned.



Here are some questions to guide next steps:

- What were the tangible and intangible outcomes from this project? - Did you reach your goal? Why or why not?
- What data exists now, that didn't before this project was conducted?
- What did you learn about materials used in this project?
- What did you learn about the designs demonstrated with this project?
- What did you learn about the process of planning and installing this project?
- Will you be able to implement the project in a longer-term or permanent installation? Why or why not?
- How can you continue to engage residents and local agencies to work towards longer term solutions?



Please share your responses to these questions with Bike Walk Montana and other project partners!

Pop-up projects are iterative, adaptable processes that we can learn from to improve efforts across Montana.

Resources

1. **The Tactical Urbanists Guide to Materials and Design** – Street Plans Collaborative
The bible of materials and design ideas from the creators of the “pop-up project” concept
https://issuu.com/streetplanscollaborative/docs/tu-guide_to_materials_and_design_v1
2. **City of Burlington’s Community-Led Demonstration Project Policy + Guide**
Done in collaboration with Street Plans and Burlington bike/ped advocacy group, Local Motion – this guide inspired efforts in Bozeman, and at Bike Walk MT
<https://www.burlingtonvt.gov/sites/default/files/CommunityLedDemonstrationProjectPolicyGuide2018.pdf>
3. **Burlington Public Works Quick Build Design + Materials Standards**
Taking demonstration projects to interim projects with more durable materials and more detailed design standards https://www.burlingtonvt.gov/sites/default/files/QUICK_BUILD%20GUIDE_0.pdf
4. **City of Seattle’s Adaptive Design Guide**
Details on specific design elements, as well as an overview of SDOT’s Implementation and Operation process
<https://streetsillustrated.seattle.gov/urban-design/adaptive-design/>
5. **Small Town and Rural Multimodal Networks Guide**
All about managing speed, volume, use, and mode considerations in rural areas with specific design recommendations and case studies from rural communities
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024lg.pdf
6. **Bikeway Selection Guide**
A framework for selecting which types of bike facilities are appropriate in which contexts
https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

Contacts and potential partners

Western Transportation Institute – *Offers technical assistance to communities that want to improve multimodal transportation options*

Rebecca Gleason, Danae Giannetti - Small Urban, Rural, and Tribal Center on Mobility
(406) 994-6114

<https://westerntransportationinstitute.org/>

Bike Walk Montana – *Statewide Bicycling and walking non-profit advocacy group. Has Pop Up Trailer with supplies for local groups and agencies to utilize.*

(406)449-2787

Bikewalkmontana.org

The Rural Institute for Inclusive Communities

The Montana Disability and Health Program – *Organized to respond to the health priorities of Montanans with disabilities across the life course*

52 Corbin Hall – University of Montana

Missoula, MT 59812-7056

(406) 243-4956

www.ruralinstitute.umt.edu

MonTECH—Improving lives with technology

29 McGill Hall, University of Montana

Missoula, Montana 59812

877-243-5511 Missoula (Toll Free)

406-657-2089 Billings Office

Montana Independent Living Project – Promotes independence for people living with disabilities

3825 Valley Commons Dr #2,

Bozeman, MT 59718

(406) 522-7300

<http://www.milp.us/>

Other local partners and organizations to consider:

- Local health agencies – Community health clinics, hospitals, and non-profits
- Local schools – Administration, engaged teachers, and student groups
- Local chapters of 4H or Scouts
- Community event organizers – farmers markets, local festivals etc.
- Cycling/running/walking clubs, community advisory boards, trails and outdoor recreation organizations

Appendices

- A. Sample Survey
- B. Example On-Site Sign and Flyer
- C. Materials, Tips & Tricks
- D. Neighborhood Traffic Calming Frequently Asked Questions
- E. Sample Project Proposal

APPENDIX A

Sample survey: This is a short survey template that seeks to understand changes in feelings of safety as a result of a pop-up project. Survey questions should be guided by the specific goals of the project and can help determine whether the expected outcomes were reached, or the hypothesis of the organizers was supported or not.

Explanation of the purpose and goal of the project, who helped make it happen, and how respondents' input will be used/shared/kept anonymous unless they choose to enter their contact info.

1. How did you travel through the [STREET EXAMPLE] traffic calming project? (checkboxes: bike; bike with children; on foot; on foot with children; driving or riding in a passenger vehicle; driving a bus or other large vehicle; other – comment box)
2. These [curb extensions/traffic circles/crosswalks etc.] made me feel safer traveling on/across [STREET EXAMPLE] (scale: strongly agree; agree; neither agree nor disagree; disagree; strongly disagree; comment box)
3. The main safety issues on [STREET EXAMPLE] are: (checkboxes: speeding vehicles; poor visibility at pedestrian crossings; uncontrolled intersections; lack of bike infrastructure; other - comment box)
4. How could this project be improved? (Comment box)
5. How supportive would you be of a permanent installation of this project? (scale: very supportive; somewhat supportive; neutral; somewhat unsupportive; very unsupportive)
6. Please enter your email address if you would like to be included in correspondence regarding the results from this project. Thank you!

APPENDIX B

Sample on-site sign:

This 18"x24" sign was printed, laminated and positioned in the grassy area between the sidewalk and street (aka "boulevard"). It provides an explanation of each of the intersection treatments at the project site, provides a survey link, contact info for the project lead, and logos of the project sponsors and organizers.

POP-UP TRAFFIC CALMING PROJECT

These curb extensions are an effort to calm traffic & improve safety for people walking, biking, and driving near Bogert Park by:


- Bringing more visibility to pedestrians at crosswalks
- Narrowing the travel lane

Project will remain in place until City leaf pickup in October, pending public support


OFFER YOUR FEEDBACK!

go to the following link or scan the QR code >


surveymonkey.com/r/SChurchSt



Project planning, installation, and evaluation made possible by Bogert Park Neighborhood Association and the following:




BOZEMAN
COMMUTER
PROJECT



BOZEMAN^{MT}
MONTANA
STATE UNIVERSITY | Western
Transportation
Institute



FAIR SHARE COMMUNITIES



CASHMAN
Nursery & Landscaping

Questions or concerns? Email bozemancommute@montana.edu

Sample neighbor flyer: This flyer, as well as the on-site sign, were created using the online design tool [Canva](https://www.canva.com). It's easy to use and free!

These flyers were printed out 4 to a sheet of 8.5"x11", cut, and distributed to households in the neighborhood after the installation of the project. They were also handed out by volunteers at farmers markets.

LINDLEY PARK TRAFFIC CALMING PROJECT

These traffic circles are an effort to slow drivers and bring more visibility to pedestrian crossings. Please let us know what you think! Go to the following link or take a picture of the code to access the survey.

www.surveymonkey.com/r/CypressSt



PROJECT MADE POSSIBLE BY

the Lindley Park Neighborhood Association and the following



sweet pea



GREENSPACE
LANDSCAPING, INC.



BOZEMAN
COMMUTER
PROJECT



FAIR SHARE COMMUNITIES



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APPENDIX C

Materials: tips and tricks

The following pictures show some creative ways to use materials that are free or low cost and easy to find in most communities.

Old tires: Use as planters! Paint the outside with spray paint, or roll/brush it on to the tire directly. Have someone with experience using power tools measure and cut out two half circles of plywood, or several “slats” of plywood that can be slipped in to the tire to close the bottom and hold dirt in or set potted plants on. Tires can also be stacked and bolted together to build height and act as the centerpiece of a traffic circle or mark a pedestrian crossing. Avoid placing anything taller than 36” near a pedestrian crossing or at the center of a traffic circle in order to maintain visibility.

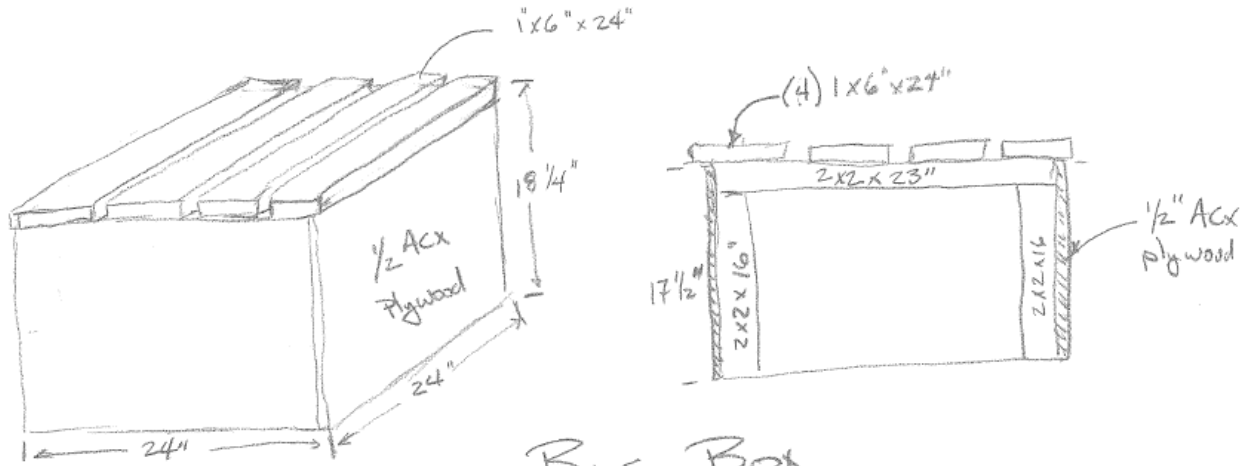
Tires can also be partially cut so they can be laid end to end to create a new curb line. They can be laid straight out on their sides to make curb extensions, pedestrian islands, traffic circles or other borders. This requires use of a power saw, protective equipment, and expertise. Please do not attempt without taking appropriate precautions. Most tires have some kind of radial steel woven throughout the rubber and this can make them very difficult to cut.

Reflective delineators in concrete bases: Although traffic cones, bollards, or “candlesticks” will do the trick, reflective delineator posts can provide a different aesthetic and sturdier feature to provide vertical reflectivity for longer term projects (2+ weeks). Delineators come with plastic bases that can be drilled into concrete bases for use in pop-ups instead of directly into the pavement when they are installed semi-permanently. You’ll need concrete mix, and cardboard concrete forms tube from your local hardware store. Dimensions are 10-12” in diameter and cut into 8” tall cylinders.

Planter boxes: Planter boxes can be easily made with scrap wood according to the needs of any given project. Collapsible or reusable planter boxes are pictured here and were made by a project volunteer.



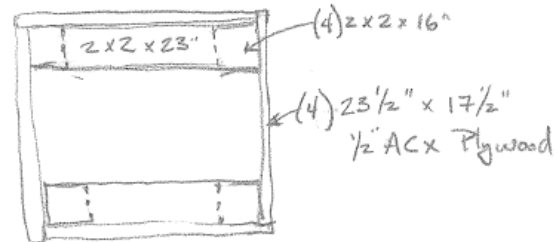
Bus boxes: Quick and easy seating for bus stops and parklets, these boxes are simple and make a great canvas for incorporating color and art into pop-up projects.



Bus Box
A.T.S.

Materials for 2 boxes

- 1 ~ 4'x8' x 1/2" ACX plywood
- 3 ~ 2x2x8' pine
- 2 ~ 1x6" x 8' pine



Streamline
A PROGRAM OF MTRC

These "bus boxes" are a place for Streamline riders to rest while they wait for a ride.

Help take care of our bus stops, let us know if they need some love!

(406)587-2434

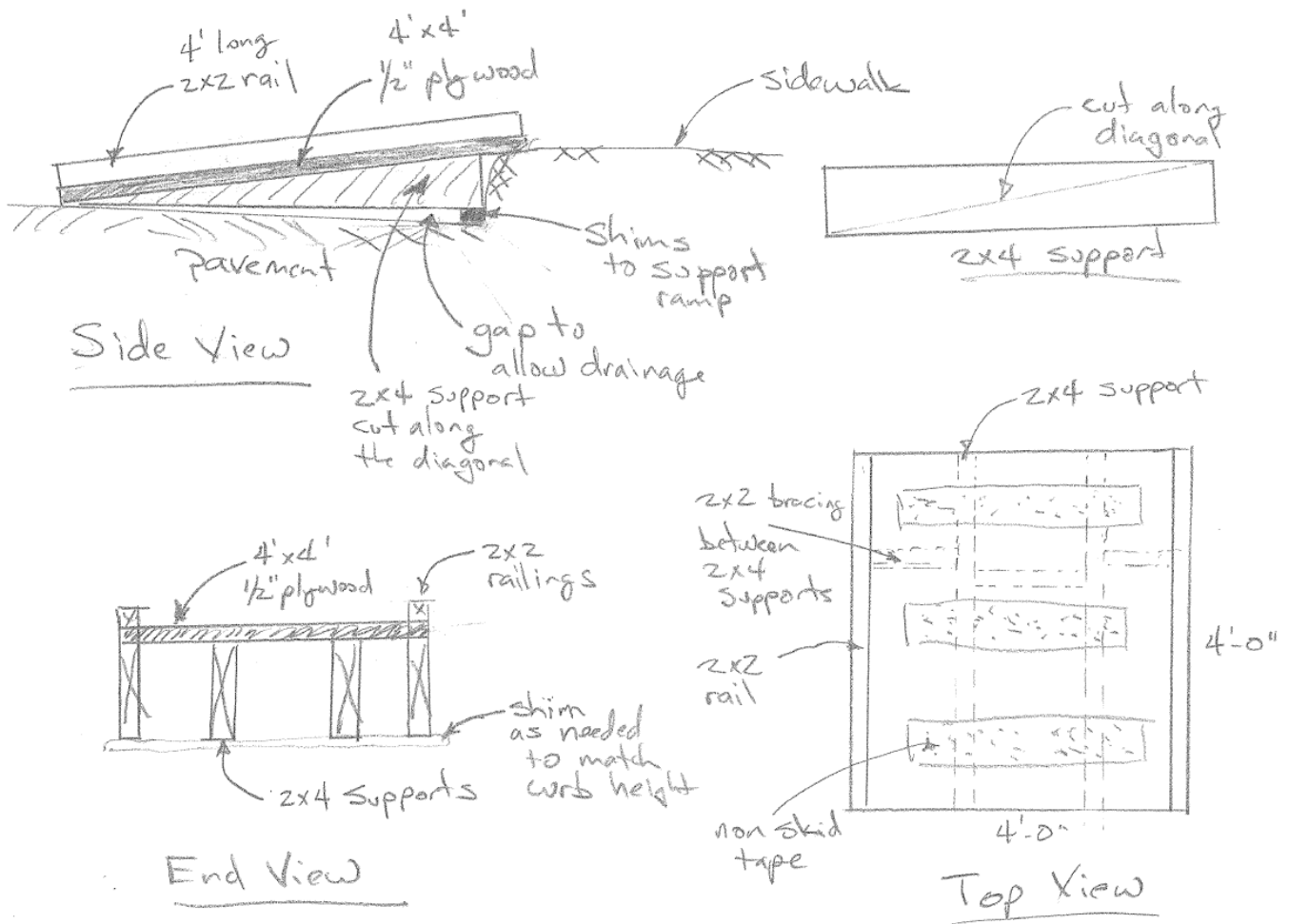
Made with help from:

- Bozeman Senior Center
- Girl Scout Troop 3966
- Streamline
- Western Transportation Institute



Curb

Ramps: DIY curb ramps can provide temporary accessibility where pop-up up curb extensions are installed at an intersection that does not have curb cuts already. Tactile warning (not pictured in photo below) can be incorporated into curb ramps with [adhesive pads of “truncated domes.”](#)



APPENDIX D

Neighborhood Traffic Calming Frequently Asked Questions

(Example from City of Bozeman)

Can we install stop signs to slow traffic?

Stop signs are intended to help drivers and pedestrians determine who has the right-of-way at an intersection. Stop signs are installed where accidents or other data show that drivers are not observing the right-of-way rule under state law. Bozeman, like many jurisdictions, does not install stop signs to slow traffic. When stop signs are installed as "speed breakers," accidents don't decrease, and sometimes INCREASE.

What does it take to install stop signs at an uncontrolled intersection?

Stop sign installation is warranted at intersections when the highest volume street has an average daily traffic volume of at least 6,000 vehicles (think Babcock between Willson/Rouse). This threshold exists because this is the traffic volume where an approaching vehicle is likely to encounter another vehicle on the cross street. Stop signs installed where they are unwarranted may cause drivers to fail to adhere to stop signs because they don't see a need to stop if they continually approach a stop sign where they rarely or never encounter a vehicle traveling by on the cross street.

Wouldn't additional speed limit signs help to slow traffic?

Speed limit signs alone don't necessarily slow traffic. Lowering the speed limit below typical roadway safety standards is also ineffective as a stand-alone effort at addressing speeding, because most drivers travel at a speed they deem typical for the roadway conditions. Wide streets with multiple lanes, no on-street parking, no street trees, or buildings that are set far away from the street or separated from the street by parking lots create conditions where it feels comfortable for drivers to travel at higher speeds. In Bozeman, the speed limit on residential streets is 25 mph on all streets within the city limits unless otherwise posted. Speed limit signs are installed on arterial streets where the speed limit changes, and at periodic intervals along the street. Speed limits on local streets are determined at the state level by the [Montana Transportation Commission](#).

Can we install speed humps?

Speed humps pose challenges for winter maintenance and can damage graders and plow trucks. Similar to stop signs, they may cause drivers to speed up to make up for lost time in between humps.

What can our neighborhood do about people who speed on our street?

Speeding is a valid concern for many of our residential neighborhoods, and addressing this concern requires active participation by residents

working in a strong partnership with the City of Bozeman. Community education campaigns, law enforcement, and street design all need to work together to influence driver behavior.

Yard signs are available for free at the City Shops – they can be



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picked up during regular business hours. The City of Bozeman also supports neighborhood efforts to implement pop-up traffic calming projects.

APPENDIX E

Sample project proposal

Bogert Park/S. Church St. Pop-up Traffic Calming Project Proposal

5/17/19 - Bogert Park Neighborhood Association and Western Transportation Institute

Project narrative: Neighbors near Bogert Park are interested in finding ways to work with the City of Bozeman, Montana Department of Transportation, and Western Transportation Institute to calm traffic and improve safety for pedestrians, cyclists, and drivers along S. Church adjacent to Bogert Park. Neighbors would like to implement a “pop-up” traffic calming project with the help of the City of Bozeman’s Pop-up Traffic Calming Program.

Entering its third year, this program has resulted in four past projects that have successfully engaged City residents with City staff in coming up with solutions to speeding traffic, uncontrolled intersections and pedestrian/bike/vehicle safety concerns. Projects have employed temporary materials such as planter boxes, old tires, moveable reflective delineators, and pavement paint to create demonstrations of curb extensions, pedestrian islands, and neighborhood traffic circles. Temporary designs are evaluated with vehicle speed and volume studies, feedback surveys, and film to capture and better understand effects of the designs on road user behavior. Projects have had varying levels of success, resulting in 1.5-14% reduction in number of speeding vehicles. All projects had largely positive feedback, leaving both neighbors and city staff feeling like they were able to work together constructively to improve safety and livability in Bozeman neighborhoods.

The process begins with a meeting between residents facilitated by WTI, often following Neighborhood Association meetings where traffic and safety concerns are brought forth. Goals of the project are defined, data collection methods outlined, a project timeline for implementation is set, and a date is selected for a walk audit to observe the issues and concerns at a given location. Projects remain installed anywhere from one week to 1 month. The projects help raise awareness of how street design influences pedestrian, cyclist, and driver behavior often more so than signage and enforcement.

For this project, we propose that temporary curb extensions be installed at three intersections on S. Church St. on June 29th and remain in place for the summer (June-August) pending performance and feedback from the public, MDT, and the City of Bozeman.

Background: The Bogert Park Neighborhood Association first expressed interest in addressing concerns about speeding traffic and bike/pedestrian safety in Summer of 2017. Concerns include pedestrian safety and sight lines at crosswalks due to parked cars, especially during summer events at Bogert Park when parking nears capacity on the east parking lane on Church and pedestrian, bicycle, and vehicle traffic is heavy. Neighbors also expressed concerns about the speed at which vehicles travel north-south on Church St given its proximity to the park, pool, and linear trail (Gallagator trail), and Pete’s Hill (Burke Park) parking lot. Neighbors, WTI, and City Staff met in winter of 2018, and again in early May 2019 to discuss the possibility and goals of doing a traffic calming project in summer 2019.

Goal: To improve safety for the variety of users (pedestrian, bike, vehicle) accessing Bogert park by reducing vehicle speeds and bringing more awareness to pedestrian crossings across Church St.

Data collection plan: Data will be collected on vehicle speed and volume for one week before, and one week during the project to examine whether the curb extensions have an effect on vehicle speeds. A Houston Radar speed detection unit will be placed midblock between Bogert Place and Story on Church. To capture speed through intersections, traffic tubes will be placed on the South side of the intersection of Olive and Church.

Outreach will be done in coordination with the Neighborhood Association to spread the word to neighbors about the project and to solicit their feedback via online surveys. Surveys will seek to capture perceptions of the traffic calming project, and the level of support in the neighborhood for funding longer term solutions.

Tentative timeline:

May 23rd-28th: Outreach to neighbors, walk audit, draft and order informational signage regarding project plans and installation date

Early June: Pre-data collection with radar and traffic tubes

June 21st-28th: Placement of signs regarding project plans and purpose along S. Church.

June 29th: Project installation with assistance from Bozeman City Streets for traffic control, materials and traffic calming trailer

June 30th-July 6th: During data collection with radar and traffic tubes

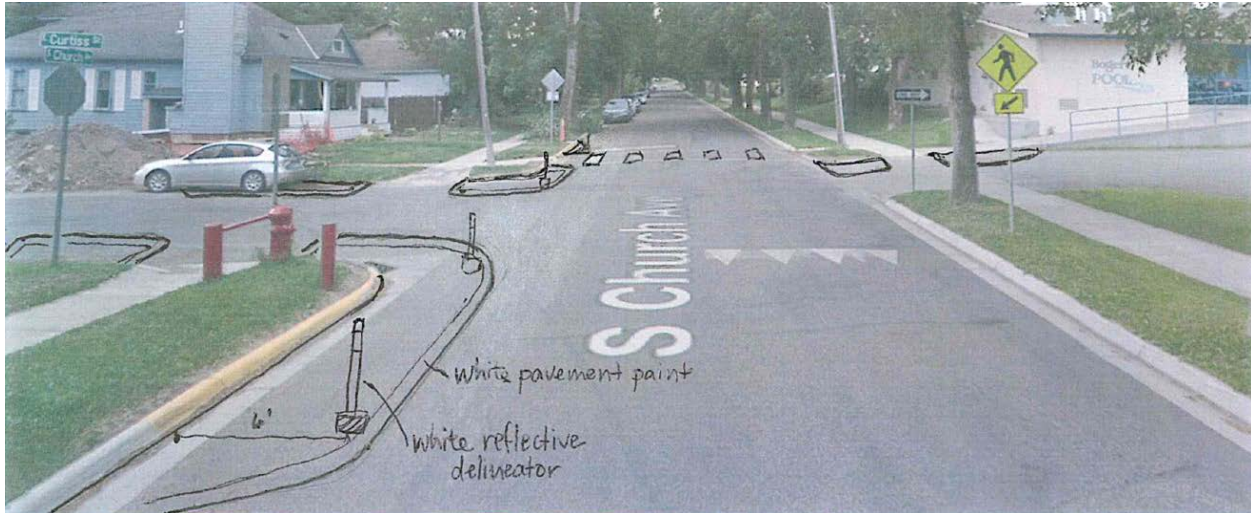
Late July: Results of project, speed data, public input compiled into project report. Decision making point of whether to leave the project up through late September, or remove the project.

Potential designs: *Street-view sketches – to be submitted with “plan view” sketches from Google MyMaps – not included.*

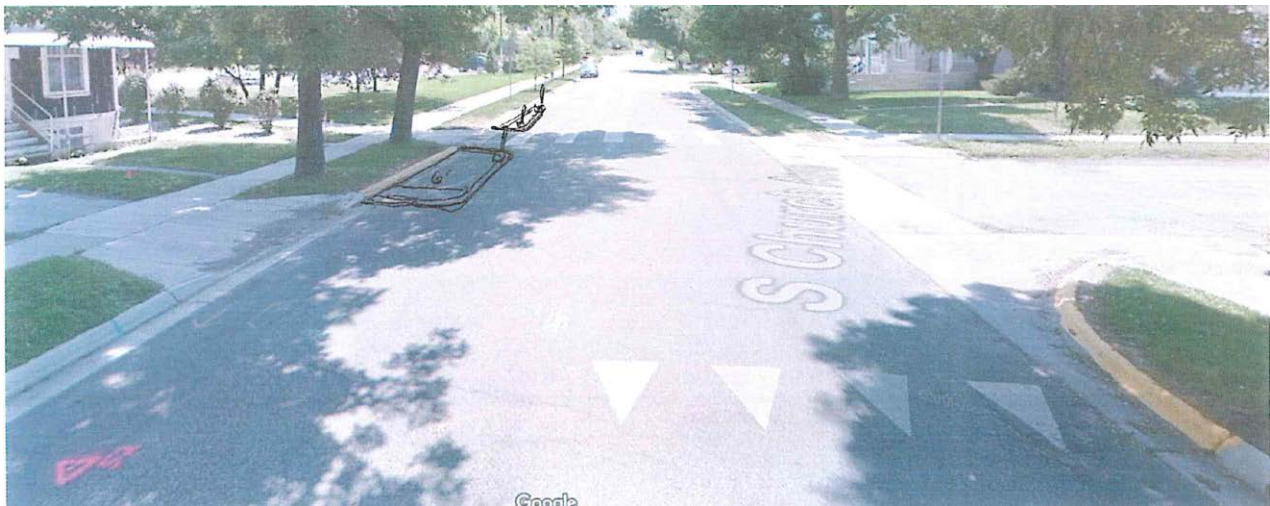
Church/Olive: 6' curb extensions in parking lane on the east side of Church, length along block face will follow the yellow painted curb. Materials used will be pavement markings (solid double white line), and vertical reflective elements (flexible delineator posts). Crosswalk markings are needed on north and south x-ings across Church.



Church/Curtiss: 6' curb extensions in parking lane on the east side of Church, length along block face will follow the yellow paint on the curb. Parking on E. Curtiss will be pushed back by curb extensions to bring more visibility to ped x-ings (photo on next page).



Church/Bogert Pl.: 6' curb extension in parking lane on east side of church where curb is marked with yellow paint. Flexible delineator posts will provide vertical reflectivity.



Church/Gallagator path x-ing: Wooden planter boxes will help define the edge of the roadway between two trail crossings where there is no curb/gutter. 2' tall circular planters could bring more emphasis to the Gallagator crossing while maintaining necessary sight lines and visibility of children, people using wheelchairs.

