

Welcome to the MTC Hardening Slow Streets Webinar!

1. We will start in a few minutes
2. You are all muted
3. If you have questions, please send them to the [Q&A](#) feature on the webinar
4. The webinar recording and presentation will be distributed to all registered participants after the webinar and will be available online





“Hardening Slow Streets: From Pilot to Permanent during COVID-19”

Jessica Zdeb, Jeremy Chrzan, Gwen Shaw,
Toole Design Group

Monday, December 14, 10am-11am

TOOLE
DESIGN



Webinar Goals

- What's next? Continue discussions on how to transition successful COVID street demonstrations and temporary installations to **permanent** projects in the Bay Area
- Further support “**quick build**” as a **project delivery method**
- Introduce **best practices** from relevant **historical treatments** to **current efforts**
- Notify agencies about potential **funding opportunities**

Diagonal Diverters, Berkeley, CA



Diagonal Diverters, Fremont Ave Neighborhood Greenway, Seattle, WA



Webinar Agenda

1. Emerging Streets and Operational Strategies
2. Why Hardening Slow Streets?
3. How to go from Pilot to Permanent
4. Strategies for Community Outreach
5. Hardening Treatments
6. Precedents and Lessons Learned



Introducing Toole Design Group

T'OOLE
DESIGN



Jessica Zdeb



Jeremy Chrzan



Gwen Shaw

Hardening Slow Streets: From Pilot to Permanent during COVID-19



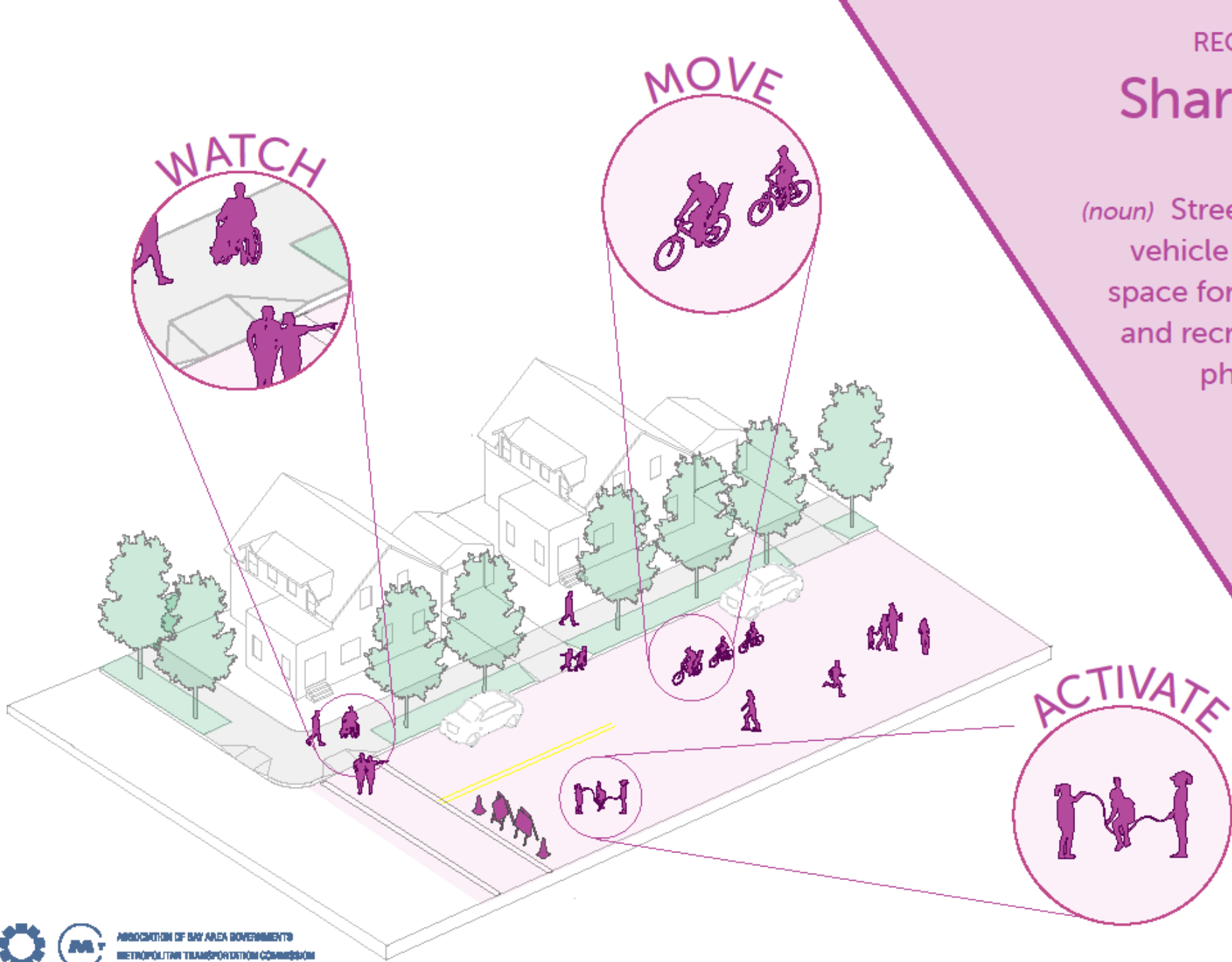
Kirkland, WA

Oakland, CA

Houston, TX

Covid-19 Trends



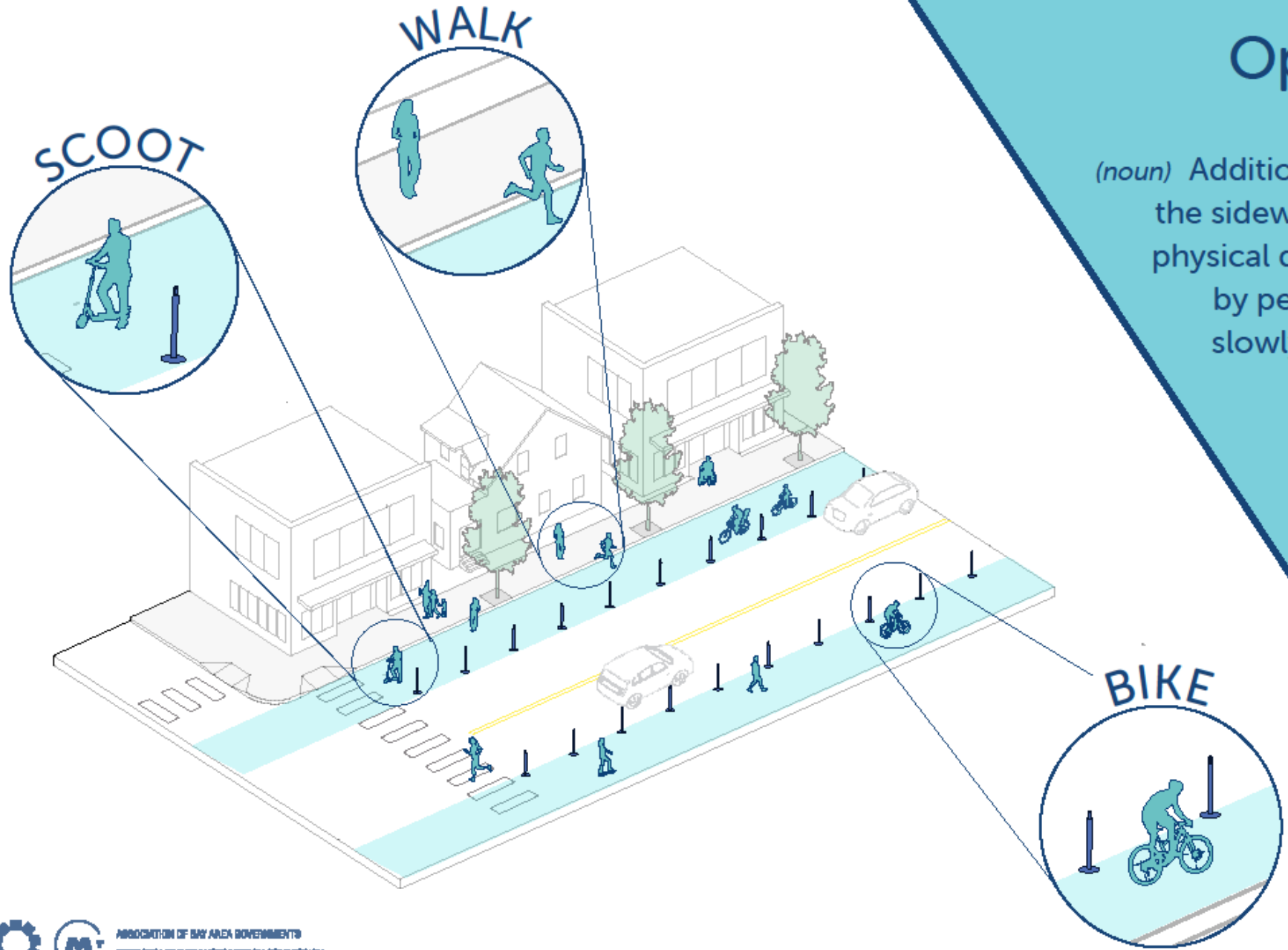


RECREATION/HEALTH

Shared Street

shārd strēt

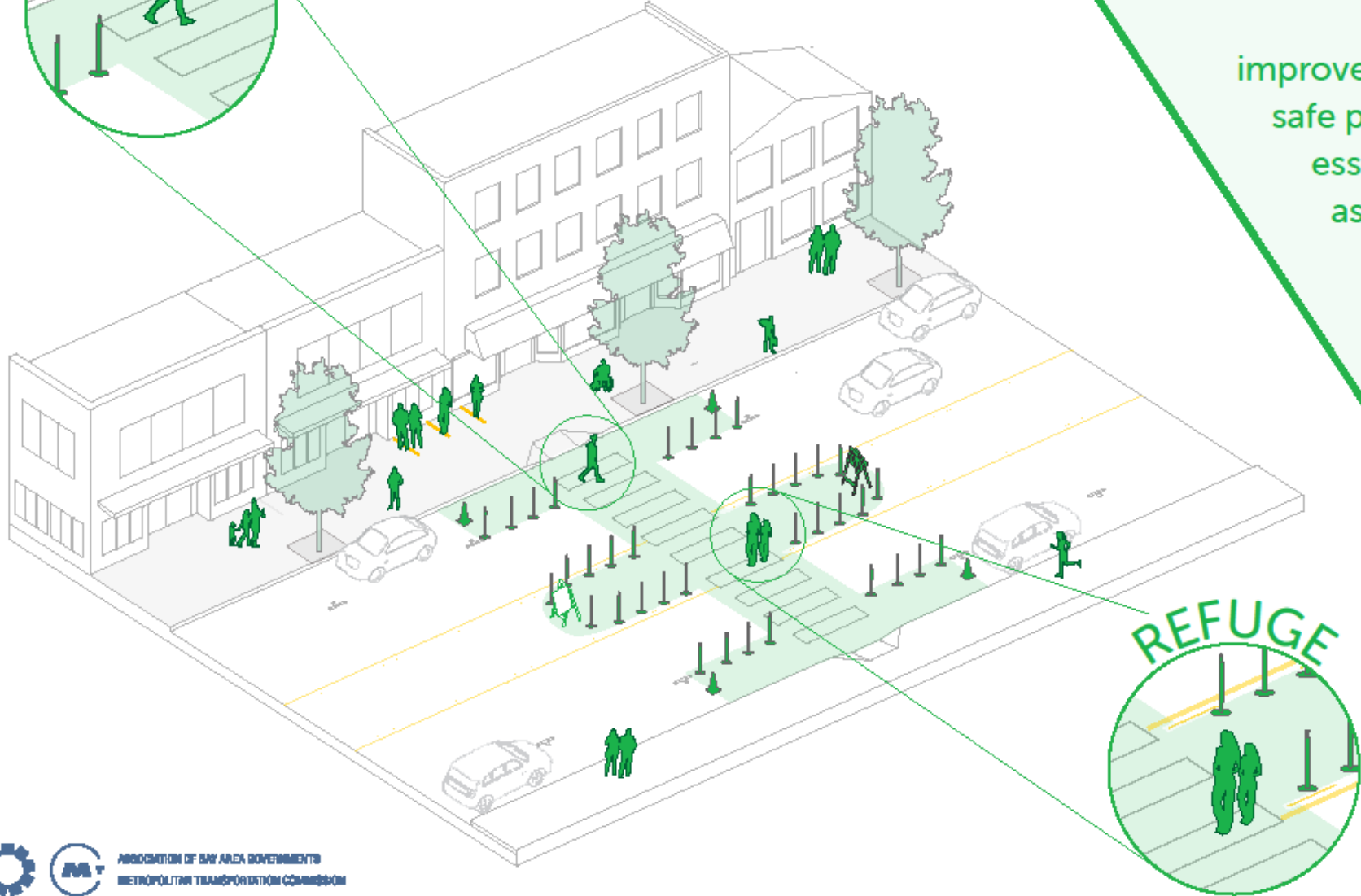
(noun) Street with only local vehicle traffic, providing space for people to move and recreate safely using physical distancing



Open Curb

ō-pən kərb

(noun) Additional space next to the sidewalk to encourage physical distancing, shared by people walking and slowly biking or rolling

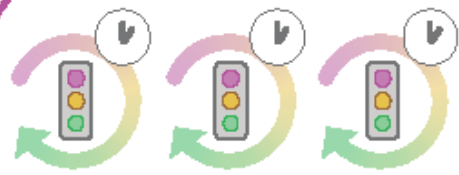


RECREATION/HEALTH
Essential Places
ə-sen·(t)hsəl plā-siz

(noun) Traffic safety improvements that provide safe pedestrian access to essential services such as grocery stores and medical offices

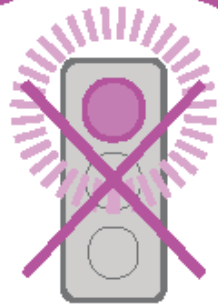


SHORTER CYCLE LENGTHS



Create more frequent crossing opportunities

SIGNAL PHASING 24/7



Don't use flash settings or require pedestrian actuation at night

AUTOMATIC WALK PHASE



Don't require actuation by a waiting pedestrian

NO-CONTACT BUTTONS



Pedestrians actuate signals without physically touching a button

The operations tools on these pages represent a selection of approaches for increasing safety and convenience for roadway users. The appropriate tool(s) for a particular location or jurisdiction should be selected based on context.



OPERATIONS

Improved Pedestrian Mobility

Give pedestrians more opportunities to cross the street with shorter wait times that don't require pushing buttons

Additional Resources to Track Trends & Transportation Responses to Covid-19



COVID-19: Transportation Resource Center



CITIES TOOLBOX



ACTIONS SPREADSHEET



MULTIMEDIA RESOURCES



TRANSIT TOOLBOX



NACTO WEBINARS & AUDIO UPDATES



METROPOLITAN TRANSPORTATION COMMISSION

Accelerating Quick Build for Complete Streets



+ ITE Covid-19 Resource Page



VISION 4 NETWORK



UNTOKENING

Mobility Justice and COVID-19

April 2020



Photo: Jean Walsh/@jwalshie, via NACTO Alameda, California



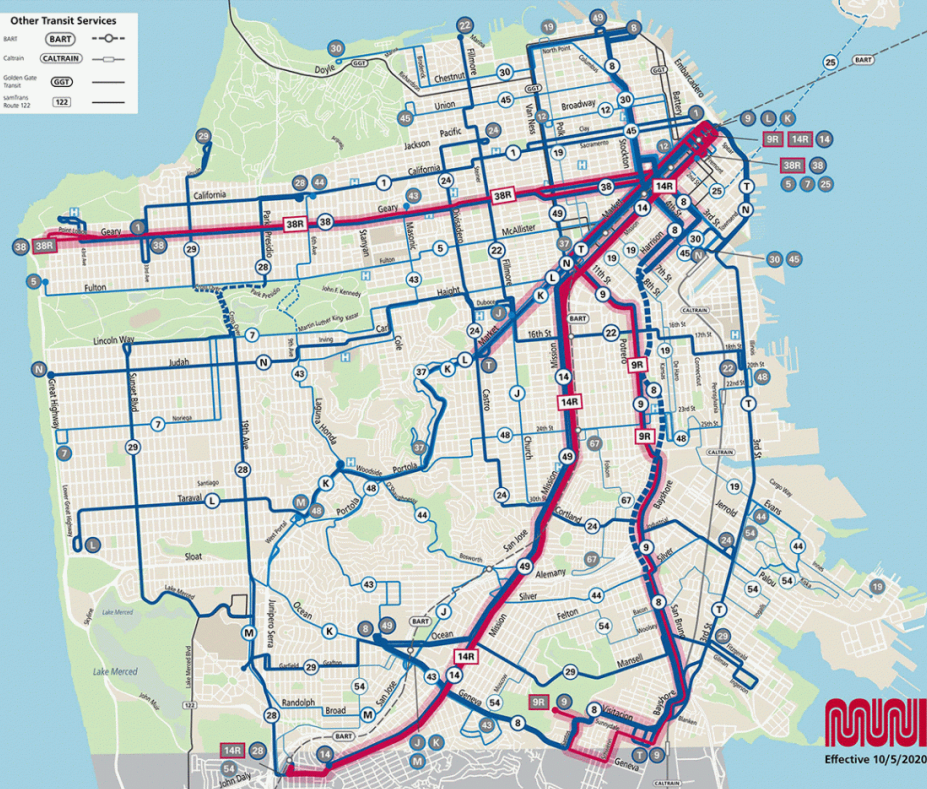
Purpose and Need



Network Benefits

- Safety, comfort, connectivity
- Apply to active and transit modes
- Needs do not evaporate post-COVID

COVID-19 Muni Core Service Plan



Safety

The frequency and severity of crashes are minimized and conflicts with motor vehicles are limited



Comfort

Conditions do not deter bicycling due to stress, anxiety, or concerns over safety



Connectivity

All destinations can be accessed using the bicycling network and there are no gaps or missing links



Directness

Bicycling distances and trip times are minimized



Cohesion

Distances between parallel and intersecting bike routes are minimized



Attractiveness

Routes direct bicyclists through lively areas and personal safety is prioritized

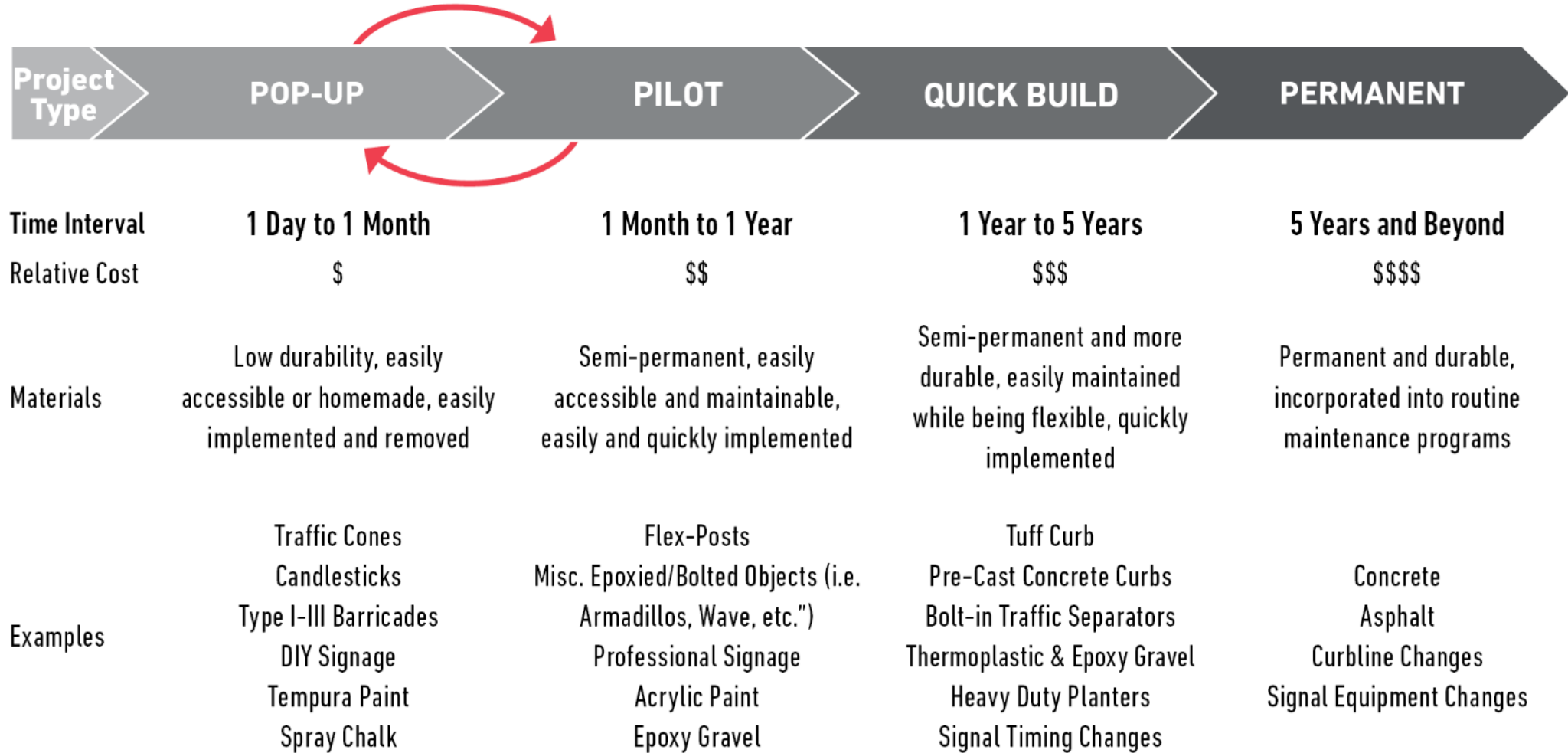


Unbroken Flow

Stops, such as long waits at traffic lights, are limited and street lighting is consistent

Source: FHWA Bikeway Selection Guide

Iterative Design Process



What do these projects look like?



What do these projects look like?



Memphis, TN (photo credit: MemFix)



Seattle, WA (photo credit: Seattle DOT)

What do these projects look like?



10 Calgary, ON (photo credits: City of Calgary)

Implementation Authority



Emergency Status Evolution

- Initial implementation relied upon Emergency Response powers at Elected Official and Chief Traffic Engineer levels



Oakland, CA

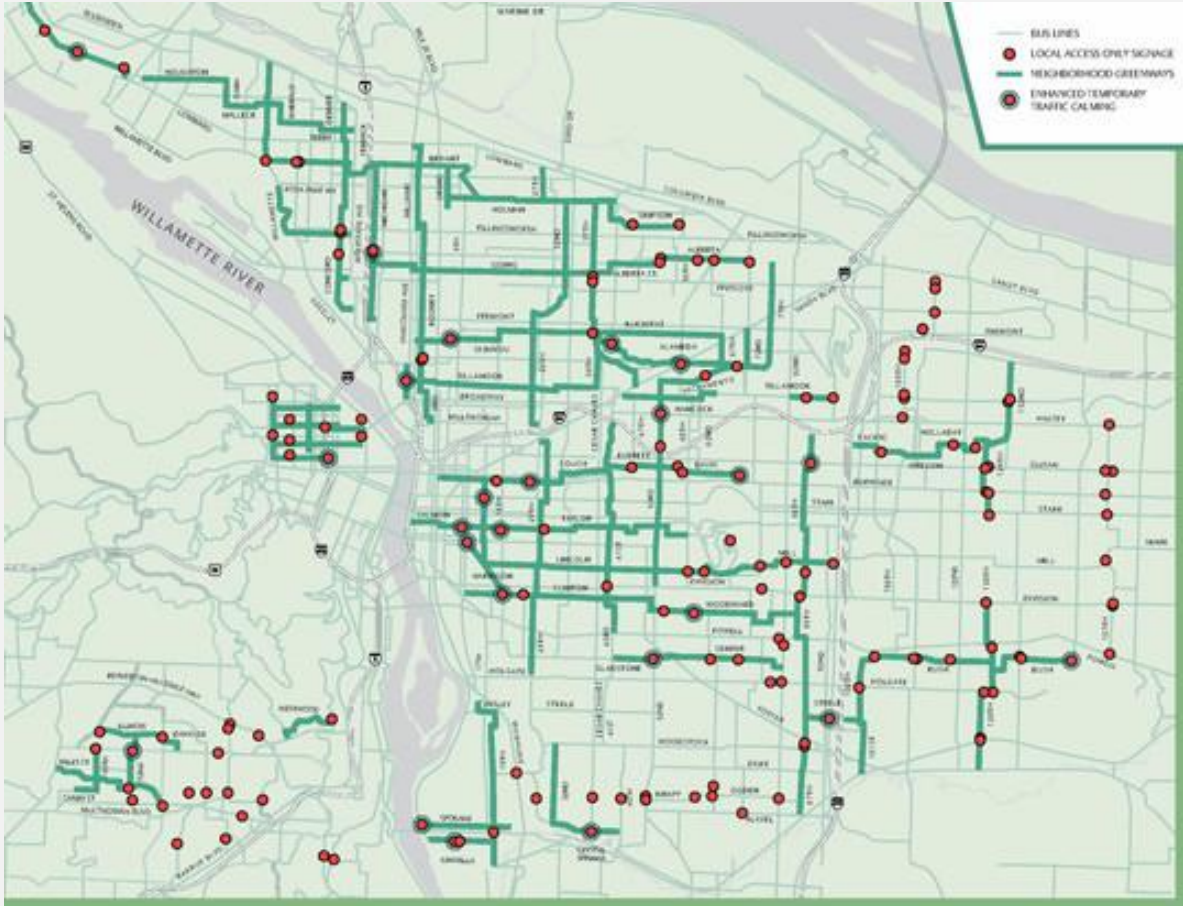
Emergency Status Evolution

- Use existing policies or programs to support continuation
 - Rely on evaluation of program to provide **data-driven analysis** showing need
 - Look to existing local, county-wide, or state-wide policies and programs where **goals align to fight pushback**

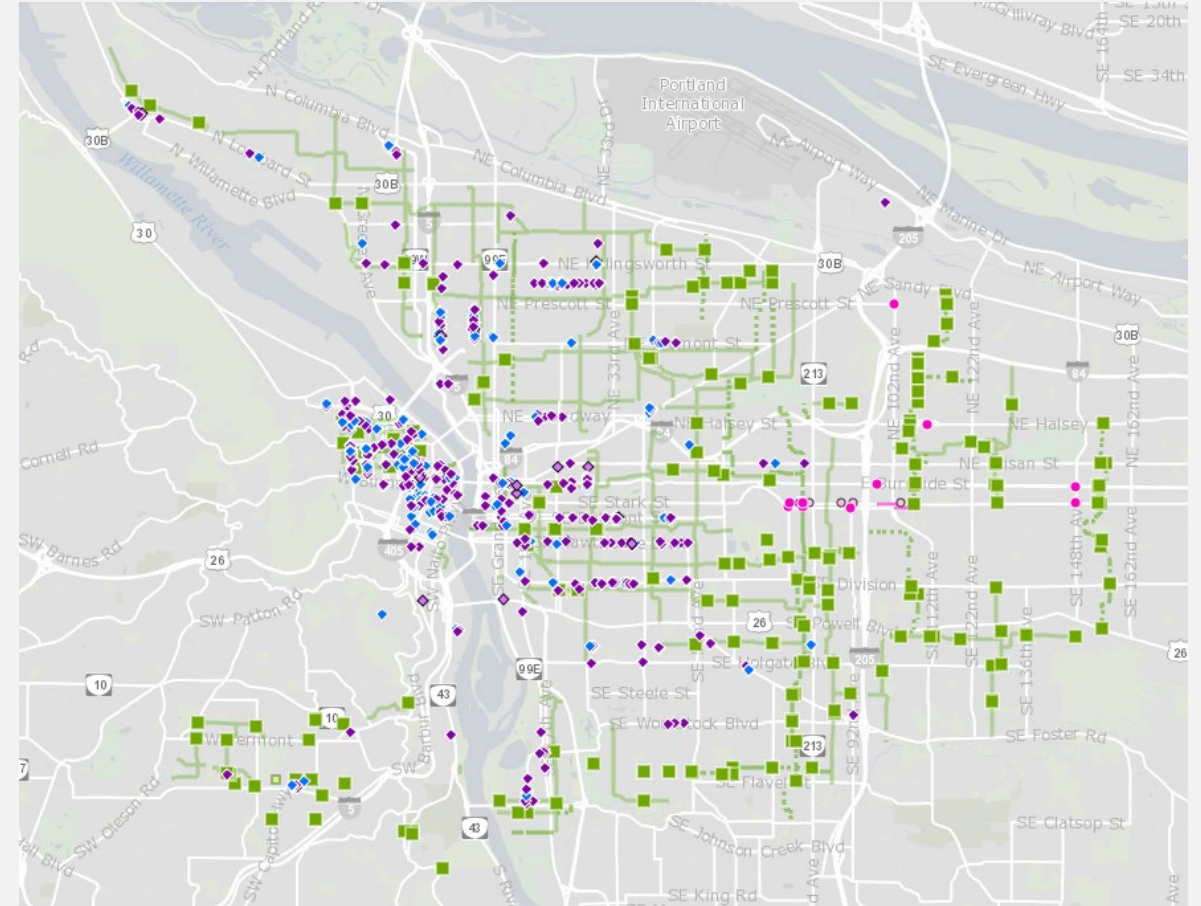


Oakland, CA

Case Study: Portland, OR



Neighborhood Greenway + Diversion Map



Slow Streets Initiative Implementations

Case Study: Portland, OR



Permanent installation on Neighborhood Greenway



Interim COVID-19 Response on Neighborhood Greenway

Considerations

- Importance of outreach, engagement, and transparency
- Data-driven methodologies and interventions provide solid cover



Madison, WI

Strategies for Community Outreach During Covid-19



Key Principles

- Communities should be involved and informed **before, during, and after** projects
- Partnerships with community members and groups will need to be maintained as projects evolve; this can be **informally or formally**
 - E.g. Local BID sets up Maintenance Agreement to monitor planters

Community destinations could provide more informal relationship opportunities

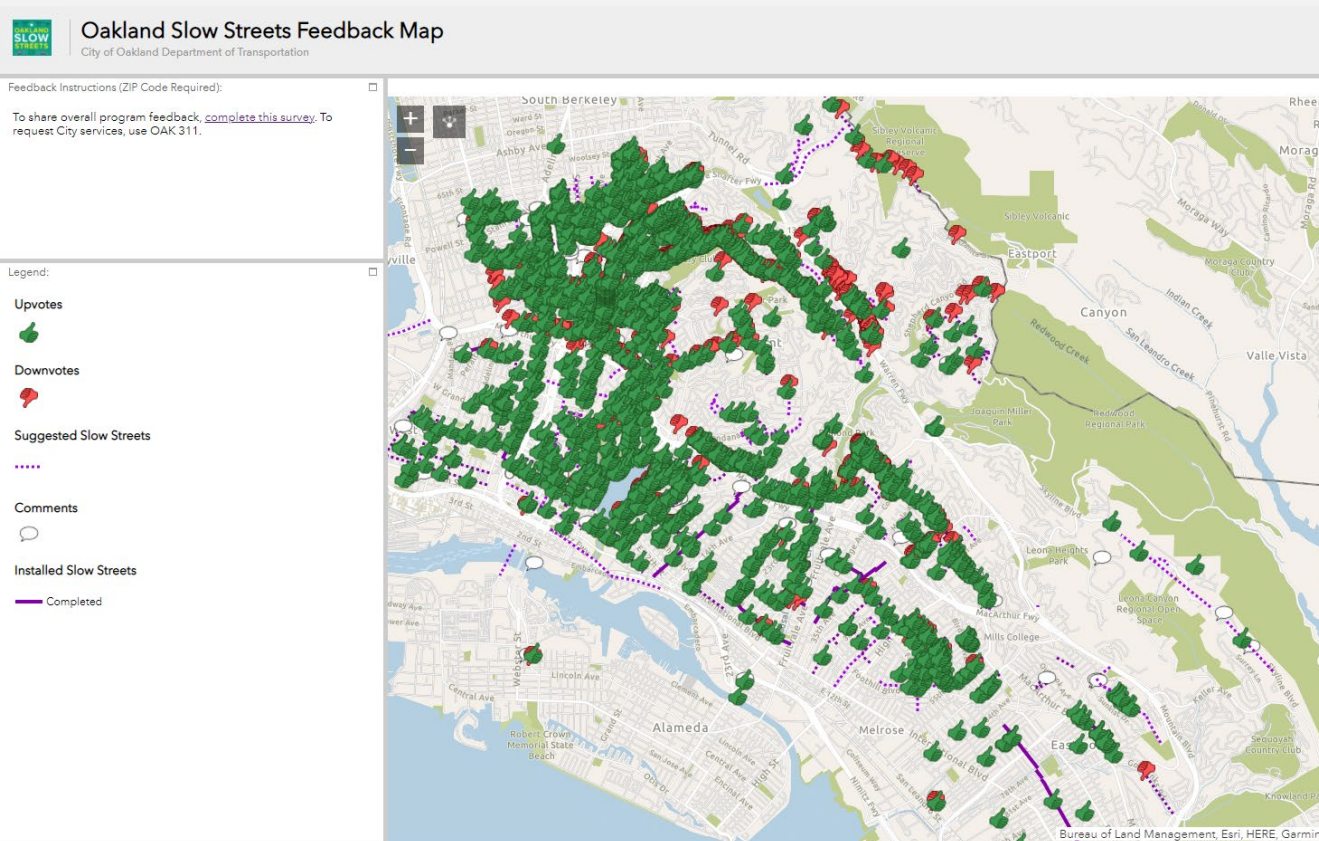


Case Study: Oakland Slow Streets

- Outreach ramped up after initial round of implementation
- 311, Twitter, website
- Engagement led to adaptation



Case Study: Oakland Slow Streets



Oakland Slow Streets General Feedback Survey Results

Total Responses
1,160



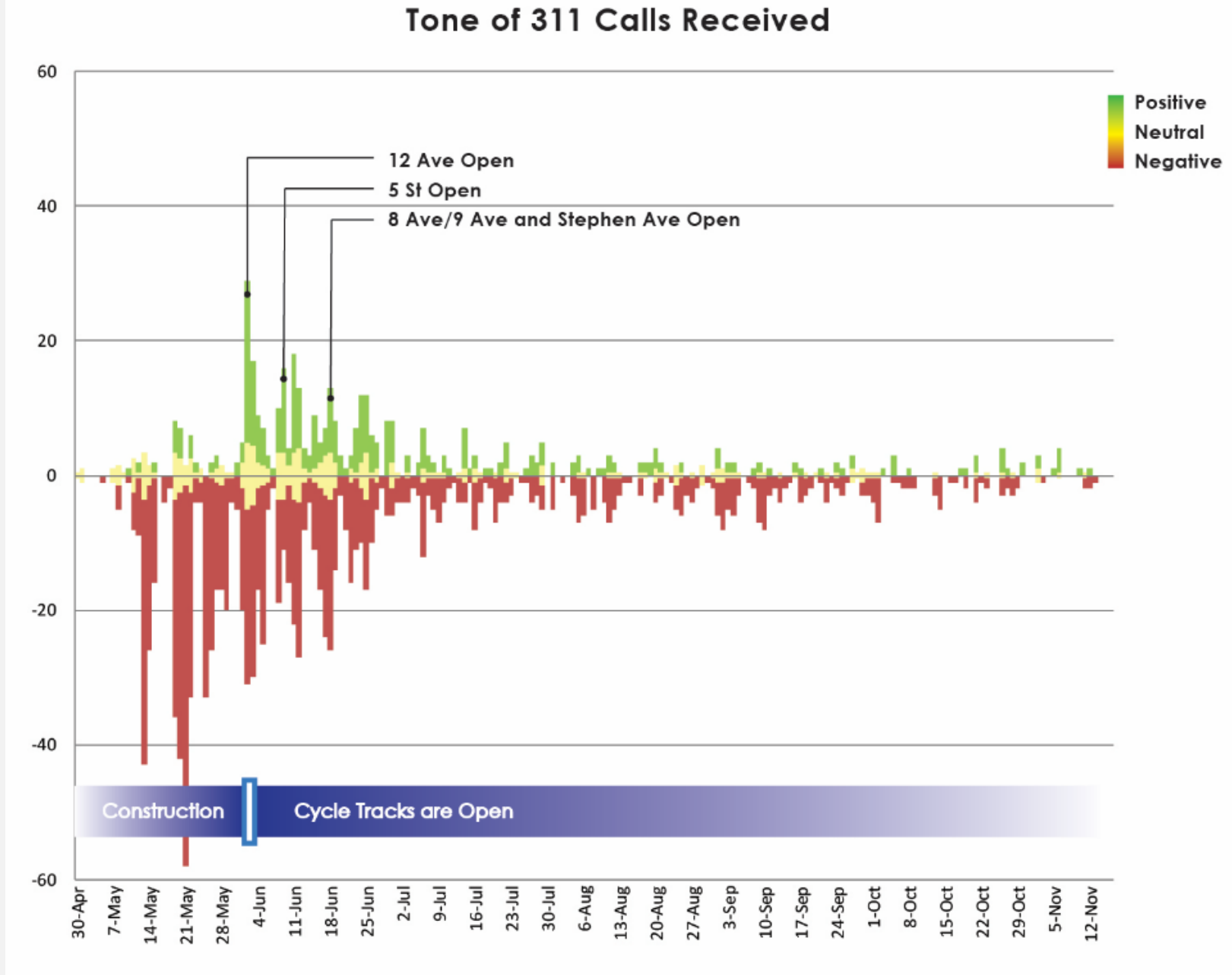
Survey at <https://tinyurl.com/oaklandslowstreets>
To learn more about the program, go to <https://www.oaklandca.gov/projects/oakland-slow-streets>
This dashboard updates automatically as new responses are submitted. If you have any questions or notice any errors, please contact npond-danchik@oaklandca.gov. Please note survey questions are optional and thus the total number of respondents varies by question.

Table of Contents

- [Geography](#)
- [Demographics](#)
- [Program Overview](#)
- [Slow Streets Use All, by Race & by Geographic Area](#)
- [Program Support](#)
- [Program Support by Income, by Gender & by Physical Disability Status](#)

Case Study: Calgary, ON

Overcoming Fear of Change



Public Strategies

- Surveys – virtual or in-person at existing events or ongoing services
- Use Quick Builds as engagement
- Work with community groups and/or subsidize their work



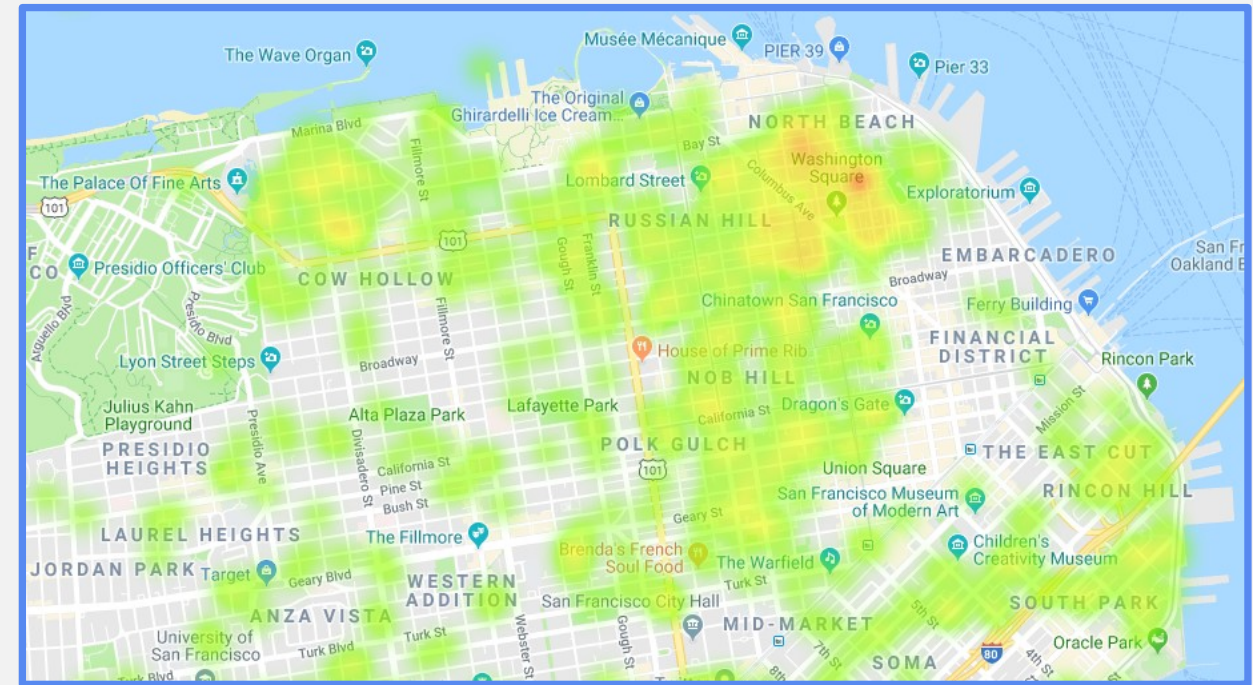
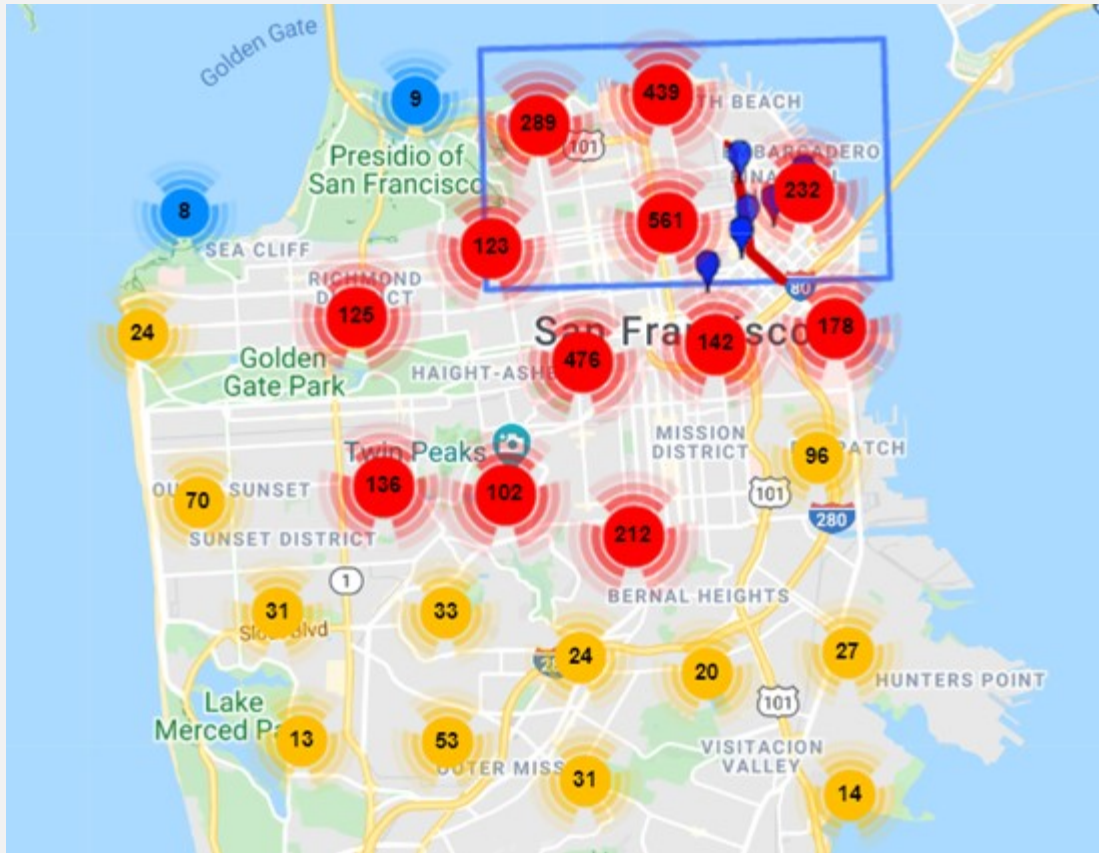
Madison, WI

On-Ground Stickers



Portland, OR – Source: PBOT

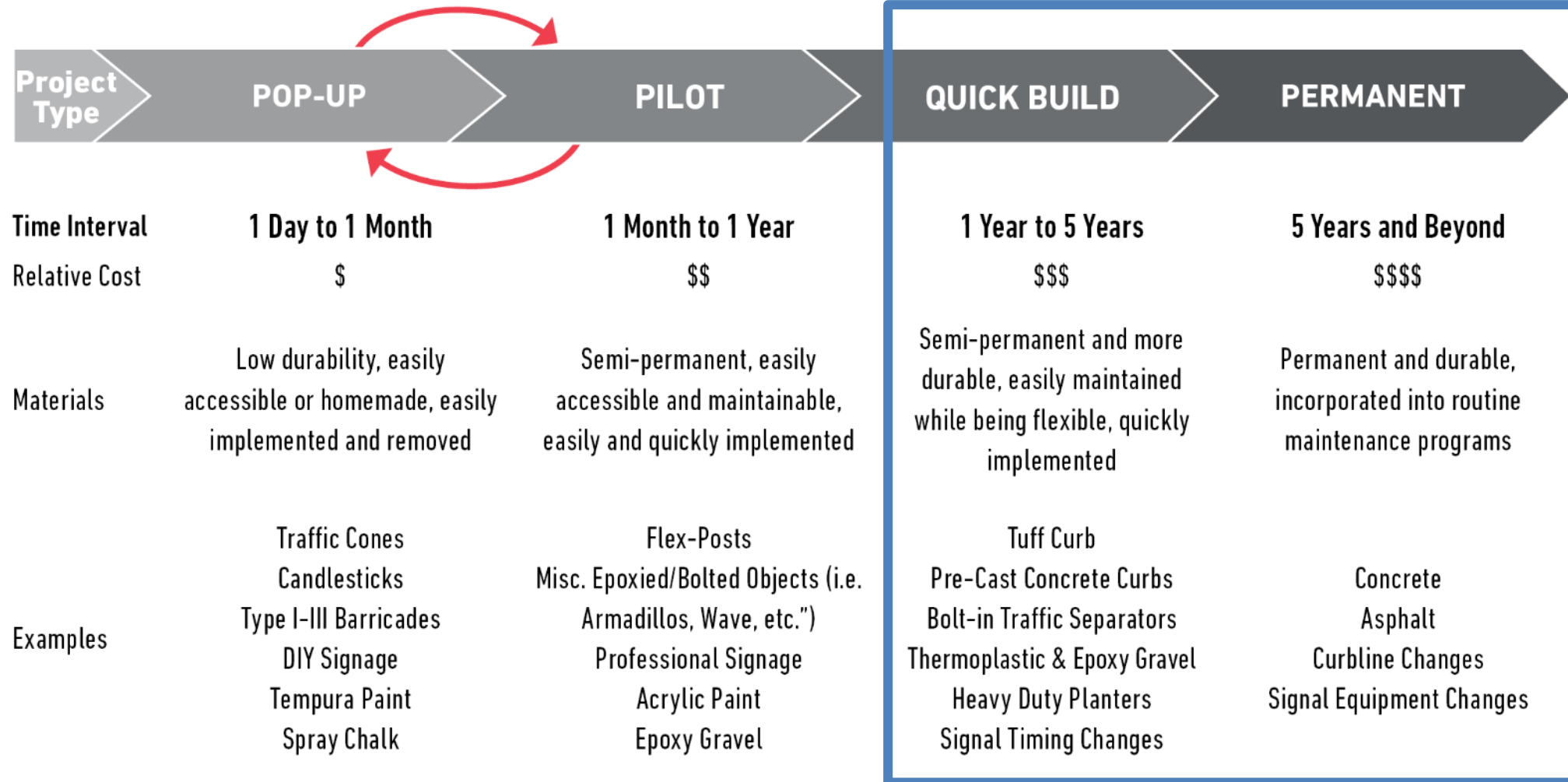
Participatory Online Maps

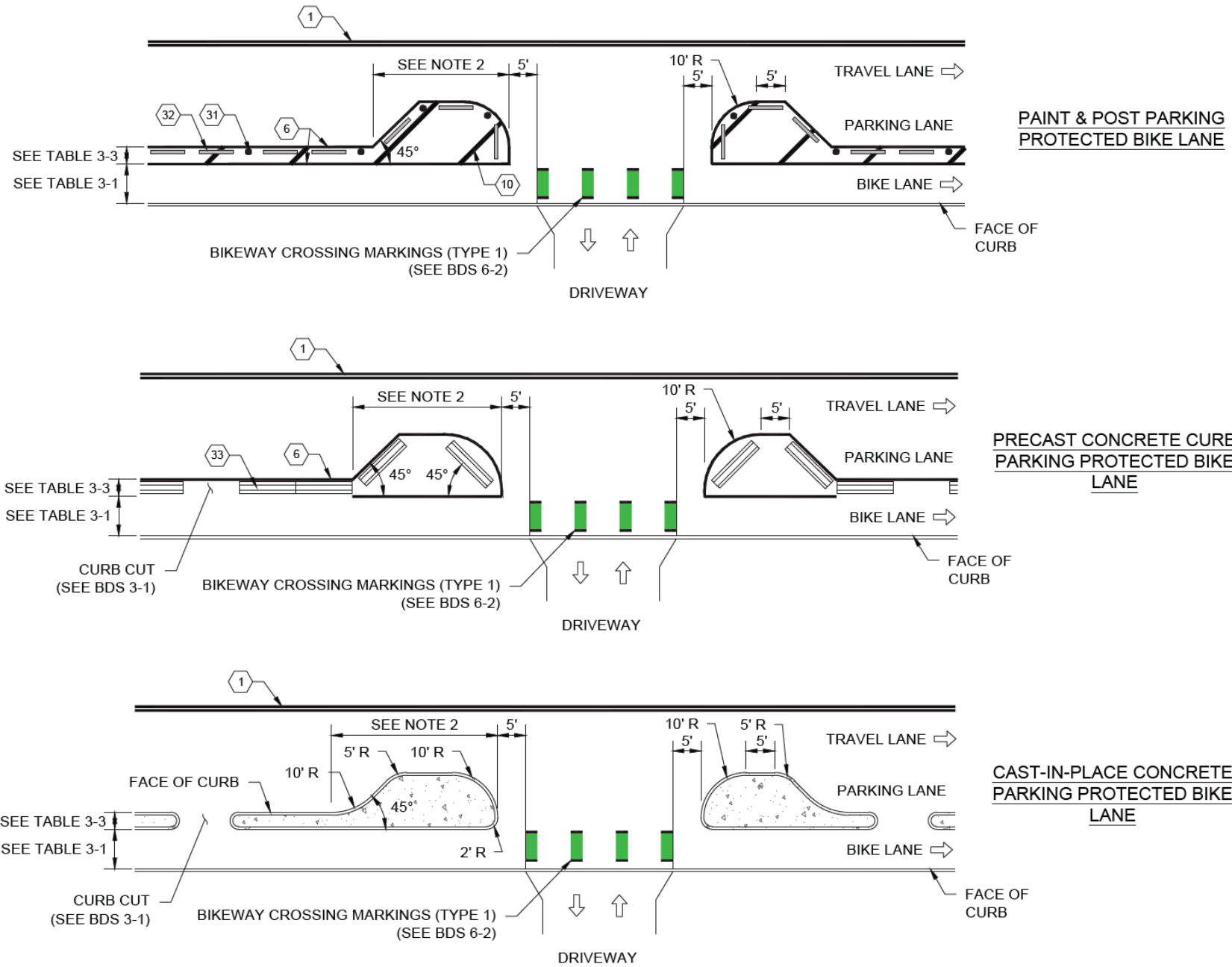


Hardening Treatments



Iterative Design Process





QUICK BUILD	PERMANENT
<p>1 Year to 5 Years</p> <p>\$\$\$</p>	<p>5 Years and Beyond</p> <p>\$\$\$\$</p>
<p>Semi-permanent and more durable, easily maintained while being flexible, quickly implemented</p>	<p>Permanent and durable, incorporated into routine maintenance programs</p>
<p>Tuff Curb</p> <p>Pre-Cast Concrete Curbs</p> <p>Bolt-in Traffic Separators</p> <p>Thermoplastic & Epoxy Gravel</p> <p>Heavy Duty Planters</p> <p>Signal Timing Changes</p>	<p>Concrete</p> <p>Asphalt</p> <p>Curblines Changes</p> <p>Signal Equipment Changes</p>

Materials Summary

MATERIALS	PROS	CONS	DURABILITY	COST
PAINT/POST	Quick install; easy to refine based on feedback or incidents	High maintenance and general labor costs	Depends on epoxy v. bolt – either way, requires monitoring and replacement (1 month – 3 years)	\$
PRE-CAST	Quick install; informs future custom build	Some limitations in design and implementation (lack of customization)	Long-lasting and can be worked into existing maintenance schedule for upgrades (1 - 8 years)	\$\$
FULL BUILD	Longer construction phase, permanent infrastructure, can be built in partnership with development	Costly, must be done as part of local/regional plans and programs	Long-lasting and can be worked into existing maintenance schedule for upgrades (8+ years)	\$\$\$

Cost and Time Comparison

Cost and Time Comparison

Better Bikeways in 2018-19

10 miles
2 years

\$1.3
million

Capital Project 2020-2025

1 mile
5 years

\$11
million



Houston, TX



Chicago, IL

Intervention Objects

in-tər-ven-shən äb-jekts

(noun) Objects that create physical and spatial boundaries through points, lines, or planes, creating safer spaces for people using the street

Intervention Object Type

POINTS

Points delineate a line.

Temporary

Permanent



Colorful Traffic Cones



Flexible Bollards



Painted Points



Plastic Drum Bollards



K-71 Bollard



Social Distance Painted Points



Planter Box



Armadillo Lane Separator



Metal Bollards

LINES

Lines separate spaces.



Colorful Crowd Barrier



A-Frame Signage Barrier



Jute Tubes



Type III Barrier



Social Distance Line Segments



Playful Seating



Playful Fencing



Complete Streets Spatial Configuration

PLANES

Planes create thick spatial edges.



Plastic K-Rails/Jersey Barriers



Barricade Covers



Hay Stacks



Painted Street



Social Distance Spherical Planes



Painted K-Rails



Seating and Landscape Edges



Parklet

Materials Summary

Selected barrier element will be based on preference, feasibility of acquisition/creation, and cost.

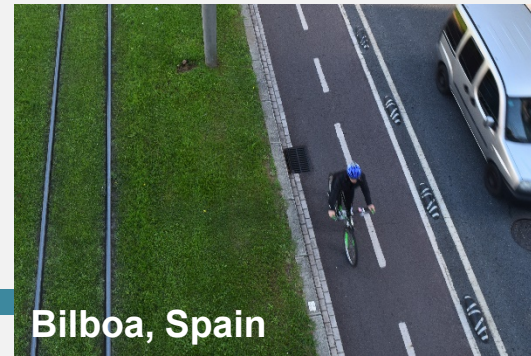
Barriers	
MUTCD - Type I or II	1 day - 1 month
Cardboard Cylinder*	1 day - 1 month
Plastic Barriers *	1 day - 1 year
Granite Blocks	1 month - 5+ years
Concrete Jersey Barrier*	1 month - 5+ years
Wooden Crate / DIY Planter	1 day - 1 month
Galvanized Steel Planters	1 day - 1 month
Large Polymer Plastic Planters	1 month - 5+ years
Self-Watering Planters	1 month - 5+ years

*Cardboard cylinders, plastic barriers, and concrete barriers can all be used in very tasteful ways when customized with paint by community members and/or local artists. For example, concrete jersey barriers can become the base for benches, tables, or covered social areas by incorporating additional materials like metal and wood.

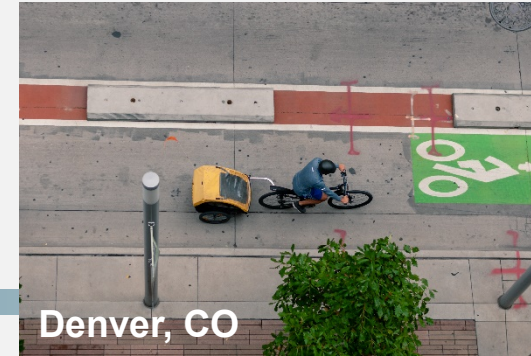
 **NYC DOT** @NYC_DOT · Nov 4
 As part of #DOTArt #BarrierBeautification initiative, Artist @zfstasi painted over 1,000 linear feet of jersey barriers along the #BikeNYC lane on Shore Pkwy between Bay Pkwy & W 22nd St in #Brooklyn.



Source: Dezigline



Bilboa, Spain



Denver, CO



Seattle, WA



Materials Summary

Signs

Traffic signs	1 day - 5 years+
Professionally made:	1 day - 5 years+
-Custom traffic signs	
-Printed/mounted	
DIY:	1 day - 5 years+
-Paint on wood, canvas, etc.	
-Vinyl on Corrugplastic	
-Printed and laminated	
-Mounting: A-frame or Zip Tie	



Portland, OR – Source: Better Block PDX



Portland, OR – Source: PBOT



San Francisco, CA – Source: SFMTA

Materials Summary

Edgelines and Symbols

Traffic Tape (Construction)	1 month - 1 year
Spray Chalk / Spray Paint	1 day - 1 year
Duct Tape	1 day - 1 month
Traffic Tape (Foil Backed)	1 day - 1 month

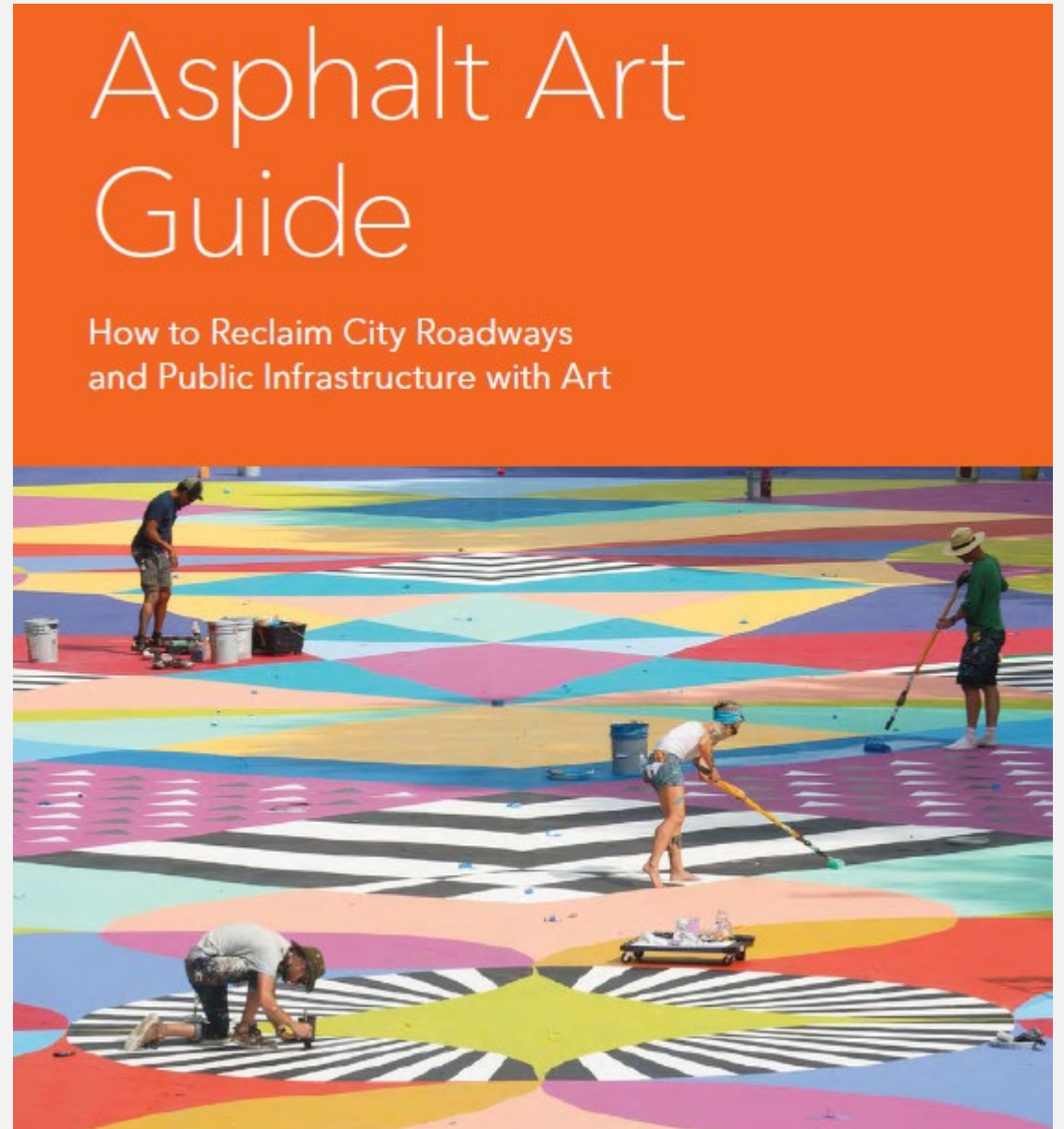
NOTES:

A paint striper can be used with spray paint/chalk for clean lines



Materials Summary

Surface Treatments	
Street Bond Pavement Coating	1 year - 5+ years
(Preformed) Thermoplastic	1 year - 5+ years
Epoxy Gravel	1 year - 5+ years
Corn Starch Paint	1 day - 1 month
Tempura Paint	1 day - 1 month
Acrylic Asphalt Paint	1 month - 3 years
Pigment Polymer Cement	1 year - 5+ years



Lane Reallocations

TYPES

- Parking Lane
- Travel Lane

APPLICATIONS

- Provide space for walking and rolling
- Provide space for queueing at bus stops, services, and retail
- Provide space for curb extensions to reduce crossing distance and improve sight lines

DESIGN

- Shy distance from vertical elements should be considered for all modes
 - The operating space of travel lanes can be narrowed to provide this shy distance
- Reducing travel lane widths slows vehicles and can provide additional space



BARD



PEDESTRIAN & BICYCLE USE ONLY



EXPANDED PEDESTRIAN AND BICYCLE SPACE

STAY SAFE
 Mantense a salvo
 Nyob kom txhob muaj mob
 Nabad qab ku joog

STAY 6 FEET APART
 Mantengase a 6 pies de distancia
 Nyob sib nrug li 6 feet
 Kala fogaada laba mitr

For more information on the City's response to COVID-19, visit [minneapolismn.gov/coronavirus](https://www.minneapolismn.gov/coronavirus)



Minneapolis



Minneapolis, MN

Case Study: PBOT Busy Streets



Traffic Calming

Volume Management

- *Preferred volumes for a Low-Stress roadway:*
 - **Preferred** - 1,000 - 1,500 vehicles per day.
 - **Acceptable** - up to 3,000 vehicles per day

Speed Management

- *Preferred speed for a Low-Stress roadway: **20 mph or less***



Portland, OR

Diverters

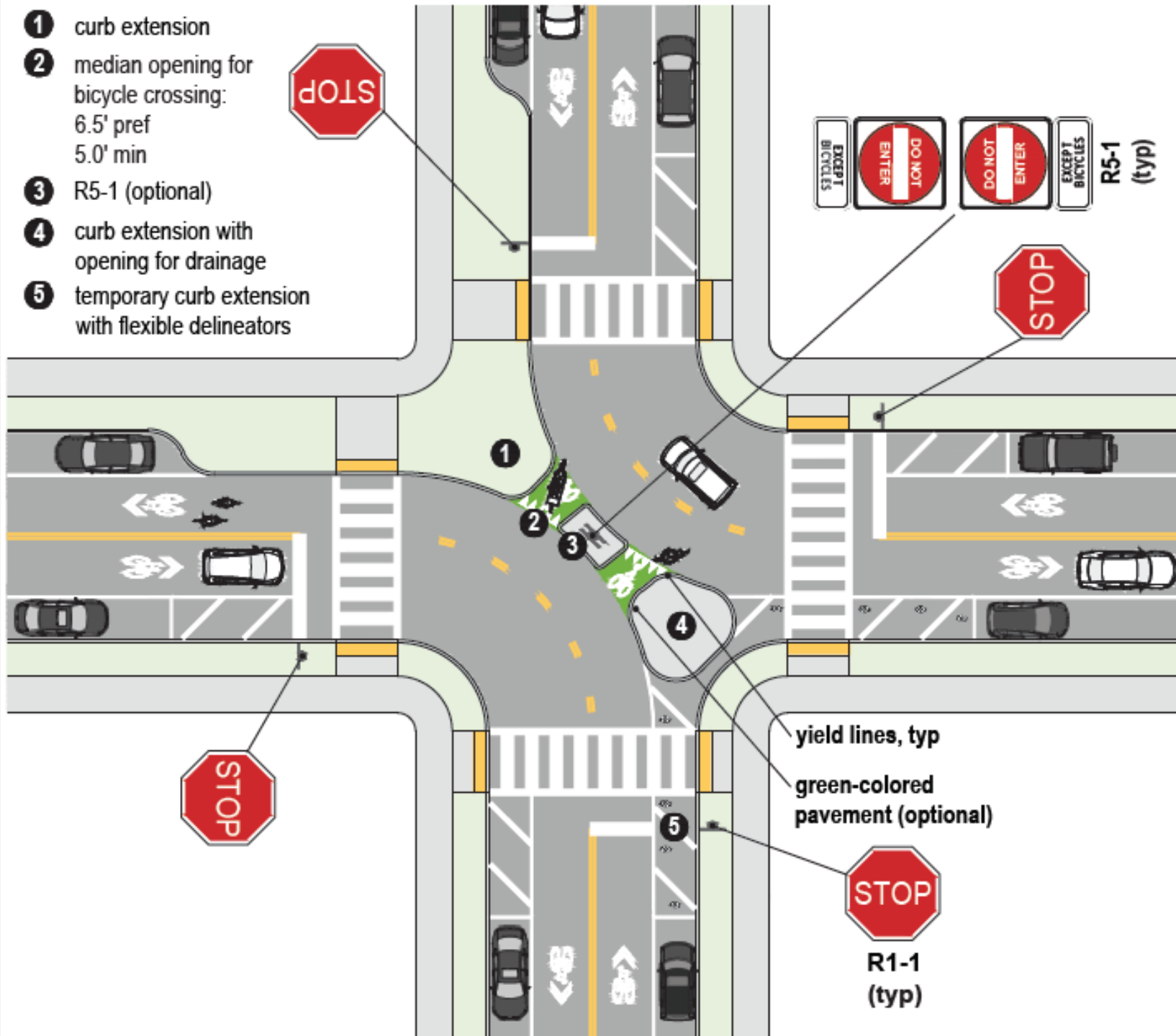
TYPES

- Diagonal & Median Diverters
- Regulatory Closure
- Right-In / Right-Out
- Partial Closures
- Full Closures

DESIGN

- Diversion treatments must be designed to provide a minimum clear width of 6 feet for a bicyclist to pass through.
- Some treatments may require a separate pedestrian accommodation.

- 1 curb extension
- 2 median opening for bicycle crossing:
6.5' pref
5.0' min
- 3 R5-1 (optional)
- 4 curb extension with opening for drainage
- 5 temporary curb extension with flexible delineators



EXCEPT BICYCLES
DO NOT ENTER
DO NOT ENTER
EXCEPT BICYCLES
R5-1 (typ)

yield lines, typ
green-colored pavement (optional)

STOP
R1-1 (typ)





Portland, OR – photos: Jonathan Maus/BikePortland



Saint Paul, MN

Horizontal Deflection

APPLICATION

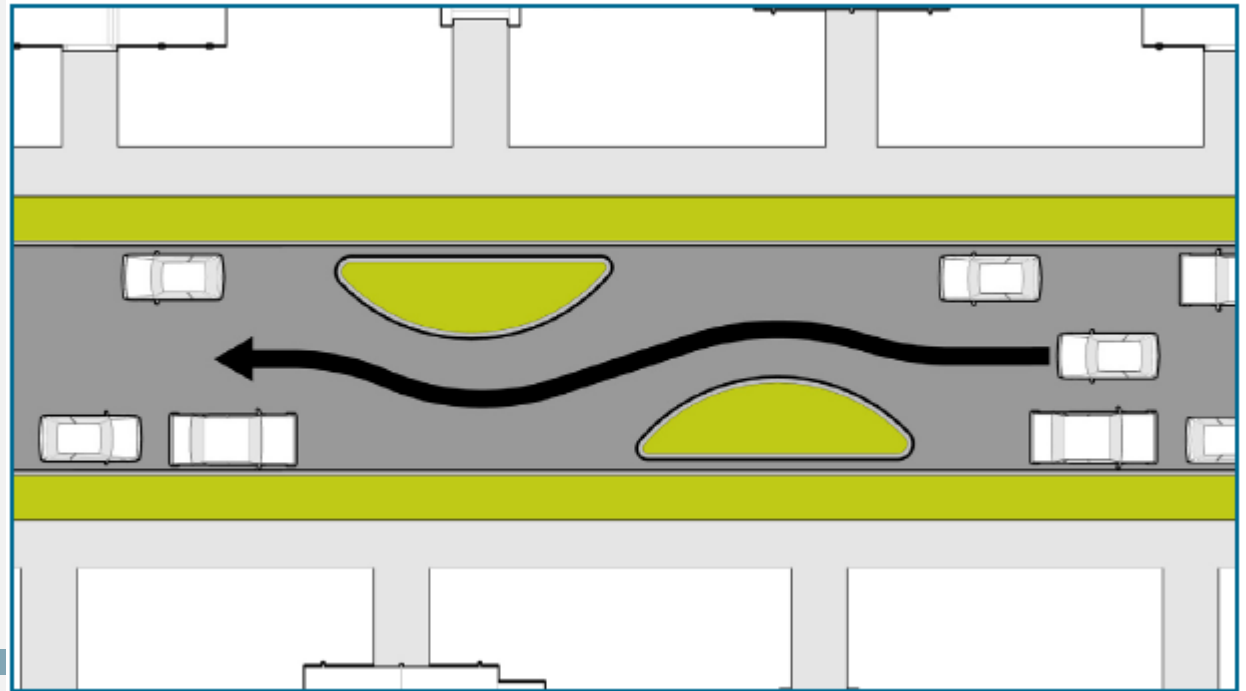
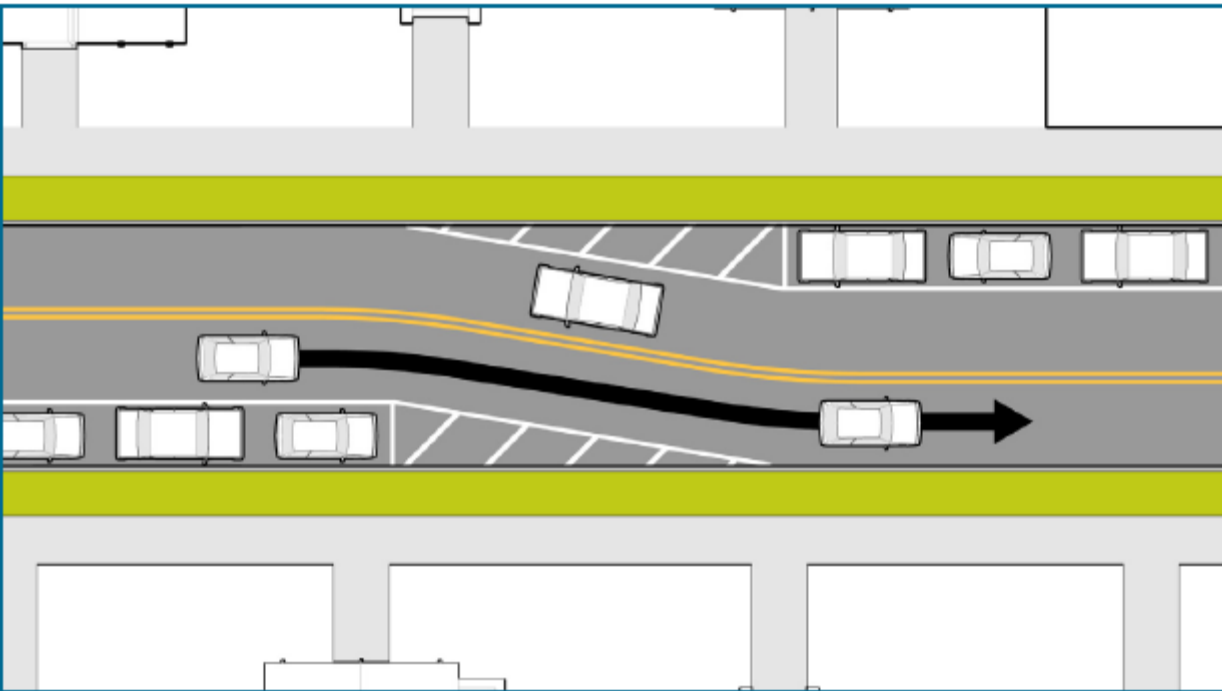
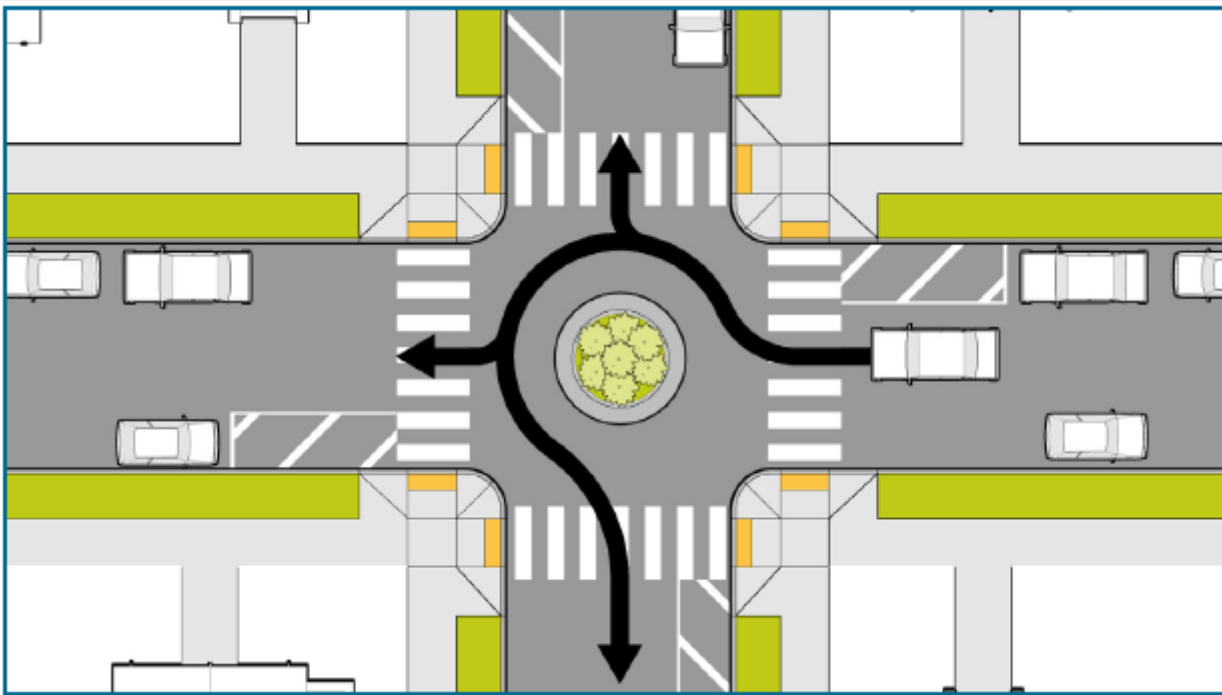
Street segments or intersections where street width contributes to higher motorist speeds

- On-street parking has low occupancy
- Desire to remove stop control at minor intersection

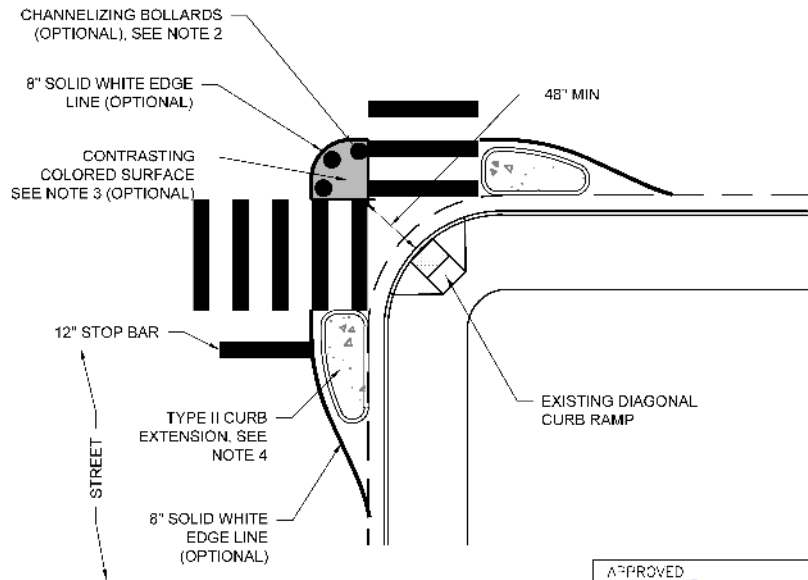
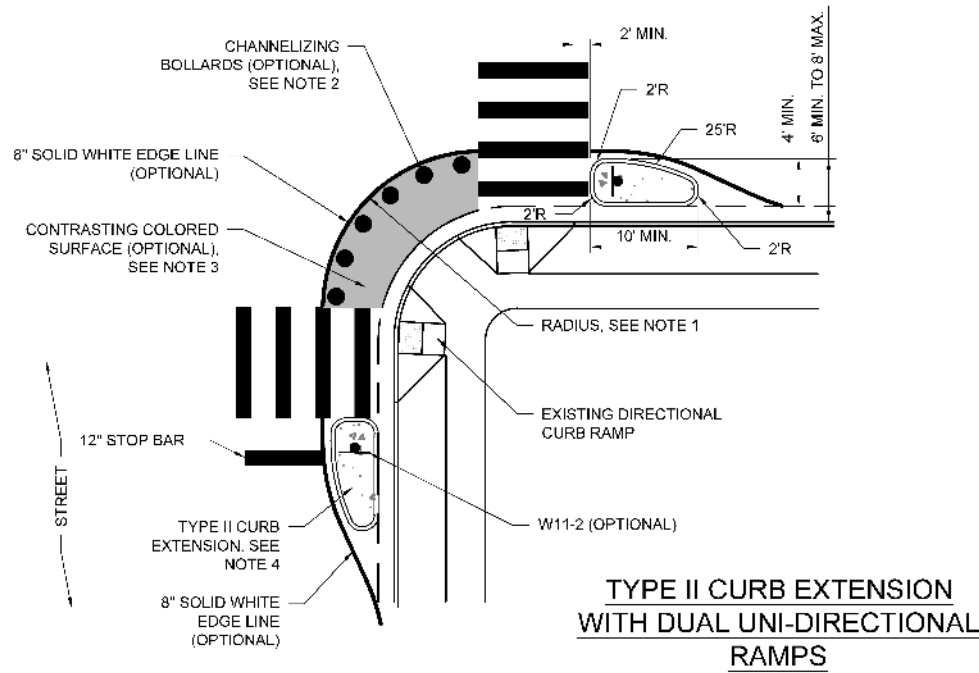
DESIGN

- Must be designed to deflect motor vehicle traffic without forcing the bicycle path of travel to be directed into a merging motorist.

Speed Management



City of Los Angeles Supplemental Street Design Guide



APPROVED 02-20-2021

Seleta Reynolds

for Seleta Reynolds, General Manager

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION



Bureau of Engineering
Department of Transportation
February 2020



Portland, OR



Portland, OR



Founex, Switzerland



Cambridge, MA

Vertical Deflection

APPLICATION

Street segments where lower motorist speeds are desired

- Typically used where traffic controls are less frequent

DESIGN

- Speed cushions provide gaps spaced for an emergency vehicle's wheelbase to pass through without slowing. These gaps also provide a space for bicyclists to pass through unabated.

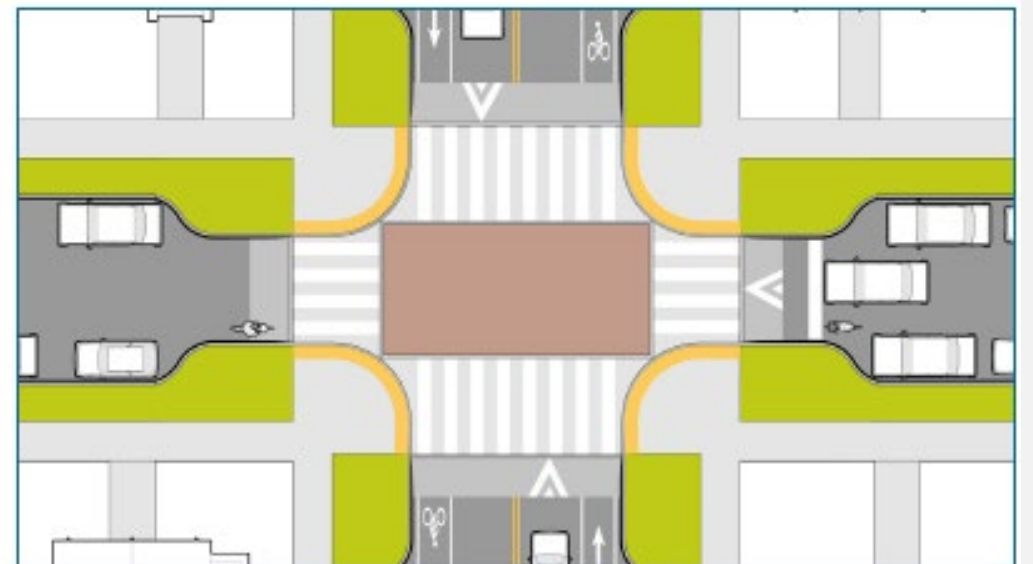
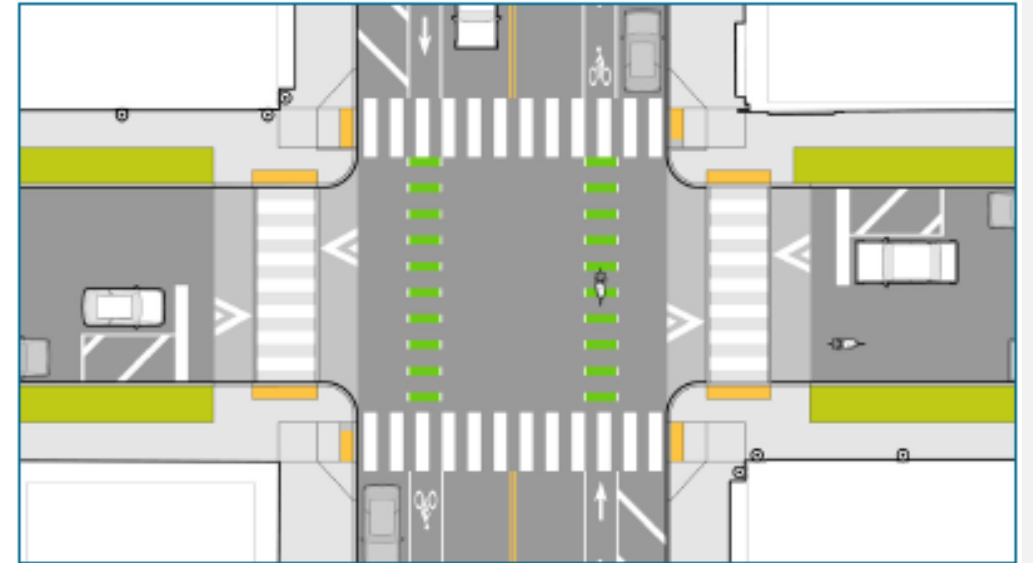
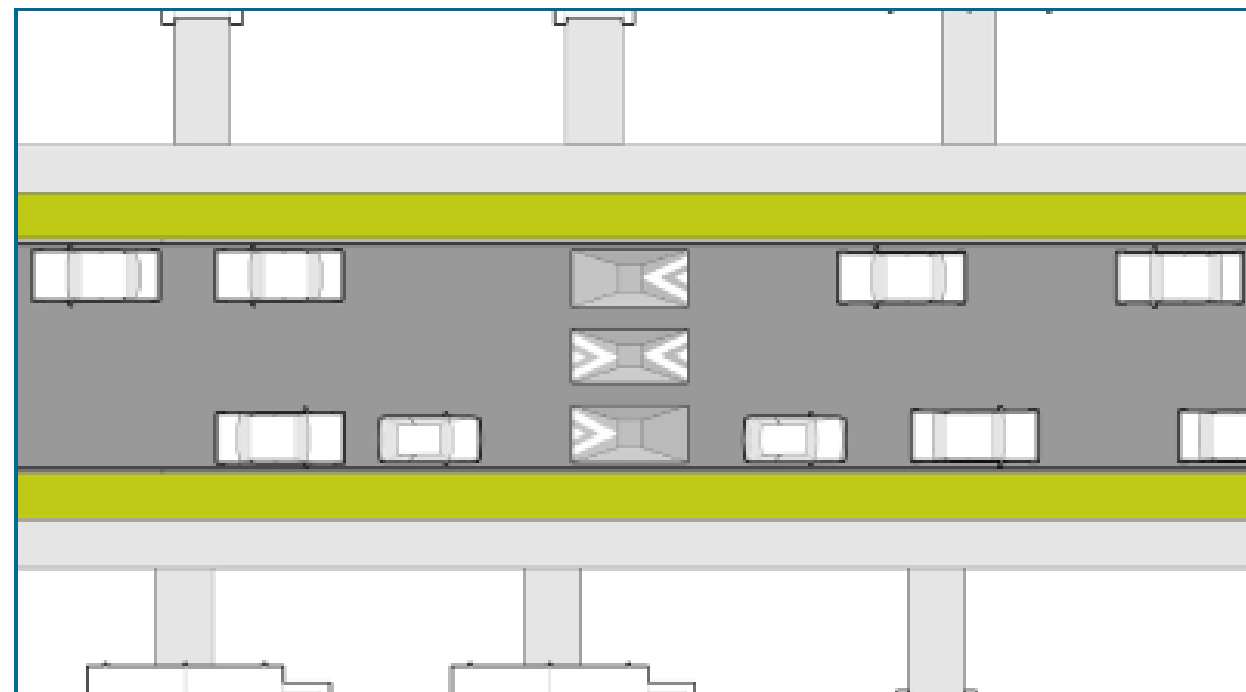
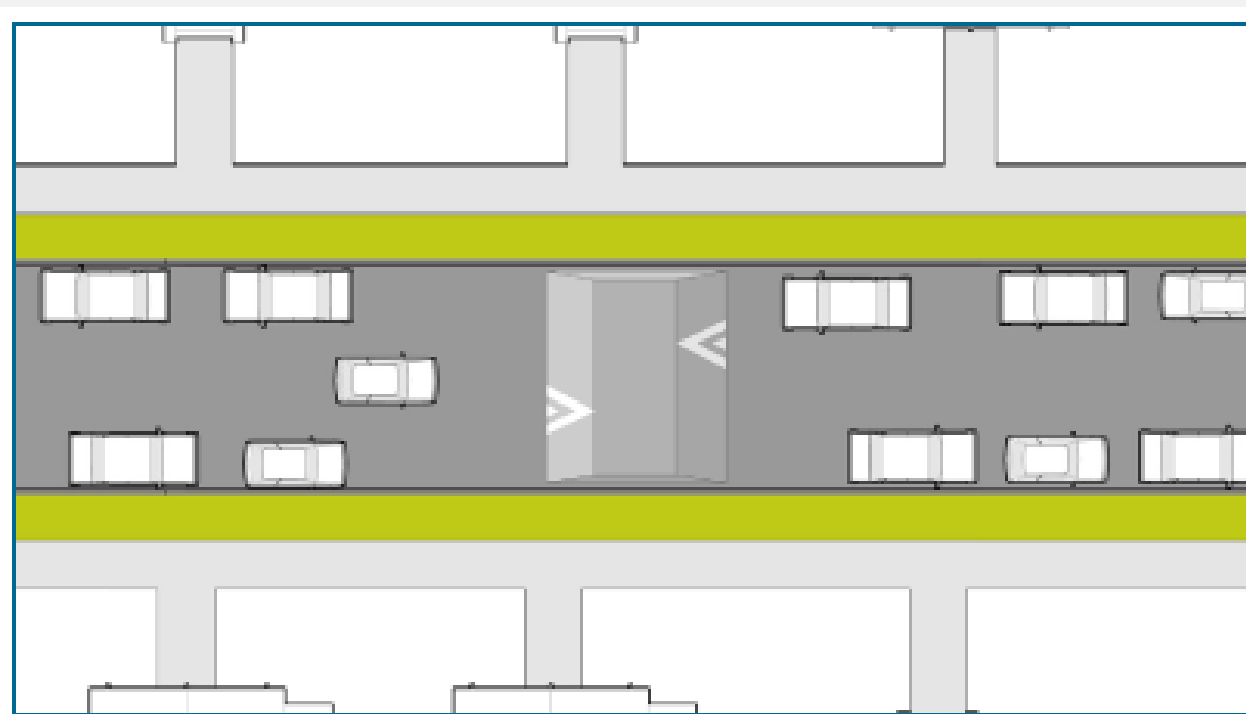
Vertical Deflection

- Rubber bolted speed humps = only interim treatment
- Likely to require sign off from Fire Chief, regardless of interim status



Photo by City of Detroit,
via [Curbed](#)

Speed Management



Emergency Response Considerations



Successful Coordination

- Engage with EMS early in project development
- Focus on shared goal: Saving Lives
 - Fire Dept. and other EMS often respond to traffic crashes
 - Slower vehicle speeds around people walking and rolling results in less severe crashes
- Work to identify creative solutions where necessary



ADDITIONAL RESOURCE

2018 NACTO Webinar featured City of Portland Fire Chief, Mike Myers on how street design and operational strategies can improve how we fight and prevent fires. US DOT Volpe Center staff also share research on how changes to the design of large vehicles could reduce their lethality to people using the street.

A write up of Q&A is provided on the NACTO Webpage:

<https://nacto.org/event/fire-trucks-and-vision-zero/>

Precedents and Lessons Learned



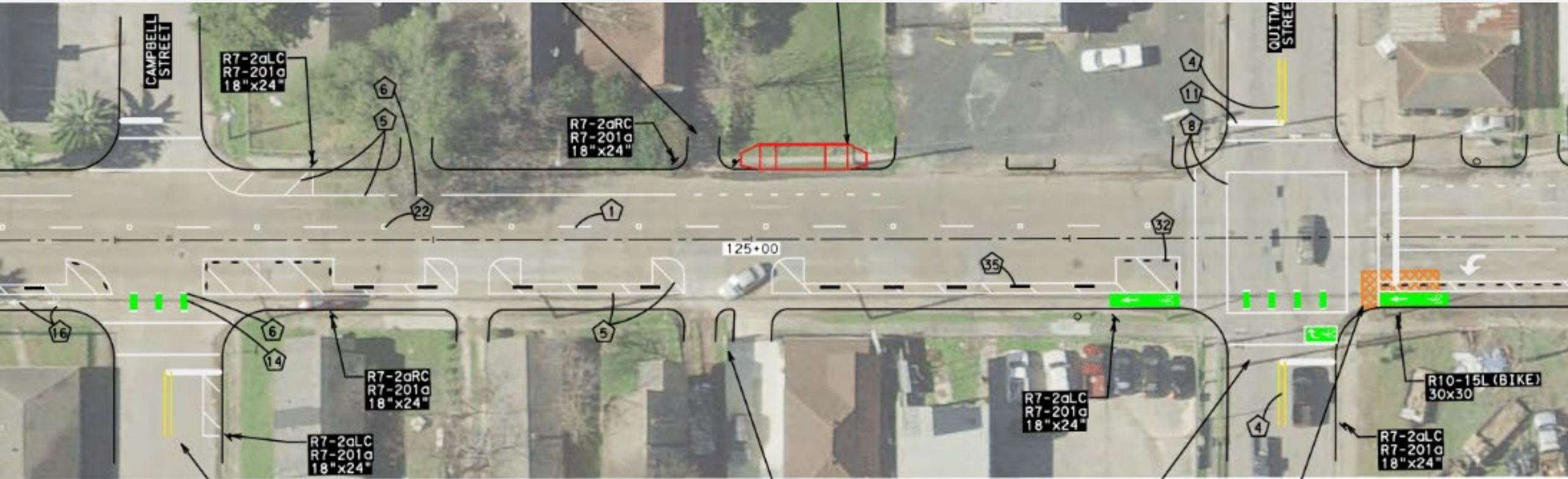
SDOT Covid-19 Response

- Stay Healthy Streets
- Keep Moving Streets
- Have announced plans to make some corridors and implementations permanent

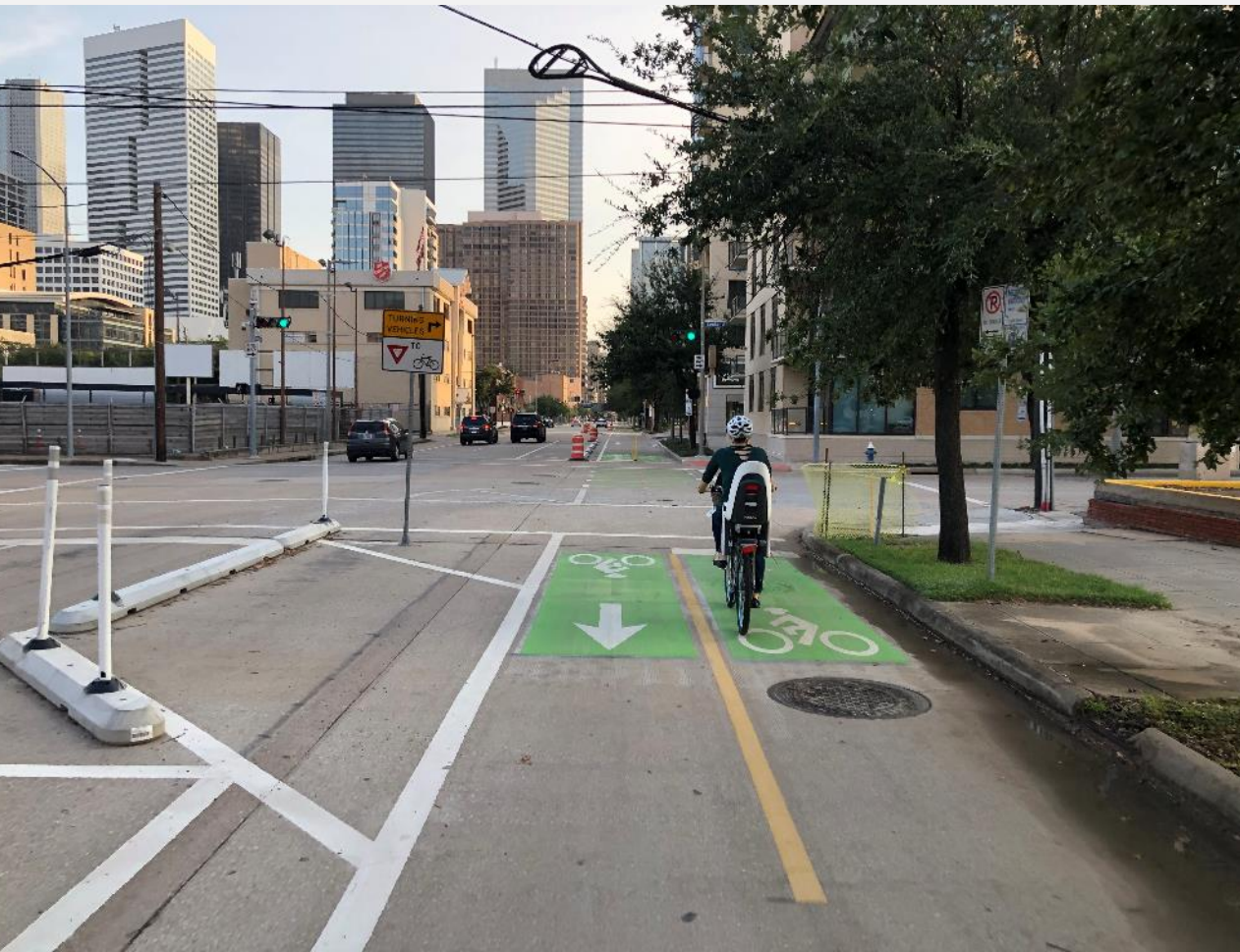


Seattle, WA

Perfect as the Enemy of the Good



Houston Rapid Implementation



MassDOT/Barr Foundation



Search Mass.gov



OFFERED BY [Massachusetts Department of Transportation](#)

Shared Winter Streets and Spaces Grant Program

A Quick-Launch/Quick-Build Municipal Funding Program

Building on the success of the Shared Streets and Spaces initiative first launched during the summer of 2020, the Massachusetts Department of Transportation is now extending the program to help municipalities address the particular challenges of winter amid the ongoing public health crisis. Shared Winter Streets and Spaces will provide cities and towns with grants as small as \$5,000 and as large as \$500,000 to improve plazas, sidewalks, curbs, streets, parking areas, and other public spaces in support of public health, safe mobility, and renewed commerce.

OFFERED BY

[Massachusetts Department of Transportation](#) →



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[COVID-19 Response](#) [Mobility](#) [Technical Assistance - Shared Streets and Spaces Grant Program](#)

Technical Assistance - Shared Streets and Spaces Grant Program

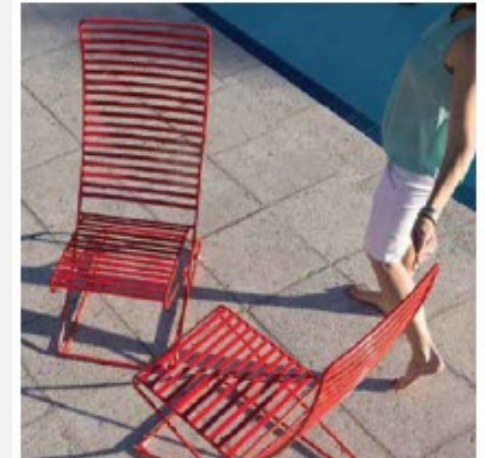
We're proud to partner with MassDOT to support communities in rapidly transforming their streets with responsible public health practices.

We're partnering with [MassDOT](#) to provide technical assistance support to



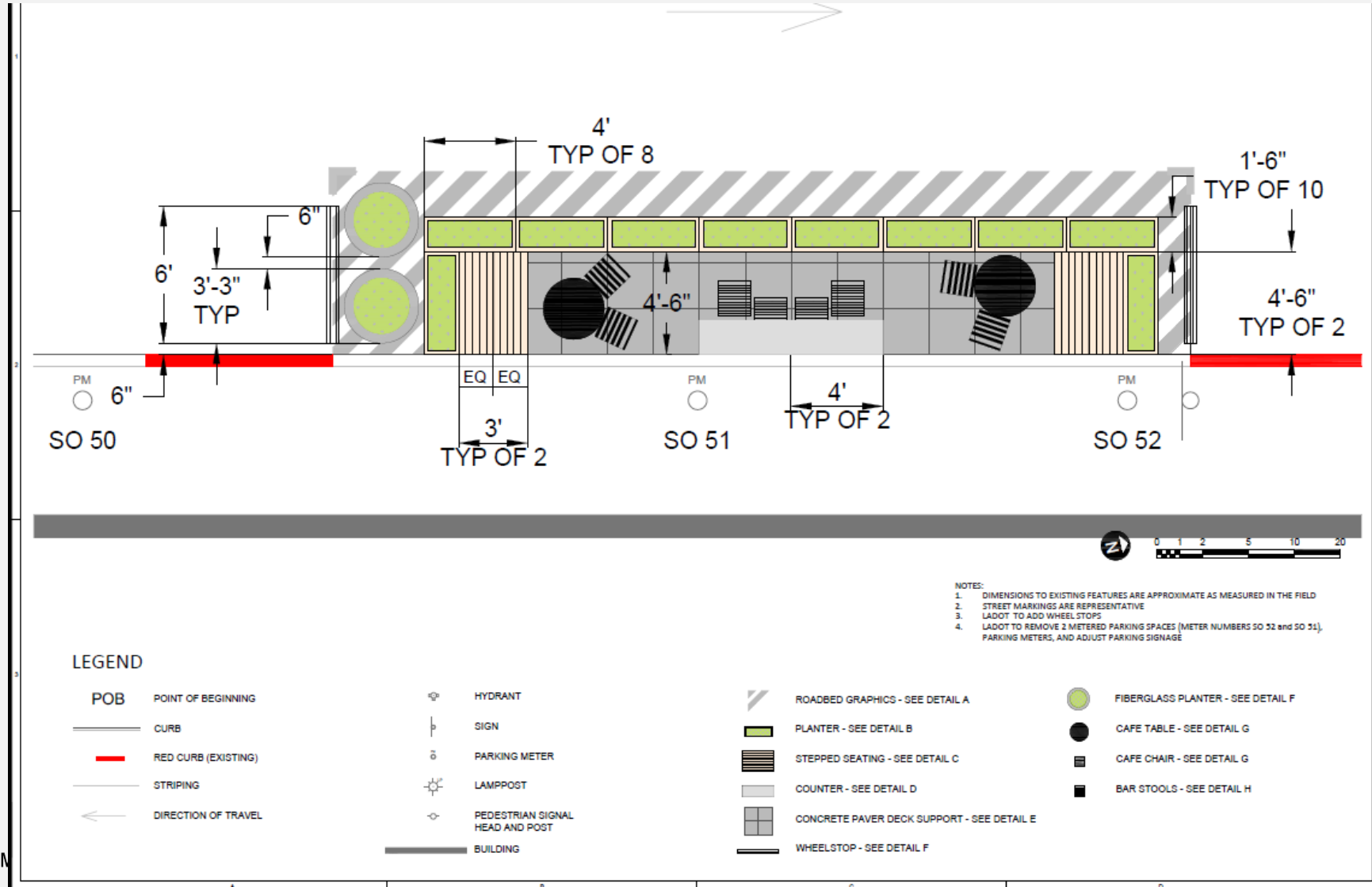
People Street Program

LA Metro funded and facilitated grant for LADOT to hire consultants to aid communities through the application and design process



People Street Program

LA Metro funded and facilitated grant for LADOT to hire consultants to aid communities through the application and design process



TOOLE
ENGINEER
ARCHITECT

No. Date Description
1 06/10/19 LADOT SUBMITTAL #2



SITE PLAN

Scale: 1/2
Date: 6/10/19
Drawn: GS
Checked: AL
Project No.:
3 of 9



Questions?

Thank you

www.tooledesign.com

Thank you and Take Care!



Contact for more info:

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nszibbo@bayareametro.gov