




*NASHVILLE DEPARTMENT of TRANSPORTATION  
& MULTIMODAL INFRASTRUCTURE*

# What We Have Been Up To & Beyond

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# Presentation Outline

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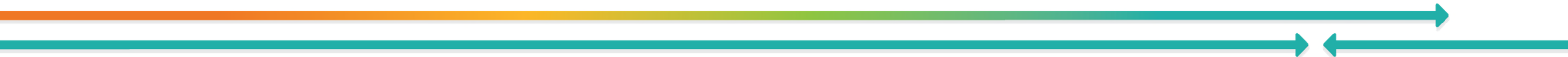
- Connect Downtown Study Update
  - Tactical Urbanism Guideline/Manual
  - NDOT SMART Grant Award
  - Traffic Impact Study Update & Guidelines
  - Complete Street Implementation Guide
- 



# The Big Gray Box

**Building a Better Downtown**

**<https://www.nashville.gov/departments/transportation/plans-and-programs/downtown-traffic-project>**





# Connect Downtown: What and Why

- Key questions we set out to answer:
  - How do we manage increasing traffic congestion through improvements in traffic mgt., curbside access, transit access, and pedestrian safety?
  - How can we support anticipated growth in employment, residential, commercial, and tourism?





# Study Area and Project Sponsors

**NDOT**

**WeGo**  
Public Transit

**TN** **TDOT**  
Department of  
Transportation



**NASHVILLE  
DOWNTOWN  
PARTNERSHIP**



# Connect Downtown Schedule





# Big Moves

## Manage Congestion

Expanded TDM program

Adaptive signals

Access management

## Maximize the Curb

More loading and unloading space

More valet and layby lanes

Better curb enforcement

## Protect Vulnerable Travelers

Core mobility lanes network

Vision Zero spot improvements

Construction and event closure management

## Connect Old and New

Transit hubs

Bridges and underpasses

Expanded pedestrian links

## Move More People

More frequent transit service

Transit priority corridors and additional bus lanes

New East Bank services

## Organize Lower Broad

Priority pick-up and drop-off areas

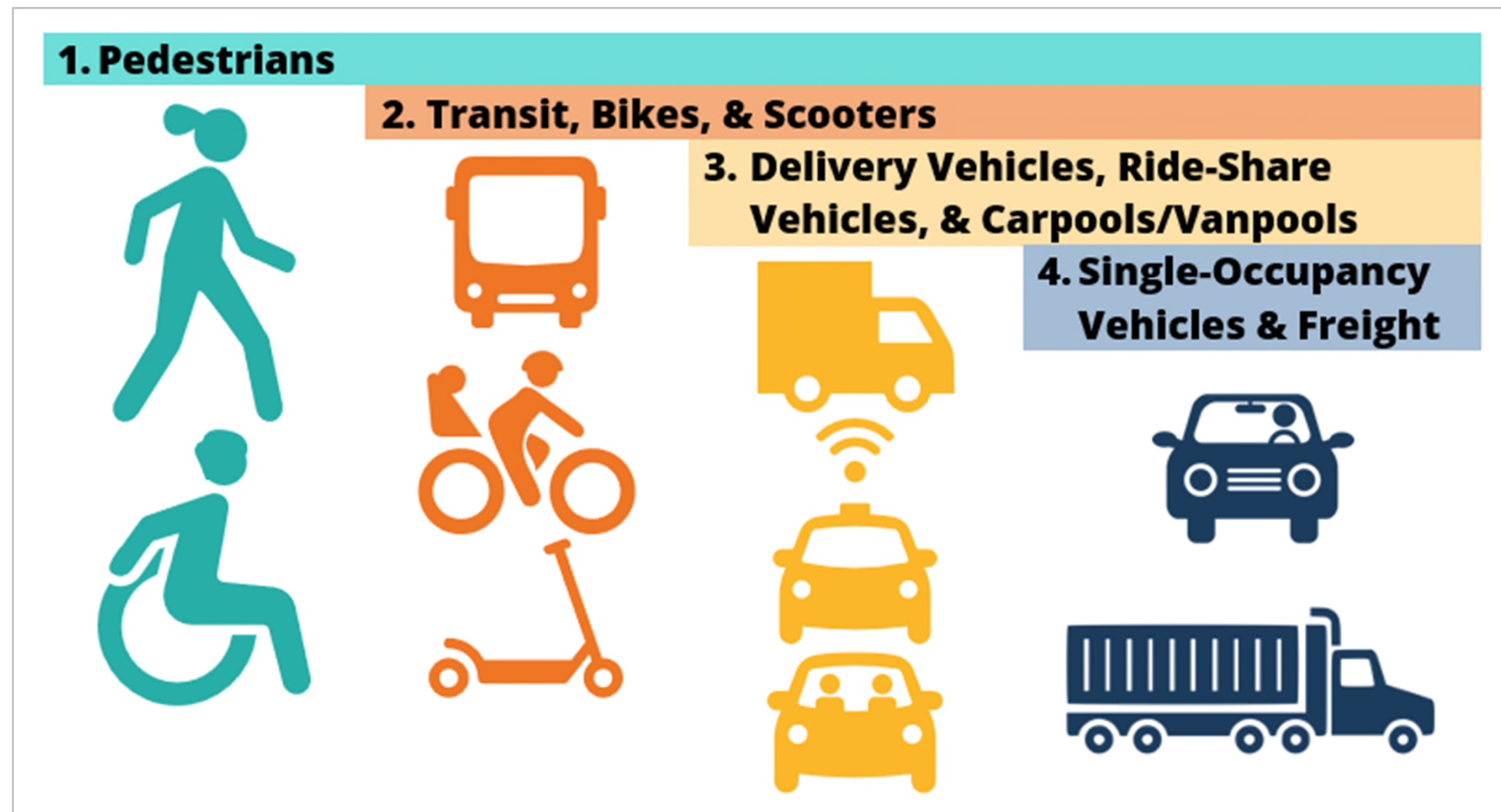
More pedestrian space

Limited permits for ETVs



# “Must Haves” for a Great Downtown

- **Pedestrian priority** (not just in a few places)
- **Great options** (with some redundancy)
- **Safe and comfortable spaces** (both traffic safety and personal safety)
- **Active management** (to address the unexpected)



A modal hierarchy for Downtown Nashville

# Traffic and Congestion Management

- **Adaptive signals**
  - Throughout inner loop
- **Operational conversions (1-way to 2-way or vice versa)**
  - 2<sup>nd</sup> from Union to interstate
  - 3<sup>rd</sup> and/or 4<sup>th</sup> north of Broadway
  - 7<sup>th</sup> from MLK to Demonbreun
- **TDM program expansion**
  - Residents, visitors, and employers
  - Downtown Code amendment



Require custom TDM plans for new development

# Transit: Infrastructure

- Transit/mobility centers
- **Transit priority corridors**
  - Westside
  - James Robertson
  - East Bank
- Additional transit priority





# Transit: Infrastructure

- Transit/mobility centers
- Transit priority corridors
- **Additional transit priority**
  - Better Bus “Major” routes (7)





# Active Transportation

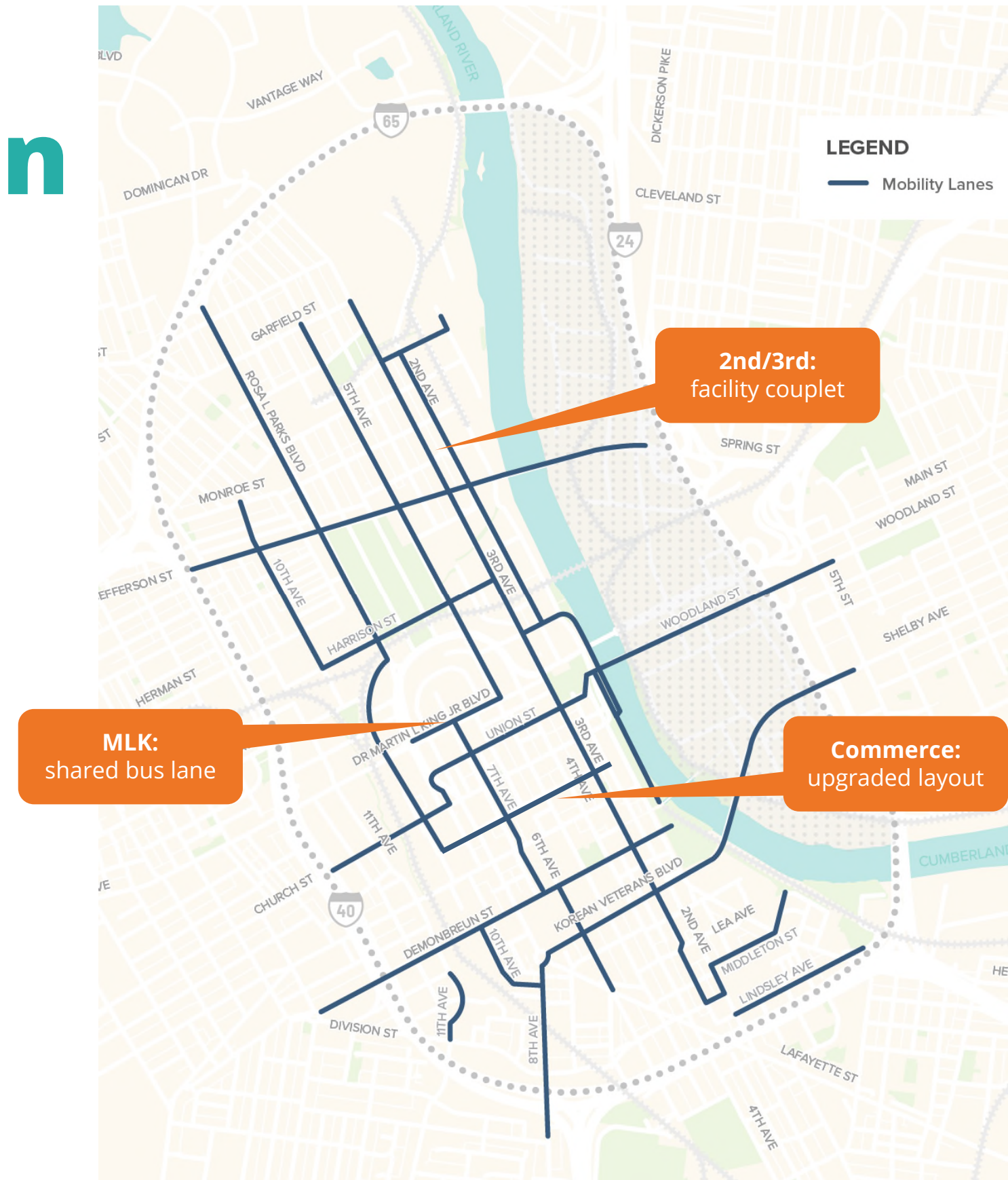
- **Mobility lanes**

- Priorities include near-term WnB projects
- Select existing facilities are upgraded
- Potential conflicts between modes require design tradeoffs
- Additional field work next week

- Planned greenways

- Gulch pedestrian connection(s)

- Additional changes to Lower Broad





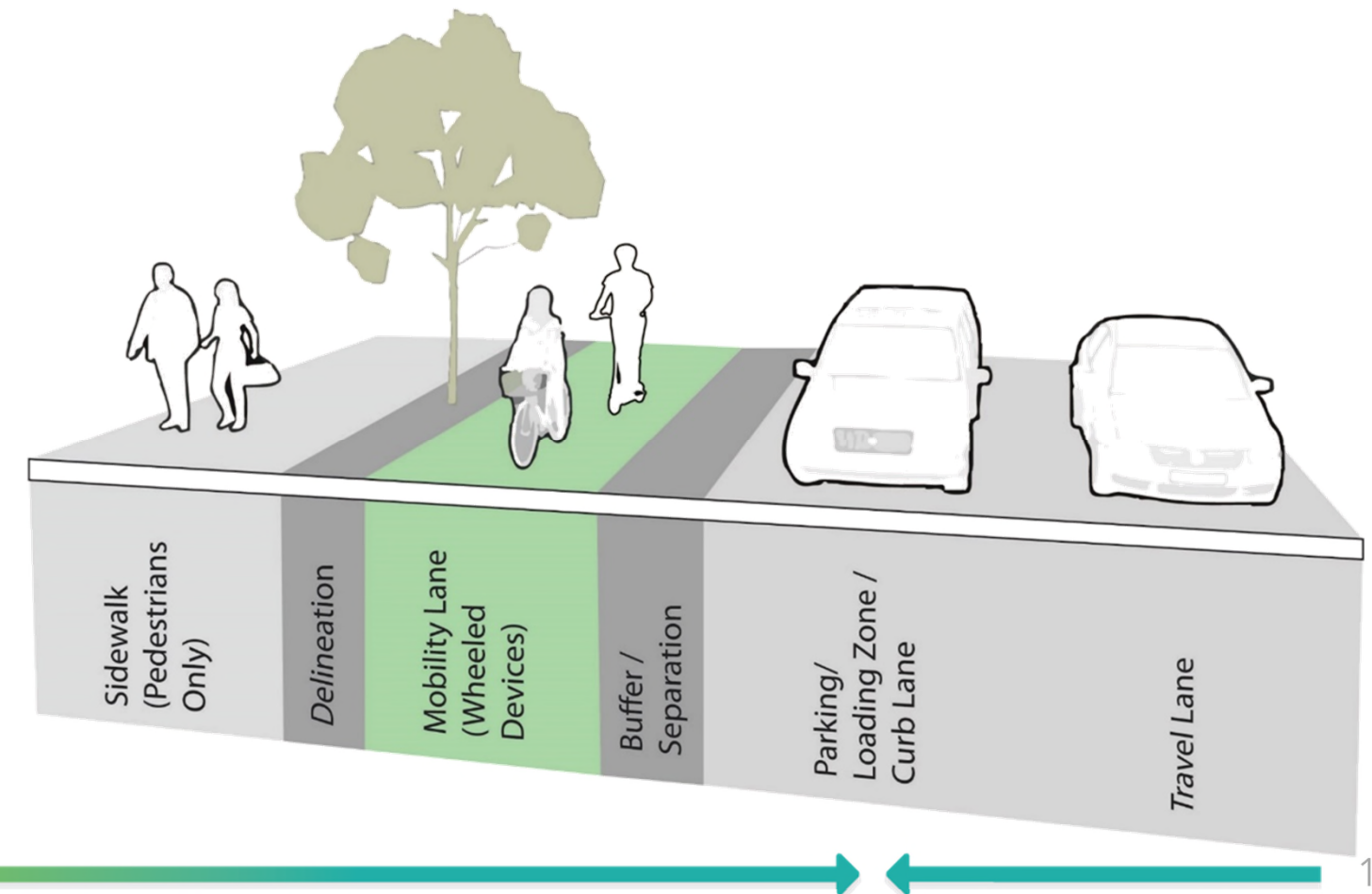
# Mobility Lanes

## Address what we heard during enagement:

- People don't feel safe biking downtown and don't like scooters cluttering the sidewalks

## Solutions:

- Provide dedicated space for people using bikes, electric bikes, scooters, and other personal micromobility devices
- Reduce conflicts between pedestrians and faster-moving travelers





# Active Transportation

- Mobility lanes
- **Planned greenways**
  - Include all currently planned facilities
  - Coordination ongoing with Metro Parks
- Gulch pedestrian connection(s)
- Additional changes to Lower Broad



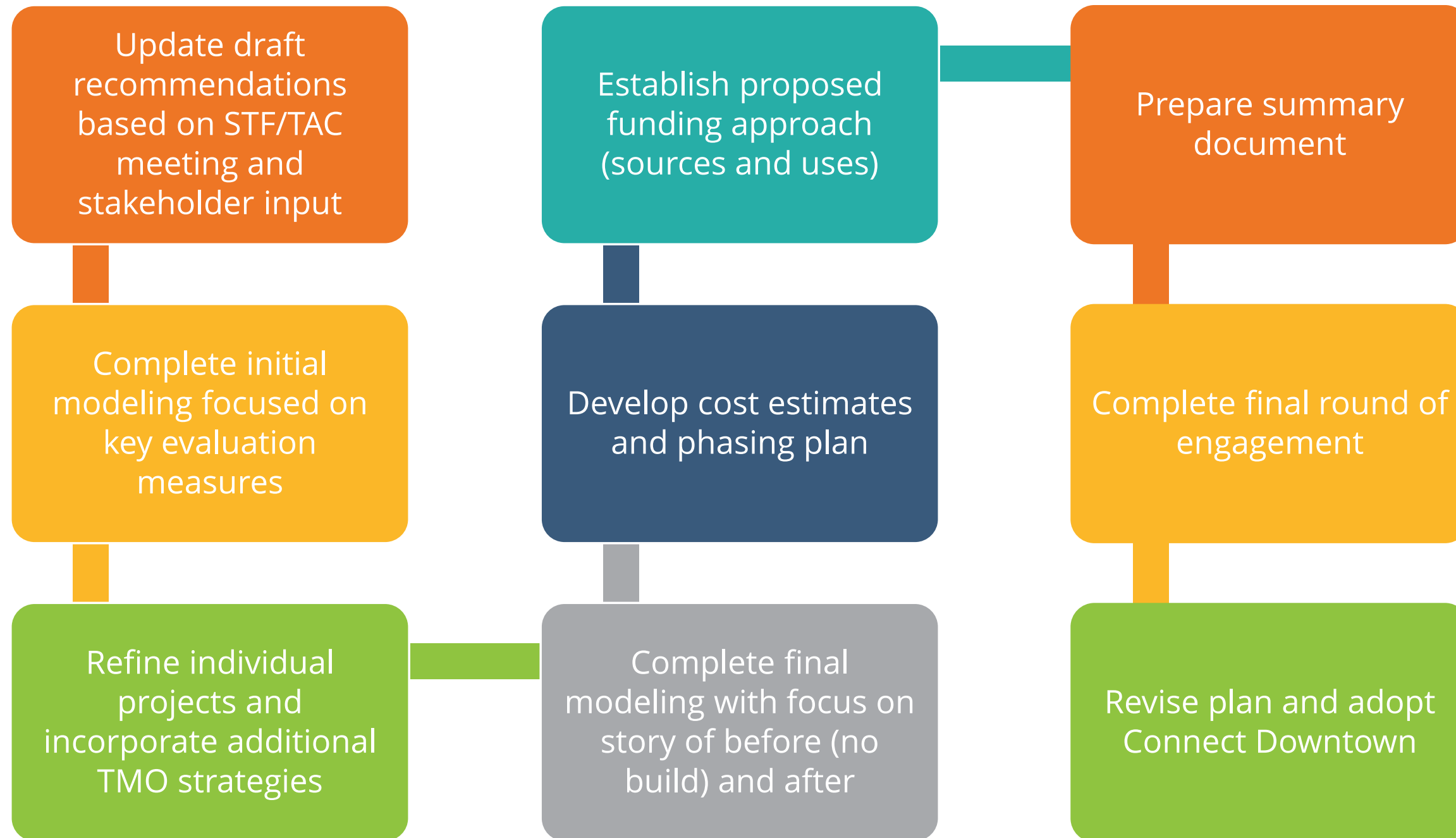
# Curb Uses

- **Focus on priority loading areas and flex lanes first**
  - Deliveries and musician loading
  - Taxis, carriages, and shuttles
  - Valet
  - Rideshare
- Expand delivery, valet, and rideshare areas based on upcoming conversations
- Identify additional uses and policies based on transit and active transportation decisions





# Putting It All Together





# Evaluation Measures: A Subset



Space provided for vulnerable travelers



Transit travel times through downtown



Accessibility to jobs and housing



Number of Vehicle Miles Traveled (VMT)

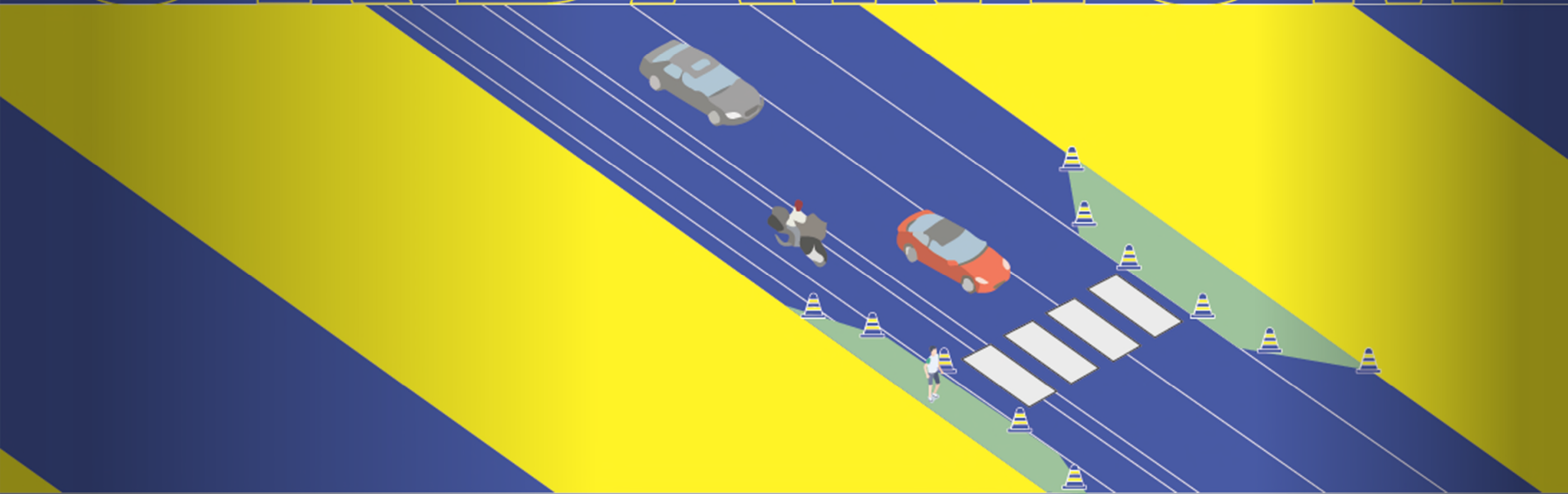


Access to curb for loading and service activities

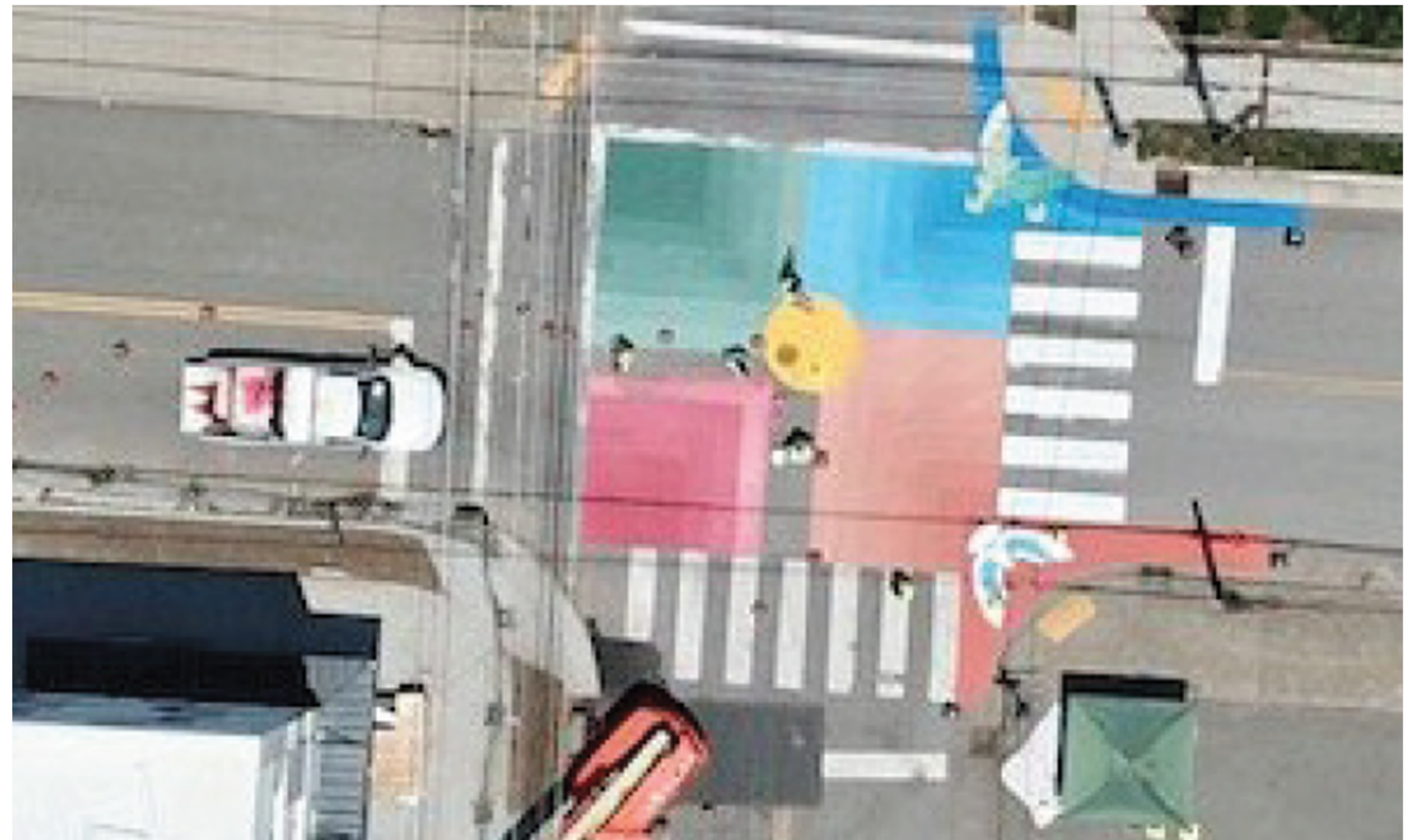


Number of people moved in key corridors

# TACTICAL URBANISM





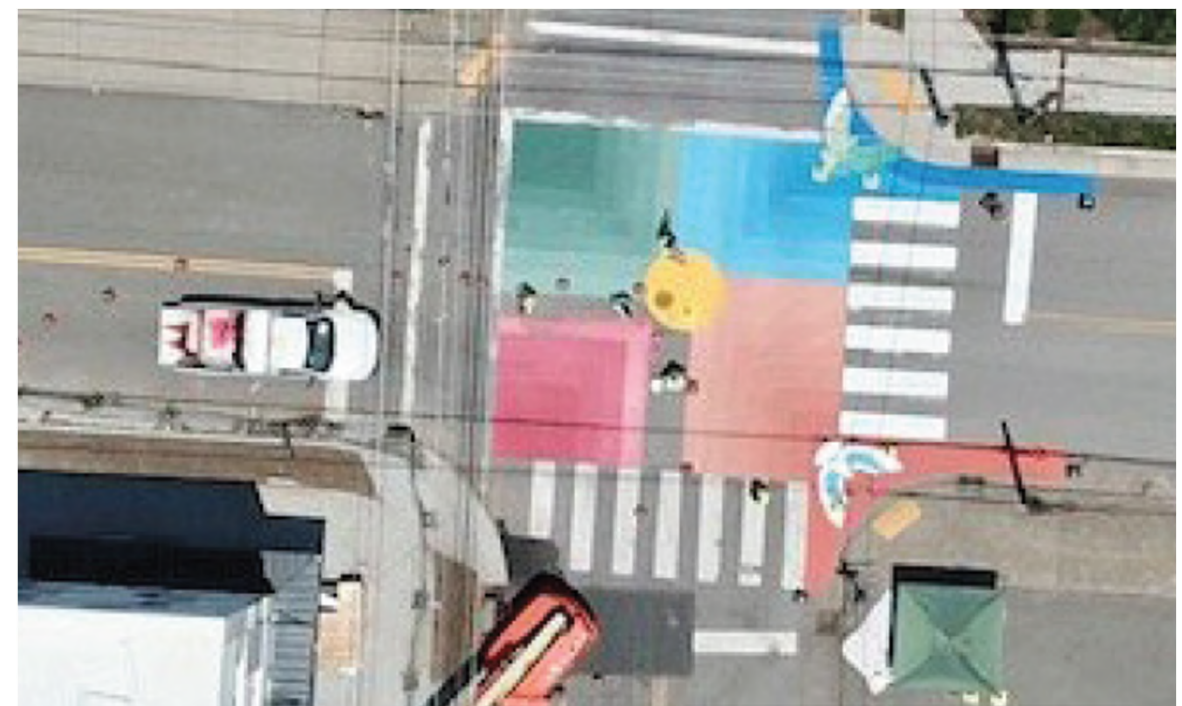




# Tactical Urbanism Guidelines

## Project Scope

- Assemble information regarding existing regulations, policies, and processes applicable to Tactical Urbanism
- Research best practices for Tactical Urbanism from peer cities
- Engage key stakeholders involved in the implementation of Tactical Urbanism
- Create a Tactical Urbanism Guide for Nashville





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## Process Overview

### 1. Identify Issue

Document problem areas and specific issues the applicant wants to address.

Identify

### 3. Apply for Tactical Urbanism Project

Download fillable PDF application from NDOT's website and complete the required forms and provide necessary documentation. Submit applications to: [NDOTapps@nashville.gov](mailto:NDOTapps@nashville.gov).

Apply

### 5. Application Approval

Once NDOT staff and other necessary agencies have approved the application, the applicant will receive a Tactical Urbanism "permit" that can be posted with the installation.

Approval

### 7. Project Installation

Once all permits have been issued, the applicant may continue with installation, following the approved installation plan, maintenance plan and schedule.

Install

### 2. Design + Brainstorm Ideas and Solutions

Come up with design(s) on how to solve and prevent the current issue(s). Utilize the application to identify required exhibits and plans.

Design

### 4. Project Review

NDOT staff and any other necessary departments will review the application(s) and may provide feedback to require additional documentation or changes. Review period may take up to 10 business days.

Review

### 6. Apply for Necessary Permits

Many Tactical Urbanism projects require additional permits. NDOT staff will provide a list of necessary permits the applicant must acquire before installation can begin.

Permitting

### 8. Project Removal

The applicant must remove all items from the public ROW, according to the approved removal plan. Early removal may be required by NDOT if installation fails to comply with the maintenance agreement.

Remove



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## Project Category Overview

### Eligible Project Types

Tactical Urbanism projects take on many different forms, each with an intent to improve upon the built environment's existing condition. This guide organizes the project types into five general categories. Some installations may incorporate project types from different categories and can be combined into one application.



**A. Traffic Calming**



**B. Parking Zone**



**C. Sidewalk Zone**



**D. Lane Closure**



**E. Active Transportation**



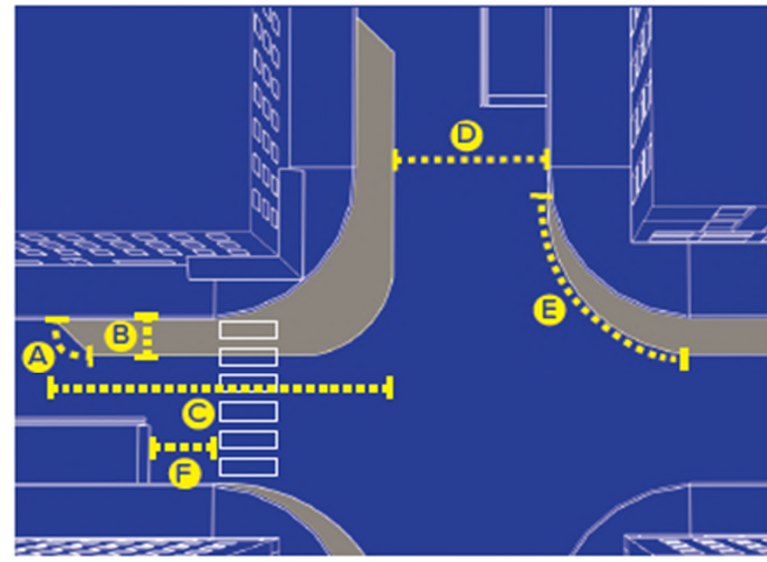
## A1. Traffic Calming: Bulb-outs | Criteria

### When to Use

A common use for bulb-outs and curb extensions is to tighten the existing curb radius and encourage slower travel speeds by turning vehicles, while reducing the physical distance for pedestrians to cross the street.

### General Suggestions and Requirements

Bulbouts must be banded in two rows of retroreflective paint or tape, 4" in width min. each strip 6" apart max. Movable traffic control devices such as traffic cones, flex posts, or solid modular planters border the bulb out.. Optional features of the bulb-out include basic site furnishings such as chairs, plants, and removable surface paint, tape, or chalk.

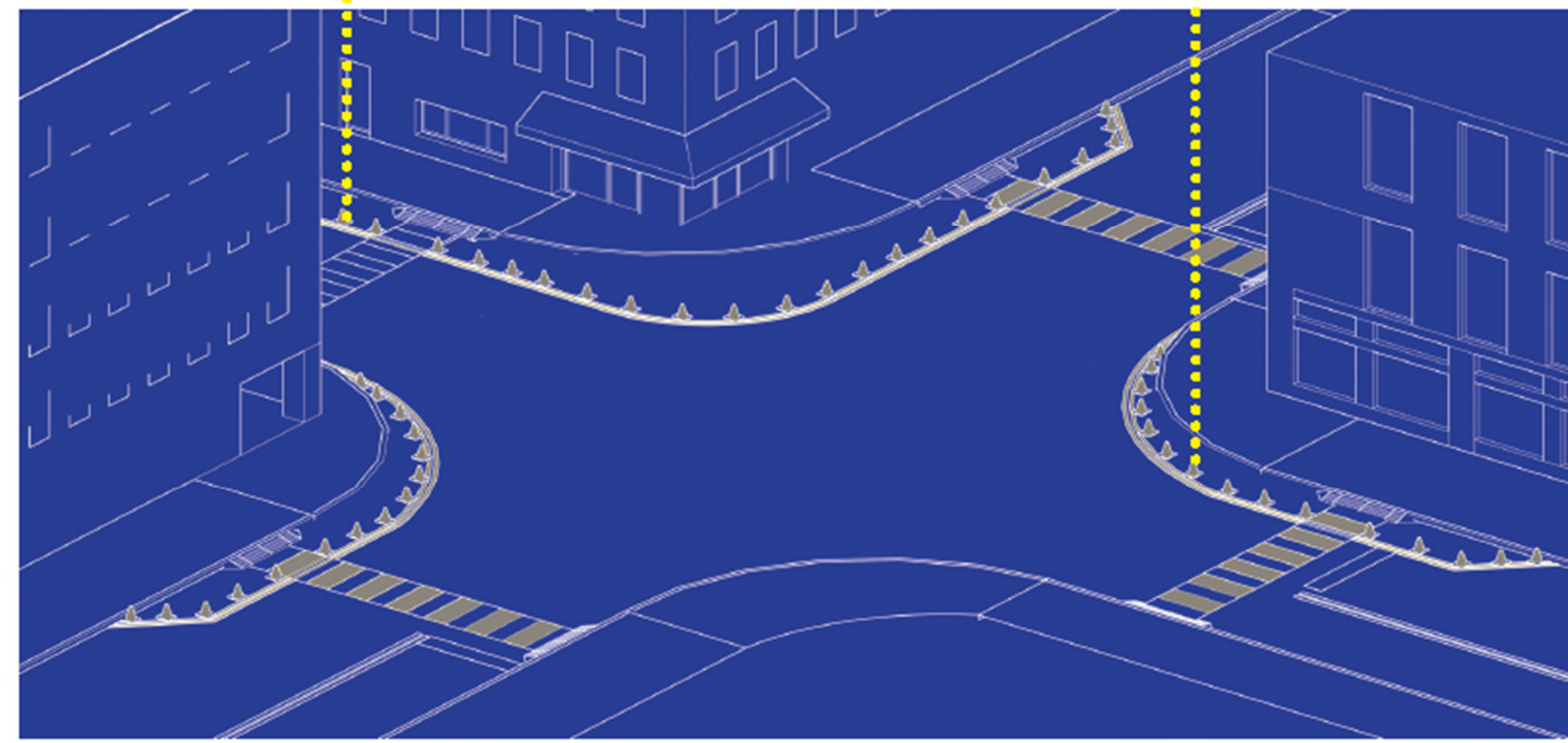


### Design and Placement

A	Extension returns at 45 degrees.
B	1' Less than Parking Width Max.
C	30' Min. Distance from Intersection.
D	20' Min. Road Width.
E	Taper Extension to Maintain 20' Width.
F	4' min. Between Crosswalk to Stop Bar.

Movable Traffic Control Devices

Striped off Pedestrian Zone



Striped off Pedestrian Zone with Optional Art

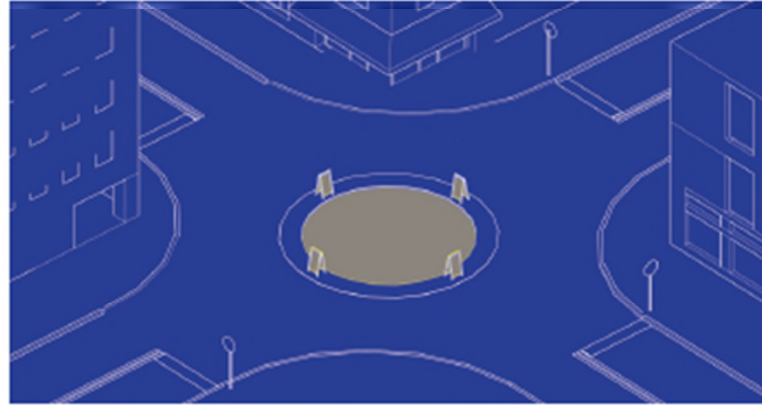


Movable Traffic Control Devices



## A7. Traffic Calming: Traffic Circle | Duration

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### Pop-Up

Pop-up examples of traffic circles are ideal for slow neighborhood roads to gather traffic calming data. Materials are minimal although traffic control professionals should be hired during installation. Art and plants can easily be included to enhance appearance and add visual delineation to drivers.



### Short-Term

Short-term examples of traffic circles have more durable semi-permanent reflective striping and barriers. Larger plants that require more maintenance can be included. The "curb" of the circle will require a sturdier material as well such as sandbags or erosion prevention socks.



### Long-Term

Requires fixed semi-permanent traffic delineators and striping. Semi-permanent surface treatment can be used to create longer-lasting artwork within the perimeter of the circle. Heat/drought resilient plant material should be used. Lane splitters should be installed to guide drivers around the circle.



Credit: Culver City



Credit: Planet Bike



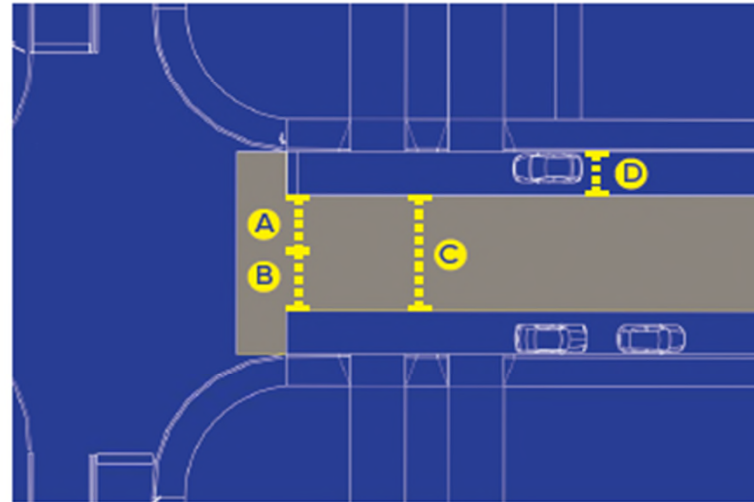
## D2. Lane Closure: Slow Street

### When to Use

Slow streets are a method to make low traffic residential roads safer and friendlier to local foot traffic. Streets are typically blocked off on one side allowing local traffic to come through. Slow streets can function as bike routes. Slow streets can also function as event space for neighborhood get-togethers like Block Parties.

### General Suggestions and Requirements

Slow streets are fairly minimal in what they require to activate the pedestrian friendly space. Streets should be closed off partially on all entrances to a block. Signage should be placed to explain that only local traffic and delivery trucks are permitted access.



### Design and Placement

A	Exit Lane Blocked Off
B	Entry Lane Open to Local Traffic.
C	Entire Street Open to Pedestrians.
D	Street Parking Open to Local Traffic.

Movable Traffic Barriers and Slow Street Signs

Street Open to Local Traffic



Slow Street Sign

Credit: San Francisco Municipal Transportation Agency

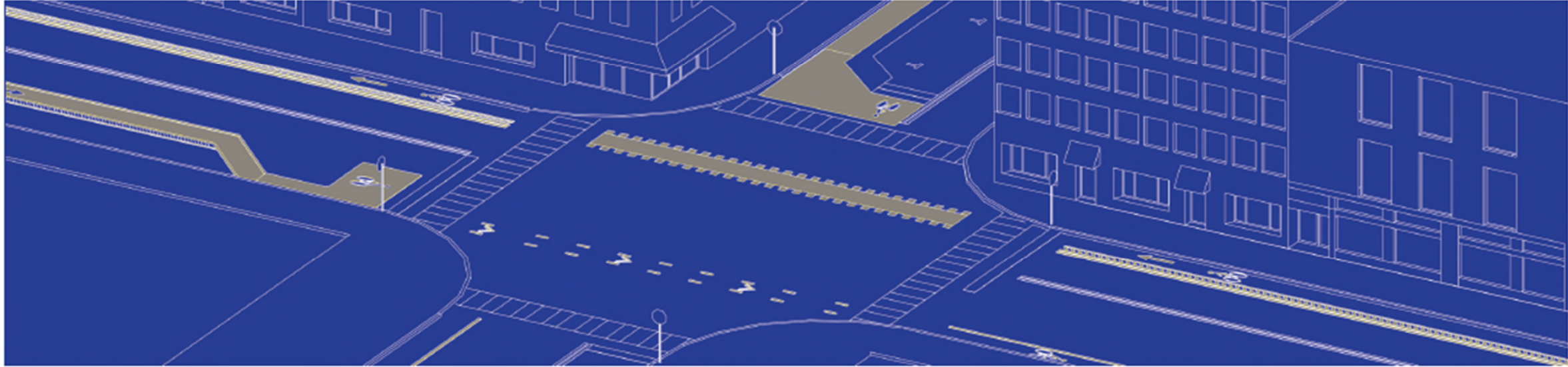


Permanent Slow Street Device

Credit: Seth Sokol



## E1. Active Transportation: Bike/Mobility Lanes | Duration



### Pop-Up

This duration should include materials that are easily movable yet durable and hefty enough to provide adequate safety for bikers. Bike Lane striping and symbols must be washable. Traffic delineators can be self-constructed for a pop-up duration.

### Short-Term

Examples of short-term bike lanes must also use removable paint for striping and symbols. Traffic barriers and delineators should be fixed to the surface or heavy enough to withstand traffic and weather. If planters are used as barriers, they will require regular maintenance.

### Long-Term

Long-term duration bike lanes should be designed as if they will last forever. The exception being that traffic barriers should be removable once the installation has ended. Semi-permanent paint and striping should be used to treat surface of bike lanes.



Credit: Dave Campbell, Bike East Bay



Credit: Croakey Health Media



Credit: BikeUtah



## Materials: Barrier Elements



### WHEEL STOP

○ ● ● ●

Estimate Cost: \$

#### Overview:

Easy to install, wheel stops can be used as low barriers and to demarcate tactical interventions. They should allow gaps for curbside pedestrian access or for cyclists to cross through.



### TRAFFIC CONE

● ● ● ○

Estimate Cost: \$

#### Overview:

Traffic cones are an affordable and easily movable barrier with reflective bands



### SPEED CUSHIONS

○ ● ● ●

Estimate Cost: \$

#### Overview:

Speed cushions are effective at reducing speeds on residential roadways.



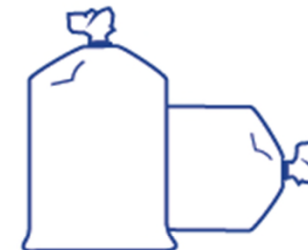
### PLANTER

● ● ● ●

Estimate Cost: \$\$\$

#### Overview:

Planters are a vibrant way to create protective barriers between the roadway and spaces for people. This planter provides a self-watering reservoir for easier maintainability.



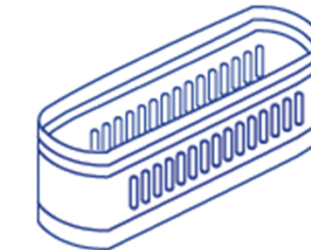
### SAND BAGS

● ● ● ○

Estimate Cost: \$

#### Overview:

Sandbags can act as a barriers or help direct water away from building.



### ROUND END SHEEP STOCK TANK

● ● ● ●

Estimate Cost: \$\$

#### Overview:

These types of planters are used as median islands, curb extensions, planters in plazas, and as makeshift roundabouts.

**Estimate Cost**  
\$ - less than \$100  
\$\$ - between \$100-500  
\$\$\$ - more than \$500

**Duration**  
● ○ ○ - temporary  
○ ● ○ - short term  
○ ○ ● - long term



# ***NDOT***

Strengthening Mobility and Revolutionizing  
Transportation (SMART) Grant:  
Leveraging Advanced Data to Deliver  
Multimodal Safety (LADDMS)

<https://www.nashville.gov/departments/transportation/traffic-management-center/smart-grants-program>



# SMART Grant Overview

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- Conduct demonstration projects focused on advanced smart city or community technologies in a variety of communities to improve transportation efficiency and safety.
  - Projects focused on using technology interventions to solve real-world challenges and build data and technology capacity and expertise in the public sector.
- Program Priorities
  - Safety and reliability
  - Resiliency
  - Equity and access
  - Climate
  - Partnerships
  - Integration
- Two Stage Grant Program
  - Stage 1 – Planning and Prototyping (\$2M max)
  - Stage 2 – Implementation (\$15M max)





# NDOT Application

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<https://www.nashville.gov/departments/transportation/traffic-management-center/smart-grants-program>

- Build partnerships early. Prior to NOFO.
  - Needed all available post-NOFO time to create a strong application
- Align with existing priorities/documents/research.
  - Vision Zero Action and Implementation Plans
  - Chattanooga Urban Testbed Program (MLK Smart City Corridor)
  - Promise Zones
  - Utilizing existing fiber
- Write the application to the NOFO
  - No wasted words.



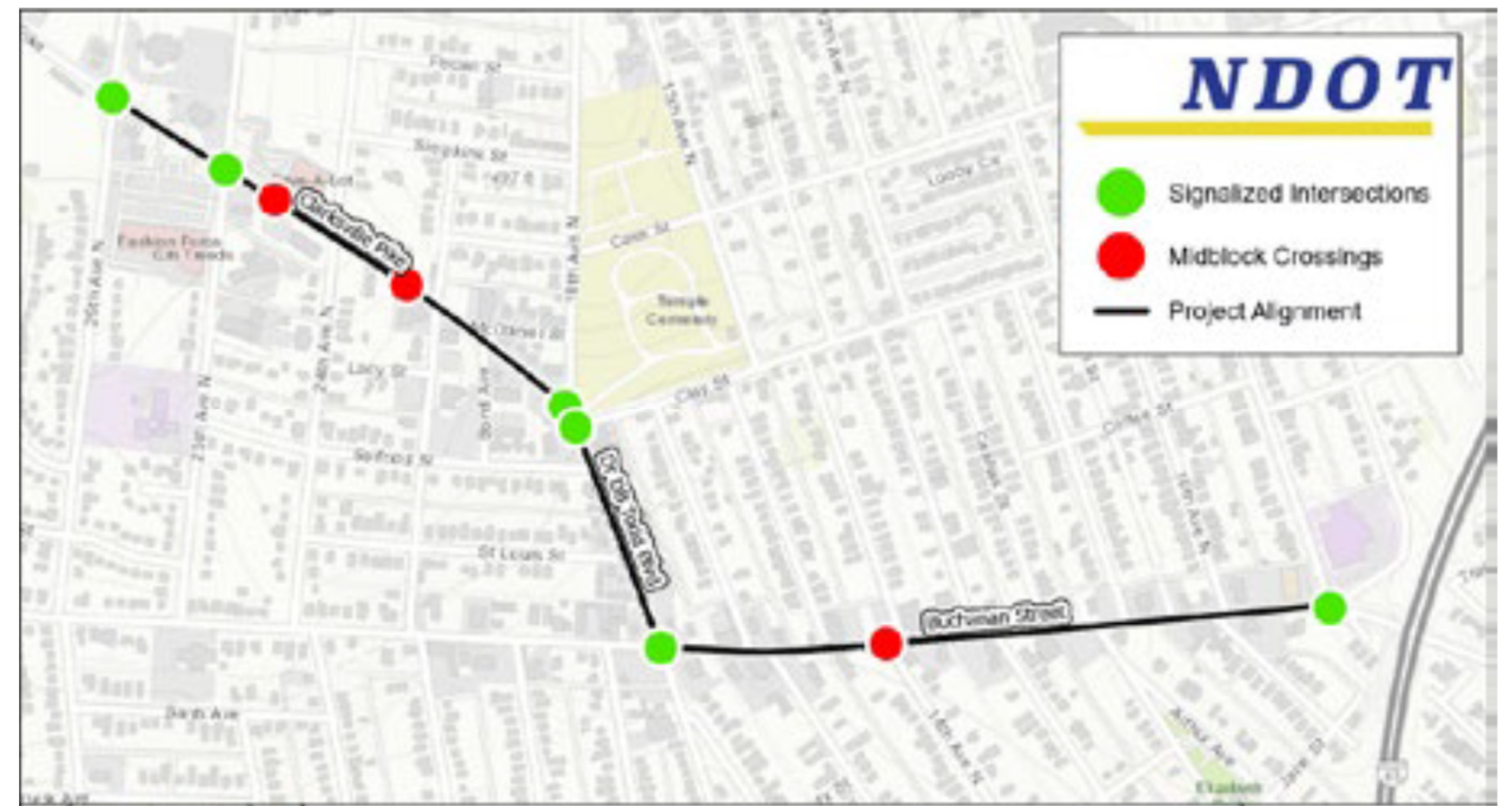
# Partners

- Tennessee Department of Transportation (TDOT)
- University of Tennessee – Chattanooga
- Tennessee State University
- Vanderbilt University



# LADDMS Project Description

- Identify safety issues outside traditional crash reports, implement targeted safety measures, and quickly evaluate safety measures for effectiveness through LiDAR, video, and other sensor data.
- 2-mile project corridor along Buchanan St., Dr DB Todd Jr Blvd., and Clarksville Pk in North Nashville. Locally controlled roadways with:
  - Transit
  - Bike lanes
  - Elementary Schools
  - Grocery Store
  - MDHA Housing
  - Nearby Parks
  - 2 and 4-lane roadway sections



# Proposed Technologies

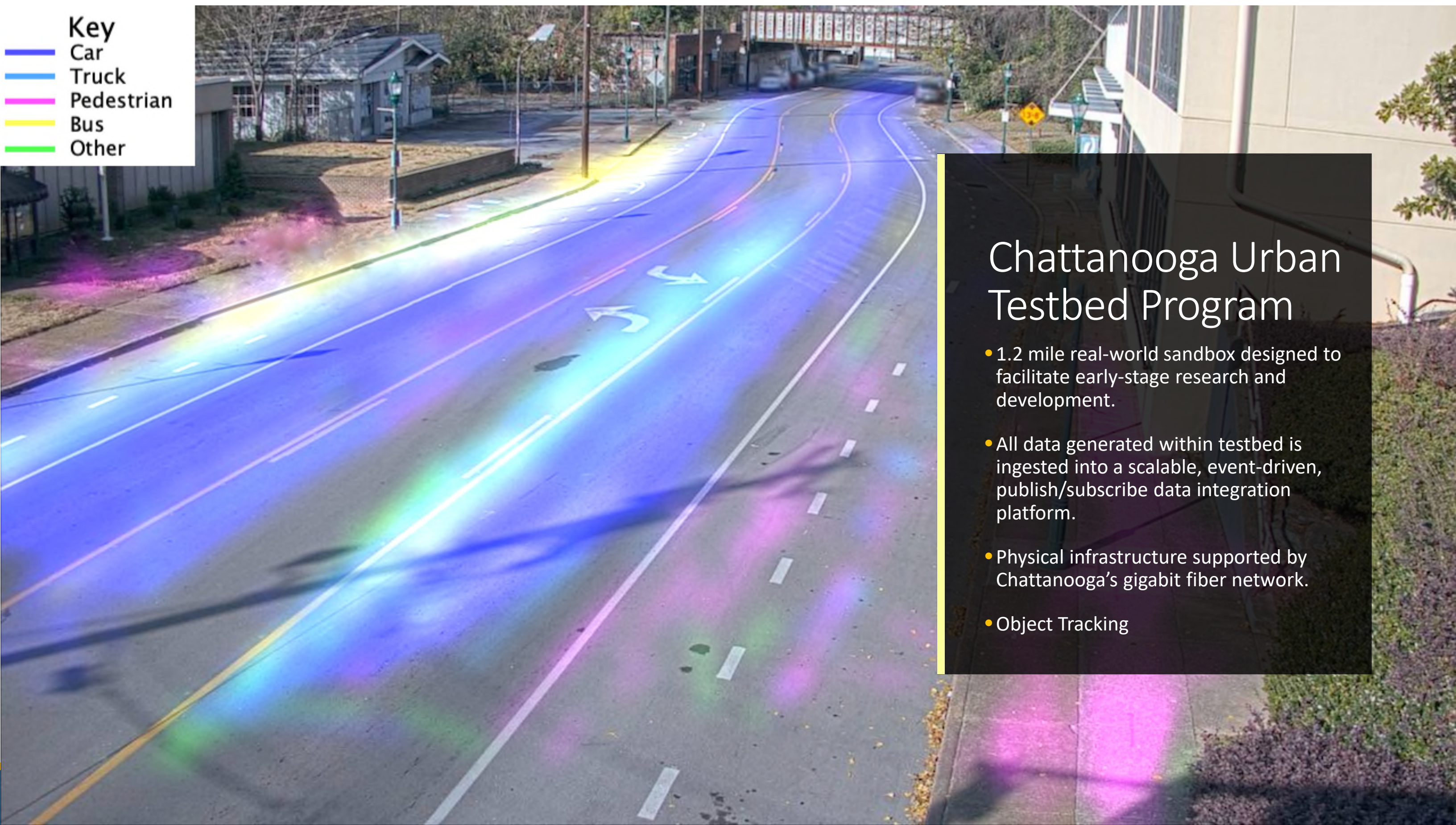
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- Install LiDAR and video sensors at key intersections and mid-block segments to collect:
  - Near-misses
  - Modal conflicts
  - Bike and pedestrian counts
  - Signal operation deficiencies
- Edge computing at signal cabinets
- Build on UTC's work along the Chattanooga Urban Testbed
  - Take next step from data collection to countermeasure implementation



**Key**

- Car
- Truck
- Pedestrian
- Bus
- Other



# Chattanooga Urban Testbed Program

- 1.2 mile real-world sandbox designed to facilitate early-stage research and development.
- All data generated within testbed is ingested into a scalable, event-driven, publish/subscribe data integration platform.
- Physical infrastructure supported by Chattanooga's gigabit fiber network.
- Object Tracking



# Vision Zero Countermeasure Implementation

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- Historically safety projects have relied on data from police reports
  - Written from a law enforcement POV
  - Not accurate from a transportation perspective
  - Captures only a small fraction of intersection events
- LADDMS will capture every event
  - Allows for ID of safety patterns
  - More data points more quickly
  - Greater accuracy to cause of safety incidents
  - Allows for real time evaluation of countermeasures
- Countermeasure installation
  - Tailored to greatest need
  - Data driven
  - Evaluate in a matter of days, weeks, months as opposed to years



# Stage 2 - Implementation

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- Able to apply after successful Stage 1
  - Verify technology
  - Accepted performance measures
  - Set safety evaluation period
  - Measurable safety improvements
- Stage 2
  - Expand along Vision Zero High Injury Network
  - Programmatic tool
  - Potential for mobile deployment from hot spot to hot spot



# ***NDOT***

## Traffic Impact Study (TIS) Guidelines Update Project

<https://www.nashville.gov/departments/transportation/developers/traffic-impact-study-tis-guidelines-update-project>



# Traffic Impact Study Guidelines Project

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Since 2004, Nashville has undergone enormous development changes and made significant investment in bicycle and pedestrian infrastructure, while new mobility-as-a-service (MAAS) technologies such as ridesharing and e-scooters have become an integral part of Nashville's transportation ecosystem.

This project will aim to modernize the Traffic Impact Study (TIS) Guidelines to align with existing mobility trends and current best practices to assist the Nashville Department of Transportation and Multimodal Infrastructure (NDOT) in building out a safe, efficient, and sustainable transportation network for all travel modes.

# Why Update?

## Challenge

### 1. Relevance

Outdated guideline not applicable to current state of practice

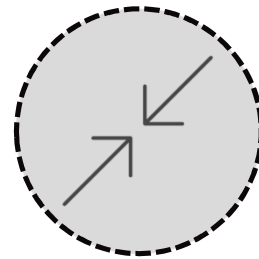


## Opportunity

Revise content to include current analysis best practices and to consider all modes

### 2. Consistency

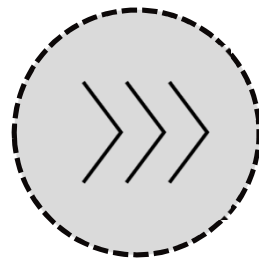
TIS Review guidelines not in alignment with updated code and recent transportation plans



Unify NDOT and Metro Nashville goals by revising guidelines to reference code and align with approved transportation plans

### 3. Efficiency

Inconsistent TIS review process creates unnecessary delay and ineffective outcomes



Leverage online platforms to provide developers with access to relevant data and transparent tracking of review status



# New Guidelines



## High-level Changes



Expanded scoping process to add clarity and efficiency



Greater emphasis on multimodal network analysis and safety review



Study requirements are more adaptable to the area context

# Scoping

## Applicant Review

1. Submittal Date
2. Planning Case No.
3. Project Name
4. Applicant Name
5. Applicant Contact Info
6. Study Type
7. **Council District**

## Project Review

1. Project Address
2. Existing and Proposed Trip Generation
3. Project Size/ Density
4. **Trip Reductions**

## Study Area Review

1. Build Year
2. Growth Rate
3. Background developments
4. Study Intersections

## Mobility Review

1. **MCSP Review**
2. **Pedestrian, Bicycle, and Transit network preliminary review**
3. **Safety preliminary review**

## Attachments

1. Study intersections
2. Site plan
3. Growth calculations
4. Loading plan

### Key

Old requirements that are staying the same

***New requirements***



# Project Timeline

Task	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Existing Assessment		[Blue bar]			★	[Blue bar]				
Interim Instructional Bulletin			[Blue bar]							
Policy and Process Revisions					[Blue bar]			★		
Digital Solution Development			[Blue bar]							

★ Stakeholder Meetings



***NDOT***

## Complete Streets Implementation Guide

<https://www.nashville.gov/departments/transportation/plans-and-programs/complete-streets>



# Green & Complete Streets Policy

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On May 23, 2016, Mayor Megan Barry signed Executive Order 31, which establish the city of Nashville's Green and Complete Street Policy. The policy established that "All Metro-owned transportation facilities in the public right-of-way including, but not limited to, streets, bridges and all other connecting pathways shall be designed, constructed, operated, and maintained to enhance environmental quality and to allow users of all ages and abilities to travel upon them safely and independently."

# Complete Street Implementation

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Item a of part 3 of the Green & Complete Streets Policy directed “All departments, agencies, or committees will review and modify current standards, including but not limited to internal policies, codes and ordinances, to ensure they effectively implement Green and Complete Streets principles; and such groups shall incorporate Green and Complete Streets principles into all future planning documents, manuals, design standards, checklists, decision-trees, rules, regulations, programs, and other appropriate endeavors”



# Complete Street Implementation Guide

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Goal: Develop an easy-to-use Complete Streets Implementation Guide for NDOT staff, consultants, and others involved in Complete Streets Implementation.

Guide Format: Highly visual user guide that references industry best practices, and includes 6 – 8 scenario application flowcharts/infographics.

# THANK YOU!

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***NDOT***



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[Nashville.gov/departments/transportation](https://www.nashville.gov/departments/transportation)