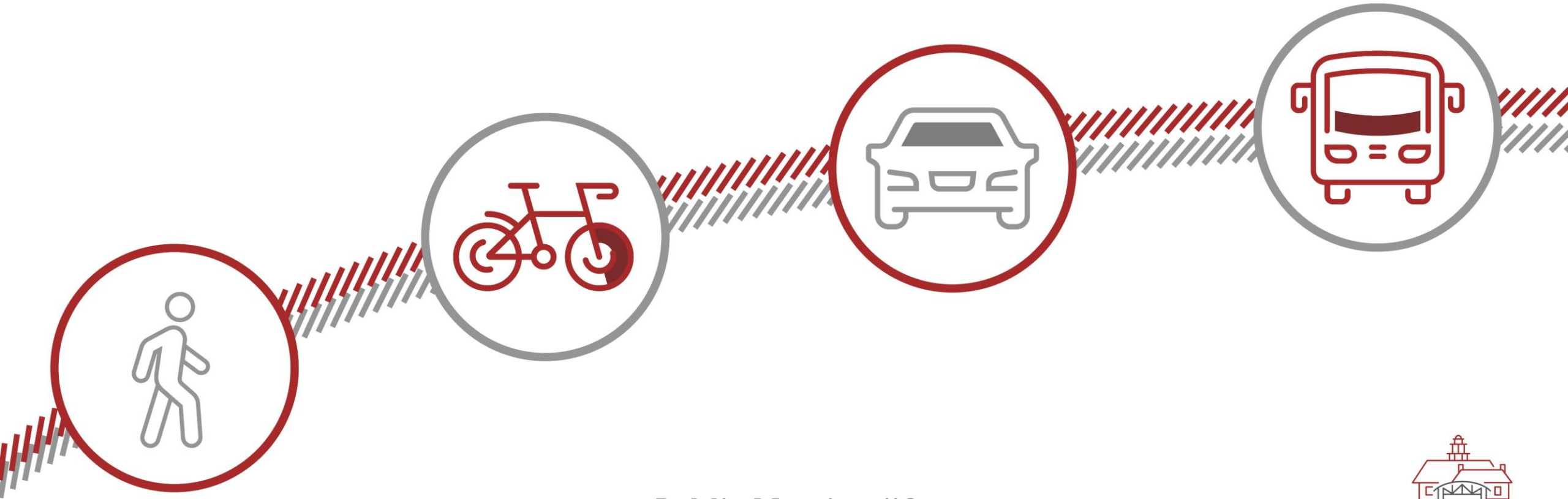


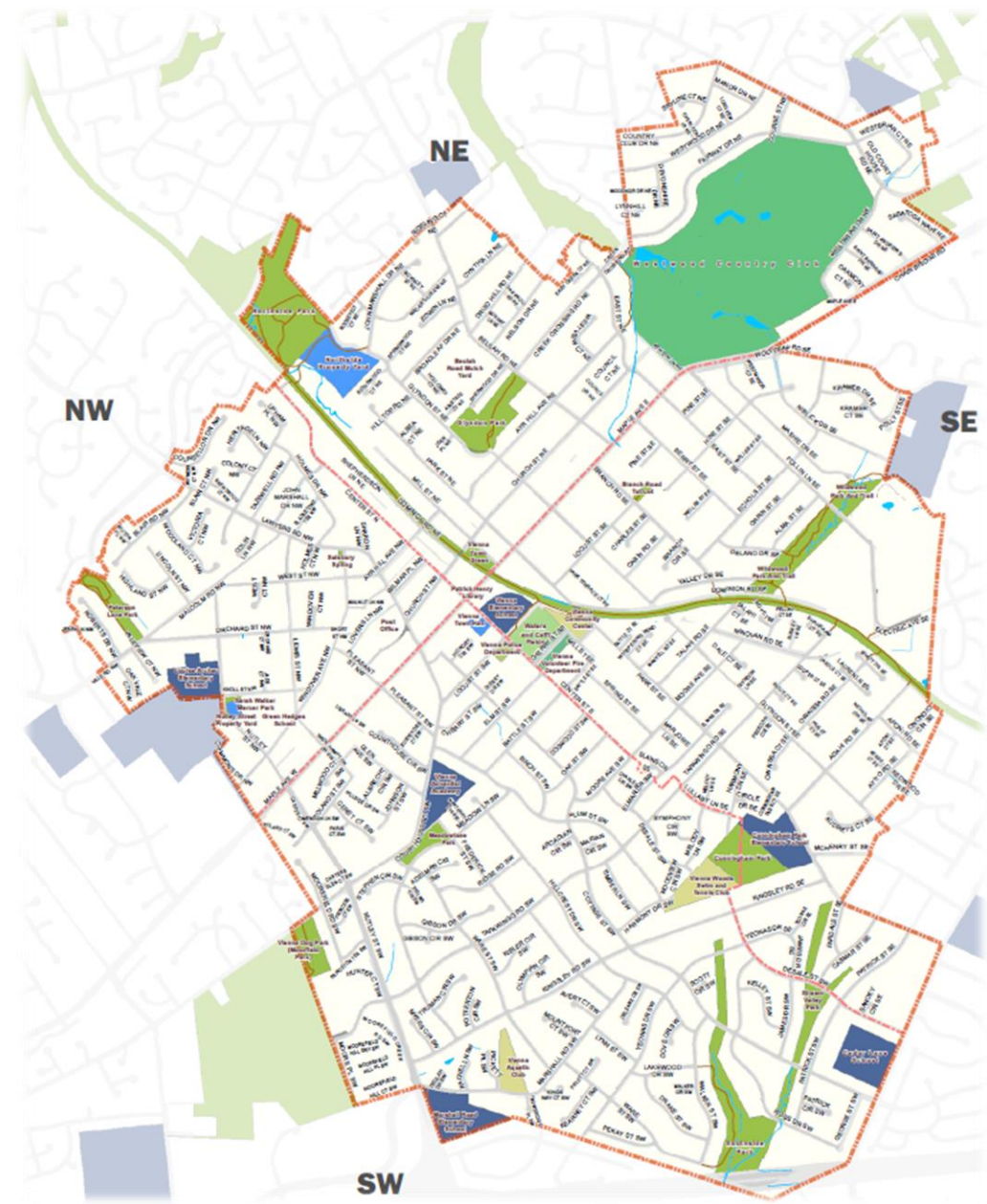
Maple Avenue Corridor

Multimodal Transportation and Land Use Study



Agenda

- Multimodal Study Recap
- Public Feedback
- Preliminary Study Concepts
 - Low Investment, High Impact
 - Providing More Travel Options
 - Completing the Network
 - Address Existing Challenges



Multimodal Transportation Study Recap

- Purpose
 - Analyze current and future multimodal transportation conditions
 - Develop near- and mid-term recommendations along Maple Avenue for all modes of transportation in coordination with existing and future land uses
- Existing Conditions
- Future Conditions
- Public Feedback Opportunities

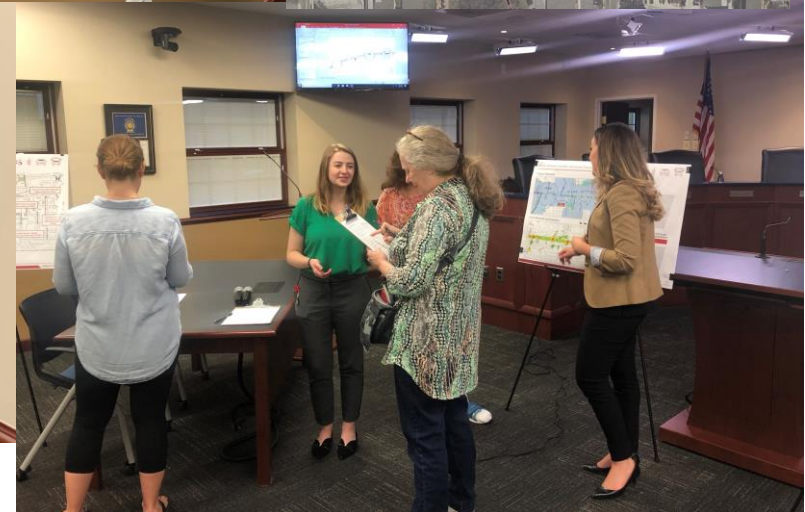
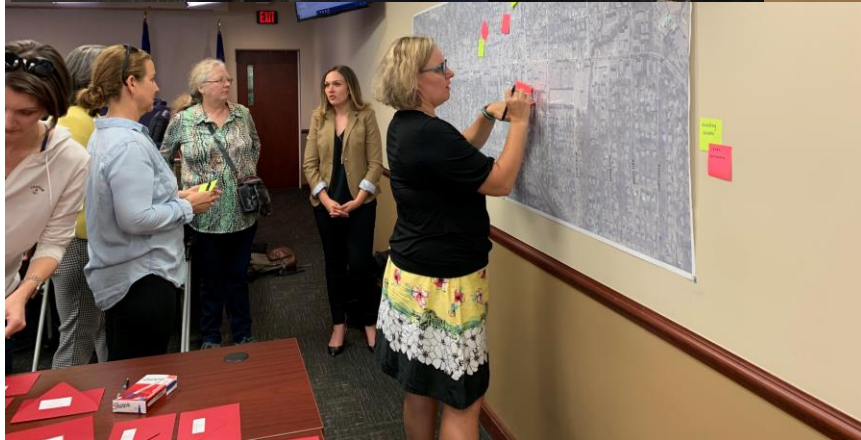
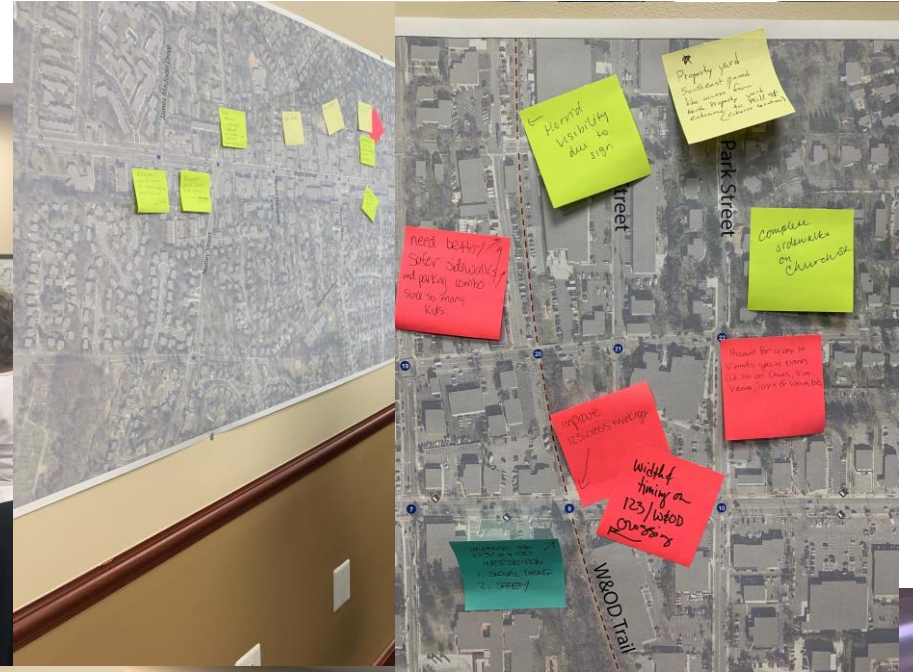


General Transportation Challenges

- Established, auto-oriented corridor
- Dual identity – “Main Street” versus “Arterial”
- Signal timing priorities
- Narrow sidewalks
- Interactions between pedestrians and autos
- Numerous full access commercial entrances
- Lack of on-street bicycle facilities
- Relatively low transit service frequency
- Numerous unconnected surface parking lots
- Discontinuous parallel street network south of Maple Avenue

Public Feedback Review

- Existing Conditions Briefing
- Future Conditions Workshop



Maple Avenue Corridor *Multimodal Transportation and Land Use Study*

Public Feedback Review

- Public Survey

WHAT ARE YOUR TOP FOUR PRIORITIES FOR TRANSPORTATION IMPROVEMENTS ALONG THE MAPLE AVENUE CORRIDOR?

Pedestrian, Bicycle, and Open Space

- A Bicycle Connectivity:** Provide a direct, safe, and continuous route for bike travel.
- B Make Streets Green:** Create more green space within the public right-of-way with medians, landscaping, and street trees.
- C Pedestrian Accessibility and Connectivity:** Widen sidewalks, provide more or improved crosswalks or signalized crossings, and improve accessibility for persons with disabilities throughout the study area.
- D Focus on Safety:** Implement projects that will improve physical safety and operations for all users.
- E Enhance Washington & Old Dominion Trail:** Enhance access and safety to and along the W&OD Trail.

Please rank your four most important transportation priorities (A to P), regardless of Category

Most Important Improvement Priorities:

Transit

- F Get Me to Metro:** Make it easier to get to Metrorail stations by walking, biking, and bus.
- G Get Me Around Town:** Make it easier to move to, from, and along the corridor by bus or circulator.
- H More Transit Service:** Provide public transit with a longer span of service (more hours of the day).
- I Fast and Reliable Transit:** Make public transit faster and help it stay on-schedule.
- J Enhance Bus Stops:** Add or upgrade bus stop amenities (shelters or benches), add real-time route information, move stops outside of pedestrian path.

Please write any additional comments in the box below:

Transportation Management

- K Public Parking Strategies:** Provide on- and off-street public parking options throughout the day.
- L Congestion Relief:** Improve the bottlenecks to keep traffic moving smoothly through the corridor.
- M Keep up with the Day-to-day:** Focus on doing maintenance such as filling potholes, fixing signs, and other community requests.
- N Activate Curb Space:** Manage curb space to balance deliveries, short and long-term parking, pickup/drop-off, and support for active modes of transportation.
- O Guide My Route:** Make small modifications to the street network and provide wayfinding signage for clear paths across town for all modes.
- P Emerging Trends:** Explore ways to integrate changing transportation trends and options (scooters, bikeshare, rideshare, autonomous vehicles).



HOW WOULD YOU INVEST TRANSPORTATION DOLLARS FOR EACH MODE ALONG THE MAPLE AVENUE CORRIDOR?

Please indicate how you would spend transportation funds by selecting ONE option in each category.

Please also share any specific ideas you have regarding how transportation funds should be invested at the bottom of this form.

What would improve traffic flow and safety?

Improve Signal Timing	Relieve Existing Bottlenecks	Roadway Maintenance and Repair	Traffic Calming or Driveway Management	Other
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What type of bicycle improvements would make you more likely to ride?

Bikeshare Stations	On-Street Bike Lanes	Trail Enhancements	Bike Parking	Other
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What would improve your walking experience?

Improve/Enhance Street Crossings	Streetscaping Improvements / Widen Sidewalks	Trail Enhancements	Fill Existing Sidewalk Gaps	Other
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What public transit improvements would be most useful?

Fast and Reliable Bus Service	Enhanced Bus Stops	More Frequent Bus Service	Local Circulator Service	Other
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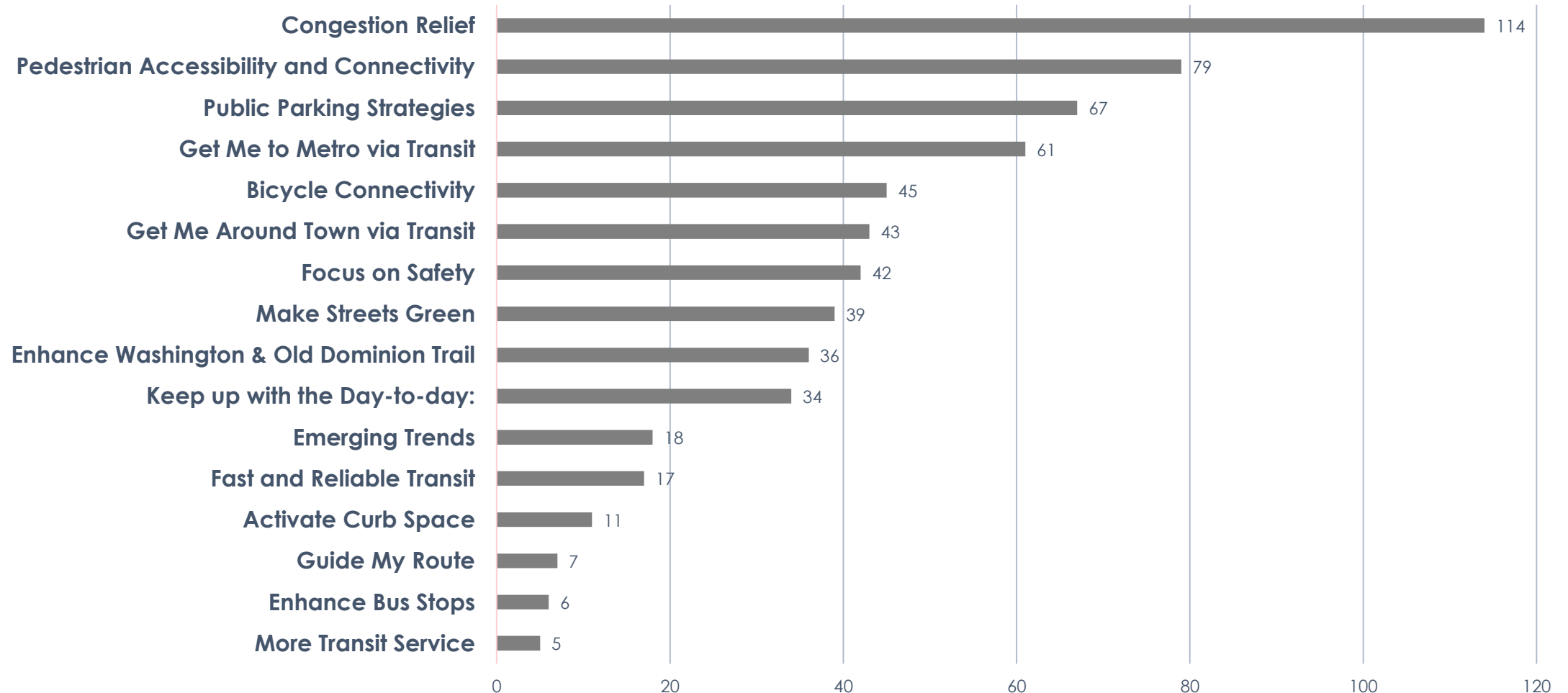
What other types of improvements would improve mobility and access?

Curb Space Management	Emerging Trends (E-Scooters, Rideshare, Etc.)	Wayfinding	Public Parking (On- or Off-Street)	Other
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My Investment Idea:

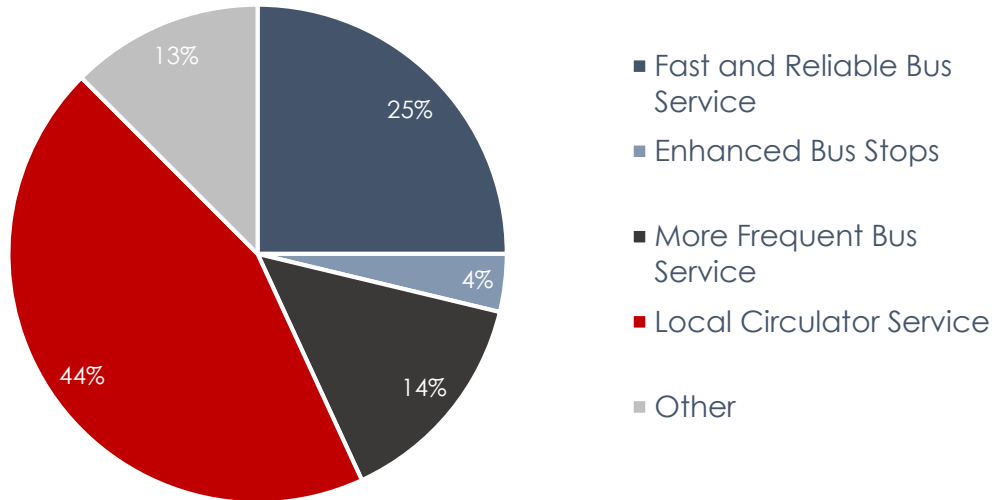


Public Feedback Review – Priorities

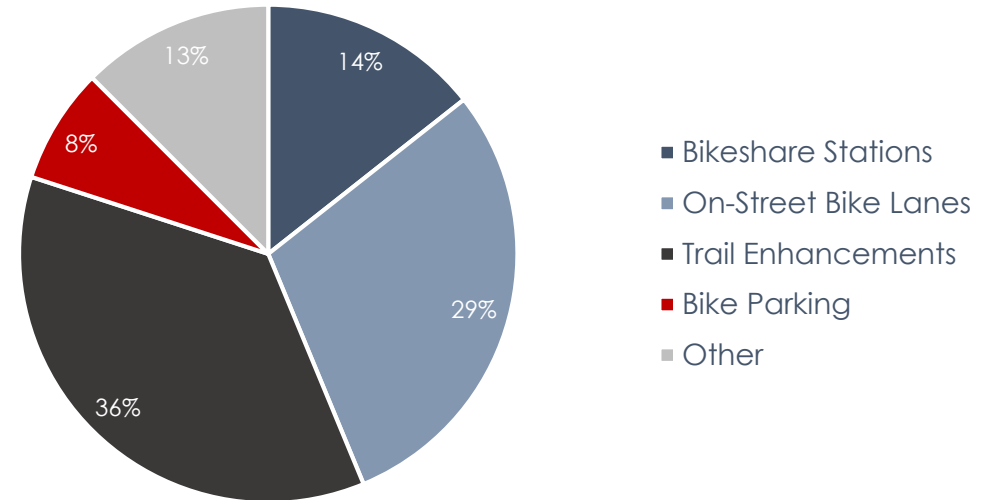


Public Feedback Review – Modal Investment

What public transit improvements would be most useful?

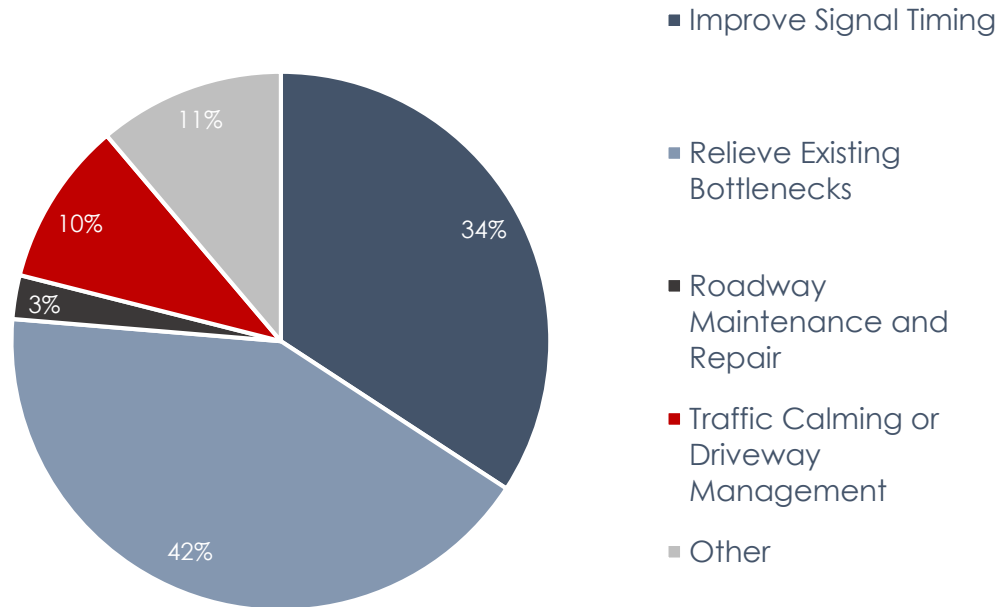


What type of bicycle improvements would make you more likely to ride?

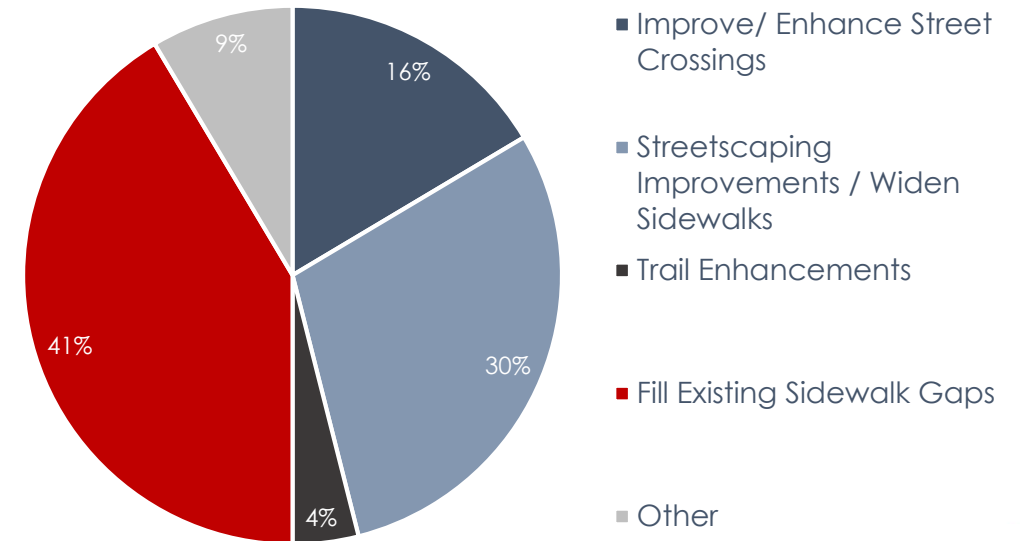


Public Feedback Review – Modal Investment

What would improve traffic flow and safety?



What would improve your walking experience?



Your Ideas – Low Investment, High Impact

Safer Crossings for Bike and Ped ●●●●●●

Community Art

Encourage Multimodal Alternatives ●●●

Bike Education and Comfort Map

Adding Green Space ●●

Campaign Against Distracted Driving



Your Ideas – More Travel Options

Adding Bike Lanes ●●●●●

Circulator Bus ●●

Parking Garage with Shuttle Bus ●●

More Routes through Town



Your Ideas – Completing the Network

More Sidewalks ●●●●●

Pedestrian Bridges ●●



Your Ideas – Addressing Existing Challenges

More Parking ●●●●●●●●●●

Traffic Enforcement ●●

Maple Avenue Bypass ●●●●●●●●●●

Widening Maple Avenue ●●

Slower Speed Limit on Maple Avenue

Reversible “Flex” Lane on Maple Avenue

More Left-turn Lanes ●●

Embrace Town Appropriate Development ●●●●●●●●

Calm Traffic through Neighborhood Streets ●●●



This Evening...

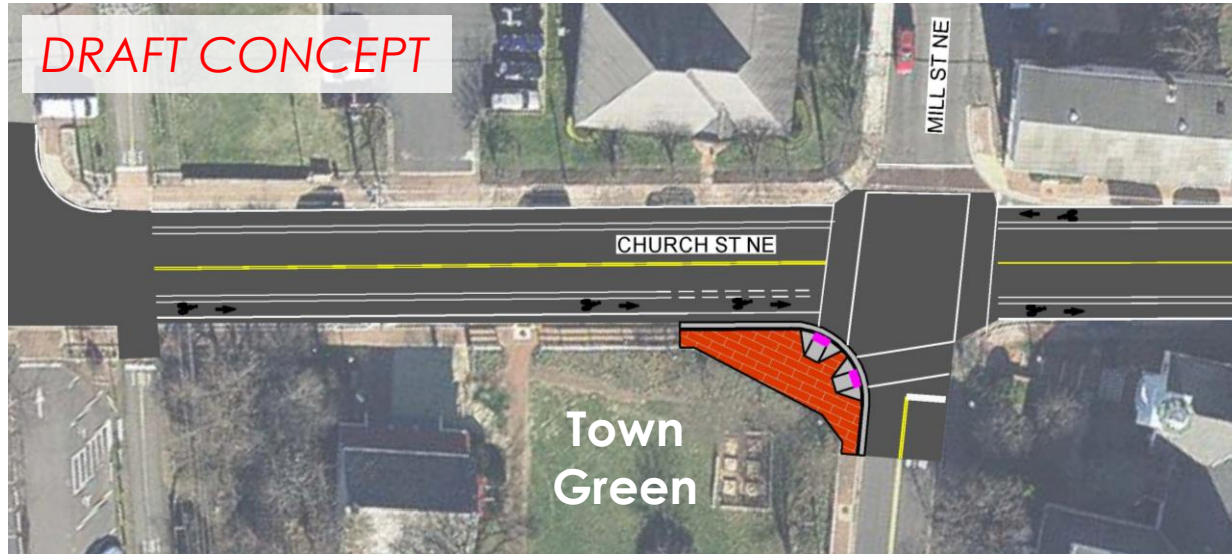
- Discuss and prioritize working concepts
- Identify “Gaps” between corridor challenges and concepts
- Identify additional options



I. Low Investment, High Impact

Working Concepts

Church Street and Mill Street *Slip Lane Removal and Intersection Redesign*



Description:

Redesign intersection to remove the existing slip lane at the SW corner of the intersection. This redesign normalizes intersection geometry, realigns crosswalks for shorter pedestrian crossings, and expands public space at the NE corner of the Town Green.

Challenges:

- Curb work required
- Potential need for utility relocation
- Potential for vehicle queuing at intersection

Opportunities:

- Reduced curb radii for slower, safer vehicle turns
- Shorter and more direct pedestrian crossings
- Elimination of slip lane elevates pedestrian access and safety

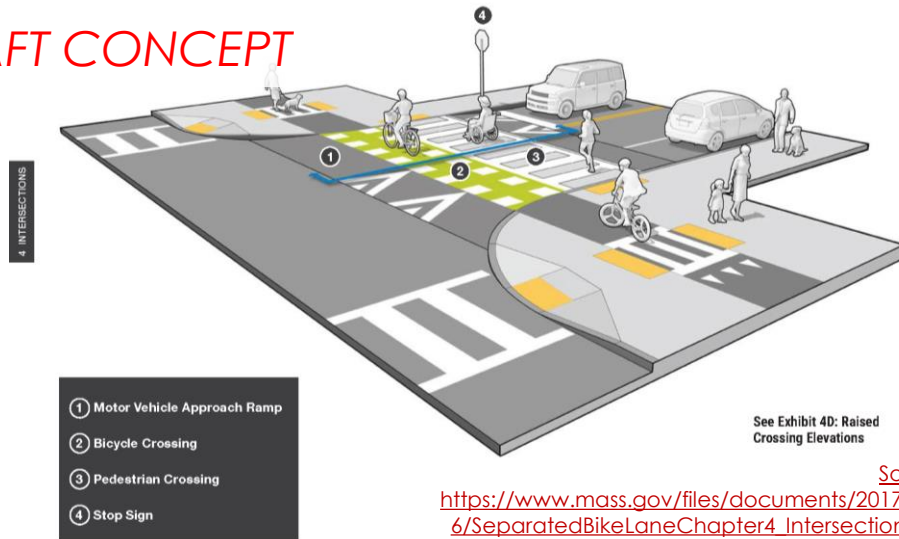
Timeline:

- Near-term

Crosswalks

W&OD Trail Crossing Redesigns

DRAFT CONCEPT



Source:
https://www.mass.gov/files/documents/2017/10/26/SeparatedBikeLaneChapter4_Intersections.pdf

Description:

Redesign crossings of the W&OD Trail at Maple Avenue and Church Street. These redesigns provide raised crossings of the trail, high-visibility pedestrian and cyclist crossing markings, consistent signage, and relocated signal push buttons.

Challenges:

- Potential right-of-way constraints
- Potential utility conflicts
- Emergency vehicle response time

Opportunities:

- Visual prominence for trail crossings
- Indicates pedestrian and cyclist priority
- Provides consistency for all trail crossings town-wide

Timeline:

- Mid-term

Crosswalks *W&OD Trail Crossing Redesigns*

at Maple Avenue

Existing



at Church Street

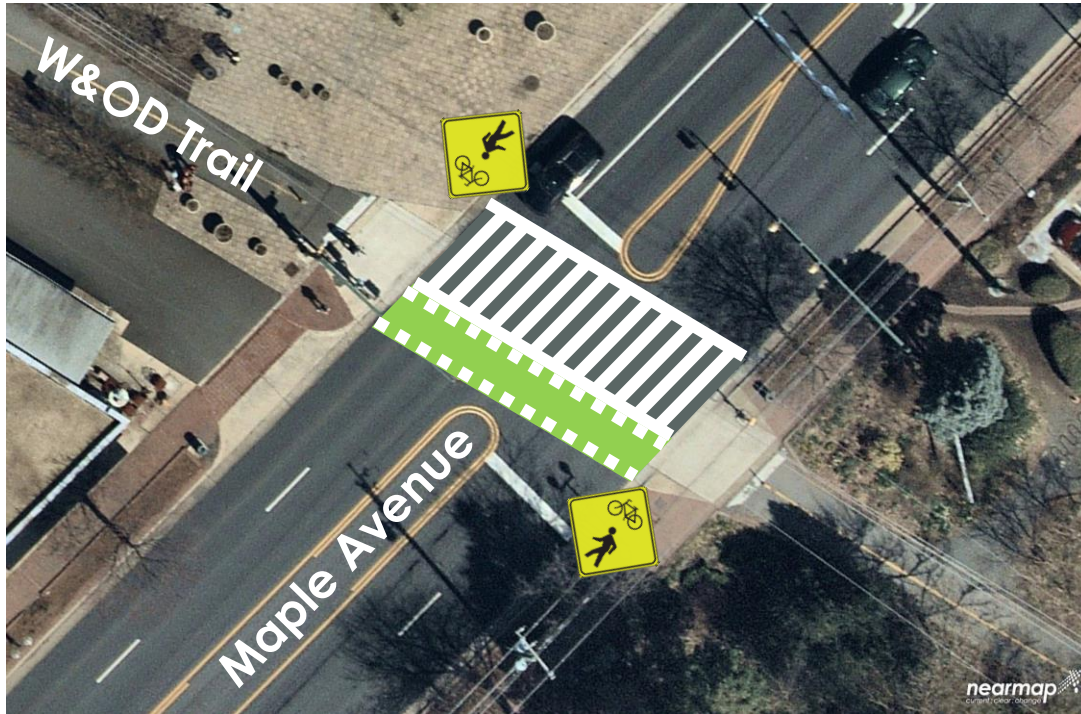
Existing



Crosswalks *W&OD Trail Crossing Redesigns*

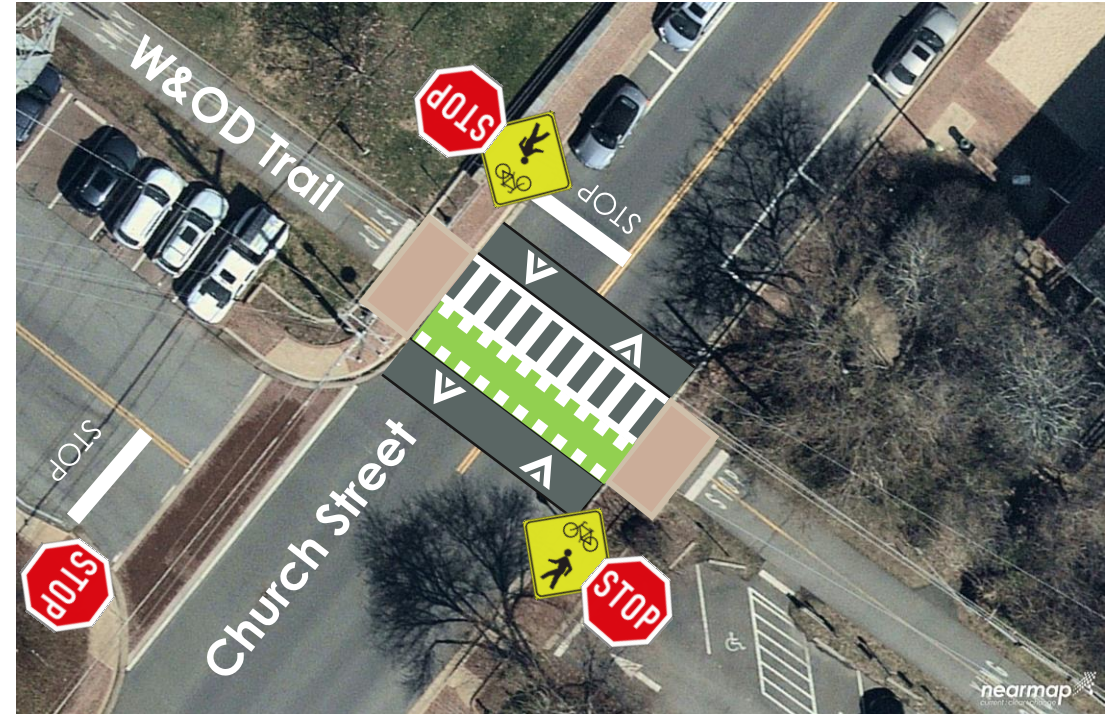
at Maple Avenue

High-Visibility Crosswalk



at Church Street

Raised Crosswalk

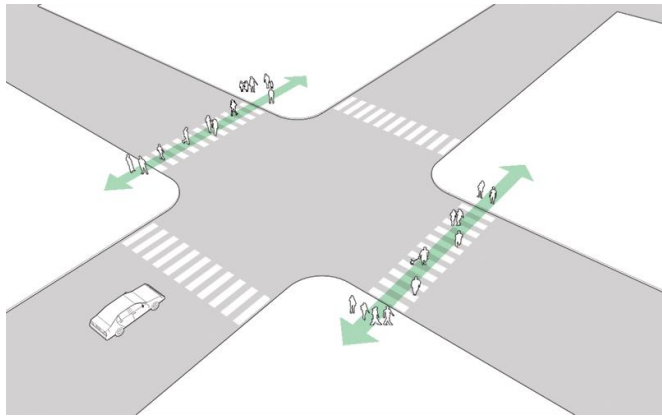


Additional W&OD Trail Crossing Considerations

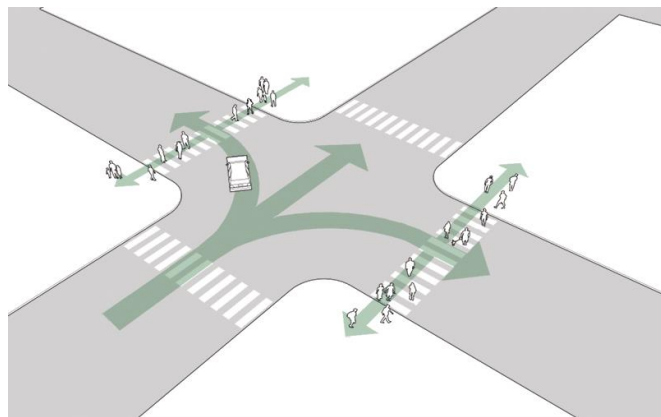
- Signage
 - Adopt a consistent trail crossing sign style to use Town-wide
- Markings
 - Install high-visibility markings at Church Street
- Push buttons
 - Relocate pedestrian signal buttons back from the street to increase safety
- Lighting
 - Enhance or add pedestrian scale lighting at trail crossings



Leading Pedestrian Intervals (LPI)



Phase 1: "Walk" signal for pedestrians



Phase 2: Delayed green light for vehicles

Description:

Adjust signal timing at intersections that see significant pedestrian activity. A Leading Pedestrian Interval (LPI) typically gives pedestrians a 3–7 second head start when entering an intersection with a corresponding green signal in the same direction of travel.

Challenges:

- May conflict with leading left turns
- May conflict with right turn on red
- Signal timing impacts

Opportunities:

- Gives pedestrians a head start
- Enhances the visibility of pedestrians
- Reinforces pedestrian right-of-way
- Shown to reduce pedestrian-vehicle collisions as much as 60%*

Timeline:

- Near-term

*National Association of City Transportation Officials (NACTO)

Leading Pedestrian Intervals



All-Way Stops



Description:

Install stop signs and mark stop bars at all intersection approaches at:

- Church Street and Dominion Road (W&OD Trail)
- Center Street and Locust Street (Vienna Elementary)



Challenges:

- Awareness and education

Timeline:

- Near-term

Opportunities:

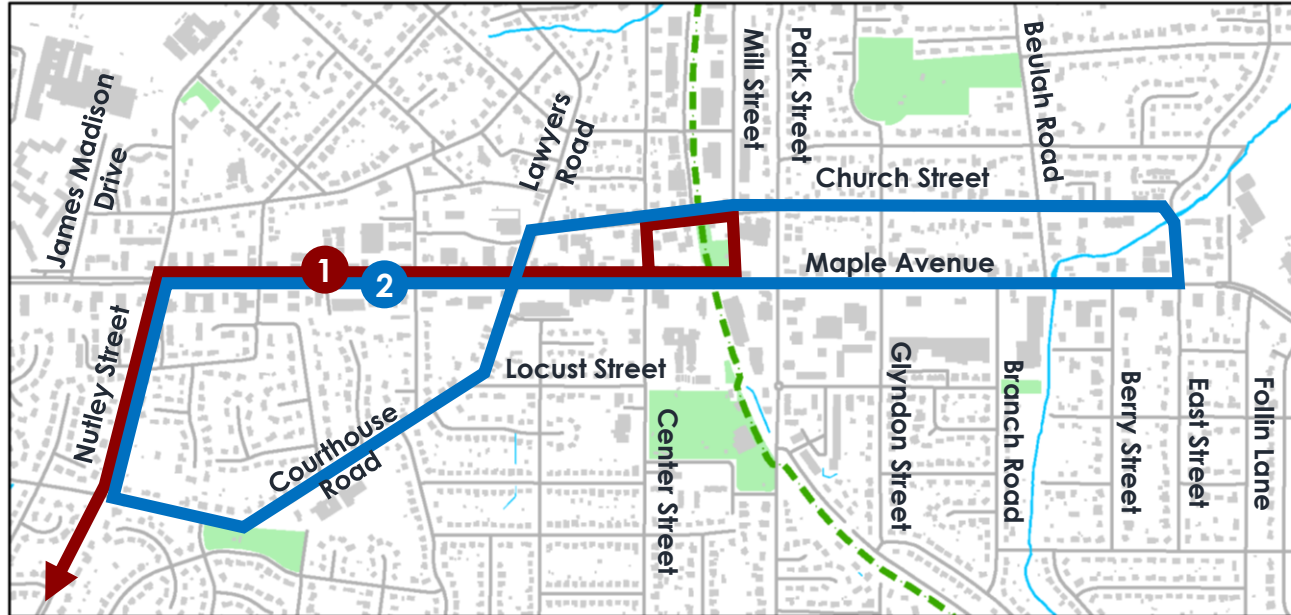
- Traffic calming
- Enhanced pedestrian and bicycle crossings

II. Provide More Travel Options

Working Concepts



Local Circulator



Description:

Provide frequent, all day bus service to and between Maple Avenue and Church Street destinations. Potential Route Options:

- ① Maple Avenue to Metro Express “Maple-2-ME”
- ② Maple Avenue-Church Street Loop

Challenges:

- Relatively high cost
- Ridership
- Integration with Fairfax Connector service
- Desired headways
- Church Street geometry

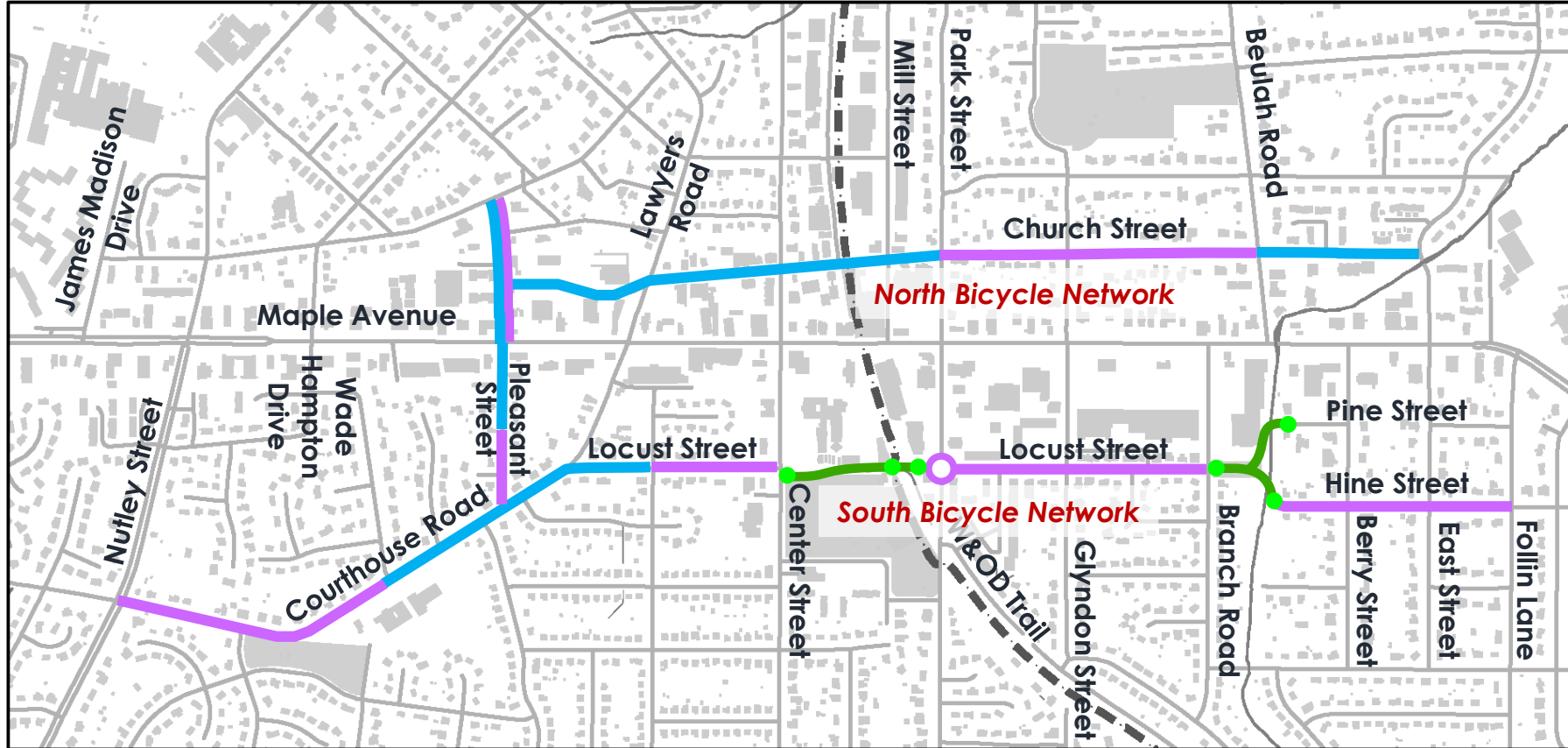
Opportunities:

- Fills existing local transit gap
- Serve local trips for existing and future residents

Timeline:

- Mid-term

Bicycle Network – Proposed



Trail and Access Point



Bike Lane



Shared Lane

Church Street *Buffered Bike Lanes*



Description:

Install buffered bike lanes along Church Street between Pleasant Street and Park Street. This design removes existing on-street curbside parking and should only be considered if the Town constructs a new parking garage in the vicinity to meet Church Street parking needs.

Challenges:

- Loss of ~ 127 on-street parking spaces
- Increased need for enforcement
- ***Contingent on Town providing structured parking to replace lost on-street spaces**

Opportunities:

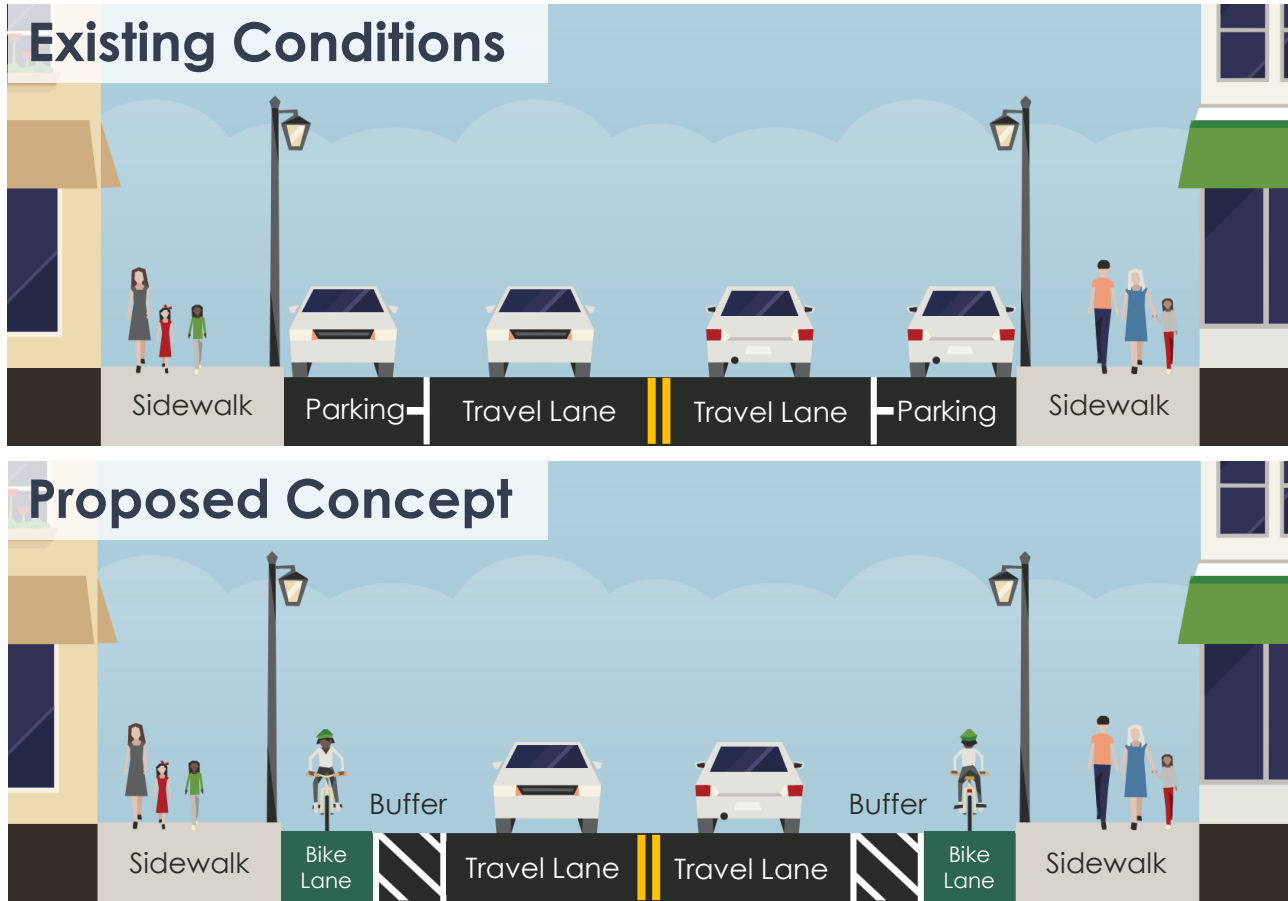
- New bike facility parallel to Maple Avenue
- Increased safety for cyclists
- Reduced parking may decrease traffic
- Narrower traffic lanes may decrease speeds

Timeline:

- Mid-term

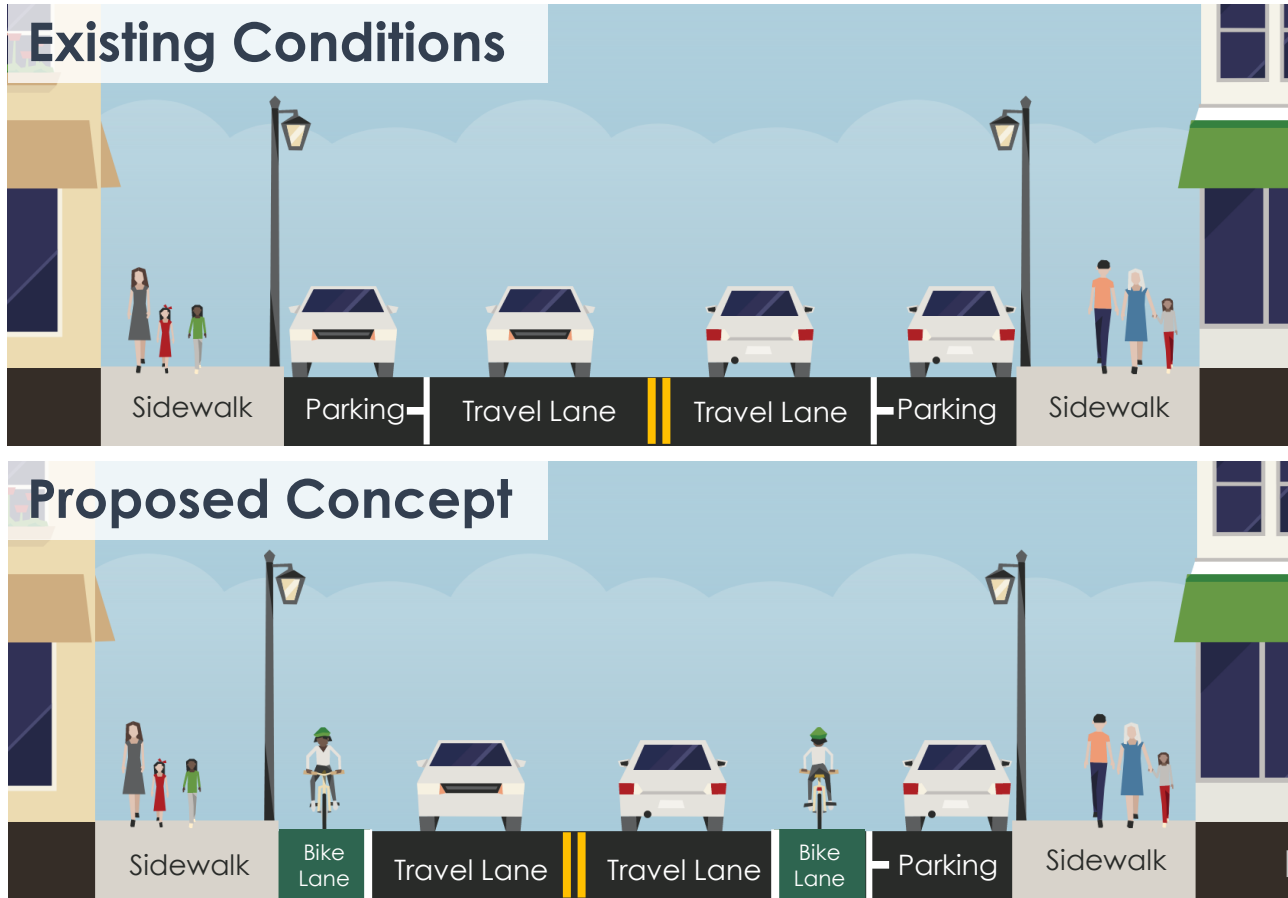
Church Street

Buffered Bike Lanes



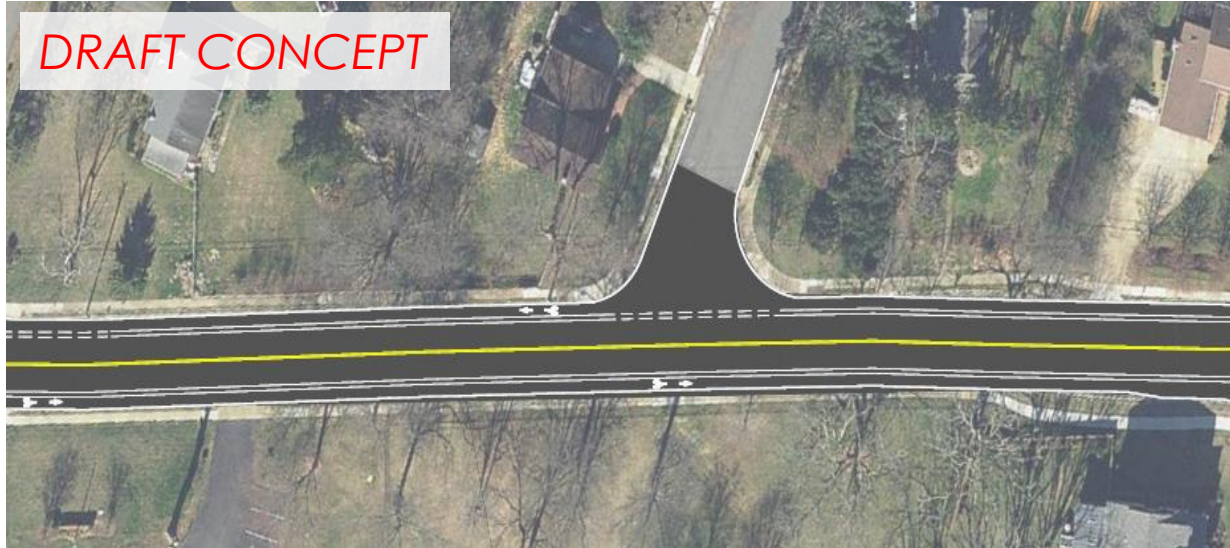
Church Street

Standard Bike Lanes (Alternate Concept)



Courthouse Road

Shoulders to Bike Lanes



Description:

Convert existing shoulders along Courthouse Road to bike lanes. Existing shoulders between Locust Street and Glen Avenue present ample width for bike lanes. However, the narrower cross section between Glen Avenue and Nutley Street can only accommodate shared lanes (“sharrows”).

Challenges:

- Conflicts at adjacent residential driveways
- Loss of de-facto parking areas
- Variable/inconsistent width of existing shoulders

Opportunities:

- New bike facility parallel to Maple Avenue
- Increased safety for cyclists
- Narrower traffic lanes may decrease vehicle speeds

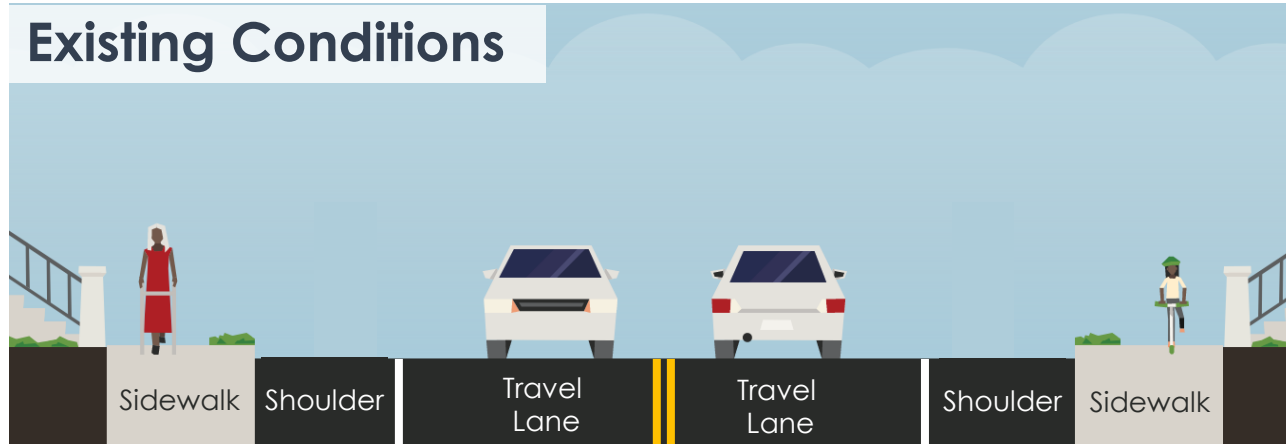
Timeline:

- Near-term

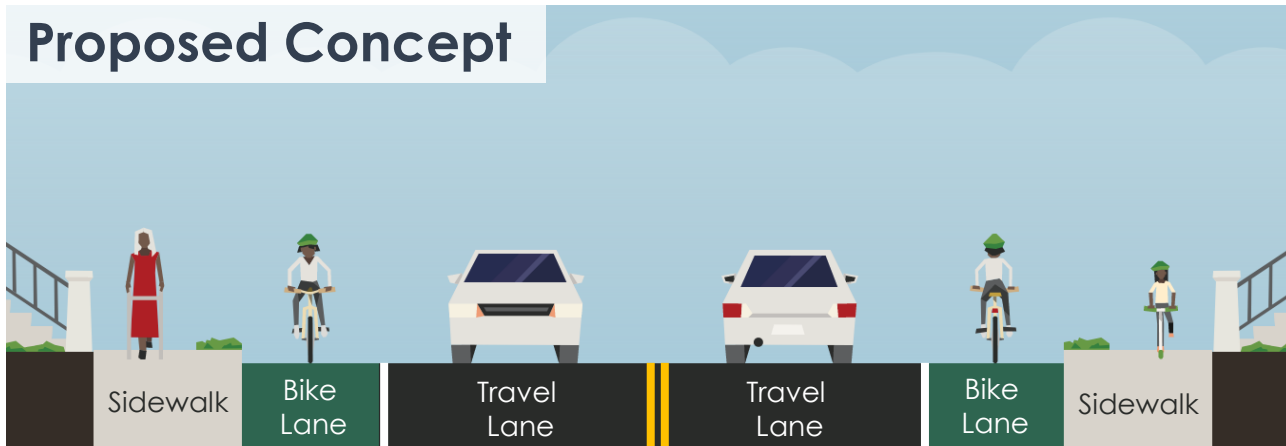
Courthouse Road

Convert Shoulders to Bike Lanes

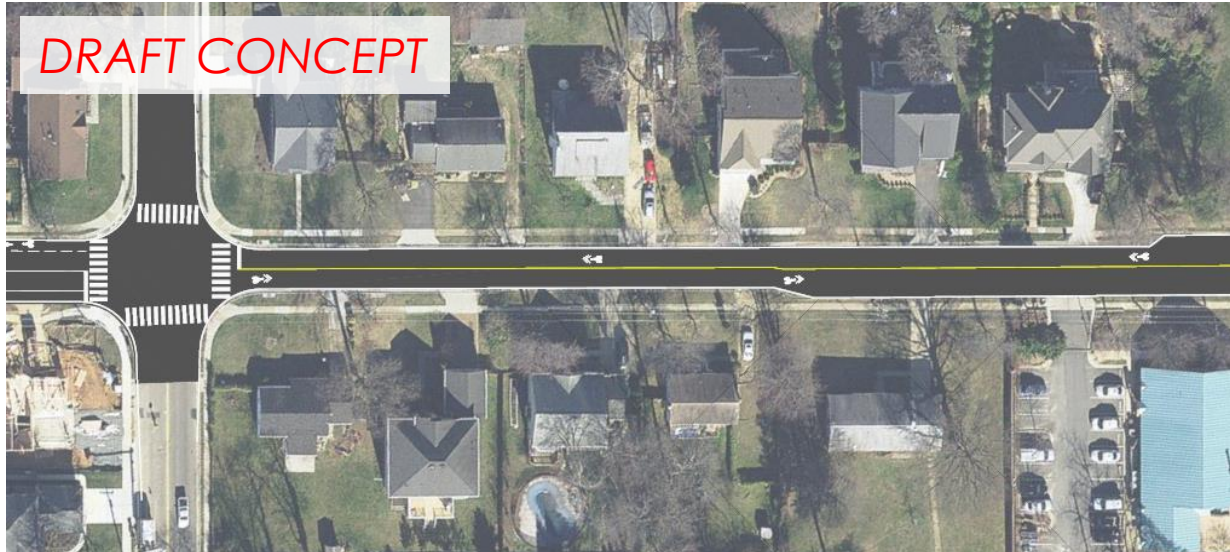
Existing Conditions



Proposed Concept



Locust Street and Hine Street *Shared Lanes to W&OD Trail*



Description:

Install shared lanes (“sharrows”) on Locust Street and Hine Street connecting to the W&OD trail.

Challenges:

- Potentially unfamiliar to cyclists and drivers
- Slow vehicle speeds required
- Not ideal for new cyclists or children
- Right-of-way needed for trail connections

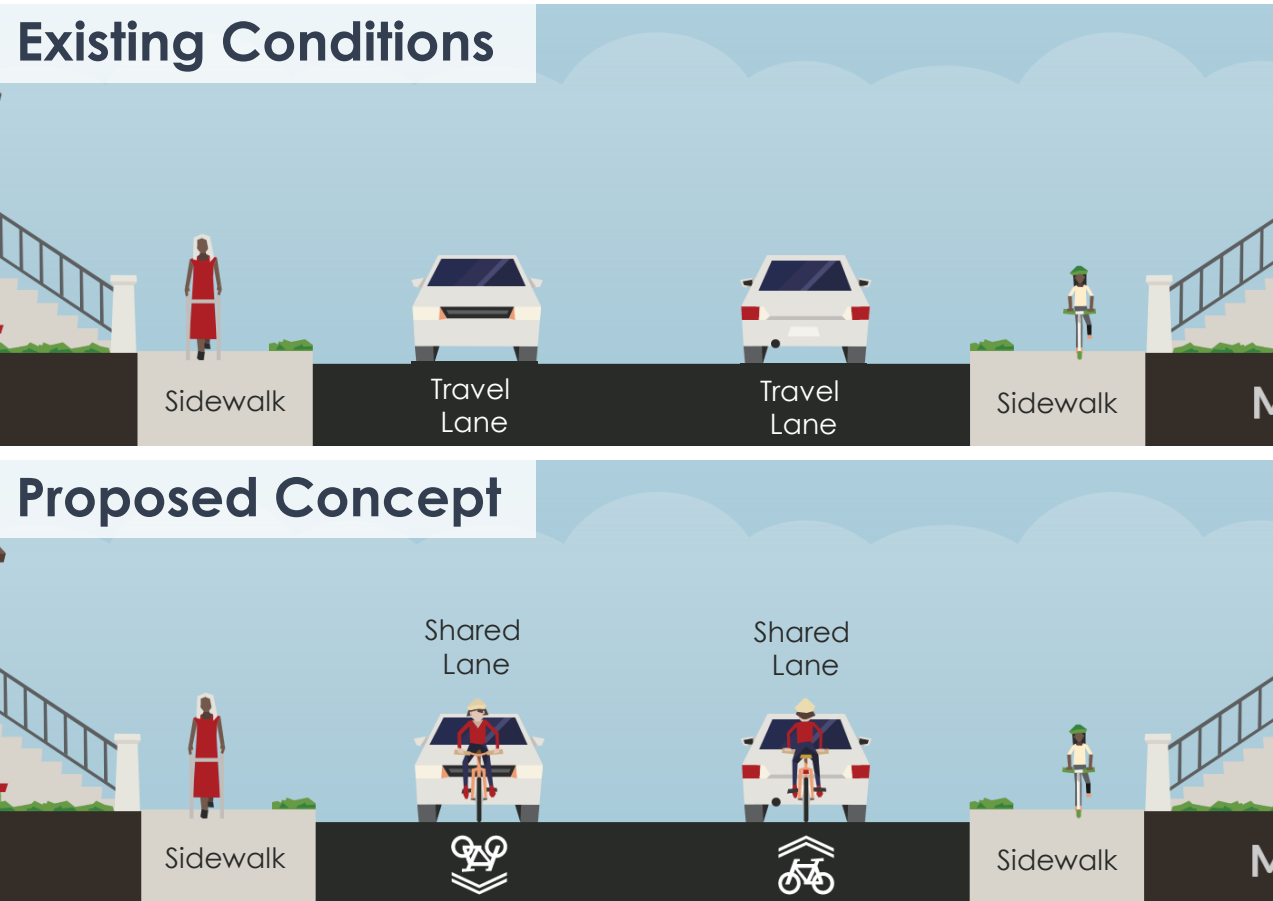
Opportunities:

- Greater connectivity to W&OD Trail
- Safer alternate route for residents
- Increased visibility for cyclists

Timeline:

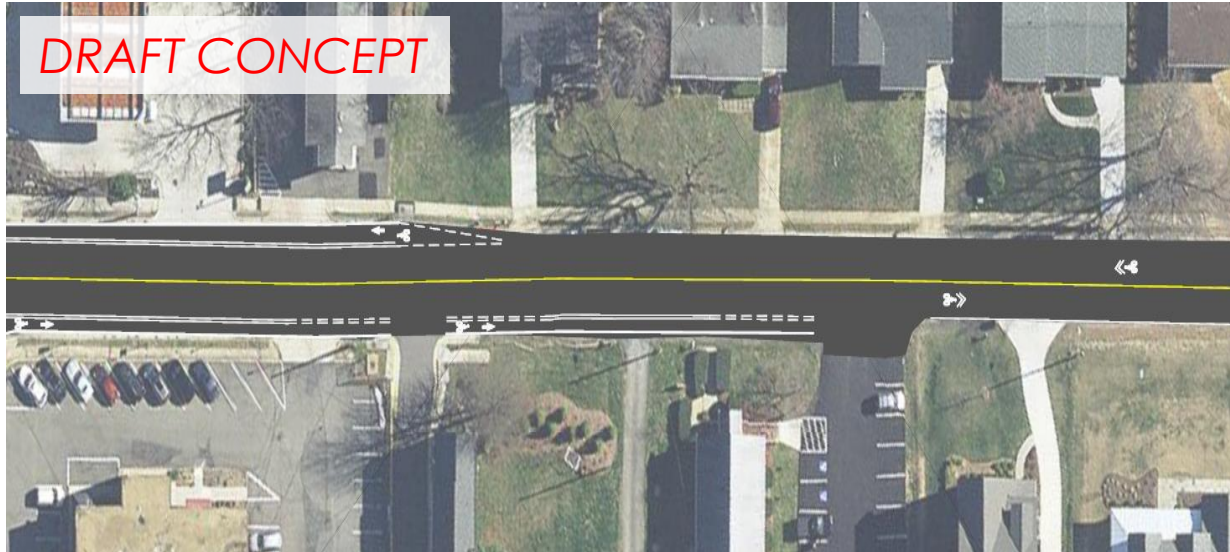
- Near-term

Locust Street and Hine Street *Shared Lanes to W&OD Trail*



Pleasant Street

Bike Lanes and Shared Lanes



Description:

Install bike lanes and shared lanes (“sharrows”) along Pleasant Street. Bike lanes in both directions are proposed where street width allows, while a bike lane in one direction and shared lanes in the other are proposed on narrower segments.

Challenges:

- Increased need for enforcement
- Variable curb width

Opportunities:

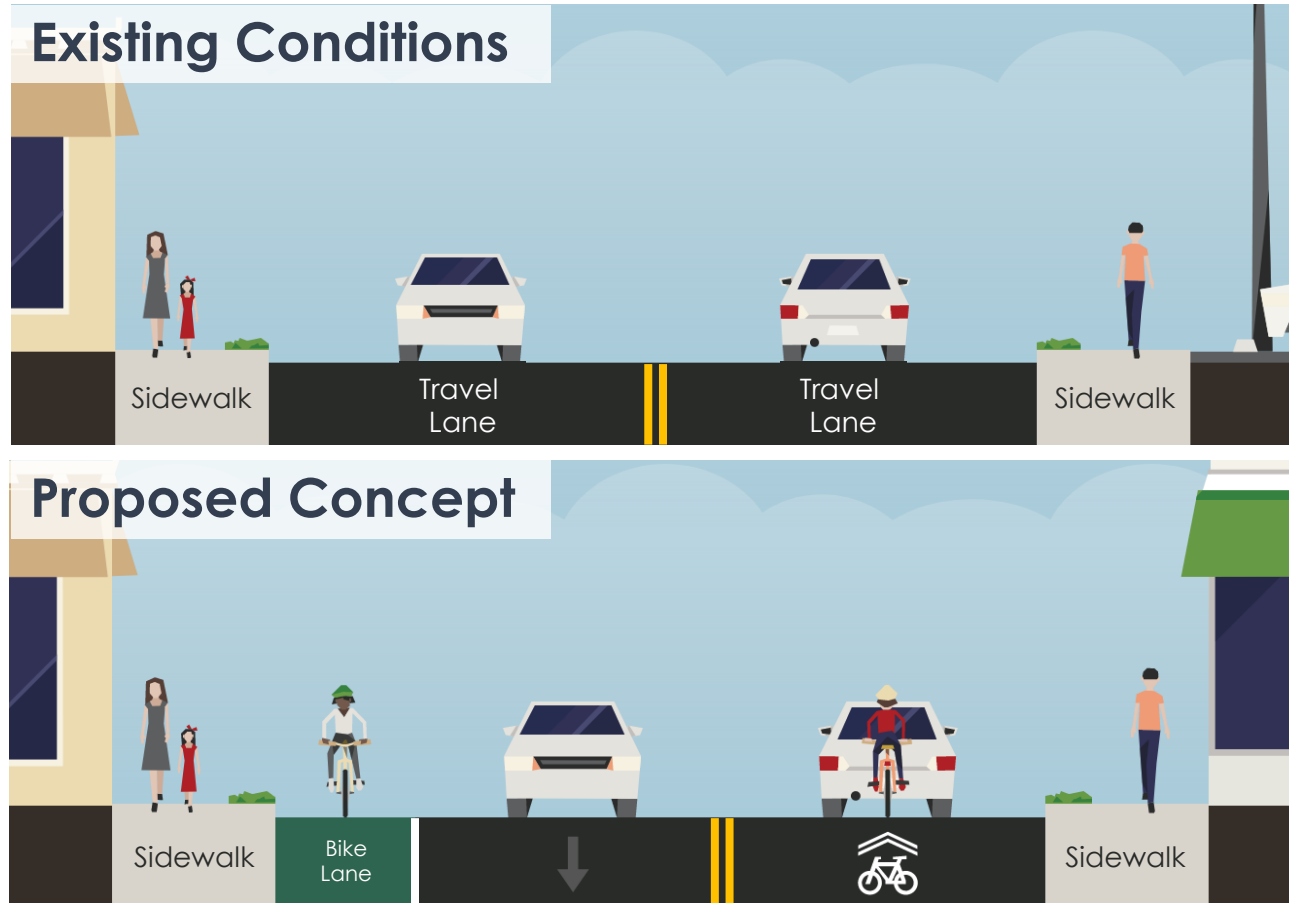
- New bike facility across Maple Avenue
- Increased visibility for cyclists
- Narrower traffic lanes may decrease vehicle speeds
- Coordination with private redevelopment

Timeline:

- Near-term

Pleasant Street

Bike Lanes and Shared Lanes



Locust Street Trail Improvement / Extension



Pleasant Street and Courthouse Road *Operational Improvements*



Description:

Relocate the existing HAWK signal approximately 400 feet to the west to be at the middle of the block and to serve potential future parking. Install a new traffic signal at the intersection of Maple Avenue and Pleasant Street to absorb additional left turns, relieving the demand for turns at Courthouse Road (also supports potential bicycle crossing).

Challenges:

- Signal relocation and installation

Opportunities:

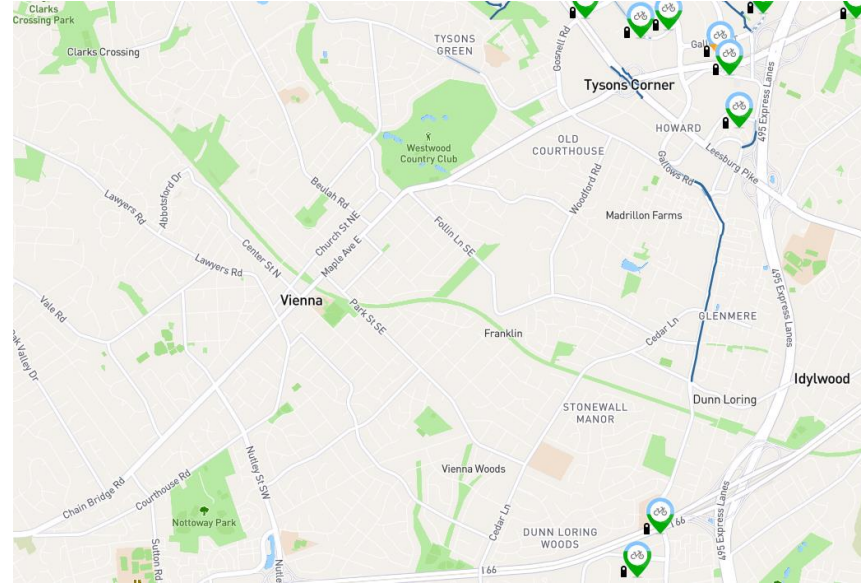
- New and relocated pedestrian crossings

Timeline:

- Mid-term

Capital Bikeshare

Explore Feasibility / Deployment



Source: Capital Bikeshare

Description:

Explore the feasibility and deployment of Capital Bikeshare docking stations in Vienna.

Challenges:

- Station siting

Opportunities:

- Fill gaps in the regional bikeshare network
- Leverage W&OD Trail access
- Provide new cycling options for residents and visitors

Timeline:

- Mid-term

III. Complete the Network

Working Concepts



Curb Ramps at Intersections



Example of a diagonal curb ramp.



Example of a perpendicular curb ramp.

Description:

Install perpendicular curb ramps to replace existing diagonal curb ramps at study area intersections as feasible. Perpendicular curb ramps provide are better aligned with marked crosswalks and provide better directional cues for blind or visually impaired pedestrians and wheelchair users.

Challenges:

- Signal timing changes
- Drainage
- Potentially longer crossing distances

Opportunities:

- Curb ramps align with crosswalks
- Better directional cues for blind or visually impaired pedestrians, wheelchair users
- Push buttons can be separated

Timeline:

- Mid-term

Curb Radii Reduction



Description:

Reduce curb radii at key intersections to facilitate safer, slower vehicle turning movements at street corners.

Challenges:

- Curb work required
- Utility conflicts
- Large truck turning movement conflicts

Opportunities:

- Slower, safer vehicle turns
- More comfortable, shorter pedestrian crossings

Timeline:

- Mid-term

Roadway Operation/Safety Improvements



Description:

Address bottlenecks and safety at specific intersections through a combination of signal timing, geometry modifications, and phasing changes.

Challenges:

- Responsive to current but not future traffic
- Limited to what can be achieved within ROW

Opportunities:

- Relatively quick implementation
- More efficient use of the existing network
- Prioritizes safety

Timeline:

- Near-Term



Branch Road – Beulah Road *Realignment/Connection (Concept A)*



Description:

Construct a new local street to serve vehicular demand between Branch Road and Beulah Road. A new alignment may present new development or public space opportunities for the existing right-of-way.

Challenges:

- Significant right-of-way needs
- Wolftrap Creek and environmental considerations

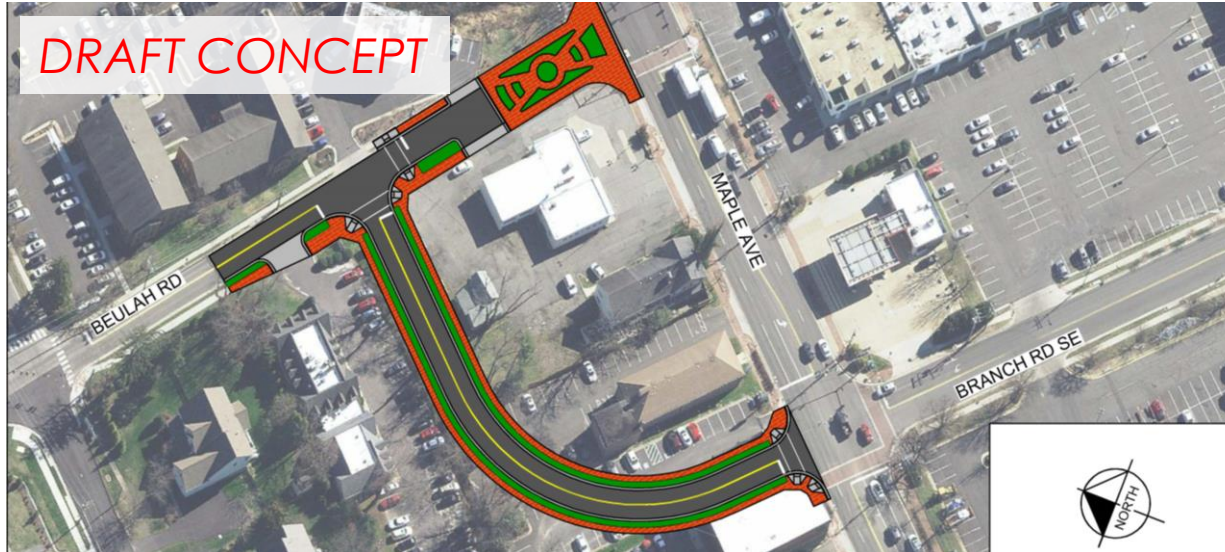
Opportunities:

- New street network connections
- Enhanced pedestrian and bicycle connections

Timeline:

- Mid-term

Branch Road – Beulah Road *Realignment/Connection (Concept B)*



Challenges:

- Significant right-of-way needs
- Property impacts

Opportunities:

- New street network connections
- Enhanced pedestrian and bicycle connections

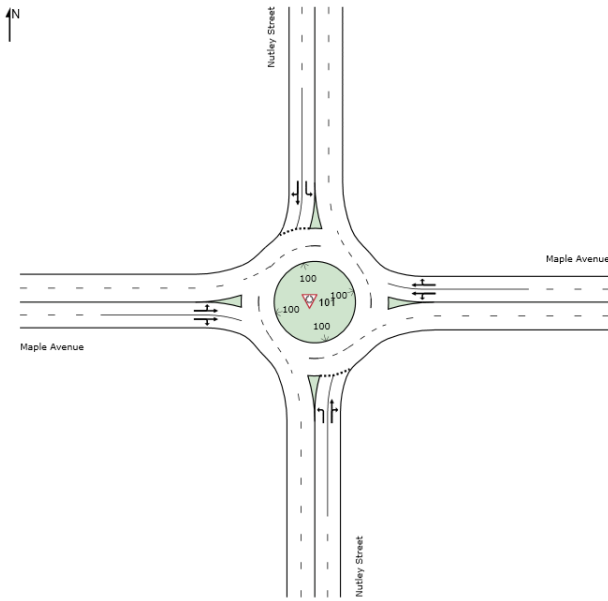
Timeline:

- Mid-term

Description:

Construct a new local street to serve vehicular demand between Branch Road and Beulah Road. A new alignment may present new development or public space options for the existing right-of-way.

Maple Avenue and Nutley Street Roundabout



Description:

Convert the existing signalized intersection to an urban multilane roundabout.

Challenges:

- Right-of-way /Property
- Pedestrian and bicyclist circulation
- Community familiarity and safety
- High cost of implementation

Opportunities:

- Traffic calming
- Gateway treatment
- Congestion/Delay reduction

Timeline:

- Mid-term

Raised Medians



Description:

Install raised medians along Maple Avenue in four key locations:

1. Glyndon Street to Branch/Beulah Road
2. W&OD Trail Crossing
3. Lewis Street/Wade Hampton Drive to Courthouse Road/Lawyers Road
4. Nutley Street to Lewis Street/Wade Hampton Drive

Challenges:

- Loss of mid-block center turn lanes

Opportunities:

- Maintains turn lanes at intersections
- Supports progression of traffic
- Provides median refuge for pedestrians
- Potential for landscaping and gateways

Timeline:

- Mid-term

Raised Medians



Raised Medians

- Existing
- Potential New
- Existing Two-Way Left Turn Lane (to remain)

IV. Address Existing Challenges

Working Concepts



Sidewalks

Fill Sidewalk Gaps



Description:

Install concrete sidewalks along segments of Church Street, Glyndon Street, and Courthouse Road. This includes areas with no sidewalks as well as areas with existing asphalt paths.

Challenges:

- Potential right-of-way constraints
- Potential utility conflicts

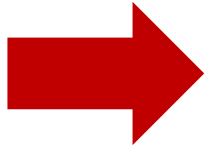
Opportunities:

- Pedestrian connectivity, access, and comfort
- Completes the sidewalk network in the study area
- ADA infrastructure compliance

Timeline:

- Near-term

Maple Avenue *Bus Stop Enhancements*



Description:

Install shelters, seating, level boarding areas, and real-time arrival information screens at bus stops along corridor

Challenges:

- Cost
- Right of way and/or utility constraints

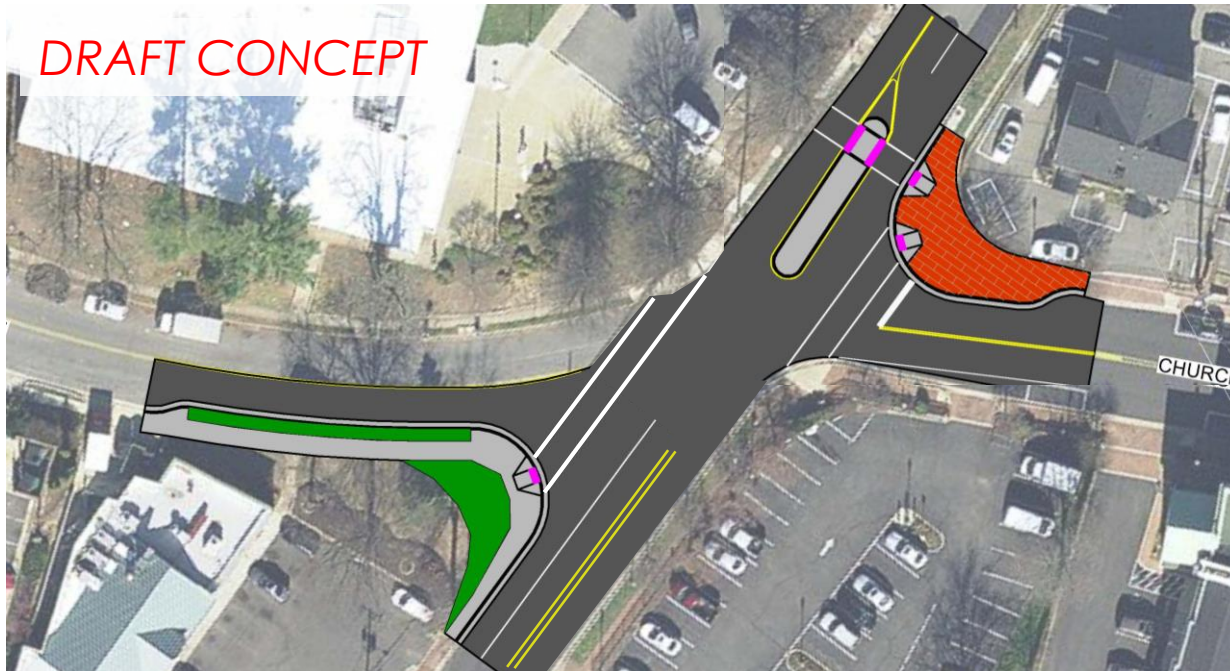
Opportunities:

- Provide amenities to enhance passenger access and comfort
- Coordination/cost-sharing with developers

Timeline:

- Near-term

Church Street and Lawyers Road *Intersection Redesign (Concept A)*



Challenges:

- Curb work required
- Potential need for utility relocation
- Traffic impacts to turn restrictions

Opportunities:

- Reduced curb radii for slower, safer vehicle turns
- Shorter and more direct pedestrian crossings
- Elimination of slip lane elevates pedestrian access and safety

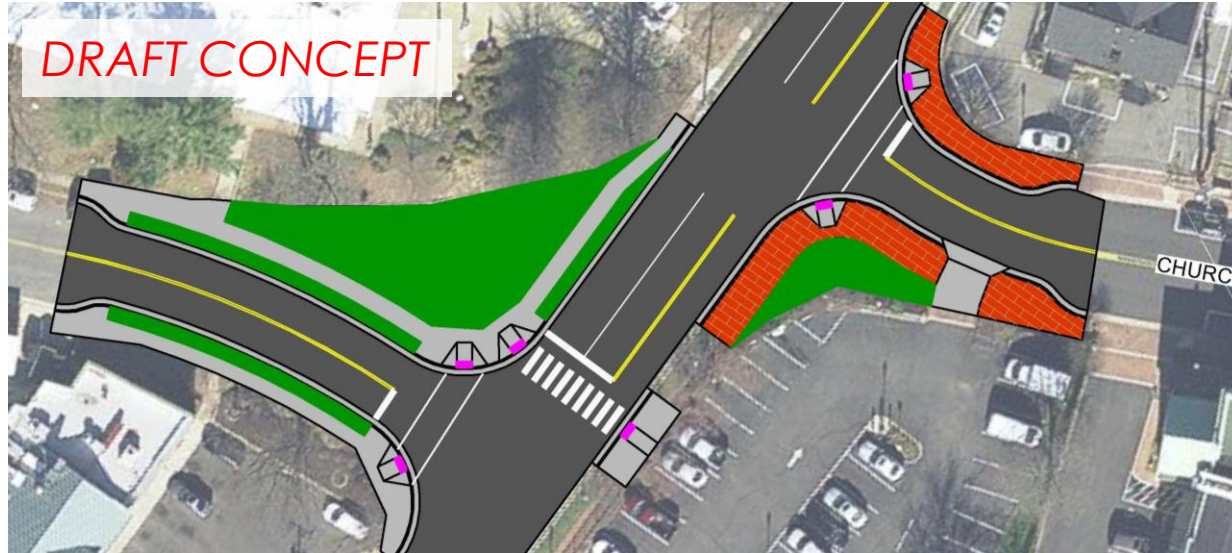
Timeline:

- Near-term

Description:

Redesign intersection of Church Street and Lawyers Road. This redesign tightens curb radii, realigns crosswalks, and provides a pedestrian refuge island. This redesign could be designed to maintain or eliminates the left turn from southbound Lawyers Road to Church Street.

Church Street and Lawyers Road *Intersection Redesign (Concept B)*



Description:

Redesign intersection of Church Street and Lawyers Road to provide two offset “T” intersections. This redesign eliminates the existing slip lane at the SW corner of the intersection, tightens curb radii, and realigns crosswalks for shorter pedestrian crossings.

Challenges:

- Eliminates through movements along Church Street
- Significant curb work required
- Potential need for utility relocation

Opportunities:

- Shorter and more direct pedestrian crossings
- Reduced curb radii for slower, safer vehicle turns

Potential Costs:

\$710,000 to \$1,372,000

Timeline:

- Mid-term

Nutley Street and Courthouse Road *Operational and Geometric Improvement*



Challenges:

- Curb work required
- Tree impacts

Opportunities:

- Increased capacity

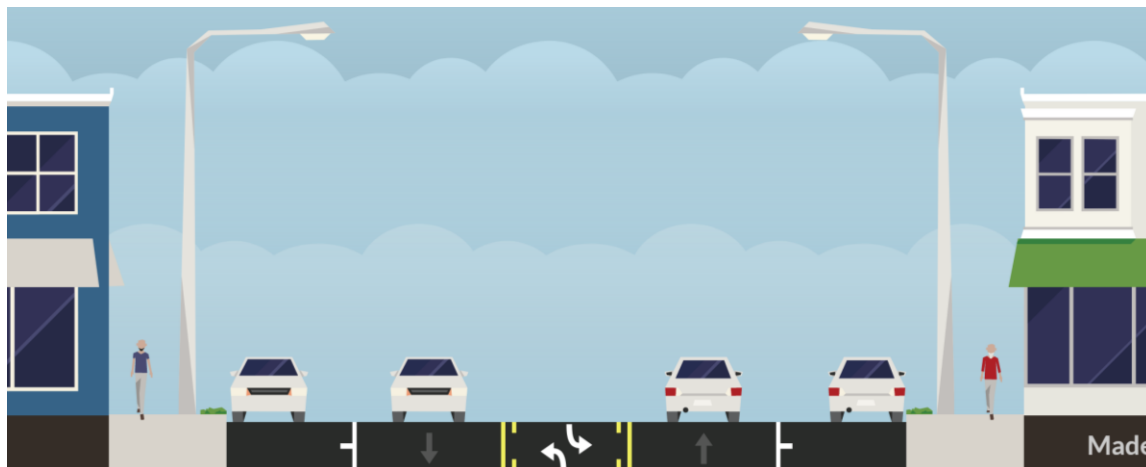
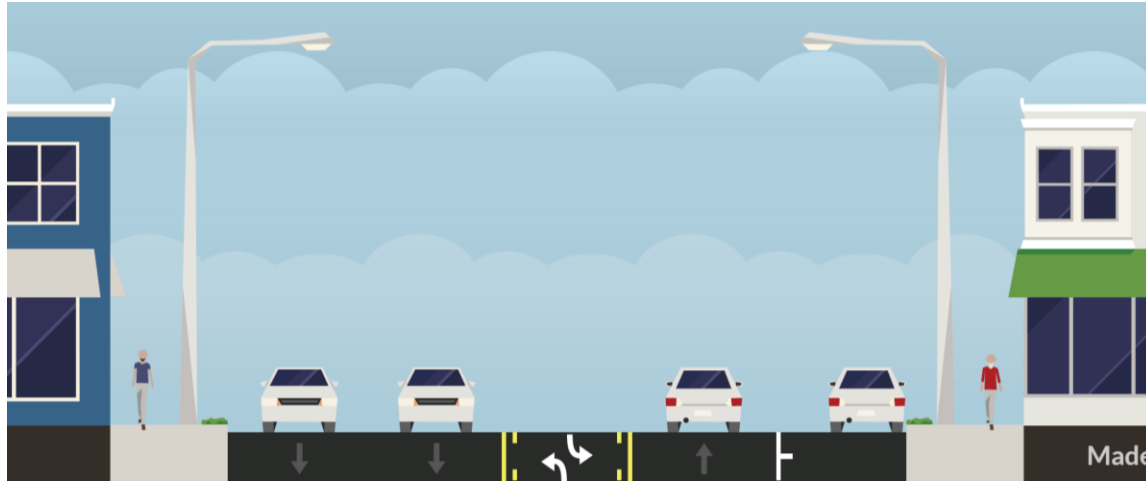
Timeline:

- Near-Term

Description:

Extend the turn bay on Nutley Street to provide greater capacity for northbound vehicles turning left onto Courthouse Road. Update phasing to signal and eastbound right turn overlap

Maple Avenue Off-Peak Parking Lanes



Challenges:

- Coordination with VDOT
- Enforcement
- Driver familiarity and safety
- Compatibility with traffic flow

Opportunities:

- Provides parking to stimulate or support evening activity
- Makes use of excess capacity during non-peak times
- Could be deployed in specific segments

Timeline:

- Near-term

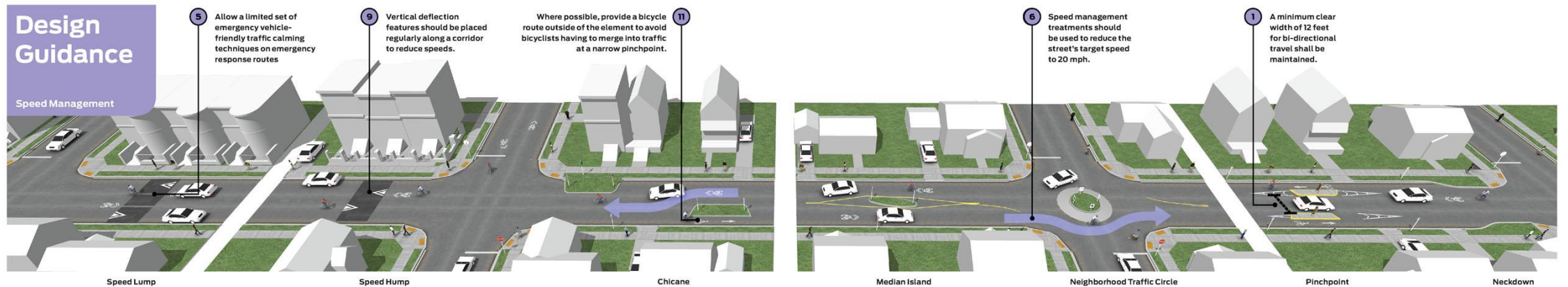
V. Studies and Strategies

Working Concepts



Neighborhood Traffic Calming

Conduct studies and identify solutions



Source: NACTO

Description:

Identify specific strategies, concepts, and solutions to address unsafe conditions in residential neighborhoods related to traffic and transportation.

Expand the scope and application of the existing traffic calming guidance

Opportunities:

Promote and protect residential character of established communities

Focus traffic and traffic improvements on major routes

Town Traffic Impact Analysis (TIA) Guidelines

Develop Vienna Specific Policies

LEVELS OF SERVICE for Intersections with Traffic Signals	
Level of Service	Delay per Vehicle (seconds)
A	≤10
B	11-20
C	21-35
D	36-55
E	56-80
F	>80

Factors Affecting LOS of Signalized Intersections

Traffic Signal Conditions:

- Signal Coordination
- Cycle Length
- Protected left turn
- Timing
- Pre-timed or traffic activated signal
- Etc.

Geometric Conditions:

- Left- and right-turn lanes
- Number of lanes
- Etc.

Traffic Conditions:

- Percent of truck traffic
- Number of pedestrians
- Etc.

Source: 2000 HCM, Exhibit 16-2, Level of Service Criteria for Signalized Intersections

Description:

Establish formal guidelines for how traffic studies will be conducted and evaluated within Town.

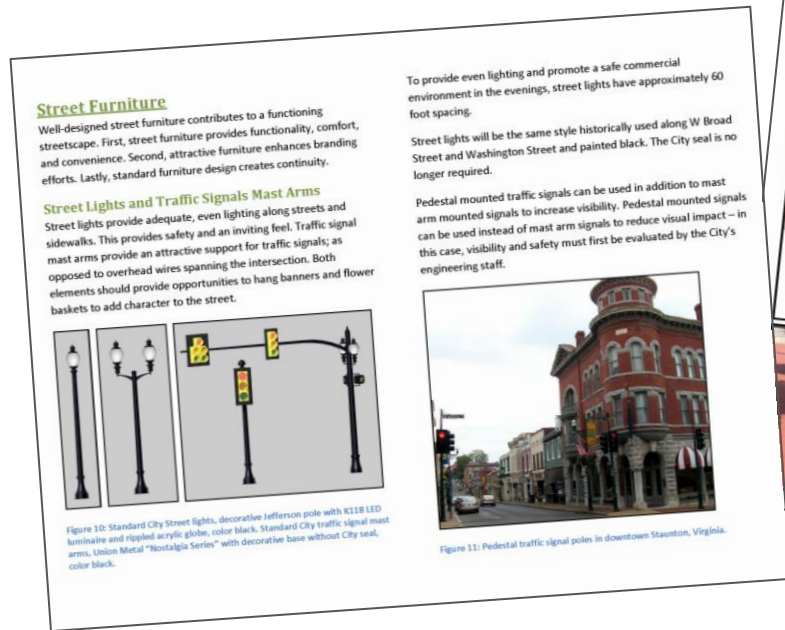
Opportunities:

- More transparency and public agreement with the process
- Consistency between traffic studies
- More formal and reliable documentation of development impacts and required improvement criteria

Timeline:

- Near-term

Develop Streetscape Master Plan and Design Guidelines



Source: City of Falls Church

Opportunities:

- Create a sense of place
- Enhance existing commercial areas
- Promote comfortable and attractive street-level experiences

Timeline:

- Near-term

Description:

Develop a town-wide Streetscape Master Plan and Design Guidelines to further highlight and build upon Vienna's history and brand through cohesive design of street improvement projects.

Town Parking Supply and Demand *Conduct Study*



Source: <https://parkingpolicy.com>

Description:

Conduct a town-wide parking study to evaluate the existing supply and demand of public parking.

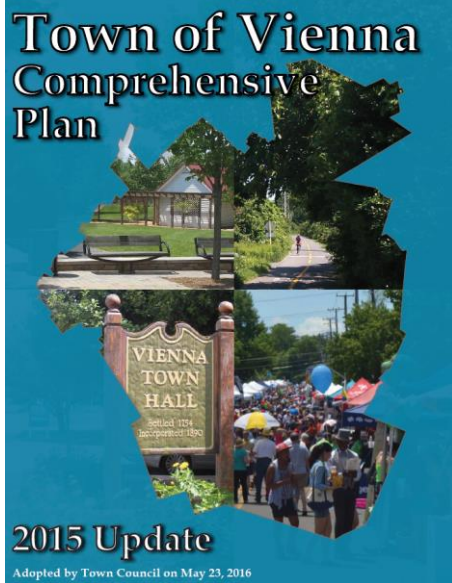
Opportunities:

- Gain an accurate inventory of Public and private parking supply and
- Identify peak and off-peak parking demand
- Identify strategies to supplement existing parking supply and have a more efficient use of existing supply
- Identify need for and location of new parking facilities

Timeline:

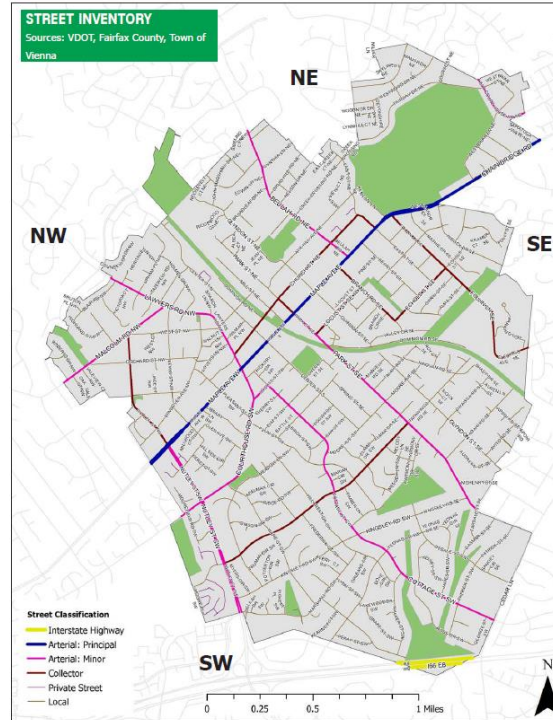
- Near-term

Long Range Transportation Master Plan *Conduct Study*



Description:

Conduct a town-wide transportation master plan to begin a comprehensive process to build consensus on transportation investments, that balance roadway, public transit, bicycle, pedestrian, and other transportation modes and support Vienna's goals for land use, economic development, and the environment through the safe and efficient movement of people and goods.



Opportunities:

- Develop a long-term vision for transportation and mobility in Vienna
- Develop a long-term implementation plan to support the vision

Timeline:

- Near-term

Signal Timing / Phasing / Lane Configuration Improvements



Description:

Deploy the Town's adaptive signal controller and update corridor signal timing at regular intervals (i.e. every two years)

Challenges:

- “Balancing” vehicle and pedestrian delays
- Establishing a performance target
- Driver familiarity and safety
- Limited by current geometry and ROW

Opportunities:

- Quick implementation
- Addresses both spot and corridor issues
- Develop more responsive time of day plans (as a precursor to adaptive signal installation)

Timeline:

- Near-term

Maple Avenue

Develop Access Management Strategy



Description:

Develop a corridor-wide Access Management strategy to close, consolidate, or relocate commercial driveways and curb cuts where feasible, for implementation at the appropriate time (when development occurs, etc.)

Challenges:

- Changes to commercial access
- Increased turns at intersections and on side streets

Opportunities:

- Fewer turns on Maple Avenue
- Fewer pedestrian and cyclist conflicts

Timeline:

- Mid-term