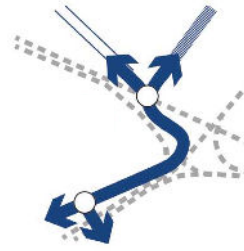




Unlocking the Lemoyne Bottleneck:

A collaborative Approach to Safe and Efficient Multimodal Streets

Introductions



Brianna Tutuska, PE
Traffic Design Lead

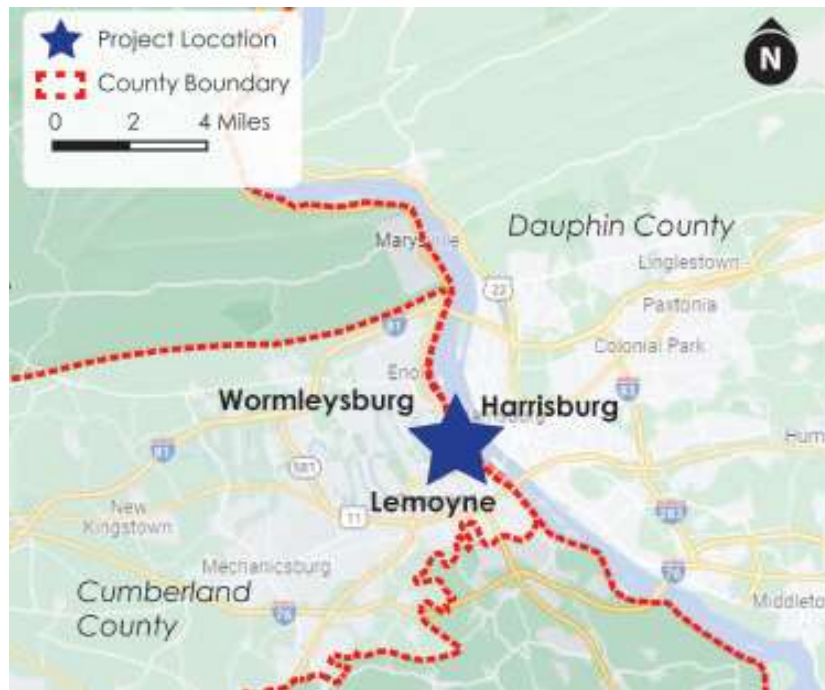


Laura Ahramjian, AICP
Public Engagement Lead



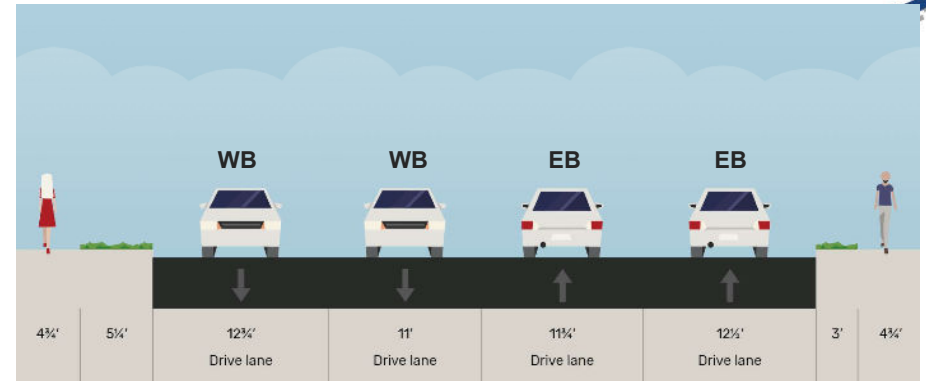
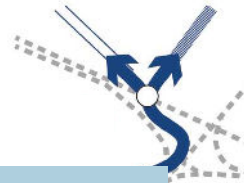
Project Location

- SR 1010 (Market Street) corridor from SR 2035 to SR 1027
- Boroughs of Lemoyne and Wormleysburg



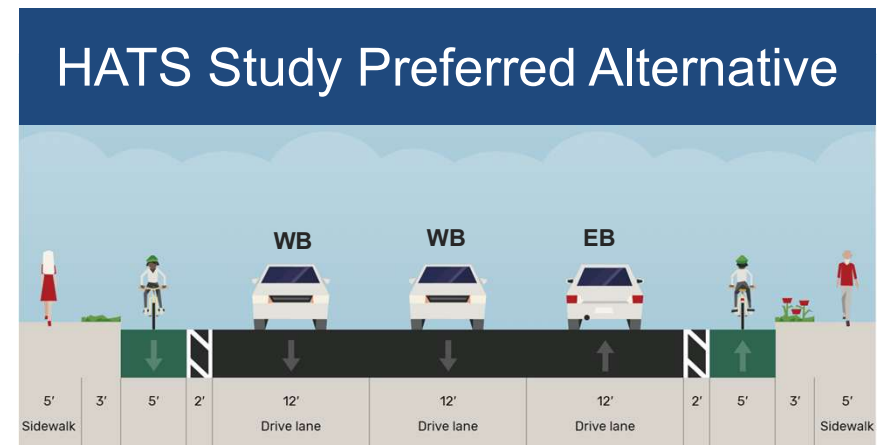
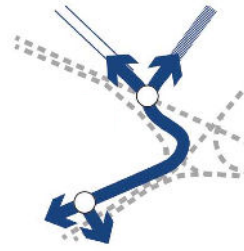
Corridor Overview

- Connector from West Shore communities to Harrisburg/City Island via Market Street Bridge
- Mix of Industrial, Restaurant, Commercial land uses
- Used by bicycle commuters and CAT transit
- AADT: 16,320 vehicles
- Posted Speed: 25 mph
- 2 signalized intersections
- 3 overhead NS rail bridges with narrow sidewalks
- Long vehicle queues heading into Wormleysburg



Project Background

- 2019 HATS Study recommended a road diet with one eastbound lane, two westbound lanes, and buffered bike lanes in both directions
- **Concerns from municipalities about congestion from road diet**
- Became a PennDOT District 8 roadway reconfiguration project



slido

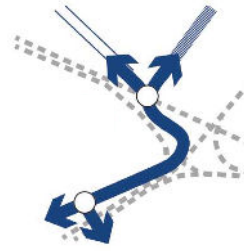
Please download and
install the Slido app on
all computers you use



**Have you worked on
a road diet project
with community
pushback?**

① Start presenting to display the poll results on this slide.

Existing Conditions



Inconsistent shoulder widths



Approaching the main curve in the road looking eastbound



Corridor pinch point with two NS overhead railroad bridges looking westbound



Northern section of Market Street looking eastbound



Approaching Front Street intersection looking eastbound

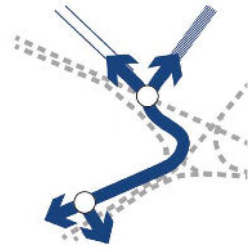


At Market Street and Front Street intersection looking westbound

Source: Google Streetview



Project Purpose & Need



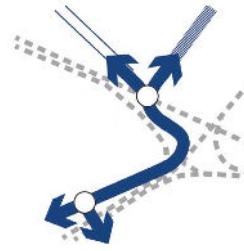
The purpose of this project is to improve mobility and safety for bicyclists, pedestrians, and motorists on SR 1010 (Market Street) through the Lemoyne Bottleneck. SR 1010 corridor

Project Needs

- High traffic volumes
- Curvilinear roadway alignment
- Limited sight distance
- Inconsistent/nonexistent shoulder widths
- Poor condition/narrow sidewalks



Project Purpose & Need



Safety concerns



- 79 reported crashes since 2012
- Fatal crash at the Market Street/Front Street intersection
- Crash concentrations at intersections and the main curve

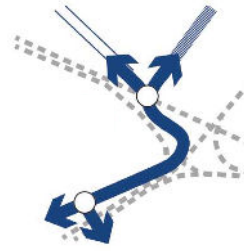
Legend

- Fatality
- Injury Crash
- Property Damage

Over 1/3 of the crashes were hit fixed object collisions



Alternatives Analysis Objective



Balance the needs of different roadway users to build buy-in from stakeholders and the community



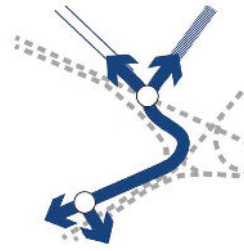
Extensive Stakeholder Outreach to Understand/ Address Concerns

Detailed Modeling of Future Traffic Conditions

Iterative Alternatives Design Process



Stakeholder + Public Engagement



Stakeholder Interviews

- Confirm roadway operations + future plans
- Understand issues and concerns



Stakeholder Workshops

- Facilitated discussion of issues + concerns
- Share draft alternatives



Public Meeting

- Share alternatives
- Gather feedback on preferred alternative and future design changes



PREVIOUS STUDIES REVIEW

EXISTING CONDITION EVALUATIONS

ALTERNATIVES ANALYSIS

PRELIMINARY ENGINEERING/ ENVIRONMENTAL CLEARANCE

FINAL DESIGN/ RIGHT-OF-WAY

CONSTRUCTION

Workshop No. 1

Workshop No. 2

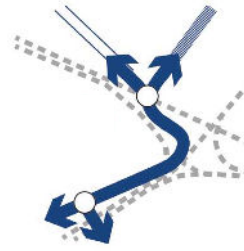
Public Meeting

Stakeholder Interviews

Anticipated Bid:
August 2026



Stakeholder Workshops



Workshop #1: Listening Session



- ✓ Identify key issues
- ✓ Project goals

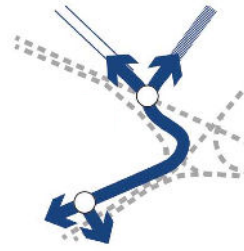
Workshop #2: Alternatives Session



- ✓ Show how alternatives perform by key issue
- ✓ Discuss tradeoffs



Key Issues + Community Concerns



Safety concerns for all travel modes

- Limited sight distances around the curve
- Insufficient lighting near Market/Front Street



Insufficient Multimodal Facilities

- Narrow sidewalk widths
- Lack of bicycle facilities



Congestion + Vehicle Queues

- Towards Wormleysburg
- Towards I-83 and Camp Hill



Emergency Vehicle + Truck Access

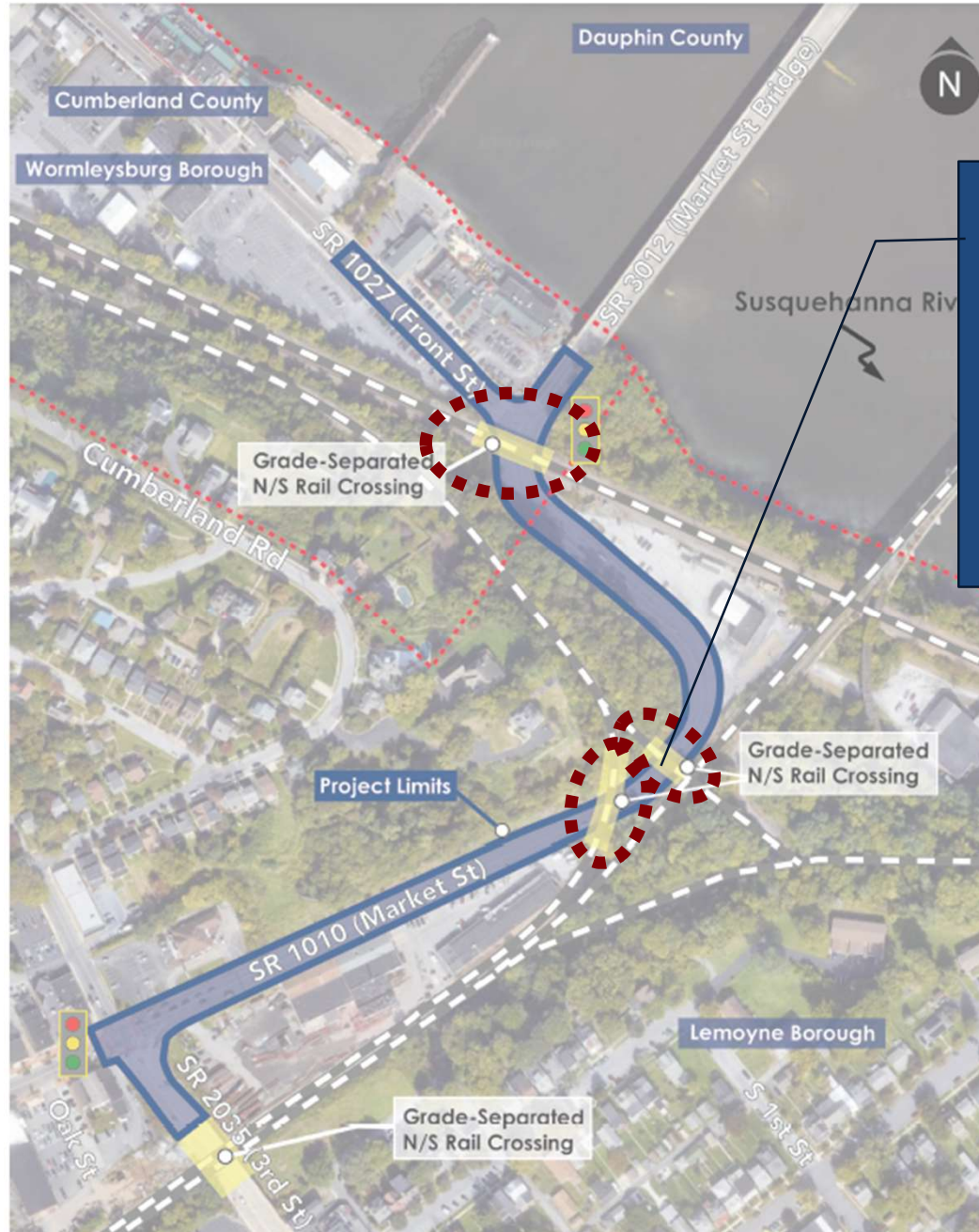
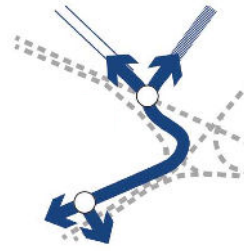
- Accommodate emergency vehicles turning out into the corridor
- Accommodate emergency vehicles to get through stopped traffic
- Consider truck access to properties



Have you worked on a project that experienced challenges coordinating with a railroad?

ⁱ The Slido app must be installed on every computer you're presenting from

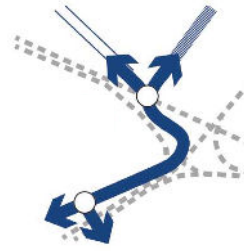
Norfolk Southern Coordination



NS Reconstructing the bridge deck and moving back abutments

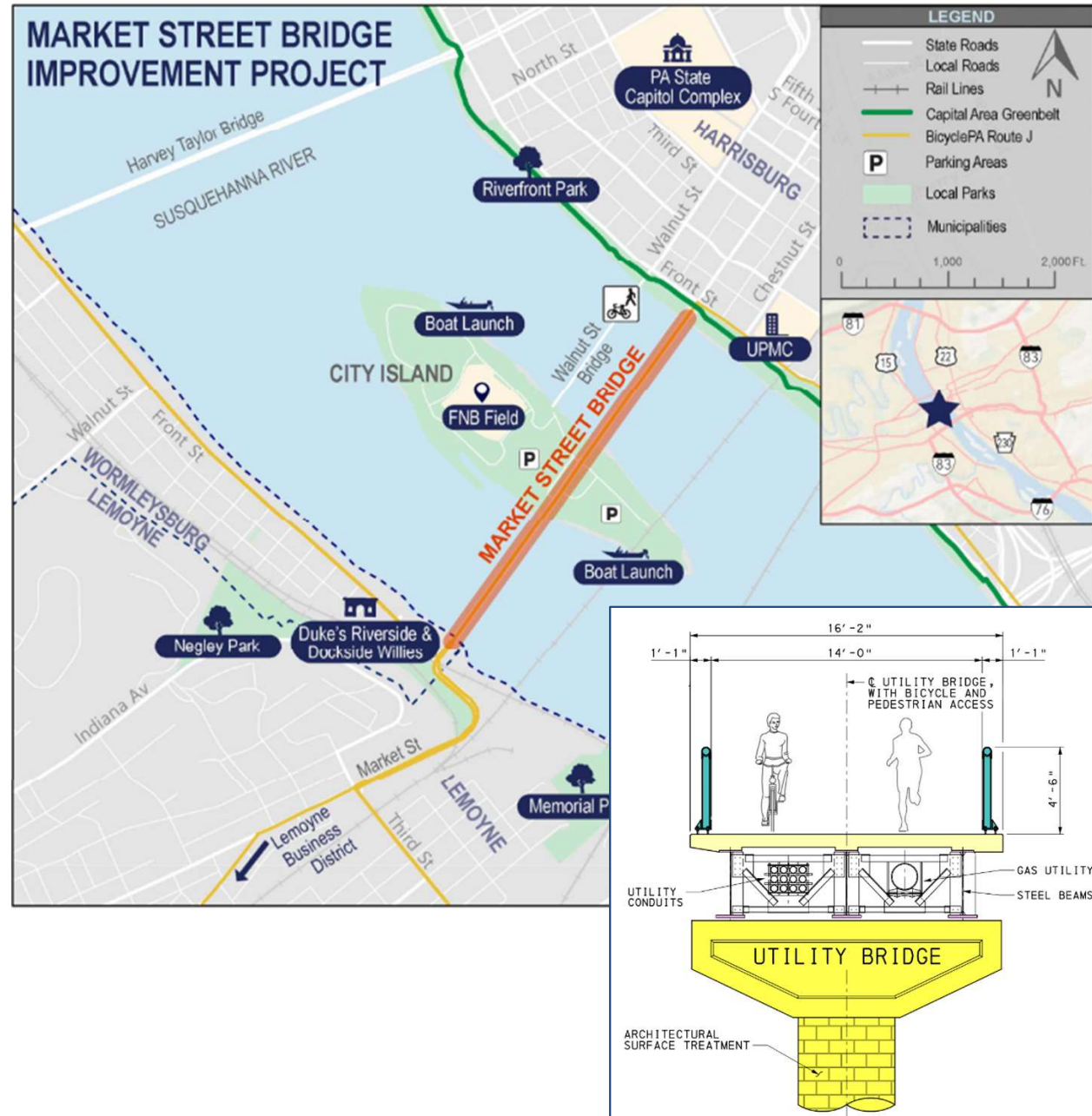


Market Street Bridge Coordination

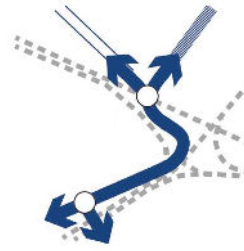


**PennDOT
Market Street
Bridge is also in
design**

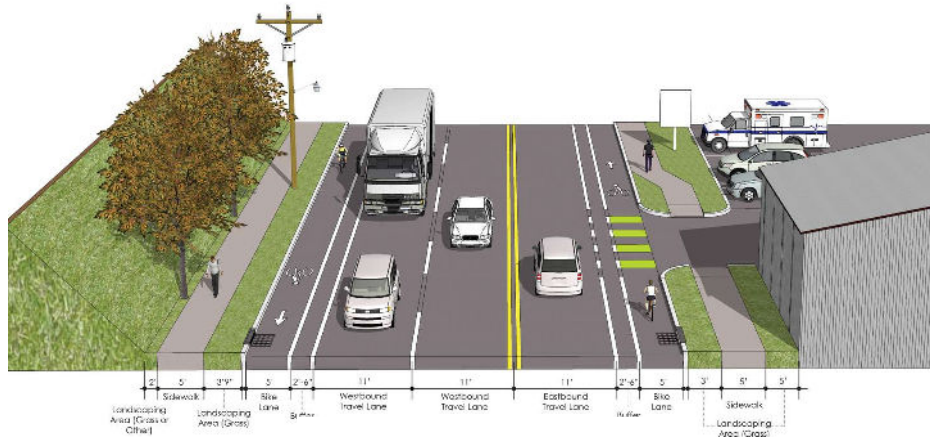
**Alternatives
need to address
multimodal tie-
ins to the bridge
design**



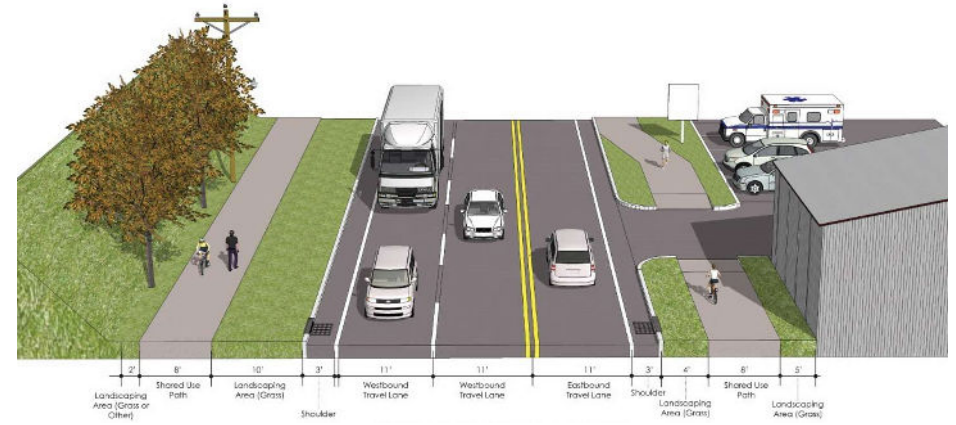
Alternative Development



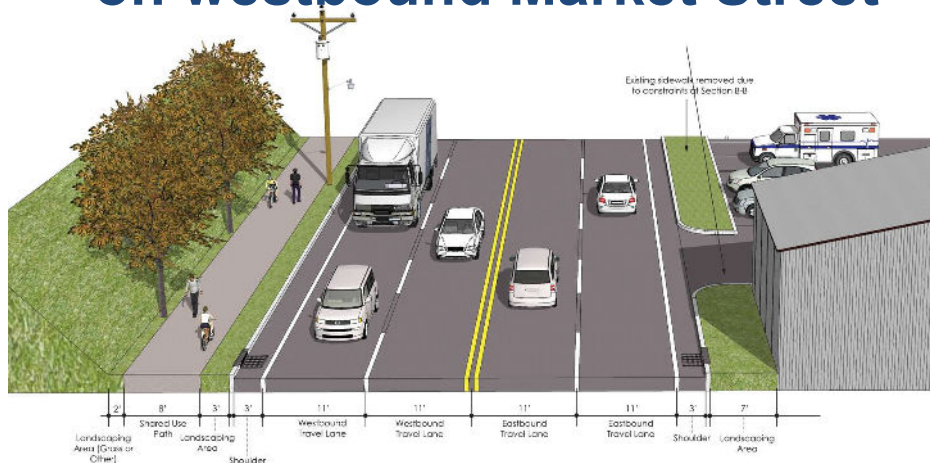
1 Three lanes with on-road bike lanes and sidewalks



2 Three lanes with shared use paths on both sides



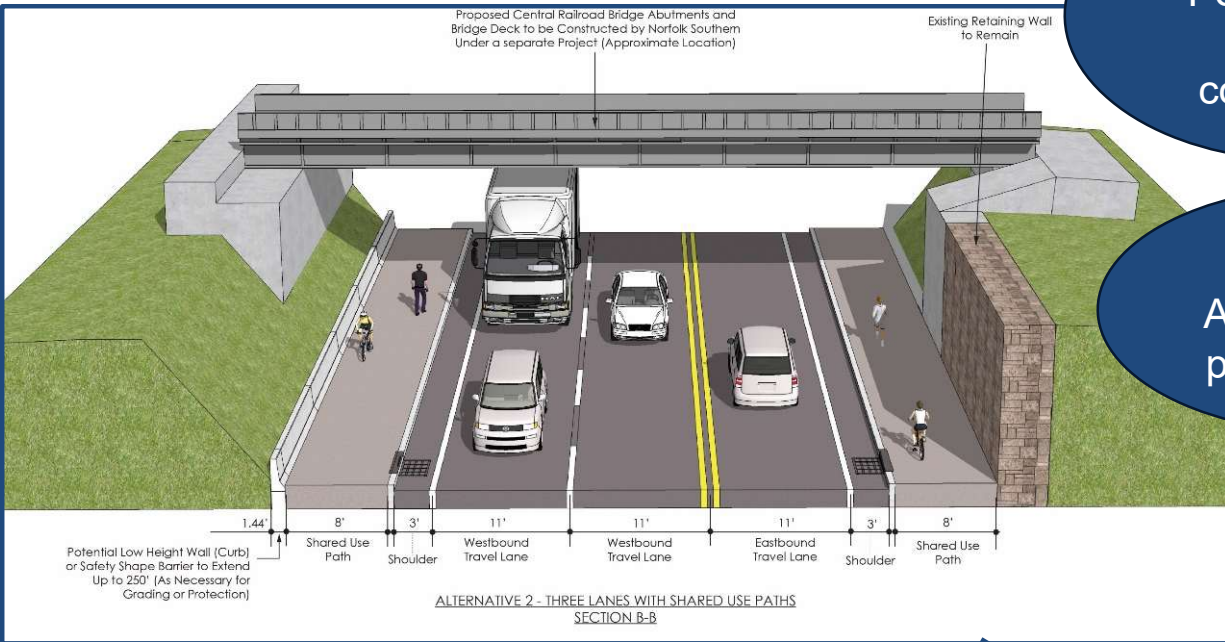
3 Four lanes with shared use path on westbound Market Street



How to present these to the public and compare pros and cons?



Alternative Design



Pedestrian & bicyclist connectivity

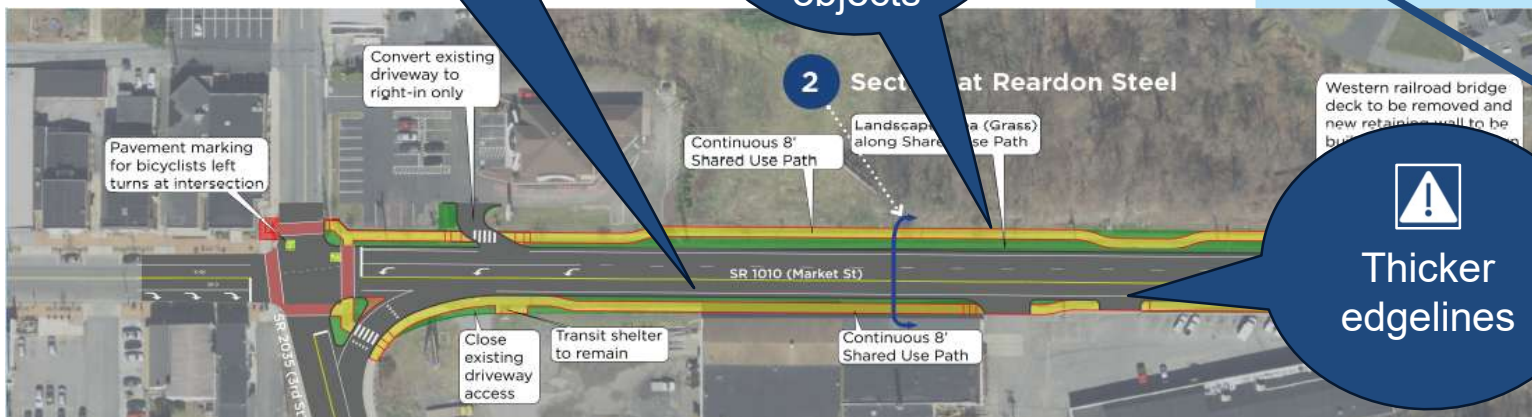
ADA compliant paths & ramps

Improved sight distance

Access management

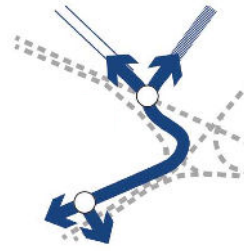
Increased distance from fixed objects

Thicker edgelines

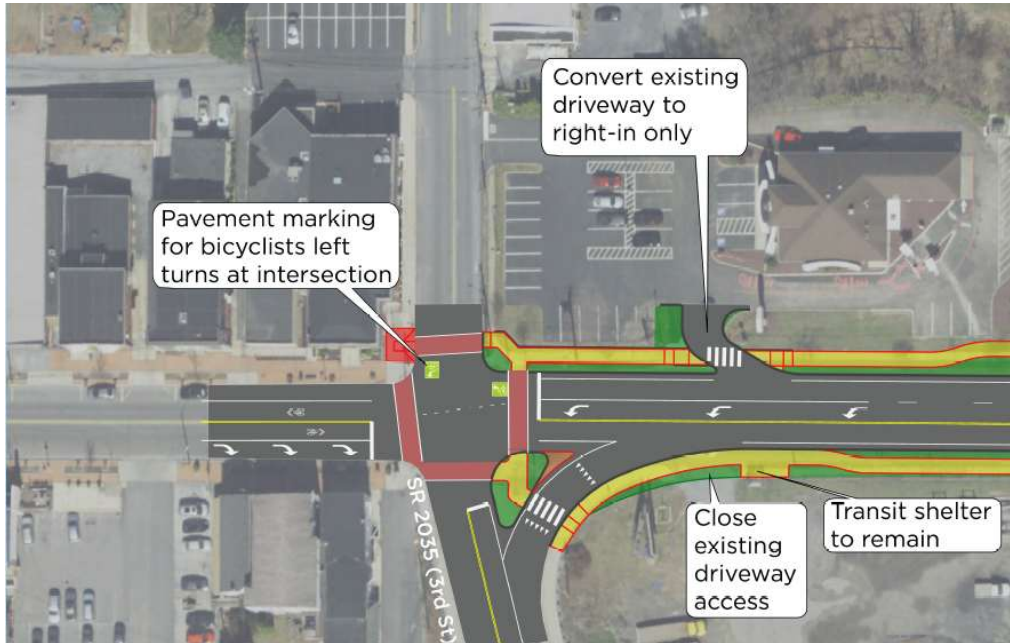


- Landscape Area
- Hardscaping Area
- Railroad Bridge
- Proposed Railroad Bridge Abutment/Walls
- Proposed Market Street Bridge

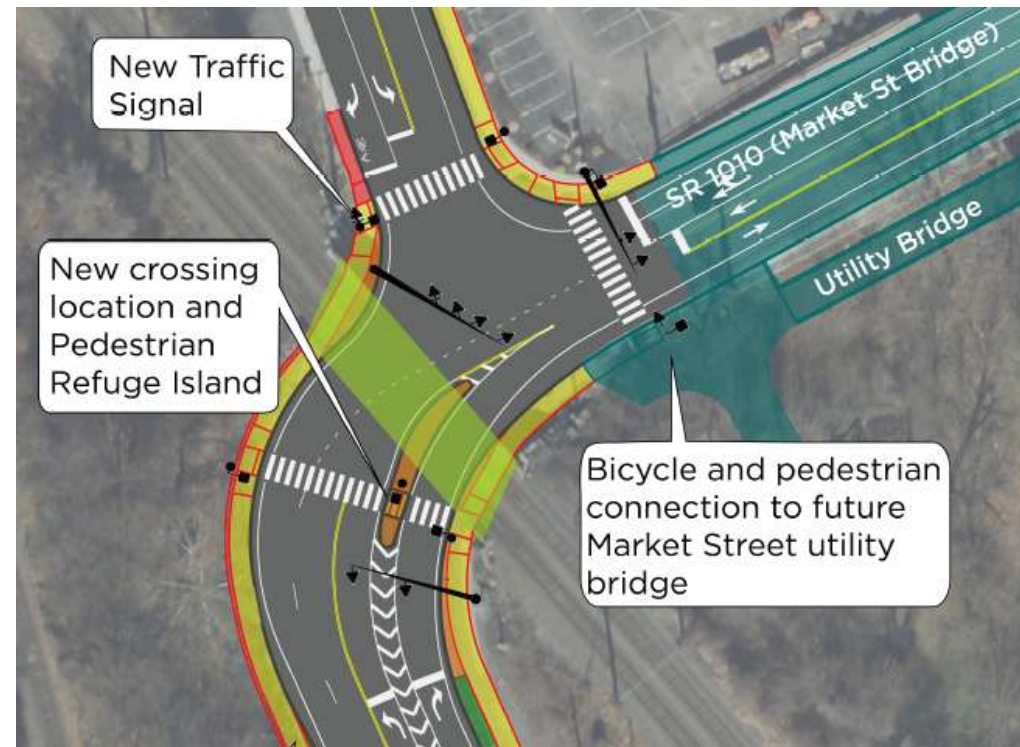
Alternative Design: Intersection Improvements



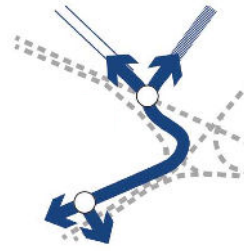
Market Street and 3rd Street



Market Street and Front Street



Alternative Design: Signal Improvements



Emergency Services
Signal Preemption
(With repeater poles to
detect around curves)



Horizontal Signal
head



Video or Camera
Detection

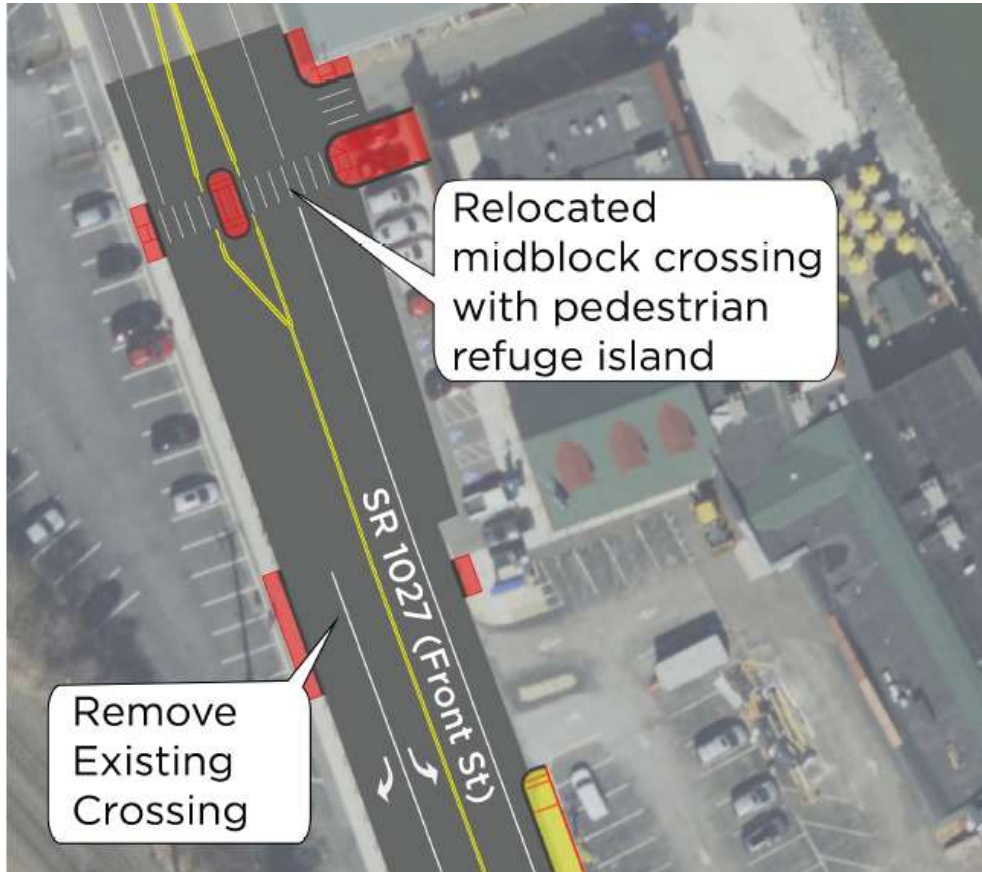
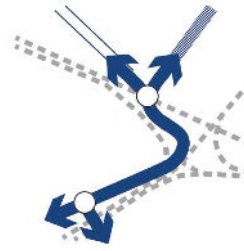


Backplates with
Reflective Borders
15% Reduction in
total crashes*

* Source: Federal Highway Administration,
Proven Safety Countermeasures

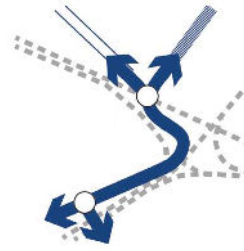


Alternative Design: Front Street Midblock Crosswalks



Alternative Analysis:

Multimodal Facilities



1 Buffered Bike Lanes + Sidewalks

- Good pedestrian connectivity
- Higher Bicycle Level of Stress

2 Shared Use Paths on Both Sides

- Good pedestrian and bicycle connectivity
- Low Bicycle Level of Stress

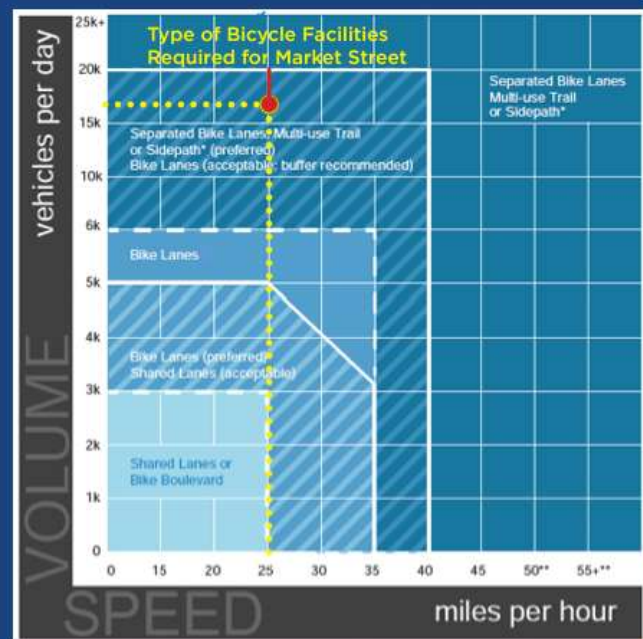
3 Shared use Path on Westbound Market Street

- Limited pedestrian/bicycle connectivity
- Low Bicycle Level of Stress

Bicycle Level of Stress

measures where the existing bicycle network is stressful for riders due to inadequate or missing facilities.

With over 16,000 vehicles per day on Market Street, PennDOT prefers separated bike lanes to lower the level of stress for bicyclists.



Source: PennDOT Design Manual, Part 2 Contextual Roadway Design April 2021 Edition, Change No. 1



Alternative Analysis: Traffic Operations

Congestion + Operations

- Maintains LOS at all intersections
- Turn-lane queues improved for movements towards Wormleysburg and I-83



VS

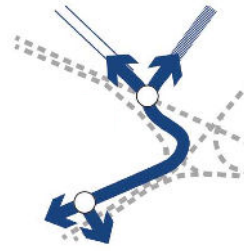


All Alternatives maintain travel times throughout the corridor and improve wait times at backups at intersections



Alternative Analysis:

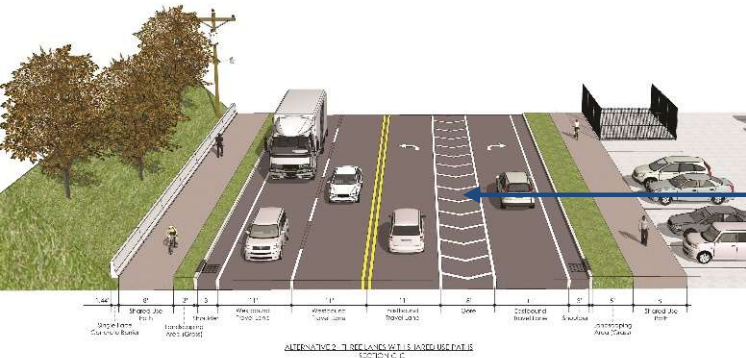
EMS Access



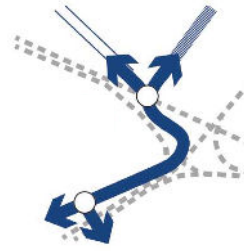
- Signal Preemption on all approaches to Front/Market Intersection
- Painted gore provides EMS access and/or vehicle pull-off area
- 2 W.B. lanes remain for maneuverability with addition of Signal Preemption at 3rd/Market Intersection























































Access and/or
vehicle pull-off area



Alternative Analysis Summary



EVALUATION LEGEND  No Change  Minor Improvement  Moderate Improvement  Major Improvement	 NO-BUILD	 ALTERNATIVE 1: Three Lanes with On-Road Bike Lanes and Sidewalks	 ALTERNATIVE 2: Three Lanes with Shared-Use Paths	 ALTERNATIVE 3: Four Lanes with Shared-Use Path on Westbound Market Street
1. Reduces crashes				
2. Provides ADA compliant sidewalks and pedestrian connections to destinations				
3. Improves pedestrian safety at crosswalks				
4. Improves bicycle safety and level of stress				
5. Improves bicycle access and connections to destinations				
6. Improves motor vehicle safety				
7. Maintains travel times throughout the Bottleneck*				
8. Improves wait times and backups at intersections				
9. Gives EMS priority at traffic signals**				
10. Provides additional space to allow EMS to pass traffic***				
11. Improves access from PennState EMS Facility****				
12. Construction Cost	System Preservation Costs	\$3.7 M	\$3.9 M	\$3.7 M



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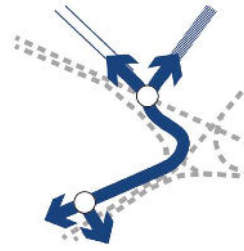
Please download and
install the Slido app on
all computers you use



Which alternative do you prefer?

① Start presenting to display the poll results on this slide.

Alternative Analysis Summary



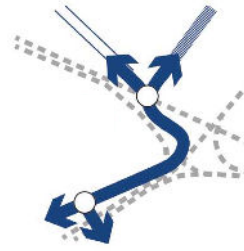
EVALUATION LEGEND				
	NO-BUILD	1 ALTERNATIVE 1: Three Lanes with On-Road Bike Lanes and Sidewalks	2 ALTERNATIVE 2: Three Lanes with Shared-Use Paths	3 ALTERNATIVE 3: Four Lanes with Shared-Use Path on Westbound Market Street
1. Reduces crashes	○	◐	●	◑
2. Provides ADA compliant sidewalks and pedestrian connections to destinations	○	●	●	◐
3. Improves pedestrian safety at crosswalks	○	●	●	●
4. Improves bicycle safety and level of stress	○	◐	●	◑
5. Improves bicycle access and connections to destinations	○	●	●	◑
6. Improves motor vehicle safety	○	◐	●	◑
7. Maintains travel times throughout the Bottleneck*	○	◑	◑	◑
8. Improves wait times and backups at intersections	○	◑	◑	◑
9. Gives EMS priority at traffic signals**	○	●	●	●
10. Provides additional space to allow EMS to pass traffic***	○	◐	◐	◑
11. Improves access from PennState EMS Facility****	○	◐	◐	○
12. Construction Cost	System Preservation Costs	\$3.7 M	\$3.9 M	\$3.7 M



**PennDOT
Selected
Alternative**



January 2024 Public Meeting

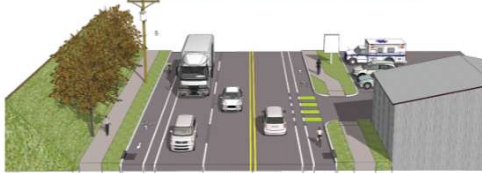


1 CONCEPT ALTERNATIVE 1 Lemoyne Bottleneck Improvements

Alternative 1 Facilities Three Lanes with On-Road Bike Lanes and Sidewalks

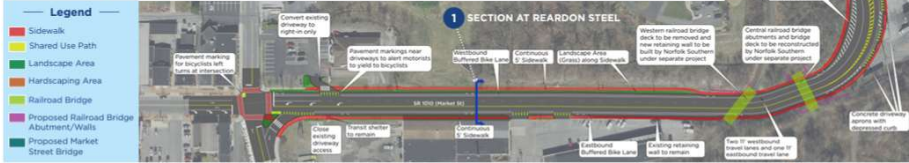
- One eastbound travel lane and two westbound travel lanes
- Continuous 5' sidewalk on both sides
- Buffered bike lanes on both sides
- One eastbound left turn lane and one right turn lane at Front Street intersection

Section View at Reardon Steel (Facing East)



Note: This illustration is a general representation and may vary due to changing conditions and constraints within the project boundaries.

MOTOR VEHICLE SAFETY	TRAFFIC OPERATIONS	MULTIMODAL FACILITIES	EMERGENCY SERVICES
<ul style="list-style-type: none"> • Widen travel lanes through the Bottleneck to 11' minimum. • Add shoulders throughout the project limits of 5' minimum which minimizes spillover from wheel paths. • Single eastbound lane eliminates weaving/lane changing through the curve. • Driveway safety improvements to reduce conflicts near the Market Street and 3rd Street intersection. • Increased distance from travel lanes to fixed objects (e.g. railroad abutments, utility poles, etc.). • Travel lanes better accommodate trucks through the curve. • Improved sight distance for drivers. 	<ul style="list-style-type: none"> • New traffic signal at Market & Front Street intersection with improved signal timing for pedestrians. • Improved signal timing at Market & 3rd Street intersection. • Maintains acceptable traffic Level of Service. 	<ul style="list-style-type: none"> • Continuous ADA compliant sidewalk and ramps on both sides of the roadway for pedestrians. • Buffered bike lanes on both sides with markings to alert motorists (no vertical separation from vehicle lanes). • Bike and pedestrian connection to future Market Street utility bridge. 	<ul style="list-style-type: none"> • Emergency Vehicle Preemption at both signalized intersection provides primary EMS access. • Buffered bike lanes provide vehicle pull-out area for secondary EMS access. • Single eastbound lane provides easier access to west of Pennsylvania Ave. Lion, LLC.



93 Attendees

Display Boards

PUBLIC PLANS DISPLAY

PROJECT: SR 1010 (Market Street) Lemoyne Bottleneck Improvement Project in Lemoyne and Wormleysburg Boroughs, Cumberland County

COMMENT FORM

1. Were you satisfied with the information provided at the plans display? Yes No

COMMENTS: Lane and sidewalk divisions were very detailed and useful.

2. Are you aware of any sensitive features (i.e. socioeconomic resources, natural resources, historic resources, public facilities, etc.) within the project limits?

COMMENTS: No

3. Are there any special features on your property that should be identified on the plans? (i.e. utility line not noted on plans, leases or easements, septic systems, etc.)

COMMENTS: N/A

4. The Department is proposing Alternative 2 as the recommended alternative. Do you agree with that recommendation? Why or why not?

COMMENTS: I agree. Physical separation from general lanes is always superior for bicycle traffic. Both sides allows for maximum visibility. Relative to me EB travel lane is a no-brainer given that it only runs to the west of 3rd and the bridge will likely begin with one EB lane anyway.

63 Comment Cards

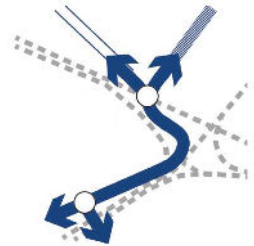
PennDOT hears from public on options to improve safety at Lemoyne bottleneck

By Jackie Jacobs | Tue, January 30th 2024 at 11:29 AM



News Coverage

Connecting Alts to Key Issues



1

CONCEPT ALTERNATIVE 1

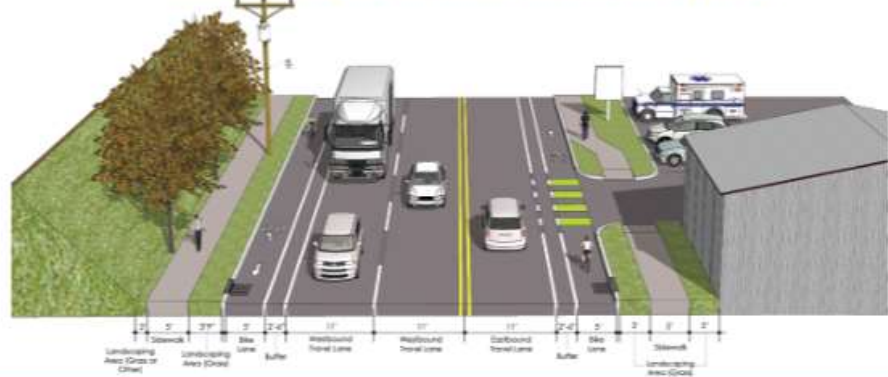
Lemoine Bottleneck Improvements

Three Lanes with On-Road Bike Lanes and Sidewalks

Alternative 1 Facilities

- One eastbound travel lane and two westbound travel lanes
- Continuous 5' sidewalk on both sides
- Buffered bike lanes on both sides
- One eastbound left turn lane and one right turn lane at Front Street intersection

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MOTOR VEHICLE SAFETY

- Widen travel lanes through the Bottleneck to 11' minimum
- Add shoulders throughout the project limits at 5' minimum which removes inlets from wheel paths
- Single eastbound lane eliminates weaving/lane changing through the curve
- Driveway safety improvements to reduce conflicts near the Market Street and 3rd Street intersection
- Increased distance from travel lanes to fixed objects (e.g. railroad abutments, utility poles, etc.)
- Travel lanes better accommodate trucks through the curve
- Improved sight distance for drivers

TRAFFIC OPERATIONS

- New traffic signal at Market & Front Street intersection with improved signal timing
- Improved signal timing at Market & 3rd Street intersection
- Maintains acceptable traffic Level of Service

MULTIMODAL FACILITIES

- Continuous ADA compliant sidewalk and ramps on both sides of the roadway for pedestrians
- Buffered bike lanes on both sides with markings to alert motorists (no verbal separation from vehicle lanes)
- Bike and pedestrian connection to future Market Street utility bridge

EMERGENCY SERVICES

- Emergency Vehicle Preemption at both signalized intersection provides primary EMS access
- Buffered bike lanes provide vehicle pull-off area for secondary EMS access
- Single eastbound lane provides easier access in/out of PennState Health Life Lion, LLC

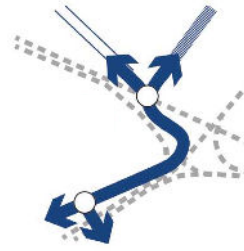


Legend

- Sidewalk
- Shared Use Path
- Landscape Area
- Hardscaping Area
- Railroad Bridge
- Proposed Railroad Bridge Abutment/Walls
- Proposed Market Street Bridge



Outreach Takeaways



Alt.
2

Majority of public officials and members of the public in favor of Alternative 2 with a Road Diet



Strong support for multimodal recommendations and suggestions for additional bicycle/pedestrian improvements

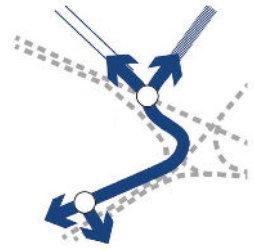


Concerns about Traffic Management and Traffic Operations



Safety and Design Concerns

Engagement doesn't end after the public meeting....

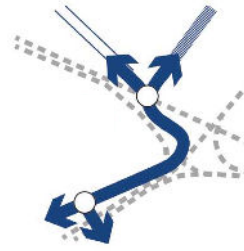


Ongoing Coordination with Project Partners

- Norfolk Southern project delays may impact design
- Mural coordination with Lemoyne Borough
- Minimal impacts to restaurants for midblock crosswalk relocations on Front Street
- Lemoyne Borough signal upgrades

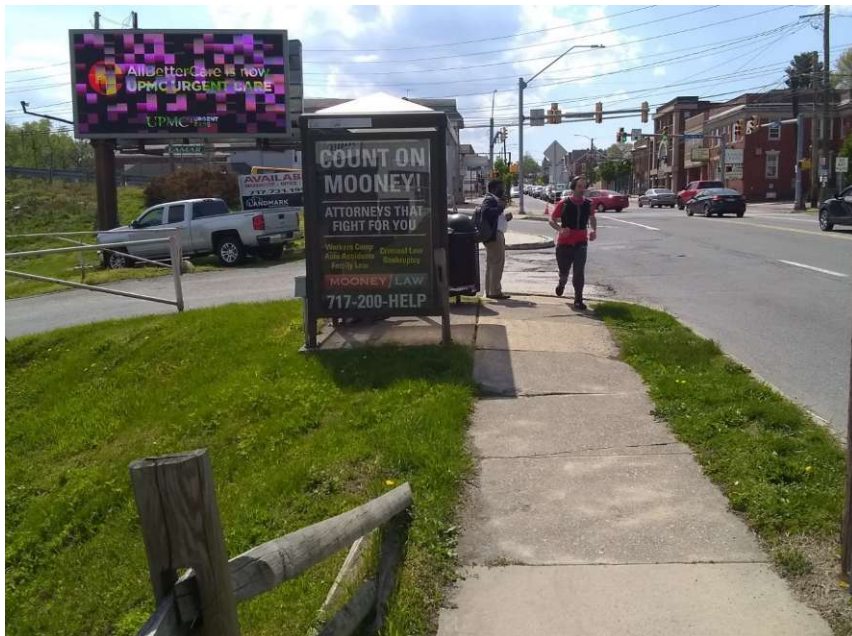


Engagement doesn't end after the public meeting....

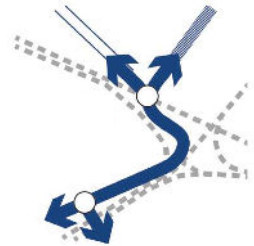


Roadway Needs May Change – Stay Flexible!

- Traffic impacts to City Island were a concern
- 4-lane section for the Market Street Bridge is moving forward
- Rabbit transit bus stop updates



Path to Success



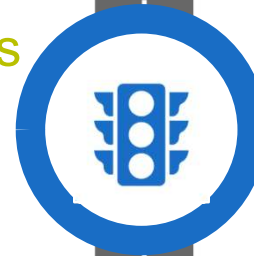
Extensive stakeholder engagement to understand community, municipality, and agency concerns



Early partnership with the MPO and County to establish purpose and need



Leveraging improvements from parallel projects



Tying traffic operations analysis to community concerns



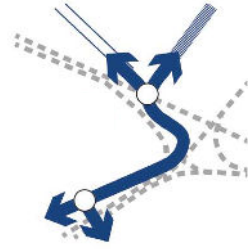
Addressing safety of all roadway users



Showing EMS accommodations



Q&A



Laura Ahramjian, AICP
Associate Planner
lahramjian@kittelerson.com

Brianna Tutuska, PE
Engineer
btutuska@kittelerson.com

