



# Safe Routes to School Infrastructure Plan



Linntown Intermediate School  
Eichhorn Middle School  
Lewisburg Area School District, Union County, PA



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# Purpose & Background

## ▶ Purpose

To provide a plan for short-term, mid-term, and long-term infrastructure and non-infrastructure improvements which will enhance the accessibility, connectivity, and safety of school walking routes.

## ▶ Background

- Safe Routes to School Grants
  - Requirements
  - Awards
  - 5 E's
- PSATS – develops schedule of participant communities
- Pennoni – provides on-site technical assistance including walkability audits

# Site Visit Overview

- ▶ This Infrastructure Plan will:
  - Provide a snap shot for planning
  - Generate discussions to further efforts to improve general student walking safety
  - Highlight existing walking safety issues
  - Provide recommendations to address each walking safety issue



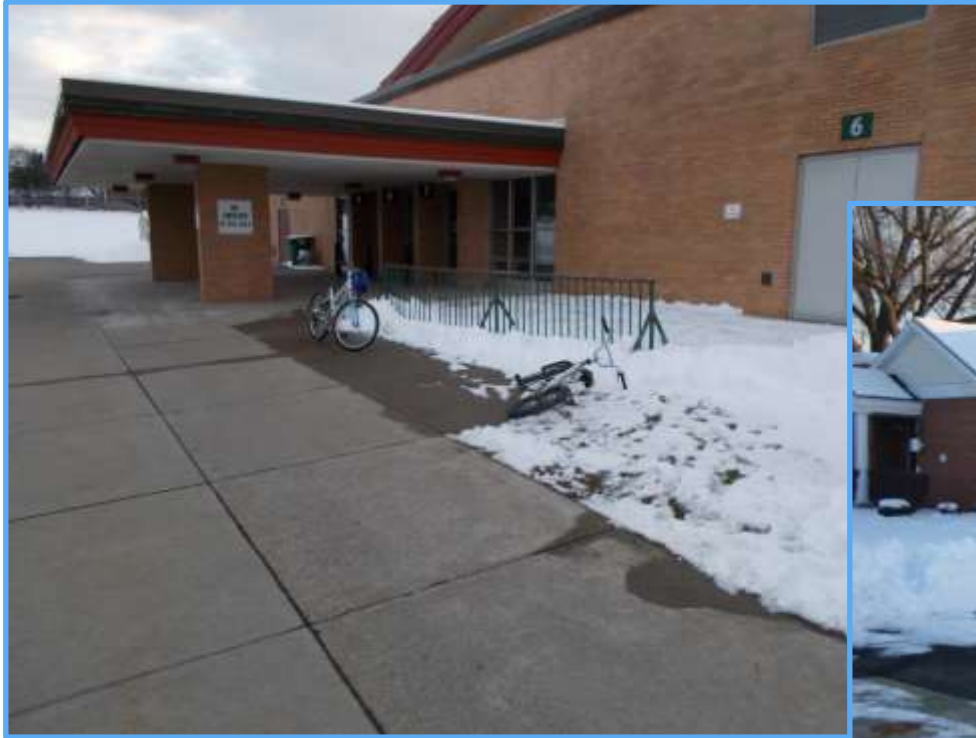
# Site Visit Overview

- ▶ Looking GOOD Items!
  - Physical separation of modes
  - POTENTIAL for more walkers
  - *Very* efficient departures and arrivals
  - No 'operations' adjustments needed!
  - Campus infrastructure and walking paths
  - Future planned improvements with development



# Site Visit Overview

- ▶ You have bicyclists...even in the winter!



# Site Visit Overview

## ▶ Eichhorn Middle School Characteristics

- Student body: 451 students (Grades 6 – 8)
- Modal Breakdown:
  - Parent Pick-Up/Drop-Off
    - 30%
  - Bussing
    - 55% of students
  - Walk/Bike
    - 11%

**Eichhorn Middle School**



# Site Visit Overview



## ▶ Eichhorn Middle School Arrival/Departure Timeline

- Morning
  - 6:30 AM: Faculty begin to arrive
  - 7:15 AM: Possible for students to enter school.
  - 7:20 AM: Bus students and parent drop-off students begin to arrive and are dropped-off at respective doors. Works GREAT! No conflicts or delays!
  - 7:40 AM: School begins
- Afternoon
  - 2:40 PM: School ends, dismissal of first flight of buses, all walkers and parent pick up. Orderly and separated. Minor delay on Washington.
  - ~3:00 PM: Second flight of buses
  - Lines cleared quickly
  - Minimal delay and conflict





# Site Visit Overview

## ▶ Linntown Intermediate School Characteristics

- Student body: 303 students (Grades 4 – 5)
- Modal Breakdown:
  - Parent Pick-Up/Drop-Off
    - 30%
  - Bussing
    - 55% of students
  - Walk/Bike
    - 11%

Linntown Intermediate School



# Site Visit Overview



## ▶ Linntown Intermediate School Arrival/Departure Timeline

- Morning
  - 7:30 AM: Faculty begin to arrive
  - 8:15 AM: Possible for students to enter school.
  - 8:15 AM: Bus students and parent drop-off students begin to arrive and are dropped-off at respective doors. Works GREAT! No conflicts or delays!
  - 8:35 AM: School begins
- Afternoon
  - 3:22 PM: School ends, all walkers and parent pick up. Great help by faculty. Orderly and separated.
  - 3:23 PM: Bussers are dismissed (slightly staggered)
  - Lines cleared quickly
  - Minimal delay and conflict



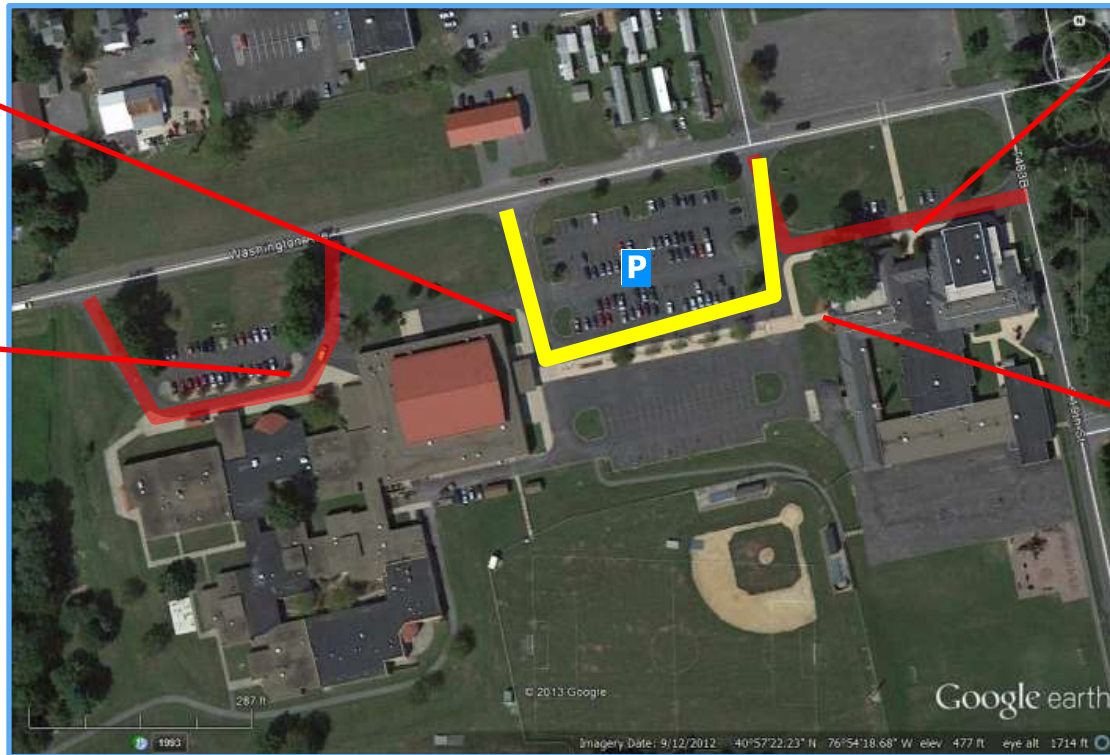
# Site Visit Overview

- ▶ A combined campus



# Site Visit Overview

## LI/EM Schools: Modal Interactions



Side Door  
Walkers and parent pickups

Main Door  
Bus and special ed students

Main Door  
Students taking bus

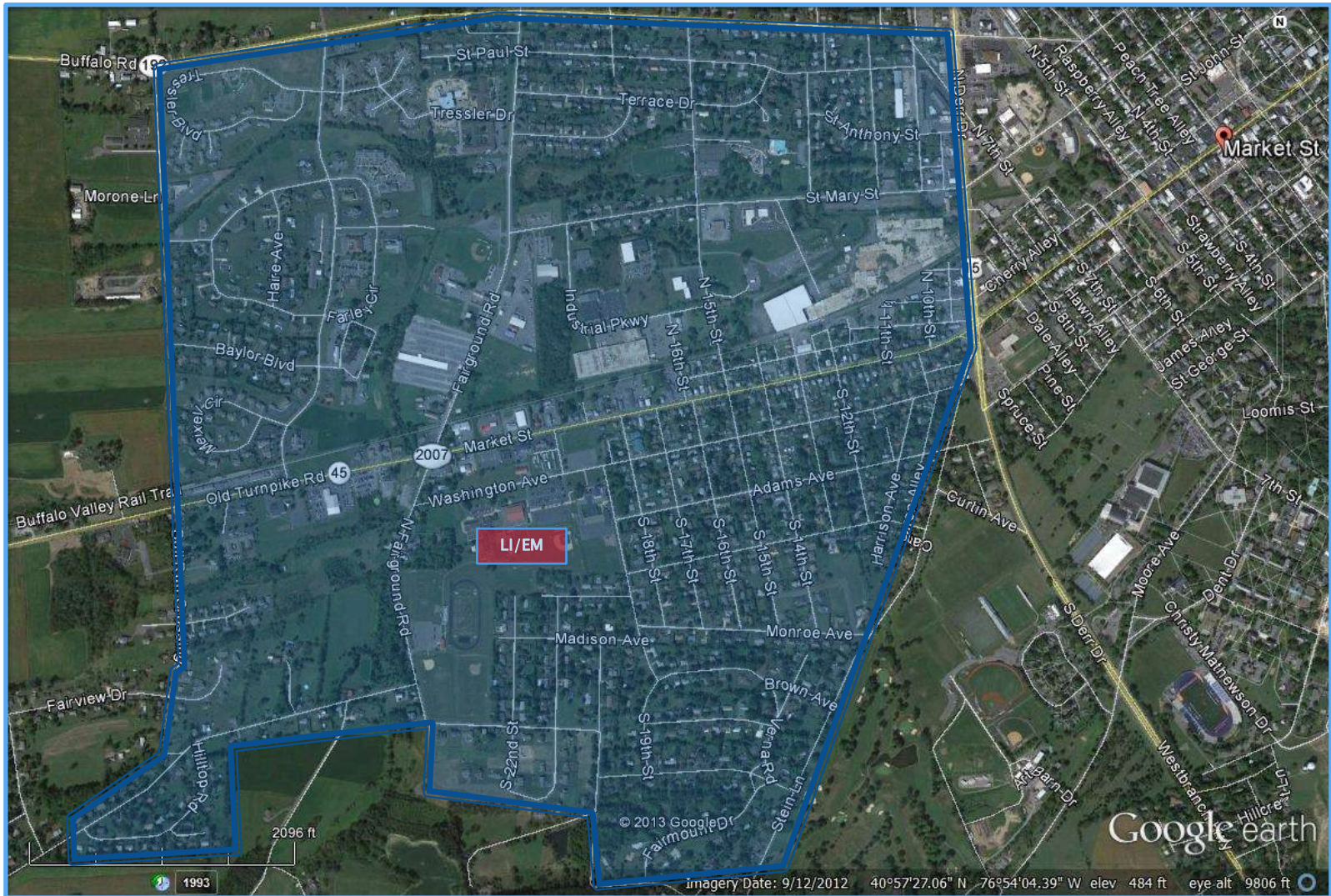
Side Door  
Walkers and parent pickups

**LEGEND**

Faculty Parking:		Bus Pick-Up/Drop-Off:		Parent Pick-Up/Drop-Off:	
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# LI/EM Potential



# Distances



# Keep in Mind...

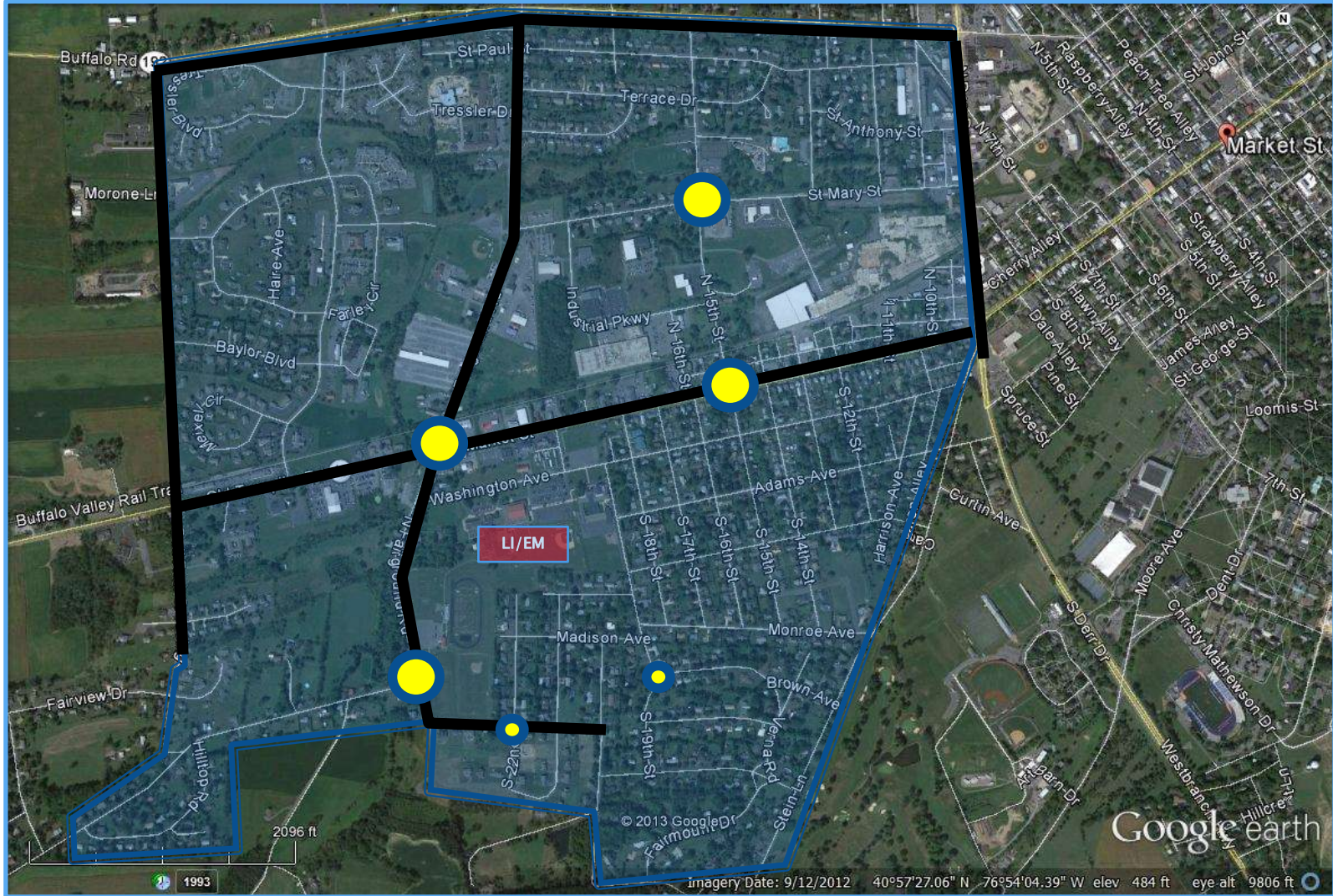
- ▶ National SRTS: “Generally speaking, it seems that people are willing to travel up to about 30 minutes to get somewhere. A 2008 article by McDonald, titled ‘Children’s mode choice for the school trip: The role of distance and school location in walking to school’ indicates that a typical walking rate for school-aged children is about 2.7 miles per hour (or 1.35 miles per 30 minute-period). Therefore, most children will probably not walk farther than 1.35 miles to/from school.”
- ▶ America Walks: “Children on a walking school bus walk at about 2 miles per hour, which is half the rate of a typical young adult.” This translates to 1 mile.

# Challenging Roads

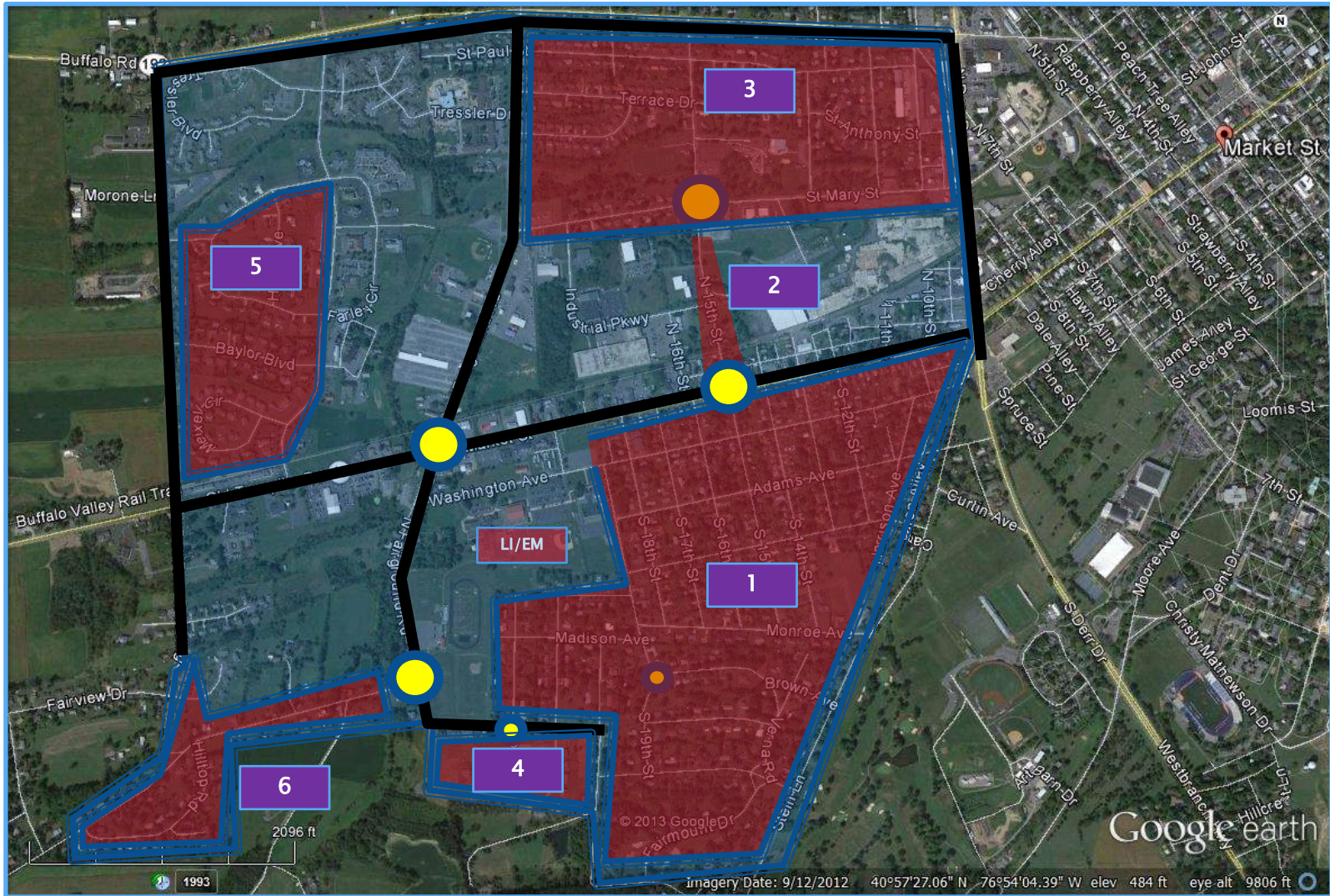




# Key Intersections



# Parts of the Puzzle



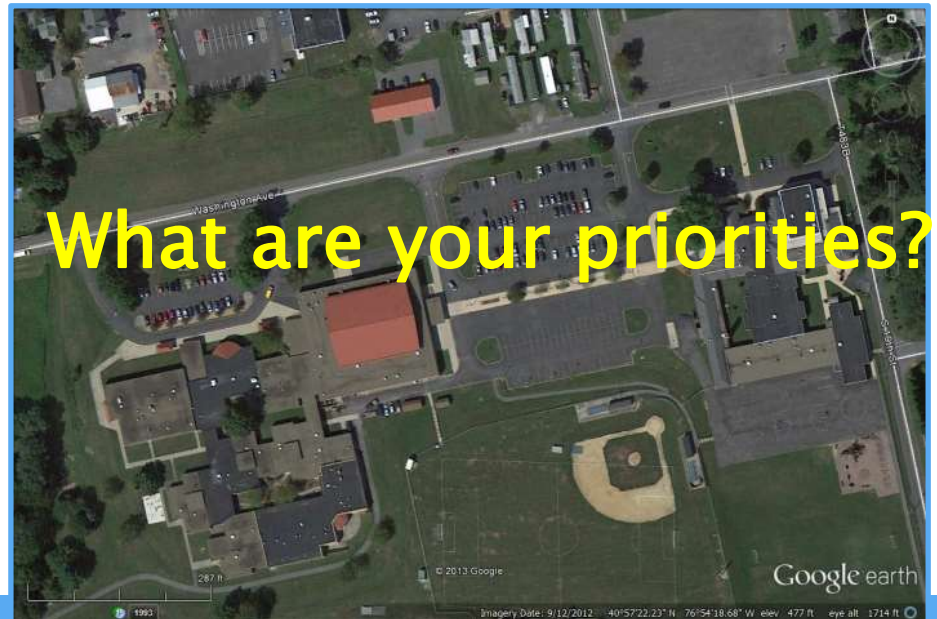
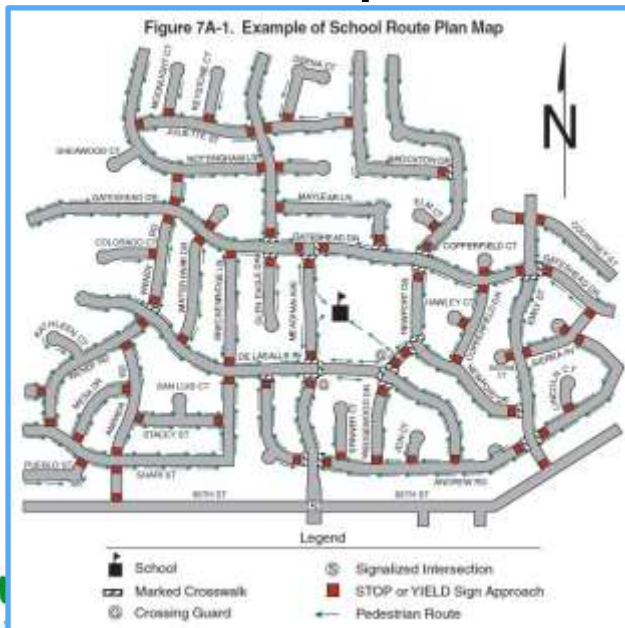
# Parts of the Puzzle

1. Core
2. Connector
3. Borough
4. Next Piece
5. Long Term
6. Outlier



# Overall Recommendation 1

- ▶ Consider establishing a School Route Plan consistent with guidance provided within Part 7 of FHWA's MUTCD. Establishes a standard for school traffic control and prioritizes “the need” for improvements. Work with the Township and their improvement plans.



# Overall Recommendation 1

## DEVELOP AN INFRASTRUCTURE PLAN; IT'S REALLY IMPORTANT!

- ▶ Plot where your students live
- ▶ Study both the logical, realistic and safest routes
  - ▶ Sometimes these are not the same things
- ▶ Improvements generally start at the school and work their way out
  - ▶ Core Area first and/or where the \$\$ is!
  - ▶ Official school zone may help some concerns and perhaps some negative effects of motor vehicle usage
- ▶ Tie in with your capital improvement/TI mitigations plans / CIP if possible – funding

# Overall Recommendation 2

## GET TO THE PARENTS!

- ▶ This will not work without informed and dedicated parents
- ▶ Need champions from more than one location
  - ▶ Core area
  - ▶ Borough Area
  - ▶ Next Piece
- ▶ Walking school buses and bike trains
- ▶ Education and Encouragement



# Overall Recommendation 3

## MUTIWAY STOP SIGNS

- ▶ Engineering and traffic studies and ordinances are necessary for enforcement
- ▶ Re-examine flow through the core area
- ▶ What Stop signs are warranted?
- ▶ Leave as-is or change? – Township must decide



# Overall Recommendation 3

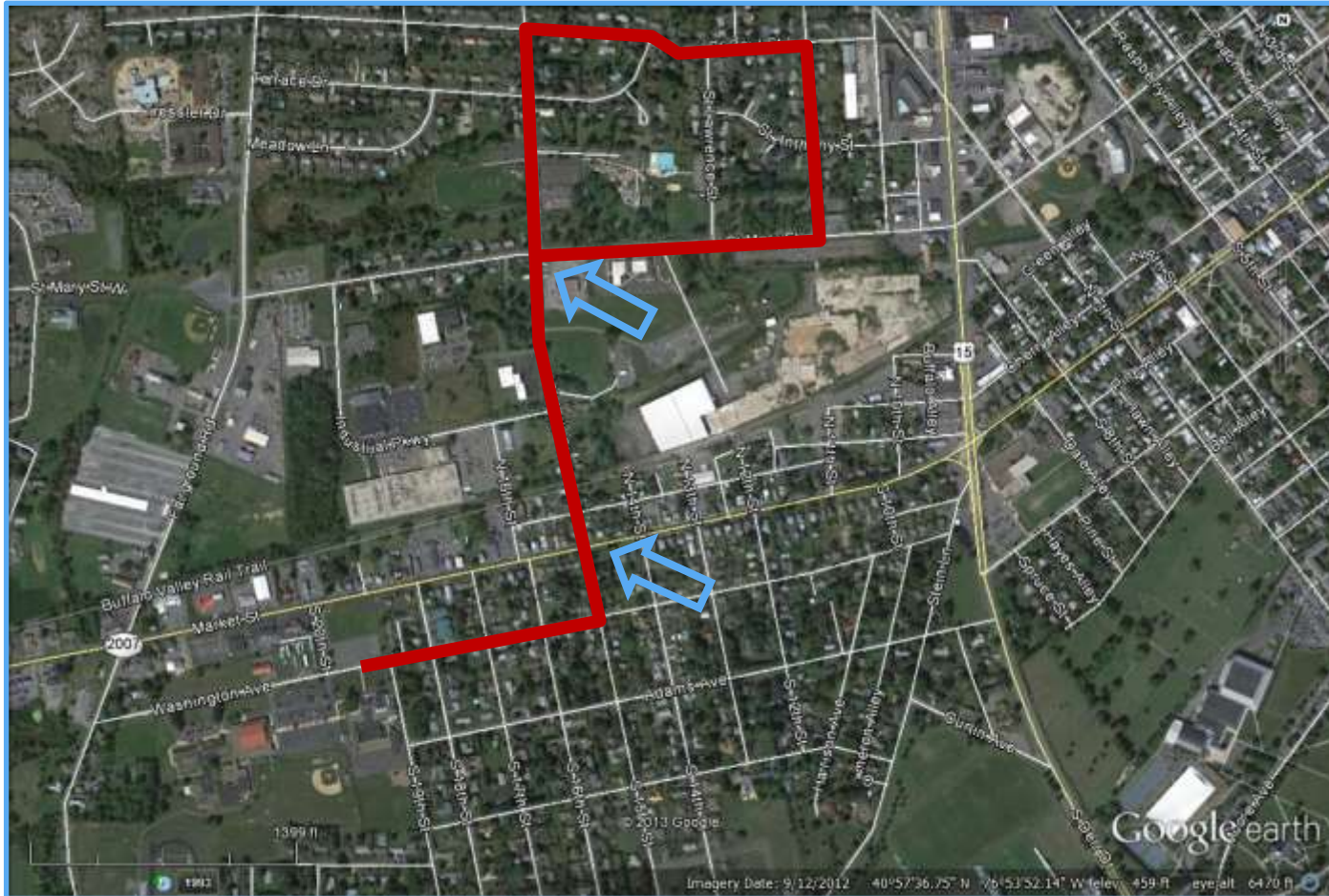
## MUTIWAY STOP SIGNS

- ▶ At every multiway stop sign, ALL WAY plaques must be installed. Note that there are unique signing requirements when, for example, 3 of the 4 legs are required to stop.





# Walking Route 1



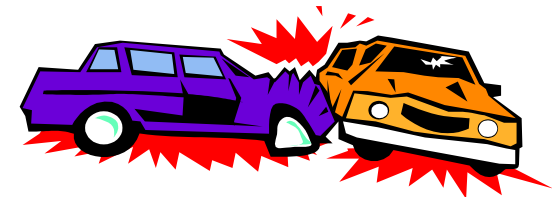
# Walking Route 1: Description

- ▶ Provides access to school for students residing north and east of the school
- ▶ Parts of 1, 2, 3 (Core, Connector, and Borough) mentioned above
- ▶ Key intersections:
  - 15<sup>th</sup> (Stop controlled) and Market
  - 15<sup>th</sup> and St. Mary (All-way Stop)
- ▶ Key walking route:
  - Washington and 15<sup>th</sup> Streets plus minor roads



# Walking Route 1: Existing Conditions

- ▶ Reportable Crash History (Most Recent 5 Years)
  - ▶ Washington Ave– 1 Crash @ Fairground – not on walking route (0 Ped)
  - ▶ 15<sup>th</sup> Street – 7 total crashes (0 Ped, 1 bicycle)
    - ▶ 5 @ Market
    - ▶ 1 @ rails-to-trails crossing
    - ▶ 1 @ St. Mary



# Walking Route 1: Existing Conditions

## *Walkability Checklist Summary*

<b>Walkability Checklist Results</b>			
<b>Question</b>	<b>Rating</b>		
Did you have room to walk?	3	out of	6
Was it easy to cross streets?	4	out of	6
Did drivers behave well?	4	out of	6
Was it easy to follow safety rules?	4	out of	6
Was your walk pleasant?	5	out of	6
<b>How does your neighborhood stack up?</b>	<b>20</b>	<b>out of</b>	<b>30</b>

A score of 20 out of 30: Okay, but it needs work.



# Walking Route 1: Existing Conditions

## *Room to Walk?*

- ▶ **No sidewalks.** This was probably the biggest barrier to walkability for students. Not *always* critical on roadways like 16<sup>th</sup> St. and other side roads that are low volume and low speed....BUT....

Washington Ave



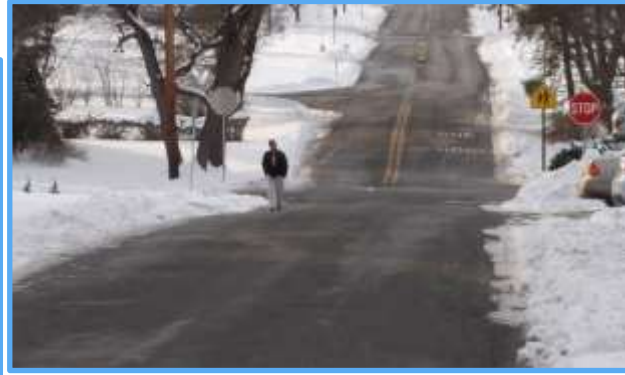
15<sup>th</sup> Street



# Walking Route 1: Existing Conditions

*Room to Walk?*

- ▶ This is what happens with no sidewalks.



# Walking Route 1: Existing Conditions

## *Room to Walk?*

- ▶ When sidewalks were in place, they ended abruptly

15<sup>th</sup> Street



15<sup>th</sup> Street



# Walking Route 1: Existing Conditions

## *Room to Walk?*

- ▶ When in place, they were sometimes blocked



Along 15<sup>th</sup> near Market Street



# Walking Route 1: Existing Conditions

*Room to Walk?*

- ▶ Winter maintenance issues



# Walking Route 1: Existing Conditions

## *Room to Walk?*

- ▶ Parked vehicles: Good AND Bad
  - Walking path – neg
  - Vehicle speeds – pos



Washington Ave

# Walking Route 1: Existing Conditions

## *Easy to Cross Street?*

- ▶ Parked cars blocked sight distance out of 15<sup>th</sup> Street along Market FOR AND TO pedestrians



**Ped view: 15<sup>th</sup> St looking  
along Market**



**Driver view: Along Market**

# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Volumes and speeds on Market made crossing difficult



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ No marked crosswalks – discussion later

15<sup>th</sup> and Washington



15<sup>th</sup> and Market



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ When provided, crosswalks are faded

15<sup>th</sup> and St. Mary



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ When provided, crosswalks are faded

Washington and 18th



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Signing issues at some crossings





# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Need curb ramps (sometimes) and a place for pedestrians to go (sidewalks)

15<sup>th</sup> and St. Mary



15<sup>th</sup> and St. Mary



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Or they end up here...



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Ramps blocked with snow



# Walking Route 1: Existing Conditions

*Easy to Cross Street?*

- ▶ Diagonal Curb Ramps



# Walking Route 1: Existing Conditions

*Was it Easy to Follow Safety Rules?*

- ▶ Remember this? What's wrong in 4/5 pictures?



# Walking Route 1: Existing Conditions

*Was it Easy to Follow Safety Rules?*

- ▶ Some bicycling on wrong side of the road



St. Mary's



Washington

# Walking Route 1: Existing Conditions

*Did Drivers Behave Well?*

- ▶ Most motorists rolled through Stops along Washington Ave.

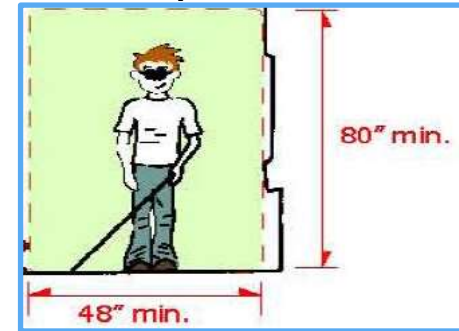


Washington Ave.

# Walking Route 1: Recommendations

## ▶ Short-Term Recommendations

- Consider working with residents, the Township, and other appropriate individuals to ensure that vegetation is kept clear of School Route Plan routes as best as possible.





# Walking Route 1: Recommendations

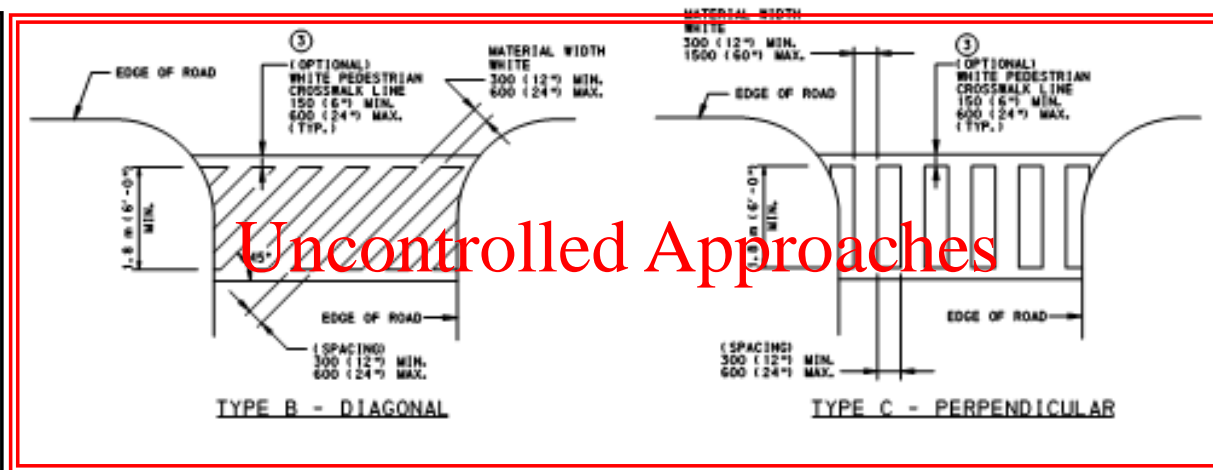
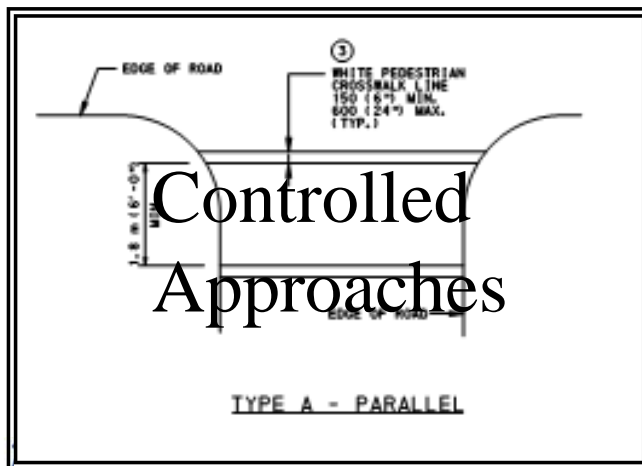
## ▶ Short-Term Recommendations

- Consider working with residents, Township code enforcement, to keep sidewalks and crossings clear of snow.



# Walking Route 1: Recommendations

- ▶ Short-Term Recommendations: Crosswalks
  - Upgrade crosswalks to Type B or C at uncontrolled approaches
    - Midblock across Washington (At LI)
    - Uncontrolled approaches across Market (e.g., 15<sup>th</sup> (?))
  - Type A okay at controlled crossings, but BE SELECTIVE
    - Follow your plan! Keep them maintained
    - 15<sup>th</sup> and St. Mary

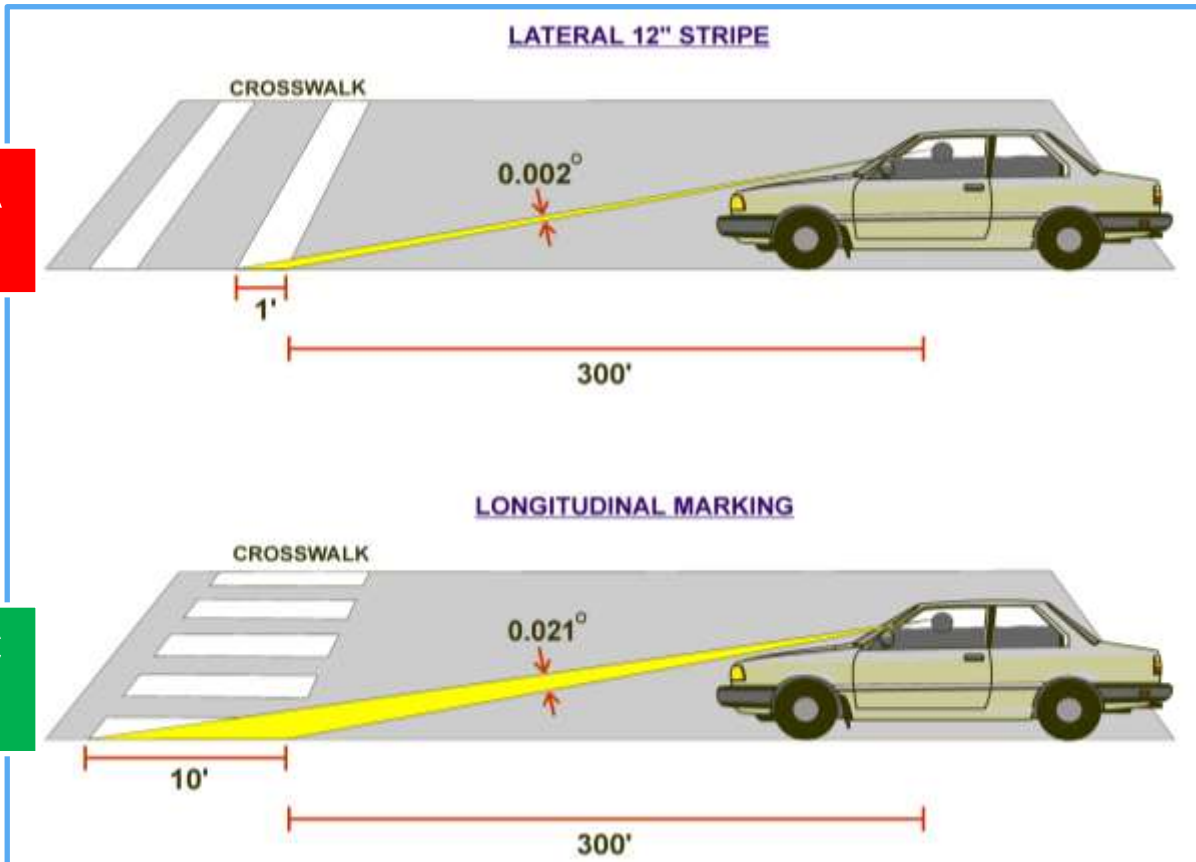


STANDARD CROSSWALK MARKINGS



# Crosswalk Visibility

Type A  
☹️



Type C  
☺️

Longitudinal markings such as Type B and Type C are more visible to drivers at a distance



# Crosswalk Visibility



Pedestrian perspective:  
what the pedestrian sees



Driver perspective:  
what the driver sees



# WHAT THE PEDESTRIAN SEES





05/31/2012

# WHAT THE DRIVER SEES





“Zebra” patterned crosswalks stand out



The staggered Type C pattern improves visibility from afar and decreases maintenance costs by decreasing vehicle wear



# Walking Route 1: Recommendations

- ▶ For example, will students cross here?



Washington Ave at Linntown  
School

# Walking Route 1: Recommendations

## ▶ Short-Term Recommendations

- IF SO, when marking this midblock crosswalk across Washington, install SCHOOL (S1-1) signs with diagonal arrows pointing down (W16-7)
- This should be in both directions
- Consider on both sides of roadway as well.
- Also, upgrade crosswalk

**Note that crosswalk lines on SCHOOL signs are no longer standard**



# Walking Route 1: Recommendations

- ▶ Short-Term Recommendations: Concept sketch



Washington Ave at Linntown  
School

# Walking Route 1: Recommendations

- ▶ Short-Term Recommendations: The Park



15<sup>th</sup> Street at the Park

# Walking Route 1: Recommendations

- ▶ Short-Term Recommendations: The Park
  - Install PEDESTRIAN (W11-2) sign with DIAGONAL ARROW POINTING DOWN (W16-7) on left side of roadway in both directions at marked crossing
  - Remove WATCH CHILDREN sign
  - Remove post-mounted YIELD TO PEDS IN CROSSWALK sign
    - Consider replacement with in-street sign?
    - Consider YIELD HERE TO PEDESTRIANS sign with Yield lines
  - Replace yellow DIAGONAL ARROW POINTING DOWN (W16-7) plaques with FYG color
  - Check ADA compliance at midblock crossing

# Walking Route 1: Recommendations

- ▶ Remember the overall recommendation of establishing a School Route Plan?
  - This may drive the improvements along the route, especially at 15<sup>th</sup> and Market
  - Future signalization may change this as well
  - What do you want to do at Market midblock?



Market St.  
midblock



# Walking Route 1: Recommendations

## ▶ Short-Term Recommendations

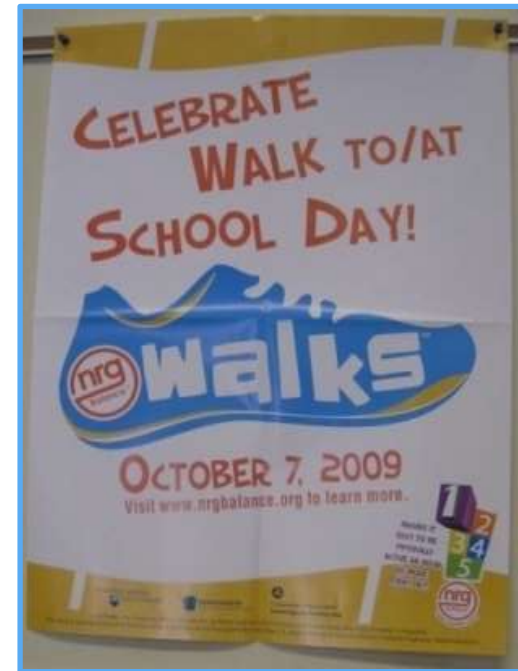
- Continue to work with the Buffalo Valley Regional Police Department to target enforcement efforts.
  - Engineering and Traffic Studies
    - Parking restrictions – statutory and non-statutory? Are additional ones necessary (sidewalks, sight distance)
    - Multiway Stops
    - Speeding
  - Ordinances
  - Where are the problems?
  - What will help with walkability?
- Enforce speeding and driver compliance at stop signs (if legally posted) at key crossing locations. Watch drivers exiting school, including school buses.

# Walking Route 1: Recommendations

- ▶ Short-Term Recommendations: Walking and Bicycling Education/Promotion
  - Walk to School Days and pedometers are great promotions.
  - Continue participating in Walk or Bike to School Day
  - Consider establishing a Walking School Bus Program
  - Get parents involved!!!
  - Teach Safe Walking and Bicycling!



Image 5: Mount Penn Elementary Center students, staff, and parents participate in the Walking School Bus





# Walking Route 1: Recommendations

- ▶ Walking and Bicycling Education/Promotion
  - Mural competition
  - Senior projects
  - Eagle Scout project
  - Bicycle Safety Course



Image 1: Claysville Elementary School students participate in a pedestrian safety course

# Walking Route 1: Recommendations

- ▶ Medium-Term Recommendations
  - Consider starting walking school bus or a bicycle train
    - Walking ENCOURAGEMENT activities
    - Senior volunteers (background checks, etc.)
    - Parents



# Walking Route 1: Recommendations

- ▶ Medium–Term Recommendations: 15<sup>th</sup> and Market
  - Engineering and Traffic Study
    - Volumes, Vehicle types, Speeds, Pedestrians (student and non–student), Crashes, Sight Distance, Gaps
  - Study should tell what to consider before signal installation
    - Crossing guard
    - Type B or C crosswalk
    - SCHOOL (S1–1) signs with plaques (W16–7) on both sides of the roadway in both directions
    - Parking restrictions
    - Yield to Pedestrian Channelizing Device may not work here because it is an intersection

# Walking Route 1: Recommendations

- ▶ Long-Term Recommendations: 15<sup>th</sup> and Market
  - When it becomes signalized
    - Crossing guard
    - Pedestrian countdown signals
    - Pushbutton activation
    - Timing (LPI)
    - Geometry and general design
    - Larger lens sizes, LEDs, backplates
    - Type B or Type C crosswalks
    - ADA compliant curb ramps
    - Sidewalks
    - Consider signage

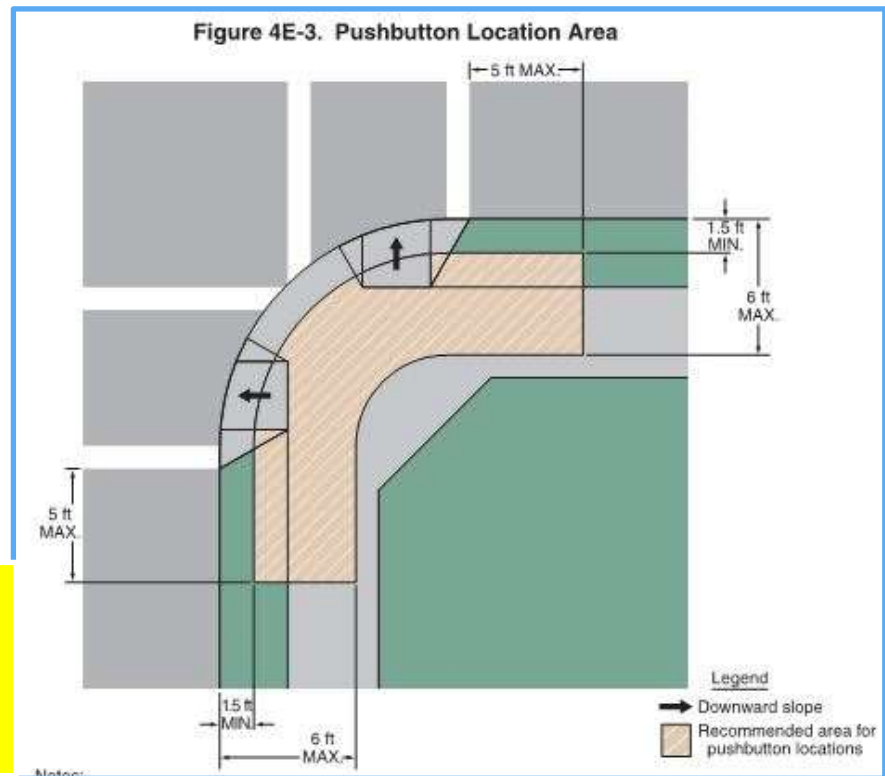


# Walking Route 1: Recommendations

- ▶ Pedestrian signal infrastructure includes pedestrian countdown signals, accessible and correctly oriented pushbuttons, visibly located and oriented signal heads, etc.



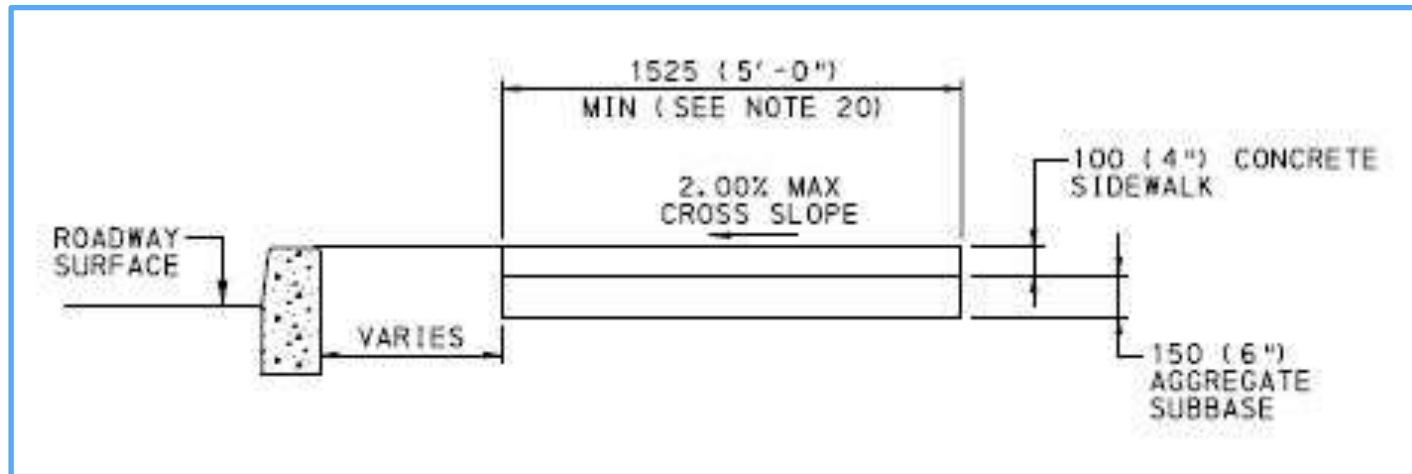
**See MUTCD  
and PennDOT  
Specifications**



# Walking Route 1: Recommendations

## ▶ Long-Term Recommendations

- Consider constructing ADA compliant **SIDEWALKS** in accordance with PennDOT Publication 72M, RC-67, *Standards for Roadway Construction* along designated School Walking Route.

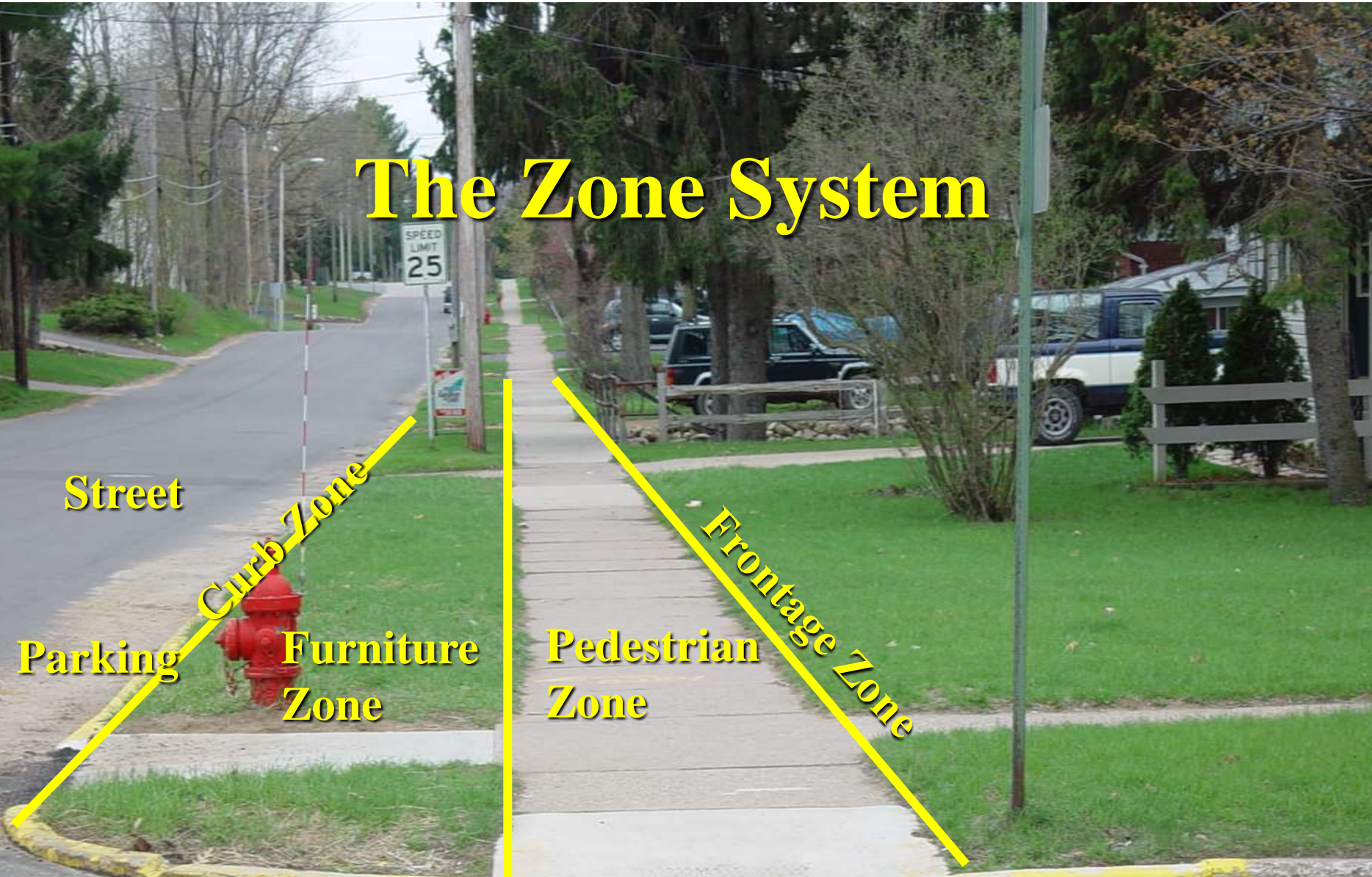


20. SIDEWALK WIDTH MAY BE REDUCED TO 1220 (4'-0"), WHEN PASSING AREAS 1525 X 1525 (5'-0" X 5'-0") ARE PROVIDED EVERY 61 METERS (200').

# Walking Route 1: Recommendations

## ▶ Long-Term Recommendations

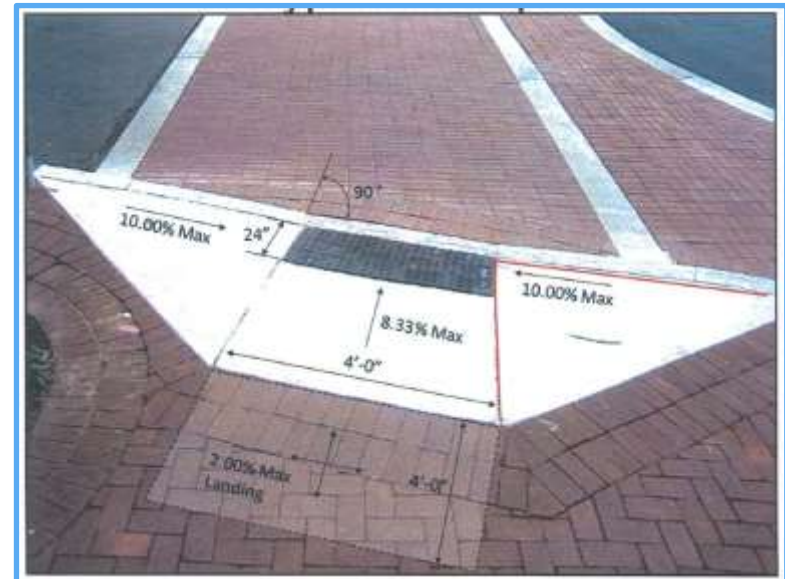
### The Zone System



# Walking Route 1: Recommendations

## ▶ Long-Term Recommendations

- Consider constructing ADA compliant curb/curb ramps in accordance with PennDOT Publication 72M, RC-67, *Standards for Roadway Construction* along entire walking route.
- Be sure ramps, crosswalks, sidewalks align





# Walking Route 1: Cost Estimates\*

## ▶ Short-term recommendations:

- ST #1 – Vegetation control improvements: Identify and trim or remove and tree, plant, brush, shrubbery that could cause a hazard: \$1,000
- ST #2 – Along walking routes, work with residents, Township code enforcement, to keep sidewalks and crossings clear of snow: Minimal
- ST #3 – Upgrade existing midblock or crossings across uncontrolled approaches to Type B or C crosswalks: \$450 / Type C patterned hot-thermoplastic crosswalk
- ST #4 – Repaint existing faded Type A crosswalks and installing Type A crosswalks at controlled locations where appropriate (e.g., 15<sup>th</sup> and Washington): \$100 / Type A patterned white waterborne crosswalk
- ST #5 – If students use midblock crossing across Washington in front of Linntown, in addition to upgrading crosswalk, consider installing School (S1-1) sign assembly: \$200 / New FYG School Crossing Sign Assembly (Includes S1-1 and W16-7P signs)
- ST #6 – If students use midblock crossing across Market and it is permitted from PennDOT, in addition to upgrading crosswalk, consider installing School (S1-1) sign assembly: \$200 / New FYG School Crossing Sign Assembly (Includes S1-1 and W16-7P signs)
- ST #7 – Consider using yield to pedestrian channelizing devices at midblock crossing(s): Free
- ST #8 – At ‘the Park’ crossings, Install PEDESTRIAN (W11-2) sign with diagonal arrows pointing down (W16-7) on left side of roadway in both directions, remove WATCH CHILDREN sign, remove post-mounted YIELD TO PEDS IN CROSSWALK sign and replace with in-street sign or YIELD HERE TO PEDESTRIANS sign with Yield lines. Replace yellow diagonal arrows pointing down (W16-7) plaques with FYG color: \$200 / New FYG Pedestrian Crossing Sign Assembly, \$100 / sign removal
- ST #9 – Continue/increase enforcement of speeding and stop sign compliance: *Varies. Generally,* working with the municipality and local police, increased enforcement is at no cost to the school district.
- ST #10 – Educate/re-educate children and parents on the safety rules for walking and biking to and from school: *Varies* – dependent on educational program developed

\*COSTS ARE FOR PLANNING PURPOSES ONLY

# Walking Route 1: Cost Estimates\*

## ▶ Medium-term recommendations:

- MT #1 – Consider establishing Walking School Bus or Bicycle Train: Varies depending on volunteers, equipment, etc.
- MT #2 – Engineering and Traffic Study for 15<sup>th</sup> and Market: ~\$5,000, but depends on scope
  - MT #2A (Dependent on study) – Crossing guard at 15<sup>th</sup> and Market: Varies
  - MT #2B (Dependent on study) – Type B or C crosswalks: \$ 450/Type C patterned hot-thermoplastic crosswalk
  - MT #2C (Dependent on study) – Before signal goes in, consider installing School (S1-1) sign assembly: \$200 / New FYG School Crossing Sign Assembly (Includes S1-1 and W16-7P signs)
  - MT #2D (Dependent on study) – Parking restrictions along Market: \$125/sign installation plus ~\$1,000 in ordinance costs

## ▶ Long-term recommendation:

- LT #1 (As 15<sup>th</sup> and Market becomes signalized) – Consider new crossing guard at 15<sup>th</sup> and Market: varies
- LT #2 (As 15<sup>th</sup> and Market becomes signalized) – Consider providing pedestrian signal infrastructure to include pedestrian countdown signals, accessible and correctly oriented pushbuttons, visibly located and oriented signal heads at 15<sup>th</sup> and Market: varies based on extent of improvements. At least \$1500 / new pedestrian signal head
- LT #3 (As 15<sup>th</sup> and Market becomes signalized) – Traffic signal timing to accommodate pedestrians (LPI, extended yellow, etc.). – Incorporated into signal timing design. At least \$2,000 for timing upgrades
- LT #4 – (As 15<sup>th</sup> and Market becomes signalized) Use LEDs (40–\$75/lamp), retroreflective back plates to signal heads and standard signal head sizes – Varies – incorporated into design
- LT #5 – Consider constructing ADA compliant sidewalks and curb/curb ramps along walking route: \$85/Square yard of concrete sidewalk, \$35 / Linear foot of curb
- LT #6 – Consider constructing ADA compliant curb ramps along walking route when sidewalks are installed: \$2,000/curb ramp



# Walking Route 2

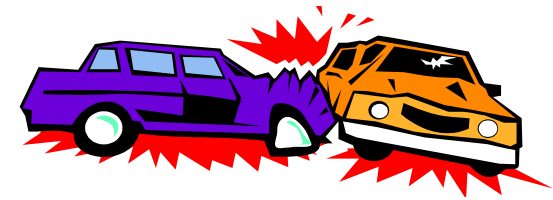


# Walking Route 2: Description

- ▶ Provides access to school for students residing south of the school
- ▶ Parts of 1 (Core) and near 4 (Next Piece) mentioned above
- ▶ Key intersections:
  - 19<sup>th</sup> Street / Adams (All way Stop control)
  - 19<sup>th</sup> Street / Jefferson (All way Stop control)
  - 19<sup>th</sup> Street / Monroe (All way Stop control)
  - 19<sup>th</sup> Street / Verna Road (2 of 3 legs stop!)
- ▶ Key walking route:
  - 19<sup>th</sup> Street
  - Adams Avenue, Verna Road, Jean Boulevard

# Walking Route 2: Existing Conditions

- ▶ Reportable Crash History (Most Recent 5 Years)
  - ▶ 19<sup>th</sup>, Verna, Jean, Fairmont (no crashes)
  - ▶ Adams Avenue – 4 crashes (0 ped)
    - ▶ 2 @ Stein, 2 @ US 15



# Walking Route 2: Existing Conditions

## *Walkability Checklist Summary*

Walkability Checklist Results			
Question	Rating		
Did you have room to walk?	4	out of	6
Was it easy to cross streets?	4	out of	6
Did drivers behave well?	5	out of	6
Was it easy to follow safety rules?	5	out of	6
Was your walk pleasant?	5	out of	6
<b>How does your neighborhood stack up?</b>	<b>23</b>	<b>out of</b>	<b>30</b>

A score of 23 out of 30: Celebrate a little!  
Your neighborhood is pretty good.



# Walking Route 2: Existing Conditions

*People do walk here!*

- ▶ People do walk here!



# Walking Route 2: Existing Conditions

## *Room to Walk?*

- ▶ **No sidewalks.** Not critical on very low volume roadways like Linden or Sunset, but would be useful on heavier volume roads like 19<sup>th</sup> St.





# Walking Route 2: Existing Conditions

*Easy to Cross Street?*

- ▶ When provided, crosswalks are faded

19<sup>th</sup> and Jefferson



# Walking Route 2: Existing Conditions

*Easy to Cross Street?*

- ▶ When provided, crosswalks are faded

19<sup>th</sup> and Adams



# Walking Route 2: Existing Conditions

## *Room to Walk?*

- ▶ Parked vehicles: Good AND Bad
  - Walking path – neg
  - Vehicle speeds – pos



Verna Street

# Walking Route 2: Existing Conditions

## *Room to Walk?*

- ▶ Walking path occasionally blocked with shrubbery



# Walking Route 2: Existing Conditions

*Was your walk pleasant?*

- ▶ Scary dogs?



# Walking Route 2: Existing Conditions

*Did Drivers Behave Well?*

- ▶ Most motorists consistently rolled through Stops along 19<sup>th</sup>, Adams, etc.



Adams Ave.

# Walking Route 2: Recommendations

- ▶ Recommendations are VERY similar to Walking Route 1
- ▶ Short term
  - Vegetation control even when there are no sidewalks
  - Upgrade and/or maintain existing crosswalks
    - Where they are faded, replace them. There are no uncontrolled locations along this route.
    - Tie the sign and pavement marking enhancements in with possible traffic control changes (multiway Stop removal). Some Type A crosswalks might be better as Type B or C if approaches become uncontrolled. See Overall Recommendations (previous) and well as medium term recommendations that follow
- ▶ Medium term
  - Engineering and traffic study for traffic control at intersections along the route
  - Decide what you can/want/need to enforce: Stops, parking, speeding?
- ▶ Long term
  - Sidewalks, ramps, etc.

# Walking Route 2: Cost Estimates\*

- ▶ Short-term recommendations:
  - ST #1 – Vegetation control improvements: Identify and trim or remove and tree, plant, brush, shrubbery that could cause a hazard: \$1,000
  - ST #2 – Repaint existing faded Type A crosswalks and installing Type A crosswalks at controlled locations where appropriate: \$100 / Type A patterned white waterborne crosswalk
- ▶ Medium-term recommendations:
  - MT #1 – Consider conducting engineering and traffic study evaluating multiway stop installations along the walking route. Study can be done internally by Township, or cost will vary depending on the scope of the study. Note that study may necessitate some upgrades to crosswalk pavement markings along the route.
- ▶ Long-term recommendation:
  - LT #1 – Consider constructing ADA compliant sidewalks and curb/curb ramps along walking route: \$85/Square yard of concrete sidewalk, \$35 / Linear foot of curb
  - LT #2 – Consider constructing ADA compliant curb ramps along walking route when sidewalks are installed: \$2,000/curb ramp

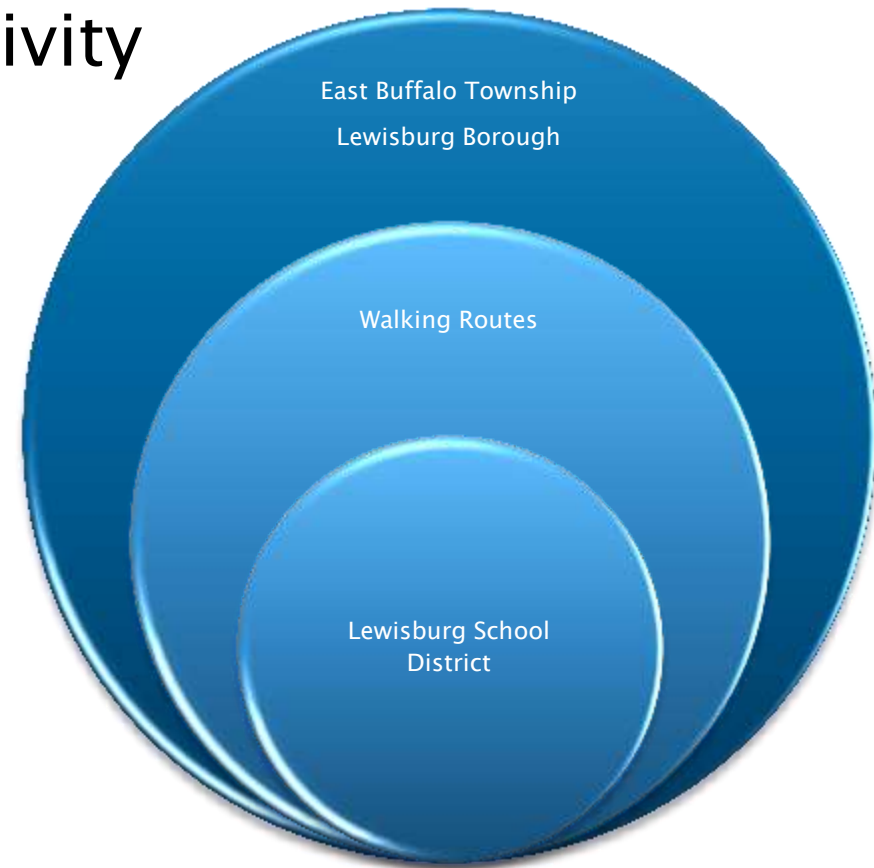
\*COSTS ARE FOR PLANNING PURPOSES ONLY





# Other Observations and Recommendations

- ▶ Alternate walking routes and additional neighborhoods = Connectivity
- ▶ Crosswalks
- ▶ Crossing guards



# Other Observations and Recommendations

- ▶ Alternate walking routes – students are using them
  - This one is behind schools to 21<sup>st</sup> and 22<sup>nd</sup> Streets – Smoketown (Area 4)



# Other Observations and Recommendations

- ▶ Alternate walking routes – students are using them
  - This one is behind schools to 21<sup>st</sup> and 22<sup>nd</sup> Streets – Smoketown (Area 4)



# Other Observations and Recommendations

- ▶ Alternate walking routes – alternate exit to 22<sup>nd</sup> Streets – towards Smoketown (Area 4)



# Other Observations and Recommendations

- ▶ To Smoketown neighborhood, final destination?  
(Area 4)



# Other Observations and Recommendations

- ▶ Connecting school campus to other neighborhoods: Opportunity is there! – Area 4



Will need to enhance crossings to get to Smoketown



# Other Observations and Recommendations

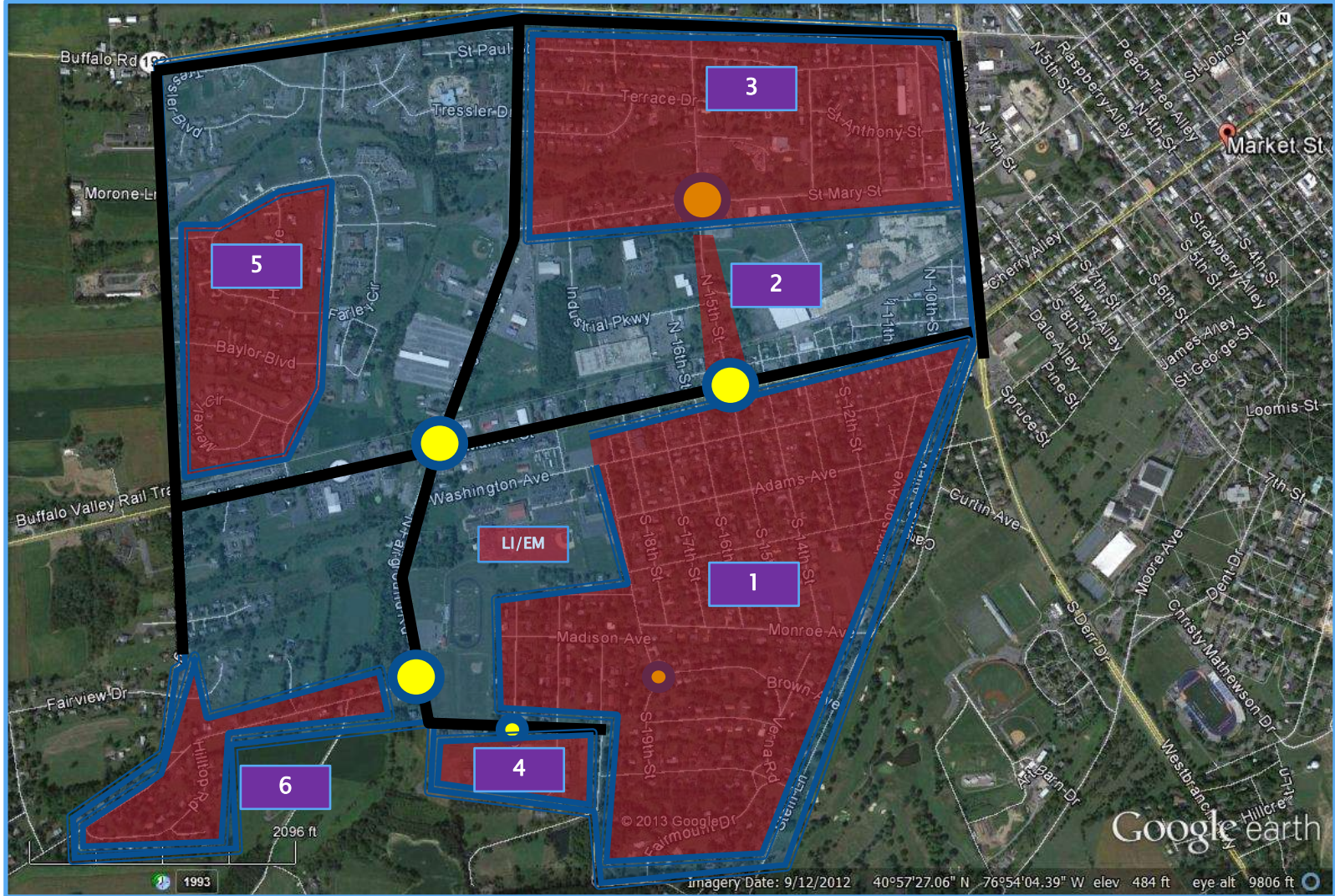
- ▶ Connecting school campus to other neighborhoods: Rail-trail may be a key long term



Area 5

Will need to enhance crossings across **Market**

# Connectivity: Parts of the Puzzle





# Connectivity: Parts of the Puzzle

1. Core – sidewalks, encouragement
2. Connector – sidewalks, maintenance, work with the project that is coming in – signalization
3. Borough – sidewalks, cooperation, encouragement. It is a bit far, but connector can help
4. Next Piece: Smoketown – intersection enhancements, encouragement
5. Long Term – rails-to-trails, crossing Market Street issues
6. Outlier – still opportunity. Did not get to review as part of this audit

# Crosswalks

- ▶ Establish legal pedestrian crossings
- ▶ Provide guidance for pedestrians crossing roadways
- ▶ Provide guidance to motorists of where pedestrians may be crossing
- ▶ An engineering study should be performed before placing a crosswalk at a midblock location, or really, across any uncontrolled approach



# Crosswalks

- ▶ At Intersections:
  - Guide pedestrians
  - Warn motorists of pedestrian crossing point
  - May be marked or unmarked
- ▶ Non-intersection locations (i.e., midblock)
  - Legally establish the crosswalk only when marked
  - Cannot be unmarked
  - Pedestrian crossing signs and possible other enhancements recommended



# Midblock Crosswalks

- ▶ An engineering study should be performed before placing a crosswalk at a midblock location, or really, across any uncontrolled approach
- ▶ Study and permit required if across a state highway
- ▶ Marked crosswalk does NOT = Pedestrian safety !!
- ▶ Should not be used under following conditions:
  - Speeds exceed 40 mph
  - Road with >4 lanes w/o raised median and ADT > 12,000
  - Road with >4 lanes with raised median and ADT > 15,000

# Midblock Crosswalks

**Table 11. Recommendations for installing marked crosswalks and other needed pedestrian improvements at uncontrolled locations.\***

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT >9,000 to 12,000			Vehicle ADT >12,000–15,000			Vehicle ADT > 15,000		
	Speed Limit**											
	≤ 48.3 km/h (30 mi/h)	56.4 km/h (35 mi/h)	64.4 km/h (40 mi/h)	≤ 48.3 km/h (30 mi/h)	56.4 km/h (35 mi/h)	64.4 km/h (40 mi/h)	≤ 48.3 km/h (30 mi/h)	56.4 km/h (35 mi/h)	64.4 km/h (40 mi/h)	≤ 48.3 km/h (30 mi/h)	56.4 km/h (35 mi/h)	64.4 km/h (40 mi/h)
Two lanes	C	C	P	C	C	P	C	C	N	C	P	N
Three lanes	C	C	P	C	P	P	P	P	N	P	N	N
Multilane (four or more lanes) with raised median***	C	C	P	C	P	N	P	P	N	N	N	N
Multilane (four or more lanes) without raised median	C	P	N	P	P	N	N	N	N	N	N	N

From “Safety Effects of Marked Versus Unmarked Crosswalk at Uncontrolled Locations” FHWA Pub # HRT-04-100, Sept. 2005.



# Crossing Guards

- ▶ Work best with a crosswalk
- ▶ Emphasize what Title 75 (Vehicle Code) requires in Section 3102 and 3542
  - 3102: Obedience to Authorized Persons to Direct Traffic
  - 3542: Right-of-way of pedestrians in crosswalks
- ▶ Title 67 § 101 Authorizing Appropriately Attired Persons to Direct, Control or Regulate Traffic
  - § 101.2. Persons authorized to direct traffic.
    - (2) Adult school crossing guards for assisting school children across busy or hazardous highways.



# Crossing Guards

- ▶ 2009 MUTCD, Section 7D.05 Operating Procedures for Adult Crossing Guards
- ▶ Standard
  - Adult crossing guards shall not direct traffic in the usual law enforcement regulatory sense. In the control of traffic, they shall pick opportune times to create a sufficient gap in the traffic flow. At these times, they shall stand in the roadway to indicate that pedestrians are about to use or are using the crosswalk, and that all vehicular traffic must stop.
  - Adult crossing guards shall use a STOP paddle.



# Crossing Guards

- ▶ PennDOT email is correct
- ▶ No legal requirement to provide a crossing guard
  - It is local decision (school district/municipality) based on an engineering and traffic study
- ▶ Marked midblock crosswalk (approved by PennDOT on State highway) or crosswalks at intersections give pedestrians the legal right-of-way as long as they are exercising reasonable care
- ▶ Crossing guards help students with this!
  - Young students may have difficulty with gap judgments. Crossing guards are visible, help find the adequate gaps, start the crossing process (traffic yields), and help students cross the street.



# Implications for this Audit

- ▶ Existing midblock across Market
  - Based on information, it is not a 'legal' midblock crosswalk – not approved/permitted by PennDOT



# Implications for this Audit

- ▶ Existing midblock across Market
  - Based on information, it is not a 'legal' midblock crosswalk – not approved/permitted by PennDOT
  - If students are crossing there, it is currently at their risk, but pavement markings should be removed as they are not approved
  - The Township should consider:
    - Complete an engineering and traffic study for a midblock crosswalk
    - If warranted, submit study to PennDOT for permit for midblock crosswalk
    - Install Type B or C crosswalk that matches curb cut
    - Install School crossing assembly warning signs
    - Use a crossing guard at this location once all TCDs are in place
    - Note this may provide a link to rail-to-trails and Area 5

# Implications for this Audit

## ▶ 15<sup>th</sup> and Market

- This is an intersection, unlike midblock just discussed
- A signal is coming and recommendations are included for pedestrian accommodation, but in the meantime...
- Do you mark a Type B or C crosswalk, install school crossing assembly, and place a crossing guard there?
  - Complete an engineering and traffic study
  - Work with PennDOT
  - Liability – need to work with your solicitor for their risk management judgment
    - Do nothing knowing students cross there?
    - Install warnings to assist students crossing without adult assistance (crossing guard)?

# Walking Forward

- ▶ Know your own walking environments:
  - What are the good things... the bad things? What changes daily and why?
- ▶ Break your walking environments down into manageable pieces (prioritize).
- ▶ As time goes by:
  - Continually tweak your operations.
  - Start to identify key walking route features (i.e. a sidewalk here or a crosswalk there) that need to be improved.
  - Observing your walking routes will lead to prioritizing your improvement efforts and thus well spent money!
  - Work with your local planning organization and other parties (School District/Township/Engineer/PennDOT/Advocates) to investigate mitigation measures and plan funding. Cooperation is essential!
- ▶ Over time:
  - Your walking environment will be what you want it to be... start at the home base (in and around the school) and work your way out.



# Further Assistance

If further details or justification are desired regarding the recommendations in this report, please contact Mark Hood, P.E. at Pennoni Associates, Inc.

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