Strongsville Town Center District Redevelopment Plan

Prepared By

NOACA
Lake
Geauga
Cuyahoga
Lorain
Medina
Planning For
GREATER
CLEVELAND

August 2015

Strongsville Town Center District Redevelopment Plan

City of Strongsville, Ohio

August 2015

Prepared by:

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

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TABLE OF CONTENTS

STUDY NEED

The Strongsville Town Center District Redevelopment Plan looks to improve multimodal transportation accommodations as well as redevelopment strategies within the area known as the Town Center District (TCD). The TCD is located near the center of the City of Strongsville, and is home to numerous civic, recreational, and commercial destinations. As a result, the area experiences tens of thousands of visitors every year, overwhelming the available parking supply and creating congestion on the two main roads that border the TCD, Pearl Road and Royalton Road. Additionally, the TCD lacks safe crossings and sidewalks. Students at the middle school located adjacent to the TCD are driven by their parents as opposed to walking the short distance because there is no safe pedestrian route. This also exacerbates congestion on Pearl and Royalton Roads. The school is currently being reconstructed, adding an additional 400 students to the area. The goal of the study was to address the TCD's congestion issues and incomplete multimodal transportation network.

PREVIOUS PLANNING EFFORTS

2009 Strongsville Walkability Community Workshop Report

NOACA conducted numerous walkability community workshops in 2008 with the assistance of the National Center for Bicycling and Walking (NCBW). The workshop focused on Pearl Road and Royalton Road along the TCD. National experts along with local officials held working groups and conducted a walk audit before working as a team on recommendations for a more walkable community. Recommendations from the workshop included increased pedestrian crossing times, painting high-visibility crosswalks, narrowing lanes and installing bicycle lanes on Royalton Road, as well as others.

NOACA 2013 Regional Bicycle Plan

Pearl Road throughout the City of Strongsville is included in the 2013 Regional Priority Bikeway network. This indicates that the road serves as an important potential connection as part of a regional bikeway network and would be considered a priority for NOACA funding.

STUDY AREA

The TCD is located at the intersection of Royalton Road (SR 82) and Pearl Road (US 42) near the center of the City. For the purposes of this plan, it extends north on Pearl Road to the Strongsville cemetery north of Zverina Lane and east on Royalton Road to the Greens of Strongsville shopping center entrance. There is a large concentration of civic, recreational, and commercial destinations located inside the TCD. Map 1 shows the boundary of the TCD, as well as the names and locations of the destinations.

Map 1 | Study Area and Destinations

POTENTIAL REDEVELOPMENT PARCELS

Amongst the numerous destinations inside the TCD are several parcels that are either vacant or underutilized. The City is pursuing redevelopment of these sites, which will increase trips to the district and create more demand for connectivity between TCD destinations. Map 2 shows the location of these potential redevelopment parcels. The details of the proposals are listed below.

1. New Multitenant Building

- PPNs: 396-10-003; 004; 005
- Proposed 10,841 SF facility
- Proposed tenants:
  - 4,525 SF Restaurant
  - 1,546 SF Restaurant
  - 2,538 SF Laser Spa
  - 2,232 SF Fast Service Eatery

2. Stand-Alone Mitchell's Ice Cream

- PPN: 396-10-016
- Proposed 2,600 SF facility
- Rezoning Passed to allow Mitchell's Ice Cream
- City awaiting Planning Commission Submission

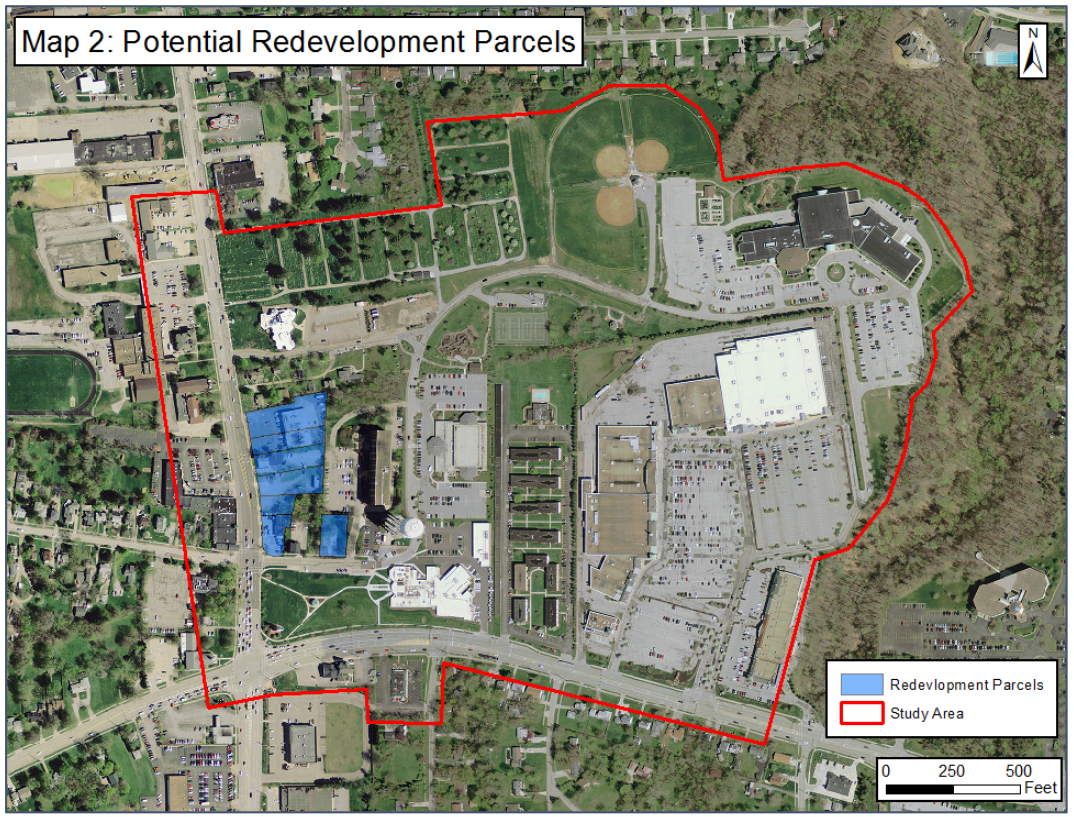
3. Existing Building Redevelopment

- PPNs: 396-10-001; 002
- 12,580 SF facility
- Existing structure would stay, storefront would be revitalized
- New tenants (not yet announced)

4. Commercial Development

- PPN: 396-10-006
- Future design center/showroom for Architectural Justice

Map 2 | Potential Redevelopment Parcels



OPPORTUNITIES

Proximity of Destinations

Typically in suburban communities such as Strongsville, destinations are spaced out to an extent that it is not feasible to consider walking as a preferred mode of transportation. However, a multitude of destinations are located within the TCD, which is approximately 125 acres. Additionally, multiple residential developments are nearby or adjacent to the district.

Pedestrian Amenities

The TCD is located in close proximity to the major institutions and commercial centers in Strongsville. Sidewalks exist along major routes, and crosswalks exist at major intersections. Signalized intersections include pedestrian beacons indicating walk phases for pedestrians. However, there can be conflicts between pedestrians and vehicles due to the length of crosswalks and vehicular turning movements.

On-Campus Senior Housing

The TCD is fortunate to have senior housing located in close proximity to the numerous destinations. Some seniors are limited in their mobility, so the more mode options made available to them, the better. A location in which seniors do not have to drive in order to complete daily tasks, such as shopping, can be highly attractive.

Gazebo on Strongsville's Freedom Trail

Northwest corner of Pearl and Royalton Roads intersection

Parking for Seniors at Greens of Strongsville

Freedom Trail

The Freedom Trail is a shared use path that travels throughout the TCD. Although there are gaps in the path that need to be completed, it has the potential to serve as the backbone of the multimodal transportation system throughout the district. The path is wide enough so that it can be comfortably used by pedestrians and bicyclists at the same time, compared to the sidewalks in the area, which are narrower.

Programming

Another key ingredient in creating a place where people want to walk and bike is the activation of space through programming. The City of Strongsville, as well as other entities, hosts a variety of events at several of the locations within the TCD. These events are well attended and can generate a higher demand for parking than what is currently available, making walking or biking a more attractive mode. Because the TCD is near residential neighborhoods and other destinations, the City can promote walking as the prefrerred way to access the district, and encourage visitors to park once rather than driving for each trip within and around the district.

Signage for the Freedom Trail

Walking connections around the TCD

CONSTRAINTS

Large, Busy Adjacent Streets and Intersections

Where they intersect at the southwest corner of the TCD, Pearl Road and Royalton Road range from five to seven lanes wide. Even with extended time allowed to cross, roads this wide can be unwelcoming to pedestrians and bicyclists. Both roads serve as major corridors for motorized traffic, so it is unlikely that either road will be narrowed to allow for shorter, less dangerous pedestrian crossings.

Missing Sidewalks and Crosswalks

The roadways along the boundaries of the TCD have complete sidewalks and crosswalks. However, there are several gaps in the sidewalk network within the district, and some intersections do not have marked crosswalks. Although vehicles typically drive slowly in the district, these gaps can still be dangerous and may deter some from walking to a location as opposed to driving.

Parking-to-Door Accommodations

Many destinations in the TCD include onsite parking for visitors and drop-off zones adjacent to their front entrance. Many approaches to TCD buildings feel unsafe and unwelcoming to pedestrians and bicyclists because there is no clear and safe right-of-way for a pedestrian to navigate to the entrance of the building.

Intersection of Pearl and Royalton Roads

Missing sidewalk at Westwood Drive

Parking lot in front of recreation center

Walls and Fences Limiting Mobility

Although destinations may be in close proximity to each other within the TCD, the distances between can be much longer due to walls or fences blocking the shortest path. While the removal or interruption of some barriers would provide more feasible walking distances, property owners may choose to keep them in place due to privacy preferences.

Car Culture

People living in suburban communities are accustomed to having to drive where they need to go. This is because destinations tend to be spaced far apart, and sidewalks and bikeways are less prevalent than they are in more urban areas. If the built environment encourages people to drive without considering other means of travel, then condtions must be ideal in order to make walking or bicycling a consideration. While it is unrealistic in the short or medium term to redevelop properties to be spaced closer and more accessible by walking and biking, there are countermeasures that can improve safety and help promote walking and biking as additional transportation options.

Wall separating destinations inside TCD

Parking lot at Senior Center

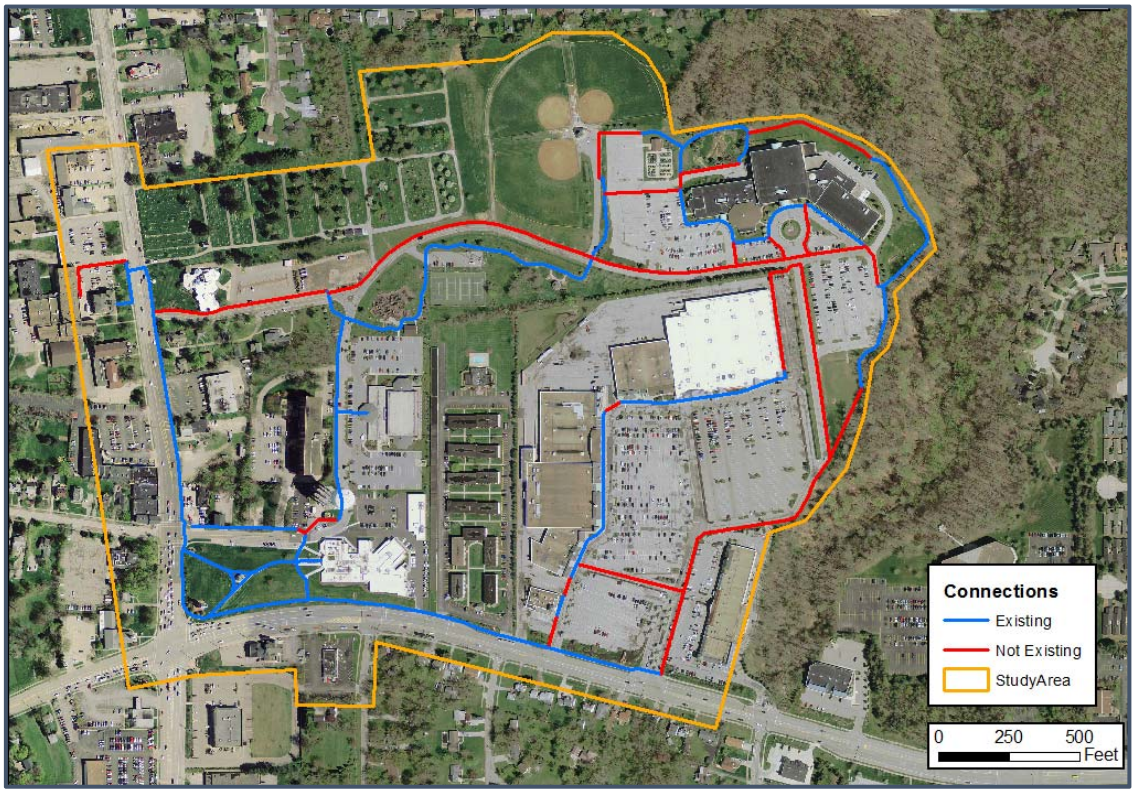
BICYCLE AND PEDESTRIAN CONNECTIONS

In order for someone to consider walking or bicycling to a destination as opposed to driving, the two main factors to consider are the existence of multimodal accommodations like sidewalks, crosswalks, shared use paths, bicycle lanes, etc., and the distance of the trip. An analysis was done on both the existing multimodal transportation network and the walkability inside the TCD in order to determine overall connectivity.

POTENTIAL REDEVELOPMENT PARCELS

Map 3 shows the existing multimodal transportation network as well as the gaps in the network inside the TCD. Notable gaps include the lack of sidewalks along Zverina Lane and continuing along Roe Lane all the way east towards the Recreation and Senior Center, as well a large section of the Freedom Trail behind the recreation center in the top right area of the district. Sidewalk gaps also exist at the entrance to the Greens of Strongsville Shopping Center at Royalton Road, and throughout the shopping center.

Map 3 | Connections



WALKABILITY ANALYSIS

The other main factor in deciding whether to drive or use a different mode is the distance of the trip. This is examined in Table 1, which shows the distance between major destinations located within the TCD. The full table can be found in the appendix of this report. Cells are colored based on their distance from one destination to the other. Green cells indicate a distance of a quarter mile or less, which is typically considered walkable. Yellow cells indicate a distance between a quarter of a mile and a half mile, which is considered walkable by some and not walkable by others, or moderately walkable. Red cells indicate a distance over a half mile, which is considered walkable by the smallest percentage of people. The furthest distance between any two destinations in the TCD is .64 miles, just under three quarters of a mile.

Table 1 | Origin and Destination Distances

	Strongsville Commons	Recreation Center	Middle School	Library	Playground & Tennis Courts	Senior Apartments	Heinen's
Strongsville Commons		0.61	0.27	0.17	0.27	0.14	0.34
Recreation Center	0.61		0.61	0.47	0.31	0.48	0.33
Middle School	0.27	0.61		0.41	0.27	0.35	0.64
Library	0.17	0.47	0.41		0.10	0.10	0.44
Playground and Tennis Courts	0.27	0.31	0.27	0.10		0.15	0.55
Senior Apartments	0.14	0.48	0.35	0.10	0.15		0.41
Heinen's	0.34	0.33	0.64	0.44	0.55	0.41	

CONNECTIVITY ANALYSIS

Using the data from both Map 3 and Table 1, this analysis of overall connectivity determines which desitination pairs are connected by the existing multimodal transportation network, as well as whether or not they have walkable distances. Table 2 below groups destination pairs into three categories: completely connected, partially connected, and minimally connected. The category for each pair was determined by whether the most conveinient path taken between the two involved many, few, or none of the gaps indicated on Map 3, and incorporates the distance categorization from Table 1 showing which pairs are very walkable, moderately walkable, or least walkable. The coloring in Table 2 corresponds to that in Table 1, where green represents distances less than a quarter mile, yellow is for distances between a quarter and half mile, and red is for distances over half a mile.

This table directly informs the reccommendations because it highlights the pairs most in need of improvements. Those pairs that are highly walkable and had partial connections are a high priority, as well as pairs that are moderately walkable and have minimal connections.

Table 2 | Connectivity Analysis

COMPLETE CONNECTION
Commons/Middle School
Commons/Police HQ & Council Chambers
Commons/Redevelopment Area
Commons/Chamber of Commerce
Commons/Senior Apartments
Rec Center/Senior Center
Historic Village/Library
Historic Village/Baseball Fields
Historic Village/Playground & Tennis Courts
Middle School/Police HQ & Council Chambers
Middle School/Redevelopment Area
Middle School/Chamber of Commerce
Middle School/Senior Apartments
Library/Baseball Fields

PARTIAL CONNECTION
Commons/Historic Village
Commons/Library
Commons/Playground & Tennis Courts
Commons/Comm. & Tech Center
Commons/Heinen's
Rec Center/Baseball Fields
Rec Center/Safety Town
Senior Center/Historic Village
Senior Center/Library
Senior Center/Baseball Fields
Senior Center/Playground and Tennis Courts
Senior Center/Safety Town
Historic Village/Middle School
Historic Village/Police HQ & Council Chambers

MINIMAL CONNECTION
Commons/Rec Center
Commons/Senior Center
Commons/Baseball Fields
Commons/Safety Town
Rec Center/Historic Village
Rec Center/Middle School
Rec Center/Library
Rec Center/Police HQ & Council Chambers
Rec Center/ Redevelopment Area
Rec Center/Playground & Tennis Courts
Rec Center/Chamber of Commerce
Rec Center/Senior Apartments
Rec Center/Comm. & Tech Center
Rec Center/Heinen's

COMPLETE CONNECTION
Library/Playground & Tennis Courts
Library/Senior Apartments
Police HQ & Council Chambers/Redevelopment Area
Police HQ & Council Chambers/Chamber of Commerce
Police HQ & Council Chambers/Senior Apartments
Redevelopment Area/Chamber of Commerce
Redevelopment Area/Senior Apartments
Playground & Tennis Courts/Senior Apartments
Chamber of Commerce/Senior Apartments

PARTIAL CONNECTION
Historic Village/Redevelopment Area
Historic Village/Safety Town
Historic Village/Chamber of Commerce
Historic Village/Senior Apartments
Historic Village/Comm. & Tech. Center
Middle School/Library
Middle School/Playground & Tennis Courts
Middle School/Comm. & Tech Center
Middle School/Heinen's
Library/Police HQ & Council Chambers
Library/Redevelopment Area
Library/Safety Town
Library/Chamber of Commerce
Library/Comm. & Tech Center
Police HQ & Council Chambers/Baseball Fields
Police HQ & Council Chambers/Playground & Tennis Courts
Police HQ & Council Chambers/Heinen's
Redevelopment Area/Comm. & Tech Center
Redevelopment Area/Heinen's
Baseball Fields/Playground & Tennis Courts
Baseball Fields/Safety Town
Baseball Fields/Senior Apartments
Playground & Tennis Courts/Safety Town
Playground & Tennis Courts/Chamber of Commerce
Playground & Tennis Courts/Comm. & Tech Center
Safety Town/Senior Apartments
Chamber of Commerce/Comm. & Tech Center
Chamber of Commerce/Heinen's
Senior Apartments/Comm. & Tech Center
Senior Apartments/Heinen’s

MINIMAL CONNECTION
Senior Center/Middle School
Senior Center/Police HQ & Council Chambers
Senior Center/Redevelopment Area
Senior Center/Chamber of Commerce
Senior Center/Senior Apartments
Senior Center/Comm. & Tech Center
Senior Center/Heinen's
Historic Village/Heinen's
Middle School/Baseball Fields
Middle School/Safety Town
Library/Heinen's
Police HQ & Council Chambers/Safety Town
Police HQ & Council Chambers/Comm. & Tech Center
Redevelopment Area/Baseball Fields
Redevelopment Area/Playground & Tennis Courts
Redevelopment Area/Safety Town
Baseball Fields/Chamber of Commerce
Baseball Fields/Comm. & Tech. Center
Baseball Fields/Heinen's
Playground & Tennis Courts/Heinen's
Safety Town/Chamber of Commerce
Safety Town/Comm. & Tech Center
Safety Town/Heinen's
Comm. & Tech Center/Heinen's

SAFETY ANALYSIS

Safety is the most important factor for all modes of transportation used in and around the TCD. Safety concerns exist in regard to the gaps in the multimodal transportation network. Existing conditions in terms of safety can be explained by crash data. Table 3 below shows the number of crashes occuring within and around the TCD from 2009 through 2013, the most recent available five year time frame. Crashes are listed by type of severity.

Over this time period, 99 percent of crashes were property damage crashes, with the other one percent injury crashes and zero fatal crashes. To provide context, this accounts for roughly 8% of the number of crashes that occurred throughout the City of Strongsville over the same time period, and roughly 5% of the serious injury and fatal crashes.

Very few crashes were reported within the TCD. This may be a result of a wide variety of factors, including lower vehicle speeds, less traffic, crashes not being reported, as well as others. Therefore, data for crashes occuring along Pearl Road and Royalton Road will be more informative. Table 4 shows the crashes occuring on just these two road segments by type.

Nearly half of the crashes accuring along these two busy roads were rear end crashes. The common cause for rear end crashes is congestion, which has been stated as an issue by the project sponsor and is partially attributed to the lack of multimodal transportation options. For the northeast Ohio as a whole, rear end crashes account for 32% of all crashes and 14% of serious injury and fatal crashes.

Table 3 | Crashes by Severity

Crash Type	Amount
Property Damage	236
Injury	3
Fatal	0
Total	239

Table 4 | Crashes by Collision Type on Royalton and Pearl Roads

Crash Type	Amount
Rear End	118
Angle	51
Left Turn	26
Sideswipe/Passing	23
Other	17

POTENTIAL REDEVELOPMENT ANALYSIS

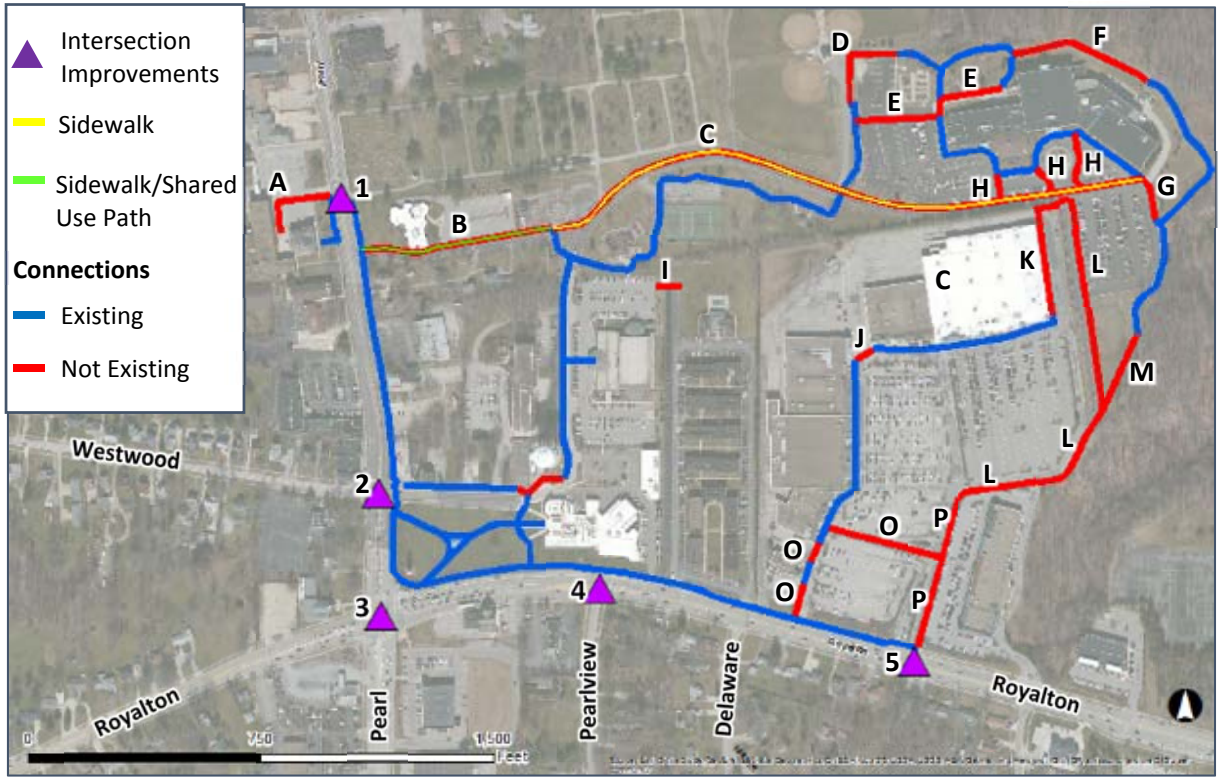
Included in the TCD are a number of parcels that the City of Strongsville has identified for potential redevelopment opportunities. It is important that any redevelopment of these parcels be supportive of multimodal transportation, both in use and in design. This can include limiting onsite parking spaces, lower building setbacks, and promoting mixed uses. Table 5 shows the size of each parel, it's existing land use, as well as it's zoning. The City of Strongsville is currently working with devlopers on design plans for some of these parcels, so opportunities for recommendations may be limited.

Table 5 | Potential Sites for Redevelopment

Parcel Number	Square Feet	Current Land Use	Zoning
396-10-016	15,684	Vacant	Commercial-General
396-10-006	13,200	Business/Commercial	Commercial-General
396-10-001	32,702	Business/Commercial	Commercial-General
396-10-003	20,436	Business/Commercial	Commercial-General
396-10-005	9,237	Vacant	Commercial-General
396-10-004	22,119	Vacant	Commercial-General
396-10-002	18,343	Business/Commercial	Commercial-General

ALL RECOMMENDATIONS

Map 4 | All Recommendations



Note: Lettered Segments Correspond to Lettered Line Items in the Cost Estimate Section on Page 29

1. Pearl Road and Middle School Driveway
   - ADA Curb Ramps
   - Countdown Pedestrian Signals
   - Pedestrian Refuge Island
   - Ladder-Style Crosswalk
   - Optimize Signal Timing for Pedestrians

2. Pearl Road and Westwood Drive
   - ADA Curb Ramps
   - Countdown Pedestrian Signals
   - Optimize Signal Timing for Pedestrians

3. Pearl Road and Royalton Road
   - ADA Curb Ramps
   - Countdown Pedestrian Signals
   - Pedestrian Refuge Island
   - Extend Pedestrian Walk Times When Push Buttons are Activated

4. Royalton Road and Pearlview Drive
   - ADA Curb Ramps
   - Countdown Pedestrian Signals
   - Pedestrian Refuge Island
   - Ladder-Style Crosswalk
   - Optimize Signal Timing for Pedestrians

5. Royalton Road and Greens of Strongsville Drive
   - ADA Curb Ramps
   - Reallocate 2nd Right Turn Lane and Excessive Entry Width as Sidewalk
   - Countdown Pedestrian Signals
   - Optimize Signal Timing for Pedestrians

BICYCLE AND PEDESTRIAN CONNECTIONS

SIDEWALK AND SHARED USE PATH

As shown in the map below in blue, a multimodal transportation network exists within the TCD, but is has several gaps. We recommend filling in the gaps that exist throughout the network. The red lines in the map below show where we believe connections must be made in order to have a complete, safe network that encourages multimodal transportation. The line in yellow and green below (Zvernia Lane starting from the intersection at Pearl Road all the way east to where it ends in front of the Recreation and Senior Center) highlights a critically needed connection, particularly for students makes trips between the middle school and the recreation center. We recommend adding a sidewalk and a shared use path here as the first step in creating a more complete multimodal transportation network. The green segment should be pursued first, followed by the yellow segment. In the short term, signage and wayfinding could be beneficial.

Map 5 | Sidewalk and Shared Use Path Recommendations

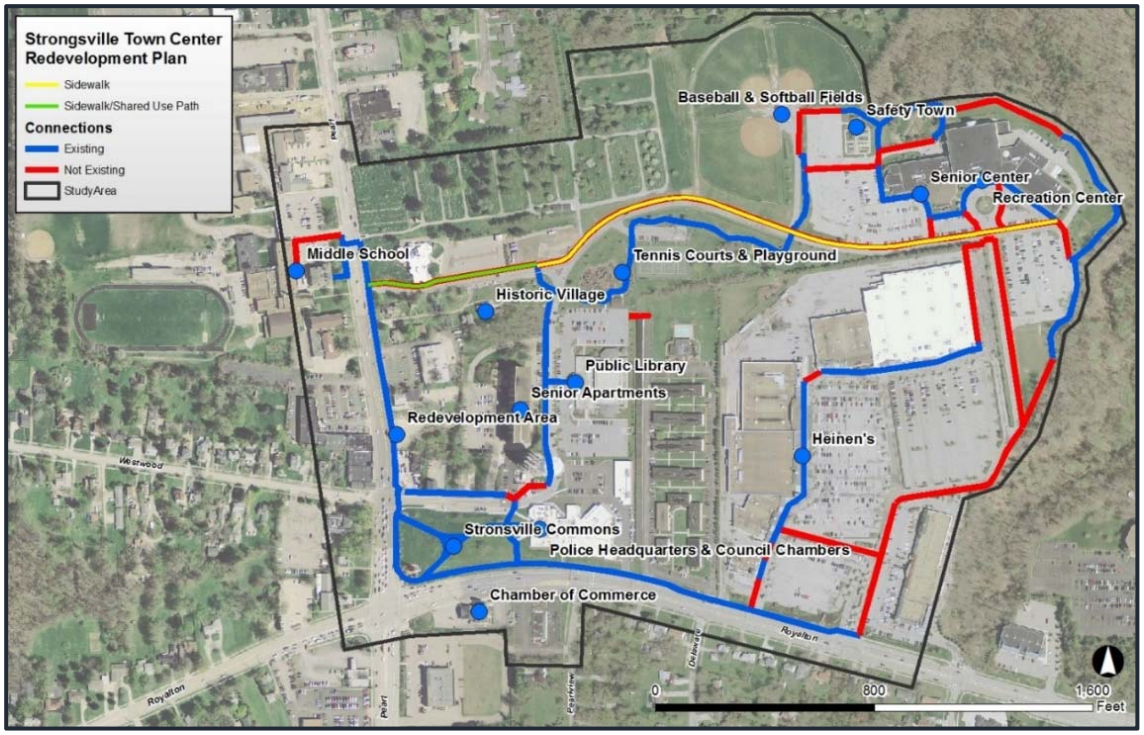


Figure 1 | Bike Route Wayfinding

D11-1

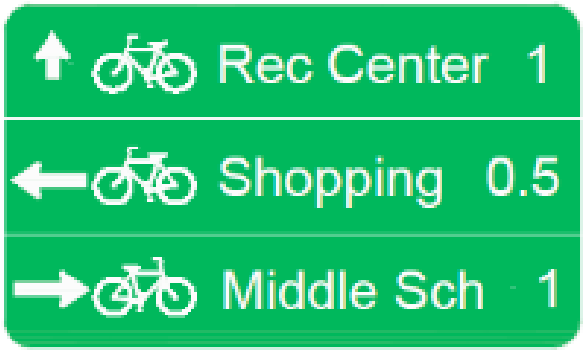
D11-1c

D11-1c

R10-24

D1-1c

D1-2c



D1-3c

PEDESTRIAN INTERSECTION IMPROVEMENTS

ROYALTON ROAD AND GREENS OF STRONGSVILLE ENTRANCE

The existing intersection of Royalton Road and the Greens of Strongsville entrance does not include sidewalk accommodations for pedestrians. Once pedestrians use the crosswalks at this intersection, there is no safe way to access the shopping center.

To address this problem, a traffic analysis of the intersection was performed to examine current traffic movements. The analysis found that the southbound approach of this intersection is very wide. Space could be reallocated from travel lanes to create room for sidewalks. Providing two northbound entry lanes is unnecessary, since there is only 1 lane feeding the entrance at any given time. This is an easy way to reallocate space and provide room for a sidewalk without impacting traffic operations.

Traffic counts were obtained for this intersection during the AM and PM peak periods to determine the feasibility of reallocating the southbound exit travel lanes. Per ODOT's roadway design manual (L&D Volume 1, section 401.6.4), double right-turn lanes are almost never recommended. The picture below, taken during a Thursday PM rush hour in February, shows that the 2nd right-turn lane is not being used. Per section 401.6.2, a double left-turn lane should be considered when hourly left-turn volumes are greater than 300. The southbound left volume is 252, which is less than 300. Therefore, the southbound (SB) approach could potentially be reduced even further from 4 lanes to 2 lanes.

Figure 2 | Greens of Strongsville Exit, Thursday February 19th, 2015 at 5pm

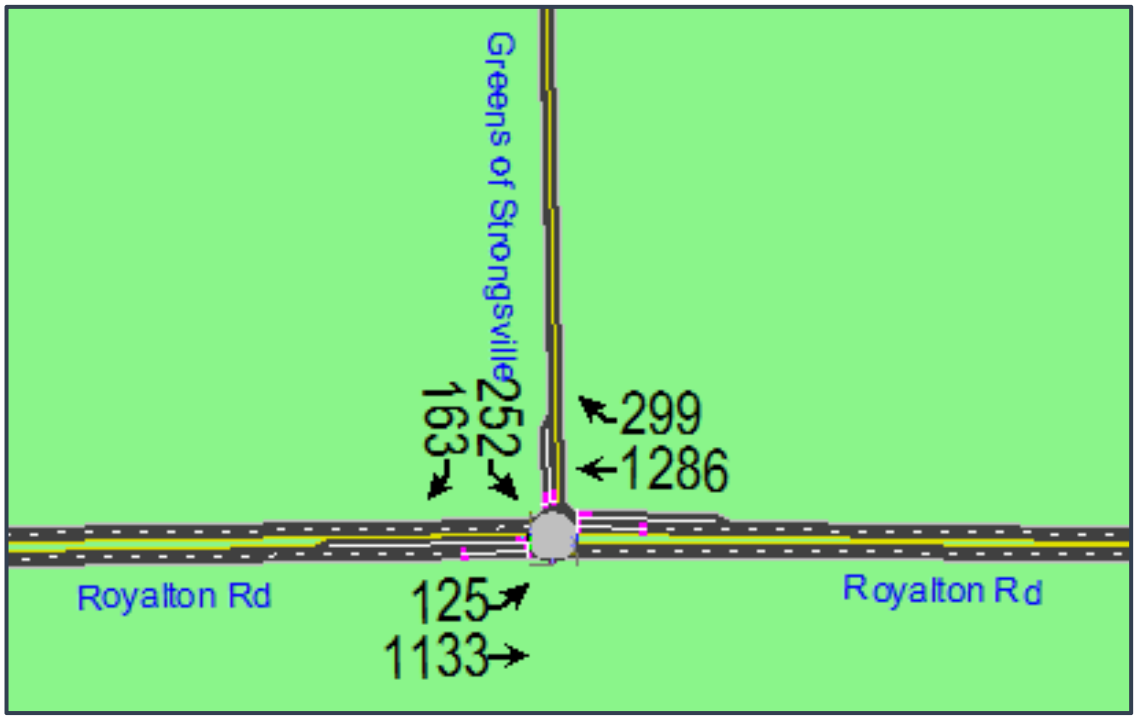
Synchro (Version 8.0) traffic analysis software was used to analyze the operations of the intersection, and verify the applicability of the ODOT L&D manual guidance with regard to changing the southbound approach. Three scenarios were analyzed:

- Existing (2 SB right-turn lanes, and 2 SB left-turn lanes),
- Alternative 1 (1 SB right-turn lane, and 1 SB left-turn lane),
- Alternative 2 (1 SB right-turn lane, and 2 SB left-turn lanes).

While both Alternatives are feasible, implementing Alternative 1 would require allocating additional time (~6 seconds) to the southbound signal phase to avoid long queues during the PM peak period. Alternative 2 shows a reduction in exit lanes from 4 to 3. This reduction is adequate for providing sidewalks, and doesn't require signal timing adjustments. See Appendix 2 for traffic analysis details.

Based on traffic counts and ODOT L&D design guidance, it is recommended that the SB approach at the intersection of Royalton Rd and Greens of Strongsville be reduced from 4 lanes to 3 lanes and that the NB entrance be reduced from 2 lanes to 1 lane. These reductions would allow for addition of a sidewalk on both sides. Alternative 2 recommendations could be implemented successfully without changes to the traffic signal timing, and is the City's preferred alternative. Because the Greens of Strongsville is a private drive, the City will need to coordinate implementation of this recommendation with the property owner.

Figure 3 | 2014 Traffic Counts during the PM peak hour period



PEARL ROAD AND ROYALTON ROAD INTERSECTION

The intersection of these two very busy roads is not currently an inviting place for pedestrians. As these two roads are the major borders of the TCD, it is important that they not act as barriers to entry but instead be designed to encourage use of alternative modes of transportation. We recommend several small changes be made to this intersection in order to make it a better place for pedestrians.

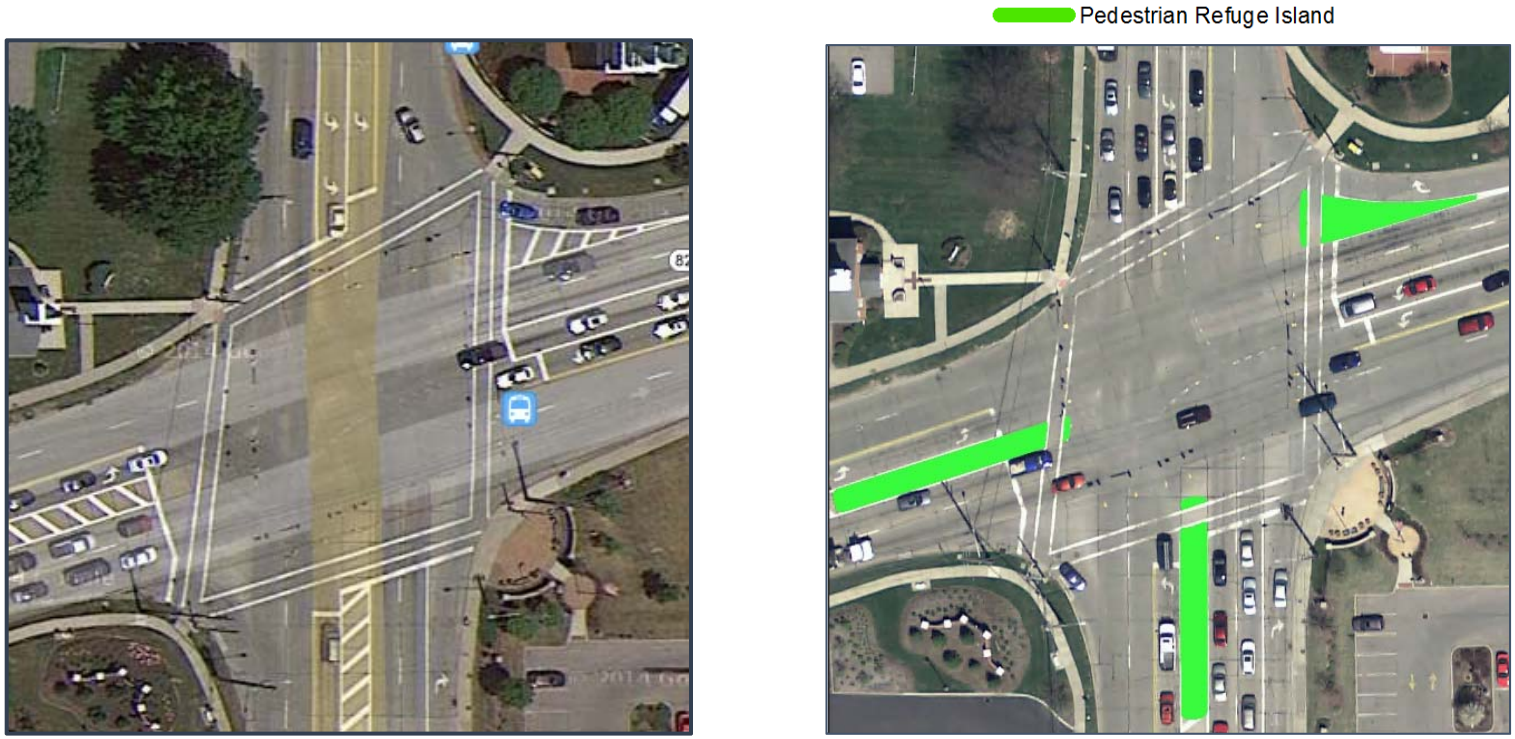
Pedestrians crossing at this intersection are forced to wait long periods of time before they can cross, and have a limited time to get across the busy street. Reprogramming the existing controller to extend signal walking times would allow pedestrians to cross at a more comfortable pace when the pedestrian push button is pushed. Vehicle travel would be minimally impacted, because pushbuttons are not likely to be activated many times during the AM and PM peak traffic hours. We also recommend installing a pedestrian refuge on Pearl Road at the south side of the intersection, and another on Royalton Road on the west side of the intersection. Pedestrian refuges give pedestrians a place to stop if they do not have time to make it to the other side (refuges can be designed to incorporate a supplemental pushbutton in case this occurs). Pedestrian refuges also tend to slow traffic, which is especially important at this very busy intersection. With vehicles turning right from Royalton Road onto Pearl Road travel at higher speeds due to a wide turning radius, the current pedestrian crossing design does not encourage these vehicles to slow down. We recommend the addition of a "pork chop island" on this corner of the intersection, in the shape of the existing hatched white area. Similar to a regular pedestrian island, a pork chop island slows down traffic and gives pedestrians a safe

Figure 4 | Pedestrian refuge example

place to stop if they get caught crossing without time to make it to the other side. Pedestrian islands are recommended as a pedestrian safety countermeasure by FHWA. More information can be found here: http://safety.fhwa.dot.gov/provencountermeasures/

Certain accommodations should be added to the four corners of the intersection in order to comply with the Americans with Disabilities Act (ADA). Installing curb ramps and truncated domes alerts the visually impaired of sidewalk/intersection transition, and helps the mobility impaired transition on and off of the sidewalk.

Figure 5 | Pearl and Royalton Roads Intersection with and without pedestrian refuges and porkchop island recommendations



PEARL ROAD AND MIDDLE SCHOOL EXIT

The intersection of Pearl Rd and the Strongsville Middle School exit is signalized, and provides the only crosswalk across Pearl Rd to the school. Moving the crosswalk to the north side of this intersection (or having an additional crosswalk) would allow the underutilized southbound left-turn pocket to be repurposed as a pedestrian refuge. Using a high-visibility striping pattern (such as the Continental, Zebra, or Ladder styles shown in Figure 6) to mark the crosswalks is recommended. The crosswalk is along the south side of the intersection, where the center-turn lane is not being used. This space could be repurposed as a pedestrian refuge to calm traffic near the school, and break up the long crossing.

In addition, the signal provides a green light for Pearl Rd at all times unless a vehicle is detected, or a pedestrian uses the pushbutton. Once the pushbutton is activated, pedestrians are stuck waiting a long time for a walk signal. If pedestrians are forced to wait more than 30 seconds, they could become frustrated and

Figure 6 | Crosswalk markings

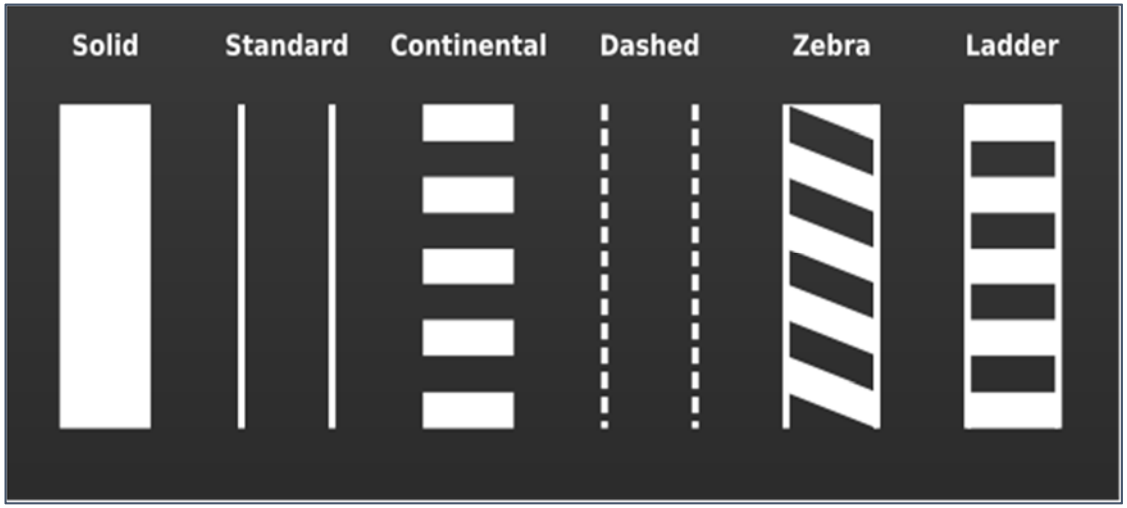


Figure 7 | Pedestrian refuge example

attempt to cross against direction of the signal. This is especially true of youth. This could be improved by providing a more rapid response to pushbutton activation.

Though prioritizing the pushbutton response may slightly impact vehicle travel times, the safety of children crossing a busy street should be the highest priority movement at this intersection. The middle school site plan, shown in Figure 8, does not currently provide a space for pedestrians to access the school along the driveway. A sidewalk should be incorporated into the design plans, and constructed along with the site reconstruction.

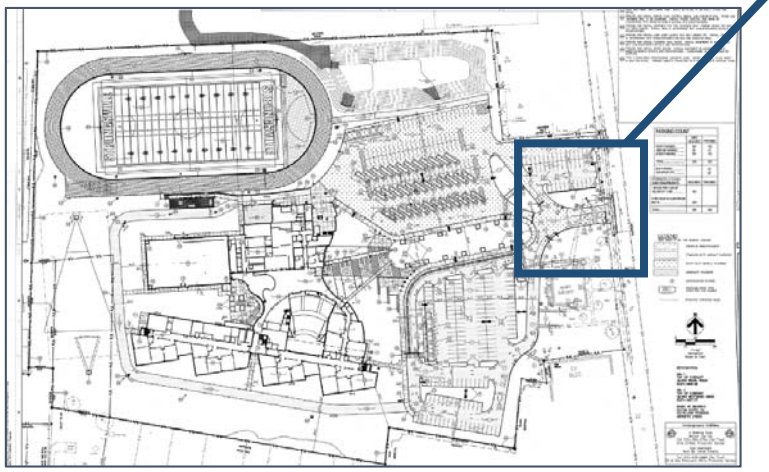
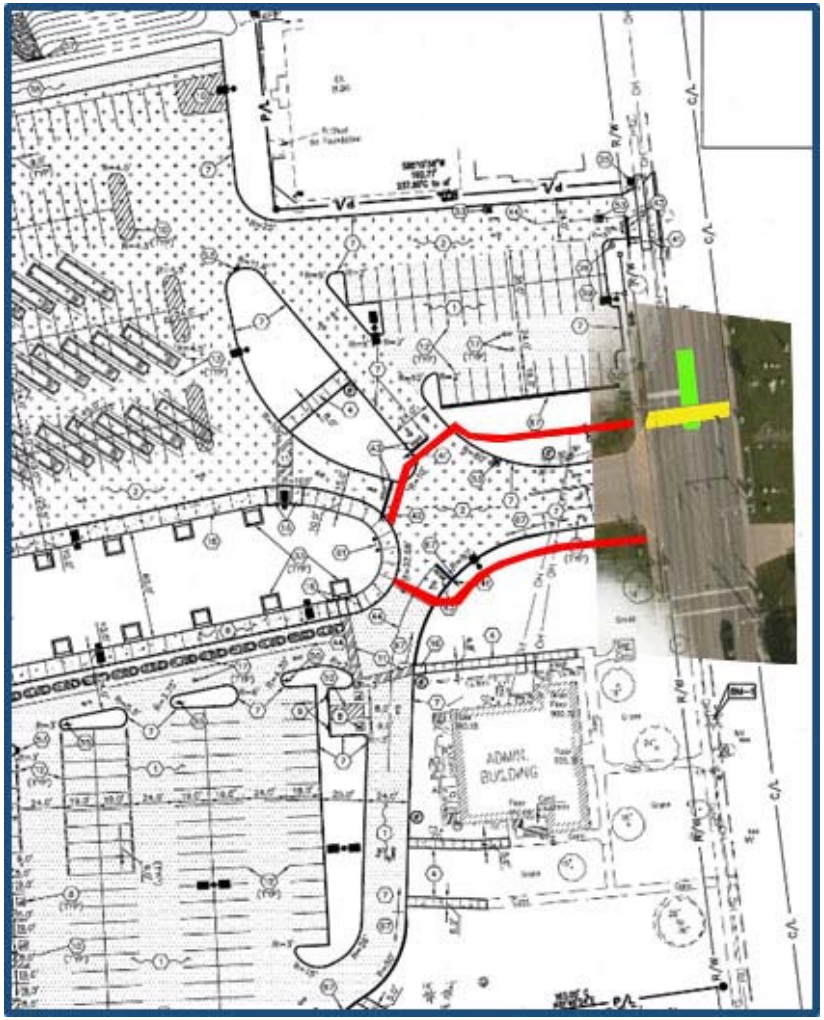


Figure 8 | Middle School Site Plan



WESTWOOD DRIVE

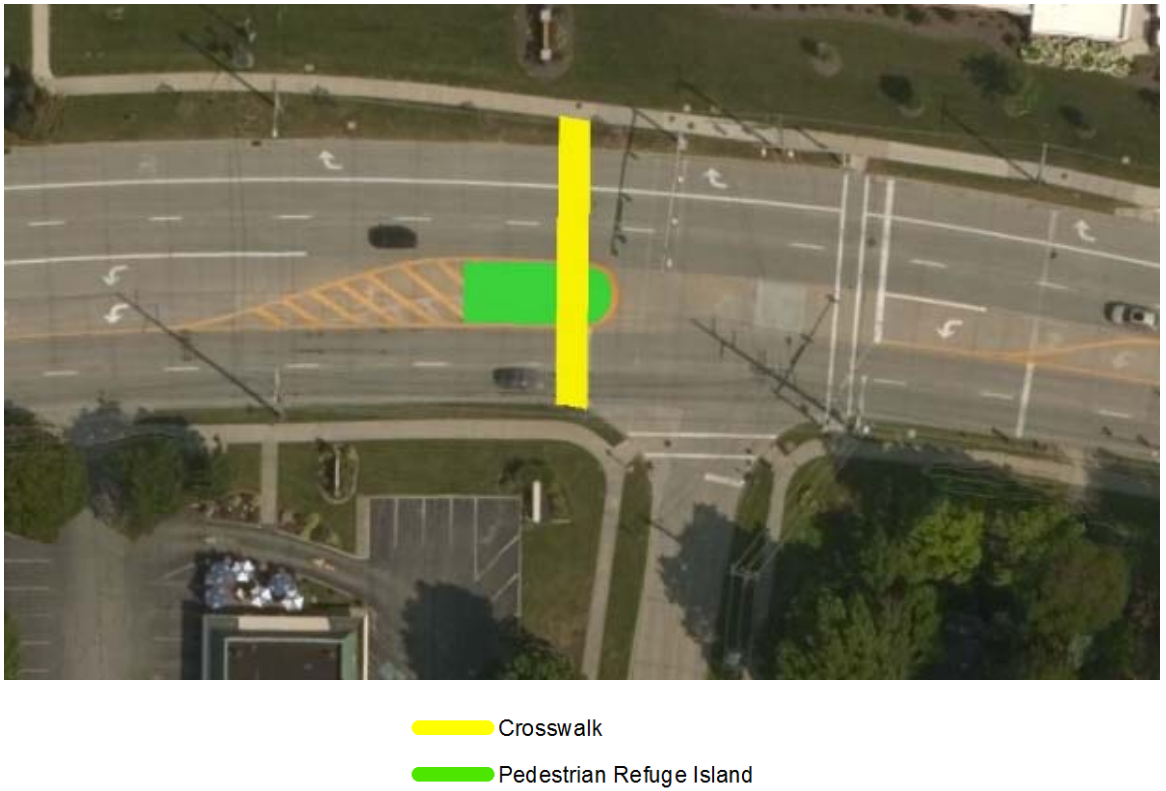
There are gaps in the striping in some places on Westwood Drive as it bends near the Council Chambers building as shown below. We recommend filling in the striping to make it safer for pedestrians and bicyclists. This will help define pedestrian and public space versus roadways and parking space. At the corner of Westwood Drive and Pearl Road, we suggest adding certain pedestrian accommodations to make the intersection safer for pedestrians. We recommend optimizing the signal timing for pedestrian crossings, specifically making the light cycle length shorter for shorter wait times when the pedestrian push button is pushed. We also recommend adding truncated domes at all four corners of the intersection, which alert the visually impaired of sidewalk/intersection transition and are in compliance with ADA.

Figure 9 | Potential landscaping and crosswalk treatments where gaps currently exist

PEARLVIEW DRIVE AND ROYALTON ROAD

The current timing at the corner of Pearlview Drive and Royalton Road is not beneficial to pedestrians crossing the street. Because Royalton is a very wide street, we recommend changing the timing of the signals to be more favorable for pedestrians, giving them shorter wait times and more time to safely cross Royalton Road when the push button is pushed. To enhance the crossing, a pedestrian refuge should be installed to give pedestrians a place to stop while crossing the busy road. A pedestrian refuge here can also help calm traffic; the speed limit here is 35 mph, which is a high enough speed to cause serious or fatal injury to a pedestrian if hit by a car. The refuge should be placed where the yellow hatched area exists now on the west side of Pearlview Road. Currently, the crosswalk is on the east side of Pearlview Road, but it should be moved to the west side of the road to coincide with the refuge.

Figure 10 | Pearlview Drive and Royalton Road intersection with proposed crosswalk and pedestrian refuge island



ROE LANE AND EHRNFELT RECREATION AND SENIOR CENTER

Behind the Ehrnfelt Recreation and Senior Center are two entrances to the Freedom Trail. On the east side, there is no connection from the Center to the entrance to the Freedom Trail; it requires a walk across the grass from the parking lot. We recommend that a path be built from the Center to the Freedom Trail, directly connecting the two and encouraging pedestrians and bicyclists to go from one to the other.

On the west side, the entrance to the Freedom Trail is off of the recreation center's shipping and receiving drive. This drive, and the adjacent parking lot have no sidewalk or crosswalk, making access to the Freedom Trail inconvenient and confusing. Adding a crosswalk across this road with signage directing users to the trail will facilitate safe and easy access to the path and potentially support increased use.

Additional accommodations should be made for pedestrians accessing the recreation center, including a high visibility crosswalk at the entrance to the recreation center from Roe Lane. Crosswalks should also be installed in other locations where new sidewalks or multiuse paths create crossings. Bike racks can be installed near the entrance to the recreation center or as a bike corral in a nearby parking space to accommodate cyclists.

Figure 11 | Missing connections around Ehrnfelt Recreation and Senior Center

IMPLEMENTATION

The recommendations of this study can be financed through a few options; the City can choose to prioritize projects in its capital program, or can work with public and private partners to implement the recommendations. One option to generate funding in the TCD is to create a business improvement district, wherein commercial properties share the costs of improvements and the responsibility of maintenance. This may be an attractive option to the City and stakeholders if redevelopment leads to increased trips to the TCD, which will increase demand for parking. Furthermore, the implementation of recommendations may catalyze investment interest in the TCD, as recent trends show increasing interest in walkable commercial and residential districts.

The cost of the recommendations can vary depending on the quality and quantity of what is installed. For example, a crosswalk can be painted for a relatively low cost, or maybe constructed of brick pavers for a significantly higher cost. For the purposes of this study, we believe it makes more sense to focus on lower cost improvements, particularly where facilities do not currently exist. In the longer term it may make sense to upgrade infrastructure, but in the shorter term it is more important to implement recommendations without delay. The benefit of doing so can then be assessed and longer term plans can be developed. Table 6 below shows average planning level costs for infrastructure items recommended in this study.

Table 6 | Potential Costs for Recommended Items

INFRASTRUCTURE ITEM	UNIT	UNIT COST ESTIMATE
Restriping	Mile	$ 40,000
Curb Extension	Pair	$ 26,000
Ladder Crosswalk	Pair	$ 5,000
Pork Chop Island	Each	$ 20,000
Raised Crosswalk	Each	$ 30,000
Crossing Island	Each	$ 10,000
Curb Ramp	Intersection	$ 12,000
5’ wide Sidewalk	Linear Foot	$ 121
10’ wide Asphalt Multiuse Path	Linear Foot	$ 138

Additional funding sources may be available through NOACA and Cuyahoga County. The NOACA TLCI Implementation Grant program can help fund up to 80% of lower cost pedestrian and bicycle infrastructure items, such as crosswalks and pedestrian islands. The intent of the program is to help implement lower cost (typically less than $50,000) projects from completed studies and plans in order to help communities improve safety and build a multimodal transportation system. Many of the recommendations in this plan are appropriate and recommeded for the program.

For higher cost projects such as sidewalks or multiuse paths, NOACA funding is available through the Surface Transportation, Congestion Mitigation and Air Quality, and Transportation Alternatives programs. Funding availabilty through these programs is extremely competitive however, and the implementation of recommendations with these sources is best achieved through larger scale road improvement projects. For example, the cost of funding a stand alone sidewalk project with federal aid funding will be much higher due to the costs of compliance with federal and state regulations than it would as a component of a road rehabilitation project, because efficiencies in the project development process can consolidate tasks and thus project costs. Therefore, for higher cost projects the City should strive to package improvements as part of larger scale projects, or find alternative funding so that costs are not inflated.

Information on additional funding sources is available in Cuyahoga County's Complete Streets Toolkit, which is attached as Appendix 1. Many of these sources can help cover the costs of both standalone projects and larger scale road improvement projects.

NEXT STEPS

With the approval of this plan, the City should begin to implement recommendations by starting with "quick wins." This includes projects that are low cost and relatively easy to implement, like striping crosswalks. Concurrently, the City can focus on seeking grants for pedestrian refuge islands, pork chop islands, and/or ADA compliant curb ramps, through sources like the TLCI Implementation Grant, Community Development Block Grants (CDBG), or county permissive license fees.

Longer term, the City will need to prioritize sidewalk and/or multiuse path projects in its capital program. Funding these projects should be consolidated with roadway work where feasible. The creation of a business improvement district may allow for the City to raise funds to implement these recommendations, especially if they will lead to increased activity and investment in the area. Other strategies for installing sidewalks could include property assessments or tax increment financing, as well as requiring installation of sidewalks or pedestian path with redevelopment. The City should cooperatively work with property owners and prospective businesses to determine the best strategy for long term sidewalk installation, as well as identifying future rehabilitation projects where sidewalk or multiuse paths can be incorporated.

Cost estimates for the study recommendations are on the next page. Each line item corresponds with the "All Recommendations" map on Page 14.

Improvements	Low	High
INTERSECTION IMPROVEMENTS	**$219,000**	**$419,000**
1) Pearl Road (US-42) @ Middle School Driveway	$48,000	$88,000
2)Pearl Rd (US-42) @ Westwood Dr	$32,000	
3) Pearl Rd (US-42) & Royalton Rd (OH-82)	$62,000	$182,000
4) Royalton Rd (OH-82) @ Pearlview Dr	$45,000	$85,000
5) Royalton Rd (OH-82) @ Greens of Strongsville Dr	$32,000	
ROADWAY SEGMENT IMPROVEMENTS	**$472,329**	**$1,030,186**
A) Middle School Driveway	$47,720	
B) Zverina Lane (Green Segment)	$1,539	$86,250
C) Roe Lane (Yellow Segment)	$4,924	$276,000
D) Rec Center Parking Lot NW	$1,416	$44,886
E) Rec Center Sidewalk West	$25,410	
F) Rec Center Multiuse Path North	$62,100	
G) Rec Center Sidewalk East	$14,520	
H) Rec Center Crosswalks	$26,730	
I) Library Connector Sidewalk	$7,260	
J) Shopping Center Crosswalk North	$6,000	
K) Shopping Center Sidewalk NE	$34,485	
L) Rec Center Drive Connector	$9,760	$168,360
M) Rec Center Multiuse Path South	$34,500	
N) Westwood Dr, near Water Tower	$9,800	
O) Shopping Center Sidewalk SW	$53,165	
P) Shopping Center Sidewalk SE	$133,000	
SUBTOTAL	**$691,329**	**$1,449,186**
30% Contingency	**$207,399**	**$434,756**
CONSTRUCTION TOTAL	**$898,727**	**$1,883,941**
10% Design Engineering Cost	**$89,873**	**$188,394**
TOTAL	$988,600	$2,072,336

Improvements	Quantity	Unit	Unit Cost	Low	High
INTERSECTION IMPROVEMENTS				**$219,000**	**$419,000**
1) Pearl Road (US-42) @ Middle School Driveway				$48,000	$88,000
ADA Curb Ramps	*1*	*Intersection*	*$12,000*	*$12,000*	
Countdown Pedestrian Signals	*1*	*Intersection*	*$20,000*	*$20,000*	
Pedestrian Refuge Island	*1*	*each*	*$10,000-$50,000*	*$10,000*	*$50,000*
Ladder-Style Crosswalk	*2*	*each*	*$3,000*	*$6,000*	
Optimize Signal Timing for Pedestrians					
2)Pearl Rd (US-42) @ Westwood Dr				$32,000	
ADA Curb Ramps	*1*	*Intersection*	*$12,000*	*$12,000*	
Countdown Pedestrian Signals	*1*	*Intersection*	*$20,000*	*$20,000*	
Optimize Signal Timing for Pedestrians					
3) Pearl Rd (US-42) & Royalton Rd (OH-82)				$62,000	$182,000
ADA Curb Ramps	*1*	*Intersection*	*$12,000*	*$12,000*	
Countdown Pedestrian Signals	*1*	*Intersection*	*$20,000*	*$20,000*	
Pedestrian Refuge Island	*3*		*$10,000-$50,000*	*$30,000*	*$150,000*
Extend Pedestrian Walk Times					
4) Royalton Rd (OH-82) @ Pearlview Dr				$45,000	$85,000
ADA Curb Ramps	*1*	*Intersection*	*$12,000*	*$12,000*	
Countdown Pedestrian Signals	*1*	*Intersection*	*$20,000*	*$20,000*	
Pedestrian Refuge Island	*1*	*each*	*$10,000-$50,000*	*$10,000*	*$50,000*
Ladder-Style Crosswalk	*1*	*each*	*$3,000*	*$3,000*	
Optimize Signal Timing for Pedestrians					
5) Royalton Rd (OH-82) @ Greens of Strongsville Dr				$32,000	
ADA Curb Ramps	*1*	*Intersection*	*$12,000*	*$12,000*	
Countdown Pedestrian Signals	*1*	*Intersection*	*$20,000*	*$20,000*	
Optimize Signal Timing for Pedestrians					

Improvements	Quantity	Unit	Unit Cost	Low	High
ROADWAY SEGMENT IMPROVEMENTS				**$472,329**	**$1,030,186**
A) Middle School Driveway				$47,720	
Sidewalks from Pearl Rd to School Bldg	*320*	*LFT*	*$121*	*$38,720*	
Striped crosswalks in parking lot	*3*	*each*	*$3,000*	*$9,000*	
B) Zverina Lane (Green Segment)				$1,539	$86,250
Multiuse path (optional)	*625*	*LFT*	*$138*		*$86,250*
Signed & Marked Bike Route	*0.12*	*miles*	*$13,000*	*$1,539*	
C) Roe Lane (Yellow Segment)				$4,924	$276,000
Multiuse path	*2000*	*LFT*	*$138*		*$276,000*
Signed & Marked Bike Route	*0.38*	*miles*	*$13,000*	*$4,924*	
D) Rec Center Parking Lot NW				$1,416	$44,886
Signed & Marked Bike Route	*0.11*	*miles*	*$13,000*	*$1,416*	*$1,416*
Multiuse path (optional)	*315*	*LFT*	*$138*		*$43,470*
E) Rec Center Sidewalk West	210	LFT	$121	$25,410	
F) Rec Center Multiuse Path North	450	LFT	$138	$62,100	
G) Rec Center Sidewalk East	120		$121	$14,520	
H) Rec Center Crosswalks				$26,730	
Crosswalk	*3*	*each*	*$3,000*	*$9,000*	
Sidewalk (optional)	*130*		*$121*	*$15,730*	
Bike racks	*10*	*each*	*$200*	*$2,000*	
I) Library Connector Sidewalk	60	LFT	$121	$7,260	
J) Shopping Center Crosswalk North	2	each	$3,000	$6,000	
K) Shopping Center Sidewalk NE	285	LFT	$121	$34,485	
L) Rec Center Drive Connector				$9,760	$168,360
Multiuse path, sidewalk, or striped path	*1220*	*LFT*	*$8-$138*	*$9,760*	*$168,360*
M) Rec Center Multiuse Path South	250	LFT	$138	$34,500	
N) Westwood Dr, near Water Tower				$9,800	
Crosswalk thru parking lot	*1*	*each*	*$3,000*	*$3,000*	
Multiuse Path Wayfinding Signs	*6*	*each*	*$300*	*$1,800*	
Plantings	*1*	*LUMP*	*$5,000*	*$5,000*	

Improvements	Quantity	Unit	Unit Cost	Low	High
ROADWAY SEGMENT IMPROVEMENTS				**$472,329**	**$1,030,186**
O) Shopping Center Sidewalk SW				$53,165	
Sidewalk	*365*	*LFT*	*$121*	*$44,165*	
Crosswalk	*3*	*each*	*$3,000*	*$9,000*	
P) Shopping Center Sidewalk SE				$133,000	
Sidewalk	*1,000*	*LFT*	*$121*	*$121,000*	
Crosswalk	*4*	*each*	*$3,000*	*$12,000*	
SUBTOTAL				**$691,329**	**$1,449,186**
30% Contingency				**$207,399**	**$434,756**
CONSTRUCTION TOTAL				**$898,727**	**$1,883,941**
10% Design Engineering Cost				**$89,873**	**$188,394**
TOTAL				$988,600	$2,072,336

5.5.4 Funding for Pedestrian and Bicycle Facilities in Ohio[54]

Funding Name	Issuing Agency	Local Match	Eligible Projects	Application Cycles	Eligible Applicants
Transportation Alternatives (TA) http://www.noaca.org/	NOACA	20%	Bicycle lanes on roadway • Bicycle parking facilities • Bicycle storage/service center • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Paved Shoulders • Signed bike route • Traffic calming • Shared Use Path Construction that can include recreational trails provided they also have transportation component	Quarterly Application Period	County, City, Village, Township, and park districts
Safe Routes to School Program (SRTS) http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/TransportationAlternatives.aspx www.dot.state.oh.us/saferoutes	ODOT	0%	• Bicycle lanes on roadway • Bike racks on buses • Bicycle parking facilities • Bicycle storage/service center • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Paved Shoulders • Signed bike route • Traffic calming • Shared Use Path Construction that can include recreational trails provided they also serve a transportation component • Safe Routes to School projects that are within a designated radius of a K-8 school	Application cycles vary based on fund availability.	County, City, Village, Township
Safety Program http://www.dot.state.oh.us/Divisions/Planning/SPPM/SystemsPlanning/Pages/FundingGuidelines.aspx	ODOT District Office	10-20%	• Bike and Pedestrian Facilities in Bike/Ped. High Crash Areas • Bike and Pedestrian Facilities that are appurtenances to the roadway project itself • Environment and safety education programs	Biannual Application Period: due by April 30 and September 30	County, City, Village, Township
Surface Transportation Program (STP) http://www.noaca.org/	NOACA	20%	• Bicycle lanes on roadway • Paved Shoulders • Signed bike route • Shared use path/trail • Spot improvement program • Bike racks on buses • Bicycle parking facilities • Trail/highway intersection • Bicycle storage/service center • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Traffic calming	Applications due on a quarterly basis	County, City, Village, Township
County Surface Transportation Program (CSTP) http://publicworks.cuyahogacounty.us/en-US/Project-Planning-Funding.aspx	County Engineers Association	20%	• Bicycle lanes on roadway • Paved Shoulders • Signed bike route • Shared use path/trail • Spot improvement program • Bike racks on buses • Bicycle parking facilities • Trail/highway intersection • Bicycle storage/service center • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Traffic calming	Annual application period	County

[54] Compiled 01/25/2013. Information deemed reliable but not guaranteed. MAP-21 eligibility components have been incorporated into this document. Heather Bowden, ODOT Bicycle and Pedestrian Planner. Revised by Cuyahoga County Planning Commission. Information deemed reliable but not guaranteed. MAP-21 eligibility components have been incorporated into this document. (Ohio Department of Transportation, 2012)

Funding Name	Issuing Agency	Local Match	Eligible Projects	Application Cycles	Eligible Applicants
Congestion Mitigation Air Quality (CMAQ) http://www.noaca.org/	NOACA designated air quality areas	20%	• Bicycle lanes on roadway • Signed bike route • Shared use path/trail • Spot improvement program • Bike racks on buses • Bicycle parking facilities • Trail/highway intersection • Bicycle storage/service center • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Non-construction outreach related to safe bicycle use	Application Cycles To Be Determined	County, City, Village, Township
State Capital Improvement Program (SCIP) http://planning.co.cuyahoga.oh.us/dopwic/	Ohio Public Works Commission (OPWC)	10%	• Bicycle lanes on roadway • Paved Shoulders • Trail/highway intersection • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Traffic calming • All improvements must be made in conjunction with roadway improvement project	Annual Application Period. Usually Due in the late summer for District One	County, Township, Village, or City. Sanitary Districts, and Regional Water and Sewer Districts
County Permissive License Plate Fees http://publicworks.cuyahogacounty.us/en-US/Project-Planning-Funding.aspx	County	0% - 50%	• Bicycle lanes on roadway • Paved Shoulders • Trail/highway intersection • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Traffic calming • All improvements must be made in conjunction with roadway and is included in the original project scope	Varies	County, City, Village, Township
Local Permissive Licenses Plate Fees http://codes.ohio.gov/orc/4504	City or Village		• Bicycle lanes on roadway • Paved Shoulders • Trail/highway intersection • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Signal improvements • Curb cuts and ramps • Traffic calming • All improvements must be made in conjunction with roadway and is included in the original project scope	Annual per Local Budget	City, Village
Recreational Trails Program http://ohiodnr.com/tabid/21369/default.aspx	FHWA & ODNR	20% [55]	• Urban trail linkages • Trail head and trailside facilities • Maintenance of existing trails • Restoration of trail areas damaged by usage • Improving access for people with disabilities • Acquisition of easements and property • Development and construction of new trails • Purchase and lease of recreational trail construction and maintenance equipment • Environment and safety education programs related to trails	Annual Application Period: Due in February	Cities, Villages, Counties, Townships, Park and Joint Recreation boards and Conservancy Districts, Jointly Sponsored Projects between Political Subdivisions, State Government Agencies, Federal Government Agencies, and Non - profit organizations
Clean Ohio Trails Fund http://clean.ohio.gov/RecreationalTrails/Default.htm	OPWC & ODNR	25% [56]	• Land acquisition for a linear trail • Trail development • Trailhead facilities • Engineering and design	Application cycles vary based on fund availability. Due in February when funding is available	Cities, Villages, Townships, Park and Joint Recreation Districts, Conservancy Districts, Soil and Water Conservation districts, and Non-profit Organizations

[55] This program can be used as a local match for the TA, SRTS, STP and CMAQ programs provided they meet both programs, however 5% of the match must be local

APPENDIX 1: CUYAHOGA COUNTY COMPLETE STREETS TOOLKIT FUNDING TABLE

Funding Name	Issuing Agency	Local Match	Eligible Projects	Application Cycles	Eligible Applicants
County Bridge Program http://publicworks.cuyahogacounty.us/en-US/Project-Planning-Funding.aspx	County Engineers Association	20%	Bike and Pedestrian Facilities that are appurtenances to the bridge project itself. Funds the replacement of county bridges	Annual Application Period:	Counties
Municipal Bridge Program http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/MunicipalBridge.aspx	ODOT	20%	Bike and Pedestrian Facilities that are appurtenances to the bridge project itself. Funds the replacement of local bridges	Annual Application Period: Due in March	City, Village
Section 402 Federal, State, and Community Highway Safety Funds http://publicsafety.ohio.gov/grants.stm	ODPS	0%	• Maps • Safety/education position • Police patrol • Helmet promotion • Safety brochure/book • Training	Annual Application Period: Due in July	County, city, township, village, law enforcement agency, board of education, health department, NOACA, state agency; or non-profit organization, church, hospital, educational service center, college or university
Federal Transit Administration (FTA) http://www.fta.dot.gov/grants/12305.html	FTA/ODOT	Varies	Bike and Pedestrian Facilities that are appurtenances to the transit project itself	Varies by program	Designated recipients
Community Development Block Grant (CDBG) http://development.cuyahogacounty.us/en-US/municipal-grants.aspx	HUD	Varies by program [57]	• Public facilities •Street Surface, repair or replacement • Sidewalks, new or retrofit • Crosswalks, new or retrofit • Street Lights, repair or retrofit, Traffic/Pedestrian Signals, repair or retrofit • Barrier removal for handicap accessibility (e.g., sidewalks, curb ramps)s • Street Furniture	Annual Application Period: Due in Fall	Urban County Community areas that meet HUD Objectives, and Entitlement Communities
Cuyahoga County Sanitary District Funds http://codes.ohio.gov/orc/6117	County	Up to 100 % based on account Balance	Storm or Sanitary Sewer Related Components	Varies based on availabilities of funds	City, Village
Ohio EPA Surface Water Improvement Fund www.epa.ohio.gov/dsw/nps/index.aspx	Ohio EPA	0%	Implementation of projects that address nonpoint source pollution (NPS) and/or stormwater runoff and result in water quality improvements in Ohio's streams, rivers and lakes	Application cycles vary based on fund availability. Deadlines vary	Local governments, park districts, conservation organizations and others

[56] This program can be used as a local match for the TA, SRTS, STP and CMAQ programs provided they meet both.
[57] This program can be used as a local match for the TA, SRTS, STP and CMAQ programs provided they meet both program eligibility categories.

Funding Name	Issuing Agency	Local Match	Eligible Projects	Application Cycles	Eligible Applicants
Ohio EPA 319 Grants www.epa.ohio.gov/dsw/nps/index.aspx	Ohio EPA	40% [58]	Correct NPS caused water quality impairment to Ohio's surface water resources. Section 319(h) implementation grant funding is targeted to Ohio waters where NPS pollution is a significant cause of aquatic life use impairments	Annual Application Period: Usually due in May	Watershed groups and others who are implementing locally developed watershed management plans and restoring surface waters impaired by NPS pollution
The Mobilization for Health: National Prevention Partnership Awards (NPPA) Program http://www.hhs.gov/ash/index.html	Dept. of Health and Human Services, Office of the Assistant Secretary for Health (OAS)	0%	Promote and accelerate partnerships, catalyzing collaborations in improving health through access to, and use of, preventive services across the United States. The program is designed to establish integrated, collaborative local, state, regional, or tribal partnerships to increase community awareness and action on preventive health services, promote health and wellness, educate and train, and establish communication programs to all community populations, regardless of social and economic barriers, and race and ethnicity	Application cycles vary based on fund availability.	Any public or private entity located in a State
The People For Bikes Community Grant Program http://www.peopleforbikes.org/pages/grant-guidelines	People for Bikes and Bike Industry Partners		People For Bikes Community Grant Program supports bicycle infrastructure projects and targeted advocacy initiatives that make it easier and safer for people of all ages and abilities to ride	Biannual Application Period: Online Letters of Interest Due January & August	Non-profit organizations and local governments
Robert Wood Johnson Foundation Grants http://www.rwjf.org/en/grants/what-we-fund.html	Robert Wood Johnson Foundation		The Robert Wood Johnson Foundation provides grants for projects in the United States and U.S. territories that advance our mission to improve the health and health care of all Americans	RWJF awards most grants through calls for proposals (CFPs) from time to time. The Pioneer Portfolio accepts unsolicited proposals at any time and issues awards throughout the year.	Public agencies, universities, and public charities that are tax-exempt under section 501 (c)(3)

[58] A match commitment form must be completed for EACH organization that is committing any match contributions

Funding Name	Issuing Agency	Local Match	Eligible Projects	Application Cycles	Eligible Applicants
Rockefeller Foundation Grants http://www.rockefellerfoundation.org/	Rockefeller Foundation		The Rockefeller Foundation works to spread the benefits of globalization to more people in more places around the world. Funding inquiries must fit within four core issue areas: Advance Health, Revalue Ecosystems, Secure Livelihoods & Transform Cities. Within the Transform Cities issue is a focus on pushing the U.S. over the tipping point toward transportation planning and infrastructure policy that serves the needs of 21st century America	The Rockefeller Foundation will consider on line inquiries for funding projects that must fit within four core issue areas and one or more of their initiatives.	
Ohio State Infrastructure Bank (SIB) http://www.dot.state.oh.us/Divisions/Finance/Pages/StateInfrastructureBank.aspx	ODOT		THE SIB funds highway, rail, transit, intermodal, and other transportation facilities and projects which produce revenue to amortize debt while contributing to the connectivity of Ohio's transportation system and further the goals such as corridor completion, economic development, competitiveness in a global economy, and quality of life	Transportation Infrastructure Bond Fund Program and Revolving loan program	Any public entity such as political subdivisions, state agencies, boards, or commissions, regional transit boards, and port authorities

Study Name Royalton & Greens of Strongsville
Start Date 12/04/2014
Start Time 7:00 AM
Site Code

	Royalton Rd. Westbound			Royalton Rd. Eastbound			Greens of Strongsville Drive Southbound		
Start Time	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right	U-Turn
7:00 AM	167	5	0	16	231	0	4	8	0
7:15 AM	170	11	0	13	230	0	8	7	0
7:30 AM	218	10	0	26	231	0	8	10	0
7:45 AM	209	29	0	26	223	0	10	17	0
8:00 AM	183	28	0	17	225	0	8	12	0
8:15 AM	163	22	0	21	187	0	16	12	0
8:30 AM	178	29	0	14	183	0	8	10	0
8:45 AM	194	31	0	23	236	0	23	12	0
4:00 PM	338	69	0	24	308	0	63	39	0
4:15 PM	312	67	0	43	272	0	72	36	0
4:30 PM	315	84	0	32	300	0	59	37	0
4:45 PM	321	79	0	26	253	0	58	51	0
5:00 PM	330	71	0	30	278	0	74	47	0
5:15 PM	306	93	0	28	282	0	56	43	0
5:30 PM	271	65	0	40	305	0	79	43	0
5:45 PM	272	78	0	41	283	0	62	28	0
PM Peak	1286	299		125	1133		252	163	
% heavy		4%			4%			1%	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	125	1133	1286	299	252	163
Satd. Flow (prot)	1736	3471	3471	1553	2323	1599
Flt Permitted	0.131				0.950	
Satd. Flow (perm)	239	3471	3471	1553	2323	1599
Satd. Flow (RTOR)				278		125
Lane Group Flow (vph)	136	1232	1398	325	274	177
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Total Split (s)	21.0	115.0	94.0	94.0	25.0	25.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Act Effct Green (s)	109.5	109.5	88.5	88.5	19.5	19.5
Actuated g/C Ratio	0.78	0.78	0.63	0.63	0.14	0.14
v/c Ratio	0.39	0.45	0.64	0.30	0.85	0.54
Control Delay	15.0	5.8	17.5	2.7	82.2	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	5.8	17.5	2.7	82.2	24.6
LOS	B	A	B	A	F	C
Approach Delay		6.7	14.7		59.6	
Approach LOS		A	B		E	
Queue Length 50th (ft)	25	171	389	15	190	43
Queue Length 95th (ft)	41	203	460	52	#303	121
Internal Link Dist (ft)		995	1018		832	
Turn Bay Length (ft)	290			200		100
Base Capacity (vph)	352	2714	2194	1083	323	330
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.45	0.64	0.30	0.85	0.54

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 17.3	Intersection LOS: B	
Intersection Capacity Utilization 63.4%	ICU Level of Service B	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 4: Royalton Rd & Greens of Strongsville

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	125	1133	1286	299	252	163
Satd. Flow (prot)	1736	3471	3471	1553	1787	1599
Flt Permitted	0.131				0.950	
Satd. Flow (perm)	239	3471	3471	1553	1787	1599
Satd. Flow (RTOR)				278		157
Lane Group Flow (vph)	136	1232	1398	325	274	177
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Total Split (s)	15.0	109.0	94.0	94.0	31.0	31.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Act Effct Green (s)	103.5	103.5	88.5	88.5	25.5	25.5
Actuated g/C Ratio	0.74	0.74	0.63	0.63	0.18	0.18
v/c Ratio	0.49	0.48	0.64	0.30	0.84	0.42
Control Delay	22.0	8.1	17.5	2.7	78.2	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	8.1	17.5	2.7	78.2	13.3
LOS	C	A	B	A	E	B
Approach Delay		9.5	14.7		52.7	
Approach LOS		A	B		D	
Queue Length 50th (ft)	31	213	389	15	244	15
Queue Length 95th (ft)	51	253	460	52	#394	84
Internal Link Dist (ft)		995	1018		832	
Turn Bay Length (ft)	290			200		280
Base Capacity (vph)	278	2566	2194	1083	325	419
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.48	0.64	0.30	0.84	0.42

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 17.5	Intersection LOS: B	
Intersection Capacity Utilization 70.2%	ICU Level of Service C	
Analysis Period (min) 15		

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Royalton Rd & Greens of Strongsville

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	125	1133	1286	299	252	163
Satd. Flow (prot)	1736	3471	3471	1553	2323	1599
Flt Permitted	0.131				0.950	
Satd. Flow (perm)	239	3471	3471	1553	2323	1599
Satd. Flow (RTOR)				278		175
Lane Group Flow (vph)	136	1232	1398	325	274	177
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Total Split (s)	21.0	115.0	94.0	94.0	25.0	25.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Act Effct Green (s)	109.5	109.5	88.5	88.5	19.5	19.5
Actuated g/C Ratio	0.78	0.78	0.63	0.63	0.14	0.14
v/c Ratio	0.39	0.45	0.64	0.30	0.85	0.47
Control Delay	15.0	5.8	17.5	2.7	82.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	5.8	17.5	2.7	82.2	12.1
LOS	B	A	B	A	F	B
Approach Delay		6.7	14.7		54.7	
Approach LOS		A	B		D	
Queue Length 50th (ft)	25	171	389	15	190	2
Queue Length 95th (ft)	41	203	460	52	#303	71
Internal Link Dist (ft)		995	1018		832	
Turn Bay Length (ft)	290			200	150	150
Base Capacity (vph)	352	2714	2194	1083	323	373
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.45	0.64	0.30	0.85	0.47

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green		
Control Type: Pretimed		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 16.7	Intersection LOS: B	
Intersection Capacity Utilization 63.4%	ICU Level of Service B	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 4: Royalton Rd & Greens of Strongsville

Intersection: 4: Royalton Rd & Greens of Strongsville

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	156	185	166	367	388	225	200	212	125	112
Average Queue (ft)	86	114	84	226	214	69	126	106	89	9
95th Queue (ft)	145	174	152	340	354	177	187	201	146	56
Link Distance (ft)		1022	1022	1060	1060		855	855		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	290					200			100	100
Storage Blk Time (%)					4	0		4	10	0
Queuing Penalty (veh)					12	0		7	12	0

Network Summary

Network wide Queuing Penalty: 32

Intersection: 4: Royalton Rd & Greens of Strongsville

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	200	224	237	412	375	225	296	127
Average Queue (ft)	89	125	97	258	217	90	183	53
95th Queue (ft)	159	203	188	379	345	222	274	97
Link Distance (ft)		1041	1041	1066	1066		854	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	290					200		280
Storage Blk Time (%)					5	0	0	
Queuing Penalty (veh)					14	0	0	

Network Summary

Network wide Queuing Penalty: 15

Intersection: 4: Royalton Rd & Greens of Strongsville

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (ft)	248	177	161	438	416	225	174	233	175
Average Queue (ft)	82	115	82	243	222	110	100	138	73
95th Queue (ft)	165	171	158	375	375	260	184	219	164
Link Distance (ft)		1035	1035	1059	1059			854	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	290					200	150		150
Storage Blk Time (%)					6	0	0	7	0
Queuing Penalty (veh)					17	1	1	19	0

Network Summary

Network wide Queuing Penalty: 38