North Wales Borough
2040

NORTH WALES BOROUGH
MONTGOMERY COUNTY, PENNSYLVANIA

WALKABILITY AUDIT REPORT

September 2021

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CONTENTS

A. WALKABILITY REPORT ORIGINS

In September of 2018, North Wales Borough Council adopted a new Comprehensive Plan: *North Wales Borough 2040*. The Comprehensive Plan was the culmination of a two-year community planning and public outreach effort. Between 2016 and 2018, Montgomery County Planning Commission (MCPC) staff conducted public outreach at community events, distributed a community survey, led a community workshop, and hosted multiple public presentations. Hundreds of comments were received that informed the goals and recommendations of the plan.

The input received throughout the comprehensive planning process made it abundantly clear that walkability was not only a benefit of living in the community, but also something that residents believed the Borough could improve upon. Roughly two out of three community survey respondents indicated that walkable neighborhoods make North Wales a desirable place to live, work, and play. When the public was asked to rank specific priorities for pedestrian and bicycle improvements there was a clear theme that walkability improvements were a priority for the majority of respondents. In addition to direct responses to the survey questions, dozens of respondents wrote in their comments on specific pedestrian trouble areas and ideas for addressing deficiencies. Based on this input, transportation safety was selected as one of four main policy priorities in the *North Wales Borough 2040 Vision statement:*

> *Enhance Transportation Safety.*
>
> *Safe, efficient movement within the Borough encourages residents to walk to local destinations and additional traffic safety measures will reduce conflicts between vehicles, bicycles, and pedestrians.*

Along with being selected as a main tenet of the vision statement, walkability was given special attention as part of the action plan. As seen in the following excerpt from the plan, projects aimed at improving walkability in the Borough were ranked as the highest priority with short- to medium-term implementation timeframes. A Borough-wide walkability audit (also known as a walk audit) emerged as one of the key deliverables that were necessary to improve walkability conditions in the community.

1.1

	High Priority	Medium Priority	Low Priority	Total
Fixing broken/crumbling sidewalks	62.43% 211	32.25% 109	5.33% 18	338
Increasing visibility of pedestrian crosswalks	41.18% 133	41.49% 134	17.34% 56	323
Connecting sidewalks to neighborhoods in Upper Gwynedd Township	36.17% 119	35.87% 118	27.96% 92	329
Adding features that provide a visual or physical barrier between pedestrians and moving vehicles, especially alone Main Street (i.e. landscaping, additional on-street parking)	30.67% 100	38.96% 127	30.37% 99	326
Installing ADA ramps at intersections	24.07% 78	45.68% 148	30.25% 98	324
Improving signal timing	18.87% 60	40.25% 128	40.88% 130	318
Decreasing traffic speed	27.22% 89	34.86% 114	37.92% 124	318
Adding sidewalks and/or bike lanes along roadways	33.84% 111	42.38% 139	23.78% 78	3128

Select North Wales Borough 2040 community survey responses

1.2 Pedestrian and Bicycle Network

Recommendations & Strategies	Implementation Type					
	Education & Outreach	Planning	Local Committee	Regulatory Control	Capital Investment	Private Development
Maintain and improve North Wales' sidewalk network to improve health outcomes for the community as a whole by encouraging overall healthy and active lifestyles.						
Conduct a Borough-wide walkability audit to inventory the location and condition of all sidewalks and crosswalks.		✓				
Conduct an audit of Borough ordinances to ensure they include appropriate dimensional and quality standards related to the Borough's pedestrian network (e.g., sidewalks, crosswalks, curb cuts, ADA ramps).		✓		✓		
Notify property owners of overgrown vegetation and require trimming or removal of plant material to clear sidewalks.	✓			✓		
Create and promote events that encourage walking such as Walk to School Day.			✓			
Evaluate and implement strategies to protect pedestrian walkability and safety, especially at intersections.						
Identify the placement and effectiveness of street lighting in the commercial and residential districts.		✓				
Improve visibility of pedestrian crosswalks by repainting walkways with continental, zebra, or ladder-style markings.			✓		✓	
Paint crosswalks at all intersections identified in the walkability audit.			✓		✓	
Improve sidewalk connectivity by installing new sidewalks in locations where they are missing and repair sidewalks in bad condition.						
Identify priority connection areas and require property owners to install new sidewalks or repair damaged sidewalks.	✓	✓		✓		✓
Institute a "sidewalk repair program" and identify opportunities for financing assistance through matching funds and/or grant funding to reduce financial burden on property owners.			✓		✓	
Increase safety and convenience of bike ridership by creating new bicycle amenities.						
Using Bike Montco as a guide, adopt a Bike Plan that identifies preferred bike routes through the Borough.		✓				
Identify placement locations for new bike amenities (e.g., bike parking at the train station and along Main Street).		✓			✓	
Coordinate with Upper Gwynedd on bike routes.	✓		✓			
Promote the Borough's bike share program through advertising and at community events.	✓					

North Wales Borough 2040, Implementation pgs. 75-76

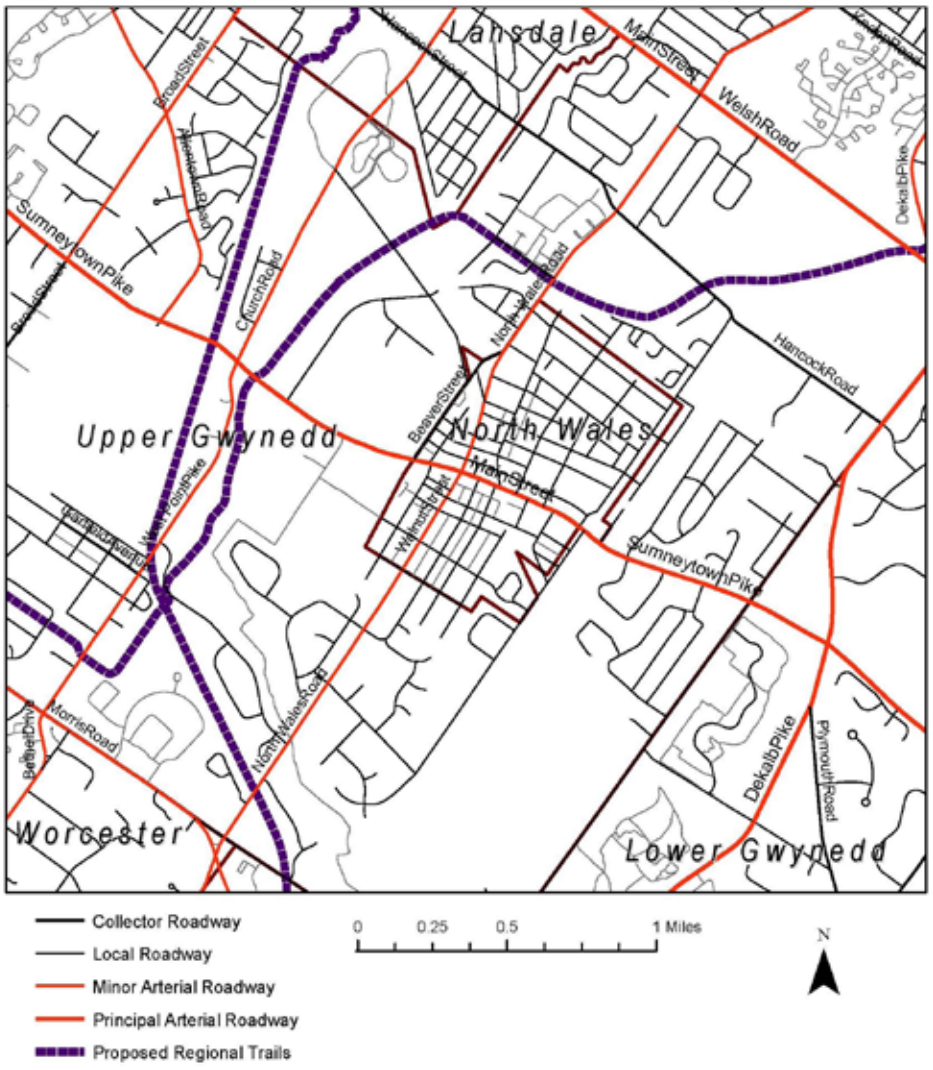
Funding Source	Priority Level and Implementation Timeline	Responsible Agencies	
		Municipal	Partners
	★★★★★		
NA	S	NWPC; NWPW	MCPC
NA	M	NWPC	MCPC
NA	S	Code Enforcement	
NA	S		PTMA; NPSD
	★★★★★		
NA	L		
State and Local grants; Municipal budget	M	NWPW	
State and Local grants; Municipal budget	M	NWPW	
	★★★★★		
NA	M	NWPC; NWPW	Property owners
State and Local grants; Municipal budget	M	NWBC	Property owners
	★★★		
NA	M		MCPC; PTMA
NA	S	NWPC	NWBBA; SEPTA
NA	Ongoing		UGT; MCPC
NA	S		PTMA

B. HISTORY OF WALKABILITY EFFORTS IN NORTH WALES

In order to understand walkability in the Borough, it is important to note that North Wales was developed as a walkable community. Population booms from the 1850s through the early 20th century, which occurred in large part due to the expansion of the North Penn Railroad, caused the Borough to rapidly expand in a gridded street pattern surrounding a downtown core. This gridded street pattern has lasting impacts today, as it is the ideal layout for keeping pedestrian trips quick and efficient.

Throughout the Borough's recent history there have been many efforts to enhance walkability, such as the transformative Main Street streetscape improvements that were completed in the 1990s. Even more recently, there has been greater emphasis on improving walkability in the Borough through updates to local ordinances to require pedestrian improvements with development, through annual maintenance and repair, and especially through a few large-scale projects.

North Wales Borough in Relation to Proposed Regional Trails



MontCo 2040 Implementation Grant Program

In 2020, the Borough was awarded a $154,725 grant from Montgomery County Planning Commission's *MontCo 2040* Implementation grant program. The goal of this grant program is to implement the goals and objectives identified in *MontCo 2040*, the County's 2015 Comprehensive Plan. The Borough intends to install new sidewalks, crosswalks, and ADA ramps on Center Street between Walnut Street and the trail connection to Parkside Place Park in Upper Gwynedd Township. As part of the project, a rectangular rapid flashing beacon is proposed for pedestrians to cross the north leg for Walnut Street (SR 2010) at its intersection with Center Street. The flashing beacon will be equipped with accessible pedestrian signals (APS). A new gateway entrance, with lighting and signage at the trailhead, will be installed to formalize the trail entryway and provide direction to recreational amenities, including the regional Green Ribbon Trail. This project will improve pedestrian connectivity, safety, and visibility at a key connection between the two communities. The total project is anticipated to cost $194,670.

Safe Routes to School Grant

In 2009, the Borough was awarded a Safe Routes to School grant in the amount of $1,069,977. The grant covered the installation of curbing, sidewalk and traffic calming measures within a half mile radius of the St. Rose of Lima Catholic School and the North Wales Elementary School on West Prospect, Washington, Second, Swartley, Summit, Pennsylvania, Fairview, Highland and Main Streets. The project hit several speedbumps along the way, including the closure of St. Rose of Lima Catholic School, however the improvements were completed in April of 2019.

Safe Routes to Transit

DVRPC's Safe Routes to Transit Program is a competitive technical assistance grant program periodically offered to municipalities in Greater Philadelphia that are interested in enhancing pedestrian and bicycle access to transit stations. In 2019, the Borough met with representatives from DVRPC, MCPC, and SEPTA for a strategic planning session regarding this program and to specifically explore pedestrian and bicycle issues in the area around the North Wales Train Station. The following recommended actions emerged from this session:

Rendering of the Center Street/Parkside Place Park Gateway

- Pursue construction of missing sidewalks along Beaver and Walnut Streets.
- Consider adding wayfinding signage near the train station to identify preferred pedestrian routes.
- Add an east-west crosswalk on Walnut Street between 4th and 5th Streets that is adequately separated from the train tracks.
- Explore the possibility of making Railroad Street one-way going northbound with new angled parking and reversing the direction of 5th and 6th Street between East Montgomery Avenue and Walnut.
- Consider adding designated bicycle routes and greenways that align with the recommendations of Bike MontCo.
- Explore the possibility of benches and shelters at existing SEPTA bus stops.

Property Owner Sidewalk Replacement

When a property owner intends to sell their property, the Borough requires the replacement or repair of sidewalks along all street frontages. This program has been extremely effective and efficient in replacing deficient sidewalks, however the pace of property sales has not been enough to keep up with maintenance demands. The Borough can expand this program to incentivize additional sidewalk construction/repair, as discussed in Chapter 8, Implementation.

C. BENEFITS OF WALKABILITY

Walking should be safe, easy, and convenient for everyone. Unfortunately, there are often gaps, deficiencies, or even hazards in pedestrian infrastructure that impact the pedestrian experience. For those who use mobility aids, obstacles to wheelchair or walker accessibility are ever-present. For those who cannot drive, such as children, households without access to a car, or people with health conditions that do not permit driving, walkability is essential to their mobility. Walkability can have drastic impacts on a community's character, safety, and health. Some of the greatest benefits of walkability are outlined below.

Source: Walk Score

Walkable neighborhoods help create vibrant business districts. Walkability has been shown to have a vast impact on commercial space value and patronage. A 2010 study examined the relationship between Walk Score® and market value of over 4,200 office, apartment, retail, and industrial properties. The analysis showed that office and retail properties with a Walk Score of 80 had an average property value 54% higher than those with a score of 20 and had a 42% higher net operating income; there was a 6% higher property value among apartments and the score had no impact on industrial property values[1]. It may go without saying, but walkable retail areas enjoy much higher levels of retail activity: in Los Angeles, walkable, dense shopping districts see retail activity up to 400% greater than automobile-centric strip malls[2]. It is quite apparent that walkable, inviting streetscapes attract patrons and increase business viability, vitality, and profits.

Walkable neighborhoods are good for your health. Encouraging healthy behaviors and physical activity can improve overall health of residents. Any type of physical activity, including walking, lowers the risk of heart disease, cancer, diabetes, and other chronic health conditions. A study in the New England Journal of Medicine found that walking two miles daily cuts the risk of death due to cancer by half[3].

In a review of 23 independent studies that examined the effect of moderate to vigorous physical activity during adolescence on cancer risk, it was shown that females aged 12-24 with the highest levels of physical activity had on average a 20% lower chance of getting breast cancer later in life[4]. These are just a few

1 Pivo, G. & Fisher, J. (2010.) The Walkability Premium in Commercial Real Estate Investments. Working Paper. Responsible Property Investing Center, University of Arizona & Benecki Center for Real Estate Studies, Indiana University.

2 Boarnet MG, Joh K, Siembab W, Fulton W, Nguyen MT. Retrofitting the suburbs to increase walking: evidence from a land-use-travel study. Urban Stud. 2011;48(1):129-59. doi: 10.1177/0042098010364859. PMID: 21174897.

3 . Hakim, A. A., Petrovitch, H., Burchfiel, C. M., Ross, G. W., Rodriguez, B. L., White, L. R., Yano, K., Curb, J. D., & Abbott, R. D. (1998). Effects of walking on mortality among nonsmoking retired men. The New England journal of medicine, 338(2), 94–99. https://doi.org/10.1056/NEJM199801083380204

4 Lagerros, Y. T., Hsieh, S. F., & Hsieh, C. C. (2004). Physical activity in adolescence and young adulthood and breast cancer risk: a quantitative review. European journal of cancer prevention : the official journal of the European Cancer Prevention Organisation (ECP), 13(1), 5–12. https://doi.org/10.1097/00008469-200402000-00002

examples of a large body of research that has shown time and time again that physical activity can lower the risk of certain types of cancers.

Obesity is a significant problem in Pennsylvania, and obesity rates are lower in walkable neighborhoods. 14.5% of children ages 10-17 in Pennsylvania suffer from obesity (26th out of 50 states); this number jumps to 33.2% among adults[5]. A growing body of research indicates that walkable neighborhoods impact obesity rates among youth. For example, a 2019 study showed that as the Walk Score® increased, youth BMI decreased[6]. This study was limited in scope and certain variables of interest were not taken into account, such as resident access to healthy food options and income level, but it was clear that walkability made for healthier youth. Further research is needed to get a more complete picture, however it is safe to say that increased walkability can only improve the health of a community.

Walkable neighborhoods are good for the environment. Walkable neighborhoods reduce the number of vehicle trips that residents make, especially short trips, which lessens the environmental impact locally and globally. Reducing vehicle trips can have an outsized impact on mitigating the impacts of climate change because vehicle emissions cause about 31% of all carbon dioxide pollution, 81% of all carbon monoxide pollution, and 49% of all nitrogen oxide pollution. Automobile-related air toxics, such as benzene, formaldehyde, and diesel particulate matter, are also released which are suspected to cause cancer and other adverse health impacts[7]. Air pollution has also been linked to asthma in youth. Although making walking more viable will not mitigate pollution entirely, any change from driving to walking reduces traffic congestion and improves air quality.

Walkable neighborhoods feel safer and encourage community strength. If more people are actively walking on streets and sidewalks, then residents generally feel safer walking to work, encouraging children to walk to school, and walking or running for recreation. Activist and writer Jane Jacobs, in her famous 1961 book *The Life and Death of Great American Cities,* coined the phrase '"eyes on the street," which is the feeling that you are safe in a bustling public space even when among complete strangers. There is a sense of community and accountability when many people are enjoying use of a public space. Walking in your community also encourages interaction with neighbors. The feeling of safety brings people together and helps to create a sense of place and identity for the community.

Walkable neighborhoods are safer. Improving pedestrian infrastructure saves lives. In Pennsylvania in a given year, there are about 4,000 pedestrian-involved crashes which result in 150 to 200 pedestrian deaths. Pedestrian-related crashes make up only 3.3% of total reported traffic crashes, however they account for .5% of all traffic crash fatalities[8]. This figure does not necessarily reflect negligence on the part of pedestrians or drivers, but rather the deficiencies in traffic controls

1.3 Pedestrian-Involved Crashes & Fatalities, 2019

Year	Total Crashes	Fatalities
2015	4,001	153
2016	4,201	172
2017	4,086	150
2018	4,129	201
2019	4,101	154

Source: PennDOT Crash Facts & Statistics, 2019

5 State of Childhood Obesity. "Pennsylvania: Rates, Ranks, and Trends." https://stateofchildhoodobesity.org/states/pa/. Accessed June 23 2021.

6 Stowe EW, Hughey SM, Hallum SH, Kaczynski AT. Associations between Walkability and Youth Obesity: Differences by Urbanicity. Child Obes. 2019 Dec;15(8):555-559. doi: 10.1089/chi.2019.0063. Epub 2019 Aug 26. PMID: 31448951.

7 Environmental Protection Agency. " Smog, Soot, and Local Air Pollution." https://www.epa.gov/transportation-air-pollution-and-climate-change/smog-soot-and-local-air-pollution. Accessed June 23 2021.

8 Pennsylvania Department of Transportation. "2019 Pennsylvania Crash Facts & Statistics." https://www.penndot.gov/TravelInPA/Safety/Documents/2019_CFB_linked.pdf. Accessed June 23 2021.

and pedestrian infrastructure. An estimated 74% of pedestrian fatalities occur where no traffic controls exist, which would include pedestrians walking within a roadway, crossing a road where no intersection exists, or crossing at an intersection where no traffic controls exist; the share of fatalities drops to 17% for signalized intersections and 7% for intersections with stop signs[9]. Although not all pedestrians or drivers will follow the rules, the chances of pedestrian fatalities drop significantly as pedestrian infrastructure improves.

9 Cambell, B.J, Zegeer, C.V., Huang, H.H.,& Cynecki, M.J. (2004). A Review of Pedestrian Safety Research in the United States and Abroad. FHWA Pedestrian and Bicycle Safety Research Program, January 2004. Publication No. FHWA-RD-03-042.

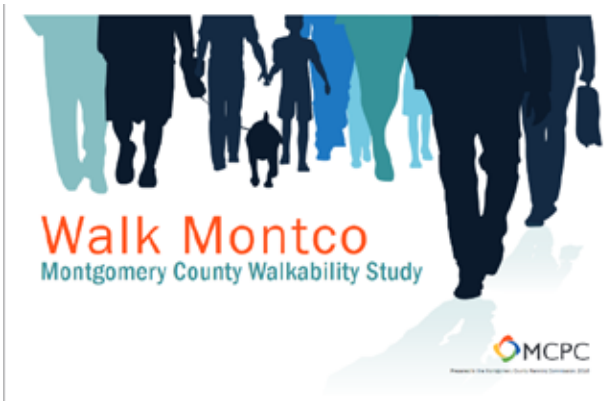
CHAPTER II. METHODOLOGY

Walkability can be a difficult concept to measure, which is where the walkability audit comes in. The value in a walkability audit is how accurate and up-to-date the data is. All data collected is accurate at the point in time that the project is undertaken and sidewalk conditions typically do not change much in the short-term. During the implementation stage of the plan, generally a several year horizon, the municipality can be assured that the data remains accurate and that improvements are being made with knowledge of the complete picture.

A. BACKGROUND RESEARCH

In general, sources are cited throughout this report, however there are a handful of documents that acted as the backbone of this report. First and foremost is *North Wales Borough 2040*, which was highlighted in Chapter 1. This document and the associated community survey are cited throughout this report because they truly set the tone for the next 20 years of the Borough's community and economic development.

Secondly, is *Walk MontCo*, a walkability study for Montgomery County, which was adopted by the county commissioners in 2016 as official county policy. The study, a major component of the county's walkability initiative, corresponds to the goals of *MontCo 2040: A Shared Vision*, Montgomery County's 2015 award-winning Comprehensive Plan. *MontCo 2040* advocates for more sidewalks and pedestrian-oriented developments to improve transportation quality and expand options. *Walk MontCo* focuses on walkability opportunities and challenges throughout Montgomery County. It recommends standards for improving walkability in general and offers specific recommendations for four selected focus areas from around the county. The plan also provides guidance on how to implement and fund walking improvements. The best practices outlined in *Walk MontCo* were used in creating the way in which context was reviewed and graded during the audit process.



When it came to synthesizing a scoring system for the walk audit, many walkability studies throughout the world with dozens of factors and just as many ways of analyzing walkability were available for our review. Of all of these options, we primarily drew on resources from the Center for Disease Control[1] (CDC), the American Association of Retired Persons[2] (AARP), and a report by Tribby et al from the *Journal of Transport and Land Use*[3]. The CDC and AARP resources offered a "do it yourself" framework that could enable small groups of people to go out into their neighborhood and inventory the existing conditions. This was supplemented by the work of Tribby et al, which gave us insight as to how we could integrate infrastructure Geographic Information Systems (GIS) analysis into the audit to enable a more complete picture. This contributed to our selected methodology of splitting up the infrastructure score and the context score, which was mainly calculated with GIS analysis.

1 Centers for Disease Control and Prevention. "Walkability Audit Tool." https://www.cdc.gov/physicalactivity/worksite-pa/pdf/walkability_audit_tool.pdf. Accessed June 23 2021.

2 American Association of Retired Persons. "AARP Walk Audit Tool Kit." https://www.aarp.org/content/dam/aarp/livable-communities/livable-documents/documents-2016/Walk-Audit-Tool-Kit/AARP-Walk-Audit-Tool-Kit-100416.pdf. Accessed June 23 2021.

3 Tribby, C. P., Miller, H. J., Brown, B. B., Werner, C. M., & Smith, K. R. (2015). Assessing built environment walkability using activity-space summary measures. Journal of Transport and Land Use, 9(1). https://doi.org/10.5198/jtlu.2015.625

B. METHODOLOGY

Walkability in general may be thought of as a "you know it when you see it" phenomenon, however that does not suit an unbiased analysis. A standardized scoring system was key to reviewing existing conditions and in recommending implementation options. A quantitative scoring system allowed a clear comparison of different locations.

Intersections and block segments were examined separately in order to make meaningful comparisons between types of pedestrian infrastructure. Intersections and block segments were each examined for the presence or absence of existing infrastructure, and then separately for the contextual need for pedestrian infrastructure at that location. The context scoring, as outlined below, looks at certain factors that are not easily observable on the ground. By integrating the context score, we are able to gauge the relative need for additional infrastructure of, say, a quiet residential neighborhood as compared to the downtown business district.

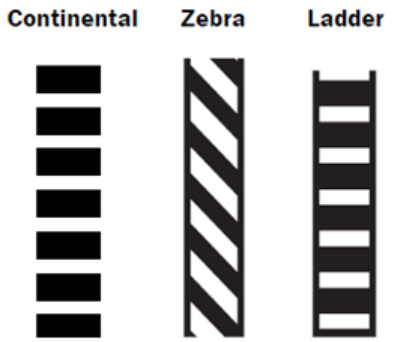
The infrastructure scores and context scores are measured separately, which allows us to review the existing infrastructure on its own merits. When the infrastructure is combined with the context scoring, however, we get a much clearer picture of what areas of the Borough should be prioritized. The relative weight of each factor was based on research, as noted above, and catered to existing conditions in the Borough.

Intersection Infrastructure Scoring: 16 points

At each intersection, the presence, absence, and condition of various types of pedestrian infrastructure were assessed in detail. Lower scores indicate a greater need for infrastructure improvements.

1. **Crosswalk(s) Present: 5 potential points**
   In Pennsylvania, every crossing that has sidewalks is legally considered to contain a crosswalk, regardless of whether it is painted or not. In order to score the maximum of 5 points, an intersection only needed to have marked crosswalks that were deemed necessary for pedestrian safety and convenience. For Main Street this may involve all four, whereas on a side street it may only include one or two crosswalks. If some marked crosswalks were present, but not across all necessary crossings, 2 points were awarded. If no crosswalks were present, then 0 points were awarded.
2. **Crosswalk style: 2.5 potential points**
   Crosswalk styles can have a drastic impact on pedestrian safety. Highly visible crosswalks, like the one connecting the municipal train station parking lot to the train station on Beaver Street, score the maximum at 2.5 points. A decorative crosswalk, like the brick paver crossing at Walnut and Main Street, receives 1.5 points. Standard crosswalks, those with only two parallel lines, receive 1 point. And, lastly, intersections with no crosswalks get 0 points. If multiple crosswalk styles were present at an intersection, the crosswalk across the higher traffic volume street was used.
3. **Crosswalk condition: 0-1.5 points**
   Crosswalk condition impacts visibility and, as paint wears away, intersections get less safe. Crosswalks in good condition receive a maximum of 1.5 points, crosswalks with faded paint are graded as fair and receive 0.75 points, and crosswalks in poor condition or lacking a crosswalk receive 0 points.
4. **Curb ramps present: 0-2 points**
   Curb ramps provide mobility for people in wheelchairs, with strollers, or those who may find a curb difficult to step up onto. The presence of at least one curb ramp on each corner receives a maximum of 2 points, whereas those with some ramps only receive 0.75 points. If no curb ramps are present, then 0 points are awarded. Please note that "ADA ramps" refer to only those curb ramps that are compliant with current ADA requirements; many existing curb ramps are not compliant.
5. **Curb ramp condition: 0-1 point**
   Curb ramps can become unusable or even become a safety hazard if they fall into disrepair. Good condition curb ramps receive 1 point, those needing repair or improvement receive 0.5 points, and if no curb ramps are present then 0 points are awarded.

A highly visible crosswalk across Beaver Street
Source: NearMap, captured March 5, 2021



Highly visible crosswalk marking patterns

ADA ramp with DWP by North Wales Elementary School

6. **Detectable warning plates: 0-1 point**
   Detectable warning plates (DWPs) are colored tactile plates that alert those with vision impairments that they are approaching the street. If all existing curb ramps have a DWPs, then 1 point is awarded. If some DWPs are present, then 0.5 points are awarded. 0 points are awarded if the intersection lacks DWPs on curb ramps.
7. **Traffic controls present: 0-3 points**
   Traffic controls directly impact pedestrian safety. The safest intersections are those that have all-way stops, so they are awarded the maximum of 3 points. Signalized intersections are nearly as safe as all-way stops, so they are awarded 2 points. Intersections with some stops receive 1 point and uncontrolled intersections, being the most dangerous, receive 0 points.

Block Segment Infrastructure Scoring: 14 points

On every block, each side of the street was evaluated separately and received a separate score. A "block segment" refers to one side of the street on one block. The presence, absence, and condition of sidewalks and other conditions that influence pedestrian safety and comfort for pedestrians was assessed in detail. Lower scores indicate a greater need for infrastructure improvements.

1. **Sidewalk: 2 points**
   The presence of sidewalks is perhaps the most important aspect of safe pedestrian infrastructure. The maximum 2 points was awarded for full sidewalks, with partial sidewalks receiving 0.5 points, and no sidewalks receiving 0 points. When combined with the next three associated factors, a street with sidewalks could score a maximum of 10 points whereas those without receive 0 points.
2. **Average width of the sidewalk: 3 points**
   In addition to the presence of sidewalks, a segment could earn up to 3 additional points if the sidewalk was 60 or more inches in width on average, which is the minimum comfortable width for two people to walk side-by-side. Points drop to 2 points between

48 and 59 inches, to 1 point between 36 and 47 inches, and 0 points below 35 inches. Areas without sidewalks received 0 points for this metric.

3. **Minimum width of the sidewalk: 3 points**
   In addition to evaluating the typical width of the sidewalk, the walk audit process included measuring and evaluating any obstacles in the sidewalk such as utility poles. If the narrowest width was still at least 48 inches, the accepted minimum passable sidewalk width, then a sidewalk could score 3 additional points. Points drop to 2 points between 36 and 47 inches, to 1 point between 24 and 35 inches, and 0 points below 24 inches. Areas without sidewalks received 0 points for this metric.
4. **Sidewalk condition: 2 points**
   Sidewalk condition was ranked from good to poor. A good condition sidewalk (without cracks or other deficiencies) received 2 points, those in fair condition (some cracks or other issues) received 1 point, and anything in need of replacement or missing a sidewalk received 0 points.
5. **The presence of obstructions in the sidewalk: 1 point**
   Many sidewalks have an obstruction that narrows the width of the sidewalk. The most common culprit were utility poles and, to a lesser degree, street signs. If no obstructions were present, then 1 point was awarded. If there were obstructions or no sidewalk, then 0 points were given.
6. **Presence of a landscaped verge: 1 point**
   A verge, the landscape strip between the sidewalk and the street, acts as a barrier between pedestrians and vehicles. Verges may contain grass and street trees, which help keep pedestrians cool during hot weather. Streets with full-length verges received 1 point, those with partial verges received 0.5 points, and streets lacking a verge received 0 points.
7. **Presence of on-street parking: 0.5 point**
   On-street parking acts as a physical, protective barrier between pedestrians and vehicles. Block segments that allow on-street parking were awarded 0.5 points, and those without received 0 points.
8. **Whether sidewalks are flat at driveways: 1 point**

A poor condition sidewalk with severely uplifted blocks

A sidewalk with an abrupt bump at a driveway

When poorly designed, driveways can act as barrier to pedestrians enjoying the sidewalk. Some driveways have a curb that drops without a ramp, some that are designed to connect to the sidewalk have harsh slopes, and others remain flat and comfortable for users. If driveways acted as a barrier to a pedestrian, then it received 0 points. If sidewalks remained flat at driveways, then 1 point was awarded.

9. **Desire lines present: 0.5 points**
   Desire lines or desire paths are areas that pedestrians use regardless of the fact that there is no infrastructure for them. During the walk audit, these were seen on a handful of streets that lacked sidewalks or had partial sidewalks. If desire lines were present, then 0 points were awarded. All segments lacking desire lines received 0.5 points.

Desire lines vs. existing infrastructure
Source: 99% Invisible

Context Scoring: 19 points for intersections & 16 points for block segments

Context scoring identifies the most important areas to have high-quality pedestrian infrastructure. Thus, those locations which generate higher volumes of pedestrian traffic or have a higher need for safety infrastructure are given lower point values, indicating a greater need for pedestrian infrastructure.

1. Proximity to schools: 2 points
   Walking to school should be safe and easy for all students. Intersections and streets within ¼ mile of a school receive 0 points, which indicates high importance for pedestrian infrastructure and a greater likelihood of the presence of a vulnerable pedestrian population. This goes up to 1 point between ¼ and ½ mile, as it is perceived that less students will walk this distance. 2 points are given beyond the ½ mile radius, as it is not anticipated that many students will walk so far.
2. **Proximity to the train station: 2 points**
   Walking to the train station should be the preferred alternative to driving to a parking lot, so those intersections and streets nearest the train station have the highest need for pedestrian infrastructure. Intersections within ¼ mile of the train station receive 0 points. This goes up to 1 point between ¼ and ½ mile, as it is safe to assume that lesser percentage of commuters are willing to walk this distance. 2 points are given beyond the ½ mile radius, as it is not anticipated that many will walk so far.
3. **Proximity to the business district: 2 points**
   It should be comfortable and attractive to walk to and within the downtown business district, so those areas nearest or within the business district have the highest need for pedestrian infrastructure. Intersections within ¼ mile of the business district receive 0 points. This goes up to 1 point between ¼ and ½ mile, as it is perceived that less people are willing to walk this distance. 2 points are given beyond the ½ mile, as it is not anticipated that many will walk so far.
4. **Proximity to the library: 1 point**
   This factor was given slightly less weight due to its relative patronage when compared to schools, the train station, and the business district. Areas within ¼ mile of the library will see the most foot traffic, so

they receive 0 points. 0.5 points are assigned between ¼ to a ½ mile and 1 point is assigned beyond that.

5. **Proximity to SEPTA bus stops: 1 point**
   This factor was also given slightly less weight due to its relative patronage when compared to schools, the train station, and the business district. Experts generally agree that there is a high capture rate for ridership if a bus stop or destination is within ¼ mile, but this diminishes as distance increases. Therefore, 0 points were assigned for areas within ¼ mile and 1 point was assigned beyond that.

6. **Roadway class**
   Roads are classified by the function they serve in the transportation network. Arterials and collectors generally carry larger volumes at higher speeds. Local roads are smaller and carry less traffic at lower speeds. Arterial streets (Main and Walnut Streets), seeing the most traffic, require the best pedestrian infrastructure and safest crossings. The scoring differed by one point between the intersections and sidewalks.

   a. Intersections: 3 points
      Arterial streets (Main and Walnut Streets) receive 0 points, as these need the most pedestrian safeguards. Collector streets (Beaver Street) receive 1 point, as they see less traffic than arterials but still warrant additional pedestrian safety features. Local roads (all other streets) have varying traffic volume levels, but don't generally see through traffic as much and therefore are assigned 3 points.

   b. Block Segments: 2 points
      Arterial streets (Main and Walnut Streets) receive 0 points, as these need the most pedestrian safeguards. Collector streets (Beaver Street) receive 1 point, as they see less traffic than arterials but still warrant additional pedestrian safety features. Local roads (all other streets) have varying traffic volume levels, but don't generally see through traffic as much and therefore are assigned 2 points.

7. **Adjacent roadway class (Street Segments ONLY). 1 point**
   During the walk audit, it was observed that local streets that intersect with Walnut Street, Main Street, and Beaver Street (classified as arterial and collector streets) generally saw increased vehicle turning and traffic. Because of this increased traffic, it was clear that an additional metric was appropriate. If a block segment intersects with an arterial street, then 0 points were awarded. This score increases to 1 for collector streets and to 2 for local streets.

8. **Annual average daily traffic (AADT): 3 points**
   This data is collected by Delaware Valley Regional Planning Commission (DVRPC) for certain roadways. The relative AADT was tiered with under 500 trips getting 3 points, 500-2,000 receiving 2 points, 2,000-6,000 receiving 1 point, and anything over 6,000 receiving 0 points. Main Street sees over 18,000 vehicle trips daily, Walnut Street sees nearly 7,000, Beaver sees under 6,000, and all other streets fall much below that.

9. **Comprehensive plan support: 1 point**
   Many streets were identified in *North Wales Borough 2040* as needing walkability improvements. Any streets noted in the plan received 0 points and all others received 1 point.

10. **Pedestrian-involved crash data (PennDOT): 1 point**
    PennDOT tracks data related to pedestrian involved vehicle crashes. With this data, we were able to identify how many pedestrian were struck at certain intersections over the last 10-year period. If no crashes occurred, then 1 point was assigned, if one crash occurred then 0.5 point was assigned, and if there were multiple incidents then 0 points was assigned.

11. Crosswalk Distance for Arterial and Collector Streets: 3 points (Intersections ONLY)
    Arterial and collector streets see significantly more traffic than local roads, which makes crosswalks that much more important for pedestrian safety. For this factor, we looked at the intersections along Main, Beaver, and Walnut Streets and reviewed where the nearest crosswalks were located. If there were no crosswalks across at the intersection in question, we measured the distance to the nearest crossing in

either direction. If a marked crossing was located within 600 feet in either direction, then 2 points were awarded 0 points were awarded if there were no crosswalks within 600 feet.
After the nearest crosswalk was identified, the same calculation was done in the opposite direction from the intersection. 1 point was awarded if the next closest crosswalk was also located within 600 feet of the intersection and 0 points if not.

Field Visitsf

In order to get accurate information, it was critical that the study team physically walk the streets of the Borough and document the existing conditions. Infrastructure factors were noted using a combination of paper and iPad forms, samples of which can be reviewed in the appendices. Measuring tapes were used to measure the sidewalk width and safety vests were worn, but otherwise no special equipment was needed.

On June 15th, July 16th and October 27th of 2020, MCPC staff conducted fieldwork inventorying segments of the Borough's sidewalk and intersection network based on the above-noted infrastructure factors. During the audit, both written notes and photographs were taken to document existing conditions. During these first three dates, roughly half of the Borough's intersections and block segments were documented.

Following some unforeseen delays in the project, three MCPC staff members and the Assistant Borough Manager, Alan Guzzardo, met on June 4th of 2021 to inventory much of the remaining streets. A few weeks later, on June 17th, one MCPC staff member returned to the Borough to collect missing or incomplete data and to revisit Main Street, as it was identified as a focus area for this project.

Aerial Imagery (NearMap) Inventorying

In addition to fieldwork, high-accuracy aerial imagery from NearMap was utilized to both inventory certain data and to review/confirm outliers from in-person fieldwork. NearMap aerial imagery is captured for the county three times annually; the imagery

Alan Guzzardo, Assistant Borough Manager, measuring sidewalk width on Beaver Street on June 4, 2021

NearMap imagery of the intersection of Main and Walnut Streets, June 5, 2021

used for this report was collected on March 5, 2021, but previous dates were also used throughout this process. This process was utilized to quickly scan the Borough and note all streets that were lacking sidewalks altogether, which were generally not walked by staff. Thanks to the high accuracy of the imagery, certain intersections were also inventoried using a combination of NearMap and Google Maps.

Geographic Information Systems (GIS)

Inventorying context factors would have been extremely time consuming without the use of GIS. MCPC collected GIS shapefiles for the business district, the library, schools, the train station, SEPTA bus stops, intersections, and block segments. Staff then created a ¼ and ½ mile buffer surrounding the locational context factors and identified all intersections and block segments that were located within these buffer areas. By using GIS for this process, it was both extremely accurate and efficient.

Other Data Sources

There are a few other data sources that must be credited for the success of this project. Delaware Valley Regional Planning Commission's (DVRPC) Travel Monitoring program[4] provided accurate and up-to-date Annual Average Daily Traffic counts. Pennsylvania Department of Transportation's (PennDOT) Crash Information Tool[5] was also extremely important to this study, as it provided information on pedestrian-involved vehicle crashes over the past 10 years. This was particularly helpful with providing insight regarding intersections in need of upgrades.

1/4 mile buffer surrounding the North Wales Area Library

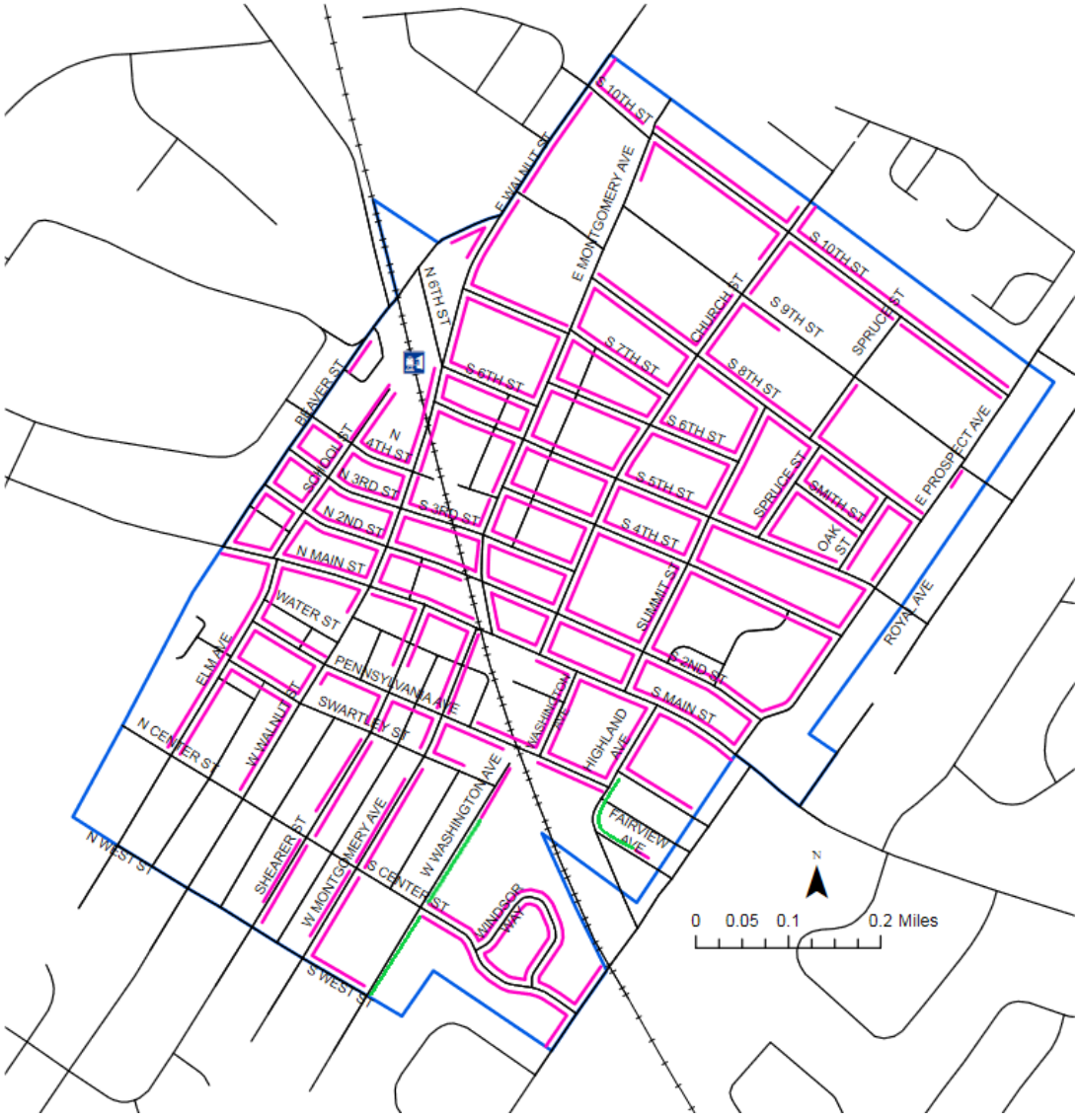
4 Delaware Valley Regional Planning Commission. https://www.dvrpc.org/traffic/VehicleTravelMonitoring/

5 PennDOT. https://crashinfo.penndot.gov/PCIT/welcome.html

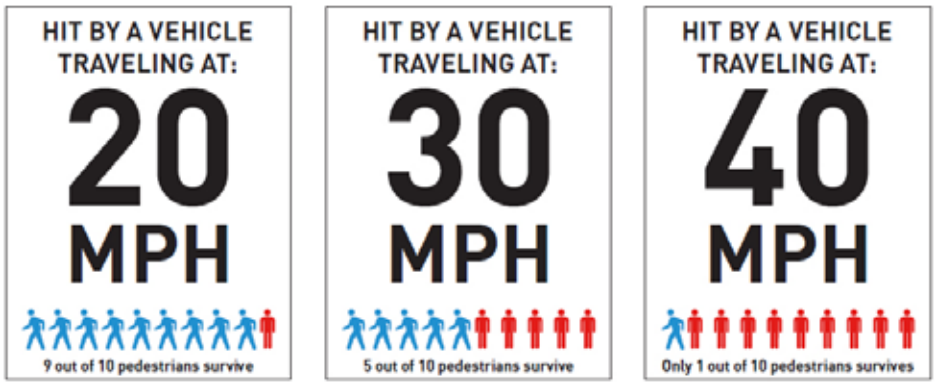
CHAPTER III. EXISTING CONDITIONS

A. THE WALKING LANDSCAPE IN NORTH WALES

The Borough has quite a robust system of existing sidewalks, although there is certainly room for improvement. The Borough was developed with a gridded street pattern with blocks that are generally less than 600 feet in length, which makes it easier for pedestrians to get more directly to their destinations and, if safe crossings are available at all corners, to cross the street close to where they need to be. There are quite a few longer blocks, such as the north side of Main Street between Summit Street and Prospect Avenue, however there are remedies to make these blocks more pedestrian friendly. For example, *Walk MontCo* would recommend mid-block crossings along any block that exceeds 600-feet in length; this would be an ideal solution for any blocks along high traffic streets that meet or exceed this distance.



The sidewalk network at the time of the comprehensive plan (2019) remains mostly unchanged, with the exception of new sidewalks installed as part of the SRTS grant which are marked in green.



Source: Seattle DOT

The Borough deserves high marks for its Borough-wide speed limit of 25 miles per hour (MPH). There are certain areas in the Borough where the speed limit drops to 15 MPH, such as South 2nd Street between Summit Street and East Prospect Avenue. This is of great importance because there is a demonstrable correlation between vehicle speed and pedestrian fatalities. When asked about traffic safety concerns in the *North Wales Borough 2040* community survey, over half of respondents were concerned about traffic violations along residential streets (speeding and stopping at stop signs) and over one third were concerned about the same issues along Main Street/Sumneytown Pike. Traffic calming design along with enforcement can work in concert to address these concerns.

Transit is a strong driver of pedestrian activity and the Borough is well serviced by SEPTA buses and regional rail. The North Wales train station (Lansdale/Doylestown Line) is located between Beaver, Walnut, Railroad, and 4th Streets and connects residents to destinations such as Center City Philadelphia, Lansdale, Ambler, and Doylestown. Around one third of North Wales passengers access the train station on foot. SEPTA Route 96 has bus stops along Main Street and Walnut Street, however ridership is fairly low at around 16 passengers per week. This route connects riders to Doylestown to the north and the Norristown Transportation Center to the south. The Borough has adopted a transit-oriented development zoning district surrounding the train station, which includes land use and design standards aimed at improving the built environment for pedestrians and transit riders alike.

B. CHALLENGES TO WALKING

Streets without Sidewalks

Sidewalks are of the utmost importance for pedestrian safety and convenience. Although the majority of the Borough streets have sidewalks, there are several areas where sidewalks are missing.

Beaver Street, a high traffic collector street, lacks large sections of sidewalk between 4th Street and Walnut Street. To make matters worse, there is a blind curve in Beaver Street which puts pedestrians walking

A blind curve on Beaver Street between 6th and Walnut Streets

along the street in danger; luckily, there have not been any reported pedestrian-vehicle crashes along this stretch of street in the last 10 years.

Another notable area missing sidewalks is the north side of the Pennsylvania Avenue Bridge, which also lacks a crosswalk to connect to the sidewalk on the south side of the street. During the walk audit fieldwork, staff observed a family with children walking and in a stroller in the roadway. This family could have crossed the street to use the sidewalk on the south side of the street, however there are no marked crosswalks within a reasonable distance.There are several blocks in neighborhoods south and north of Main Street which lack sidewalks. Although these areas may see lower traffic volumes relative to other areas of the Borough, it would vastly improve walkability if all gaps in the sidewalk network were filled in.

Obstacles in the Sidewalk

Perhaps the most rampant challenge to using sidewalks in the Borough is the presence of obstacles in the pathway. Obstacles in the sidewalk have the effect of narrowing the width of the usable sidewalk at certain points, which can prevent those in wheelchairs from enjoying use of the sidewalk altogether. These obstacles come in many forms, but the most prevalent offenders were garbage cans (which were not always counted as 'obstacles' in scoring, because they are temporary), overgrown vegetation, and street signs. Overgrown vegetation can be remedied by having Borough code enforcement officials notify property owners that it is their responsibility to keep the sidewalk clear of obstructions. This can be a daunting task, especially when it is such a widespread issue, however an education campaign could make this an easier tasks to accomplish. Policy options will be offered in Chapter 8, Implementation.

A family walking in the road on the Pennsylvania Ave bridge

A sidewalk with overgrown vegetation that impedes walking

Sidewalks in Poor Condition

Although the majority of streets have sidewalks, many of the sidewalks are in a state of disrepair. This can range from minor cracks in the sidewalk that don't yet impact pedestrians to serious hazards that make the sidewalk more of a hindrance than a benefit. Throughout the Borough there were many blocks of the sidewalk that had sunken or raised, which create tripping hazards (staff fell prey to some of these). Some sections of sidewalk had clearly been cut for various purposes and replaced with either gravel or asphalt in place of concrete. There were also some more serious issues such as a hole in the sidewalk and some sections of sidewalk with severe uplift that discouraged pedestrians from using the sidewalk at all. The mere presence of a sidewalk cannot always be relied upon as a good indicator of a walkable neighborhood.

Intersections without Marked Crosswalks

There are many intersections throughout the Borough that would benefit from painted crosswalks. Some side streets have limited traffic controls, so a simple painted crosswalk would do a lot to improve safety. With that said, the areas in greatest need of painted crosswalks are the downtown business districts and the intersections across Main Street, Walnut Street, and Beaver Street. An analysis of these areas showed a large number of crossings had some crosswalks, but not across all important crossings.

Blocks that exceed 600-feet in length should have mid-block crosswalks so that pedestrians do not feel the need to jaywalk. One of the longest blocks without a crossing is Main Street between Summit Street and Prospect Ave at around 680 feet; a mid-block crosswalk at Highland Avenue would make it easier for pedestrians

Sidewalks in various states of disrepair throughout the Borough

to cross Main Street safely. Any intersections that are around 600 feet or greater should be reviewed for midblock crossings with additional safety features, such as high-visibility signage or even pedestrian controlled buttons with flashing beacons.

Missing Curb Ramps or in Disrepair

Curb ramps enable people of all abilities to use the sidewalk network. When curb ramps are missing, key connections are lost and make it difficult or impossible for people with mobility limitations to get to their destination. There are many intersections that lack curb ramps on some or all corners, or which have curb ramps in such disrepair that they are not particularly useful.

Detectable warning plates (DWPs), which are generally yellow or orange colored tactile plates, enable people with vision impairment to know when they are approaching an intersection or other crossing that warrants additional caution. DWPs are missing from many existing curb ramps.

Railroad Crossings

There are five at-grade railroad crossings in the Borough, which may cause concern for pedestrians. Some of the crossings offer pedestrian facilities, however those lacking facilities can be intimidating to pedestrians.

The railroad crossing at Main and Montgomery Streets will be explored in detail as a study area in Chapter 7, Focus Areas. We'll discuss potential upgrades that could be utilized to increase pedestrian's actual and perceived safety at these crossings.

A curb ramp and DWP in need of maintenance

Railroad crossing at Main St & Montgomery Ave

C. PRIME EXAMPLES IN NORTH WALES

During the walk audit, we found that there were many areas that were highly walkable and beautiful. We will highlight just a few of the best examples in the Borough below.

SEPTA Parking on Beaver Street

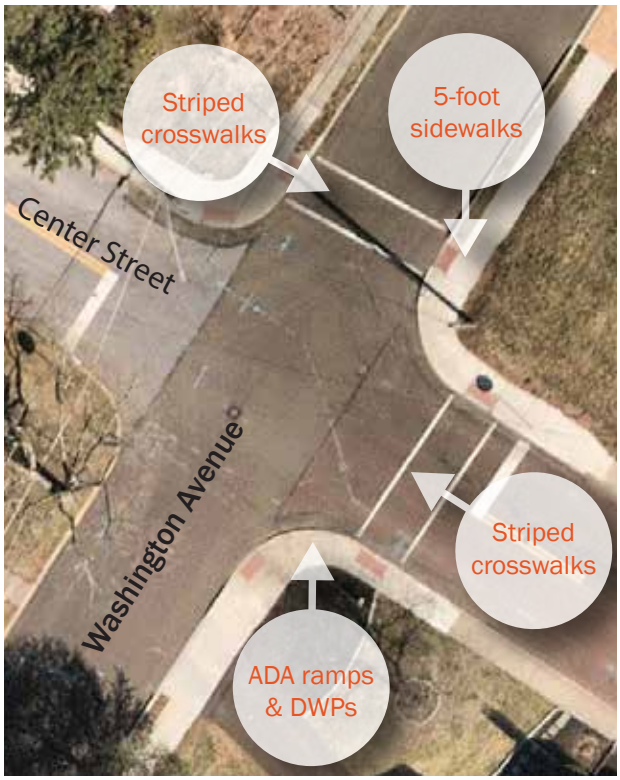
The sidewalk along the SEPTA-owned train station parking lot on Beaver Street is both beautiful and highly usable for pedestrians. There is ample landscaping to both separate the user from the street and the parking lot, sidewalks are 8 feet wide, there are attractive street lamps, and there are highly visible crosswalks across both Beaver Street and at the entrance to the parking area. The sidewalk and streetscape design generally meet the recommendations from *Walk MontCo*. The highly visible crosswalk makes for a safer route to connect those who are parking to the train boarding platform.

Washington Avenue between Swartley and Center Streets

This section of Washington Avenue was constructed in 2019 as part of the Safe Routes to School grant. The east side of the Washington Avenue between Swartley Street, near the library, all the way to West Street was redone and upgraded. The intersections at Swartley, Center, and West Street had ADA curb ramps installed that each have detectable warning plates (DWPs) and select crosswalks were painted. Highly visible crosswalks could have been selected, however this area likely does not see too much vehicle traffic. Although this is a residential area of the Borough, pedestrian improvements will increase safety for school children, those visiting the library, and the neighborhood overall.

Although the existing sidewalks, curb ramps, and crosswalks are well-designed, future improvements to the southwest corner of the intersection with additional crosswalks and sidewalks would continue to add to the pedestrian-friendly environment at this location.

The sidewalk along the municipal parking lot on Beaver Street is a prime example of a well-designed sidewalk and streetscape. NearMap June 5, 2021



The intersection of Center St and Washington Ave was recently improved to meet best practices. NearMap March 20, 2021.

Windsor Way and Center Street

One of the newer developments in the Borough, Windsor Way, was designed with walkability in mind. This is in large part thanks to the regulations in the Borough's Subdivision and Land Development Ordinance, which dictate the design of streets and sidewalks among many other factors. The entirety of Windsor Way and the length of Center Street between Washington and Prospect Avenue all feature 5 feet wide sidewalks that were installed as part of this development. The sidewalks remain flat at driveways, as the driveway apron is located in a five foot wide landscaped verge. Keeping pedestrians separated makes for a more pleasant pedestrian experience.

Summit and 2nd Street

During the start and end of the school day, a crossing guard helps school children navigate the intersection of Summit and 2nd street as they go to and from school. The intersection was redone as part of the Safe Routes to School grant project. The improvements included new curb ramps with yellow detectable warning plates on all four corners. Segments of sidewalk were also redone to complement the intersection improvement. Although crosswalks were painted along all sides, a high visibility crosswalk would be more appropriate given how important student safety is. This area will be part of a focus area in Chapter 7. There is, of course, a glaring deficiency at this intersection: the missing sidewalk on the south side of 2nd Street. Both of the blocks between Church and Summit Streets and Summit Street and Prospect Avenue are lacking sidewalks. Missing sidewalks throughout the Borough should be systematically installed, but this may be a priority area, given the proximity to the elementary school. This will be discussed in subesequent chapters.

The development of Windsor Way included excellent pedestrian facilities that make for a walkable neighborhood. NearMap June 5, 2021.

Summit & 2nd St, NearMap June 5, 2021

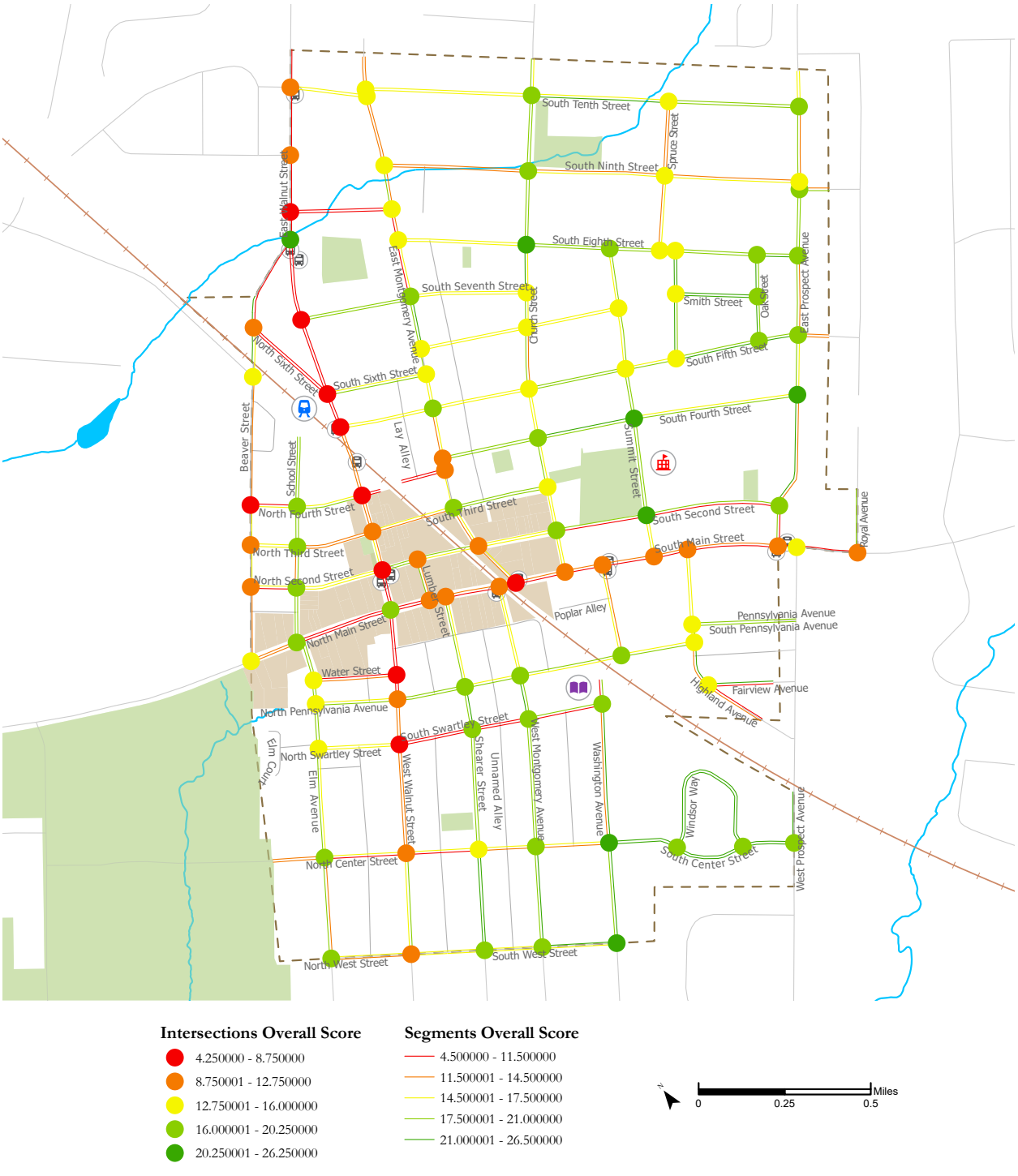
CHAPTER IV. SUMMARY OF FINDINGS AND BEST PRACTICES

A. SUMMARY OF AUDIT FINDINGS

After completing the analysis for every intersection and block segment in the Borough, we found what we generally expected. The infrastructure scoring factors identified areas that do not accommodate pedestrians very well, while context scores worked as force to either increase or decrease the score to indicate relative need for improvements at that location. As anticipated, Main Street, Walnut Street, and Beaver Street emerged as clear focus areas for improvements; this was based on both deficiencies of existing infrastructure and priority context scores. Something that wasn't anticipated at the start of the project were the many areas further away from these main corridors that jumped out as priorities for improvement. A handful of intersections and sidewalks in residential areas had deficiencies sufficient to counteract their high context scores, thus bumping them up to medium priorities.

Main Street, Walnut Street, and Beaver Street had various issues which made them rank among the bottom for both intersection scores and block segment scores. Many of the intersections lacked painted crosswalks and curb ramps, which caused their infrastructure scores to be extremely low. For block segments, many sidewalks were either narrow, obstructed, in disrepair or missing altogether. Context scores for these three roadways were the highest in the Borough, because of their roadway classes as well as their proximity to locational context factors.

When it came to local roadways, there were several areas that lacked sidewalks and/or adequate intersection infrastructure. In most cases, the lowest scoring blocks in residential neighborhoods lacked sidewalks and, in most cases, areas without sidewalks also lacked curb ramps and crosswalks. Several residential streets had sidewalks in quite poor condition as well, which ranked them nearly as low as those lacking sidewalks altogether; some of these issues must be addressed by property owners, which will require code enforcement involvement. Stop signs have a positive impact on pedestrian safety in


South Tenth Street
South Ninth Street
South Eighth Street
South Seventh Street
South Sixth Street
South Fifth Street
South Fourth Street
South Third Street
South Second Street
South Main Street
North Sixth Street
North Fourth Street
North Third Street
North Second Street
North Main Street
Water Street
North Pennsylvania Avenue
South Pennsylvania Avenue
Pennsylvania Avenue
Fairview Avenue
Highland Avenue
Poplar Alley
Lay Alley
Unnamed Alley
Walnut Street
East Walnut Street
East Montgomery Avenue
West Montgomery Avenue
Church Street
Oak Street
Smith Street
Spruce Street
East Prospect Avenue
West Prospect Avenue
Summit Street
Lumber Street
Shearer Street
Washington Avenue
Windsor Way
Beaver Street
School Street
Elm Court
Elm Avenue
West Walnut Street
Royal Avenue
North Swartley Street
South Swartley Street
North Center Street
South Center Street
North West Street
South West Street
Intersections Overall Score
4.250000 - 8.750000
8.750001 - 12.750000
12.750001 - 16.000000
16.000001 - 20.250000
20.250001 - 26.250000
Segments Overall Score
4.500000 - 11.500000
11.500001 - 14.500000
14.500001 - 17.500000
17.500001 - 21.000000
21.000001 - 26.500000
N
0
0.25
0.5
Miles

residential areas and it was found that the vast majority of intersections in residential areas had stop signs on at least some of the streets and about 18% were all-way stops. Although not all drivers will fully stop at stop signs, they at least slow down, providing drivers an opportunity to stop for pedestrians if present. When it comes to residential areas, targeted improvements will need to be made over several years in order to address all deficiencies.

We'll take a deep dive into the many factors that went into the overall scores for intersection and blocks in the following two chapters, but first we'll go through some of the best practices that can be employed to improve walkability. A summary of the total scores for intersections and blocks can be reviewed on the following page.

B. BEST PRACTICES

Sidewalk Location

Sidewalks (and trails) and crosswalks are the most important aspect of a walkable community. Sidewalks should always be considered as part of new development or redevelopment, even if there is limited connectivity in the immediate area. Certain areas warrant sidewalks more so than others, however, and these include mixed use and commercial areas and medium and high density residential districts. There are other considerations to make as well, such as the presence of transit stops (train stations or bus stops), schools, parks, and libraries. For that reason, we used proximity to these aforementioned locations as the backbone of the context scoring system. Certain locations may not warrant sidewalks in all cases, specifically residential areas with densities below 1 unit per acre.

4.1 Sidewalk Location Guidelines by Type of Development

TYPE OF DEVELOPMENT	SIDEWALK LOCATIONS FOR NEW DEVELOPMENT*	SIDEWALK LOCATION FOR EXISTING DEVELOPMENT*
• Commercial, Office, and Industrial • Residential (along arterial roads)	Both sides of streets.	Both sides of streets. Every effort should be made to add sidewalks where they do not exist and complete missing links.
• Residential (along collector roads)	Both sides of streets.	Apartments, townhouses, or twins—both sides of street. Single family detached homes—prefer both sides of streets; require at least one side.
• Residential (along local streets)		
– More than 4 units/acre	Both sides of streets.	Prefer both sides of streets; require on at least one side.
– 1-4 units/acre	Prefer both sides of streets; require at least one side.	Prefer both sides of streets*; require on at least one side or 6 foot shoulders* on both sides.
– Less than 1 unit/acre	One side of street preferred, shoulder on both sides required.	One side of street preferred, at least 6 foot shoulders on both sides.

Adapted from guidelines published in the Institute of Transportation Engineers' Design and Safety of Pedestrian Facilities
* Changes made from the guidelines to reflect Montgomery County conditions are noted with an asterisk.

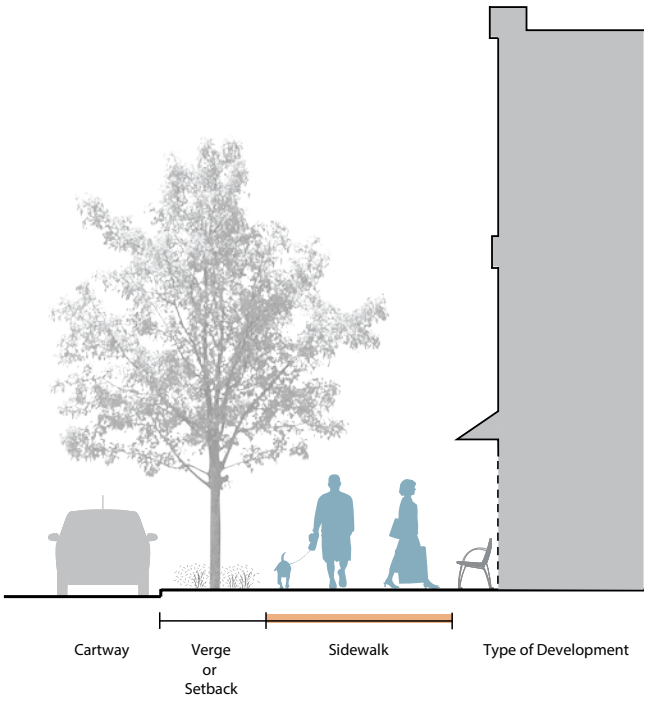
Source: Walk MontCo

Sidewalk Requirements

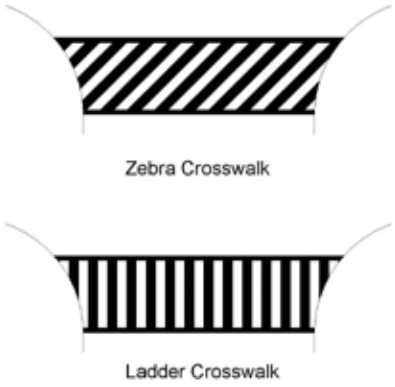
It is critical that users of all abilities are considered when designing a sidewalk. Sidewalks designed for a range of users are more comfortable and will encourage more users to choose to walk to their destination. In most cases, sidewalks should be a minimum of five feet wide. Wider sidewalks allow pedestrians to walk side-by-side and allow others to pass comfortably. Sidewalks less than five feet wide can feel less comfortable for multiple users, but four feet wide sidewalks can be effective in lower density settings. The streetscape in downtown business districts plays a key role in the success of the district and in the character of the community. Sidewalks should be at least 8 feet wide in walkable commercial areas and have space for additional space for features like street trees, benches, waste receptacles, and outdoor dining that do not obstruct the minimum walkway width. These streetscape features have the added benefit of separating pedestrians from traffic. Pedestrians are more comfortable on a sidewalk when they are buffered from traffic; in our audit, we included data on the presence or absence of on-street parking and landscaped verges as a way to assess if there was any buffering between pedestrians and moving traffic.

Crosswalk Design Standards

Pedestrians are more likely to avoid walking in areas that do not give them a safe, convenient, and direct route to their destination. Crosswalks can act as key linkages across busy roadways to safely get a pedestrian to their destination. Crosswalks should be painted in places that make sense for both the pedestrian and drivers, are of a prominent style that is both easily recognized and aesthetically pleasing, and have good sight distance for vehicles approaching the crosswalk. Crosswalks should, where feasible, be well lit by street lights and have signage or flashing lights to alert drivers of the upcoming crosswalk.



TYPE OF DEVELOPMENT	VERGE WIDTH	SIDEWALK WIDTH
CENTRAL BUSINESS DISTRICT SIDEWALKS	5′	8′
COMMERCIAL, OFFICE, AND INDUSTRIAL SIDEWALKS OUTSIDE OF CENTRAL BUSINESS DISTRICT	5′ - 8′	5′
RESIDENTIAL SIDEWALKS ALONG MAJOR STREETS	5′ - 8′	5′
RESIDENTIAL SIDEWALKS ON LOCAL STREETS WITH MORE THAN 4 HOMES PER ACRE	2′	5′
RESIDENTIAL SIDEWALKS ON LOCAL STREETS WITH 4 HOMES PER ACRE OR LESS	2′	4′ - 5′



Source: Walk MontCo

Crosswalks can be enhanced with curb bumpouts (AKA bulb outs or curb extensions), medians, or refuge islands shorten the distance that a pedestrian needs to walk across a roadway. Roadways can be studied for a "road diet" to calm traffic through narrower street or other methods that benefit pedestrians by slowing down traffic and shortening crossings. Where the distance between crosswalks exceeds 600 feet in length, crosswalks, including mid-block crossings, may be necessary so that pedestrians will not opt for an unsafe crossing. In some cases, particularly in commercial areas, shorter block lengths may also warrant mid-block crossings.

Safe Transportation for Every Pedestrian (STEP)[1]

PennDOT is a champion for FHWA's STEP program, an innovative and systematic application of cost-effective pedestrian safety improvements. PennDOT focuses on the following six of the seven STEP countermeasures (#7 is pedestrian hybrid beacons, which benefit multilane, high volume roadways): **Rectangular Rapid Flashing Beacons (RRFB).** A RRFB includes two rectangular-shaped yellow indicators, each with an LED array, which flash with high frequency when activated (generally by a pedestrian-controlled button). RRFBs are best utilized at mid-block or uncontrolled crossing locations because they draw attention to crosswalks and pedestrians.

1. **Leading Pedestrian Intervals (LPI).** Traditional signalized intersections generally allow pedestrians to cross at the same time as vehicles getting a green light to turn. LPI refers to a three to seven second window that allows pedestrians to start crossing a roadway before vehicles get a green light. LPIs help reduce conflicts between pedestrians and left- or right- turning vehicles and can provide enhanced safety for slower moving pedestrians. LPIs have been shown to reduce pedestrian-involved crashes by 13%.
2. **Crosswalk Visibility Enhancements**. Improving and enhancing crosswalk lighting, signage and markings draws attention to pedestrians and can help pedestrians identify safe crossings. Enhancements may include high visibility markings of crosswalks, parking restrictions near crosswalks, advanced "stop" or "yield" markings, signs and curb bumpouts/extensions. Visibility enhancements can reduce crashes by 23-48%.

Rectangular Rapid Flashing Beacon
Source: Carol Kachadoorian (2012)

3. **Raised Crosswalks**. Raised crosswalks are generally painted or constructed of a high-visibility material

1 https://www.penndot.gov/about-us/StateTransportationInnovationCouncil/Innovations/Pages/STEP.aspx

that draws attention to them. Raised crosswalks can keep pedestrians at the same grade as sidewalks, which both improves accessibility and increases visibility of pedestrians. Raised crosswalks can also act as a form of speedbump, which slows vehicle traffic.

4. **Pedestrian Crossing/Refuge Islands.** Medians can be designed as refuge areas for pedestrians, thereby reducing the time and distance that a pedestrian is in the roadway and drawing attention to pedestrians.
5. **Road Diets.** A typical road diet converts an existing four-lane, undivided roadway to two through-lanes and a center, two-way left turn lane. This reduces the number of lanes that a pedestrian needs to cross and the reclaimed roadway can be used to construct bike lanes, wider sidewalks, or add on-street parking. Road diets can be quite cost-effective if only pavement markings are required to implement the reconfiguration. Road diets are estimated to reduce total crashed by 19% in urban areas and as much as 47% in suburban areas.

C. BEST PRACTICES APPLIED

Several of the best practices of this chapter are applied to specific locations in the Borough in the following three chapters, but we will note broad application of best practices below.

Sidewalks

Missing sidewalks. Based on the relatively high density of dwelling units per acre throughout the Borough, it is recommended that sidewalks be constructed on both sides of the street throughout the borough. Furthermore, Montgomery County's *Growth and Preservation Plan* calls for all areas within designated growth area to have sidewalks installed as part of new development or redevelopment; the entirety of the Borough is within the designated growth area. Even if one property is developed and sidewalks do not connect beyond the property lines, the sidewalk should be installed because it can act as a catalyst for additional investment. The Subdivision and Land Development and Zoning Ordinance can be used to enforce the installation of new sidewalks when development occurs.

Narrow Sidewalks. Sidewalks throughout the Borough are in many cases below the minimum width for best practices, but obstacles also shrink the usable area of sidewalks. In most cases, narrow sidewalks should be widened to the new standard as part of the zoning and/or subdivision and land development process. Obstacles in the sidewalk should be removed in as many locations as possible and, where they are immovable, the sidewalk should be expanded to accommodate them.

Poor condition sidewalks. Sidewalks in poor condition can become all but unusable, so targeted repairs through code enforcement should be prioritized.

Crosswalks & Mid-Block Crossings

The majority of intersections throughout the Borough are lacking marked crosswalks. High-visibility crosswalks should be painted along Main Street, Beaver Street, and Walnut Street in many locations. The same treatment should be applied near the elementary school, parks, transit stops, and potentially other locations throughout the Borough. Marked crosswalks may not be strictly necessary at other intersections throughout the Borough where traffic, low speeds, low and few lanes exist. The National Association of City Transportation Officials (NACTO) recommends using 3000 AADT, 20 MPH, and two or more lanes of traffic as a general rule of thumb for necessary crosswalks (although other factors must be considered)[2]. Given the Borough-wide speed limit of 25 MPH, two lanes being the norm, and few streets exceeding 3000 AADT, many local streets most likely do not require marked crosswalks.

Mid-block crossings are necessary along longer blocks, which exist in a handful of locations throughout the Borough. Although in many cases a crosswalk every 600 feet may be adequate, NACTO recommends

2 National Association of City Transportation Officials. Urban Street Design Guide: Crosswalks and Crossings. https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/

studying pedestrian traffic in commercial districts and perhaps installing crossings less than 300 feet apart. Mid-block crossings should be studied along Main Street and Walnut Street in particular. All mid-block crossings should include RRFBs and in some cases a curb bumpout may be appropriate.

Signal Timing

The intersections of Walnut Street with Main Street and Beaver Street are the only two intersections in the Borough that have traffic lights. The signal at Main Street and Walnut Street is aging and the pedestrian signals no longer operate as intended; they also do not meet modern accessibility standards. Grant funding may be available to upgrade or update this traffic signal to make it safer for pedestrians. A Leading Pedestrian Interval could be employed as well, which would give pedestrians extra time to cross this busy intersection and improve safety and visibility.

CHAPTER V. DATA & ANALYSIS—INTERSECTIONS

A. OVERVIEW

5.1

	Context Score (highest possible: 19)	Infrastructure Score (highest possible: 16)	Total Score (highest possible: 35)
Average Score	10.97	4.73	15.70
Median Score	12.5	3.75	16.25
Highest Score	17.5	14	30.75
Lowest Score	1.5	1	4.25

Throughout the audit process, we analyzed 104 intersections in the Borough. This included only intersections of public streets and did not include named or unnamed alleys. Some intersections were shared with Upper Gwynedd Township, such as the intersection of Main and Beaver Streets. At each intersection, the presence, absence, and condition of various types of pedestrian infrastructure were assessed in detail. Lower scores indicate a greater need for infrastructure improvements.

As explained in Chapter 2: Methodology, there are both contextual and infrastructure-based factors used to grade each intersection. Lower scores indicate deficiencies in existing infrastructure and greater contextual need for pedestrian improvements. We believe that the factors of review and the assigned scores resulted in an accurate way to rank intersections in the Borough for current conditions and for prioritizing upgrades.

The average total combined score for intersections was 15.70 and the median score was 16.25 out of a total of 35 potential points. The average context score was just under 11 and the median score was 12.5 out of 19 potential points. This indicates that, on average, many intersections were not in areas that were in critical need of pedestrian infrastructure. This makes sense, seeing as the 75% of the Borough is residential in nature. The average infrastructure score was just under 4.75 and the median score was 3.75 out of a total of 16 potential points. These values are strikingly low with the average intersection earning only 25-33% of the total possible points. This is in large part due to the majority of intersections lacking painted crosswalks throughout the Borough.

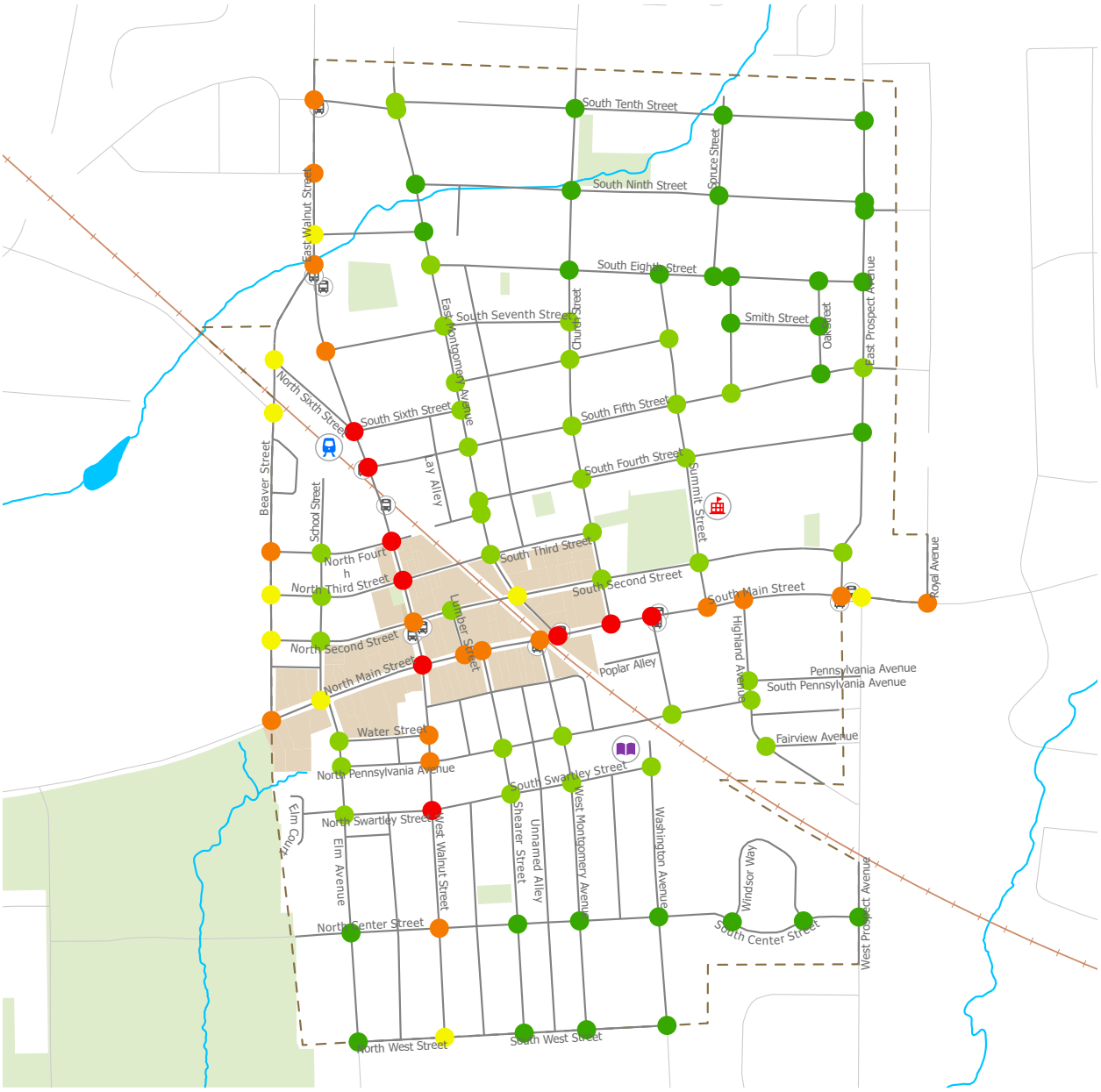
B. CONTEXT SCORES

Context scores are predictably lowest along Main Street, Beaver Street and Walnut Street. All intersections along these roadways fell below 10 out of 19 (the only other intersection to score below 10 is at East Montgomery Avenue and 2nd Street). The low scores are based on the several factors:

- Main Street and Walnut Street are arterial roadways and Beaver Street is a collector roadway. These classifications corresponds to high AADT: 18,158 for Main Street, 6,650 for Walnut Street, and 5,878 for Beaver Street.
- All three roadways pass through the business district and are generally within close proximity to all locational factors (the train station, SEPTA bus stops, the business district, the library, and the elementary and middle schools).
- There are several intersections along these roadways that lack crosswalks and which do not have crosswalks within 600-feet in one or both directions.
- Pedestrian-involved vehicle crashes have occurred most regularly along these roadways.
- All three roadways are identified in *North Wales Borough 2040* as needing improvements to pedestrian facilities.

C. INFRASTRUCTURE SCORES

Infrastructure scores tell a very different story from context scores. As noted at the start of this chapter, the average and median infrastructure scores fell below 5 out of 16 potential points. The highest score in the Borough was the intersection of Summit and 4th Streets at 14 points. 10 intersections, or nearly 10% of all intersections in the Borough, scored only 1 point.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East Montgomery Avenue
West Montgomery Avenue
Alley
Beaver Street
School Street
Lumber Street
Summit Street
Highland Avenue
Royal Avenue
Poplar Alley
Elm Court
Elm Avenue
Shearer Street
Unnamed Alley
Washington Avenue
Windsor Way
Intersections Context Score
1.500000 - 4.000000
4.000001 - 6.500000
6.500001 - 10.000000
10.000001 - 13.500000
13.500001 - 17.500000
N
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0.25
0.5
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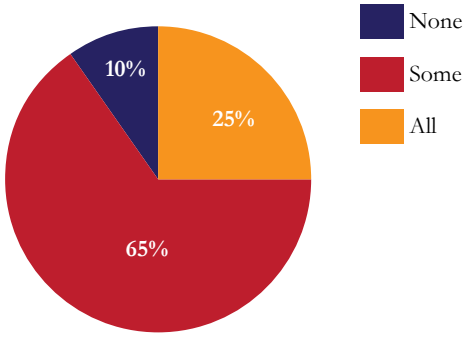
The bulk of infrastructure points, 9 out of the 16, are based on the presence or absence of crosswalks. With this in mind, it should be unsurprising that many of the lowest scores were located in residential areas. Painted crosswalks and curb ramps, with or without DWPs, were rare in residential areas; many of these intersections may not warrant a painted crosswalk, but ADA ramps with DWPs should be prioritized. In most cases, low infrastructure scores were counterbalanced by higher context scores – just as the methodology intended. Since residential neighborhoods are generally not priority areas, we'll move our focus to Main Street, Walnut Street, and Beaver Street once again.

Intersections on Main Street vary greatly in existing infrastructure and thus have a wide range of scores. On average, intersections scored around 6.5 out of 16. This is better than both Walnut and Beaver Street and aided by the fact that the intersections of Main Street with School Street, Walnut Street, Shearer Street, Summit Street, and East Prospect Street all score above 8. These intersections generally had high visibility or decorative crosswalks across Main Street and had ADA ramps with DWPs on all corners. The intersections of Main Street with Beaver Street, Lumber Street, East and West Montgomery Avenue, Church Street, Washington Avenue, Highland Avenue, West Prospect Avenue, and Royal Avenue all score below 5 points; they lacked crosswalks and, in many cases, lacked crosswalks close by in either direction.

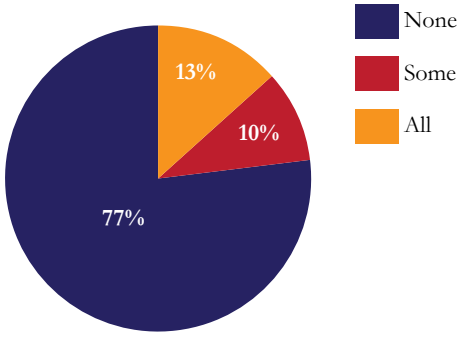
With the exception of the intersections of Walnut Street with Main Street and Beaver Street, which scored very well, all intersections on Walnut Street scored below 5 points; the average score was just under 5 points. All sub-5 point intersections lacked crosswalks across Walnut Street; if high-visibility crosswalks were installed, an additional 9 points could be granted to each intersection (flipping them to be among the highest scores). The majority of intersections had stop signs only for the local roads meeting Walnut Street, which would further indicate a need for crosswalks across Walnut Street.

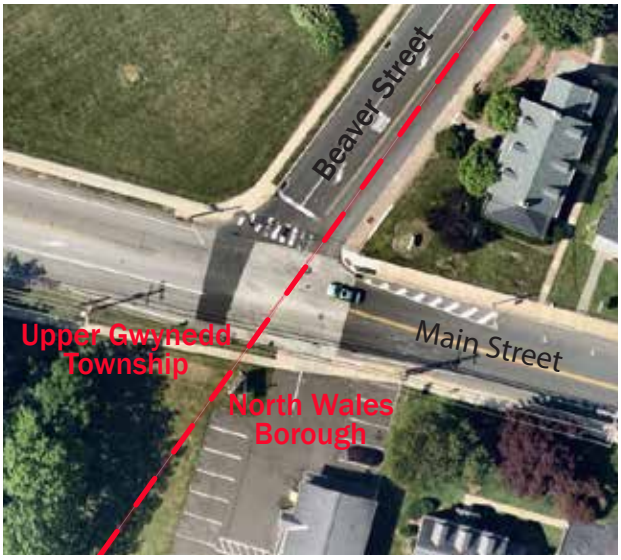
The average intersection on Beaver Street scored around 5.8 points out of 16. Many crosswalks were missing, which may in part be due to the fact that the street is split between North Wales Borough and Upper

ADA CURB RAMPS AT INTERSECTIONS

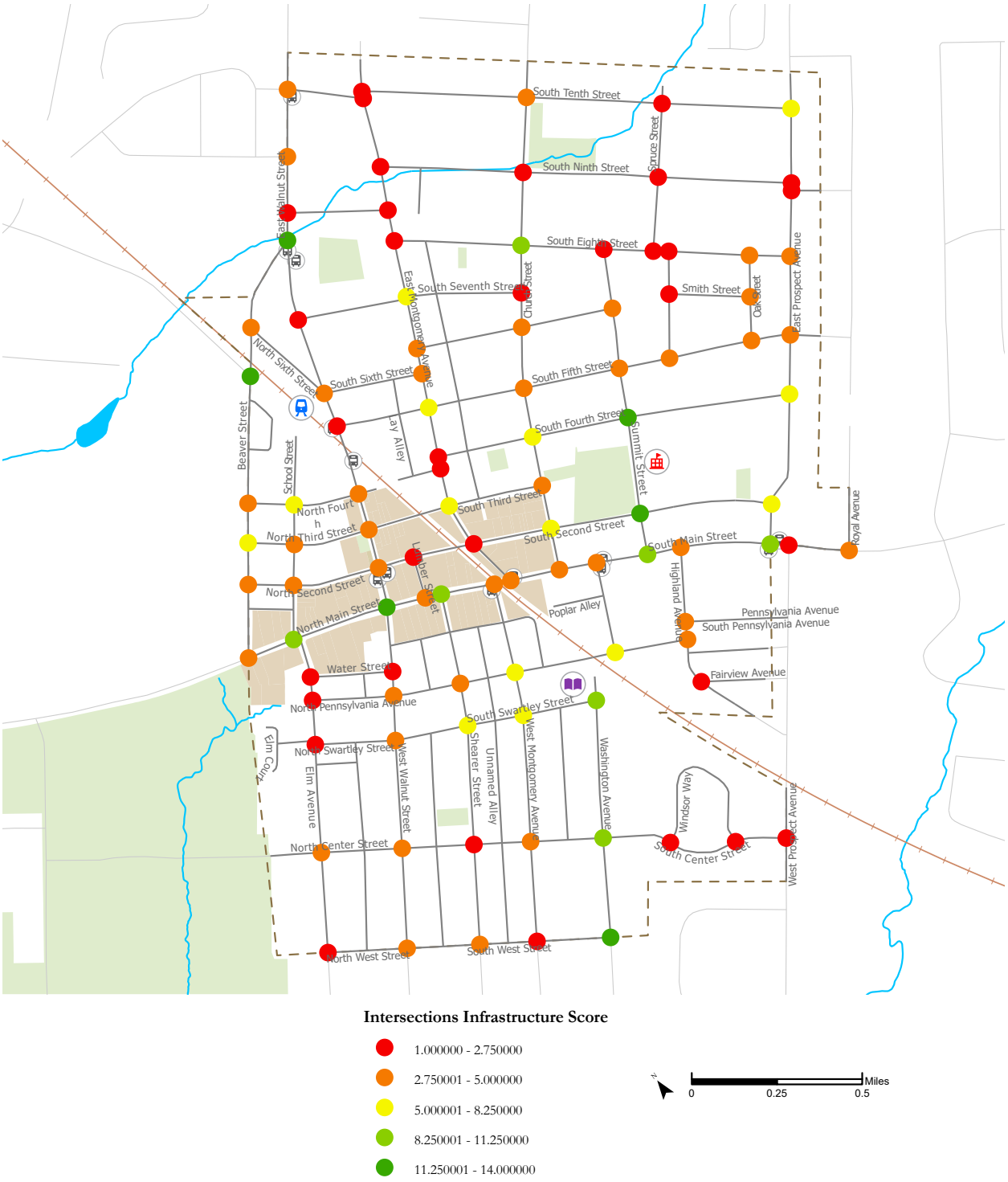


CROSSWALKS AT INTERSECTIONS





NearMap, June 5, 2021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Intersections Infrastructure Score
1.000000 - 2.750000
2.750001 - 5.000000
5.000001 - 8.250000
8.250001 - 11.250000
11.250001 - 14.000000
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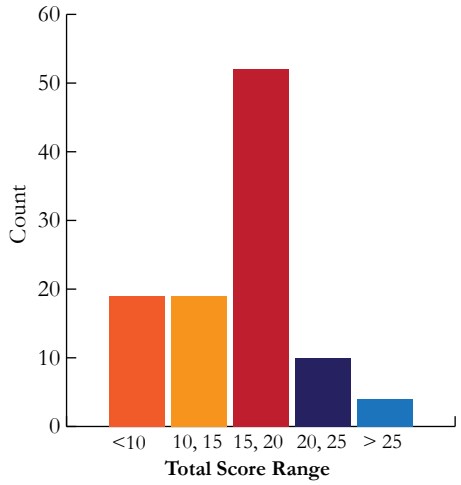
Gwynedd Township. Many of the corners on Beaver Street did not have curb ramps or, if they did, they were in poor condition or lacked DWPs. There are also sidewalk deficiencies along Beaver Street, which will be discussed in the following chapter. Improvements to sidewalks could be made in conjunction with intersection improvements. The intersection of Main Street and Beaver Street is particularly problematic, as there is nowhere to cross Main Street until School Street to the east or several hundred feet to the west in Upper Gwynedd Township.

D. OVERALL SCORES

Total scores throughout the Borough aligned very closely to what was assumed at the start of this study. The top 5 intersections were all located in residential areas; these intersections had high context scores and average infrastructure scores. The highest scoring intersection was the intersection of Washington Avenue and West Street with 30.75 out of 35 potential points. The lowest 6 scores were all located along Walnut Street, with the lowest being intersection of Walnut Street and 5th Street at 4.25 total points. The intersection of Walnut Street with 5th Street does not have any crosswalks, has poor condition curb ramps where they exist, and only has one DWP; the intersection connects directly to the train station, so it should be viewed as a priority.

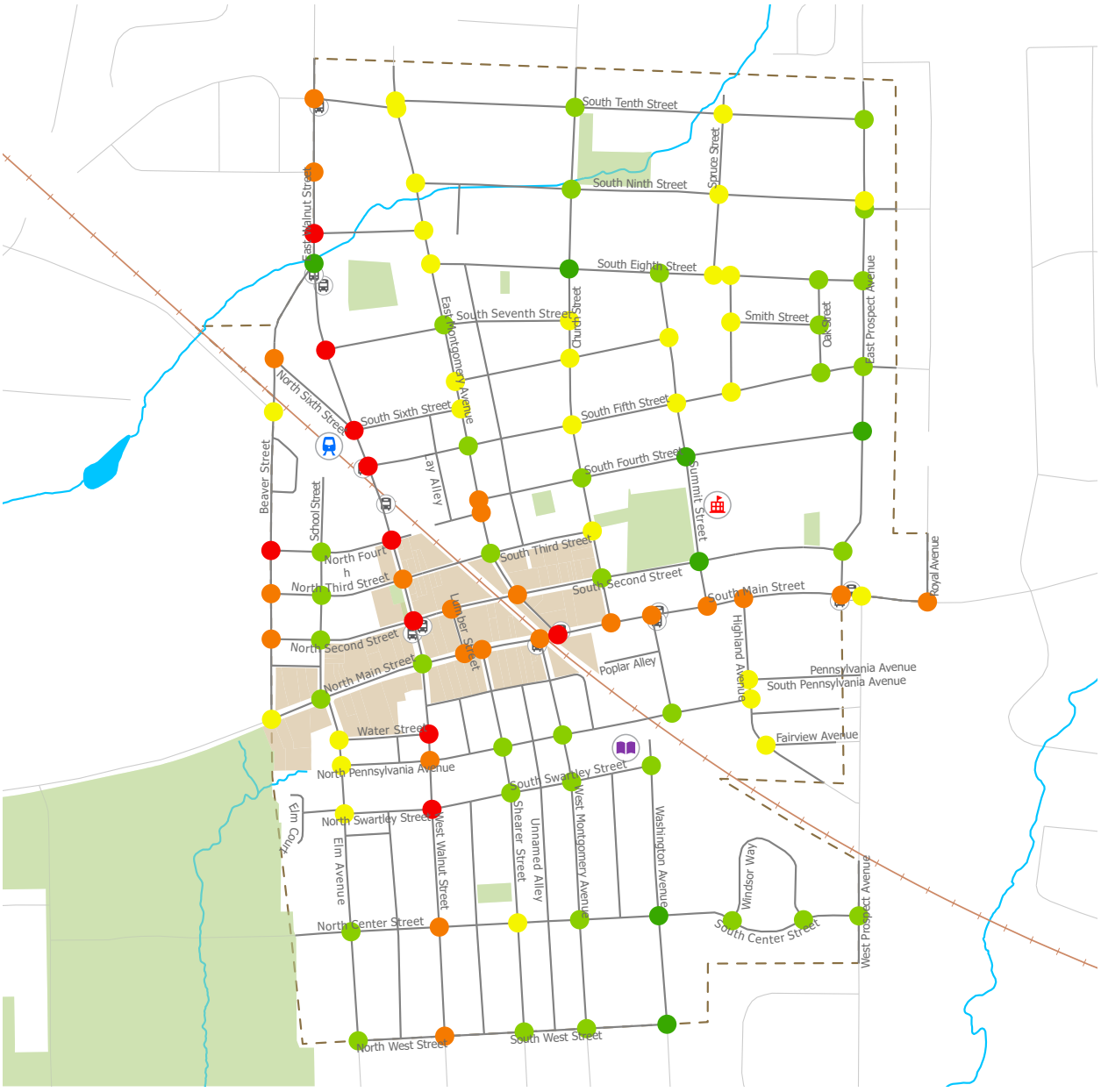
Overall, intersections along Main Street, Beaver Street, and Walnut Street scored lower than the rest of the Borough. 29 out of 35 intersections along these roadways scored below 8.75 out of 35 total points. Apart from these three roadways, only 3 other intersections scored below 8.75, and they are all located on East Montgomery Avenue within or adjacent to the business district.

Overall Score Distribution



Washington Avenue & West Street
30.75 out of 35 points

- Full points for presence of a good condition crosswalk, but lost 1.5 points for having a standard crosswalk vs. high-visibility style.
- Lost 1.25 points for lacking curb ramps on all corners, however there are no sidewalks to connect to. DWPs present on all existing ramps.
- Stop signs on all streets.
- Within ½ mile of the business district and ¼ mile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Summit Street
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Highland Avenue
Royal Avenue
Elm Avenue
West Walnut Street
Shearer Street
West Montgomery Avenue
Washington Avenue
Windsor Ave
West Prospect Avenue
Intersections Overall Score
4.250000 - 8.750000
8.750001 - 12.750000
12.750001 - 16.000000
16.000001 - 20.250000
20.250001 - 26.250000
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0.25
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Miles

Apart from intersections previously noted, all other intersections in the Borough scored between 12.75 and 30.75 points. Scores are fairly spread out, with certain areas having concentrations of higher scores. The area immediately surrounding North Wales Elementary School scores very well, but as you get even one block further the scores tend to drop off. The residential area bounded by Shearer Street to the west, Pennsylvania Avenue to the north, and municipal boundaries to the south and east scores very well overall with most intersections above 16 points. The total scores for residential areas are improved by the fact that, generally speaking, there are fewer locational context factors. For example, the highest scoring intersection in the Borough is within ¼ mile of the library but no other locational context factor.

E. TOP PRIORITIES

As seen throughout this chapter and the report overall, it is clear that Main Street, Beaver Street, and Walnut Street are priority areas for improvement. Main Street and Beaver Street are under the Borough's control, with Beaver Street requiring coordination with Upper Gwynedd Township. Walnut Street is under PennDOT jurisdiction, which will require coordination and permitting. There are additional factors to consider when working with a state roadway, so we'll look at local and Walnut Street separately. All recommendations herein are theoretical and need to be reviewed by a qualified traffic engineer.

Main Street

As previously noted, there are 4 intersections on Main Street that score quite well relative to the borough overall. The intersection of Main Street and Walnut Street scored particularly well for several reasons: the intersections is controlled by a traffic signal, all crosswalks are made of decorative brick and are in relatively good condition, and there are curb ramps on all corners. Many other intersections along Main Street either lacked crosswalks entirely or lacked a crosswalk across Main Street and, in many cases, the nearest crosswalk was several hundred feet from the intersection being studied. When an intersection lacks a painted crosswalk, most pedestrians are likely to cross there anyway, since seeking one out in either direction takes them out of their way and there is no guarantee that they will find one. The first step to improving the intersections along Main Street would be to paint at least one high-visibility crosswalk across Main Street at each intersection. These crosswalks would not be fully usable without ADA ramps connecting them to the sidewalk, so ADA ramp with DWPs should be included in any intersection improvements. The following crosswalks should be considered:

- **Main Street and Beaver Street**
  As previously stated, this intersection is shared with Upper Gwynedd Township, so the only possibility explored here is for the east side of the intersection. A new ADA curb ramp will need to be installed to the west of the existing driveway apron on the south side of Main Street. A high-visibility crosswalk could then be painted to connect the south side of the street to the newly installed ADA curb ramp on the north side of the street. Lastly, an RRFB could be installed to alert drivers of the pedestrian crossing location.
- **Main Street and East/ West Montgomery Avenue**
  These two intersections are explored in-depth in Chapter 7, Focus Areas. Briefly, curb bumpouts may be feasible at one or both intersections and crosswalks are sorely needed. Both sides of the street

NearMap, June 5, 2021

also have SEPTA bus stops, which adds another dimension to pedestrian safety concerns.

- **Main Street and Church Street**
  At this intersection, one crosswalk across Main Street should suffice. There is a hatched area on the northwest side of the intersection that could potentially house a curb bumpout. A bumpout here would shorten the distance that pedestrians need to traverse. Pedestrian crossing signage should be installed if this route is pursued. Install ADA ramps throughout.
- **Main Street and Washington Avenue**
  If a new crosswalk is installed at the intersection of Main Street with Church Street, a crosswalk at this location may not be strictly necessary, as there would be an intersection to the east and west within 300 feet. However, there are SEPTA bus stops on both sides of Main Street at this intersection; a crosswalk connecting the north and south sides of the street would enable bus riders to take a more direct path to their bus stop.
- **Main Street and Highland Avenue**
  This intersection is similar to the previous intersection, except that the nearest crosswalk to the west is nearly 500 feet away. A high-visibility crosswalk on the east side of this intersection would be beneficial.

Beaver Street

With the exception of the intersection of Beaver Street and Walnut Street, which seems to have adequate pedestrian infrastructure installed, the intersections along Beaver Street are generally in need of improvements. Since the west side of Beaver Street falls within Upper Gwynedd Township, we'll generally focus our comments within the Borough. Intersections that score well are not addressed below, only those with lower scores where specific improvements are recommended.

- **Beaver Street and Main Street**
  This was reviewed on the previous page.
- **Beaver Street and 2nd Street**
  This intersection could use a new ADA ramp with a DWP on the southeast corner; there is a fairly new ramp and DWP on the northeast corner. A standard or high-visibility crosswalk should be installed north-south to alert those entering Beaver Street from 2nd Street that pedestrians have the right-of-way.
- **Beaver Street and 3rd Street**
  This intersection needs, at minimum, a DWP installed on the northeast corner, a new ADA ramp with a DWP on the southeast corner, and a standard or high-visibility crosswalk north-south connecting them. There is an existing crosswalk east-west across Beaver Street to connect the Borough to the Merck Campus.
- **Beaver Street and 4th Street**
  Since there is no sidewalk on the north side of 4th Street or along Beaver Street north of this intersection, there is no present need to connect the southeast corner of the intersection to those areas. There are, however, new ADA ramps with DWPs on the two corners in Upper Gwynedd Township. The Borough may wish to explore collaborating with the Township on improving this intersection, perhaps by adding a crosswalks across Beaver Street at the south side of the intersection. At minimum, an ADA ramp with a DWP should be installed on the southeast corner of the intersection.
- **Beaver Street and 6th Street (aka Railroad Street)**
  This intersection has several flaws, which are in large part due to the fact that there are no sidewalks along 6th/Railroad Street or Beaver Street north of this intersection. If sidewalks were installed, then new ADA ramps and a crosswalk would be recommended connecting the northeast and southeast corners of the intersection. There is a high-visibility crosswalk just south of this intersection that connects the SEPTA parking lot to the train station. Improvements to this intersection would be recommended if accompanied by the installation of connecting sidewalks.

Walnut Street (PennDOT)

As a state-owned roadway, the Borough will have to coordinate with PennDOT in order to effectuate substantial alterations to Walnut Street. PennDOT is generally in favor of pedestrian improvements on their roadways, especially in a borough context, and will likely be receptive to working with the Borough on improvements. When repaving a roadway, PennDOT is often willing to install new or improved crosswalks if requested by the municipality, especially if a local plan, such as this one, calls for those improvements. Only intersections in need of specific improvements are noted below.

- **Walnut Street and West Street**
  There are only sidewalks on Walnut Street north of this intersection. The sidewalks end at ADA ramps with yellow DWPS, where a high-visibility crosswalk could be beneficial.
- **Walnut Street and Center Street**
  This intersection has seen recent improvements with the addition of new curb ramps and DWPs. There are further improvements proposed as part of the *MontCo 2040 Implementation* grant, which includes an Accessible Pedestrian Signal (APS) with a Rectangular Rapid Flashing Beacon (RRFB) to allow pedestrians to cross Walnut Street.
- **Walnut Street and Swartley Street, Pennsylvania Avenue, 2nd Street, 3rd Street, 4th Street, & 10th Street**
  The majority of these intersections have adequate curb ramps, however DWPs are missing in a few locations. The recommendations are similar throughout all intersections: paint crosswalks in as many locations as feasible. Crosswalks are the missing link that can improve these intersections.
- **Walnut Street and Water St**
  Water Street is a very short one-way street with limited sidewalk. A crosswalk here could be explored, but it is likely that a pedestrian could use a crosswalk to the north or south to safely get to Water Street.
- **Walnut Street and 6th /Railroad Street**
  There are no sidewalks along 6th/Railroad Street between Walnut and Beaver Streets or on the west side of Walnut Street north of this intersection; there are sidewalks along Walnut Street in the other directions and on 6th Street. There is an ADA ramp on the southwest corner of the intersection, by the train station, which does not connect to another on the opposite side of Walnut Street. ADA ramps should be installed on the northeast and southeast corners of the intersection, and sidewalks should connect the three sides; this may be complicated by the railroad crossing painting.
- **Walnut Street and 7th Street**
  There are likely few pedestrians that need to cross Walnut Street at this intersection, so improvements relate only to the 7th Street. The northeast and southeast corners on 7th Street lack DWPs, which is the first step to becoming more pedestrian-friendly. A crosswalk may also be installed connecting these two corners.
- **Walnut Street and 8th Street**
  There are no sidewalks along this block of 8th Street, which causes a gap in pedestrian connection to nearby Hess Park. The northeast and southeast corners need DWPs installed and a crosswalk to connect them.

CHAPTER VI. DATA & ANALYSIS—BLOCK SEGMENTS

A. OVERVIEW

6.1

	Context Score (highest possible: 16)	Infrastructure Score (highest possible: 14)	Total Score (highest possible: 30)
Average Score	9.2	7.3	16.5
Median Score	9.5	8	16.5
Highest Score	14.5	13.5	26.5
Lowest Score	1.5	1	4.5

Throughout the audit process, we analyzed 310 block segments in the Borough. On each block, both sides of the street were evaluated separately and received a separate score. A "block segment" refers to one side of the street on one block. The presence, absence, and condition of sidewalks and other conditions that influence pedestrian safety and comfort for pedestrians were assessed in detail. Lower scores indicate a greater need for infrastructure improvements.

The average and median total combined score for block segments was 16.5 out of a total of 30 potential points; even at 55% of the total points, block segments score much better overall than intersections, indicating that there is generally more of a need for pedestrian infrastructure improvements at intersections than along block segments. The average context score was just over 9 and the median score was 9.5 out of 16 potential points. This underscores the fact that 75% of the Borough is made up of residential neighborhoods. The average infrastructure score was around 7.3 and the median score was 8 out of a total of 14 potential points. The infrastructure scores are relatively high and show just how much of the Borough is currently served by sidewalks.

B. CONTEXT SCORES

Context scores for blocks mirror those of intersections with the highest scores in residential areas and with the lowest scores along Main Street, Beaver Street and Walnut Street. All intersections along these roadways fell at or below 7.5 out of 16, with the average being just 3.75. Low scores are based on the several factors (many of which were noted in the previous chapter):

- Main Street and Walnut Street are arterial roadways and Beaver Street is a collector roadway. These classifications corresponds to high AADT: 18,158 for Main Street, 6,650 for Walnut Street, and 5,878 for Beaver Street.
- Adjacent roadway class is a unique context factor for block segments, which indicates the highest class of roadway that a block segment meets. For example, Beaver Street between Main Street and 2nd Street would have an adjacent roadway class of arterial because it intersects with Main Street. This factor acts as a proxy for vehicle traffic volume, which wasn't available for all streets.
- All three roadways pass through the business district and are generally within close proximity to all locational factors (the train station, SEPTA bus stops, the business district, the library, and the elementary and middle schools).
- Pedestrian-involved vehicle crashes have occurred most regularly along these roadways.
- All three roadways are identified in *North Wales Borough 2040* as needing improvements to pedestrian facilities.


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Shearer Street
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Washington Avenue
Windsor Way
Royal Avenue
Pennsylvania Avenue
South Pennsylvania Avenue
Highland Avenue
Fairview Avenue
Segments Context Score
1.500000 - 3.500000
3.500001 - 6.500000
6.500001 - 9.500000
9.500001 - 11.500000
11.500001 - 14.500000
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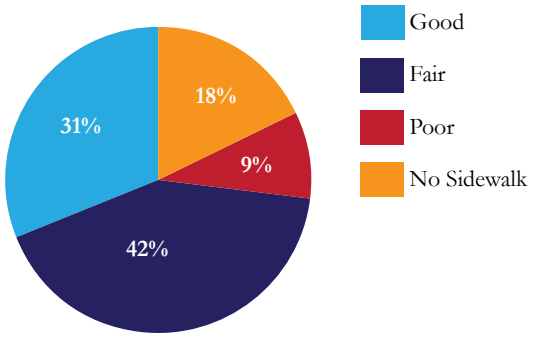
0.25
0.5
Miles

C. INFRASTRUCTURE SCORE

The majority infrastructure points were assigned based on whether or not a block segment has a sidewalk. The average and median infrastructure scores fell between 7 and 8 out of 14 potential points, which indicates that the majority of blocks in the Borough have sidewalks. In fact, about 3 in 4 block segments in the Borough have sidewalks along the full length of the block. Among full or partial sidewalks in the Borough, 31% are in "good" condition, 42% are in "fair" condition, and only 9% are in "poor" condition. "Bad" condition sidewalks had certain hazards that indicate a need for immediate repairs, which could range from a whole block needing a redo to only a few places in need of repairs.



Excluding blocks without sidewalks (valued at 0-inches), the average sidewalk width in the borough is just shy of 60 inches. Less than 10% of all sidewalks in the Borough are on average under 48 inches in width, which is quite surprising for an older borough. Although the average width for sidewalks is adequate in many cases, there are dozens of streets that have obstacles that cause them to choke down to a very narrow width. Nearly 20% of sidewalks narrow below 36 inches in width, which is the minimum width for ADA accessibility; this doesn't even take into account that a passing area of at least 60 inches in width must be available every 200 feet (although a driveway may qualify in some cases). To add to this accessibility issue, nearly 1 in 3 sidewalks have grade changes at driveways that could be difficult for some people to traverse; it is worth noting that this factor was somewhat more subjective than others, as we were unable to measure the grade and instead relied on a visual survey.

The highest score in the Borough was 13.5 points, which was shared among the following four block segments: the north side of 4th Street between Church and Summit Street, the east side of Shearer Street between West Street and Center Street, the east Side of Washington Avenue between West and Center Street and Center Street and Swartley Street. These block segments had much in common: they are all in residential areas, had quite wide sidewalks for the full length of the block, all sidewalks were in good condition, the sidewalks lacked obstructions, the blocks had on-street parking and landscaped verges, and sidewalks remained more or less flat at driveways.

By our count, 56 block segments completely lack sidewalks and, as expected, these are the lowest scoring. Following these 56 block segments, the next lowest scoring block segments included the 27 block segments with only partial sidewalks as well as areas where sidewalks were narrow, obstructed, and/or in disrepair. Missing blocks were spread throughout the Borough and can be seen as the darkest red on the map on the following page. On several occasions during the audit, we witnessed pedestrians walking along the road rather than taking a chance on an uneven sidewalk. Not all block segments lacking sidewalks will warrant new sidewalks to be installed, but many may. Blocks that warrant sidewalks will be reviewed as priority areas later in this chapter.

D. OVERALL SCORE

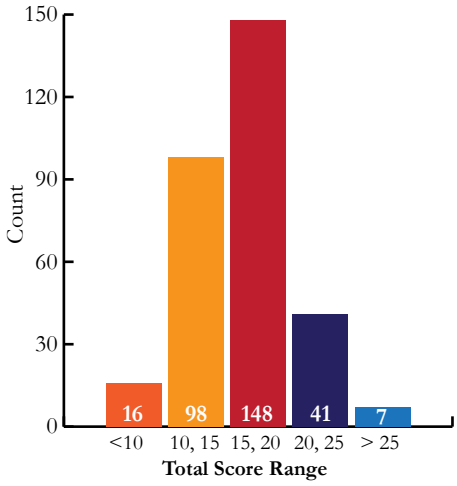
The overall score distribution ended up being more or less of a bell-curve, with many scores around the middle, between 15 and 20, and very few below 10 or over 25. The lowest score was a mere 4.5 points and the highest was 26.5 points. The average and median score was 16.5—just over half of all total points.

The highest scoring block segments were generally located in residential areas, which was at least in part thanks to the high context scores for residential areas.


South Tenth Street
South Ninth Street
Spruce Street
East Walnut Street
South Eighth Street
East Montgomery Avenue
South Seventh Street
Church Street
Smith Street
Oak Street
East Prospect Avenue
North Sixth Street
South Sixth Street
South Fifth Street
Beaver Street
School Street
Lay Alley
Summit Street
South Fourth Street
North Fourth Street
South Third Street
South Second Street
Royal Avenue
North Third Street
South Main Street
North Second Street
Lumber Street
Poplar Alley
Pennsylvania Avenue
South Pennsylvania Avenue
North Main Street
Water Street
Fairview Avenue
Highland Avenue
North Pennsylvania Avenue
South Swartley Street
North Swartley Street
Elm Court
Elm Avenue
West Walnut Street
Shearer Street
Unnamed Alley
West Montgomery Avenue
Washington Avenue
Windsor Way
South Center Street
West Prospect Avenue
North Center Street
North West Street
South West Street
Segments Infrastructure Score
1.000000 - 3.500000
3.500001 - 6.500000
6.500001 - 8.500000
8.500001 - 10.500000
10.500001 - 13.500000
N
0
0.25
0.5
Miles

The scores closest to the top were generally newly installed sidewalks, which were designed to be at least five feet in width for the full length of the block.

The lowest scoring block segments are, predictably, those streets that entirely lack sidewalks. In some cases the context score worked to bring them up from the very bottom, but they still score significantly lower than average. In some cases, very low context scores also worked against blocks that had decent infrastructure scores; however, this was only apparent on a select few blocks along Main and Walnut Streets.



Some sections of pavers along Main Street are in disrepair. Many pavers are sunken between blocks of concrete or are broken causing an uneven sidewalk

E. TOP PRIORITIES

The top priorities for improvements are based on both infrastructure and context factors. Certain blocks have existing sidewalks that are in need of repairs, some of which may be quick and cost-effective. Other blocks are lacking sidewalks entirely and, due to their importance, should have sidewalks installed as soon as is feasible.

Sidewalks in Poor Condition

Just under 10% of all block segments have sidewalks in "bad" condition (refer to the chart at the end of this chapter). Bad condition was only assigned if immediate repairs were needed or if a large portion of the sidewalk had serious deficiencies that could result in hazards in the near future. In some cases, relatively minor repairs are needed, like the removal and replacement of uplifted/sunken block of concrete or the installation of a missing block. In other cases, full block segments need to be reviewed for a full redo. For example, there are four block segments on Main Street that rise to the level of "bad." These blocks were redone in the 1990s with brick pavers, but now many pavers are crumbling or uneven and are now causing tripping hazards.


South Tenth Street
South Ninth Street
South Eighth Street
South Seventh Street
South Sixth Street
South Fifth Street
South Fourth Street
South Third Street
South Second Street
South Main Street
North Fourth Street
North Third Street
North Second Street
North Main Street
Water Street
North Pennsylvania Avenue
South Swartley Street
North Swartley Street
North Center Street
South Center Street
North West Street
South West Street
East Walnut Street
East Montgomery Avenue
North Sixth Street
Beaver Street
School Street
Lay Alley
Church Street
Summit Street
Spruce Street
Smith Street
Oak Street
East Prospect Avenue
Royal Avenue
Lumber Street
Poplar Alley
Pennsylvania Avenue
South Pennsylvania Avenue
Fairview Avenue
Highland Avenue
Elm Avenue
West Walnut Street
Shearer Street
Unnamed Alley
West Montgomery Avenue
Washington Avenue
Windsor Way
West Prospect Avenue
Segments Overall Score
4.500000 - 11.500000
11.500001 - 14.500000
14.500001 - 17.500000
17.500001 - 21.000000
21.000001 - 26.500000
N
0
0.25
0.5
Miles

Block Segments Missing Sidewalks

There are 57 block segments without sidewalks and 27 more with partial sidewalks. Where there are short gaps, filling in the gaps can be a cost-effective way to improve connectivity for pedestrians. If there are longer gaps, there will be more planning and consideration needed for how to prioritize construction of new sidewalks.

There are several block segments with partial or missing sidewalks surrounding the train station, which is an area that sees above average pedestrian activity. The east side of Beaver Street between 6th/Railroad Street (by the train station) going north towards the intersection with Walnut Street lacks a section of sidewalk along a blind curve; this could be a safety hazard if a pedestrian chose to walk in the roadway at this point. Several other nearby blocks are missing sidewalks: the west side of Walnut Street between 6th/Railroad Street and Walnut Street lacks sidewalks until the Wawa, much of east side of Beaver Street between 4th Street and the train station lacks sidewalks, the north side of 4th Street lacks sidewalks, as do both sides of 6th/Railroad Street north of the train station. Most of this area is within the Transit-Oriented Development district (which does not include 4th Street and the southernmost sections of Beaver Street), which requires 8-foot-wide sidewalks that are free from obstacles per Section 184-9 of the Borough's Subdivision and Land Development Ordinance (SALDO).

There are many other areas of the Borough that area lacking sidewalks, which are noted on the following page. Constructing sidewalks can become a huge expense, so the Borough will need to prioritize construction over a years-long horizon. In accordance with Section 184-9 of the SALDO, new or replacement sidewalks in residential zoning districts should be at least 5 feet wide and 8 feet wide in commercial or mixed use districts (TOD, OR, and ROR).

Obstructions in the Sidewalk

Obstructions in the sidewalk causes sidewalks to become quite narrow in many parts of the Borough, which is an accessibility issue. This issue is present on dozens of sidewalks throughout the Borough, so there is no one target area. The Borough should consider

Many sidewalks are missing around the train station- they are noted in red.


Utility poles can obstruct sidewalks

how they can install traffic signage in ways that are less obtrusive to pedestrians. With that said, a much more prevalent issue are utility poles in the sidewalk. The Borough should consult with utility companies about consolidating or removing utility poles along certain streets. Buried utilities can be required as part of the land development process as well. Vegetation growing in or over the sidewalk is a more easily rectifiable, but no less persistent, issue.

6.2 Sidewalks in "Poor" Condition

Street	From (W/S)	To (N/E)	Side of Street
Beaver	6th	Walnut	E
10th	Montgomery	Church	N
10th	Montgomery	Church	S
School	2nd	3rd	W
Pennsylvania	Shearer	Montgomery	N
Highland	Pennsylvania	Main	E
5th	Montgomery	Church	S
Main	School	Walnut	N
Summit	5th	6th	E
Main	Elm	Walnut	S
Montgomery	Swartley	Pennsylvania	E
Beaver	Main	2nd	E
Main	Shearer	Montgomery	S
Walnut	10th	Border	E
4th	Summit	Prospect	N
Walnut	6th	7th	E
Spruce	5th	Smith	E
5th	Church	Summit	N
5th	Spruce	Oak	N
Prospect	5th	8th	W
Oak	Smith	8th	W
Smith	Spruce	Oak	N
Smith	Spruce	Oak	S
School	4th	Train Station	W
Walnut	5th	6th	E
Beaver	2nd	3rd	E
Main	Walnut	Shearer	S
Main	Beaver	School	S
5th	Church	Summit	S

6.3 Block Segments with Partial Sidewalks

Street	From (W/S)	To (N/E)	Side of Street
Beaver	6th	Walnut	E
Church	10th	11th	E
Highland	Fairview	Pennsylvania	W
Washington	Center	Swartley	W
Walnut	7th	Beaver	W
Prospect	2nd	4th	E
Montgomery	Main	2nd	W
Beaver	4th	Wissahickon	E
Prospect	4th	5th	E
9th	Church	Spruce	S
9th	Spruce	Prospect	S
Center	Elm	Walnut	N
Center	Walnut	Shearer	N
Washington	West	Center	W
Water	Elm	Walnut	S
Pennsylvania	Montgomery	Washington	S
Center	Shearer	Montgomery	N
Montgomery	8th	9th	W
Walnut	5th	6th	W
Center	Montgomery	Washington	N
Elm	West	Center	W
Prospect	8th	9th	W
Prospect	9th	10th	W
Montgomery	West	Center	W
Prospect	8th	9th	E
Lumber	Main	2nd	E
9th	Prospect	Royal	N

6.4 Block Segments Missing Sidewalks Entirely

Street	From (W/S)	To (N/E)	Side of Street
2nd	Beaver	School	S
2nd	Church	Summit	S
2nd	Summit	Prospect	S
4th	Beaver	School	N
4th	Walnut	Montgomery	Both
5th	Prospect	Royal	Both
6th (Railroad)	Beaver	Walnut	Both
8th	Walnut	Montgomery	Both
9th	Montgomery	Church	Both
9th	Church	Spruce	N
9th	Spruce	Prospect	N
9th	Prospect	Royal	S
Center	ParksidePark	Elm	S
Center	Elm	Walnut	S
Center	Walnut	Shearer	S
Center	Shearer	Montgomery	S
Center	Montgomery	Washington	S
Elm	West	Center	E
Fairview	Highland	Prospect	S
Highland	Prospect	Fairview	W
Montgomery	7th	8th	W
Montgomery	8th	9th	E
Montgomery	9th	10th	W
Montgomery	10th	Dead end	W
Prospect	Main	2nd	E
Prospect	5th	8th	E
Prospect	9th	10th	E
Prospect	10th	Royal	W
Spruce	8th	9th	W
Spruce	9th	10th	W
Swartley	Walnut	Shearer	S
Swartley	Shearer	Montgomery	S
Swartley	Montgomery	Washington	S
Walnut	6th	7th	W
Washington	Swartley	Pennsylvania	W
West	Elm	Walnut	N
West	Elm	Walnut	S
West	Walnut	Shearer	Both
West	Shearer	Montgomery	Both
West	Montgomery	Washington	S

CHAPTER VII. FOCUS AREAS

The focus areas in this chapter were selected for their relative importance and to act as brief case studies for ideal improvements. The intersection of Main Street with East and West Montgomery Avenues came up as priority through conditions identified on the ground, which will be addressed through recommendations in this chapter. The area around North Wales Elementary School has seen substantial investment recently, so we wanted to build upon this effort with additional recommendations. The Walnut Street frontage around the train station could use a series of improvements to make it more inviting to transit riders wishing to walk to and from the train station.

A. MAIN STREET AND MONTGOMERY AVENUE

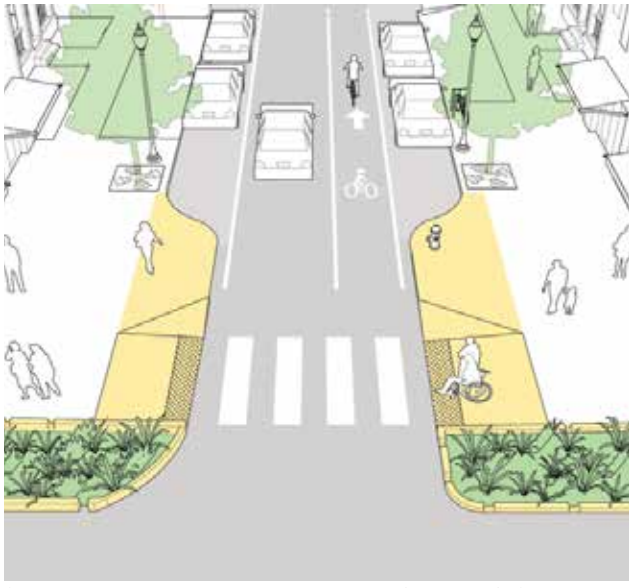
Existing Conditions and Concerns

If you walk north on West Montgomery Avenue and want to continue onto East Montgomery Avenue, you would need to turn right (east) at Main Street, cross the railroad tracks, and then turn left to cross Main Street. There are no striped crosswalks connecting the north and south sides of Main Street at either intersection of Montgomery; the nearest crosswalk is either 350 feet to the west (Shearer Street) or over 900 feet to the east (Summit Street). The missing crosswalks exacerbate the safety concerns at this confusing intersection. West Montgomery Avenue has newly installed ADA curb ramps with DWPs and a freshly painted standard crosswalk. These recent additions improve safety when crossing West Montgomery Avenue, however there is not a particularly clear pathway for pedestrians to continue across the railroad tracks. There are existing pedestrian gates that block the pathway when a train is coming. The intersection of Main Street and East Montgomery Avenue also has a standard crosswalk, however there are no DWPs on the existing curb ramps (which are most likely not up to ADA requirements).

Recommended Improvements

The intersection of Main Street and East Montgomery Avenue, pictured to the right, is a prime example of an area that may benefit from a curb bumpout. There are existing hatched areas on the north and south sides of the street, where cars should not be driving currently, which are in the exact locations where formal bumpouts could be built. Bumpouts can simply be concrete or be more ornate with brick pavers and may include low-growing landscaping; pedestrian

The intersections of Main Street with East and West Montgomery Avenues. NearMap, June 5, 2021.

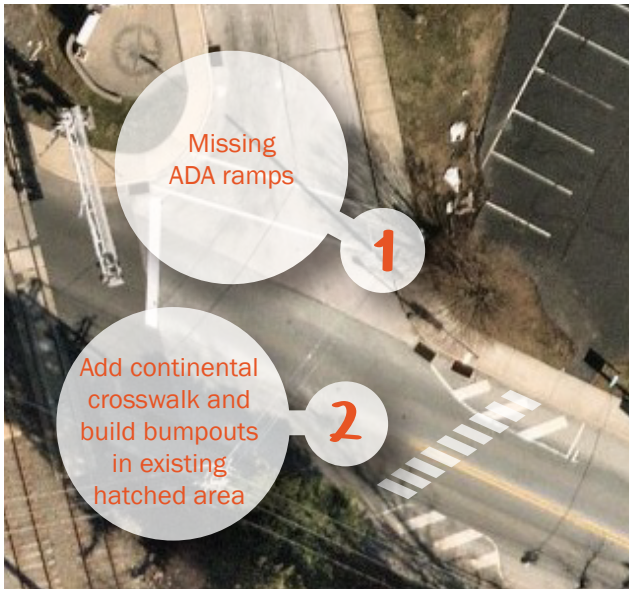


Graphic depiction of a large, urban bumpout Source: NACTO

crossing signage would also be appropriate. Both the proposed and existing crosswalks should be converted to high-visibility markings. And, lastly, ADA curb ramps with DWPs should be installed at all crosswalks.

The intersection of Main Street and West Montgomery Avenue may also benefit from a curb bumpout, which will involve coordination with the North Wales Fire Station. In lieu of built bumpouts, high-visibility paint can be used to mimic a bumpout (brick or yellow coloration). A high-visibility crosswalk across Main Street should be added. As shown in the graphic below, modifications to the intersection can be made to make it more pedestrian-friendly without a bumpout across Main Street. Lastly, there are newly installed ADA curb ramps with DWPs and a newly striped crosswalk on West Montgomery Avenue which are adequate as-is.

The last piece of the puzzle is how pedestrians navigate the railroad crossing on both sides of the street. The crossings currently include a mixture of concrete sidewalk, concrete along the train tracks, and asphalt to fill in the gaps in between. First and foremost, the sidewalk should be continued up to the tracks so that there is no noticeable change in grade or material; this can be done with brick paving, as proposed om the graphic below, or a standard concrete sidewalk. In addition to this, simple paint striping across where the sidewalk continues across the tracks would be highly beneficial. This would show a pedestrian that they are (a) allowed to walk across the tracks and (b) where they should walk. The asphalt or concrete in the designated pedestrian crossing area should be well-maintained and come as close to the tracks as possible to reduce tripping hazards.



Rendering of the proposed improvements along the south side of Main St and W Montgomery Ave

B. NORTH WALES ELEMENTARY SCHOOL

Existing Conditions & Concerns

This area recently saw a large-scale investment in the form of a Safe Routes to School grant that was aimed at improving pedestrian safety around North Wales Elementary School. The recommendations for this area are to maximize the scores that these intersections can achieve, based on the scoring method utilized in this project.

Recommended Improvements

1. **Summit Street and 2nd Street Intersection**
   This recommendation rings true for all intersections in this area, but it is recommended that a high-visibility style of crosswalk is painted on all sides of the Summit Street and 2nd Street intersection. There are no sidewalks on the south side of 2nd Street between either Church Street and Summit Street or Summit Street and East Prospect Avenue. Due to this, the curb ramps on the southeast and southwest corners of this intersection are relatively narrow. Therefore, it is recommended that bumpouts be considered for each corner to allow children to safely cross and wait to cross during the start/end of the school day. Bumpouts can slow traffic and make for safer/slower vehicle turning movements, which would improve this intersection.
   As part of a future project, we would recommend that missing sidewalks be filled in between Church Street and Summit Street; a sidewalk between Summit Street and East Prospect Avenue does not appear necessary at this time.
2. **Main Entrance Mid-Block Crossing**
   The block between 2nd and 4th Streets is over 500-feet in length, which could warrant a mid-block crossing. The potential for a mid-block crossing is further supported by the fact that the main entrance to the school is located in the middle of the block. A high-visibility crosswalk, such as a ladder style, should be considered.
3. **Summit Street and 4th Street Intersection**
   All crosswalks should at this intersection should be upgraded from standard high-visibility markings. Detectable warning plates are missing from the two curb ramps on the north side of the intersection, which should be prioritized for installation.
4. **Entrance on 4th Street**
   The entrance is quite wide for one-way traffic at 30-feet wide; both wider streets and one-way traffic patterns encourage faster speeds. Narrowing this entrance reclaiming additional sidewalk could improve safety in this area. Additionally, the existing crosswalk has standard parallel lines, but a high-visibility style crosswalk would draw more attention to the crosswalk.
5. **East Prospect Avenue and 2nd Street Intersection**
   This intersection has a unique setup, as there is a curve on the north side of 2nd Street (which is a one-way street going east-west for this block) that makes for a wider street and turning path for vehicles. The south side of the intersection has a similarly wide turning area. Due to these factors, the crosswalk is several feet longer than it would be for a typical one-way street intersection; therefore, a high-visibility crosswalk is recommended. In addition to this, the ramp on the south side of the intersection should be enlarged to make it safer. There are no sidewalks along the south side of 2nd Street nor along the east side of Prospect Avenue in

Source: NearMap, March 5, 2021

this area, which means there is currently no need for ramps or crosswalks across East Prospect Avenue. The construction of sidewalks are advisable along Prospect Avenue and, potentially, along 2nd Street if there is adequate width in the right-of-way.

6. **Main Street and East Prospect Avenue Intersection** The sidewalk that connects to the northeast corner of this intersection is four-feet-wide on average, but becomes extremely narrow within the last 10 feet approaching the intersection. This is made worse by the stone wall that obscures view of pedestrians. With this in mind, we would recommend a curb bumpout at the northeast corner of the intersection. Due to the limited visibility at this intersection from the stone wall, a high-visibility crosswalk should be installed across East Prospect Avenue; the crosswalk across Main Street should be repainted at the same time if it is at all faded. All corners connected by crosswalks should have ADA ramps with DWPs installed.
7. **Main Street and East Summit Street Intersection** There is a decorative crosswalk across Main Street on the eastern side of this intersection, which has stamped concrete that mimics brick pavers. This crosswalk and the crosswalk across Summit Street are missing detectable warning plates on all curb ramps, which should be prioritized for installation. The crosswalk across Summit Street could also be repainted to be more visible.

A graphic overview of these recommendations appears on the following page.

C. NORTH WALES TRAIN STATION

Existing Conditions & Concerns

The east side of the North Wales Train Station has several factors that could be improved. The parking lot entrance is far wider than it needs to be, the railroad crossings could be more pleasant for pedestrians, and there are various sidewalk and crosswalk improvements that could be made. Pedestrian improvements could increase the likelihood that a commuter would prefer to walk to the train station as opposed to driving. Specific deficiencies and proposed improvements are outlined below.

Recommended Improvements

1. **Improve the SEPTA parking lot entrance** The existing parking lot entrance is a whopping 57 feet in width at its widest point, which happens to be where pedestrians cross. This is far wider than necessary for vehicles and increases pedestrian risk of being struck by an incoming or outgoing vehicle. The driveway should be reduced down to 24 feet in width (at the most) and the sidewalk should be extended through bumpouts within this reclaimed pedestrian

Near Map Imagery of the Train Station focus area


East Prospect Avenue
Add bumpout on east side of prospect near cemetery
7a
Improve ramp on South side of 2nd St. and paint crosswalk
6
Add continental crosswalk
5
paint cross-walks, add ADA ramps and tactile ramps
7b
4TH Street
Add tactile plates at North Summit St.
4b
Paint crosswalks
1
2nd Street
Missing ADA ramps and painted crosswalk
8
Main Street
Summit Steet
4a
Paint all crosswalks
Add mid-block crossing
3
2
Add bumpouts and ADA tectile plates
Feet
0
100
200
N

space. A bus shelter could be added within this area, as shown in the rendering below.

2. **Improve railroad track crossings**
   Railroad crossings are not particularly pleasant for pedestrians at present. The material for the crossing should be consistent throughout, rather than a combination of asphalt and concrete. Crosswalk stripes should be painted over the railroad tracks so that pedestrians understand where the "sidewalk" continues.
3. **Highly visible crosswalks should be added**
   Highly visible crosswalks should be added at the intersection of 5th and Walnut Streets—one across Walnut Street and another across 5th Street. The curb ramps should be improved to best practices as well.

   Highly-visible crosswalks should be also added at the intersection of 6th and Walnut Streets—one across Walnut Street and another across 6th Street. New curb ramps should be constructed on the northeast and southeast corners to connect 6th Street to the existing curb ramp on the southwest corner of the intersection.
4. **Missing Sidewalks should be constructed**
   6th Street (AKA Railroad Street) lacks a sidewalk on both sides. Sidewalks should be added and a crosswalk should connect the south and north sides of the intersection with Walnut Street.

Rendering of the proposed improvements to the North Wales Train Station along Walnut Street

CHAPTER VIII. IMPLEMENTATION STRATEGIES

This chapter covers strategies and funding sources for implementing improvements to walkability throughout the Borough. The implementation table concludes the report.

A. LEGAL RESPONSIBILITY OF PROPERTY OWNERS

The Streets and Sidewalks Ordinance regulates the construction of curbs and sidewalks and maintenance thereof. Section 181-1 of the Ordinance requires property owners to construct, reconstruct, or repair the curb and sidewalk in front of or along a property within sixty (60) days of being given written notice. This ordinance indicates that the Borough is empowered to require a missing sidewalk to be installed at any point in time. Apart from maintenance/repair of sidewalks during the property resale process, the Borough has not been aggressive in enforcing these regulations. Furthermore, Section 181-14 requires that any property owner or tenant clear snow and ice from their sidewalk within 24 hours of the end of a storm. Section 181-18 also requires that a property owner keeps their sidewalk clear of any form of litter with exceptions for trash disposal.

In addition to the requirements of the above, the Zoning Ordinance houses a key provision that requires property owners to keep the sidewalk clear of vegetation. Section 208-133.C(4) of the Zoning Ordinance states that, "On any lot, no wall, fence or other structure shall be erected, altered or maintained and no hedge, tree, shrub or other growth shall be planted or maintained within the right-of-way which shall interfere with a free and unobstructed view down or across sidewalks where they exist or lands located at or near the intersection of any two streets or a street and railroad; or at any curve in any street. The purpose of this prohibition shall be to assure a full and unobstructed view in all directions at such crossings or curves and to so prevent the use of such lands for any purpose or in any manner which may interfere with or obstruct the vision of persons traveling upon such sidewalks or streets within the Borough."

B. LAND DEVELOPMENT REGULATION

Zoning Ordinance

A zoning ordinance includes regulations for specific areas, or districts, of a community. Zoning ordinances primarily dictate the type and scale of development. Importantly, zoning ordinances also include language related to the purpose of regulations and the aspirations of the community. North Wales's zoning ordinance includes the following language related to the walkability:

§ 208-101 Purpose and Applicability of the Transit Oriented Development District (TOD):

"Support new development that includes diverse pedestrian-compatible, higher density, transit friendly designs and expands economic development opportunities and minimizes distances between destinations by requiring linked sidewalks and pedestrian oriented access….Enhance the visual character and physical comfort of the district by minimizing pedestrian and vehicular conflicts and encouraging the renovation and erection of buildings and storefronts that provide direct connections to the street and sidewalk. "

§208-105. Development Design Standards

A. Purpose

1. The purpose of this section is to require pedestrian oriented buildings and to require building entrances to be oriented toward the streets, sidewalks and/or public access ways. Windows must facilitate views into and out of buildings. Requirements for orientation and primary entrances are intended to:
   a. Provide for convenient, direct and accessible pedestrian access to and from public sidewalks, transit facilities, residential and commercial users;
   b. Provide a safe, pleasant and enjoyable pedestrian experience by connecting activities between buildings in the TOD and within a structure to the adjacent sidewalk and/or transit stop; and

c. Promote use of pedestrian and mass transit modes of transportation to access residential and commercial facilities.

These are just a few examples from the Zoning Ordinance that demonstrate the Borough's commitment to improving the pedestrian experience. A natural next step would be to add specific regulations to the Ordinance that work towards meeting these goals.

Subdivision and Land Development Ordinance

The Subdivision and Land Development Ordinance, or simply SALDO, is a critical tool in getting walkability improvements installed as part of the land development process. Some examples of what to include in a SALDO include:

- Requirements to connect trails and sidewalks within the Borough and to the county trail system
- Design streets and sidewalks to encourage safety for all users; include sidewalk widths and design that meet or exceed the minimum standards to ensure access for a variety of users
- Design of subdivisions should connect to the existing street grid and include pedestrian cut-throughs if cul-de-sacs or dead ends are unavoidable

Section 184-9 of the Borough's SALDO requires non-residential areas to have 8-foot wide sidewalks that are free from obstructions and five-foot sidewalks in residential areas. These requirements meet best practices, so improvements to the SALDO could include requirements for streetscape enhancements.

Official Map

Official Maps are authorized under Article IV of the Pennsylvania Municipalities Planning Code and enable a community to guide the course of development over the long-term. An official map is a declaration of the governing body's interest in acquiring private lands for public purposes in the future. An Official Map includes the location of existing and proposed public lands, utilities, infrastructure, trails, parks open space, and roads.

An Official Map can help to improve walkability in a variety of ways. Mapping out the sidewalk network can be used as leverage to require improvements in the land development and subdivisions process. Trail system tie-ins are also key to an Official Map, however in the case of North Wales this will most likely include sidewalk connection to trails in Upper Gwynedd Township. An Official Map can also be used as a way to guide municipal acquisitions. It helps with requests for funding, and sets the groundwork for the future of the community.

C. FUNDING OPTIONS

- **Municipal Capital Improvements Plan**
  Pedestrian improvements can be included as part of a municipal Capital Improvements Plan. A Capital Improvements Plan spans a 5-year timeframe and is made up of specific projects. The Capital Improvements Plan must be fiscally constrained. Projects are pursued on a set schedule as outlined in the plan.
- **Coordination with PennDOT**
  PennDOT is a valuable and necessary partner when it comes to upgrading state-owned roadways. PennDOT has been paying increased attention to pedestrian improvements during roadway projects and usually will implement pavement marking upgrades and may be willing to include ADA curb ramps and crosswalks during repaving projects. Walnut Street is the only PennDOT roadway within the Borough and it would benefit from pedestrian upgrades.
- **Municipal Liquid Fuels**
  The Municipal Liquid Fuels funding program enables participating municipalities to receive funding based on the mileage of eligible roadways. These funds can be used for construction, reconstruction, maintenance or repair of roads and streets; this can include curb ramps, lane and crosswalk painting, signs and signals, and roadway clearing. Unfortunately funding cannot be used for sidewalks or curbs, unless they are required for ADA compliance. In 2021, North Wales received $92,625.04.

- **Cost Sharing Program**
  The Borough currently requires property owners to repair sidewalks along their property when they intend to sell. This program works very well and keeps the cost burden off of the Borough, however it is not effective at upgrading large swaths of sidewalk throughout the Borough. This program could be enhanced by setting a timeframe when **all** sidewalks in the Borough must be updated or constructed; this time period could be between one and five years. During this period, the Borough could negotiate with vendors through a competitive bidding process that enables a low cost based on the quantity of work. The Borough could then either open up the program to applicants to utilize the vendor at the negotiated low price or offer matching funding to expedite the process. Having a deadline for all sidewalks to meet Borough standards would make this process quick and effective.

Grant Opportunities

There are many grant opportunities available for pedestrian improvements which have varying eligibility and match requirements. MCPC is able to assist with grant writing and administration, should the Borough choose to pursue outside funding. Several grant programs are outlined below, however new programs may be offered in the future.

- **County Transportation Program (CTP)**
  Montgomery County offers a grant program to redistribute the $5 County Vehicle Registration fee. Eligible projects include a wide variety of improvements that benefit pedestrians, such as lane and crosswalk painting/marking, construction of ADA curb ramps, construction of pedestrian trails along highway right-of-ways, maintenance of alleys, and construction/reconstruction/maintenance of roads, bridges, culverts, and drainage facilities. Note that the addition of new sidewalks is usually not eligible for funding through this program. Approximately $1 million in funding is allocated in 2021. Additional information can be found here: https://www.montcopa.org/2971/County-Transportation-Program-CTP

- **MontCo 2040 Implementation Grant**
  Since 2016, the County has offered a grant program to promote the implementation of the county comprehensive plan, *MontCo 2040: A Shared Vision*. A wide variety of projects are eligible for funding and there is a strong emphasis on pedestrian improvement projects. A total of $10.2 million has been awarded to 95 grants in 46 municipalities. Awards generally range between $10-200,000. Additional information can be found here: https://www.montcopa.org/2453/Montco-2040-Implementation-Grant-Program

- **Transportation Alternatives (TA) Set-Aside Program**
  The TA Set-aside program offers funding for pedestrian and bicycle infrastructure (including trails), public transportation enhancement projects, historic preservation of transportation facilities, vegetation management, wildlife mortality, and other non-driver oriented projects. This is a great funding source for larger, more expensive projects. In the 2021 funding year, $21M is allocated with $8M within the Delaware Valley Region. Additional information can be found here: https://www.dvrpc.org/tap/pa

- **Multimodal Transportation Fund**
  This grant program is offered by Pennsylvania DCED for development, rehabilitation and enhancement of transportation assets in existing communities. Projects can include streetscape, lighting and sidewalk enhancements as well as pedestrian safety and connectivity improvements. This program can specifically be used to encourage transit-oriented development projects. Grants projects must be between $100,000 and $3,000,000. Additional information can be found here: https://dced.pa.gov/programs/multimodal-transportation-fund/

- **PennDOT Green Light- Go**
  This grant program is open for a range of projects related to existing traffic control signals across the state. This can include signal upgrades (not routine maintenance), such as LED bulb installation, signal retiming, detection or controller upgrades,

modernization, or intelligent transportation system (ITS) upgrades to connect with autonomous vehicles. Traffic monitoring and signal removal studies are also eligible. More information can be found here: https://www.dot.state.pa.us/portal%20information/traffic%20signal%20portal/fundglg.html

- **PennDOT Automated Red Light Enforcement (ARLE)**
  The ARLE program goal is to improvement safety at signalized intersections by automating enforcement. Funding raised from automated enforcement is redistributed through communities throughout the state through a grant program. This grant program can fund pedestrian safety improvements at signalized intersections. There is no local match required for this program and a municipality can submit applications for as many intersections as they wish. Additional information can be found here: http://www.dot.state.pa.us/portal%20information/traffic%20signal%20portal/FUNDARLE.html
- **Highway Safety Improvement Program (HSIP)**
  The HSIP, offered by the Federal Highway Administration, funds projects that reduce traffic fatalities and serious injuries on all public roads. The HSIP requires a data-driven approach to improving highway safety. There are many projects that may qualify under this program, however roadway improvements to separate pedestrians from vehicles (including medians and islands) are specifically noted as eligible. Additional information can be found here: https://safety.fhwa.dot.gov/hsip/about.cfm

D. IMPLEMENTATION PLAN

Tables on following pages.

9.1	TARGET AREA: NORTH WALES TRAIN STATION AREA				
	Location(s)	**Recommendation**	**Priority Level**	**Funding Sources**	**Involved Parties (including Borough)**
Intersections	Walnut Street & Railroad/6th Street	Paint high-visibility crosswalks across Walnut Street on the south side of the intersection and north-south across both Railroad and 6th Streets; add missing ADA ramps.	High	Grant funding; Municipal budget; PennDOT; SEPTA	SEPTA; PennDOT
	Walnut Street & 5th Street	Paint high-visibility crosswalk(s) across Walnut Street on the north/south side(s) of the intersection and north-south across 5th Street; add missing ADA ramps.	High	Grant funding; Municipal budget; PennDOT	SEPTA; PennDOT
	East side of Beaver Street, all intersections with roads and train station parking lots	Paint high-visibility crosswalks north-south at each intersection and construct associated ADA ramps.	Medium	Grant funding; Municipal budget; SEPTA	SEPTA
Sidewalks	Walnut Street between Railroad Street and Beaver Street	Construct sidewalks (8-feet-wide) where gaps exist on the west side of the street.	High	Grant funding; property owner expense; municipal budget	Property owners; PennDOT
	Beaver Street, between 4th Street and Walnut Street	Construct sidewalks (8-feet-wide) where gaps exist on the east side of the street.	High	Grant funding; property owner expense; municipal budget	Property owners
	Railroad Street	Construct sidewalks on both sides of the street (8-feet-wide).	Medium	Grant funding; property owner expense (SEPTA); municipal budget	Property owners; SEPTA
	4th Street between School and Beaver Streets	Construct sidewalks (5-feet-wide) on the north side of the street.	Low	Grant funding; property owner expense; municipal budget	Property owners
	Beaver Street, entire length	Repair specific areas where hazards exist and/or reconstruct segments with 8-feet of sidewalk that is free from obstacles	Medium	Grant funding; property owner expense; municipal budget	Property owners
	Walnut Street, between railroad tracks and 6th Street	Add sidewalks to shrink the parking lot entrance to 24 feet; improve railroad crossing; potential to add bus shelter.	Medium	Grant funding; SEPTA; municipal budget	SEPTA

9.2	TARGET AREA: MAIN STREET				
	Location(s)	**Recommendation**	**Priority Level**	**Funding Sources**	**Involved Parties (including Borough)**
Intersections	Main Street & Beaver Street	Paint a high-visibility crosswalk north-south on the east side of the intersection and construct associated ADA ramps.	Medium	Grant funding; municipal budget	Upper Gwynedd Township
	Main Street & Walnut Street	Upgrade signal to modern standards, install automated red-light enforcement, and add LPI to pedestrian signal.	Medium	Grant funding; municipal budget	PennDOT
	Main Street & East/ West Montgomery Avenue	*Refer to chapter VII, Focus Areas*	High	Grant funding; municipal budget; SEPTA	Borough only
	Main Street & Church Street	Paint high-visibility crosswalk north-south on the east side of the intersection; add ADA ramps throughout; explore a curb bumpout and signage.	High	Grant funding; municipal budget	Borough only
	Main Street & Washington Avenue	Add crosswalk connecting the north and south sides of Main Street, near SEPTA bus stops.	Medium	Grant funding; municipal budget; SEPTA	SEPTA
	Main Street & Highland Avenue	Install high-visibility crosswalk north-south on the east side of the intersection.	High	Grant funding; municipal budget	Borough only
Sidewalks	North side: Beaver Street to School Street and Walnut Street to Shearer Street	Repair specific areas where hazards exist (e.g., pavers) and/or reconstruct segments with 8-feet of sidewalk that is free from obstacles (include streetscape enhancements).	High	Grant funding; property owner expense; municipal budget	Property owners
	South side: Beaver Street to West Montgomery Avenue (all blocks)		High	Grant funding; property owner expense; municipal budget	Property owners

9.3	TARGET AREA: WALNUT STREET				
	Location(s)	**Recommendation**	**Priority Level**	**Funding Sources**	**Involved Parties (including Borough)**
Intersections	Walnut Street and West Street	Paint a high-visibility crosswalk east-west on the north side of the intersection.	High	Grant funding; Municipal budget; PennDOT	PennDOT
	Walnut Street and Center Street	**Upgrades to this intersection are planned for construction in 2022. Upgrades include the installation of an RRFB and crosswalks. See page 4 for additional information.**			
	Walnut Street & Swartley Street, Pennsylvania Avenue, 2nd Street, 3rd Street, 4th Street, & 10th Street	Install missing ADA ramps/DWPs where necessary and add high-visibility crosswalks east-west across Walnut Street and standard or high-visibility crosswalks on both east and west sides of intersection.	High	Grant funding; Municipal budget; PennDOT	PennDOT
	Walnut Street and 6th / Railroad Street	*Noted above under "North Wales Train Station Area"*	High	Grant funding; Municipal budget; PennDOT; SEPTA	PennDOT
	Walnut Street and 7th Street	Paint a crosswalk north-south on the east side of the intersection (7th Street).	Medium	Grant funding; Municipal budget; PennDOT	PennDOT
	Walnut Street and 8th Street	Improve corner with ADA curb ramps and a north-south crosswalk across 8th Street.	Medium	Grant funding; municipal budget	PennDOT
Sidewalks	East side of Walnut Street: 5th Street to 6th Street, 6th to 7th Street, 10th Street to municipal border with Upper Gwynedd	Construct missing sidewalk segments, repair specific areas where hazards exist and/or reconstruct segments with 5 or 8 feet in width depending on location (include streetscape enhancements near the train station and downtown).	High	Grant funding; municipal budget; PennDOT	PennDOT; Property owners
	West side of Walnut Street: 5th Street to 6th Street, 6th Street to 7th Street, 7th Street to Beaver Street		High	Grant funding; municipal budget; PennDOT	PennDOT; Property owners

9.4	GENERAL RECOMMENDATIONS			
	Location(s)	**Recommendation**	**Priority Level**	**Involved Parties (including Borough)**
	Refer to pages 46-47 and full audit database	Install new sidewalks that meet best practices wherever sidewalks are missing.	Medium/High	Property owners; PennDOT; SEPTA
	Refer to pages 46-47 and full audit database	Repair sidewalks in "poor" condition and, when complete, those in "fair" condition.	High	Borough Code Enforcement; property owners
	Along Main Street, Beaver Street, Walnut Street, North Wales Elementary School, and the North Wales Area Library (refer to full audit database)	Consider the installation of high-visibility style crosswalks at both intersections with existing standard crosswalks and where no crosswalks exist.	Medium/High	SEPTA; PennDOT
	Borough-wide	*Remove vegetation that is intruding on the sidewalk, which may include an educational campaign (social media posts, fliers) to inform property owners of their responsibilities.*	High	Borough Code Enforcement; property owners
	Borough-wide	Work with utility companies to identify utility poles that impede pedestrian traffic and identify mitigation.	Medium	Borough Code Enforcement; utility companies; property owners
		Determine if future street sign installations can be less intrusive.	Medium	
		Code Enforcement of moveable obstacles in the street for excessive periods of time, such as trash or personal property.	Low/Medium	
	Borough-wide	Install missing ADA ramps at all intersections and repair those in poor condition. Add DWPs to existing ramps that are lacking them.	High	PennDOT
	Streets and Sidewalks Ordinance	Consider adding language similar to that of Section 208-133.C(4) of the Zoning Ordinance related to property owner responsibility in keeping vegetation out of the sidewalk.	Medium	Borough Solicitor; MCPC
	Subdivision and Land Development Ordinance	Adopt drafted SALDO amendments.	High	Borough Solicitor; MCPC
		Consider adding steetscape design element requirements based on the massing of buildings, such as requiring planters (in-ground, hanging baskets and window boxes), benches, bike racks, public art or other decorative elements. Such requirements can be based off of building massing, for example X required items per Y feet of façade frontage on certain streets.	Medium	
	Zoning Ordinance	Adopt drafted TOD district amendments.	High	Borough Solicitor; MCPC
		Consider streetscape requirements similar to the proposed amendments to the TOD district to other commercial and mixed-use districts.	Medium	

APPENDICES

A. SELECT EXCERPTS FROM *NORTH WALES BOROUGH 2040* PUBLIC SURVEY

B. AUDIT SPREADSHEETS

C. SAMPLE AUDIT FORMS

D. PLANNING COMMISSION MEETING MINUTES

- SEPTEMBER 6, 2021
- AUGUST 4, 2021
- JUNE 2, 2021
- MAY 5, 2021
- DECEMBER 2, 2020
- AUGUST 5, 2020
- JULY 1, 2020
- JUNE 3, 2020
- MAY 6, 2020
- MARCH 4, 2020
- FEBRUARY 5, 2020

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