January 2022

Churchman's Crossing Plan Update

WILMAPCO

New Castle County 1673 Delaware

DelDOT

WILMAPCO Resolution

Wilmington Area Planning Council

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RESOLUTION

**BY THE WILMINGTON AREA PLANNING COUNCIL (WILMAPCO)
TO ENDORSE THE
CHURCHMANS CROSSING PLAN UPDATE**

WHEREAS, the Wilmington Area Planning Council (WILMAPCO) has been designated the Metropolitan Planning Organization (MPO) for Cecil County, Maryland and New Castle County, Delaware by the Governors of Maryland and Delaware, respectively; and

WHEREAS, the WILMAPCO Council recognizes that comprehensive planning for future land use, transportation, sustainable economic development, environmental protection and enhancement, and community health and livability are necessary actions to implement the goals and objectives in the 2050 Regional Transportation Plan (RTP); and

WHEREAS, the New Castle County Department of Land Use and DelDOT requested that WILMAPCO coordinate with them to update the land use and transportation plan for the Churchmans Crossing area; and

WHEREAS, the Churchmans Crossing Plan Update assessed existing demographic, land use, environmental, traffic, and market conditions; and

WHEREAS, the Churchmans Crossing Plan Update employed continuous and rigorous public engagement throughout the planning process; and

WHEREAS, the Churchmans Crossing Plan Update includes revised recommendations for transportation improvements and land use strategies to guide the future of the Churchman's Crossing area. The plan update used a collaborative process that considered environmental, community, and economic impacts of proposed improvements early in the planning process, consistent with the Federal Highway Administrations Planning and Environmental Linkages (PEL) approach;

NOW, THEREFORE, BE IT RESOLVED that the Wilmington Area Planning Council does hereby endorse the final report and recommendations of the Churchmans Crossing Plan Update.

1/13/2022
Date:

John Sisson, Chairperson
Wilmington Area Planning Council

WILMAPCO
Partners with you in transportation planning

Executive Summary

The Churchman's Crossing area is a vitally important economic growth area for New Castle County and the State of Delaware with its location along the I-95 Corridor between Newark and Wilmington. Roughly bounded by SR 2 (Capitol Trail / Kirkwood Highway) to the north; Red Mill Road, Marrows Road, and Salem Church Road to the west; Old Baltimore Pike and SR 273 (Ogletown Road / Christiana Road) to the south; and Airport Road, the Christina River, and SR 7 (Limestone Road) to the east, the Churchman's Crossing area is a mix of residential and commercial development. Economic development in the area is anchored by health care and education institutions, along with financial, retail, and hospitality industries. Both I-95 and the SEPTA Wilmington/Newark rail line run east and west through the study area, providing access to, from, and through Churchman's Crossing.

The Churchman's Crossing Plan Update is a comprehensive update to the 1997 Churchman's Crossing Study to establish new recommendations on transportation solutions and land use policies throughout the Churchman's Crossing region. The 1997 Churchman's Crossing Study was a joint effort by WILMAPCO, DelDOT, and New Castle County to develop a land use and transportation vision for the area. Sixty-one study recommendations were made, including expanding transit service, improving transit supportive infrastructure, implementing numerous intersection and bicycle/pedestrian improvements, travel demand management measures, and creating new roadway connections.

Since 1997, there have been several changes to the residential and commercial development patterns in Churchman's Crossing, altering the landscape of the area. An estimated 4.8 million square feet (MSF) of new development has occurred since 1997 and another 3.7 MSF of committed development is currently pending. Although most of the transportation improvements that have been constructed within the Churchman's Crossing region in the past two decades reflect the recommendations contained in the 1997 Study, more than half of the transportation recommendations from the 1997 Study have still not been implemented, including new roadway connections, intersection improvements, and new transit service.

The Churchman's Crossing Plan Update includes revised recommendations for transportation improvements and land use strategies to guide the future of the Churchman's Crossing area. The Churchman's Crossing Plan Update used a collaborative process that considered environmental, community, and economic impacts of proposed improvements early in the planning process, consistent with the Federal Highway Administration's Planning and Environmental Linkages (PEL) approach. This document serves as a response to the PEL Questionnaire and can be used to inform the National Environmental Policy Act (NEPA) review process to shorten project delivery in the future.

Planning Process

Consensus building and establishment of stakeholder support were key elements of the Churchman's Crossing Plan Update process. This was accomplished through a facilitated

stakeholder outreach process that included a stakeholder listening tour, Management Committee and Advisory Committee meetings, and interactive public workshops.

The Management Committee, which included WILMAPCO, DelDOT, and the New Castle County Department of Land Use, guided the overall process.

The Advisory Committee comprised of county and state elected officials, municipalities, community groups, businesses, special interests, and citizens provided input on issues, opportunities and constraints, draft scenarios, transportation alternatives, screening criteria, and implementation strategies. Advisory Committee meetings were scheduled to allow stakeholders to provide meaningful feedback as study related materials were being prepared in advance of public workshops with sufficient time for the project team to proactively incorporate feedback throughout the process.

The Churchman's Crossing community, including residents, employers, and employees were invited to participate through interactive public workshops, and provided feedback through a comment form on the project website, social media, and direct communications with WILMAPCO staff.

Scenario Planning & Transportation Alternative Screening Analysis

Four integrated transportation and land use scenarios were developed and refined through feedback from the stakeholder listening tour and the Management and Advisory Committees. These "bookend" scenarios provided a multitude of possible paths that could be explored and tailored to help define actions to achieve desired outcomes.

Based on the outcomes from the scenario planning process, as well as stakeholder feedback, a "Balanced" land use forecast that better balances jobs and housing in the study area was used to evaluate potential transportation alternatives. Twelve transportation alternative screening criteria were identified and used to evaluate 24 transportation alternatives.

Preferred Concept Plan

The evaluation of alternative land use assumptions and transportation alternatives yielded a set of recommended land use principles and transportation projects that together can enhance the Churchman's Crossing area and support it as a vibrant and key economic area in New Castle County and Delaware.

Four land use principles are recommended as part of future planning and zoning activities, including inclusion in the ongoing countywide comprehensive plan update, to support a more balanced land use:

- Efficient Development Location: The greatest potential for new development is in the eastern portion of the study area, generally between Fairplay SEPTA Station and the Christiana Mall. This area has the potential to create a new "transit spine" between the existing transit resources.

- Mix of Uses: Vertical and horizontal mixed-use development on existing commercial properties provide an opportunity to reduce trip lengths, while existing single family residential communities should be preserved. The Churchman's Crossing area is exemplified by single-use zoning, either residential or commercial. Mixed-use development and redevelopment of existing commercial properties presents an opportunity to accommodate additional economic growth while minimizing effects on the roadway network.
- Compact Design: New development can be designed to improve walkability. Compact design features that encourage development scaled toward walking rather than driving include local, two-lane interior roadways with short block lengths, continuous building frontage with minimal setbacks and substantial fenestration (ratio of doors and windows to total fronting wall space), and utilization of on-street parking with minimal surface-lot parking located at the rear of properties.
- Transportation Demand Management: Policies, programs, and services to support TDM can augment the transportation-efficient location and design advantages in the area noted above. Suggested TDM elements include parking management strategies, reduced or free transit for property tenants, use of vanpools or carpools, agreements with Transportation Network Companies (TNCs) to provide last-mile service, micro mobility options including micro transit and bike or scooter sharing, and policies that help reduce reliance on single-occupant-vehicle travel.

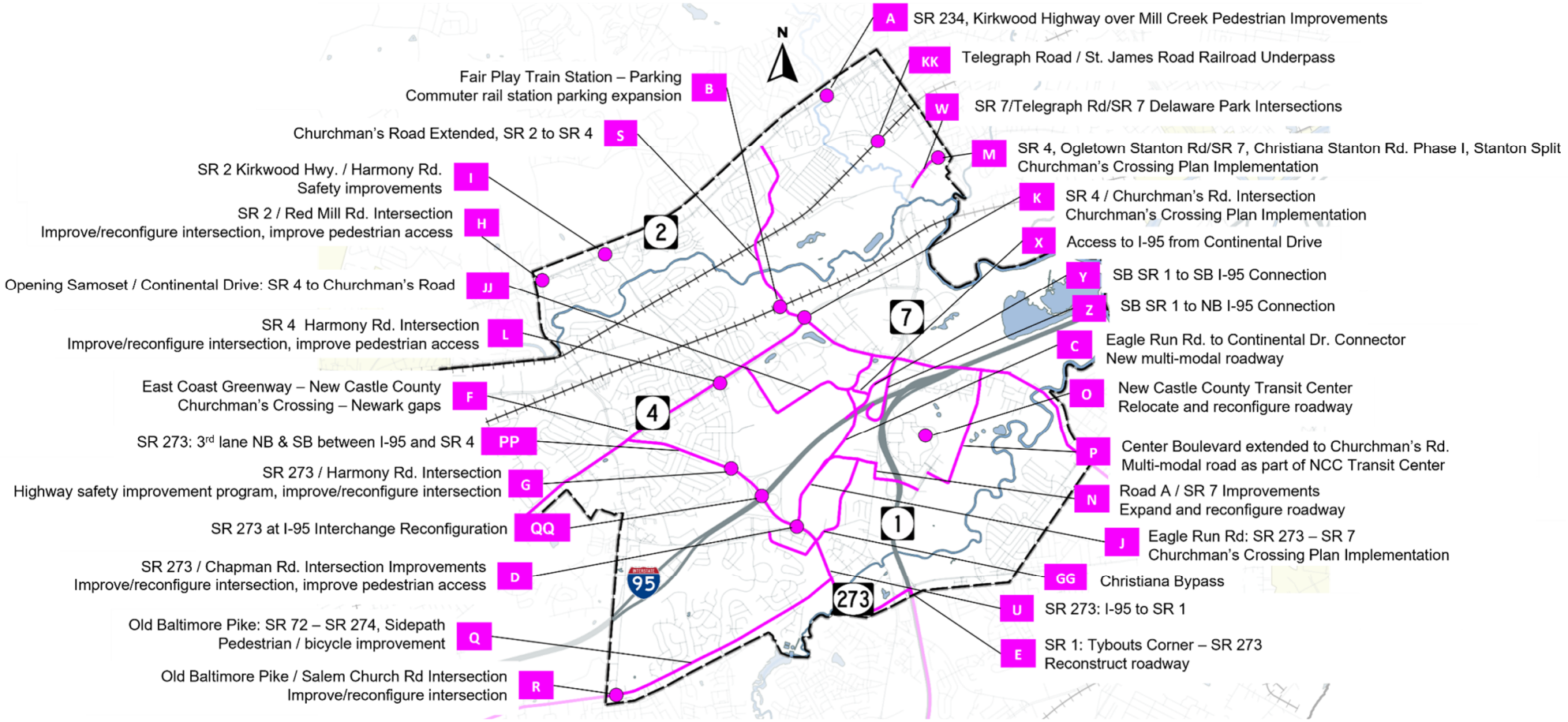
Thirty-five (35) transportation projects are recommended, consisting of 18 projects that are already on WILMAPCO's 2050 Regional Transportation Plan (RTP) financially constrained project list, two (2) projects that were identified in the RTP aspirations list, and 15 new project recommendations. A map of recommended transportation improvements is included in **Figure E-1**. Non-mapped transportation recommendations include:

- Micro Transit: On-demand transit services that are focused on providing more direct services between communities, employers, and commercial destinations than existing fixed route bus service
- Automated Transit Vehicles: Transit service on a fixed route using driverless vehicles
- New Bus Transit Routes: Routes to and from the Christiana Mall and SR 7 – Pike Creek, SR 2 – Prices Corner, SR 141 and SR 273 – New Castle, US 13 – Llangollen, SR 273 – Wilton, and SR 2 and SR 4 – Newark
- Transit Access Improvements: New and reconstructed bus pads, shelters, and accessible pathways and routes between bus stops and nearby destinations
- Pedestrian / Bicycle Improvements along Existing Roads: New pedestrian and bicycle facilities where existing roadway connections can be leveraged to provide multi-modal connectivity including completing gaps in the East Coast Greenway, a connector along SR 7 near Ogletown Stanton Road, and other existing roadways that are improved through various pavement/rehabilitation and capital projects.

- Pedestrian / Bicycle Improvements serving Existing Communities: Pedestrian and bicycle connections from existing communities to lower-stress routes and shared-use paths outside those communities, including Lewden-Greene and Coventry Park connectors, the SR 7 connector, and a pedestrian and bicycle only extension of Brownleaf Road to Samoset Drive.

Next Steps

Implementation of individual projects will take a variety of forms and follow different timelines based on the cost, complexity, and size of each. Two newer implementation strategies – Transportation Improvement Districts (TIDs) and Complete Community Enterprise Districts (CCEDs) – can complement more traditional approaches to implementation. TIDs and CCEDs can promote intergovernmental coordination, support sustainable development and complete communities, enhance safety, and provide better coordination of the land use and transportation systems toward achieving economic development and livability goals. The Churchman's Crossing Plan Update includes a TID strategic plan, should that be a desired implementation tool.



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1. Project Introduction

The Churchman's Crossing area has been, and continues to be, a vitally important economic growth area for New Castle County and the State of Delaware with its location along the I-95 Corridor between Newark and Wilmington. Significant commercial and employment centers are found in Churchman's Crossing, which was formerly known as the "Edge City" of Metroform.

Concerns about future transportation conditions from existing and anticipated land use culminated in the landmark and innovative 1997 Churchman's Crossing Study, which analyzed transportation and land use conditions and made recommendations on land use policies, transit improvements, transportation demand management (TDM) strategies, and roadway and multi-modal improvements. The Study and its recommendations were adopted into the 2020 Metropolitan Transportation Plan (MTP) and subsequently into the 2030 Regional Transportation Plan (RTP).

A goal of the 1997 Study was for it to be a "living document" and for it to include indicators that DelDOT, New Castle County, and WILMAPCO would utilize to monitor and determine when certain improvements should be implemented. Various monitoring plans were prepared on an annual basis from the adoption of the Study in 1997 to 2004, and between 2006 and 2011, with more comprehensive summaries of transportation and land use conditions published in 2004 and 2019.

Since 1997, there have been several changes to the residential and commercial development patterns in Churchman's Crossing, altering the landscape of the area. Some of these changes were anticipated by the 1997 Study assumptions, while others were not. Notable changes include expansions at the Christiana Hospital, Delaware Park & Casino, J.P. Morgan Chase & Co., and numerous changes near the Christiana Mall. An estimated 4.8 million square feet (MSF) of new development has occurred since 1997 and another 3.7 MSF of committed development is currently pending.

Most of the transportation improvements that have been constructed within the Churchman's Crossing region in the past two decades reflect the recommendations contained in the 1997 Study. They include multiple interchange and intersection modifications, and numerous transit, pedestrian and bicycle improvements; however, more than half of the transportation recommendations from the 1997 Study have not been implemented, including new roadway connections, intersection improvements, and new transit service.

There is now a need to analyze future transportation improvements using updated land use forecasts, and measures that can better assess the effectiveness of the full transportation system, including its roadways, pedestrian and bicycle facilities, and transit services.

Therefore, the Wilmington Area Planning Council (WILMAPCO), Delaware Department of Transportation (DelDOT), and New Castle County Department of Land Use have developed this comprehensive update to the 1997 Churchman's Crossing Study to establish new recommendations on transportation solutions and land use policies throughout the Churchman's Crossing region.

A. Project Background

Study Partners

WILMAPCO is responsible for administering the Churchman's Crossing Plan Update in collaboration with DelDOT and New Castle County Department of Land Use. These three agencies collectively served as the project's Management Committee, along with the Delaware Transit Corporation (DTC), an operating agency of DelDOT. The Management Committee was supported by a consultant team led by RK&K, along with Renaissance Planning Group, Kramer & Associates, and Rybinski Engineering.

Study Area

Churchman's Crossing is located in New Castle County, to the southwest of Wilmington, Delaware and east of Newark, Delaware. The project study area is a modified version of the "inner core" boundary identified in the 1997 Churchman's Crossing Study (**Figure 1**). The study area is roughly bounded by SR 2 (Capitol Trail / Kirkwood Highway) to the north; Red Mill Road, Marrows Road, and Salem Church Road to the west; Old Baltimore Pike and SR 273 (Ogletown Road / Christiana Road) to the south; and Airport Road, the Christina River, and SR 7 (Limestone Road) to the east. Both I-95 and the SEPTA Wilmington/Newark rail line run east and west through the study area.

The study area includes a mix of residential and commercial development. Many of the commercial developments include one or several large buildings surrounded by surface-level parking, which could provide valuable redevelopment opportunities in the pursuit of a more accessible, multi-modal, and efficiently functioning transportation network. Major industries within the study area include health care and social services, retail, entertainment, and financial services.

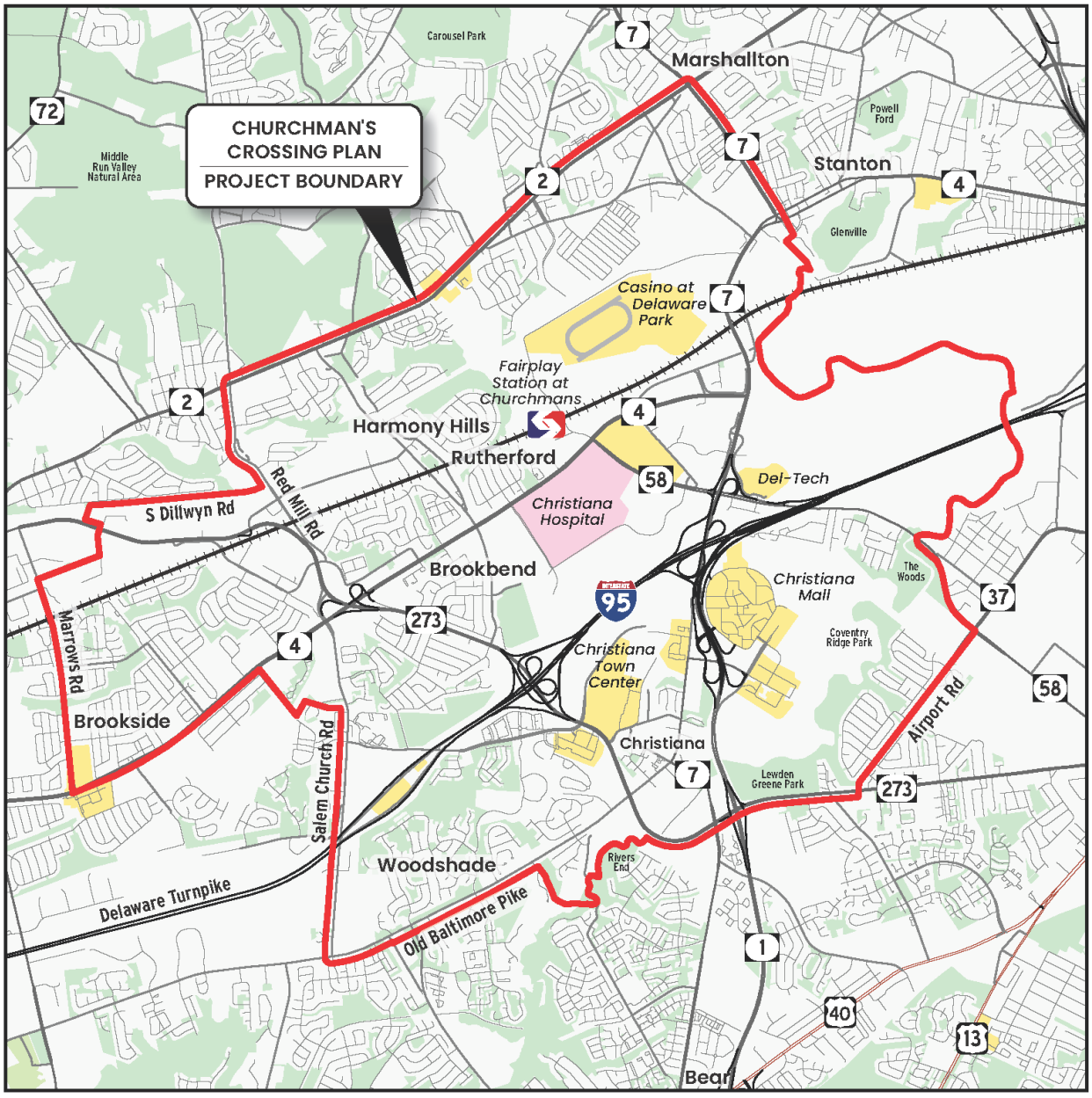


Figure 1. Project Study Area

1997 Churchman's Crossing Study

The 1997 Churchman's Crossing Study was a joint effort by WILMAPCO, DelDOT, and New Castle County to develop a land use and transportation plan that supported the vision for this economically important area. Sixty-one study recommendations were made, including expanding transit service, improving transit supportive infrastructure, implementing numerous intersection and bike/ped improvements, TDM measures, and creating new roadway connections. The Study and its recommendations were adopted by the WILMAPCO Council into the 2020 Metropolitan

Transportation Plan (MTP) on September 11, 1997, and subsequently into the 2030 Regional Transportation Plan (RTP).

Of the more than 60 recommendations identified in the 1997 Study, 25 projects were implemented over the past two decades, including multiple interchange improvements, intersection improvements, the new Fairplay SEPTA station, bus service improvements, two new Park & Ride lots at Fairplay Station and near SR 273 and SR 7, and new bikeways; however, several recommendations in the original 1997 Study have yet to be implemented, including new roadway connections, MARC commuter rail service, and additional Park & Ride lots, intersection improvements, bus service improvements, and sidewalks and bikeways. The recommendations from the 1997 Study were intended to complement each other, and not to be "picked and chosen from"; all components were considered necessary to accommodate both local and through traffic and to provide transportation choices in the Churchman's Crossing area.

In addition to the transportation improvement projects, the 1997 Study included suggested improvements to the land use process and land use design guidelines to support more opportunities to ride share, walk, bike, and access transit, including recommendations related to the Comprehensive Development Plan Update, zoning and subdivision regulations, and subdivision reviews. Some of the recommendations have been included in the Unified Development Code (UDC), while others are ongoing or have not yet been started.

Finally, the 1997 Study included recommendations for travel demand management (TDM), including traveler information, commuter services, alternative work schedules, parking management, and other transportation systems management strategies. At the time of the 1997 Study, the Transportation Management Association (TMA) Delaware partnered with the Delaware Transit Corporation (DTC) and DelDOT to work with Churchman's Crossing employers to promote alternate commute options and other TDM efforts. TMA Delaware has since disbanded, and traffic mitigation agreements are used on a case-by-case basis.

The 1997 Churchman's Crossing Study can be downloaded at the WILMAPCO website: www.wilmapco.org/Churchmans/.

Streamlined Project Delivery

This study is being completed as part of a streamlined project development process in accordance with the Federal Highway Administration's Planning and Environmental Linkages (PEL) guidelines. PEL is a "collaborative and integrated approach to transportation decision-making that considers benefits and impacts of proposed transportation system improvements to the environment, community, and economy during the transportation planning process[1]" (FHWA, accessed 2021). This study will inform the environmental review phase of the recommended transportation projects in accordance with the National Environmental Policy Act (NEPA) as well

[1] Federal Highway Administration, *Environmental Review Toolkit: FHWA Initiatives to Accelerate Project Delivery – Planning and Environmental Linkages*, https://www.environment.fhwa.dot.gov/env_initiatives/PEL.aspx (accessed July 16, 2021).

as preliminary engineering. In collaboration with the project planning partners and the public, this study identifies the following:

- Project vision
- Range of transportation alternatives
- Preferred concept plan of transportation improvements
- Preliminary analysis of potential environmental impacts from proposed transportation improvements
- Preliminary transportation improvement cost estimates
- Implementation considerations

This report serves as a response to the PEL Questionnaire, and a checklist is provided in **Appendix A**. Study transportation recommendations will be considered for implementation in DelDOT's Capital Transportation Program (CTP). The graphic below shows how the PEL work could inform future NEPA documentation, based upon the type of transportation improvements (**Figure 2**).

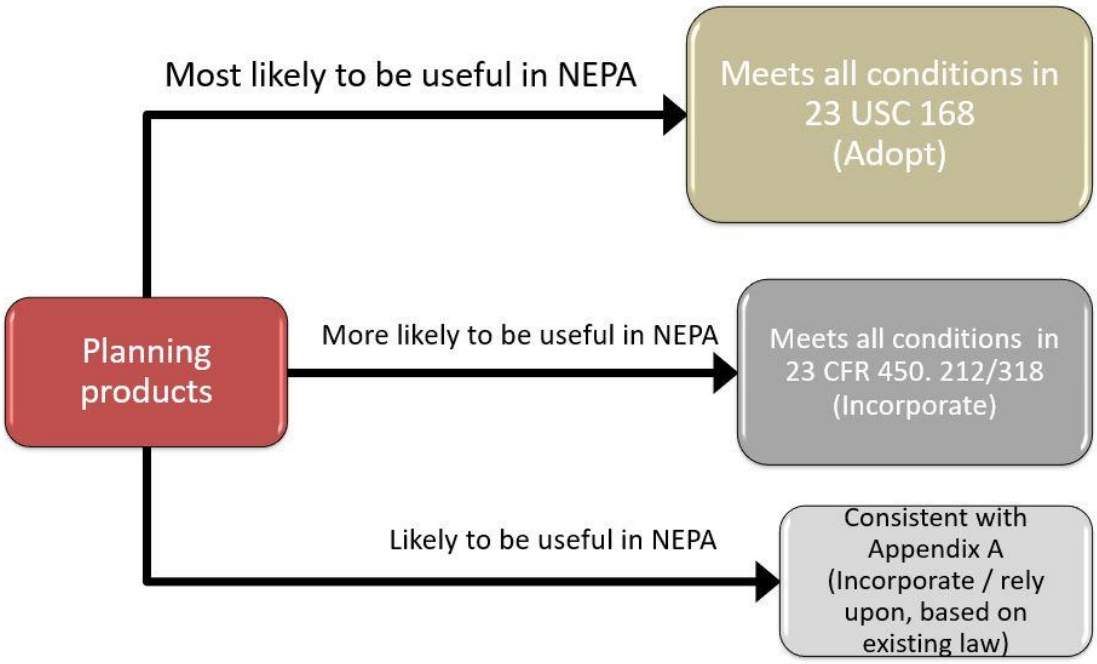


Figure 2: Relationship of PEL Planning Products to NEPA

B. Existing Transportation Network

Regional Roadway Network

I-95 runs approximately east-west through the study area, providing access to, from, and through Churchman's Crossing. East of Churchman's Crossing, multiple interstates, including I-95, I-295,

and I-495 provide access to Wilmington, Delaware, and destinations north and east into Pennsylvania and New Jersey.

State Routes within the study area include SR 1 (Korean War Veterans Memorial Highway), SR 2, SR 4 (Chestnut Hill Road / Ogletown-Stanton Road), SR 7, SR 58 (Churchman's Road), and SR 273.

SR 1 begins near SR 58 and extends southward to the Maryland state line near Fenwick Island in Sussex County, providing access to major cities and beaches throughout Delaware. Other state routes within the Churchman's Crossing area provide regional connections throughout New Castle County.

Local Roadway Network

The local street network in the Churchman's Crossing area consists of numerous subdivision streets that are served by various collectors and arterials, which provide access to the state routes and interstates. Predominant collectors and arterials in the study area include east-west routes (Chapman Road, Old Baltimore Pike, Ruthar Drive) and north-south routes (Red Mill Road, Harmony Road, Telegraph Road / St. James Church Road).

Near the I-95 and SR 1 interchange, there is a network of roads providing access to the Christiana Mall and surrounding retail including Road A, Center Boulevard, and various ramps to and from both I-95 and SR 1. To the north and west of the interchange, the Christiana Hospital, Bank of America, and Christiana Executive campuses, as well as numerous other businesses, are served by a local network that includes Samoset Drive and Continental Drive.

Transit

Fixed route bus transit is available throughout the study area on local streets with service provided by DART First State (**Figure 3**). Primary transit corridors in the study area include I-95, SR 1 SR 2, SR 4, SR 7, SR 58, SR 273, Delaware Park Boulevard, Salem Church Road, Chapman Road, Old Baltimore Pike, Road A, Center Boulevard, and the Mall Ring Road. The highest transit ridership occurs around the Christiana Mall where there is a large Park & Ride location, and along SR 1 and I-95 which carry numerous routes to Wilmington, Delaware, and other popular destinations. DART also offers paratransit and on-demand services.

SEPTA's Wilmington/Newark line runs approximately east-west through the study area. The Fairplay Station is located within the study area between Newark and Wilmington. DART also serves Fairplay Station and there is a Park & Ride lot at the station to provide multi-modal connectivity.

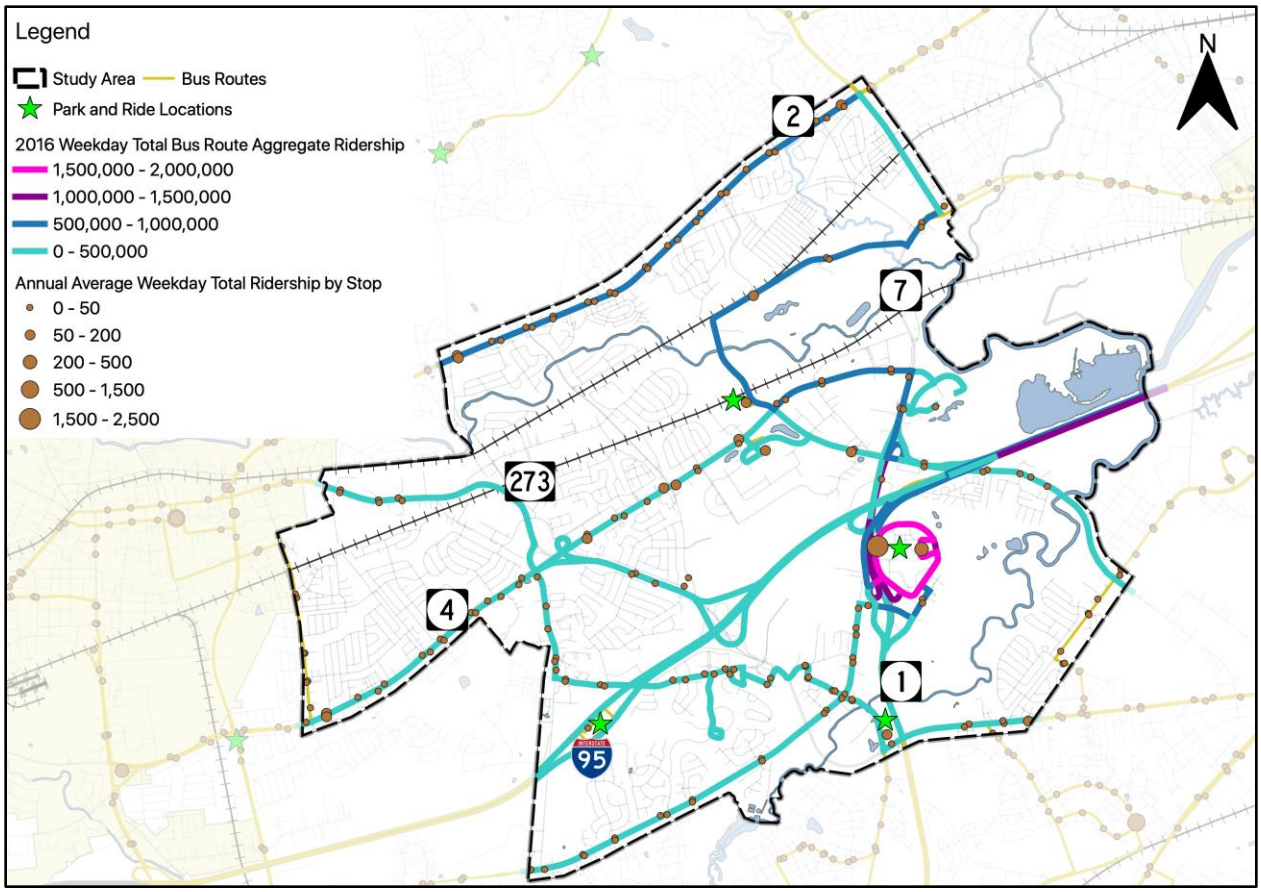


Figure 3: Fixed Route Bus Ridership

Non-motorized Transportation Network

Biking and walking are additional forms of transportation in the study area. People traverse the study area to connect to schools, activity centers, and businesses from neighborhoods within the region. Popular routes include portions of the East Coast Greenway (ECG) along SR 4 and SR 58 and the Lewden-Greene and Coventry Park trails along the Christina River.

Bicycle level of traffic stress (LTS) is a measure of connectivity used to show which roadways are suited for bicyclists of different abilities or comfort levels. There are four levels: (1) low-stress routes, where bicycles are separated from traffic; (2) roadways with low volumes of vehicles traveling at low speeds, such as a buffered bike lane on a calm street; (3) roadways that host heavy traffic but have separate bike lanes or wide shoulders that can be used by bicyclists; and (4) roadways where bicyclists must share the road with high-speed or high-volume traffic. Bicycle LTS also corresponds to archetypal bike riders. For example, young children and other inexperienced cyclists will be most comfortable on LTS 1 routes, average adult cyclists can handle LTS 2 routes, more enthusiastic and confident riders willing to tolerate some stressful roadways and intersections may be comfortable on LTS 3 roadways, and only advanced cyclists can tolerate riding on LTS 4 routes. **Figure 4** shows the bicycle LTS of the roadways in the Churchman's Crossing study area.

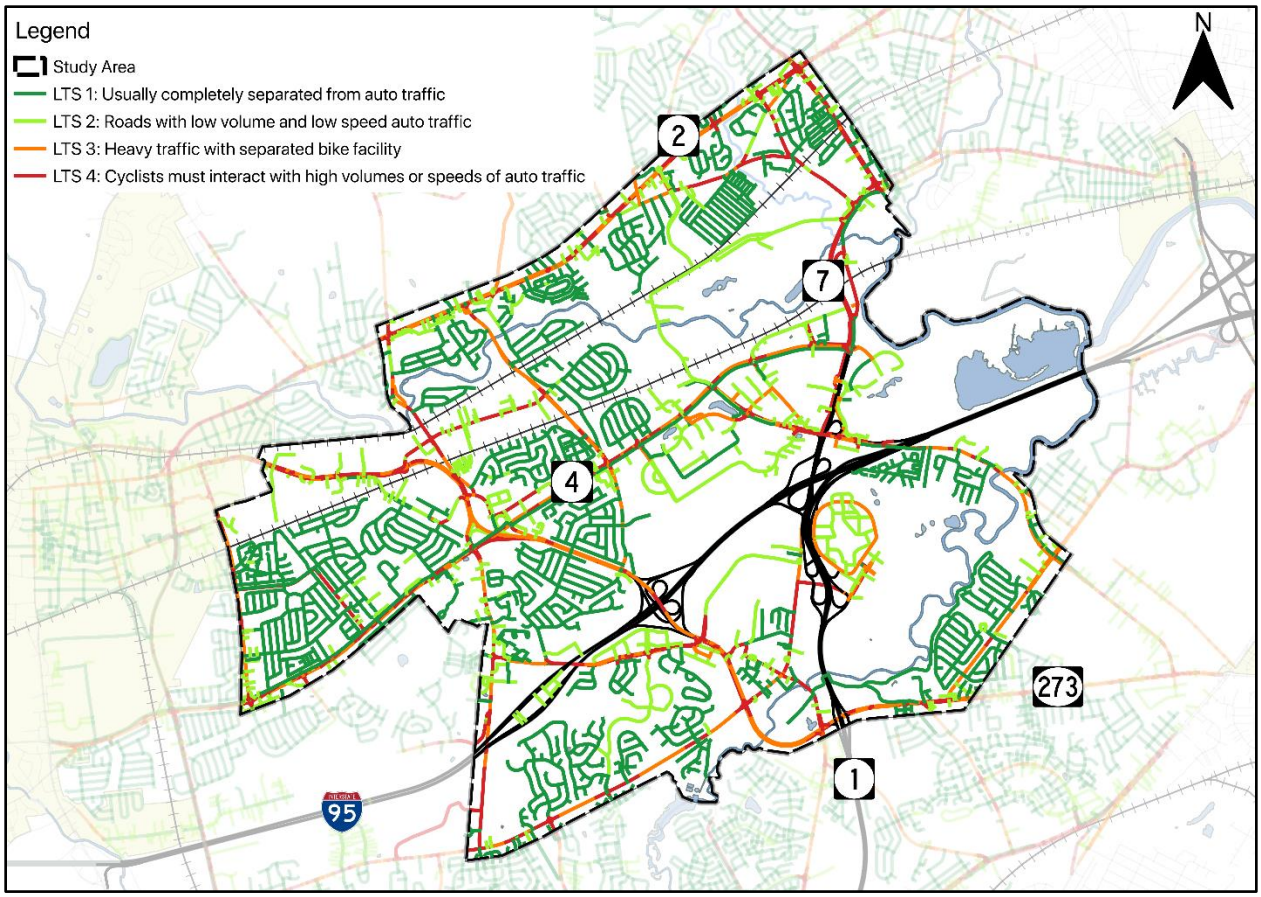


Figure 4: Bicycle Level of Traffic Stress

Pockets of dark green in **Figure 4** show neighborhood streets that provide low-stress biking conditions for nearly all riders. Although many of the area's major arterials are designated as connector or regional bicycle routes, they are also LTS 3 or 4 (orange and red in **Figure 4**), indicating higher-stress roadways that only more experienced and confident bicyclists would be comfortable riding. Bicycle LTS 2, 3, and 4 roadways, as well as roads such as I-95 and SR 1 where bicycle and pedestrian traffic is prohibited, separate the more comfortable LTS 1 roads inside neighborhoods, creating "islands" or clusters of disconnected low-stress roads, shown in **Figure 5**. Each color represents a disconnected island, and travel from one island to another would require a bicyclist to travel on a higher-stress LTS 2, 3, or 4 route.

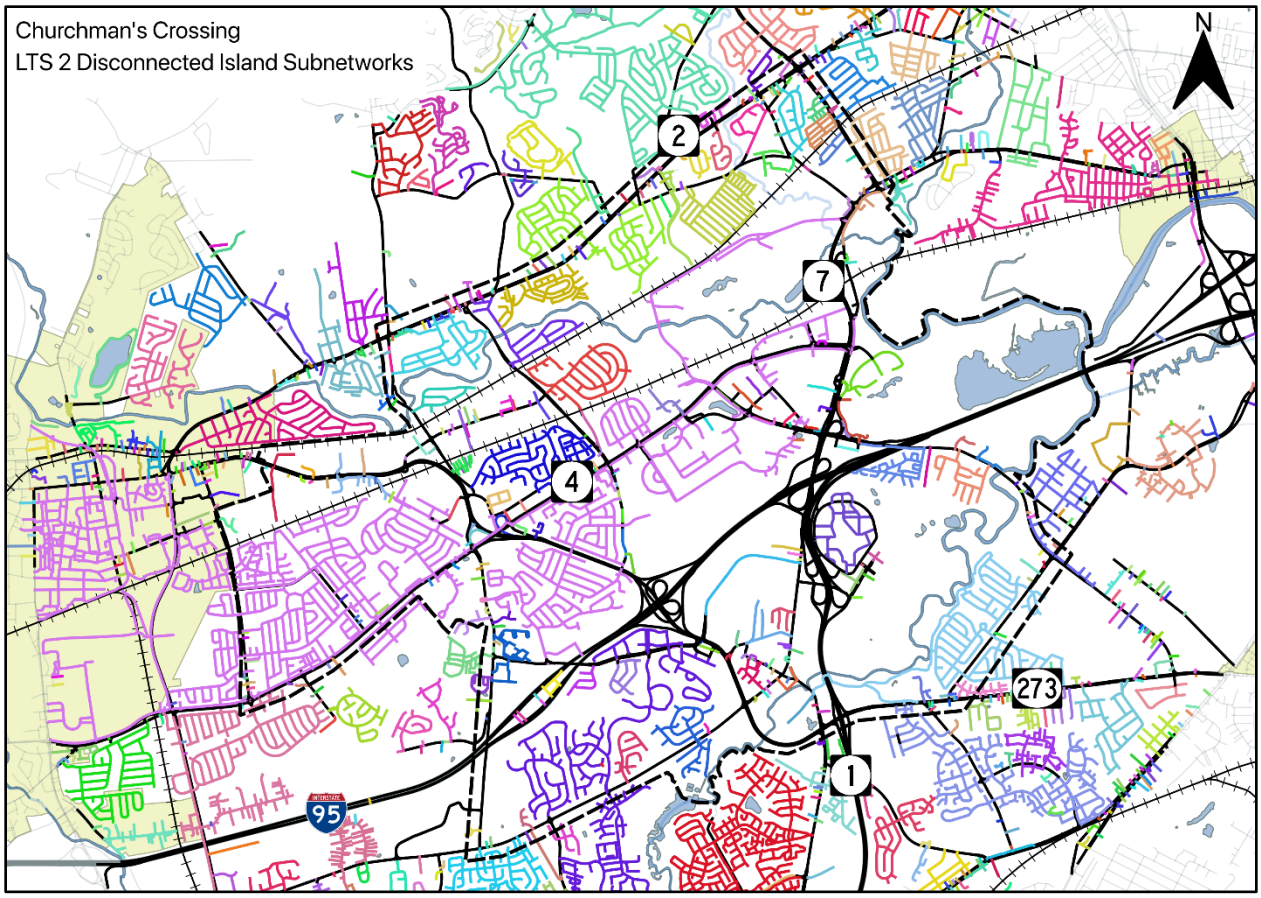


Figure 5: Disconnected Bicycle "Islands"

C. Existing Traffic Operations

The project team performed two types of analysis to quantify existing traffic operations:

- **Congestion hotspots:** Travel time data was used to identify hotspots where traffic backs up at any time during the day.
- **Intersection level of service (LOS):** Critical movement summation (CMS) analysis was used to evaluate operations at nine (9) key intersections during the morning and evening rush hours.

Congestion Hotspots

To identify congestion hotspots in the study area, the project team analyzed weekday travel time data from the 2019 National Performance Measure Research Data Set (NPMRDS) for the hours between 6:00 AM and 10:00 PM. The metric used to measure congestion on a roadway segment is a ratio of the average travel time for the given hour to the uncongested travel time: the higher the ratio, the more congested the segment is during that hour. NPMRDS data for each hour between 6:00 AM and 10:00 PM were compiled into a video that is available on the project website: www.wilmapco.org/Churchmans/.

Figure 6 shows the congestion during the AM rush hour; **Figure 7** shows the congestion during the PM rush hour. The NPMRDS data indicates there is mild to moderate congestion throughout the day, and the worst congestion in the study area occurs during the evening rush hour, between 5:00 and 6:00 PM. Evening congestion is particularly pronounced along SR 1, Churchman's Road (SR 58), Kirkwood Highway (SR 2), SR 4, and SR 273 (shown as dark red in **Figure 7**).

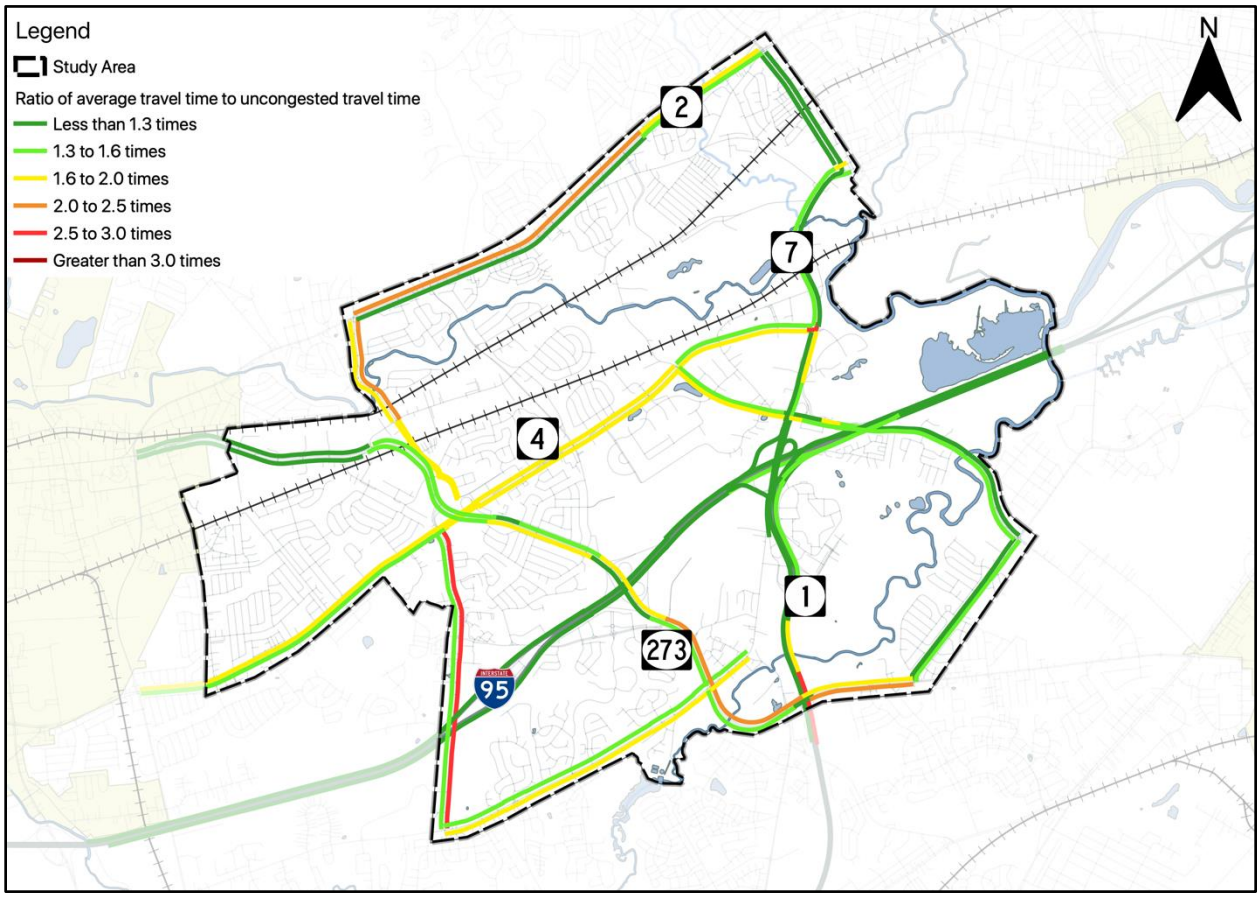


Figure 6: 2019 Existing Conditions AM Peak Travel Times, 7:00 - 8:00 AM

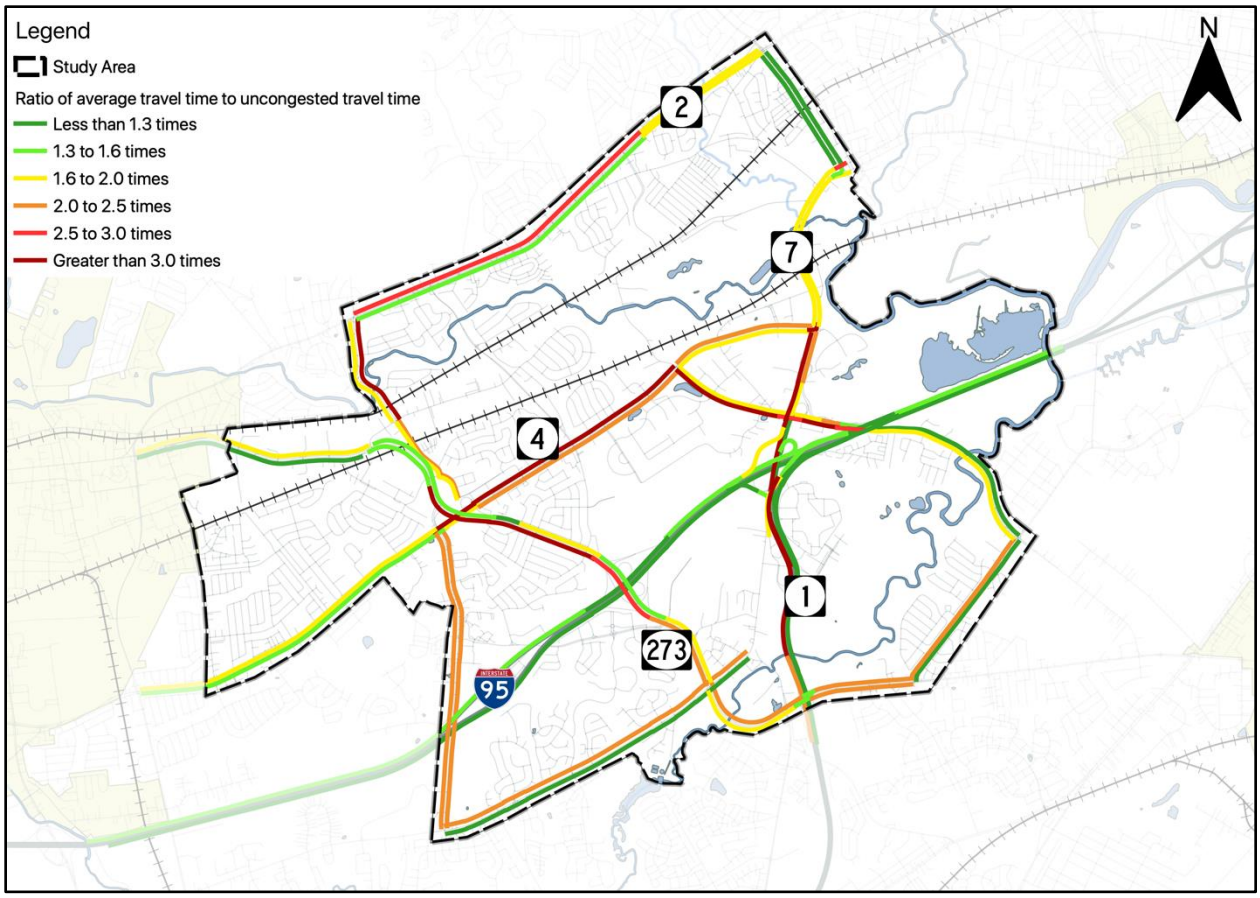


Figure 7: 2019 Existing Conditions PM Peak Travel Times, 5:00 - 6:00 PM

Intersection LOS

Nine (9) key intersections in the Churchman's Crossing Area were identified from the 1997 Study and subsequent monitoring efforts for more detailed intersection level analysis:

- SR 2 and Delaware Park Drive
- SR 4 and SR 58
- SR 2 and Harmony Road
- SR 2 and SR 7
- SR 4 and Harmony Road
- SR 58 and SR 1 / SR 7 Southbound Ramps
- SR 58 and Cavaliers Country Club Drive
- SR 273 and Chapman Road / Eagle Run Road
- SR 273 and Old Baltimore Pike

DelDOT and WILMAPCO provided the most recent turning movement count data at each of the key intersections. Counts were collected between 2016 and 2019, prior to impacts from the COVID-19 pandemic. For counts collected prior to 2019, the project team used a moderate

growth rate of 1 percent growth per year to forecast baseline 2019 volumes at each of the nine (9) intersections. The resulting volumes are provided in **Appendix B**.

Traffic analyses were performed using critical movement summation (CMS) methodology. CMS analysis is a planning-level tool to compare demand volume at an intersection to the intersection's capacity, based on the number of lanes. CMS analysis sums the volumes that would cross or conflict with one another through the intersection. The sum of these conflicting volumes is the intersection's critical movement volume. CMS results are reported in terms of level of service (LOS). LOS is represented by letter grades ranging from A (lowest critical movement volume) through F (volume exceeds capacity). **Table 1** provides the LOS that corresponds to critical movement volume values, measured in vehicles per hour.

Table 1: Level of Service (LOS) Criteria for Critical Movement Summation (CMS) Analysis

Level of Service	Critical Movement Volume (vehicles per hour)
A	Less than 1,000
B	1,000 to 1,150
C	1,150 to 1,300
D	1,300 to 1,450
E	1,450 to 1,600
F	More than 1,600

The resulting 2019 baseline LOS for each of the nine (9) key intersections is summarized in **Table 2**. Although the intersection of SR 58 and the SR 1 / SR 7 southbound ramps operates at LOS F during the PM peak, all other intersections operate at LOS E or better under existing conditions during the AM and PM peak hours, which indicates that volumes are less than the existing capacity at the intersections. CMS analysis worksheets for each intersection are included in **Appendix C**.

Table 2: 2019 Existing Conditions Intersection LOS

Intersection	AM Peak Hour LOS	PM Peak Hour LOS
SR 2 & Delaware Park Dr	A	B
SR 4 & SR 58	A	B
SR 2 & Harmony Rd	C	D
SR 2 & SR 7	D	D
SR 4 & Harmony Rd	D	D
SR 58 & SR 1 / SR 7 Ramps	C	F (v/c ratio 1.03)
SR 58 & Cavaliers Country Club Drive	A	C
SR 273 & Chapman Rd / Eagle Run Rd	E	E
SR 273 & Old Baltimore Pike	C	D

D. Existing Crash Data

Each year WILMAPCO performs a statewide intersection crash analysis for all intersections that had ten (10) or more crashes annually over the preceding three (3) calendar years. The analysis considers the total number of crashes (frequency), costs associated with the manner of impact

(rear end, side swipe, head on, etc.), and the severity (fatality, injury, property damage only). The results are composite statewide crash rankings with the top rankings indicating the worst safety performance. WILMAPCO provided the statewide intersection crash rankings based on the 2016 to 2018 crash data, shown in **Figure 8**. Six (6) intersections in the study area ranked among the 20 worst intersections statewide in terms of crashes between 2016 and 2018:

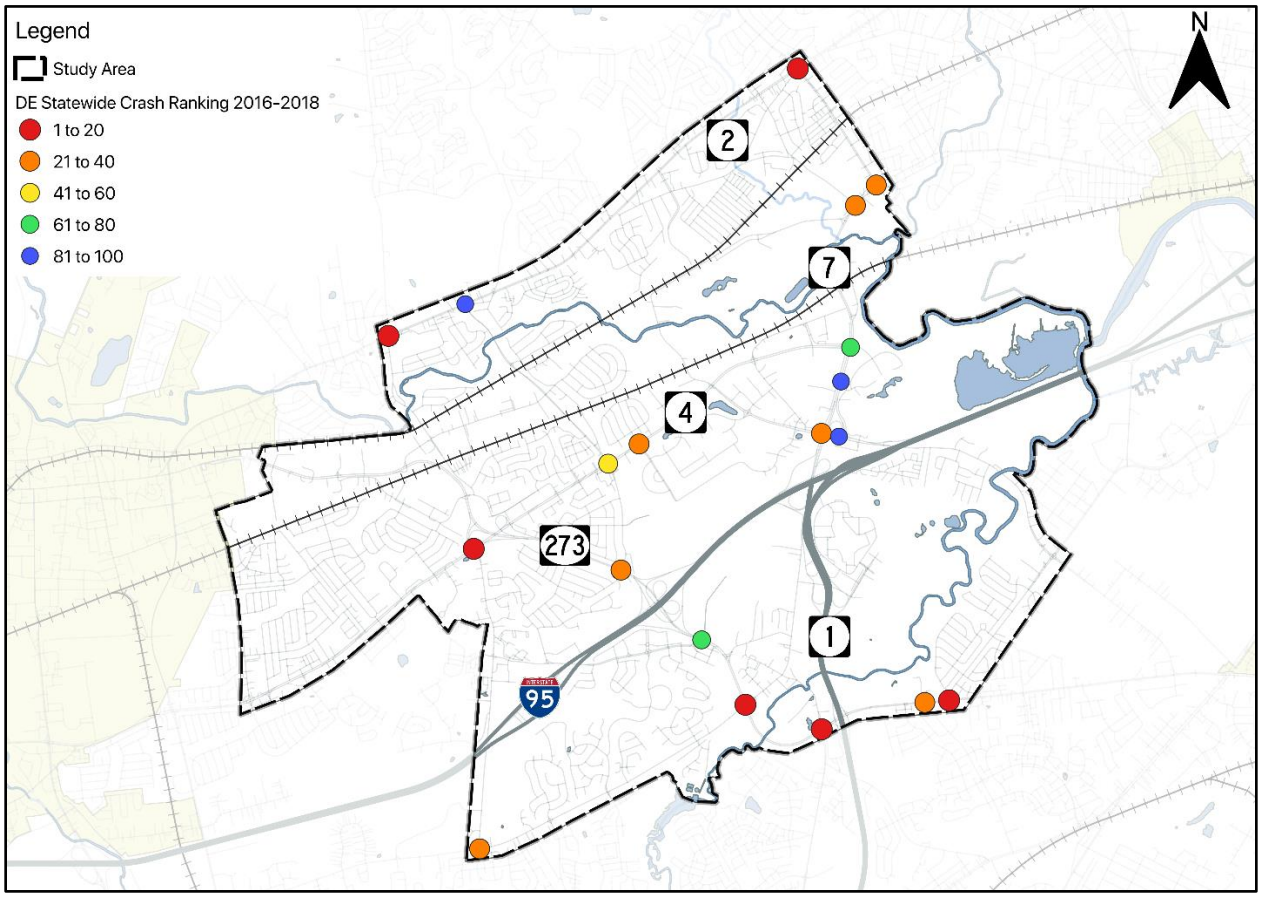


Figure 8: Statewide Crash Rankings, 2016 – 2018 Crash Data

E. Other Planning Studies

There are several ongoing or recently completed planning studies and related initiatives that support transportation improvements in and around Churchman's Crossing, as described below.

In 2019 a comprehensive update to the monitoring efforts was completed to document changes in conditions from 2004 through 2017 to serve as a starting point for the current Churchman's Crossing Plan Update. The 2019 update documented current conditions in terms of existing and planned land use development, multi-modal facilities, AM and PM peak hour traffic operational analyses at five (5) intersections that were monitored annually between 1997 and 2014, and statewide intersection crash analysis results for 2013 to 2015 (most recently available at the time of the study). The 2019 update identified 4.8 million square feet (MSF) of development that occurred between 1997 and 2019 and an additional 3.7 MSF that was committed as of 2019. The

update documented substantial increases in SEPTA ridership since the Fairplay Station opened in 2000 as well as numerous bus stops in the study area that rank among the top 20 percent statewide of ridership in the state. Although the report identified several intersections that operate at LOS E or LOS F, analyses indicated that there were stable operations over time at five (5) intersections monitored consistently between 1997 and 2019.

In 2017 an Economic Market Analysis of the SR 273 Corridor was performed for the New Castle County Department of Land Use by the University of Delaware. The study area for the market analysis was similar, though not identical to the Churchman's Crossing Plan Update study area. Key findings from the market analysis indicated that the area had more jobs than residents and was likely to remain a major regional employment center and shopping destination. The report recommended encouraging mixed-use development opportunities, enabling residential development to rebalance the area's population-to-employment ratio, encouraging transit-oriented development around Fairplay Station, and engaging in partnerships to develop a startup pipeline. The market analysis informed the development of land use scenarios for the current Churchman's Crossing Plan Update.

These planning studies were used to inform this study and were consistent with the overall goals in improving transportation facilities to provide a safer and better-connected network for vehicles, pedestrians, and bicyclists. The studies are also found on the project website: http://www.wilmapco.org/churchmans/.

Additionally, at the time this updated study is being published, the New Castle County Department of Land Use is in the process of updating the countywide comprehensive plan (NCC2050: https://ncc2050-nccde.hub.arcgis.com/). The community vision for the comprehensive plan update (published in January 2021) includes the following six themes:

- Livable Built Environment for All
- Conservation and Preservation
- Robust Economy
- Sustainable Growth
- Thriving Places and Community Character
- Diverse Engagement

The county comprehensive plan process is synthesizing recommendations developed for sub-areas of the county, called Community Area Master Plans (CAMPs), with policy recommendations that will apply across the county. Comprehensive plan area recommendations for four CAMPs have been developed through independent County and WILMAPCO-led studies during the past five years:

- Concord Pike Master Plan
- North Claymont Area Master Plan
- Route 9 Corridor Master Plan
- Southern New Castle County Master Plan

The Churchman's Crossing Plan Update is the fifth CAMP being evaluated at a greater level of detail to inform the countywide comprehensive plan update. All five sub-area plans were identified for an independent level of study separate from the countywide comprehensive plan update. The advantages of these joint land use/transportation studies are to evaluate land use and transportation system elements in a holistic approach, recognizing that a range of governmental agencies have responsibility for discrete elements of plan implementation. The recommendations in the current Churchman's Crossing Plan Update are intended to inform future actions for land use and transportation plan adoption elements by these respective agencies.

SEPTA, working with Amtrak and DTC, are also evaluating what options may be available to improve regional rail service to the SEPTA Station at Churchman's Crossing. Options being discussed include an extension of an existing rail track that could help support better service to and from the Churchman's Crossing area.

2. Planning Process

WILMAPCO serves as the Metropolitan Planning Organization (MPO) for the region and manages the regional Unified Planning Work Program (UPWP). The UPWP is a program funded partially by the Federal Highway Administration, Federal Transit Administration and state and local partners to advance planning for priority projects. The Churchman's Crossing Plan Update has been funded through the UPWP.

As mentioned in earlier sections of this report, WILMAPCO, DelDOT, DTC, and New Castle County Department of Land Use served as the Management Committee for the Churchman's Crossing Plan Update.

In addition to the Management Committee, an Advisory Committee comprised of county and state elected officials, municipalities, community groups, businesses, special interests, and citizens was assembled to provide input on issues, opportunities and constraints, draft scenarios, transportation alternatives, screening criteria, and implementation strategies. The following organizations were invited to participate on the Advisory Committee:

- Bank of America
- Bike Delaware
- Christiana Executive Campus
- Christiana Fire Company
- Christiana Hospital
- Christiana Mall (Brookfield Properties)
- City of Newark
- Civic League for New Castle County
- Committee of 100
- Delaware Department of Natural Resources & Environmental Control (DNREC)
- Delaware Nature Society
- Delaware Office of State Planning
- Delaware Park

- Delaware Transit Corporation (DTC)
- Delaware Technical Community College (Del-Tech)
- J.P. Morgan Chase
- New Castle County Chamber of Commerce
- Rutherford Community
- Shipps Realty, LLC
- Town of Christiana

A. Project Scope and Schedule

The Churchman's Crossing Plan Update began in mid-2020 with a listening tour hosted by the consultant team. Stakeholders were invited to meet with the consultant team to build relationships and share information about opportunities, issues, and concerns at the outset of the study. The project team presented findings from the listening tour, as well as a summary of existing conditions and trends, at the first community workshop, held September 16, 2020. Materials from the first community workshop, including themes from the listening tour and the summary of existing conditions and trends, as well as all other public workshops, are included in **Appendix D**.

Following the first workshop, the project team worked with the Management and Advisory Committees to develop transportation and land-use scenarios for analysis. Initial results were presented to the public at the second public workshop on March 3, 2021. Feedback from the Advisory Committee and the public workshop were used to establish the land use scenario used for analysis and to confirm transportation alternatives to be evaluated in later stages of the project.

Between March and June of 2021, the project team worked with the Management Committee and Advisory Committee to establish screening criteria to evaluate transportation improvement alternatives. Screening analysis results and preliminary transportation recommendations were presented at the public workshop held on June 23, 2021.

An overview timeline of project activities and meetings is included in **Figure 9**. Due to the COVID-19 pandemic, all meetings for the Churchman's Crossing Plan Update were held virtually.

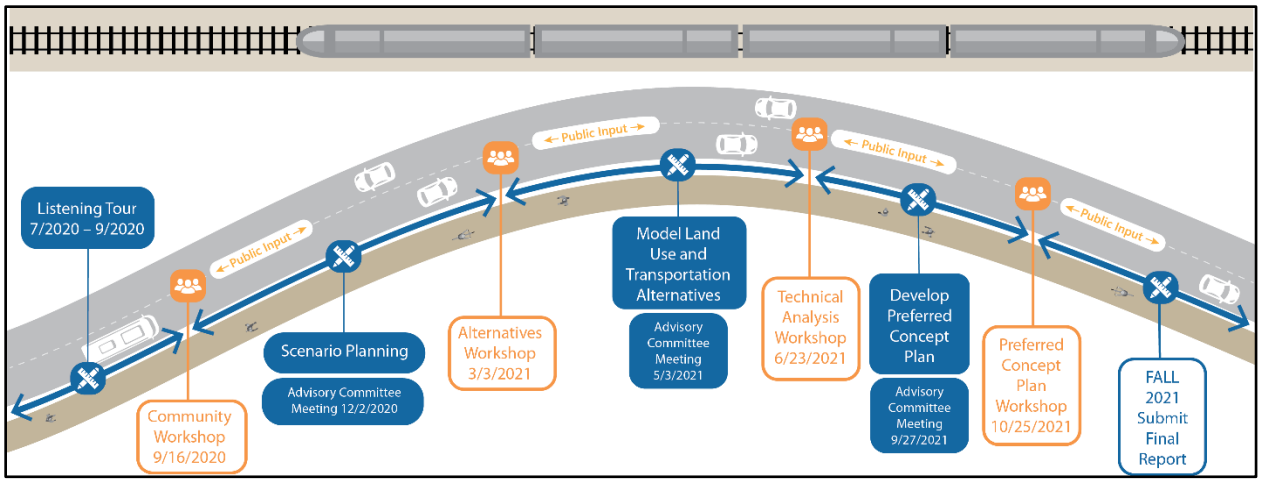


Figure 9: Project Schedule

B. Agency Coordination

Agency Coordination was handled through DelDOT's regularly scheduled meetings with federal and state agencies with interest or regulatory authority over environmental resources. The agencies include the Federal Highway Administration (FHWA), US Army Corps of Engineers, Environmental Protection Agency (EPA), US Fish and Wildlife Service, DNREC, State Historic Preservation Office (SHPO), and Delaware Department of Agriculture. The project team presented an introduction and status of the Churchman's Crossing Plan Update at DelDOT's Spring 2021 Environmental Resource Agency Meeting on March 12, 2021. A status update of the Churchman's Crossing Plan Update including the recommendations was presented at the Fall 2021 meeting on October 7, 2021. A copy of the presentations are available on the project website: www.wilmapco.org/Churchmans/.

C. Stakeholder Coordination and Public Engagement

The Churchman's Crossing Plan Update utilized consistent coordination with the Management Committee and input from the Advisory Committee at key decision points during the life of the study. Advisory Committee meetings were scheduled to allow stakeholders opportunities to engage with the project team, review information, and provide meaningful feedback as study related materials were being prepared in advance of public workshops with sufficient time for the project team to proactively incorporate feedback throughout the process. **Table 3** provides a summary of public engagement and the key topics discussed.

Applicable meeting documents can be found in **Appendix D**. Meeting recordings are available on the WILMAPCO website: www.wilmapco.org/Churchmans/. Written comments that were received during the study are summarized in **Appendix H**.

All public workshops were advertised on WILMAPCO's Facebook page, the project website, and in newsletters and direct communications to the project email list. Targeted public outreach was also performed prior to the third public workshop to increase participation, particularly among minority residents in the project study area. WILMAPCO coordinated with 13 of the area elected officials to increase outreach efforts and encourage public participation among their constituents, particularly residents of 11 communities identified as having a higher concentration of underrepresented minority populations.

Table 3: Summary of Stakeholder and Public Engagement

Management Committee Meetings	
Last Wednesday of each month, June 2020 – December 2021	• Recurring calls to discuss project schedule, technical analysis, and public involvement efforts
Advisory Committee Meetings	
7/2020 – 9/2020	• Listening tour interviews
12/2/2020	• Introduction to transportation and land use scenario planning • Transportation improvement projects • Land use considerations • Scenario planning metrics
5/3/2021	• Preliminary analysis results • Screening criteria • Introduction to implementation tools
9/27/2021	• Project overview • Alternatives considered • Transportation alternative screening analysis • Recommendations • Expected outcomes • Implementation strategies
Public Workshops	
9/16/2020	• Overview of transportation and land use planning • Existing conditions and trends
3/3/2021	• Overview of transportation and land use scenario planning • Transportation improvement projects • Land use considerations • Scenario planning metrics • Scenario planning results
6/23/2021	• Transportation alternative screening criteria • Analysis results • Initial project recommendations • Introduction to implementation tools

Table 3 continued: Summary of Stakeholder and Public Engagement

Public Workshops (continued)	
10/25/2021	• Project overview • Alternatives considered • Transportation alternative screening analysis • Recommendations • Expected outcomes • Implementation strategies
DelDOT Environmental Resource Agency Meetings	
3/12/2021	• Introduction of Churchman's Crossing Plan Update • Planning and Environmental Linkages (PEL) process • Environmental, cultural, and community resources in the study area
10/7/2021	• Project overview • Environmental, cultural, and community resources in the study area • Alternatives considered • Transportation alternative screening analysis • Recommendations

3. Project Vision

The vision for the Churchman's Crossing Plan Update is guided by three goals:

- Enhance quality of life
- Plan for sustainable growth
- Provide transportation choices

These goals also guided the original 1997 Churchman's Crossing Study. The vision was presented at a public workshop for the 1997 Study on July 19, 1995, and was a part of the documentation of the original 1997 Study. Input from the public in 1995 focused on quality of life, land use and transportation issues.

During the stakeholder listening tour, similar themes regarding quality of life for Churchman's Crossing residents, the impacts of future development, and the need for transportation choices other than single-occupant vehicles continued to resonate 25 years later.

4. Existing Conditions

A. Land Use

The Churchman's Crossing study area incorporates a mix of different uses, as summarized in **Figure 10** and described below. The eastern portion of the study area houses a key economic engine for New Castle County, with the most significant clustering of jobs other than in the incorporated municipalities of Wilmington and Newark. Significant employers in this area include Christiana Hospital, Delaware Park, Christiana Mall, J.P. Morgan Chase, Bank of America, and the

SLM Corporation (known as "Sallie Mae"). These developments tend to be on parcels with large acreages and impervious surface that has more parking area than building area (shown as black buildings surrounded by red parking in **Figure 10**), given their commercial nature as daytime activity centers. The last few remaining properties with significant undeveloped land exist in the eastern end of the study area (shown as white in **Figure 10**), but much of that area has limited development potential due to wetlands, floodplains, and waterways (shown in tandem in blue in **Figure 10**) associated with the Christina River and its tributaries. A second concentration of commercial properties exists in the northwestern (the western portion) portion of the study area along SR 273 between the CSX and Amtrak rail lines. About half of the study area is composed of established residential neighborhoods.

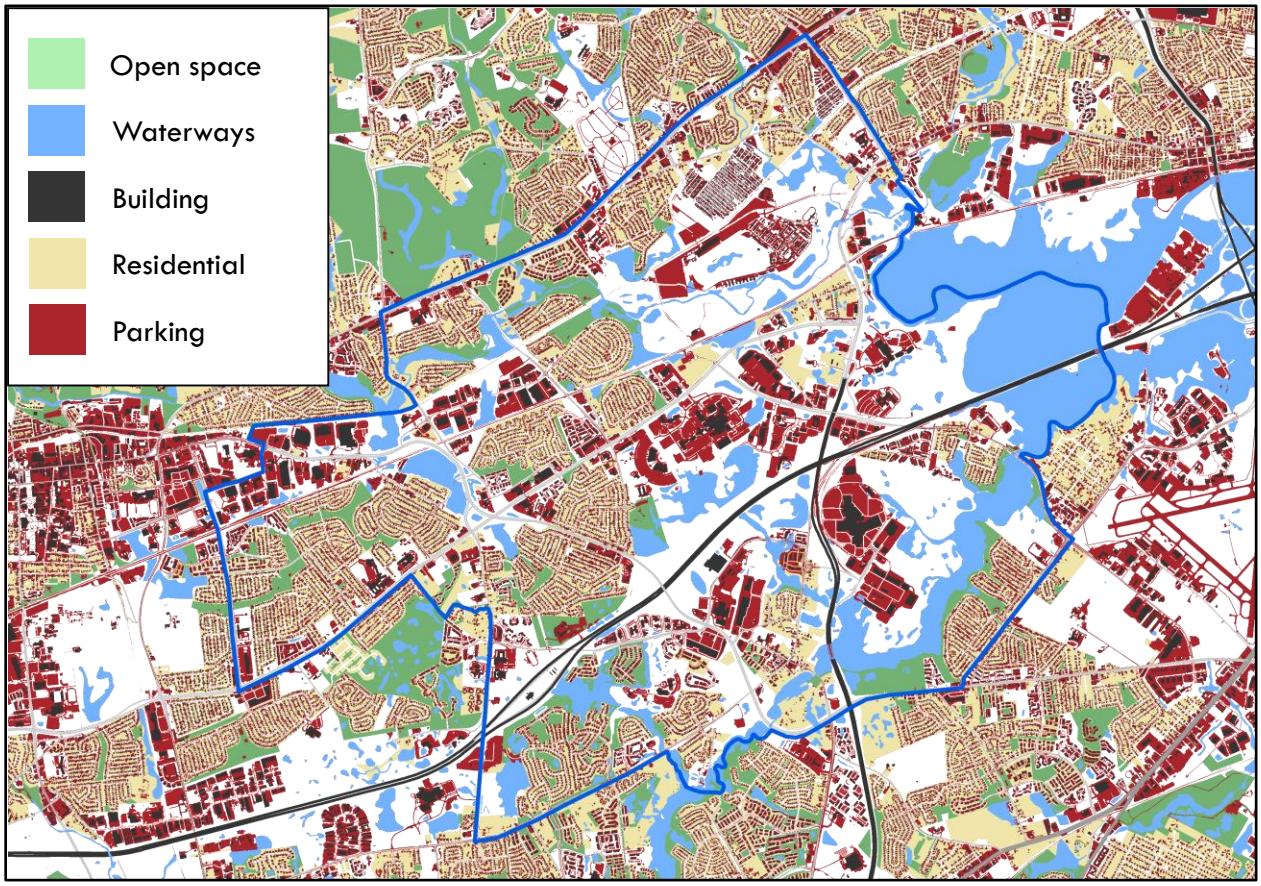


Figure 10: Existing Land Coverage

Churchman's Crossing is primarily a jobs center that attracts people into the area in the morning and outbound in the evening (**Figure 11**). Economic development in the Churchman's Crossing study area is anchored by health care and educational institutions (commonly referred to jointly as "eds and meds"), along with financial, retail, and hospitality industries. An analysis of jobs flows in an area defined by the Census Bureau and roughly similar to the Churchman's Crossing study area shows that approximately 95% of people who work in Churchman's Crossing live in a different area, while approximately 5% of people who are employed in Churchman's Crossing also live in the area, as shown in **Figure 11**. Conversely, approximately 15% of residents both live and

work in Churchman's Crossing, while 85% work in another area. The reason for this disparity is the disproportionate number of jobs relative to households compared to other parts of New Castle County (**Figure 12**). This job flow pattern results in a higher level of congestion due to people entering the area in the morning and exiting in the evening. One strategy to mitigate this issue is creating a better balance of residential and employment land uses.

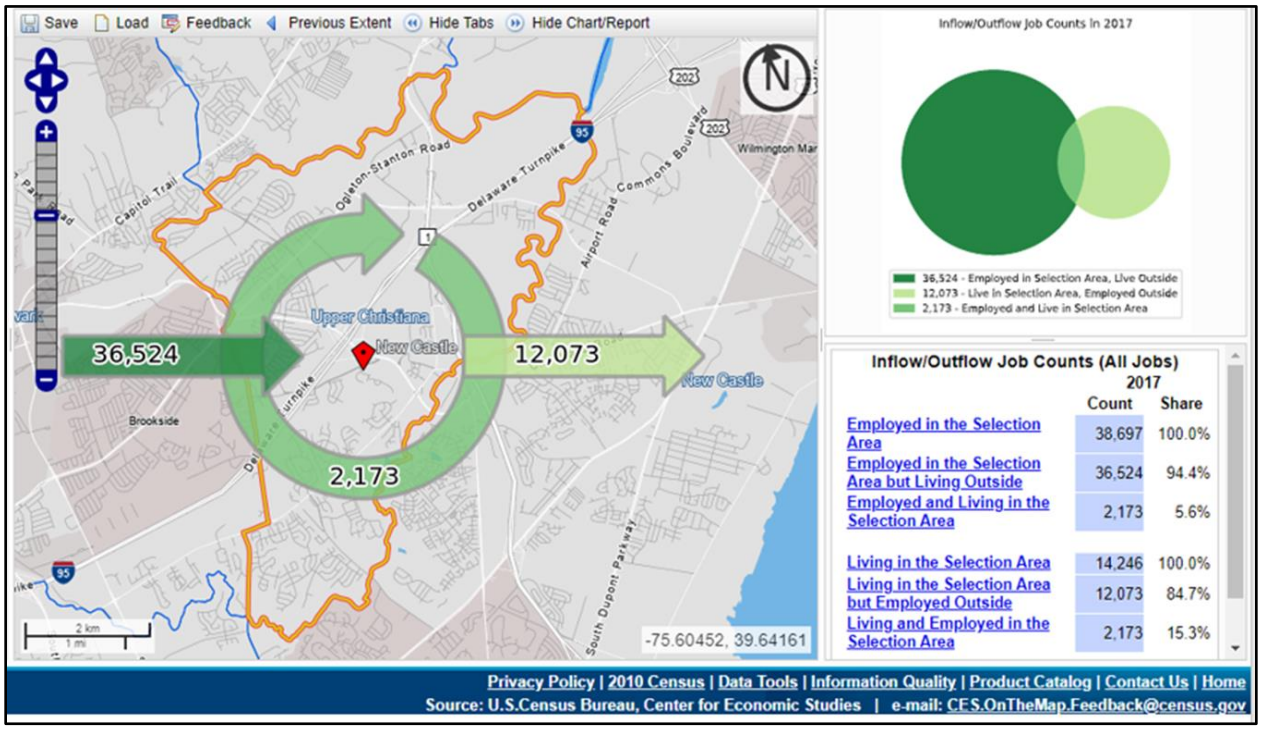


Figure 11: Existing Job Flows

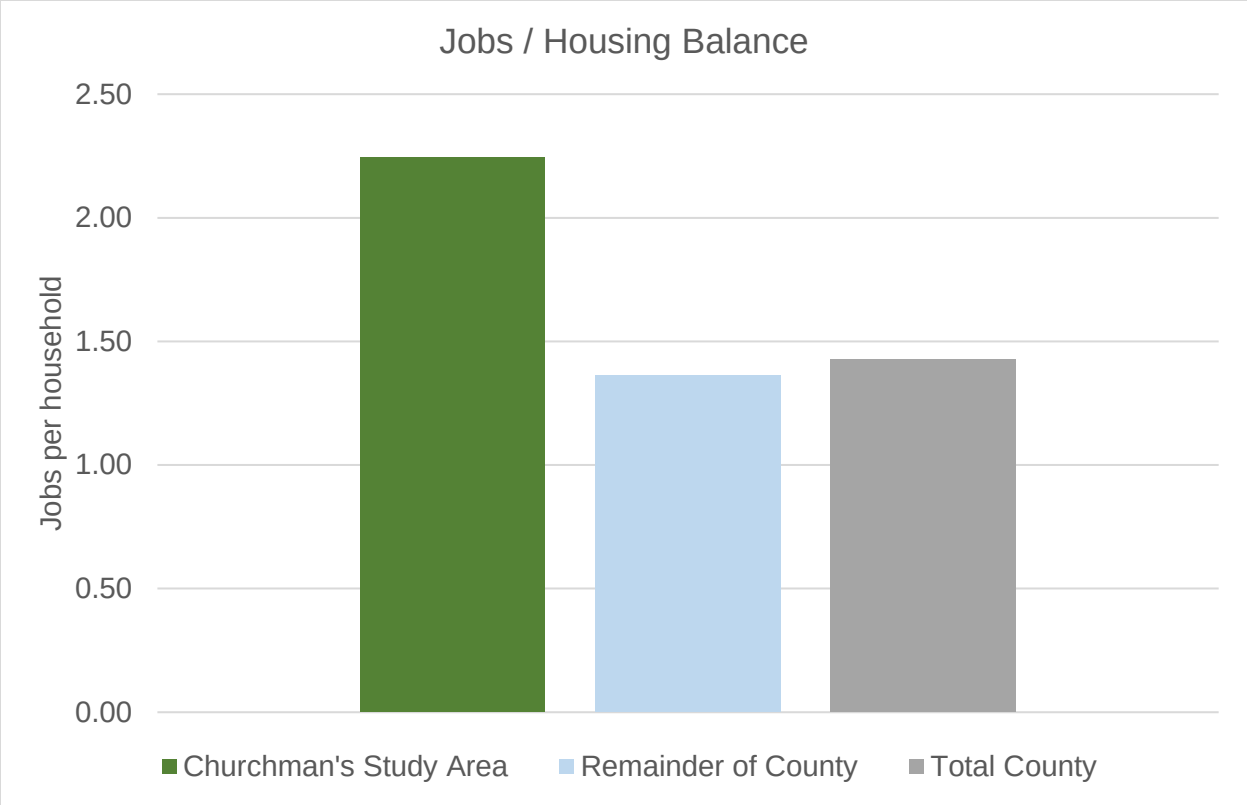


Figure 12: Existing Jobs-to-Housing Balance

Adopted land use forecasts for the study area reflect econometric forecasts for the county as developed and adopted by the Delaware Population Consortium (DPC) and allocated to different Transportation Analysis Zones (TAZ) by WILMAPCO. The econometric conditions countywide paint a picture of economic stasis, with a slight decrease in employment projected between 2020 and 2050 and only a small growth in population, as shown in **Figure 13**.

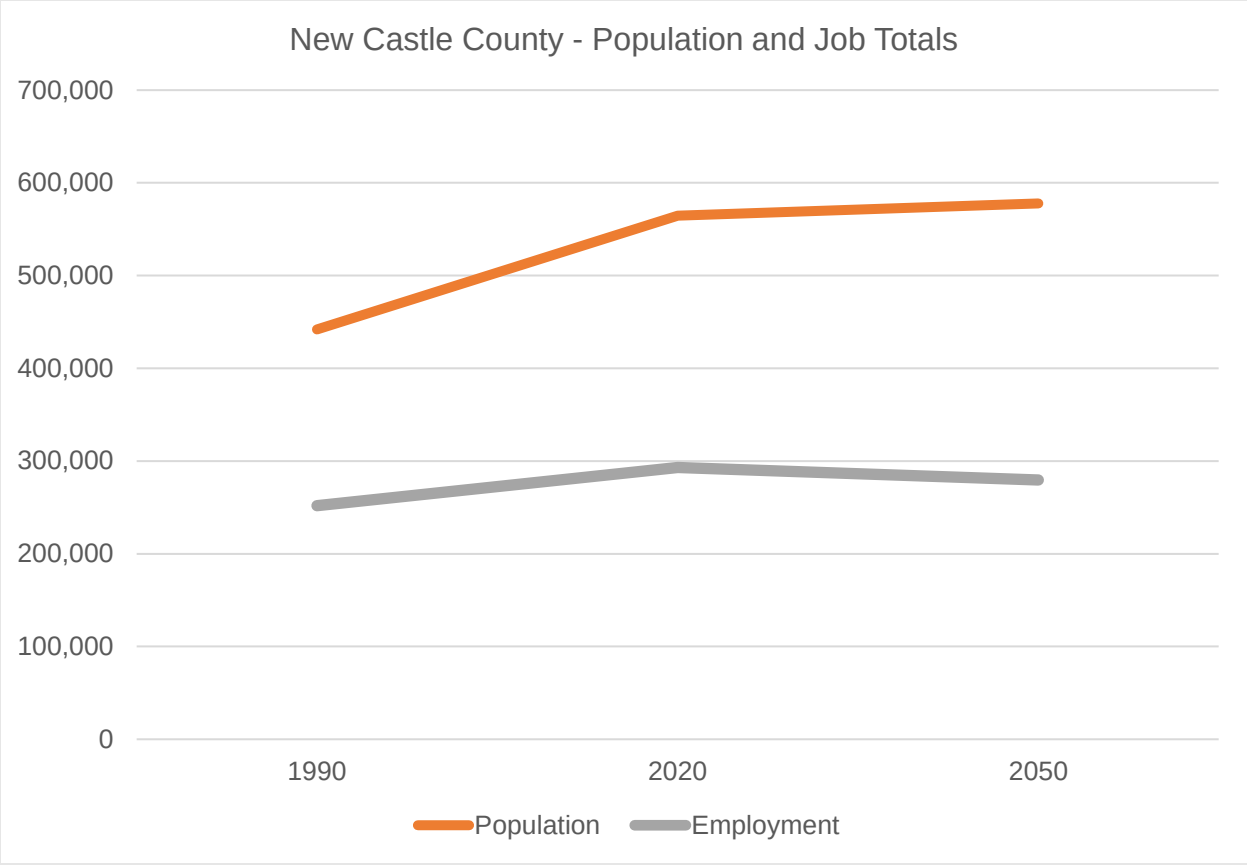


Figure 13: New Castle County Historic and Projected Population and Employment Totals

B. Demographic Characteristics

While the Churchman's Crossing Study area is generally known for its commercial and employment centers, neighborhoods are also an integral part of the activities in the area.

The communities within Churchman's Crossing have varying socio-economic and demographic characteristics. Environmental Justice (EJ) neighborhoods represent concentrations of racial and ethnic minority and low-income populations. Areas are designated as moderate or significant EJ neighborhoods in WILMAPO's 2019 Transportation Justice Plan based on a combination of census data, affordable housing development locations, and elementary school feeder zone demographic data. Two (2) moderate EJ neighborhoods are located within the Churchman's Crossing study area, around the Allendale Village Apartments and the Murray Manor manufactured home community, as shown in **Figure 14**.

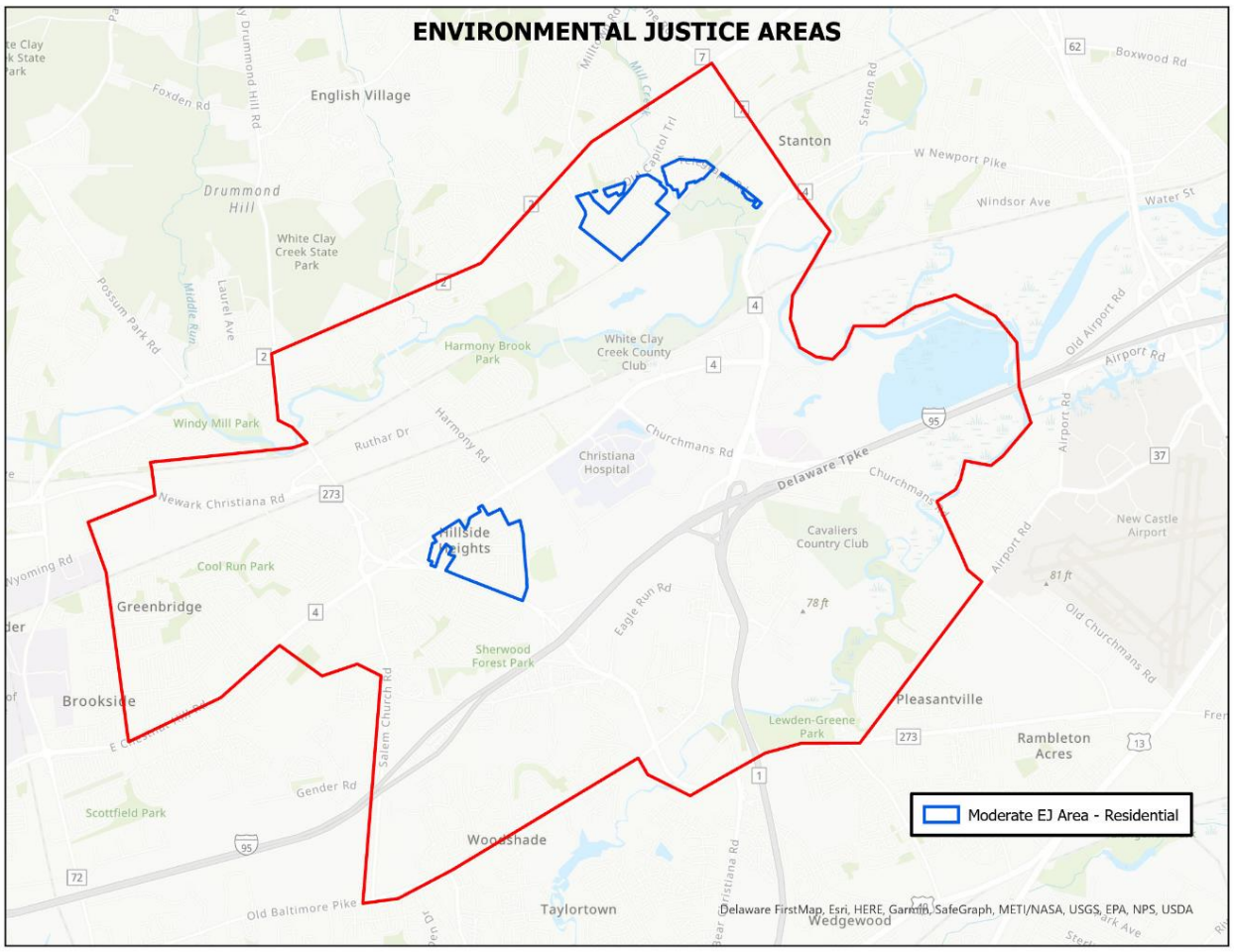


Figure 14: Environmental Justice Areas

Although not specifically EJ neighborhoods, based upon census data, the Cavalier Apartments and Buckingham Place Townhomes were identified as having a higher concentration of Asian residents. There are also clusters of Hispanic residents in Liberty Point Apartments, Christiana Village, Arbor Pointe Apartments, and Georgetown Manor Apartments, among other locations. African American clusters include Korman Villas, Chasemont Apartments, and Harbor Club.

These community characteristics were used to help inform some of the benefits and potential impacts from transportation improvements in the criteria matrix and land use strategies that were evaluated as part of the Churchman's Crossing Plan Update to ensure there are no disproportionate impacts to minority and low-income groups. The data also helped with targeted outreach to these communities to inform these communities of public input opportunities, particularly the virtual public workshops. After identifying disproportionately low minority involvement in the initial public workshops, targeted public outreach via elected officials representing each of these areas was used to engage non-white residents and encourage minority participation prior to the third public workshop. Continued efforts are needed to include these communities throughout the planning, design, and construction processes as projects progress.

C. Environmental and Historic Features

Figure 15 and **Figure 16** show the known natural environmental and cultural resources in the Churchman's Crossing study area, respectively. These resources have been identified through available GIS information.

Environmental Resources include wetlands, floodplains, and tributaries associated with both the Christina River in the southern part of the study area, and White Clay Creek in the northern part. The Christina River watershed is one of two watersheds in the county that are subject to a water quality improvement plan under the National Pollutant Discharge Elimination System (NPDES) permit for the discharge of stormwater through the municipal separate storm sewer system.

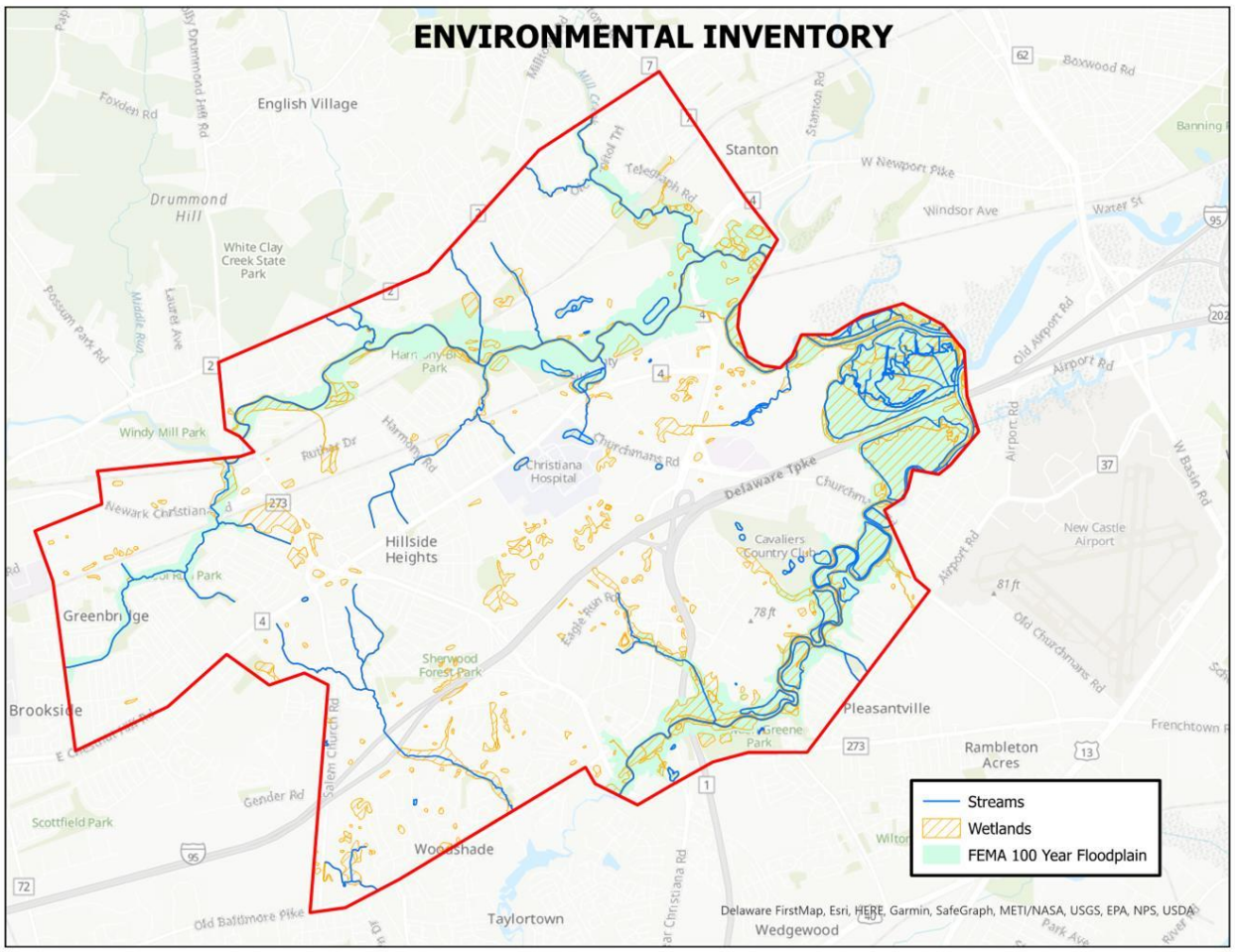


Figure 15: Environmental Inventory

For cultural resources, of note in the study area is the Christiana Historic District and associated properties including the John Lewden House and Old Fort Church. Other National Register Historic Places (NRHP) include the Hale-Byrnes House, St James Church, England House and Mill, and Robert Ferguson House. There may be NRHP or properties eligible to be zoned historic

(H-eligible) within the study area in addition to what is shown in **Figure 16** that have not yet been identified.

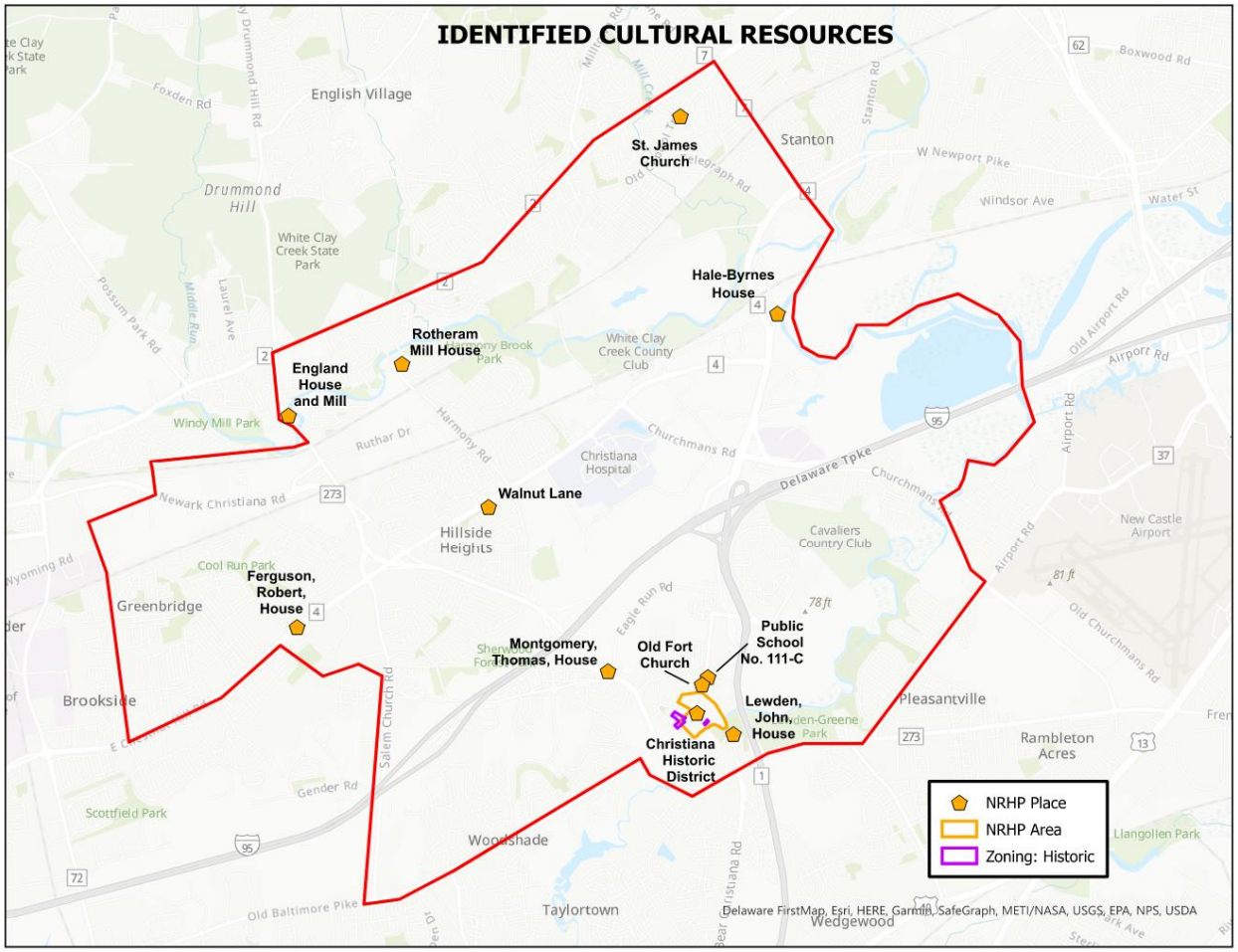


Figure 16: Existing Cultural Resources

D. Community Resources

Figure 17 shows community resources in the Churchman's Crossing study area, including the hospital and parks. The Christiana Hospital at SR 4 and SR 58 not only provides an important medical center for the Churchman's Crossing area but also for the rest of the state and region, along with being a major employer.

Public parks in the study area include Lewden-Greene Park, Coventry Ridge Park, Gallaher School Park, and Rutherford Park.

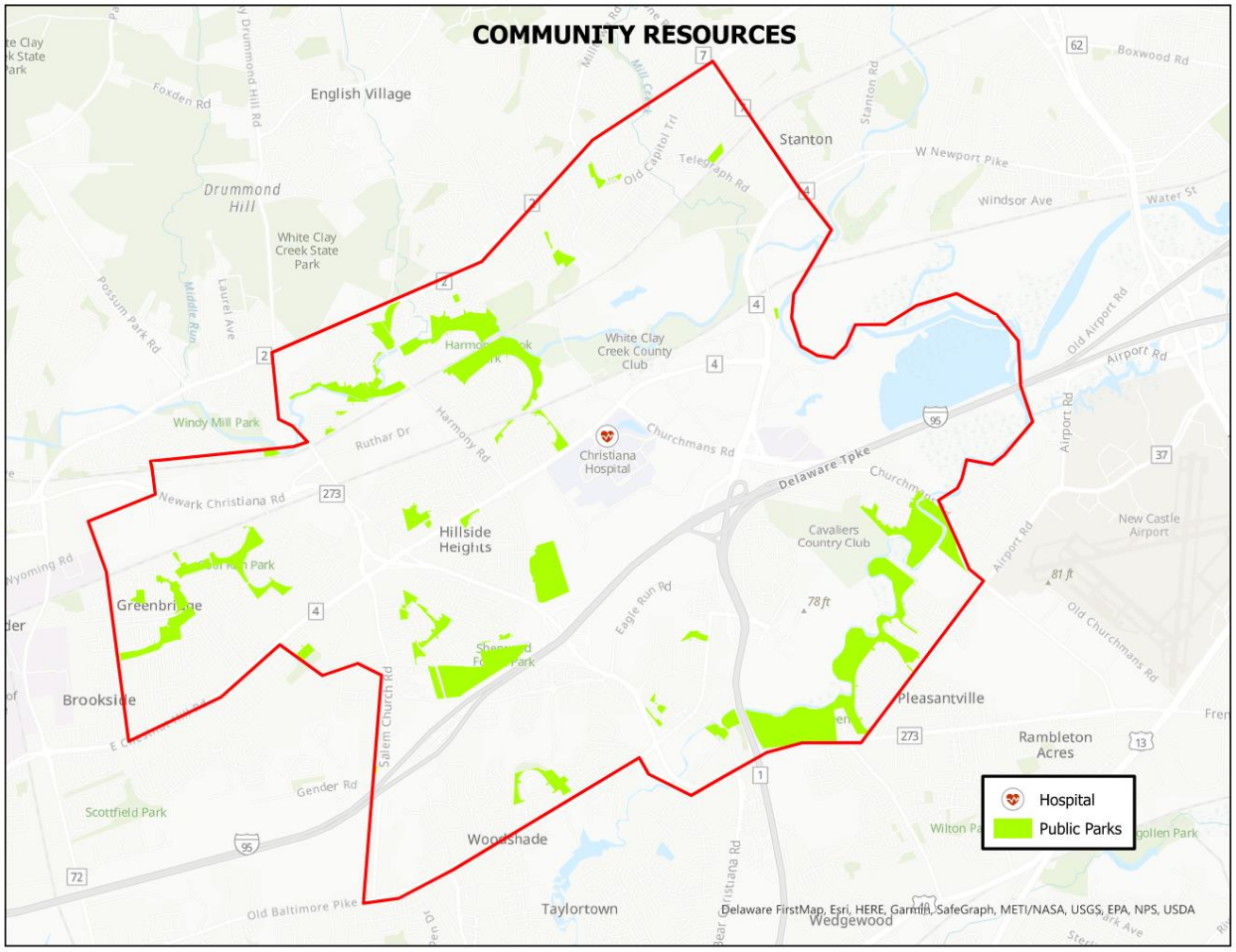


Figure 17: Existing Community Resources

5. Alternatives Considered

Based on the input and feedback from the listening tour, the first public workshop, and from the Management and Advisory Committees, the project team developed four (4) "bookend" scenarios consisting of integrated transportation and land use assumptions for preliminary analysis. The purpose of the scenario planning step was to explore how different transportation investments and land use development patterns would affect mobility and accessibility for travelers to, from, and within the Churchman's Crossing study area.

The bookends are defined by two (2) land use scenarios and two (2) transportation scenarios as shown in **Figure 18**. The bookend scenarios were each evaluated along with sensitivity testing to obtain results of a combination of alternatives that lie between each bookend. The results provide a multitude of possible paths that can be tailored to suit a specific future and help define actions to achieve the desired outcome. The following sections of this report summarize the scenario planning approach and results; full details are available in **Appendix E**.

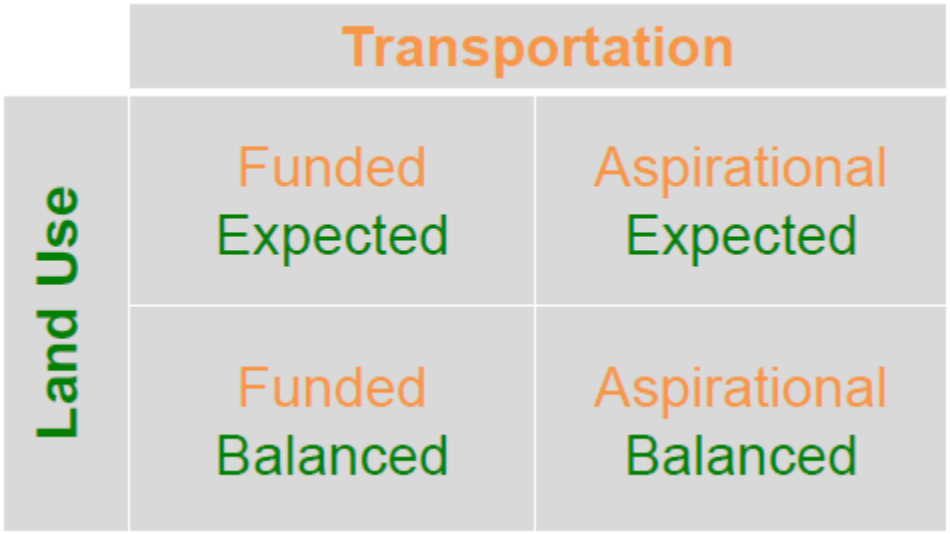


Figure 18: Scenario Planning "Bookends"

A. Transportation Scenarios

The transportation alternatives used for scenario planning consisted of the "Funded" and "Aspirational" projects identified in WILMAPCO's 2050 Regional Transportation Plan (RTP). The RTP sets a broad vision for transportation in the region, identifying long-term transportation needs and the projects that can address those needs.

The RTP identifies and prioritizes capital projects that can be pursued through 2050 with available funding. The resulting list is a collection of "financially constrained" projects. The Churchman's Crossing Plan Update used the RTP financially constrained list as the "Funded" transportation scenario, as shown in **Figure 19**. The Funded transportation network includes 18 projects that are distributed throughout the Churchman's Crossing study area and consider a variety of modes and facility types, bicycle and pedestrian accommodations for improving non-motorized accessibility, and physical road improvements that increase motor vehicle capacity.

Many of the Funded projects are currently in DelDOT's Six (6) Year Capital Transportation Program (CTP), with work underway or substantially complete:

- Construction is substantially complete on three (3) projects:
    - Project J, Eagle Run Road
    - Project N, Road A / SR 7 Improvements
    - Project R, Old Baltimore Pike and Salem Church Road intersection improvements. Note that additional improvements are being considered to realign the intersection of Old Baltimore Pike and Salem Church Road

- Seven (7) projects are currently in the Design phase:
    - Project B, Fairplay Station parking expansion
    - Project D, SR 273 / Chapman Road intersection improvements. Note these are short term improvements. Additional improvements are not yet funded in the CTP.
    - Project H, SR 2 / Red Mill Road intersection improvements
    - Project L, SR 4 / Harmony Road intersection improvements
    - Project M, SR 4 / SR 7 Phase 1, Stanton Split
    - Projects O, New Castle Transit Center, which includes Project P, roadway connections between Road A/Center Boulevard and Churchman's Road
- One (1) project is currently in the Planning phase:
    - Project E, SR 1 widening, Tybouts – SR 273. Note the SR 1 Widening is also funded for design in the CTP, after completion of the Planning Phase
- Two (2) projects are funded to begin design in later years of the CTP:
    - Project I, SR 2 / Harmony Road intersection improvements
    - Project K, SR 4 / Churchman's Road intersection improvements

While not studied in detail as part of the Churchman's Crossing Plan Update, the RTP financially constrained projects served as the baseline for analysis.

The RTP also identifies capital projects that would address long-term needs, but that cannot be funded based on current funding forecasts. These projects are included in the RTP on the "Aspirations List." The Aspirational transportation network for the Churchman's Crossing Plan Update included the four (4) projects on the RTP Aspirations List in the study area, as shown in **Figure 20**.

Finally, several additional projects were identified during the scenario planning process for consideration during later stages in the study. Although these projects were not explicitly included in either the Funded or Aspirational transportation networks for scenario planning, they were identified through prior studies (including the 1997 Churchman's Study), feedback from the public at virtual public workshops, and coordination with the Management and Advisory Committees concurrent with the scenario planning step. These "Additional" transportation projects include a diverse array of improvements, such as interchange improvements, intersection and ramp improvements, existing roadway extensions, new roadway connections, transit access roads, and travel demand management projects. The additional projects that were evaluated in later stages of the Churchman's Crossing Plan Update are shown in **Figure 21**. Projects identified between the first and second virtual public workshops are shown in green, and projects identified between the second and third workshops are shown in yellow.

In addition to the projects shown in **Figure 19**, **Figure 20**, and **Figure 21**, on an ongoing basis DelDOT implements smaller scale improvements such as signal timing improvements, signing and striping improvements, and lighting upgrades. Smaller projects that are implemented through regular operating activities were not evaluated as part of the Churchman's Crossing Plan Update, because it was assumed that these projects would continue to be implemented as part of DelDOT's programs to maintain the existing transportation network and system.

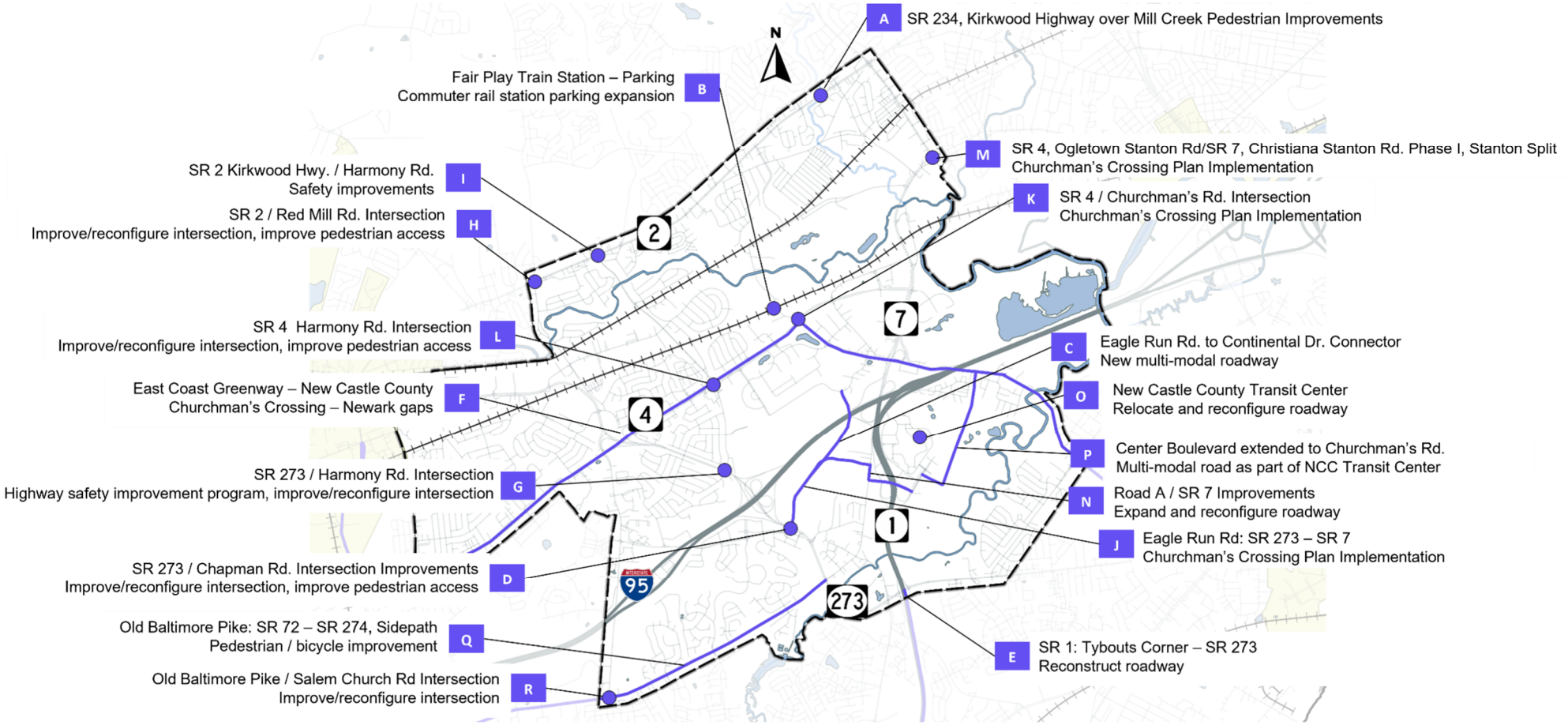


Figure 19: Funded Transportation Projects

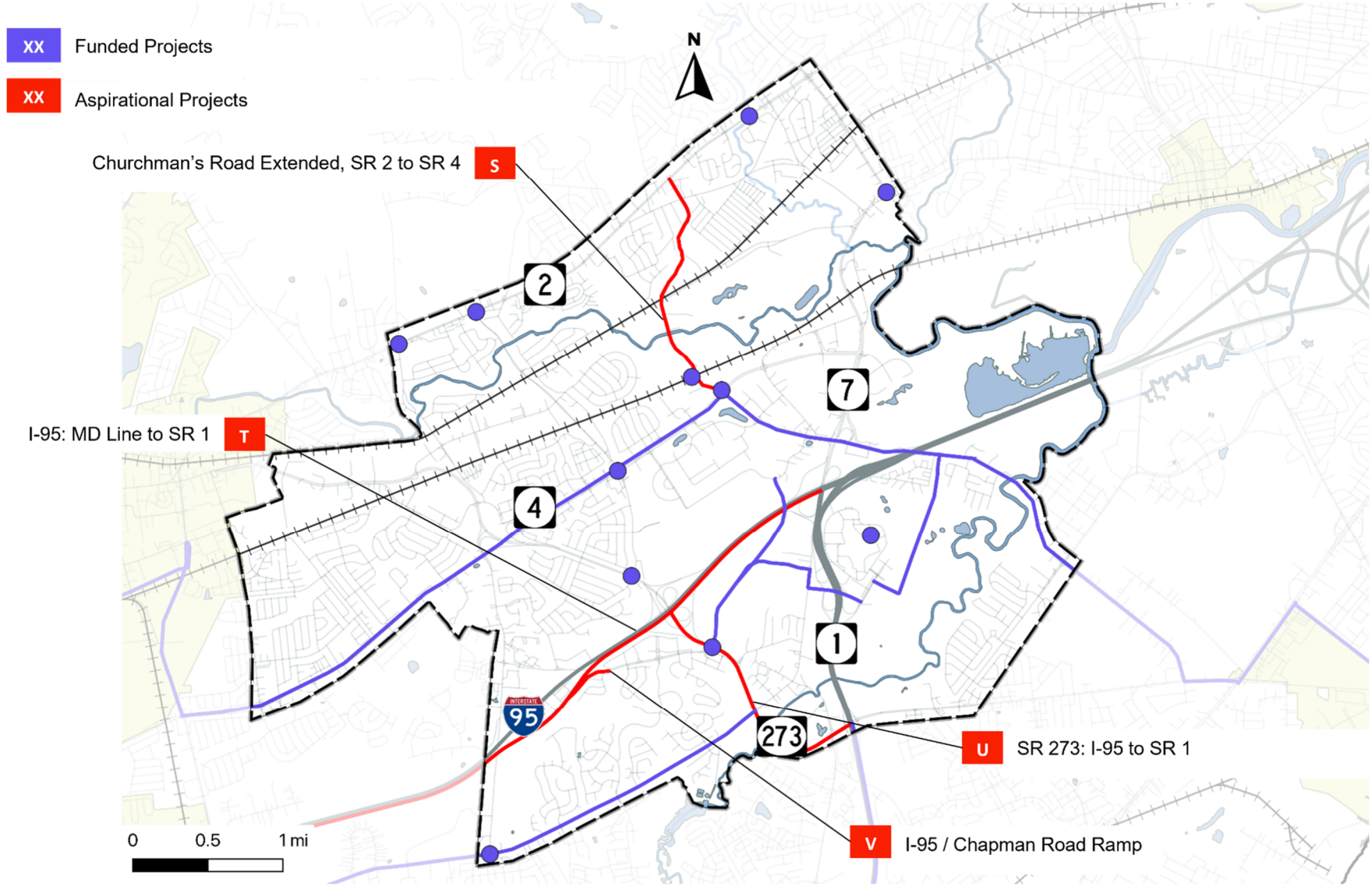


Figure 20: Aspirational Transportation Projects

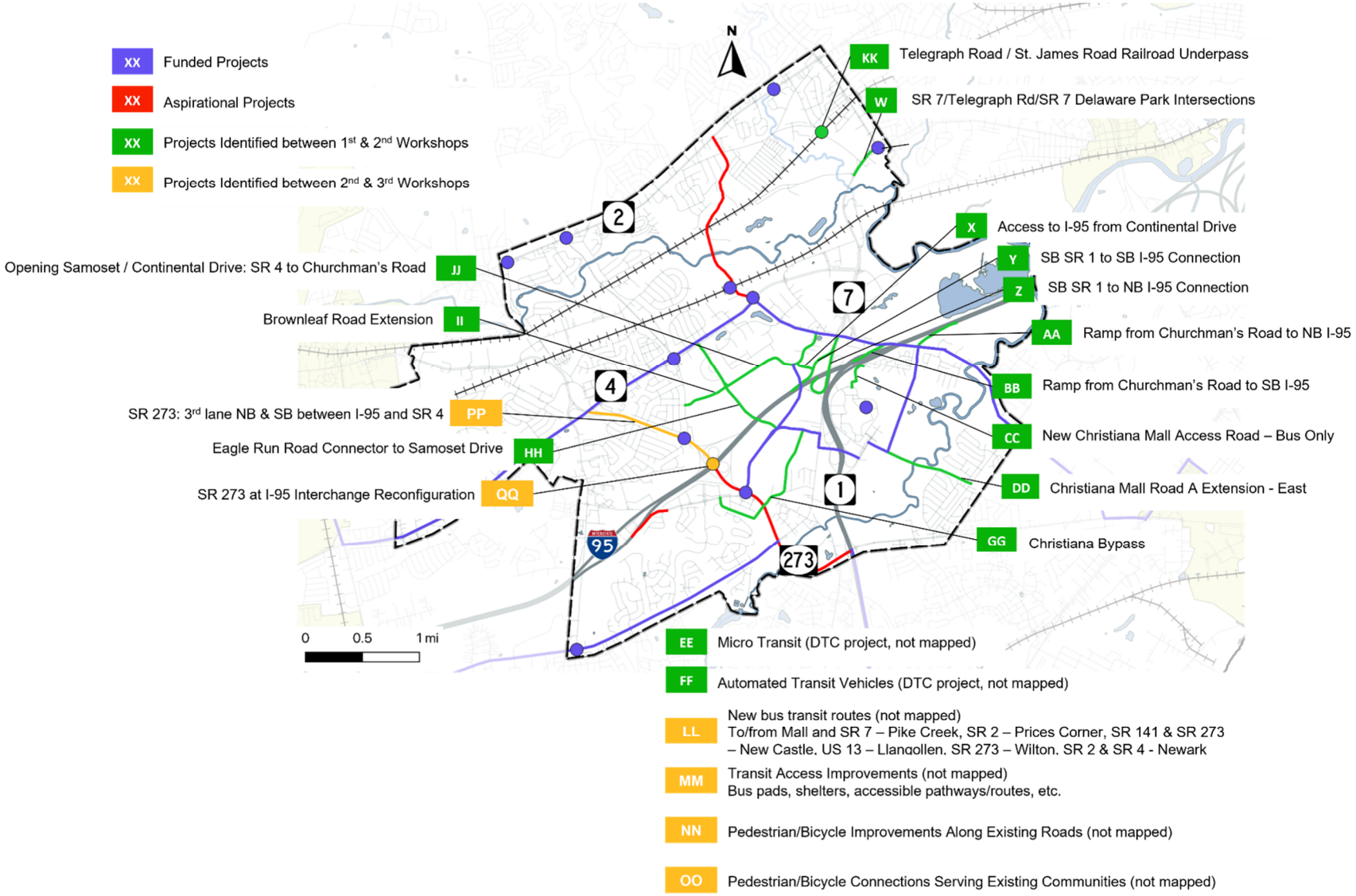


Figure 21: Additional Transportation Projects for Evaluation

B. Land Use Scenarios

To evaluate land use and transportation system performance in tandem, two alternative land use scenarios were developed, one consisting of "Expected" growth and the other presenting a more "Balanced" growth vision in terms of population and employment. Development of both land use scenarios was led by the New Castle County Department of Land Use in conjunction with initial phases of their comprehensive plan update process.

The Expected scenario, defined as the continuation of current trends, is the first of two land use bookends. This scenario, which is also referred to as "business as usual" (BAU), is based on existing growth patterns, and projects that are already in development or expected to occur based on regional econometric studies. An analysis of the BAU scenario indicates that the job to housing ratio in Churchman's Crossing is expected to increase by approximately 10% by 2050 (**Figure 22**). In other words, without policy intervention the number of jobs and housing will increase, although the number of additional jobs will increase disproportionately compared with the number of additional housing units. A jobs/housing balance of roughly 1.5 jobs per household would reflect the number of employed residents in a typical household.

The Balanced scenario, which includes the implementation of polies and actions to increase an area's mixture of uses and improve density, diversity, and design, is the second land use bookend. The Balanced scenario provides an alternative view of growth that provides opportunities for a greater share of study area employees to live nearer their workplaces. The resulting job to housing ratio in the Churchman's Crossing area would still be higher than the remainder of the county, but closer to the county-wide total (**Figure 22**).

The total population and jobs for the Churchman's Crossing study area for each scenario are as follows:

- Current (2019) conditions: 36,600 residents in 14,900 households; 33,500 jobs
- Expected (2050) conditions: 39,700 residents in 14,800 households, 37,100 jobs
- Balanced (2050) conditions: 55,200 residents in 20,700 households, 38,800 jobs

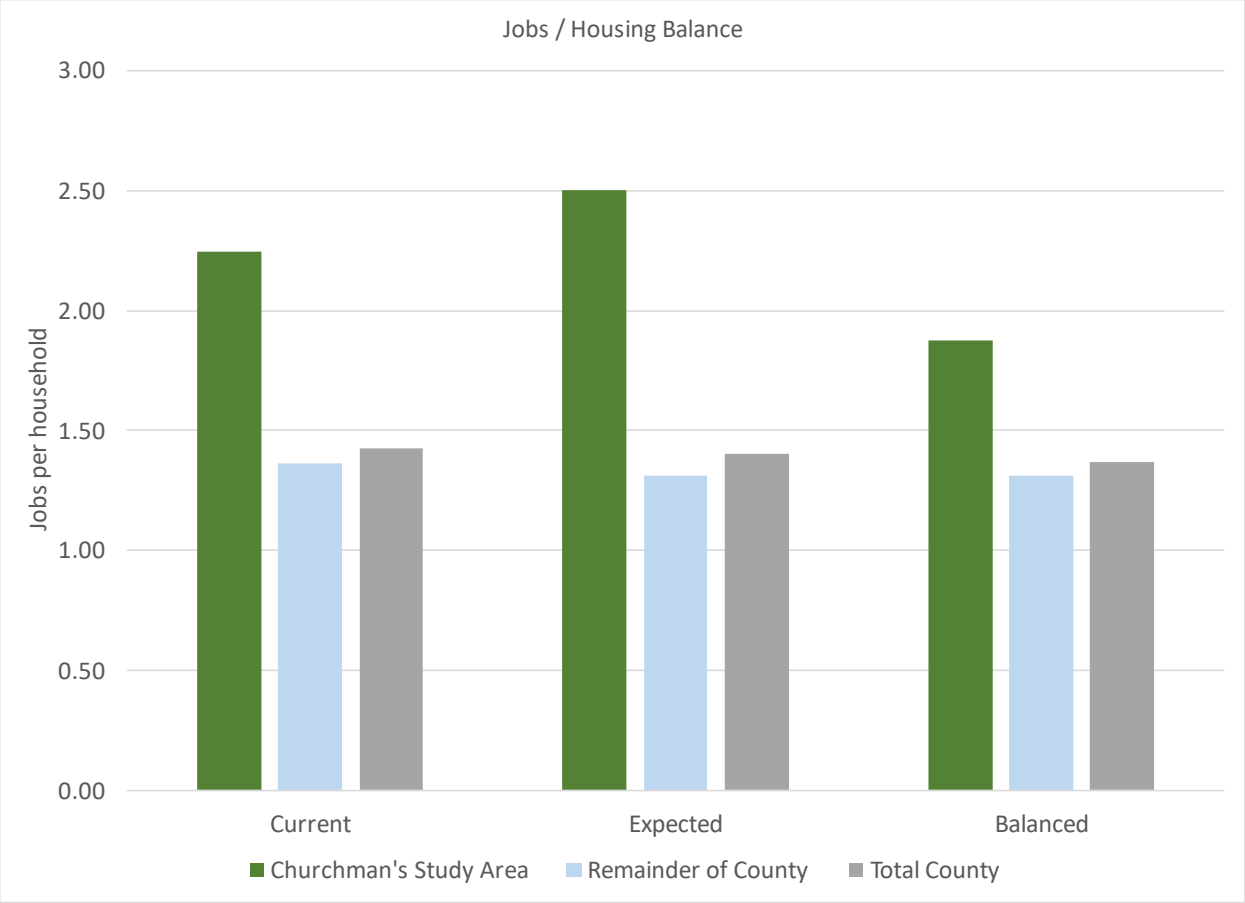


Figure 22: Current and Projected Jobs-to-Housing Balance

Figure 23 and **Figure 24** show where the residential and employment growth, respectively, is assumed to be concentrated under the Balanced land use scenario. The Churchman's Crossing study area is roughly represented by approximately 16 TAZs that are used in the regional travel demand model. Employment growth under the balanced scenario was assumed to be primarily in TAZs surrounding the Christiana Hospital, Fairplay SEPTA Station, and the Christiana Mall. Residential growth was assumed to be in similar areas to foster live-near-work policies to reduce commute lengths.

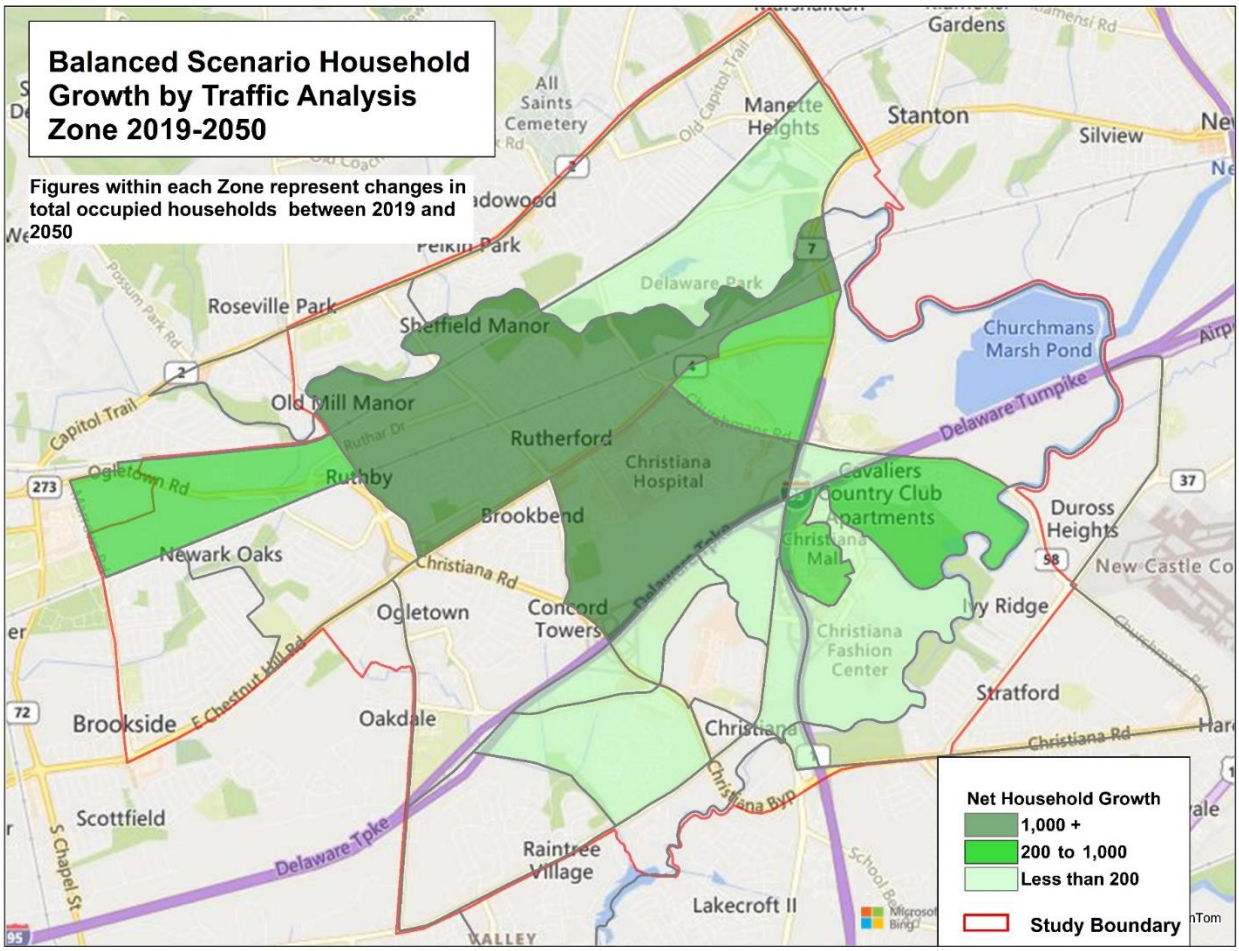


Figure 23: Balanced Land Use Scenario – Residential Growth

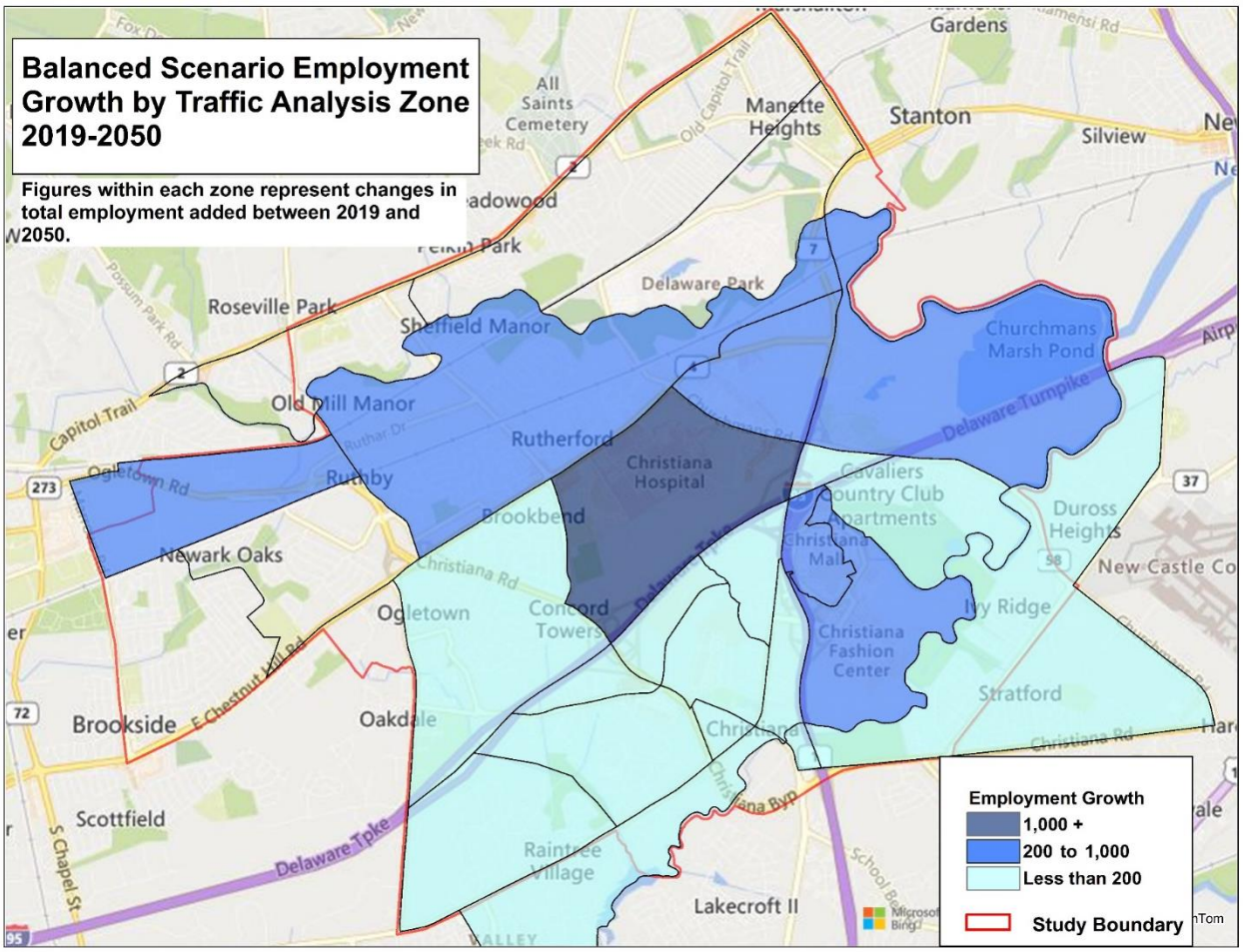


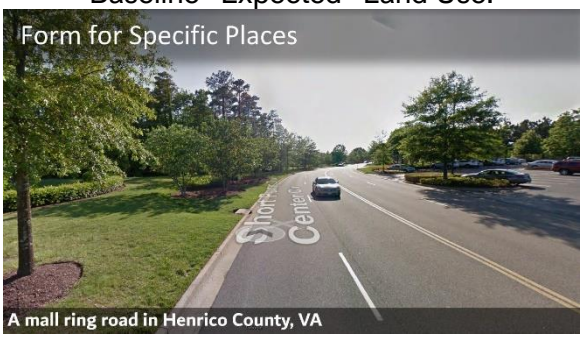
Figure 24: Balanced Land Use Scenario – Employment Growth

Figure 25, **Figure 26**, and **Figure 27** provide visualizations of how the Balanced land use scenario could look from a design form perspective, compared to the business-as-usual or Expected scenario. These visualizations were prepared as part of the New Castle County Department of Land Use comprehensive plan update process and presented to the community at the comprehensive plan update's "Deep Dive" session on April 7, 2021. These general concepts are also consistent with the strategies and design guidelines noted in the original 1997 Churchman's Study.

The diverse mix of uses in the Balanced scenario improves local accessibility by increasing residential development near employment, which in turn facilitates shorter vehicular work trip lengths and reduces vehicle miles traveled (VMT) by making jobs and other destinations closer to where people live and by increasing the quality of the walking and transit environment. Furthermore, plans and policies that encourage mixed-use centers with better design, residential density, and housing affordability also decrease the amount of vehicle trips generated. Design policies that encourage shorter blocks, connectivity, and pedestrian-scale infrastructure promote fewer vehicle trips and more walk trips. Policies that increase residential density reduce VMT by reducing the external vehicle trips entering an area. Affordable housing decreases VMT by

attracting transit dependent residents and as well as people who choose to take transit or non-vehicular modes of transportation instead of driving single-occupant vehicles. In addition to impacting travel behavior, different designs that incorporate green stormwater infrastructure, trees, and other improvements can also provide environmental and ecosystem benefits including flood mitigation, better water quality, improved aesthetics, and resilience to climate change.

Baseline "Expected" Land Use:

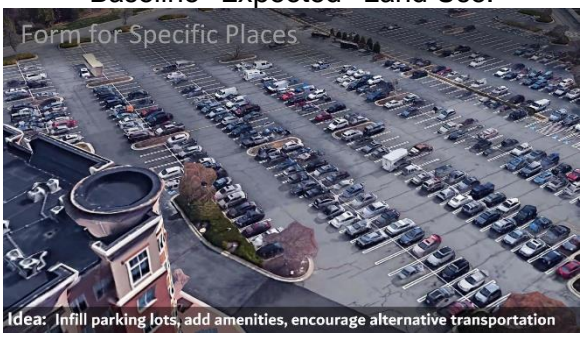


Potential "Balanced" Land Use:

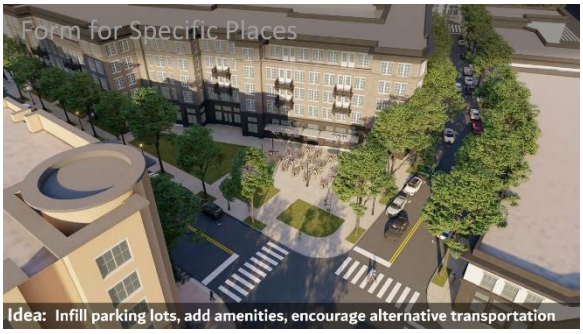
Source: New Castle County Department of Land Use "Deep Dive" Presentation 4/7/2021

Figure 25: Expected vs. Balanced Land Use Visualization – Mall Ring Road

Baseline "Expected" Land Use:



Potential "Balanced" Land Use:



Source: New Castle County Department of Land Use "Deep Dive" Presentation 4/7/2021

Figure 26: Expected vs. Balanced Land Use Visualization – Commercial Campus Parking

Baseline "Expected" Land Use:

Potential "Balanced" Land Use:

Source: New Castle County Department of Land Use "Deep Dive" Presentation 4/7/2021

Figure 27: Expected vs. Balanced Land Use Visualization – Shopping Plaza Frontage

Scenario Planning Metrics

Three primary screening metrics were used to assess the relative performance of the scenarios from the perspective of land use and transportation system effectiveness. The three metrics included:

- Speed/proximity analysis: an assessment of average trip speeds and trip distances. This metric accounts for the idea that motorists are more willing to accept lower speeds to reach nearby destinations in more urban areas, while rural areas with more distant destinations require higher speeds to meet a person's "travel time budget."
- Relative arterial mobility: an assessment of travel times across the study area arterial network during peak commuter periods as compared to free-flow conditions. This metric assigns a level of service (LOS) to roadway segments as opposed to individual intersections.
- Fiscal sustainability: an assessment of the degree to which tax revenue is associated with future development. This metric accounts for the potential return on investment from "higher and better" land uses that generate additional tax revenue that can be used for funding transportation and other services for people living and working in the area.

Scenario Planning Findings

The outcomes of the scenario planning process were presented at the second virtual public workshop. Key findings include the following:

- Under any of the scenarios examined, the arterial roadway system in the study area will operate at close to Level of Service (LOS) D from an areawide perspective.
- A land use scenario that better balances jobs and housing in the study area provides a more efficient use of transportation system investments, and that efficiency can be further improved with supportive land use and transportation demand management (TDM) policies.
- Important transportation projects to improve multimodal connectivity within the study area are those that span multiple properties, including Churchman's Road Extended (Project S in **Figure 20**), a new arterial connection across I-95 (Project C in **Figure 19** or Project HH in **Figure 21**), and enhanced transit connecting the Fairplay station to the Christiana Mall transit center. Implementation tools that leverage private sector interest in these projects are examined further in Section 9.E of this report.
- Although capacity improvements along I-95 (Project T in **Figure 20**) have effects on I-95, the effects on the surrounding arterial system are negligible due to the amount of through traffic traveling on I-95. This project should remain separate from any recommendations from the current Churchman's Crossing Plan Update.

Following the second public workshop, in conjunction with the Advisory and Management Committees, the project team determined that the Balanced land use scenario should be used to evaluate potential transportation alternatives in subsequent stages of the study process.

Transportation alternatives that were further analyzed based on the Balanced land use assumption included three (3) of the four (4) projects from the Aspirational scenario – Churchman's Road Extended (Project S), widening SR 273 between SR 1 and I-95 (Project U), and the northbound I-95 ramp to Chapman Road (Project V) – as well as all "Additional" projects shown in **Figure 21**. As noted above, capacity improvements along I-95 (Project T) were not carried forward because this project would have more regional impacts on users traveling through the region than within the project study area. The RTP financially constrained projects (**Figure 19**) were also not evaluated in more detail in later stages of the process because these projects are already funded. The baseline for analysis assumed that all projects in the Funded network would be completed.

6. Transportation Alternative Screening Criteria

The project team identified 12 screening criteria consistent with the project vision to capture tradeoffs and compare transportation alternatives. These criteria were presented to both the Management and Advisory Committees for review and input. Then, the project team qualitatively assessed each project based on all 12 screening criteria to assign a rating from "most beneficial" to "most adverse" for each of the criteria. The ratings are summarized in a matrix format in **Figure 28**.

The criteria used to evaluate each of the transportation alternatives were defined as follows:

- Connectivity: Does the project create new high-quality connections? High-quality connections include new crossings of major barriers, such as the Amtrak line or I-95, to connect sub-areas within the study area. Some projects are more operational in nature or impact a more localized intersection or area around the improvement.
- Extent of Effect: How many users will benefit from the project? This criterion considered both the anticipated number of users and the length to estimate person miles of travel, compared to vehicle miles of travel.
- Congestion: The congestion criterion was similar to the relative arterial mobility metric used in the scenario planning phase of the study. Projects that would be expected to result in low volume-to-capacity ratios, or which could be underutilized, were rated lower than projects that may result in some moderate congestion during the peak periods and relatively uncongested conditions during other hours of the day.
- Transit Enhancement Opportunities: Projects that provide new connections, improve access to transit stops, enhance the transit experience, or improve transit performance received the highest ratings. These could include roadway projects that can also serve new or enhanced transit service.
- Mode Share: Will the project reduce reliance on driving alone? Roadway capacity expansion projects may increase single-occupancy vehicle trips by reducing congestion

while new connections may have a mixed effect by providing better transit service and multi-modal amenities alongside the new roadways.

- Bicycle & Pedestrian Level of Traffic Stress: DelDOT's Bicycle LTS model was used to evaluate improved connectivity to schools, community centers, employment centers, transit, and parks.
- Economic Development / Redevelopment Opportunities: Does the project help create "location, location, location" for new or re-developable properties? Projects that improve access to locations that can be redeveloped rated higher than operational improvements that do not change access.
- Safety: Does the project address existing safety concerns? Although all projects would be designed to address safety, new roadway connections and capacity improvements may reduce some congestion related crashes while introducing new conflict points at new intersections or larger pedestrian crossings.
- Constructability / Engineering / Legal: Are there legal (deed restrictions as an example), maintenance of traffic, property owner coordination, or other anticipated challenges to constructing the project? Challenges could include the need to build an underpass or overpass, relocate roadside utilities, or modify access along the Interstate, among others.
- Natural Environment Impacts: What impacts are there to streams, wetlands, or flood plains? Available GIS data was used to identify resources that may be impacted.
- Cultural / Historic Resource Impacts: What impacts are there to cultural and historical resources? Available GIS data was used to identify resources that may be impacted.
- Noise / Property Impacts: What impacts are there to existing residential communities and businesses? Projects that may have substantial noise impacts or direct impacts to private properties rated lower than those that could be accommodated within existing right-of-way with minimal impacts to adjacent properties.

WILMAPCO

Churchman's Crossing Study

PROJECT CRITERIA SUMMARY

June 2021

DelDOT

		FUNDED	RTP ASPIRATIONS			ADDITIONAL PROJECTS																		
	Transportation Improvement Alternative	RTP Financially Constrained Improvements	Churchmans Road Extended, SR 2 to SR 4	SR 273: 3rd lane NB & SB between SR 1 and I-95	Northbound I-95 Ramp to Chapman Road	SR 7 Intersections: SR 7/Telegraph Road, SR 7/Delaware Park Boulevard	Southbound I-95 Access from Continental Drive	Southbound SR 1 to Southbound I-95 Connection	Southbound SR 1 to Northbound I-95 Connection	Northbound I-95 Ramp from Churchmans Road	Southbound I-95 Ramp from Churchmans Road	Christiana Mall Access Road-Bus Only	Christiana Mall Road A Extension - East	Christiana Bypass	Eagle Run Rd. Connector to Samoset Dr. (2nd I-95 Crossing)	Brownleaf Road Extension	Opening Samoset Dr./Continental Dr:: SR 4 to Churchmans Road	Telegraph Road/St. James Road Railroad Underpass	Micro Transit (DTC)	Automated Transit Vehicles (DTC)	New bus transit routes *To/from Mall and SR 7 - Pike Creek, SR 2 - Prices Corner, SR 141 & SR 273 - New Castle, US 13 - Llangollen, SR 273 - Wilton, SR 2 & SR 4 - Newark*	Transit Access Improvements: Bus pads, shelters, accessible pathways/routes, etc.	Pedestrian/Bicycle Improvements Along Existing Roads	Pedestrian/Bicycle Connections Serving Existing Communities	SR 273: 3rd lane NB & SB between I-95 and SR 4	SR 273 at I-95 Interchange Reconfiguration
	Map	A-R	S	U	V	W	X	Y	Z	AA	BB	CC	DD	GG	HH	II	JJ	KK	EE	FF	LL	MM	NN	OO	PP	QQ
CRITERIA	Connectivity		●	○	◐	○	◐	◐	◐	◐	◐	◐	●	◐	○	◐	◐	○	◐	◐	◐	◐	◐	○	○
	Extent of Effect – Person Miles Traveled		●	●	○	●	○	○	○	○	○	○	◐	○	◐	○	○	○	○	○	○	○	○	●	◐
	Congestion		●	●	○	◐	●	●	●	◐	●	○	○	◐	◐	◐	●	○	○	○	○	○	○	●	●
	Transit Enhancement Opportunities		●	○	○	◐	●	●	●	◐	◐	◐	●	◐	○	◐	●	◐	●	◐	●	●	●	○	○
	Mode Share		○	◑	◑	◑	◑	◑	◑	◑	◑	◐	○	○	○	○	○	○	◐	◐	◐	◐	◐	◐	○
	Bicycle & Pedestrian Level of Traffic Stress		●	●	◑	◐	◑	○	○	◑	◑	◑	◐	○	○	○	◐	○	○	○	○	◐	◐	◐	●	●
	Economic Development / Re-Development Opportunities		●	○	○	○	◐	○	○	○	○	◐	◐	●	○	◐	●	◐	●	●	●	●	●	●	○	○
	Safety		○	○	◑	●	◑	○	◐	●	●	●	○	○	○	○	○	●	●	◐	◐	●	●	●	○	●
	Constructability / Engineering / Legal		◑	◑	◑	◑	◑	◑	○	●	●	●	◑	○	●	○	◑	●	○	◑	○	○	○	○	●	◑
	Natural Environment Impacts		◑	◑	○	◑	○	○	○	●	○	○	●	●	○	◑	○	○	◐	◐	◐	○	○	○	○	○
	Cultural / Historic Resource Impacts		◑	◑	○	◑	○	○	○	◑	○	○	●	◑	○	◑	○	○	○	○	○	○	○	○	○	○
	Noise / Property Impacts		◑	◑	◑	◑	○	○	○	◑	◑	○	●	◑	◑	●	○	○	◐	◐	◐	◐	○	○	●	○
	Cost	$377.3M	$85.0M	$33.0M	$3.8M	$3.7M	$2.5M	$11.1M	$1.9M	$7.1M	$25.0M	$0.9M	$34.0M	$19.3M	$54.0M	$5.0M	$7.2M	$1.9M	$0.5M	$1.2M	$6.0M	$5.0M	$10.0M	$10.0M	$40.0M	$37.0M

RATING

● Most Beneficial ◐ ◑ ○ Neutral ◑ ● Most Adverse

RK&K

Figure 28: Transportation Alternative Screening Criteria Matrix

7. Transportation Alternative Screening Analysis

Each of 24 transportation project alternatives – three (3) aspirational projects shown in **Figure 20** (not including capacity improvements on I-95) and all additional projects identified in **Figure 21** – were evaluated using the 12 aforementioned screening criteria. A summary of the findings for each is provided in this section, including the project team's recommendation on whether each should be carried forward as part of the final package of recommended transportation improvements. Each project was considered individually for screening analysis. The expected traffic operations resulting from the collection of recommended projects are summarized in **Section 8.D.** of this report.

A. Churchman's Road Extended SR 2 to SR 4 (Project S)

Churchman's Road Extended, shown as Project S in **Figure 20**, would be a four-lane boulevard type roadway connecting the intersection of SR 4 and SR 58 with SR 2 at Delaware Park Boulevard. The new connection would likely utilize and widen the current bridge over White Clay Creek and would include a shared-use path on both sides. Project S:

- Provides the most benefit to the most transportation users (all modes) of all projects considered
- Is projected to carry between 40,000 and 45,000 vehicles per day by 2050
- Provides congestion relief to Harmony Road and along SR 7, which has been studied extensively over several decades
- Constructability challenges: Constructing bridges over Amtrak, White Clay Creek, and CSX

Churchman's Road Extended is recommended to be included in the Churchman's Crossing Plan Update.

B. SR 273: 3rd Lane Northbound & Southbound between SR 1 and I-95 (Project U)

Project U, shown in **Figure 20**, includes an additional lane in each direction on SR 273 between SR 1 and I-95. The widening project would also include a shared-use path along the south side of the road for bicyclists and pedestrians. Project U:

- Provides congestion relief to a heavily traveled corridor
- Provides new pedestrian and bicycle connections to currently isolated points of interest
- Widening would impact the bridge crossing the Christina River, and may impact Christiana Village Historic District or Thomas Montgomery House

Widening SR 273 between SR 1 and I-95 is recommended to be included in the Churchman's Crossing Plan Update.

C. Northbound I-95 Ramp to Chapman Road (Project V)

Project V, shown in **Figure 20**, would provide a new direct ramp from northbound I-95 to Chapman Road. The ramp:

- Creates redundant movement to existing ramp at SR 273
- Is projected to carry a relatively low daily volume
- Additional interstate ramp between service plaza and SR 273 interchange creates more challenging driving environment for motorists along I-95 corridor

The northbound I-95 ramp to Chapman Road is not recommended to be included in the Churchman's Crossing Plan Update.

D. SR 7 Intersections (Project W)

Project W, shown in **Figure 21**, would include intersection improvements along SR 7 at Telegraph Road and Delaware Park Boulevard, including turn lanes and pedestrian and bicycle improvements. The proposed intersection improvements:

- Provides congestion relief to heavily traveled corridor that serves multiple transit routes
- Provides pedestrian and bicycle improvements in Stanton area, which has high level of traffic stress (LTS) today
- Improvements may include widening near White Clay Creek and impacts to Hale-Byrne House

The SR 7 intersection improvements are recommended to be included in the Churchman's Crossing Plan Update.

E. Southbound I-95 Access from Continental Drive (Project X)

Project X, shown in **Figure 21**, would provide a new connection from Continental Drive onto the southbound I-95 ramp (from SR 58). The new ramp:

- Draws traffic from heavily congested movements from Continental Drive to Churchman's Road to I-95 by providing more direct connection
- Faces potentially significant challenges adding access to an existing I-95 Interstate ramp
- Combination of this project with proposed Southbound SR 1 to Southbound I-95 Connection (Project Y) would present additional constructability challenges

The southbound I-95 access from Continental Drive project is recommended to be included in the Churchman's Crossing Plan Update. This project should be studied in conjunction with Project Y below as part of the project development process.

F. Southbound SR 1 to Southbound I-95 Connection (Project Y)

The southbound SR 1 to southbound I-95 connection, Project Y in **Figure 21**, would provide a direct connection for motorists on SR 7 / SR 1 destined for southbound I-95, eliminating the need to travel through the signalized intersection at SR 58. Project Y:

- Draws traffic from heavily congested intersection at SR 7/SR 1 SB ramps and Churchman's Road
- Was anticipated as a part of the original design of the I-95/SR 58 interchange, with the design of SR 1 including accommodations for this future connection
- Faces potentially significant challenges adding access to an existing I-95 Interstate ramp
- Combination of this project with proposed Southbound I-95 Access from Continental Drive (Project X) would present additional constructability challenges

The southbound SR 1 to southbound I-95 connection is recommended to be included in the Churchman's Crossing Plan Update. This project should be studied in conjunction with Project X above as part of the project development process.

G. Southbound SR 1 to Northbound I-95 Connection (Project Z)

Project Z (**Figure 21**) would provide a direct connection for motorists on SR 7 / SR 1 destined for northbound I-95, eliminating the need to travel through the signalized intersection at SR 58 (similar to Project Y). The southbound SR 1 to northbound I-95 connection:

- Draws traffic from heavily congested intersection at SR 7/SR 1 SB ramps and Churchman's Road
- Was anticipated as a part of the original design of the I-95/SR 58 interchange, with the design of SR 1 including accommodations for this future connection
- Would be relatively easy to implement, requires removal of temporary barrier and restriping
- Creates new 1000-ft long weave along SR 1 southbound that is projected to operate acceptably in 2050

The southbound SR 1 to northbound I-95 connection is recommended to be included in the Churchman's Crossing Plan Update.

H. Northbound I-95 Ramp from Churchman's Road (Project AA)

Project AA (**Figure 21**) would provide a direct connection from SR 58 to northbound I-95, at approximately the same location as the proposed Center Boulevard extension included in the RTP financially constrained project list (Project P in **Figure 19**). The northbound I-95 ramp from SR 58:

- Provides direct connection from Churchman's Road east of I-95 and from mall area to I-95, reducing volume at Churchman's Rd and SR 1 ramp intersections
- Creates new shorter weave between proposed ramp and major split for I-95/I-295

- Capacity improvements that would address long term needs on I-95, including potential collector-distributor lanes, may preclude access to I-95 towards Wilmington and I-495 from this ramp

The SR 58 to northbound I-95 ramp is not recommended to be included in the Churchman's Crossing Plan Update.

I. Southbound I-95 Ramp from Churchman's Road (Project BB)

As the mirror image to Project AA above, Project BB (**Figure 21**) would provide a direct connection from southbound I-95 to SR 58. Although this connection was originally evaluated in the 1997 Study and re-considered in the present study, reconfiguration of I-95 / SR 1 interchange precludes construction of this ramp.

Therefore, the southbound I-95 to SR 58 ramp is not recommended to be included in the Churchman's Crossing Plan Update.

J. Christiana Mall Access Road – Bus Only (Project CC)

The bus only Christiana Mall access road (Project CC in **Figure 21**) would provide a direct ramp from the Christiana Mall area near Cabela's on the north side of the mall onto northbound I-95 that would be signed for transit vehicles only. Project CC:

- Provides redundant movement to adjacent uncongested ramp to the west along the Mall Ring Road
- Potentially significant challenges adding access to I-95 Interstate ramp

The Christiana Mall bus only access road is not recommended to be included in the Churchman's Crossing Plan Update.

K. Christiana Mall Road A Extension – East (Project DD)

The Christiana Mall Road A extension to the east (Project DD in **Figure 21**) would be a two-lane roadway with sidewalks on either side connecting the Christiana Mall and Fashion Center area on the west to Airport Road on the east. Project DD:

- Provides new multi-modal connections, including an eastern access to the Christiana Mall area
- Would result in considerable environmental impacts: new crossing of Christina River, floodplain, stream system
- Has the potential impacts to historic resources
- Potential impacts to community park and adjacent communities west of Airport Road

The Christiana Mall Road A extension is not recommended to be included in the Churchman's Crossing Plan Update.

L. Christiana Bypass (Project GG)

The Christiana Bypass (Project GG in **Figure 21**) would be a two-lane roadway with sidewalks on either side between Chapman Road and Eagle Run Road, east of the existing Chapman Road and Eagle Run Road alignments. A portion of the bypass is currently under development from the intersection of Chapman Road and Lawrence Drive to the intersection of SR 273 and Browns Lane. The proposed bypass would continue from SR 273 along Browns Lane then north to Eagle Run Road. Project GG:

- Provides new multi-modal connections in Christiana Town Center area
- Provides increased opportunity for economic development near existing retail areas
- Potential impacts to Christina River tributary, undisturbed areas, and additional traffic along Lawrence Drive

The Christiana Bypass is recommended to be included in the Churchman's Crossing Plan Update.

M. Eagle Run Road Connector to Samoset Drive (2nd I-95 Crossing) (Project HH)

Project HH (**Figure 21**) would provide a two- or four-lane boulevard type roadway with sidewalks on either side connecting Eagle Run Road and Samoset Drive via a bridge over I-95. This project was evaluated as a second I-95 crossing, to evaluate the need for a second or wider crossing of I-95. There is already a project in the RTP financially constrained project list (Project C in **Figure 19**) that would cross I-95 to connect Eagle Run Road and areas south of I-95 with Continental Drive and areas north of I-95.

Although analysis results indicate that there is existing and anticipated future demand for an I-95 crossing, construction of a second bridge would be costly and impactful. However, the alignment shown for Project HH in **Figure 21** could be considered as an alternative to the alignment of Project C in **Figure 19**.

Therefore, the project team recommends that only one (1) crossing of I-95 be pursued and that future NEPA studies consider both alignments as part of the project development process. A second crossing of I-95 is not recommended to be included in the Churchman's Crossing Plan Update.

N. Brownleaf Road Extension (Project II)

The Brownleaf Road extension (Project II in **Figure 21**) would be a two-lane roadway with sidewalks on either side connecting Brownleaf Road near Gallaher Elementary School with Samoset Drive and Continental Drive. Project II:

- Provides additional connectivity between neighborhoods west of Harmony Road and Hospital area and businesses along Continental Drive
- Connectivity benefits would be influenced by opening of Samoset Drive / Continental Drive (Project JJ) and Eagle Run Road Connector to Samoset Drive over I-95 (Project HH)

- Additional traffic and potentially higher speeds in front of Robert S. Gallaher Elementary School and athletic fields south of school

As a roadway connection this project would have tradeoffs related to the project vision. The project would be expected to improve connectivity in the region, thereby providing transportation choices, but would also be expected to negatively impact quality of life in the surrounding neighborhood near the school and park by drawing traffic from parallel roadways. However, the multi-modal connections of an adjacent sidewalk or shared-use path would contribute to both enhancing quality of life and providing transportation choices.

Therefore, the Brownleaf Road Extension is not recommended to be included in the Churchman's Crossing Plan Update as a roadway connection; however, a pedestrian and bicycle connection at this location is recommended as a multi-modal improvement as part of Project OO below.

O. Opening Samoset Drive / Continental Drive (Project JJ)

Opening Samoset Drive / Continental Drive (Project JJ in **Figure 21**) would reestablish the roadway connection between Samoset Drive and Continental Drive for all motorists. Under existing conditions, there is a gated Bank of America property along Continental Drive that has restricted access. The Christiana Hospital and other businesses located along Samoset Drive can access Samoset Drive, but cannot use Continental Drive to head north and east of the Hospital. Similarly, businesses located along Continental Drive cannot continue beyond the gates to access Samoset Drive. Project JJ:

- Provides congestion relief by providing alternative access to SR 4 and Churchman's Road
- Provides increased opportunity for economic development in the Hospital area
- Would result in minimal traffic impacts during construction
- Would require coordination with private property owners

Opening Samoset Drive / Continental Drive to all motorists is recommended to be included in the Churchman's Crossing Plan Update, including the necessary coordination with private property owners.

P. Telegraph Road / St. James Road Railroad Underpass (Project KK)

Project KK (**Figure 21**) would address an existing low bridge over Telegraph Road that is frequently struck. Numerous warning systems and signing improvements have been implemented to address the bridge strike issue. Although it would be challenging to re-build the railroad underpass, the project team recommends carrying forward the improvements needed to permanently address the low clearance.

The Telegraph Road / St. James Road Railroad Underpass project is recommended to be included in the Churchman's Crossing Plan Update.

Q. Micro Transit (DTC) (Project EE)

Project EE would include deployment and utilization of on-demand transit services that are focused on providing more direct services between communities, employers, and commercial destinations than existing fixed route bus service in the area. DTC previously implemented micro-transit DART Connect service in Georgetown and Millsboro, Delaware. Micro-transit would provide:

- Improved access and connectivity for transit users
- Flexible system specifically benefits users that are not near existing or planned fixed routes
- Reduces VMT growth and corresponding negative environmental impacts

The deployment of micro-transit service is recommended to be included in the Churchman's Crossing Plan Update.

R. Automated Transit Vehicles (DTC) (Project FF)

Project FF would include deployment and utilization of automated transit vehicles (ATVs) in support of statewide technology initiatives. ATVs would operate on a fixed route using driverless vehicles. ATVs would provide:

- Depending on implementation, improved access and connectivity for transit users
- Potentially less flexibility than traditional fixed route or on-demand service
- Legal hurdles to overcome and would require continued testing of automated vehicles

The use of ATVs is recommended to be included in the Churchman's Crossing Plan Update.

S. New Bus Transit Routes (Project LL)

New bus transit routes (Project LL) that could serve the region include routes to and from the Christiana Mall and SR 7 – Pike Creek, SR 2 – Prices Corner, SR 141 and SR 273 – New Castle, US 13 – Llangollen, SR 273 – Wilton, and SR 2 and SR 4 – Newark. New transit routes would provide:

- Improved access and connectivity for transit users
- Reduces VMT growth and corresponding negative environmental impacts

New bus transit routes to serve areas not currently served by existing fixed route service are recommended to be included in the Churchman's Crossing Plan Update, specifically routes to and from the Christiana Mall and SR 7 – Pike Creek, SR 2 – Prices Corner, SR 141 and SR 273 – New Castle, US 13 – Llangollen, SR 273 – Wilton, and SR 2 and SR 4 – Newark.

T. Transit Access Improvements (Project MM)

Transit access improvements (Project MM) include bus pads (new and reconstructed), shelters (new and reconstructed), and accessible pathways and routes between bus stops and nearby destinations. These improvements would provide:

- Improved safety, accommodations, and accessibility for transit users
- Potentially attracts more transit users

Transit access improvements including bus pads (new and reconstructed), shelters (new and reconstructed), and accessible pathways and routes between bus stops and nearby destinations are recommended to be included in the Churchman's Crossing Plan Update.

U. Pedestrian / Bicycle Improvements along Existing Roads (Project NN)

Pedestrian and bicycle improvements along existing roadways (Project NN) include dedicated bicycle facilities and shared-use paths along existing roadways that do not have these features. Although closing gaps in the East Coast Greenway (ECG) is already included in the RTP financially constrained list (Project F in **Figure 19**), Project NN would address other gaps in a connected bicycle network and provide new pedestrian and bicycle facilities where existing roadway connections can be leveraged to provide multi-modal connectivity. Project NN would provide:

- Improved multi-modal access and connectivity
- The ability to potentially attract more transit users
- Potential for minor property impacts

Pedestrian and bicycle improvements along existing roads are recommended to be included in the Churchman's Crossing Plan Update. Locations that have been identified include gaps in the East Coast Greenway along SR 4 and SR 58 and a connector along SR 7 near Ogletown Stanton Road. Additionally, pedestrian and bicycle upgrades should be pursued along existing roads, particularly in conjunction with future pavement/rehabilitation and capital projects, to improve bicycle level of traffic stress.

V. Pedestrian / Bicycle Improvements serving Existing Communities (Project OO)

Similar to Project NN above, Project OO would include pedestrian and bicycle connections from existing communities to lower-stress routes and shared-use paths outside those communities. Locations that have been identified are a connector from the Lewden-Greene and Coventry Park trails to the ECG along SR 58 and connections for the communities near the SR 7 / SR 4 Staunton Split. The pedestrian and bicycle-only connection extending from Brownleaf Road to Samoset Drive discussed above would also be included in Project OO. Project OO would provide:

- Improved multi-modal access and connectivity
- The ability to potentially attract more transit users
- Potential for minor property impacts

Pedestrian and bicycle improvements that would provide additional connections for existing communities are recommended to be included in the Churchman's Crossing Plan Update. Locations that have been identified include Lewden-Greene and Coventry Park connectors, a SR 7 connector, and a pedestrian and bicycle only extension of Brownleaf Road to Samoset Drive. In addition to the connections noted above, pedestrian and bicycle connections should be pursued

through capital improvements or other funding programs to improve linkages between neighborhoods and destinations.

W. SR 273: 3rd Lane Northbound & Southbound between I-95 and SR 4 (Project PP)

Project PP, shown in **Figure 21**, includes an additional lane in each direction on SR 273 between SR 4 and I-95. In conjunction with Project U, Project PP would provide a consistent six-lane cross section along SR 273 throughout the project study area from SR 4 to SR 1. Project PP:

- Provides congestion relief to heavily traveled corridor
- Provides new pedestrian and bicycle connections to currently isolated points of interest
- Widening would result in substantial property impacts

Widening of SR 273 between SR 4 and I-95 is recommended to be included in the Churchman's Crossing Plan Update.

X. SR 273 at I-95 Interchange Reconfiguration (Project QQ)

The SR 273 at I-95 interchange reconfiguration project (QQ in **Figure 21**) would improve operations and safety along SR 273. This interchange has previously been identified as a safety concern. An earlier planning study identified a diverging diamond (DDI) interchange as the preferred alternative for long-term improvements. The DDI would accommodate the third through lane along SR 273 and provide a separated ped/bike facility through the interchange and over I-95. Near-term improvements include isolated geometric changes to signalize the southbound I-95 to westbound SR 273 movement, increasing the distance between the new signal and Harmony Road, and ramp modifications for the northbound I-95 to westbound SR 273 ramp to increase the weaving distance between the loop ramps. Near-term improvements are currently under construction while the future DDI project has not yet been funded. This study considered the future interchange reconfiguration, which would:

- Replace the existing high-speed interchange with a design that is more consistent with a signalized arterial (i.e., SR 273)
- Provide a new bicycle and pedestrian connection over I-95
- Remove multiple bridges,
- The Project is entirely within state ROW, and provides opportunities for sustainable stormwater management

The future SR 273 at I-95 interchange reconfiguration project is recommended to be included in the Churchman's Crossing Plan Update.

8. Preferred Concept Plan

A. Recommended Land Use Principles

The evaluation of alternative land use assumptions as part of the scenario planning process yielded several conclusions related to community density, diversity, and design that can be further

refined and codified as part of the community area master plan process. The concepts below are generally oriented toward policies and processes that can be managed through planning and zoning initiatives, although it is useful to keep in mind that actual land use implementation will generally be implemented by private sector development. While the Churchman's Crossing Plan Update benefitted from an actively engaged constituency, the stakeholder feedback regarding land use focused on concepts and recommendations organized in a general sense without addressing specific development proposals from any individual property owners or representatives. More direct coordination with property owners would be expected as part of comprehensive plan completion, adoption, and implementation.

The following land use principles are suggested as part of subsequent planning and zoning activities, organized into several principles on development form and supporting policies. The ongoing countywide comprehensive plan update (https://ncc2050-nccde.hub.arcgis.com/) is expected to broaden the principles recommended below and integrate the land use recommendations for the Churchman's Crossing area into the goals, objectives, and strategies for the entire county.

Principle 1: Efficient Development Location. The greatest potential for new development is in the eastern portion of the Churchman's Crossing study area, generally between the Fairplay SEPTA station and the Christiana Mall. This area benefits from several characteristics:

- The greatest potential for development from both the few remaining greenfield properties in the study area plus large, relatively undeveloped, commercial properties where infill development may be practical
- A generally contiguous area of non-residential development that can serve as a buffer to mitigate visual / noise concerns of the effect of development on established residential communities
- Proximity to existing transit resources and the potential to create a "transit spine" between the SEPTA station and the Christiana Mall transit center

Principle 2: Mix of Uses. The Churchman's Crossing study area is exemplified by single-use zoning (i.e., all development on a property should either be residential or commercial). Both vertical mixed use (residential and commercial uses in the same building such as ground-floor retail in a midrise apartment building) and horizonal mixed use (residential and commercial uses in adjacent building) provide an opportunity to reduce trip lengths, particularly for everyday retail needs such as convenience retail and restaurants. The existing single-family residential communities should be preserved to reflect the expectations of property owners and renters. The existing commercial properties, however, present an opportunity to accommodate additional economic growth while minimizing effects on the roadway network.

Principle 3: Compact Design. The potential exists for new development to be designed to improve walkability with design features that encourage development scaled toward walking rather than driving. These compact design features include:

- Two-lane interior site roadways designed as local streets (even if privately maintained) with short block lengths

- A relatively continuous building frontage with minimal setbacks to the fronting street (as well as minimal buffers between adjacent uses) and substantial fenestration (ratio of doors and windows to total fronting wall space)
- Minimal surface-lot parking, located (along with loading zones) at the rear of properties; utilization of on-street parking spaces

Principle 4: Transportation Demand Management (TDM). Policies, programs, and services to support TDM can augment the transportation-efficient location and design advantages in this area. Suggested TDM elements include:

- Manage parking to establish a maximum number of parking spaces in lieu of, or in addition to, the current requirements for a minimum number of parking spaces
- Unbundle parking from other property sales/leases so that the cost of providing parking is passed on to the occupants through a choice of parking space access
- Establish a "park-once" approach to vehicular travel; foster shared parking agreements and easements
- Reduced or free transit fare media for property tenants, with resources expanded to reflect paratransit elements ranging from traditional TDM services such as vanpools and shuttles to potential agreements with Transportation Network Companies (TNCs) to provide last-mile services
- Examination of micromobility options such as bikesharing or scooter services
- Consideration of related policies and programs that help reduce reliance on single-occupant-vehicle travel; for instance, policies that encourage affordable or workforce housing tend to foster lower rates of driving

The land use principles noted above are recommended to continue to enhance the Churchman's Crossing area and support it as a vibrant and key economic area in the county and state. The principles are flexible to help the area adapt to the changing retail and commercial business climates while also ensuring that the built form of development and redevelopment is consistent with community goals, including enhancing the quality of life and providing transportation choices.

B. Recommended Transportation Improvements

Based upon the input from the Management Committee, Advisory Committee, and public comments, as well as an assessment of the transportation alternatives based on the project screening criteria, 35 projects are recommended, as shown in **Figure 29**. The projects consist of 18 projects that are already on the RTP financially constrained list, along with two (2) projects from the RTP aspirations list, and 15 new projects.

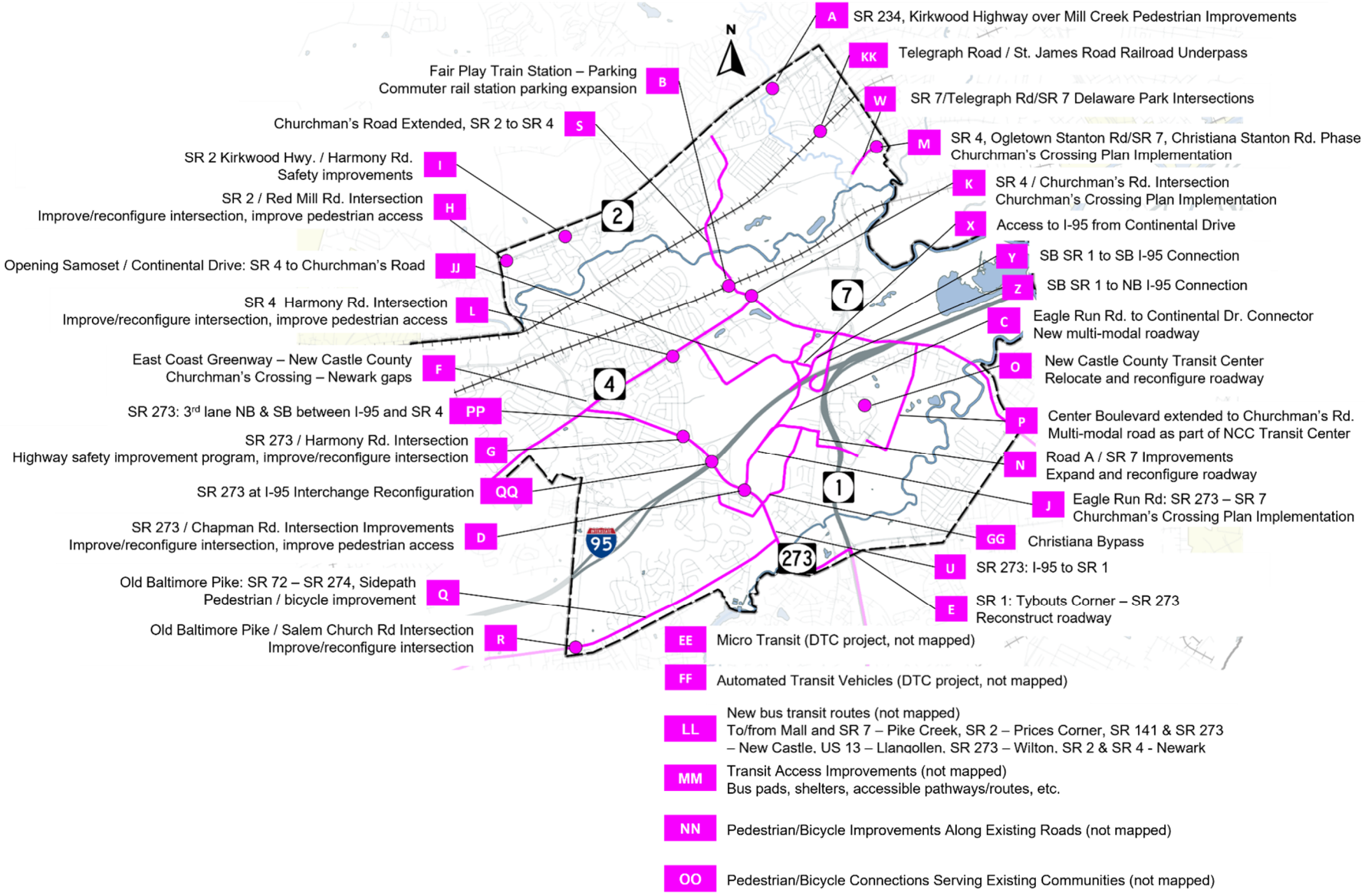


Figure 29: Recommended Transportation Improvements

C. Expected Outcomes

Relative Arterial Mobility

As noted earlier, relative arterial mobility provides an assessment of travel times across the study area arterial network during peak commuter periods as compared to free-flow conditions. This metric was used both quantitatively during the scenario planning phase of the study and assessed qualitatively as part of the transportation alternative screening analysis.

Relative Arterial Mobility is similar to the more commonly used intersection LOS in that it considers forecast travel times by motorists against a letter-grade standard that reflects user expectations developed by the Transportation Research Board. The primary advantage of Relative Arterial Mobility is that it provides the ability to consider system performance across a larger geographic area than an individual intersection, essentially blending the experience at intersections (where most delay is typically accrued in an arterial roadway network) with the travel experience between intersections. As indicated in **Figure 30**, a prototypical suburban arterial that's two miles in length may have five intersections, two of which are with other high-volume arterials where LOS E may be expected (with a likely stop at the traffic signal) and three of which are with lower-volume neighborhood entrances (where most vehicles on the arterial pass through during the green phase with no delay). If the arterial has a free-flow speed of 40 MPH, two LOS E intersections have 75 seconds of delay each and the three LOS B intersections have 15 seconds of delay each, the total segment travel time is 6.25 minutes (of which 4 minutes reflect segment travel at 40 MPH and 2.25 minutes are intersection delay). The net travel speed (2 miles in 6.25 minutes) including delays is 19 MPH, which is an arterial LOS D. By assessing delay across the roadway segments where travel is occurring (as contrasted with an intersection "point"), the delay at given points can be put in the context of delays experienced over a longer time period, such as a complete trip from point A to point B.

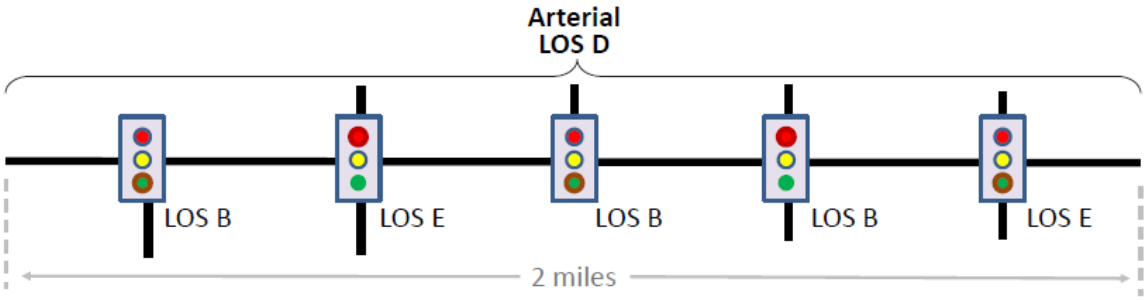


Figure 30: Conceptual Linkage between Intersection and Arterial LOS

Recognizing that the travel needs vary from place to place within the overall Churchman's Crossing study area, the assessment of Relative Arterial Mobility was considered for each of six (6) subareas (**Figure 31**), generally reflecting the role of both natural barriers (i.e., water features) and manmade barriers (I-95 and rail lines) in multimodal connectivity. These subareas were also used in the scenario planning process described in **Appendix E**.

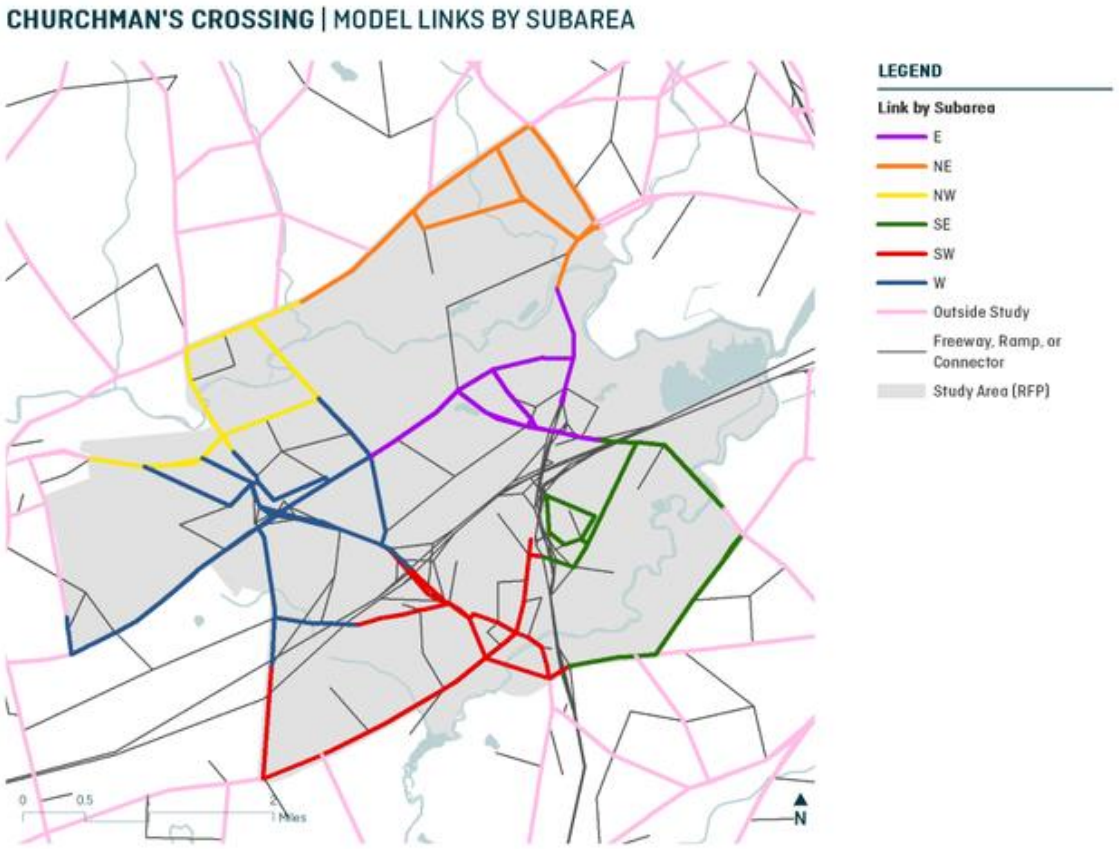


Figure 31: Subareas for Relative Arterial Mobility Evaluation

Relative Arterial Mobility results for the six (6) subareas under 2050 proposed conditions are presented in **Table 4**. For the overall suite of project recommendations (**Figure 29**), all subareas are projected to achieve LOS D in the morning peak period, but three subareas fail to achieve LOS D in the PM peak period. All six areas combined are close to the LOS D/E threshold during the PM peak period, with a "PM peak to free-flow speed" ratio of 0.397 as compared to a LOS D threshold of 0.400. Reducing PM peak period VMT by 10% in the southwest subarea, 5% in the northeast subarea, and 1% in the northwest area would be forecast to achieve LOS D areawide. VMT reductions can be achieved by pursuing the TDM strategies described above.

Table 4: Projected 2050 Relative Arterial Mobility

Area	VMT AM	VMT PM	Estimated MPH AM	Estimated MPH PM	MPH @ Freeflow	AM / Freeflow	PM / Freeflow	AM Arterial LOS	PM Arterial LOS
W	38,700	44,300	23.3	19.7	43.5	0.54	0.45	D	D
SW	32,100	36,000	17.3	16.0	43.0	0.40	0.37	D	E
SE	9,800	11,500	24.6	18.9	45.9	0.54	0.41	D	D
NW	21,900	23,500	20.7	16.8	43.9	0.47	0.38	D	E
NE	59,000	69,800	18.8	15.8	41.8	0.45	0.38	D	E
E	40,900	45,200	21.0	18.1	44.6	0.47	0.41	D	D

Intersection Operations

In addition to the relative arterial mobility results discussed in the preceding section, the Peninsula model output was used to develop year 2050 peak hour turning movement volumes at the nine (9) key intersections identified in Section 1.C. For this study, methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report 255 *Highway Traffic Data for Urbanized Area Project Planning and Design* (Pendersen et al., 1982) and NCHRP Report 765 *Analytical Travel Forecasting Approaches for Project-Level Planning and Design* (Horowitz et al., 2014), were used to refine link ADT volumes and develop turning movement forecasts.

These reports provide a set of procedures to use the raw Peninsula model output from the 2019 baseline and future year 2050 conditions, in conjunction with existing daily roadway link volumes, to estimate future daily link volumes. After developing future daily link volumes, iterative proportional fitting (IPF) methods outlined in NCHRP 765 and Transportation Research Record (TRR) 1287 *Model of Turning Movement Propensity* (Furth, 1990) were used to estimate 2050 daily turning movement volumes from the link volumes. Existing 2019 daily turning movement volumes were used as the starting point for IPF, and the future daily link volumes estimated in the first step of post-processing were the target inflows and outflows at each intersection. The IPF function iteratively adjusted the turning movement volumes to achieve the forecasting inbound and outbound daily link volumes.

Finally, peak hour forecasts were developed from the daily turning movement forecasts using k-factors. K-factors are the ratio between peak hour and daily traffic volumes. Existing 2019 k-factors were calculated from the peak hour volumes shown in **Appendix B** and the daily turning movement volumes used to seed the IPF function. The k-factors were then applied to the forecast 2050 daily turning movement forecasts. At locations that were nearing capacity, k-factors were manually adjusted to account for the likelihood of peak hour spreading that typically occurs when intersections approach capacity. The resulting 2050 forecast peak hour turning movement volumes are shown in **Appendix B**.

Traffic operational analyses using critical movement summation (CMS) methodology were performed using the 2050 forecast peak hour volumes to determine future year LOS at the nine (9) key intersections. The results are presented in **Table 5** and CMS analysis worksheets are included in **Appendix C**. The results indicate that with the proposed improvements included in

the preferred concept plan (**Figure 29**), the intersection of SR 58 at SR 1 / SR 7 ramps, which operates at LOS F under existing conditions is projected to operate at LOS A or B in the AM and PM peak hours, respectively.

Although the intersections of SR 2 at SR 7 and SR 4 at Harmony Road are projected to operate at LOS F during the PM peak hour in 2050, the volume-to-capacity ratios for these intersections are only slightly above 1.00. Additionally, the relative arterial mobility results presented above indicate that even with some LOS F intersections, the arterial LOS would be LOS D during the AM peak and LOS D/E during the PM peak. Small VMT reductions in the area would be expected to result in LOS D operations during both the AM and PM peak, even with isolated intersections projected to operate at LOS F. The SR 4/Harmony Road Intersection Improvements project (Project L in **Figure 19**) is currently in the design phase and includes improvements to address congestion and safety. Although there is not currently a project proposed at the intersection of SR 2 and SR 7, multiple studies have considered this intersection for capacity and safety improvements and determined that additional geometric improvements beyond additional turn lanes and through lanes would be necessary to reduce delays. Alternatives that may be considered as part of future studies include innovative intersection designs, such as a continuous flow intersection or an elevated left-turn intersection. These two intersections could be candidates for additional improvements approaching or beyond 2050. Traffic monitoring at each of these two intersections is important to understand when, or if, additional improvements may be recommended in the future.

Table 5: Projected 2050 Intersection LOS

Intersection	AM Peak Hour LOS	PM Peak Hour LOS
SR 2 & Delaware Park Dr	C	E
SR 4 & SR 58	B	D
SR 2 & Harmony Rd	B	C
SR 2 & SR 7	E	F (v/c ratio =1.04)
SR 4 & Harmony Rd	E	F (v/c ratio = 1.06)
SR 58 & SR 1 / SR 7 Ramps	A	B
SR 58 & Cavaliers Country Club Drive	A	D
SR 273 & Chapman Rd / Eagle Run Rd	D	E
SR 273 & Old Baltimore Pike	B	C

D. Conceptual Cost Estimate

Conceptual cost estimates were developed for each transportation project. The total capital costs for the preferred concept plan (**Figure 29**) is approximately $652 million, which includes $377 million for the RTP financially constrained projects, $118 million for the two (2) aspirational projects that are recommended as part of this study (i.e., does not include I-95 widening), and $157 million in additional projects, including transit capital costs. Detailed cost estimates are included in **Appendix F**.

As noted earlier in this report, construction is substantially complete on three RTP financially constrained projects: Project J (Eagle Run Road), Project N (Road A / SR 7 Improvements), and Project R (Old Baltimore Pike and Salem Church Road intersection improvements). It should be noted that while Project R is complete, it focused on relatively small-scale immediate safety improvements. Discussions are continuing on whether longer term improvements should be considered at the offset intersections of Old Baltimore Pike and Salem Church Road, including a realignment of Salem Church Road, to address longer-term operational and safety needs.

The cost estimates for these three completed projects equal approximately $17.7 million of the $377 million total for RTP financially constrained projects.

E. Direct, Indirect, and Cumulative Effects

Direct effects to social, economic, and environmental resources, based upon GIS and "desktop" level data were used to develop the ratings found in the criteria matrix shown in **Figure 28**. Future detailed assessments may be necessary to confirm direct effects and identify indirect and cumulative effects, depending on the type of transportation improvement.

9. Next Steps

The Churchman's Crossing Plan Update has been developed to guide transportation and land use in the area over the next twenty years. The study includes multiple transportation project recommendations based on an updated land use forecast. The land use forecast and recommendations were guided by the project goals to enhance quality of life, plan for sustainable growth, and provide transportation choices. These were the same goals that guided the original 1997 Churchman's Crossing Study.

The recommendations presented in this plan are at different stages in the implementation process. Funding for approximately half of the recommendations has already been identified as part of WILMAPCO's 2050 RTP. Some of these financially constrained projects are already in development, while others are included in DelDOT's current six-year Capital Transportation Program (CTP). The remaining projects are expected to be incorporated into future CTPs and implemented between now and 2050.

Two (2) recommended transportation improvement projects were identified as aspirational projects in the 2050 RTP and 15 additional projects that are recommended in this report have not been adopted into any long-range plans. These projects have not yet been funded for planning, design, and construction.

Project implementation can take a variety of forms. The project team recommends that WILMAPCO include all projects identified in the preferred concept plan in the next update to the RTP. Based on the cost, complexity, and size of the project, different agencies may implement projects on different timelines. Larger investments will need to go through their own planning process, including a NEPA study to determine if the proposed improvements will have significant environmental effects and to identify mitigation strategies. Smaller projects may be pursued through DelDOT's CTP, WILMAPCO's Transportation Improvement Program (TIP), regular

operating budgets, or other grants and funding programs. Stakeholders and community members are encouraged to voice their support for both individual projects, and the collection of projects as a whole, to their local elected leaders to help ensure that the recommendations receive necessary funding to advance through the project development process and ultimately be implemented.

A. Environmental Review

The scope and complexity of each project will also dictate the necessary environmental reviews. Existing environmental resources, including streams, wetlands, and floodplains, were identified using available GIS data. Impacts to each of these resources, as well as other social, cultural, and economic resources, will need to be confirmed as part of the project development process.

B. Mitigation Strategies

Mitigation strategies for individual projects will also needed to be identified as part of the project development process. Mitigation must also be documented as part of the process for any projects that require a NEPA study.

Early in the process, the public commented on existing flooding issues and concerns about the potential for future flooding due to increases in impervious surface area. Stormwater best management practices should be considered as part of project implementation.

Additionally, the transportation demand management (TDM) strategies that were identified in the 1997 Churchman's Crossing Study remain relevant today. Alternative work schedules, parking management, and other transportation systems management strategies are vital mitigation tools to manage the number of peak hour trips and ensure arterial level of service goals are met.

C. Traffic Monitoring

The COVID-19 pandemic dramatically impacted traffic volumes in March 2020 and transformed the way people live and work. Although there have been sustained increases in working from home, biking, and walking, traffic volumes are already rebounding. Additionally, there have been different impacts to single-occupant vehicle use compared to transit and carpools which present challenges for social distancing.

The long-term effects of COVID-19 on transportation and land use are unknown but are expected to be more subtle than the dramatic changes that took place at the start of the pandemic. The Churchman's Crossing Plan Update is intended to address land use and transportation needs many years into the future; therefore, the scenario planning and modeling efforts undertaken as part of this study did not explicitly account for short-term travel impacts due to COVID-19.

As recommendations are implemented, additional traffic monitoring (either annually or in regular intervals) can help further understand future traffic patterns and identify appropriate timing of various improvements. Traffic monitoring is appropriate at each of the nine (9) key intersections studied in the 1997 Study and in the current Churchman's Crossing Plan Update:

- SR 2 and Delaware Park Drive
- SR 4 and SR 58
- SR 2 and Harmony Road
- SR 2 and SR 7
- SR 4 and Harmony Road
- SR 58 and SR 1 / SR 7 Southbound Ramps
- SR 58 and Cavaliers Country Club Drive
- SR 273 and Chapman Road / Eagle Run Road
- SR 273 and Old Baltimore Pike

Additional intersections that may be appropriate for regular traffic monitoring include:

- SR 2 and Red Mill Road
- SR 2 and Milltown Road
- SR 4 and SR 7 (Staunton Split)
- SR 7 and Telegraph Road
- SR 273 and Ruthar Drive
- Harmony Road and Ruthar Drive
- SR 4 and Salem Church Road
- SR 4 and Samoset Drive
- SR 7 and SR 4 / JP Morgan Chase Entrance
- SR 58 and Continental Drive
- SR 273 and Brown's Lane
- SR 273 and SR 7
- SR 273 and Appleby Road
- SR 273 and Airport Road
- SR 48 and Airport Road
- Road A and Center Boulevard

D. Critical Issues to be Considered

Public involvement, and particularly engagement with minority or underrepresented groups, will continue to be critical as the plan is adopted and projects are implemented. Individual projects will have varying impacts and may attract interest from different stakeholder groups.

One overarching concern expressed by some members of the Advisory Committee and reiterated at each public workshop was the possible timing of transportation improvements and development. As projects are implemented, consideration will need to be given to ensure that needed transportation infrastructure is in place as development occurs to support the project goals of enhancing quality of life and providing transportation choices.

E. Implementation Strategies

Traditionally, transportation projects have been implemented by DelDOT through the project development process while land use recommendations have been implemented by New Castle

County, with most transportation and land use coordination occurring at the development level through subdivision and building regulations and concurrency, or adequate public facility, requirements. In addition to the more traditional approach to implementation, there are two newer implementation strategies that are recommended for the Churchman's Crossing Plan Update. The strategies described below can promote better intergovernmental coordination, support sustainable development and complete communities, enhance safety, and provide better coordination of the land use and transportation systems toward achieving economic development and livability goals.

Transportation Improvement District (TID)

Many of the transportation recommendations identified in this report are located in the public right-of-way and, as noted above, do not yet have a dedicated funding source. Securing the needed funding can take many years and may not be possible given the needs in other areas of the county and state.

One potential option is to create a Churchman's Crossing Transportation Improvement District (TID). A TID is "a geographic area defined for the purpose of securing required improvements to transportation facilities in the area." TIDs are an alternative funding mechanism for transportation investments. Funding comes from a combination of public and private sources based on an established agreement between DelDOT and New Castle County that applies to developers interested in the area. The agreement includes a fee schedule for anticipated development. The agreement also includes service standards to define acceptable transportation operations and the methods to measure operations.

DelDOT and New Castle County have guidelines and ordinances that outline the policies and legal requirements of a TID. Although development of a TID is beyond the scope of this study, the concept of a TID was a part of the study discussions, including at public workshops. The project team worked with the Management Committee and Advisory Committee to develop a strategic plan (included in **Appendix G**) to develop a TID, should that be a desired implementation tool.

Complete Community Enterprise District (CCED)

Another tool that can be considered during the implementation process is creation of a Complete Community Enterprise District (CCED). A CCED is "a geographic area defined to create transit-oriented development districts." CCEDs do not provide dedicated funding mechanisms, but they do promote "complete communities" that are walkable, bikeable, and transit friendly. These development districts include incentives and other requirements that can support reduced auto ownership and dependency.

CCEDs are defined in Delaware Code and the requirements were recently revised by House Bill Number 18 signed into law in June 2021. Sub-areas within the Churchman's Crossing project study area may be considered for a CCED where transit-oriented development is desirable, such as around Fairplay Station, Christiana Hospital, and the Christiana Mall. In addition to transportation improvements that enhance mass transit and maximize the use of walking and bicycling, zoning changes for any CCEDs will be necessary to ensure there is sufficient area zoned for residential use.