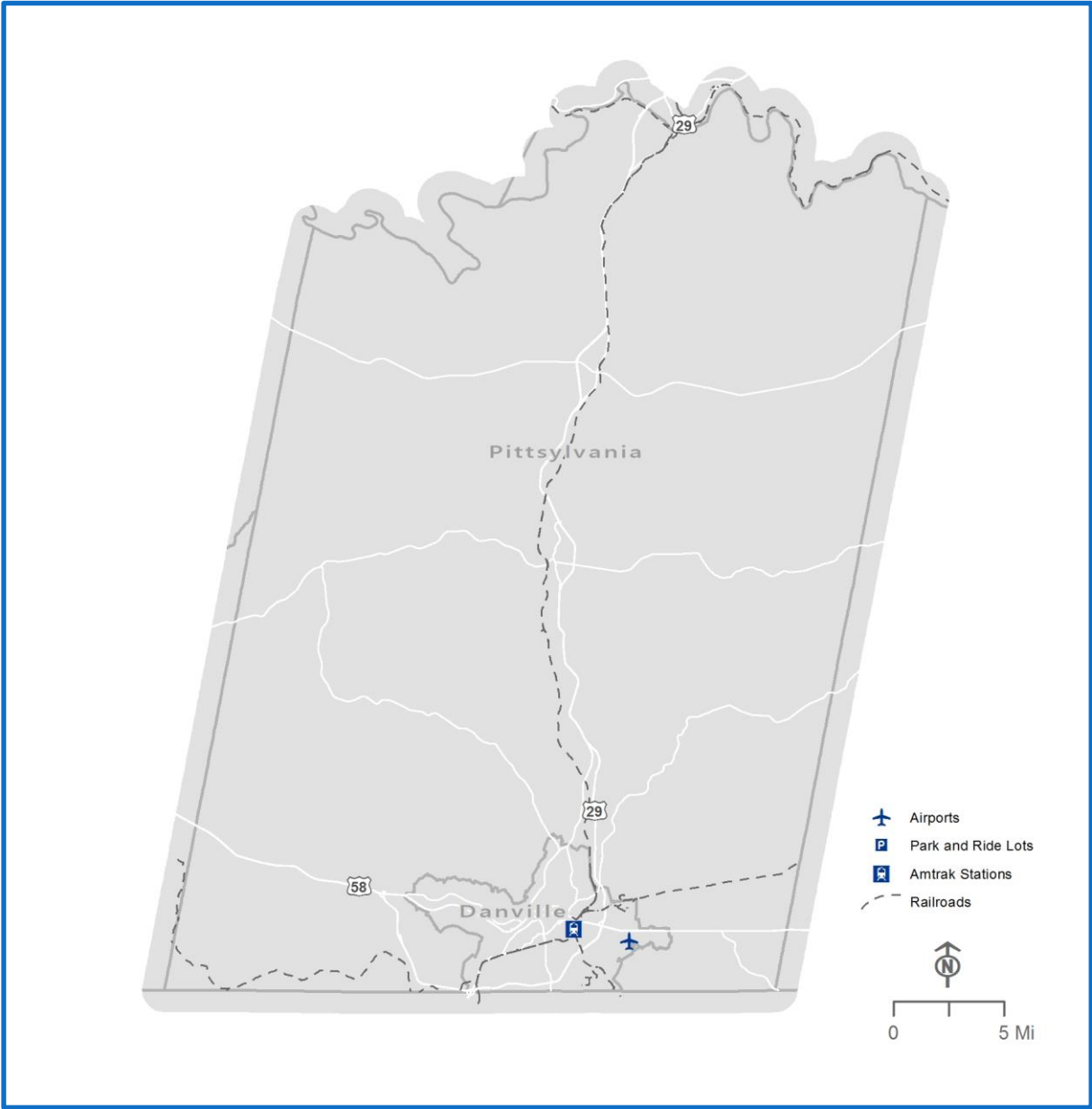


# VMTP 2025 Needs Assessment

## Regional Needs Profile



### Danville Region

December 2015

# 1. NEEDS ASSESSMENT PURPOSE

The VMTP 2025 Needs Assessment framework is based on two principal objectives underlying transportation policy to enhance economic competitiveness. These are 1) to attract and retain the 21<sup>st</sup> century workforce, and 2) to support goods movement for Virginia businesses. The purpose of this Transportation Needs Assessment is to identify the Transportation Needs that are part of the Danville Regional Network that would support regional industries and workforces.

This document is one portion of the overall Needs Assessment for regional Networks that deals with the Needs Assessment for the Danville Region. There is a separate document entitled VMTP 2025 Needs Assessment: Regional Networks Introduction, which provides an overall introduction into the background and methodology of the Needs Assessments. In this document, details are provided on the 2025 Needs development process, as well as the economic factors shaping regional Transportation Needs. This introductory document provides a foundation for the regional needs described here. The focus of this Transportation Needs Assessment is to identify the Transportation Needs that are part of the Danville Regional Network, and that would support regional industries and workforces.

## Defining Transportation Needs

Transportation needs, as considered in the 2025 Needs Assessment, are defined as the gap between the transportation system in place currently that serves the current industries in a region, and the future transportation system needed to serve the desired future economy in the region. The gap between the transportation needs and economic conditions is the basis for the findings in this report. The following sections outline the Danville Regional Economic Profile, regional Transportation Profile, and regional Transportation Needs Profiles.

## Defining a Regional Network

This portion of the VMTP 2025 Needs Assessment is for a Regional Network. For the purposes of the VMTP Needs Assessment, the final determination of Regional Networks was developed as part of the outreach process in working with each region, as explained in the Regional Network Needs Assessment Introduction.

In the Danville Region, the needs analysis area includes the City of Danville and Pittsylvania County. However, as shown in the Needs Assessment, below, other areas beyond the immediate needs analysis area were considered in the Needs Assessment as well.

## 2. ECONOMIC PROFILE

### A. INTRODUCTION

The trends analysis conducted as part of the VTrans2040 Vision Plan showed strong indications that future economic success for both states and regions will hinge on attracting and retaining increasingly scarce talented workers, particularly from among the well-educated Millennials. In addition, future goods movements will be critical to supporting Virginia’s current and emerging businesses. A key part of understanding emerging transportation needs statewide is understanding the current and future economic conditions in different parts of the state. The Needs Assessment therefore focuses on understanding the major economic dynamics of each region and using that understanding to shape transportation needs.

The Study Team used available data from state and national sources, as well as input from the Danville Region’s stakeholders to identify an overall current economic profile for the region. The components of the current economic profiles layers together demographic and economic characteristics of the region. The Regional Profile incorporates the following baseline data for each region:

- Demographic Characteristics
- Top Industries by Employment, Output and Location Quotient
- Workforce Characteristics
- Top Employers
- Activity Centers, characteristics and travel markets (as defined by existing centers of employment as modified by input from stakeholders in each region)

### B. Demographics

At a regional level, research regarding basic demographics was analyzed as a foundation for understanding regional economic dynamics. The economic and demographic data analyzed in this report support insights regarding which workforce and/or key age groups are currently present in the region. This information is important to inform potential types of investments to attract and retain the desired workforce.

#### Statewide Demographics

According to the Woods and & Poole *2014 State Profile*, the current population in the state of Virginia is 8,185,867. By the year 2025, the Commonwealth of Virginia’s population is projected to increase by between 1 million and 1.5 million. Statewide per-capita incomes are expected to rise 21%, from \$44,765 to \$54,226.

*Table 1: Statewide Population Projections.*

Current Population (2012)	Weldon Cooper Projection (2025)	Woods & Poole Projection (2025)
8,185,867	9,203,977	9,740,553

Sources: Weldon Cooper Center for Public Service, Demographic Research Group, Intercensal Estimates for Virginia, Counties and Cities: 2010-2012, and Woods and Poole Economics, Incorporated, 2014 State Profile District of Columbia, Maryland, and Virginia. Washington DC

## Regional Demographics

As evident in Table 2, population growth is projected for the Danville Region. Projections estimate 500 new residents in the region by the year 2025.

*Table 2: Danville Region Population Projections.*

Current Population - 2012	Weldon Cooper 2025 Projection
105,803	106,356

Sources: Weldon Cooper Center for Public Service, Demographic Research Group, Intercensal Estimates for Virginia, Counties and Cities: 2010-2012, and Woods and Poole Economics, Incorporated, 2014 State Profile District of Columbia, Maryland, and Virginia. Washington DC

Table 3 provides a closer look at population projections by jurisdiction within the Danville Region.

*Table 3: County and City Population Projections.*

Jurisdiction	2012 Population	Weldon 2025 Projection	% Change (2012-2025)
City of Danville	42,996	42,789	0%
Pittsylvania County	62,807	63,567	1%

Source: Weldon Cooper Center for Public Service, Demographic Research Group, Intercensal Estimates for Virginia, Counties and Cities: 2010-2012

According to the Woods and & Poole 2014 State Profile, per-capita income for the region is expected to rise by 22% (slightly more than the state average of 21%) from \$29,515 to \$34,644. Population growth is also projected to be accompanied by a demographic shift, with a higher percentage of the population over the age of 60.

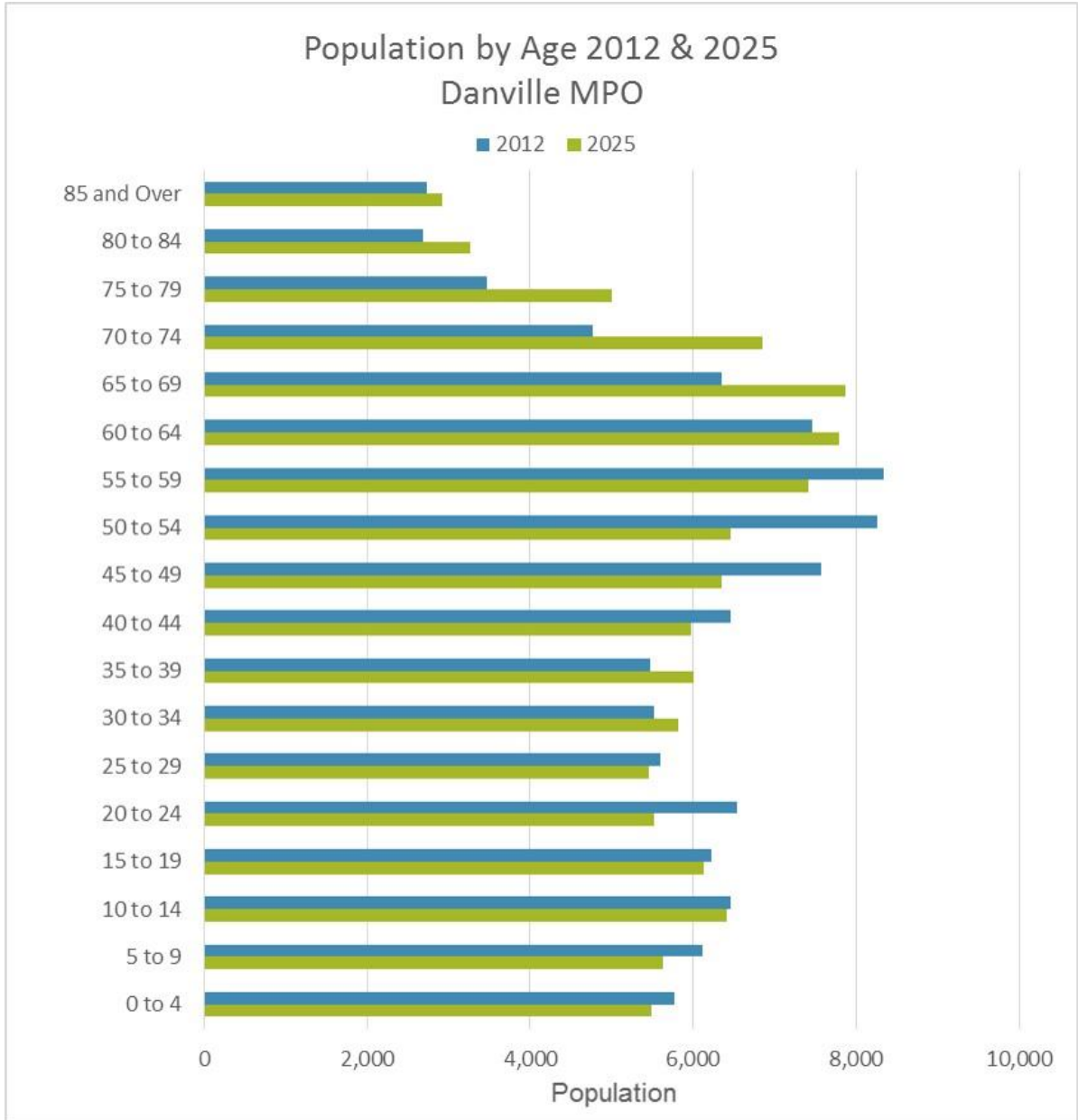


Figure 1: Population of Region 2000 in the years 2012 and Projected for the year 2025.

Source: Weldon Cooper Center for Public Service, Demographic Research Group, Intercensal Estimates for Virginia, Counties and Cities: 2010-2012

## C. Current Industry Strengths

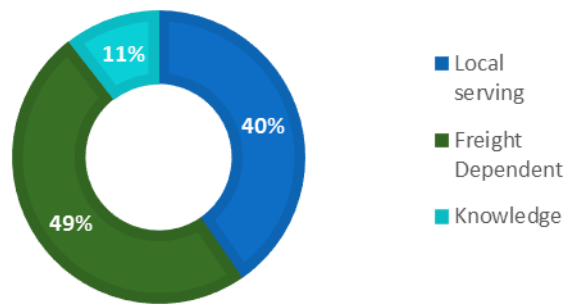
The 20 two digit, economic sectors, as defined by The North American Industry Classification System (NAICS), were analyzed with the following economic measures were to assess the strength and characteristics of the current regional economy in the Danville Region.

### Economic Sectors

The 20 industry sectors, as defined by The North American Industry Classification System (NAICS), have been grouped into three clusters – or broader economic groupings – based on the characteristics that support each industry’s growth. These economic clusters are defined as local economic sectors, Knowledge-based economic sectors, and freight-based economic sectors. Each economic cluster has different characteristics in terms of land use, commuting patterns, and other aspects of regional accessibility that are essential to attracting and retaining these businesses and their workforce. These different characteristics and each region’s mix of economic clusters combine to create unique needs, opportunities and constraints related to transportation and accessibility. For example, a region with greater economic emphasis on manufacturing or warehousing will have a greater focus on freight intermodal needs than a region with stronger knowledge-type service industries such as financial services, where passenger intermodal needs would be a greater concern.

NAICS - 2DIGIT	Industry Name	Cluster
11	Agriculture, Forestry, Fishing and Hunting	Freight Dependent
21	Mining, Quarrying, and Oil and Gas Extraction	Freight Dependent
22	Utilities	Freight Dependent
23	Construction	Freight Dependent
31	Manufacturing	Freight Dependent
32	Manufacturing	Freight Dependent
33	Manufacturing	Freight Dependent
42	Wholesale Trade	Freight Dependent
44	Retail Trade	Local serving
45	Retail Trade	Local serving
48	Transportation and Warehousing	Freight Dependent
49	Transportation and Warehousing	Freight Dependent
51	Information	Knowledge
52	Finance and Insurance	Local serving
53	Real Estate and Rental and Leasing	Local serving
54	Professional, Scientific and Technical Services	Knowledge
55	Management of Companies and Enterprises	Knowledge
56	Administrative and Support and Waste Management and Remediation Services	Knowledge
61	Educational Services	Local serving
62	Health Care and Social Assistance	Local serving
71	Arts, Entertainment, and Recreation	Local serving
72	Accommodation and Food Services	Local serving
81	Other Services, except Public Administration	Local serving
92	Public Administration	Local serving

In addition to the unique characteristics of each cluster, there are also underlying principles with respect to land use density that relate to the different economic sectors and also to the suitability of different transportation modes. These relationships work differently in different regions, and will be applied in context for all 15 of the regional networks. When considering the output of all industries present in the Danville Region, Figure 3 provides a summary of the predominance of each economic cluster, as analyzed by a methodology developed by the Study Team and used in all regional analyses throughout the state.



**Figure 3 – Top Sectors by Output (2012).**

Source: IHS Global Insight, 2012.

The freight dependent cluster is clearly the strongest in this region. Freight dependent industries make up 49% of the economic output in the Danville Region. Conversely, the knowledge and local serving sectors account for 11% and 40% of economic output, respectively. Each economic sector has different transportation characteristics and needs, as will be discussed below. The local services economic sector, for example, is typically characterized by different peak commute times; customer traffic; trip-chaining destinations; and truck deliveries.

## Top Industries by Output

Manufacturing is the strongest industry in the Danville region when measured by economic output. This is due, potentially, to the high economic value of goods produced in the nuclear and medical equipment industries, both of which fall under the broader manufacturing category, and are well represented in the region. The real estate industry comes in a close second, reflecting potentially an increase that the region has been seeing in real estate transactions and new development. Utilities, health care, and wholesale trade round out the top five industries in the region with the greatest economic output. Table 4 shows these top five industries and their percent of the regional economic output.

**Table 4: Current Industries by Output.**

Top Industries	NAICS Sector Code	% of Output
Manufacturing	31-33	23%
Real Estate	53	19%
Utilities	22	13%
Health Care	62	8%
Wholesale Trade	42	8%

Source: IHS Global Insight, 2012.

## Top Industries by Employment

In the Danville Region, public administration, health care, manufacturing, retail trade, and accommodation and food services are the top industries by employment. Table 5 shows these top industries and their percent of the workforce in the Danville Region. There is consistency with the top industries by output, including health care and manufacturing, but also some variation with industries that typically have a high number of employees with relatively low output, such as public administration, food services, and retail trade.

*Table 5: Current Top Industries by Employment. IHS Global Insight Data, 2012*

Top Industries	NAICS Code	% of Workforce
Public Administration	92	16%
Health Care	62	15%
Manufacturing	31-33	15%
Retail Trade	44-45	14%
Accommodation and Food Services	72	9%

*Source: IHS Global Insight, 2012.*

Table 6 shows that Goodyear Tire and Rubber and the Danville Regional Medical Center are the largest employers in the region. This is congruous with both the top industries by employment and output.

*Table 6: Current Top Employers. Source: InfoUSA, supplemented with VEDP, VEC, and local data.*

Employers	Employees
The Goodyear Tire & Rubber Co.	1,500 – 2,499
Danville Regional Medical Center	1,000 – 1,499

*Source: IHS Global Insight, 2012.*

## Top Industries by Location Quotient

Location quotient (LQ) is an economic measure, expressed as a ratio, which compares a region to a larger reference region according to some characteristic or asset. It is often used to quantify how concentrated a particular industry, cluster, occupation, or demographic group is in a region, as compared to the nation, and can reveal what makes a particular region unique in comparison to the national average.

Location quotients for 20 different industry categories were calculated for the Danville Region. The industries expressed in Table 7 have the highest LQ scores in the region. The score for the Administration Sector industry, for example, can be inferred to mean that these services are almost 1.5 times more concentrated in the region than in the entire nation, on average.



*Table 7: Current Top Industries by Location Quotient. Source: IHS Global Insight Data, 2012*

Top Industries	NAICS Code	Location Quotient
Administration Sector	56	1.44
Health Care	62	1.36
Retail Trade	44-45	1.27
Accommodation / Food Service	72	1.25
Real Estate	53	1.24

Source: IHS Global Insight, 2012.

## D. Activity Center Analysis

An important part of the Needs Assessment at the regional level has been the identification and evaluation of economic activity centers. For the purposes of this analysis, activity centers are defined as areas of regional importance that have a high density of economic and social activity. Activity centers were first defined in draft form using employment location patterns. A GIS-based spatial analysis was conducted to determine which areas have the greatest relative density of jobs. Activity centers, drawn with a 1-mile-radius, were then developed for these areas. Activity centers were revised, refined, or amended after discussing economic conditions with regional stakeholders. The activity centers are a tool in the development of each regional profile and do not have standing in the statewide planning and programming process such as Urban Development Areas; therefore the activity center definitions have no significance other than as a reference tool within the economic profiles. Figure 2 below shows the activity centers as blue circles.

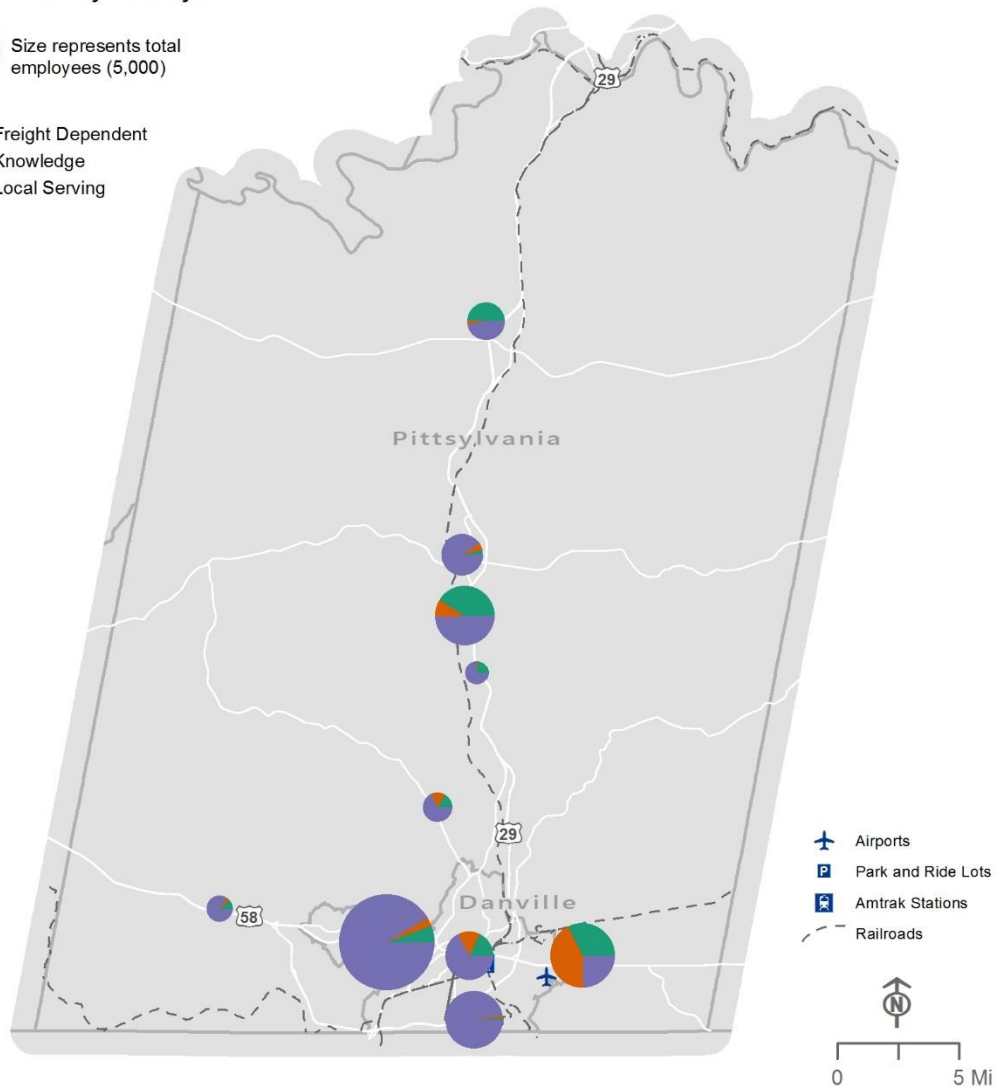
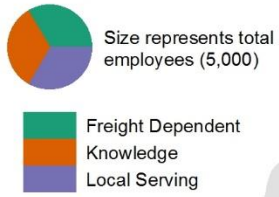
## Danville Activity Centers



*Figure 2: Map of Activity Centers based on Job Density and Stakeholder Input*

Once activity centers were identified, the next step was to analyze the type and scale of economic activity that took place in those locations. Based on the categorization of jobs by NAICS code into the three economic clusters of local, freight, and knowledge economies, analysts developed charts that represented the breakdown of employment by industry sector in each activity center, and scaled those charts based on the number of jobs in each center relative to the other centers in the region. Figure 3 below shows the mapping of each activity center broken down by industry sector, and scaled by relative number of jobs.

**Activity Center by Industry Sector**



*Figure 3: Activity Center Employment by Industry Sector.*  
Source: IHS Global Insight, 2012.

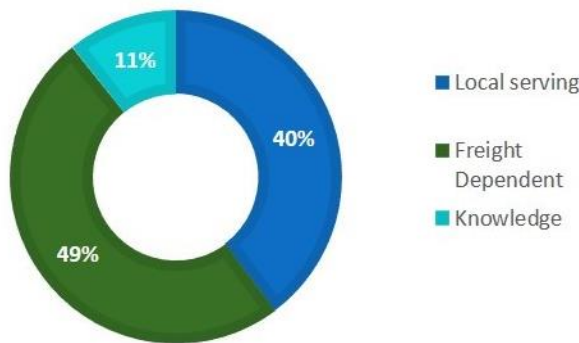
## E. Forecasted 2025 Industry and Employment Strengths

Through a series of work sessions with the Danville Region stakeholders, the Study Team used economic forecasts for 2025 and got input from stakeholders to determine the future desired economic profiles for each region. 2025 economic forecasts for employment by industry from third party data sources were the primary source for the future economic profiles. However, the intent of this process was not to presuppose Danville Region’s economic future, but to allow input from stakeholders to affirm or modify these basic economic forecasts according to regional desires.

The future economic profiles were used as the basis for determining future transportation needs to support the future economic vision in the Danville Region. The basic economic datasets that were compiled include:

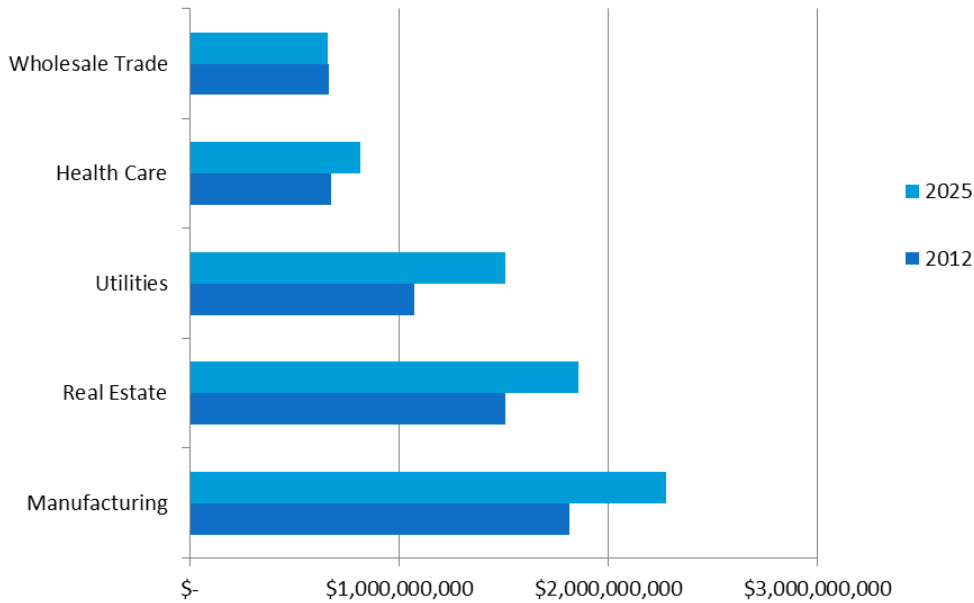
- Current Top Industries by Workforce, Output and Location Quotient
- Future Growth Industries
- Activity Center profiles
- Top Employers and Locations
- Economic Development Priorities

Substantial growth is forecasted for the Danville Region by 2025. According to statewide and national datasets used, the manufacturing and real estate industries will see the largest growth. Combined, they are expected to produce almost \$1 billion more in 2025 than was produced in 2012.



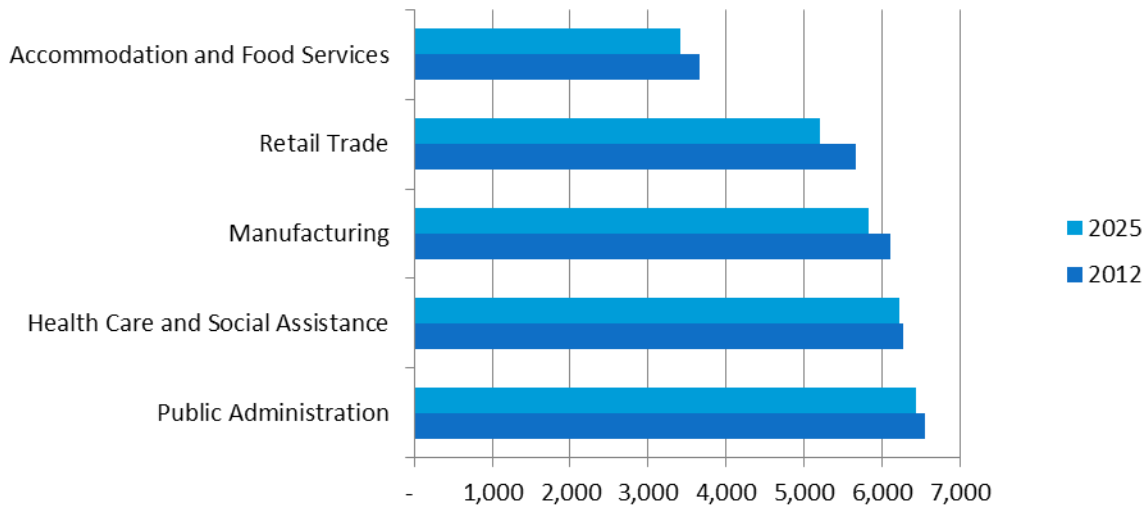
*Figure 4: Top Sectors by Employment (2025).  
Source: IHS Global Insight, 2012.*

The freight dependent sector is clearly the strongest in this region and is anticipated to remain so. Freight dependent industries make up 49% of the economic output in the Danville Region. Conversely, the knowledge and local serving clusters account for 11% and 40% of economic output, respectively. There are not any anticipated shifts in the economy that would affect the future transportation network.



**Figure 5: Top Industries by Output –**  
 Source: IHS Global Insight, 2012.

The greatest growth by output is in the transportation industry, which is estimated to grow by 119% by 2025. The industry projected to have the greatest reduction of output in 2025 compared to 2012 is finance and insurance. This industry is expected to decrease in output by 13%. In all industries combined, economic output in the Danville Region is expected to increase by almost \$2 billion by 2025. (Refer to Figure 6).



**Figure 6: Top Industries by Employment.**  
 Source: IHS Global Insight, 2012.

Employment for the aforementioned top industries is expected to decrease slightly by 2025. The top industries by employment will decrease from between 2% and 8%, with the greatest decrease is in the retail trade. However, multiple industries are anticipated to grow in employment (Refer to Table 8). The highest anticipated growth is in the utilities industry, which is expected to grow by 53%.

*Table 8: Top Industries by Employment.*

Top Industries	NAICS Code	% Change in Employment (2012-2025)
Utilities	22	53%
Mining, Quarrying, and Oil and Gas Extraction	21	50%
Educational Services	61	33%
Construction	23	31%
Real Estate and Rental and Leasing	53	18%

Source: IHS Global Insight, 2012.

## 3. TRANSPORTATION PROFILE

### A. Introduction

The following section describes the transportation and accessibility measures that were developed to capture the workforce needs and the freight needs at a regional scale. This set of measures reflects regional transportation characteristics in the Danville Region such as typical commute times and overall travel reliability. The following categories of performance metrics that were used to create a regional Transportation Profile for the Danville Region:

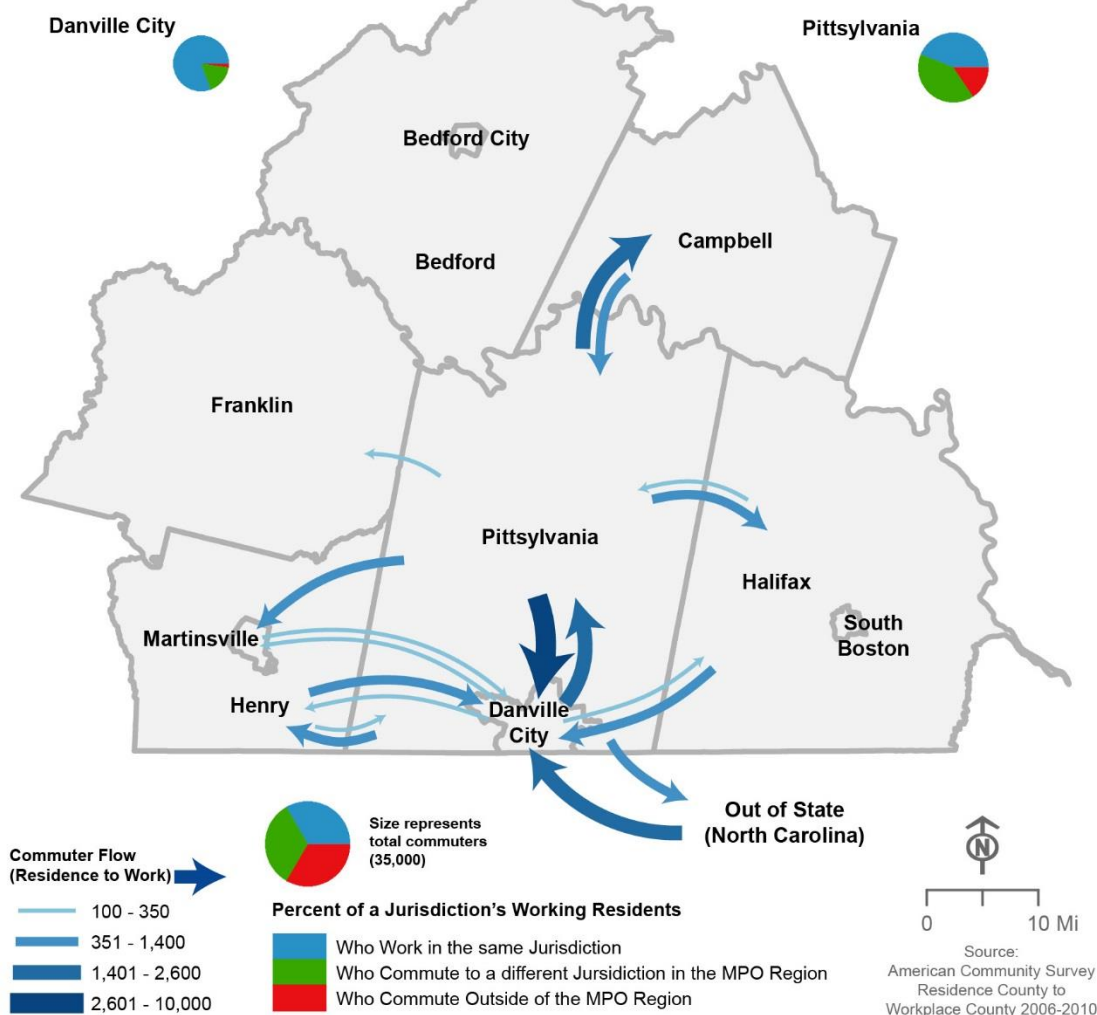
- Commuting Patterns
- Accessibility to Employment
- Roadway Measures
- Freight Measures

### B. Commuting Patterns

#### Regional Commuting Patterns

Commuting patterns in the Danville Region show that the City of Danville attracts workers not only from Pittsylvania County, but from jurisdictions surrounding the region as well as from North Carolina. As represented in Figure 5, the vast majority of workers both live and work within the same jurisdiction, or commute to another jurisdiction within the MPO area.

### Commuter Origin/Destination Flow



*Figure 7: Regional Commuting Patterns.*  
Source: Census Commuting Data, 2006-2010

## Activity Center Commuting Patterns

Equally important to the formation of a regional Transportation Profile for Danville Region was the analysis of commuting patterns between activity centers. Figures 8 through 12 below provide insights into the commuting patterns for five of the activity centers in the Danville Region. Block groups are symbolized on a color scale from dark blue to yellow, with the darker shades representing the block groups with the largest number of commuters to the activity center analyzed within that map.

The data source used to analyze the origin of workers in activity centers was the LEHD Origin-Destination Employment Statistics (LODES) data from the United States Census Bureau. The data file



provided the Census Block of the home and work locations for all persons working in the state of Virginia in 2011 based on Unemployment Insurance earnings data and Quarterly Census of Employment and Wages (QCEW) data. The LODES data is not perfectly accurate as job and home locations can be misreported through the original data sources. In addition, the Census Bureau uses noise infusion and synthetic data methods to ensure confidentiality in the publically released data. For these reasons, the data have been aggregated and reported at the Census Block Group level in the following analysis.

As shown on the map, Downtown Danville sees a significant number of commuters from the surrounding area, especially in the City of Danville. (Refer to Figure 8).

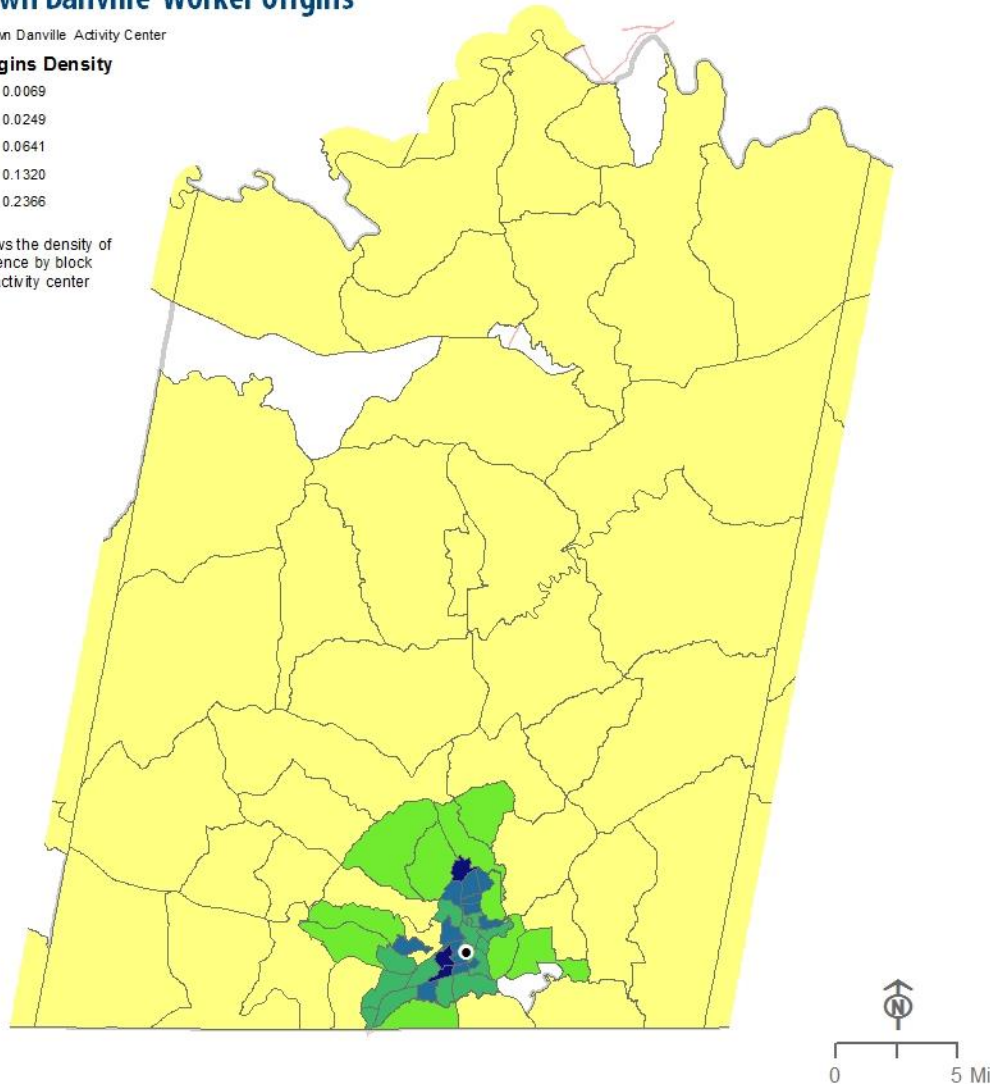
### Downtown Danville Worker Origins

● Downtown Danville Activity Center

#### Worker Origins Density



This map shows the density of workers' residence by block group for the activity center identified



*Figure 8: Commuting Patterns to Downtown Danville Activity Center.*

Source: US Census, LEHD Origin-Destination Employment Statistics (LODES), 2011

The Cane Creek Boulevard is a modest draw for workers in the region, with commutes originating in most census block groups in the region. The highest concentration of workers in the census block groups in and adjacent to the City of Danville. (Refer to Figure 9).

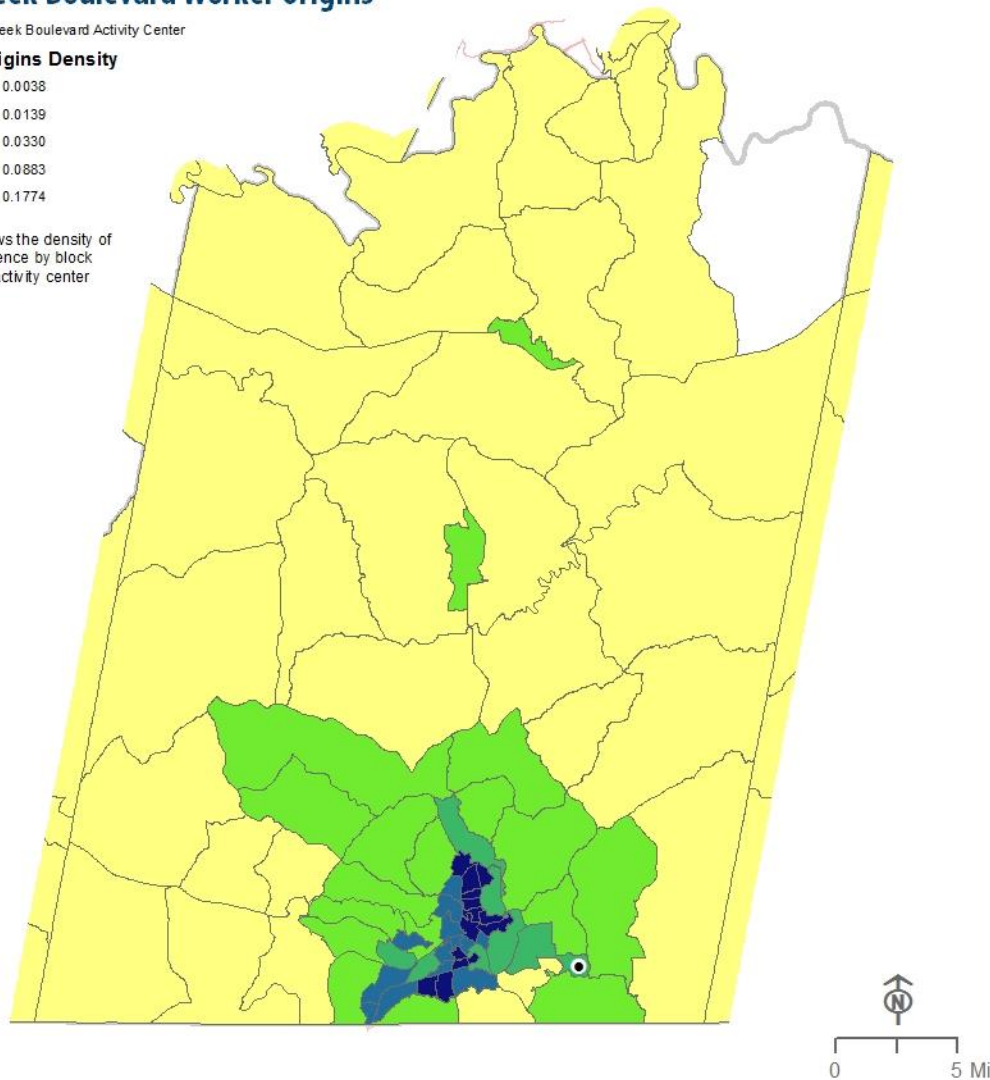
### Cane Creek Boulevard Worker Origins

● Cane Creek Boulevard Activity Center

#### Worker Origins Density



This map shows the density of workers' residence by block group for the activity center identified



*Figure 9: Commuting Patterns to Cane Creek Boulevard Activity Center.*

Source: US Census, LEHD Origin-Destination Employment Statistics (LODES), 2011

Commutes to Brosville originate in fewer block groups in the region than the aforementioned jurisdictions. Most commutes are centered in block groups around the activity center. (Refer to Figure 10).

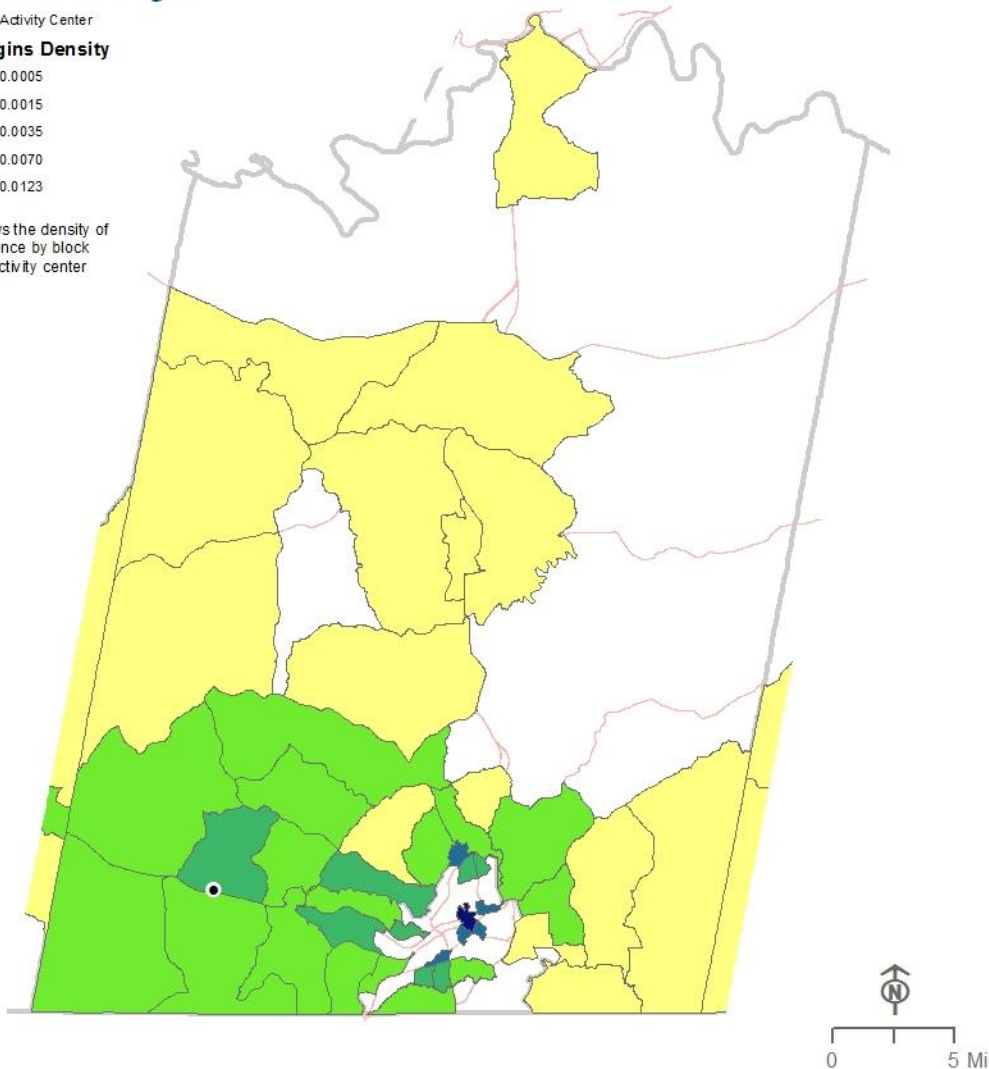
### Brosville Worker Origins

● Brosville Activity Center

**Worker Origins Density**

- 0.0001 - 0.0005
- 0.0006 - 0.0015
- 0.0016 - 0.0035
- 0.0036 - 0.0070
- 0.0071 - 0.0123

This map shows the density of workers' residence by block group for the activity center identified



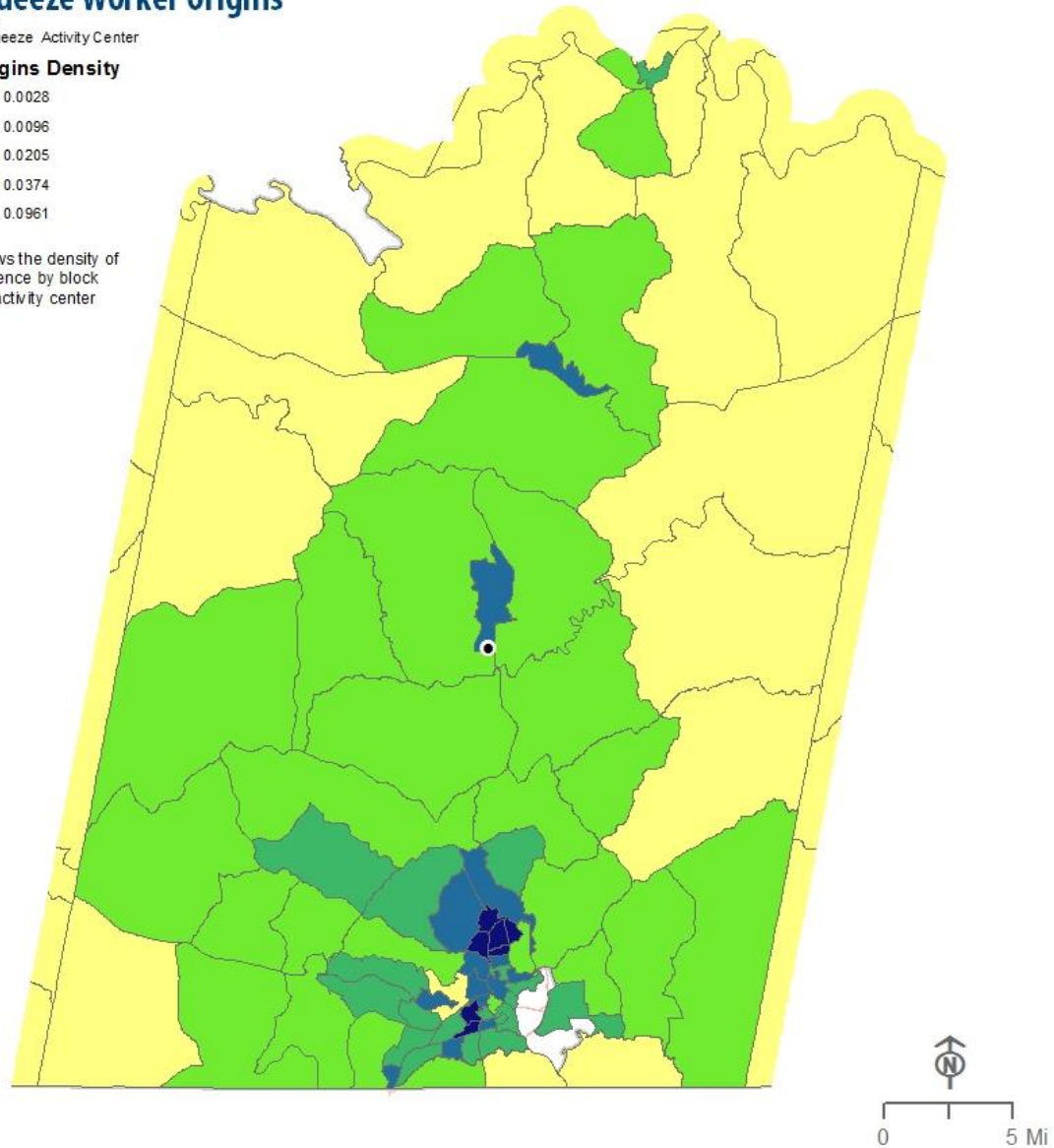
*Figure 10: Commuting Patterns to Brosville Activity Center.*  
Source: US Census, LEHD Origin-Destination Employment Statistics (LODES), 2011

Commute to Tightsqueeze originate throughout the Danville Region. The block groups with the greatest density of worker origins are in the City of Danville and along the US Route 29 corridor. (Refer to Figure 11).

### Tightsqueeze Worker Origins

- Tightsqueeze Activity Center
- Worker Origins Density**
- 0.0001 - 0.0028
  - 0.0029 - 0.0096
  - 0.0097 - 0.0205
  - 0.0206 - 0.0374
  - 0.0375 - 0.0961

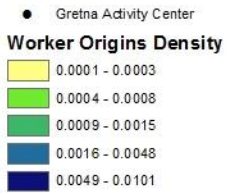
This map shows the density of workers' residence by block group for the activity center identified



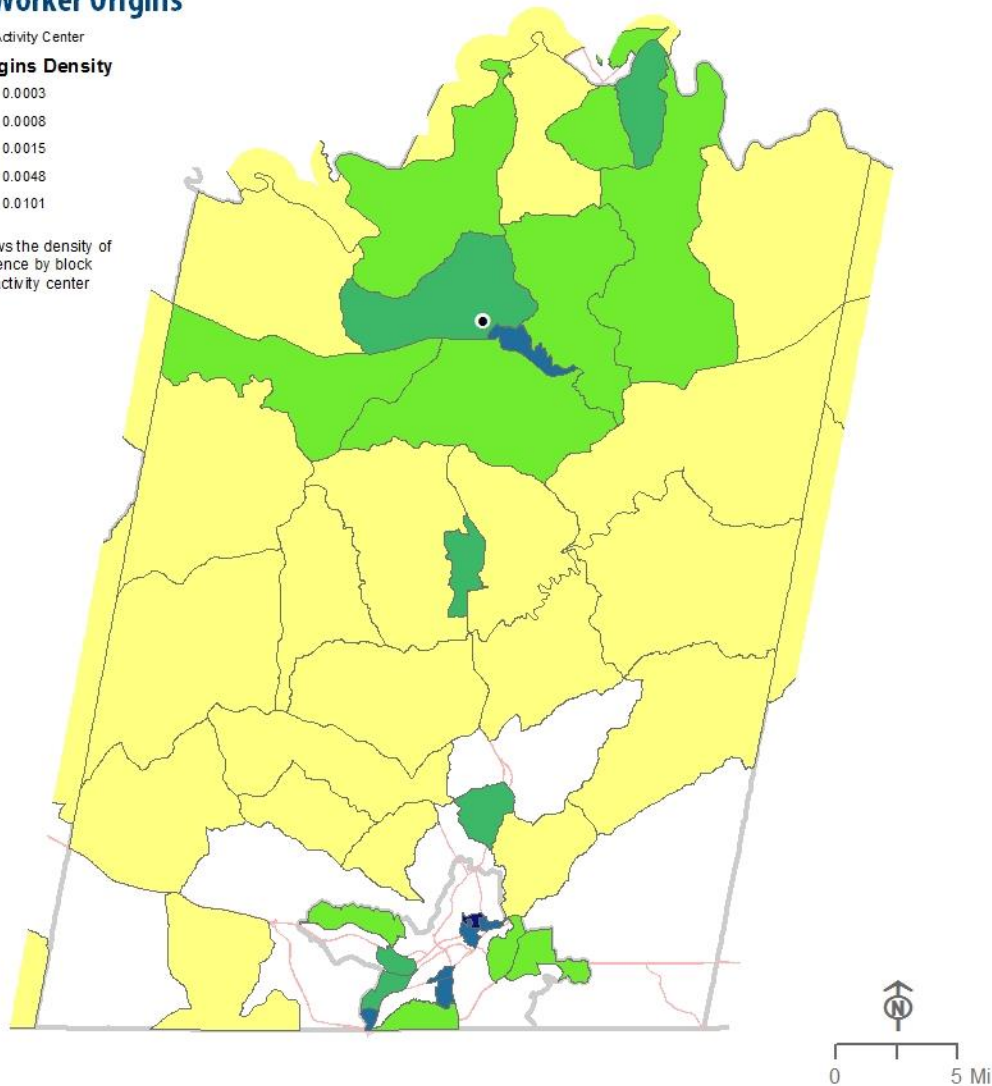
*Figure 11: Commuting Patterns to Tightsqueeze Activity Center.*  
Source: US Census, LEHD Origin-Destination Employment Statistics (LODES), 2011

Most commutes to the Gretna activity center originate in the block groups directly adjacent to the activity center. (Refer to Figure 12).

## Gretna Worker Origins



This map shows the density of workers' residence by block group for the activity center identified



*Figure 12: Commuting Patterns to Gretna Activity Center.*

Source: US Census, LEHD Origin-Destination Employment Statistics (LODES), 2011

## Mode Choice

In the Danville Region, the vast majority of commuters drive alone to work, making up 83% of commuter trips in the region. While there is some variation between jurisdictions, single occupancy vehicles are used between 79% and 85% of the time. For all jurisdictions, carpooling is the second most prevalent option, accounting for 11% of the regional mode share. Public transit use is highest in the City of Danville, which has the most robust transit system in the region. (Refer to Figure 13).

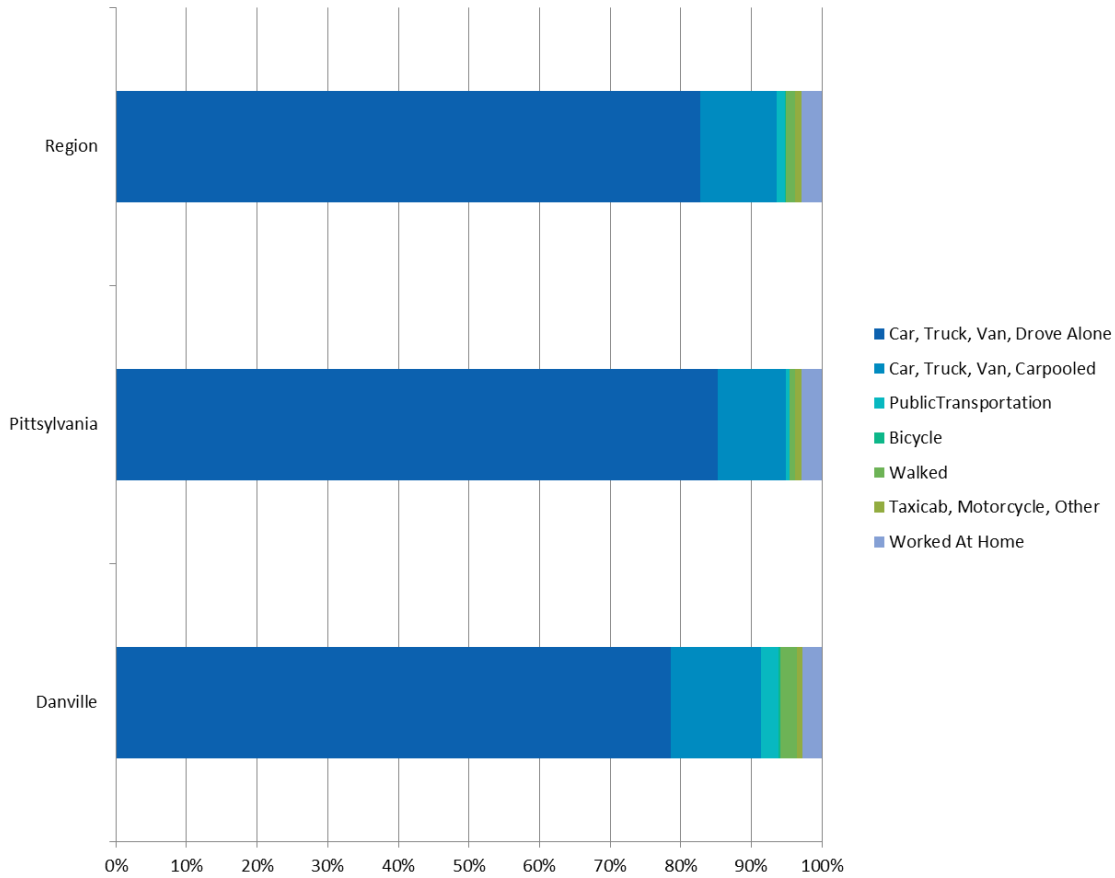


Figure 13: Mode Share Split by Jurisdiction.

Source: ACS 2013 5-Year Estimates

## Average Commute Times

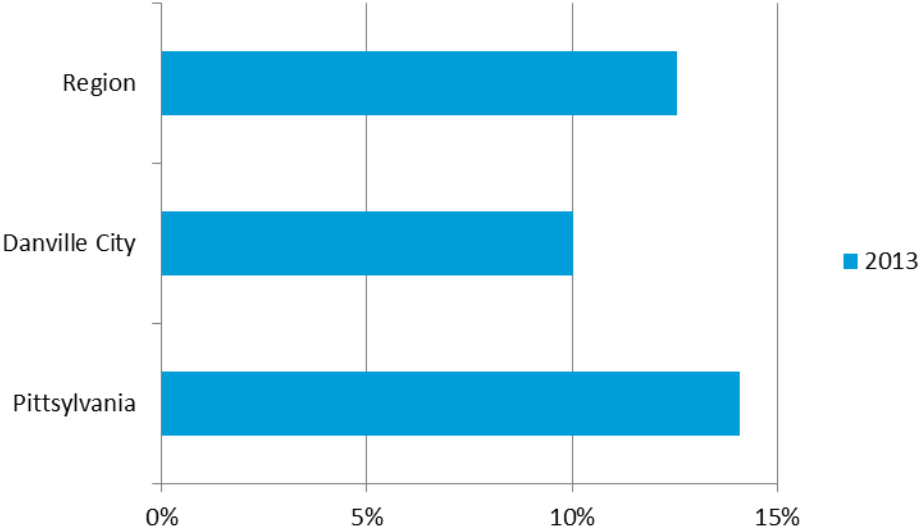
In the Danville Region, average commute times range from 21 to 28 minutes among the various jurisdictions. (Refer to Table 9). Due to its density and proximity to employment centers, the City of Danville has the shortest average commute, while the more rural jurisdiction, Pittsylvania County, has a longer average commute time.

Table 9: Mean Commute Time by Jurisdiction.

Jurisdiction	Mean Commute Time (Minutes)
Pittsylvania County	28
City of Danville	21

Source: ACS 2013 5-Year Estimates

Commutes of over 45 minutes make up only 12% of regional commutes. Pittsylvania County has the highest percentage of workers who commute over 45 minutes at 14%, this is twice as high as the City of Danville’s rate of long commutes. (Refer to Figure 14).



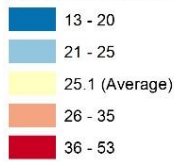
*Figure 14: Percent of Commutes Long than 45 Minutes.*  
 Source: ACS 2013 5-Year Estimates

Figure 15 provides a closer look at where longer commutes originate. Commutes are shortest in the City of Danville and in Pittsylvania County along the US Route 29 and US Route 360 corridors. Block groups outside of these corridors in Pittsylvania County, have commute times that are nearly 150% longer than the regional average, as these areas have fewer jobs in close proximity, and less access to transportation networks than more developed areas.

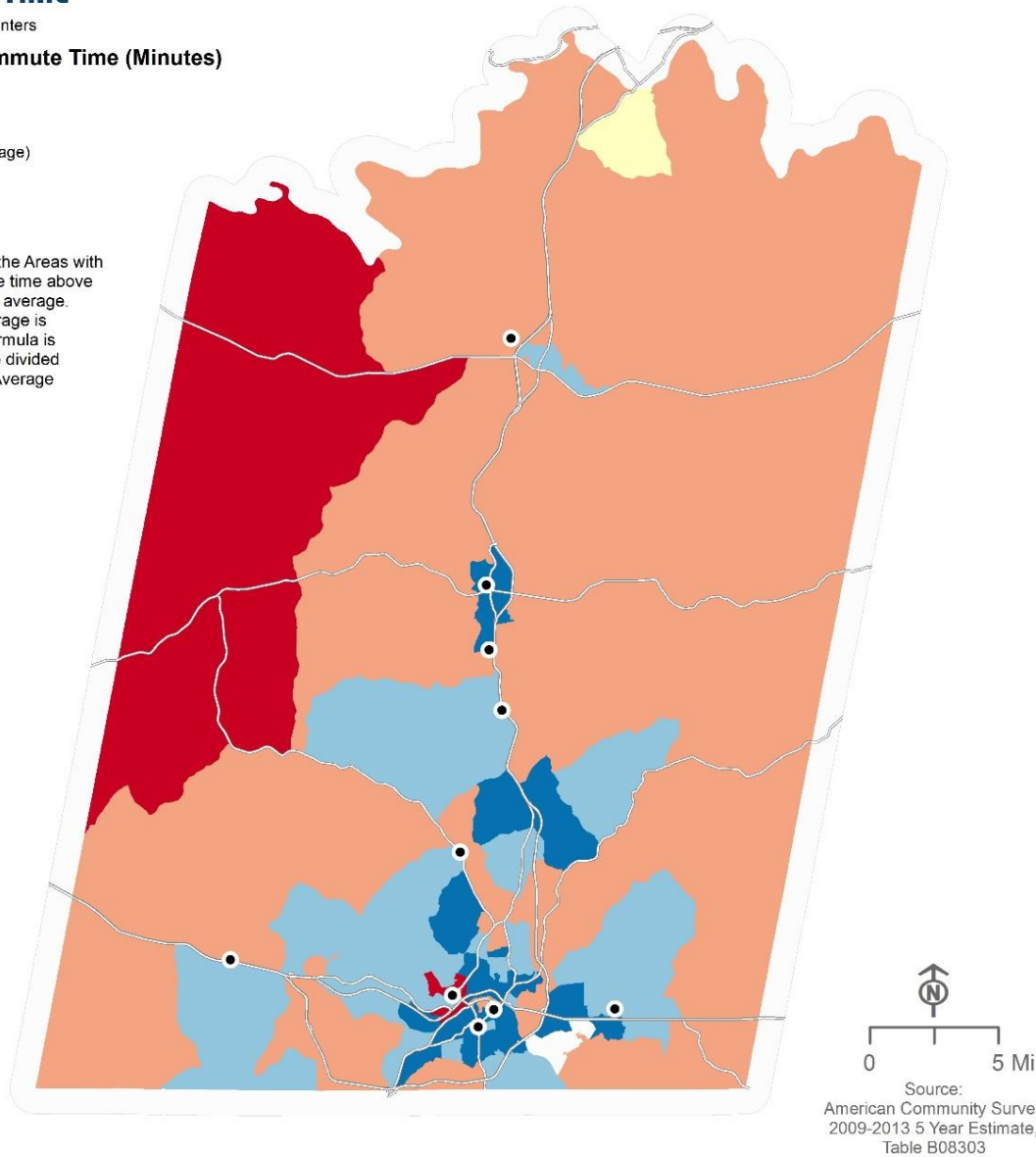
## Commute Time

- Activity Centers

### Average Commute Time (Minutes)



This map shows the Areas with average commute time above or below regional average. The regional average is 25.1 min. The formula is the Average Time divided by the Regional Average



*Figure 15: Danville Region Commute Times.*  
Source: ACS 2013 5-Year Estimates

## C. Accessibility to Employment

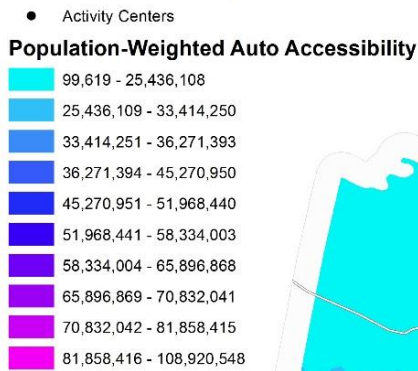
As part of the transportation conditions assessment, a set of accessibility performance measures and attributes were employed to address the workforce and freight needs at the general regional scale. This set of performance measures/attributes reflects regional characteristics such as commute times and the availability of multimodal transportation between activity centers.



## Auto Accessibility

Auto accessibility in the Danville Region is driven by two main factors: distance from activity centers, and distance from major arterial roadways. Accessibility for auto travel is measured as the number of jobs that can be reached within a 45 minute drive. The areas with the highest level of auto accessibility exist around the City of Danville, and in the US Routes 360, 58, and 29 corridors in Pittsylvania Counties. The accessibility to jobs is weighted by the population affected to provide further insight into the relative degree of access to employment for residents among areas of the region. (Refer to Figure 16).

### Auto Accessibility



Total number of jobs reachable in a 45 minute drive time for each Census Block Group multiplied by population in the CBG

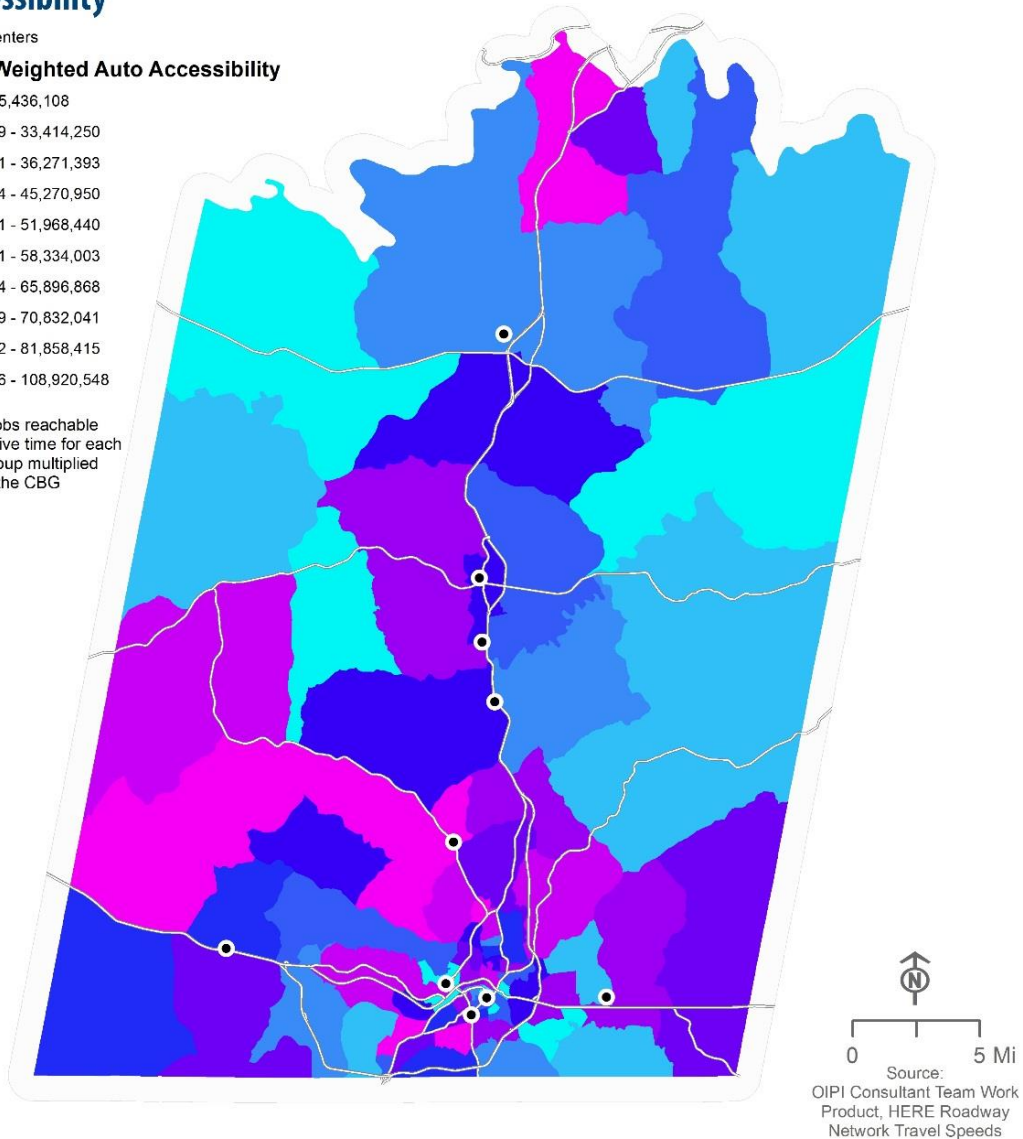
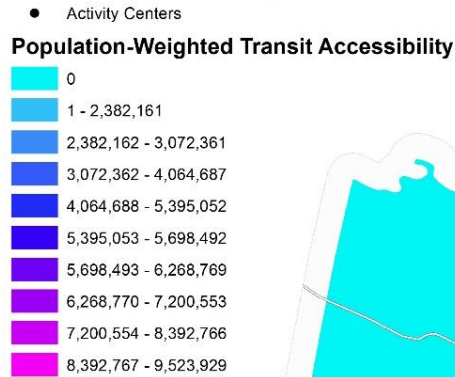


Figure 16: Auto Accessibility

## Transit Accessibility

Outside of the City of Danville, there are few fixed-route transit options in the Danville Region. This is reflected not only in the low (fixed route) transit accessibility scores for large parts of the region, but also the low number of jobs accessible from the high scoring areas. Due to the lack of inter-city transit options in the region (other than demand response services), commuters using transit are restricted in their ability to reach regional jobs. (Refer to Figure 17).

### Transit Accessibility



Total number of jobs reachable in a 45 minute transit time for each Census Block Group multiplied by population in the CBG

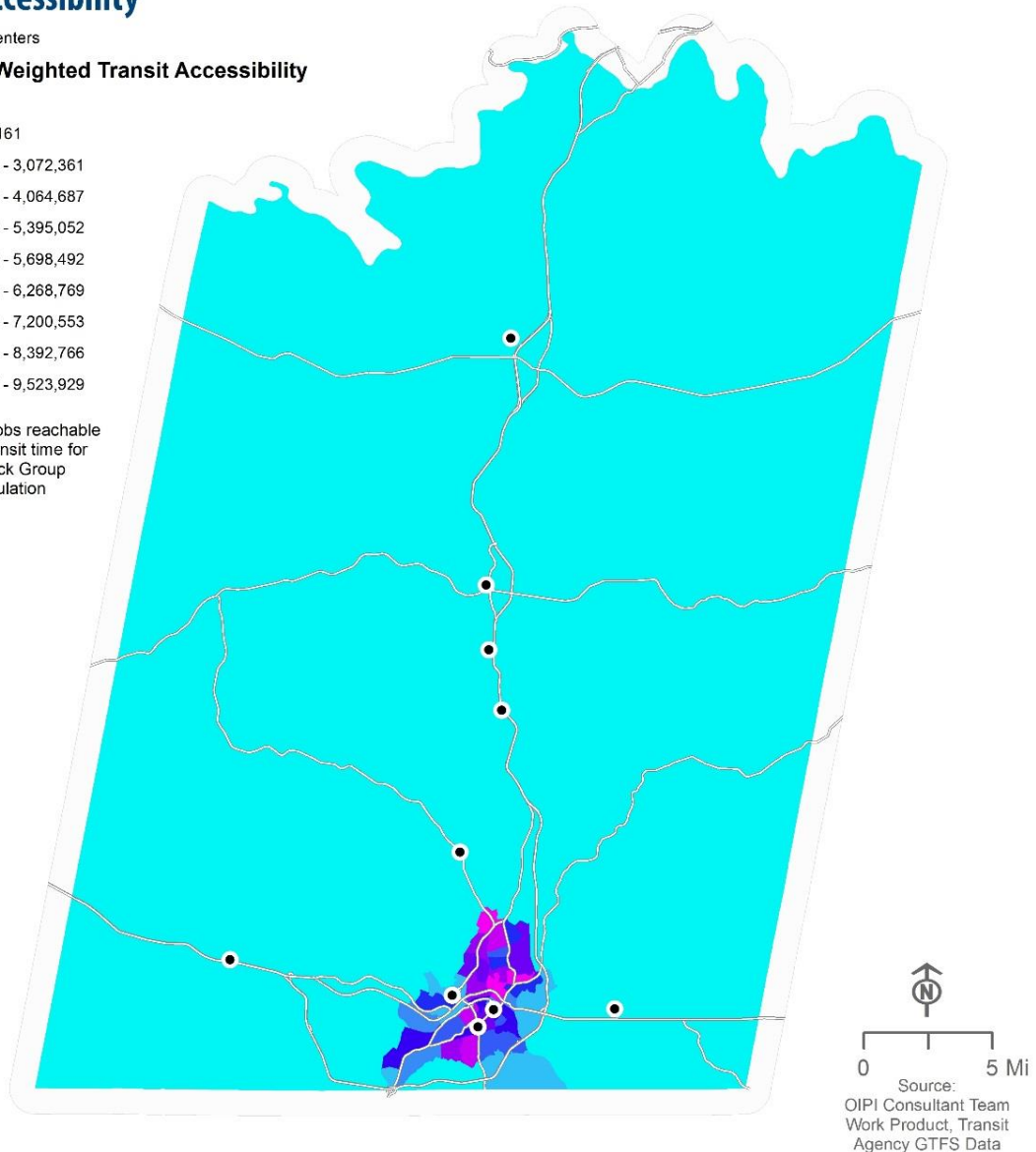


Figure 17: Transit Accessibility

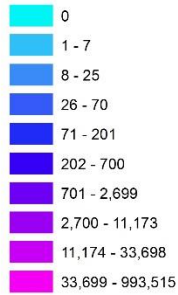
## Walk Accessibility

Walk accessibility in the area is largely determined by the mix of land use and density of development surrounding the origin of each trip. The highest scoring areas are located in and adjacent to the City of Danville. Areas in Pittsylvania County that scored high in walkability are US Route 360, US Route 58, US Route 29, and VA Route 41. The high variability within even the highest scoring areas reflects the significance of land use and job density in determining walk accessibility. (Refer to Figure 18).

### Walk Accessibility

● Activity Centers

#### Population-Weighted Walk Accessibility



Total number of jobs reachable in a 45 minute walk time for each Census Block Group multiplied by population in the CBG

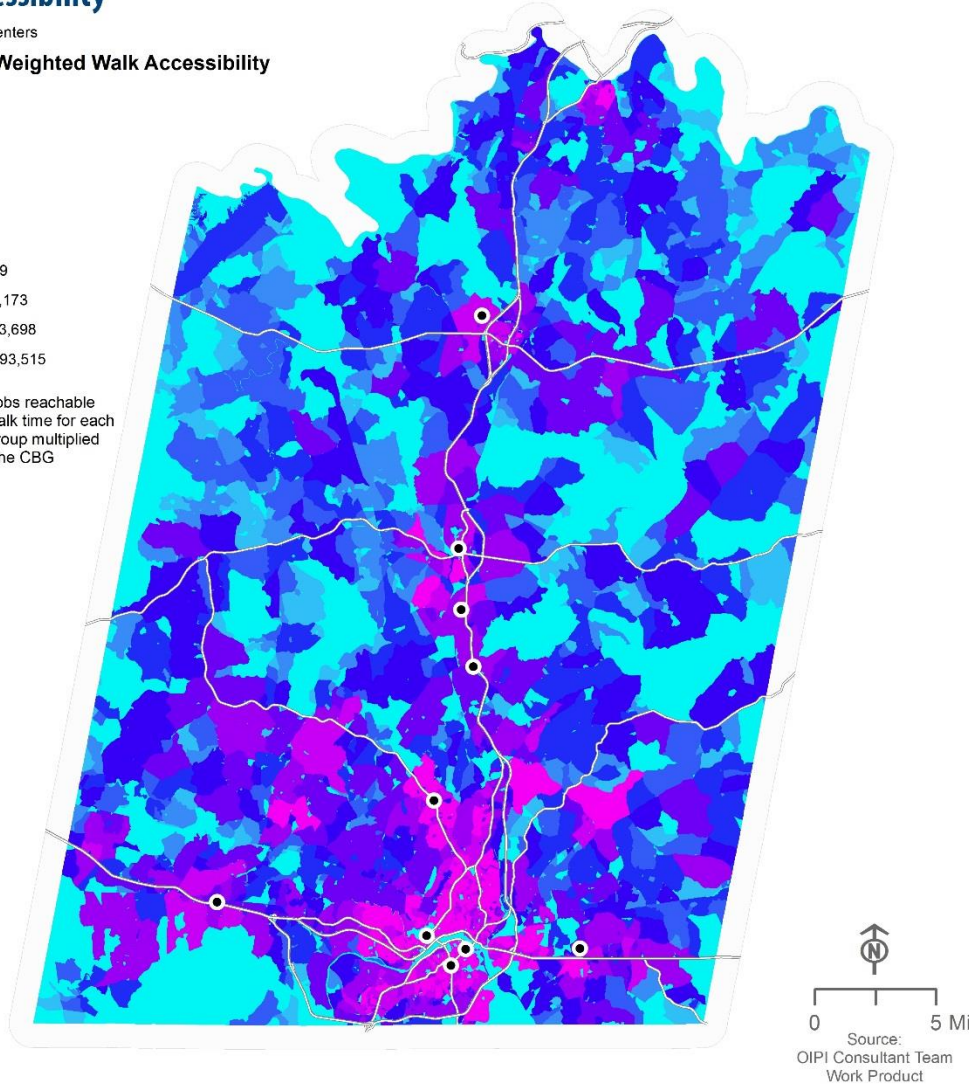


Figure 18: Walk Accessibility

## Freight Accessibility

In addition to railways, US Routes 58, 29, and 360 are the major corridors for freight movement throughout the region. Accessibility of freight origins to these roadways is dependent primarily on the proximity of the origin to highway access ramps. Most activity centers in the region are within a six minute drive from a major arterial ramp. (Refer to Figure 19).

### Access to Interstate or Principal Arterial Ramps

- Activity Centers

#### Blockgroup to Interstate or Principal Arterial Ramps

Drive Time (Minutes)

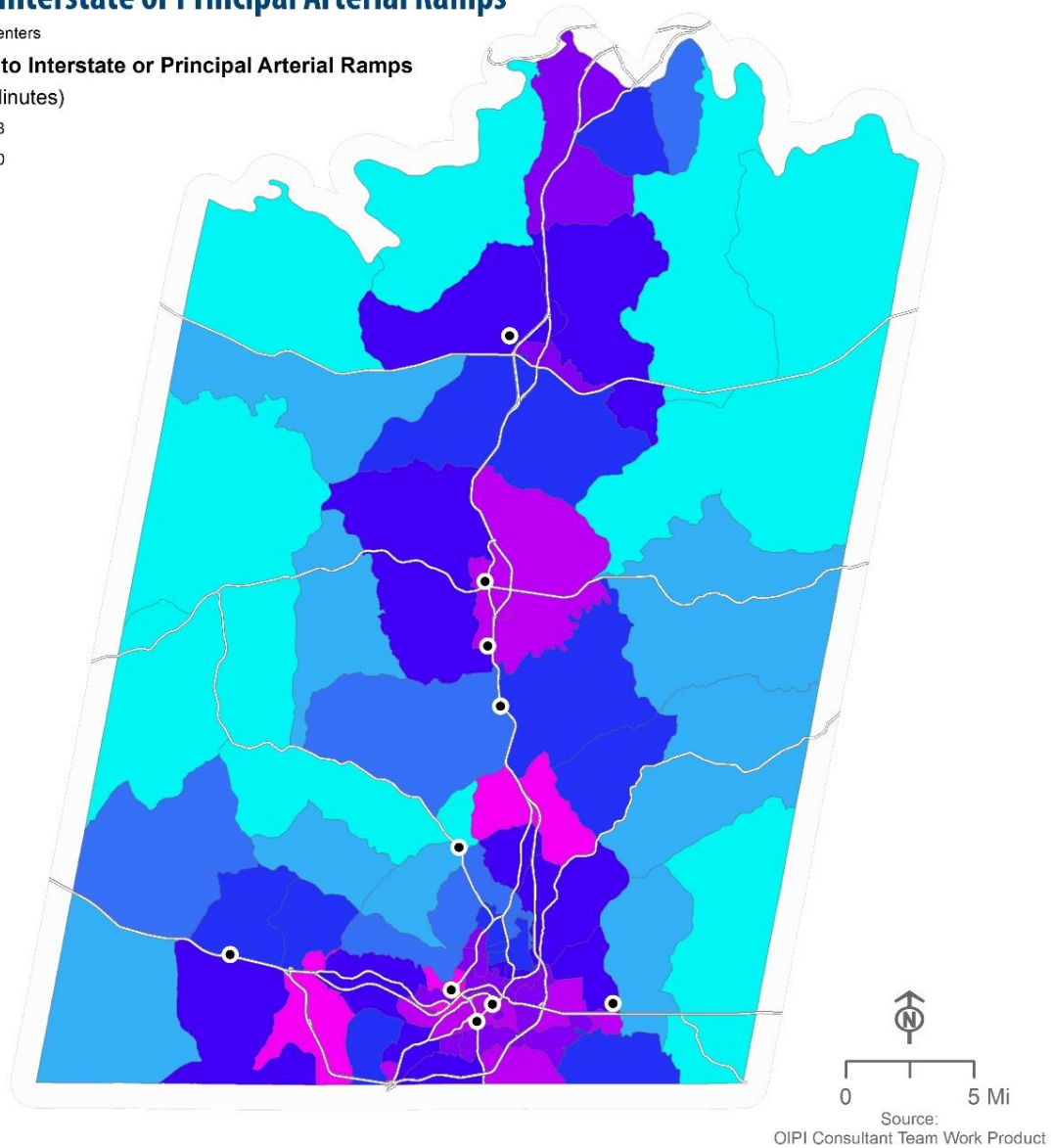
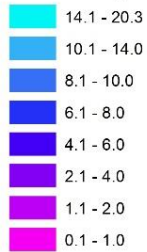


Figure 19: Access to Interstate and Principal Arterial Ramps

The location of warehouses and distribution centers is another important factor in the level of freight accessibility for the region. Most warehouses and distribution centers in the Danville Region are clustered around US Route 29 north of the City of Danville, and along US Route 360/58 to the east and west of the City of Danville. Most areas within the City of Danville, and to the north, east, and west of the city, have access to a warehouse or distribution center within a ten minute drive. (Refer to Figure 20).

### Access to Warehouse and Distribution Centers

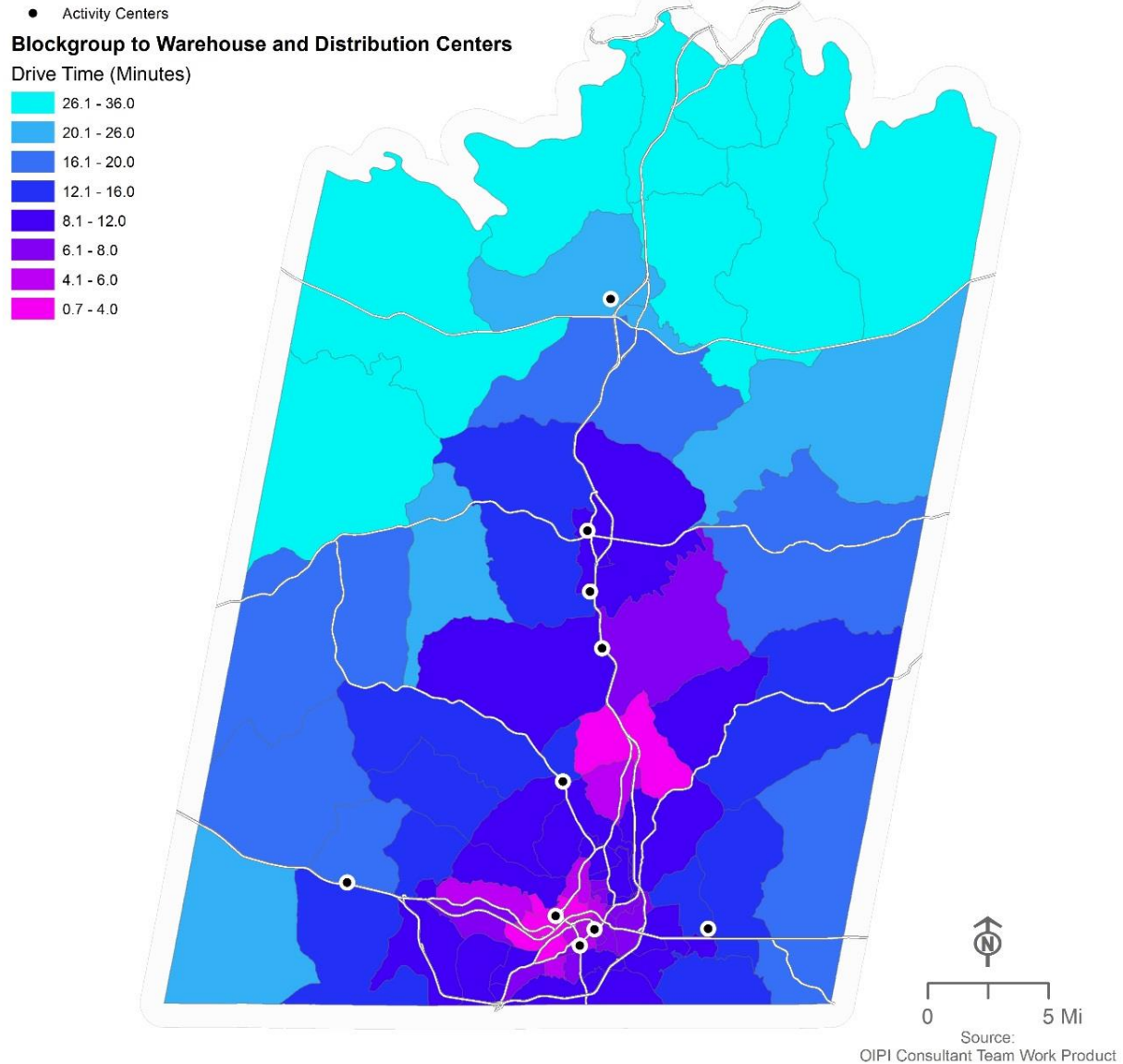


Figure 20: Access to Warehouses & Distribution Centers

Norfolk Southern operates freight rail lines that pass through the City of Danville and Pittsylvania County. The Roanoke-Blacksburg Regional Airport is the closest major airport that handles large quantities of freight. It is a little more than an hour and a half drive to the Roanoke-Blacksburg Regional Airport from most of the Danville Region. (Refer to Figure 21).

### Access to Major Air Cargo Airports

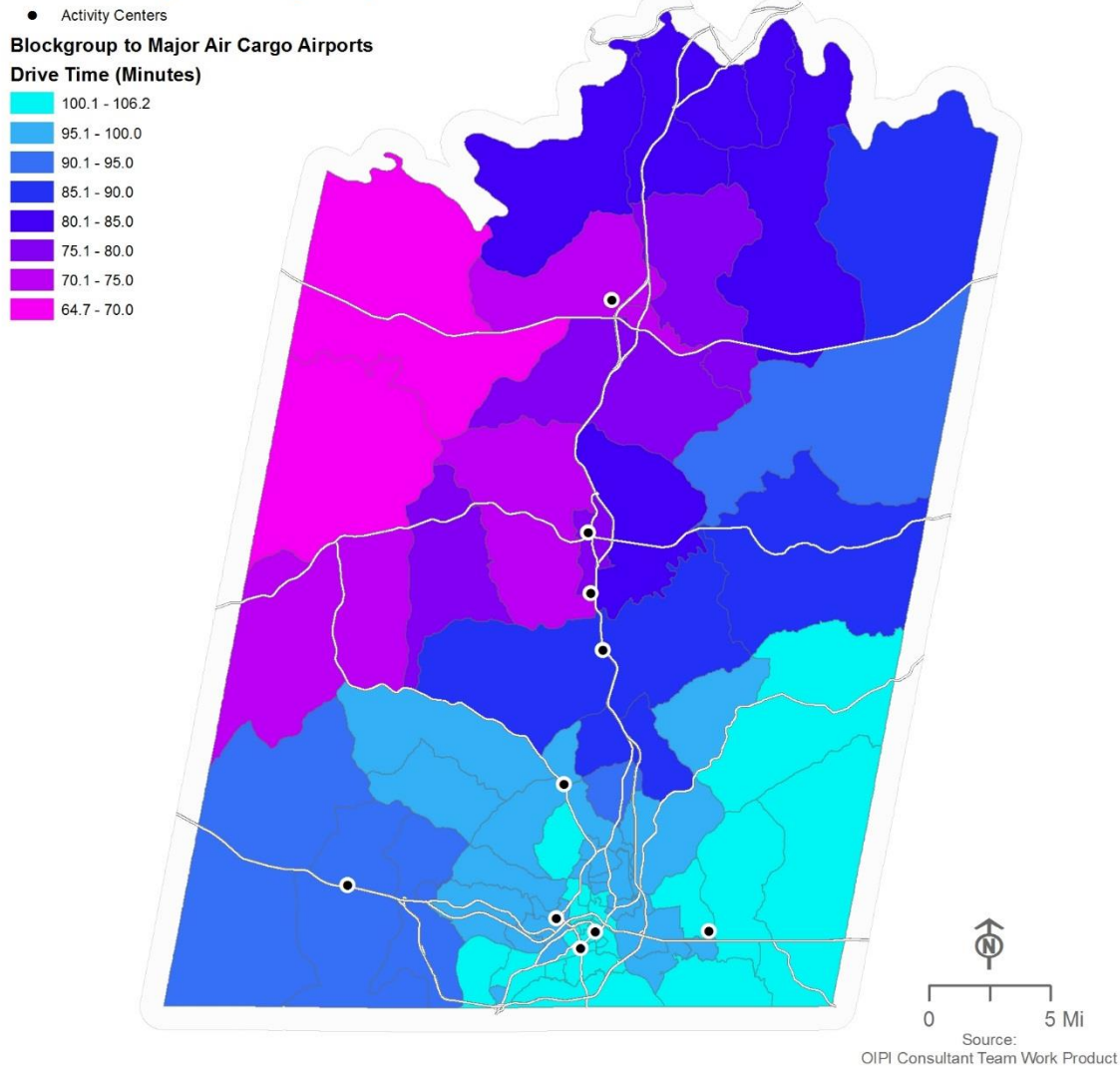


Figure 21: Access to International Airports

## D. Roadway Measures

This assessment identified the transportation conditions in the Danville Region based on a series of quantitative roadway measures. The findings in this section reflect corridor-level measures that are critical to access and mobility for people and freight.

## Travel Time Reliability

Travel time reliability measures the frequency by which trips along a specified corridor are significantly delayed. The Reliability Index, as shown in Figure 20 below, is defined as the ratio of the median speed to the 90th percentile speed during the weekday AM peak period. Data for major roadways were available for analysis in the Danville Region, as they are the major arterial roadways with heavy commuter traffic. Overall, many of these corridors scored well on the reliability index, with all of US Route 29, and US Route 58/360 in Pittsylvania County scoring as reliable. In the City of Danville US Route 58/360, US Business Route 29, and VA Route 293 have lower levels of travel time reliability. There are, however, no areas of significant concern along either corridor. (Refer to Figure 22).

### Highway Condition: PM Reliability Index

- Activity Centers
- PM Peak - Reliability Index**
- 1.0 - 1.1
  - 1.2 - 1.3
  - 1.4 - 1.5



Figure 22: Travel Time Reliability

Note: the Reliability Index is based on a statewide scale which may skew the scores for the Danville Region based on the travel time reliability in other regions throughout the state.

## Percent of Time Congested

Congestion is an important determinant of roadway level of service. The percentage of time congested was calculated for evening peak times from 2013 to 2014 for major roadways in the region. According to the analysis, the major roadways did not have an issue with congestion. (Refer to Figure 23).

### Highway Condition: PM Percent Time Congested

- Activity Centers
- PM Peak - Percent Time Congested**
- 0% - 1.4%
  - 1.5% - 5%
  - 5.1% - 13.4%

PM peak percent time congested. A percentage of the time that a typical vehicle spent in significantly congested conditions in 2014. Significant congestion is defined as operating at speeds below 50% of the free-flow speed. The free-flow speed is measured as the 85th percentile over night speed.



Figure 23: Percent of Time Congested



## Travel Time Delay

Figure 24 displays the total hours of delay per vehicle experienced during the evening peak period on Tuesdays-Thursdays in 2014. A traveler is considered as experiencing delay when travel speeds fall below the posted speed limit. Travel time delay on the Danville Regional Network is minimal, with slight delays occurring on segments of US Routes 29 and 58 in Pittsylvania C. (Refer to Figure 23).

### Highway Condition: AM Peak Delay Hours

- Activity Centers
- AM Peak Delay Hours**
- 0 - 25
  - 26 - 50

This map displays the total number of hours of delay per vehicle experienced during the weekday, AM Peak Period during the study year. Delay is measured as the difference between free flow times and AM peak travel times.

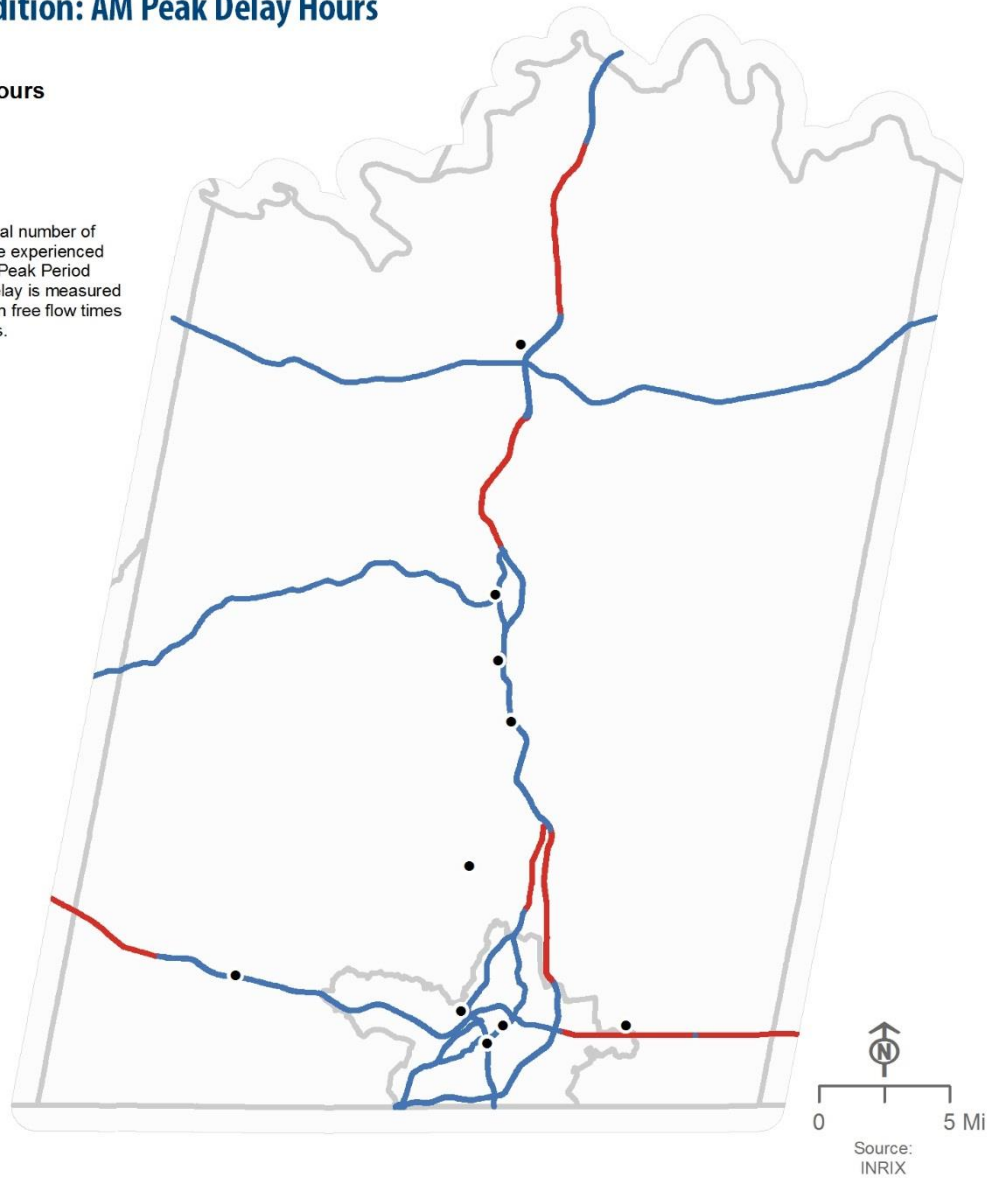


Figure 24: Travel Time Delay

## Median Speeds

Figure 25 displays the ratio of pm peak hour vehicle speeds and the speed limit. Speeds greater than 1.0 indicate travel at speeds higher than the speed limit. (Refer to Figure 25).

### Highway Condition: PM Peak Median Speed

- Activity Centers

#### Ratio of Median Speed and Speed Limit

- 0.00 - 0.50
- 0.51 - 0.85
- 0.86 - 1.00
- >1

This map displays the ratio of pm peak hour vehicle speeds and the speed limit. Speeds greater than 1.0 indicate travel at speeds higher than the speed limit.

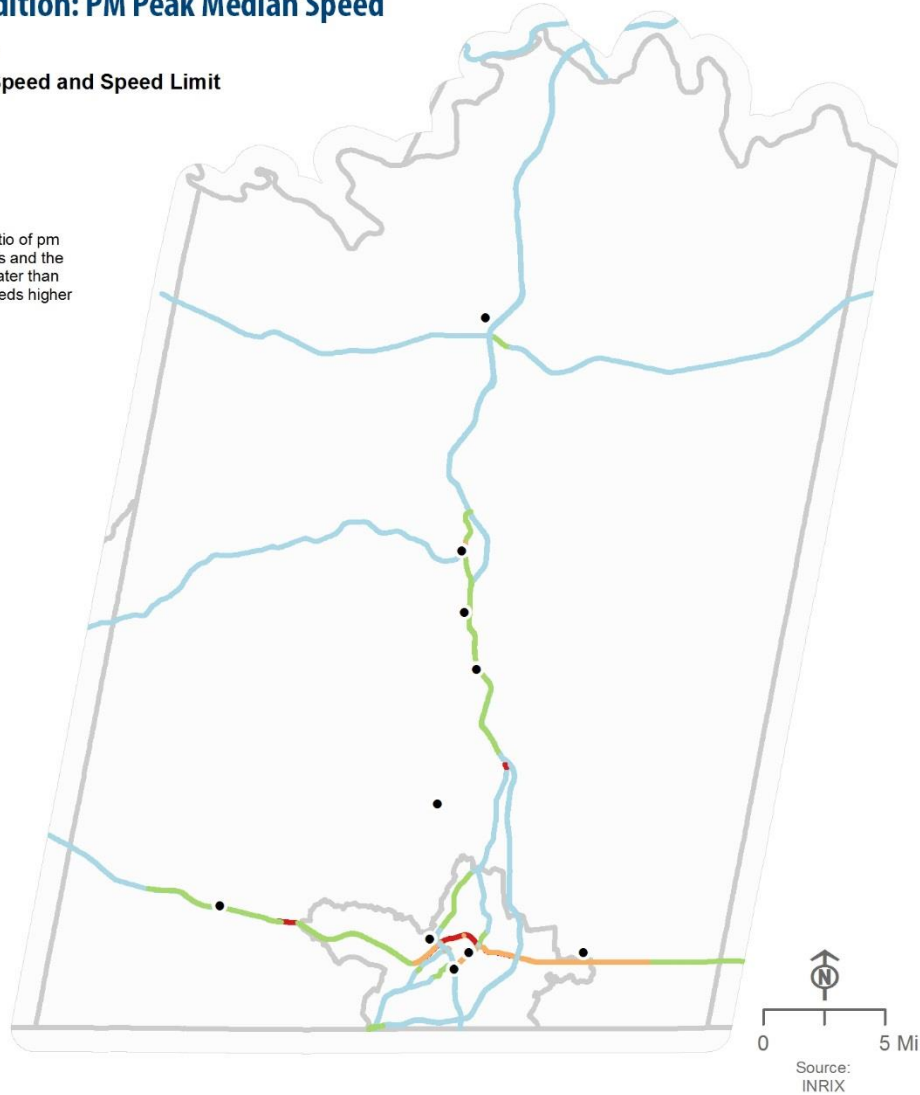


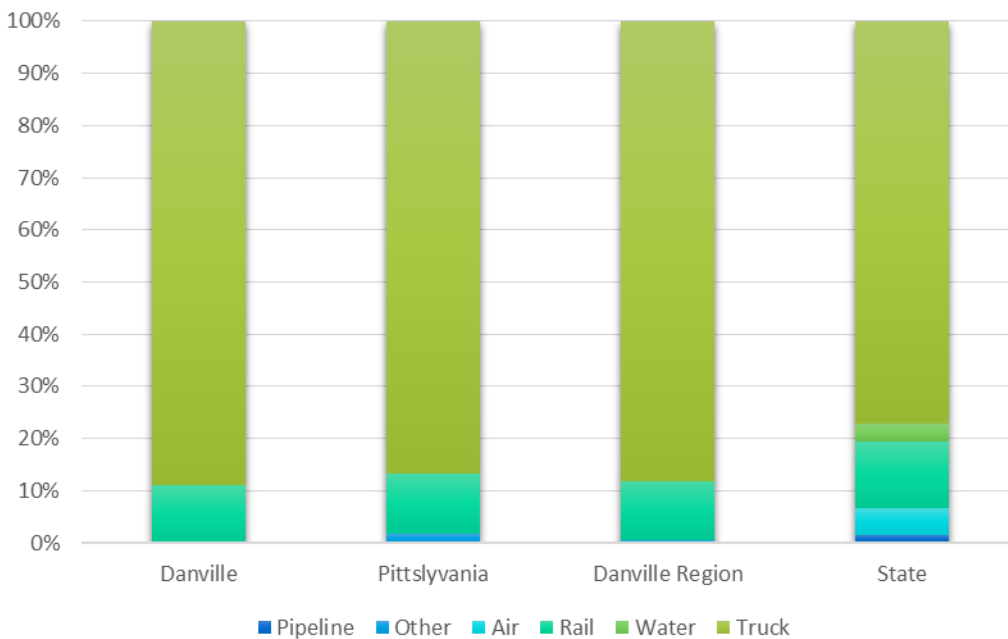
Figure 25: Median Speeds

## E. Regional & Local Commodity Flows

Another set of measures vital to the regional transportation profile are specific to the regional and local commodity flows via the various freight corridors in the region. The measures below discuss modal dependence of freight commodities, as well as the top commodities in the region by monetary value, geographic destination, and tonnage.

### Modal Dependence

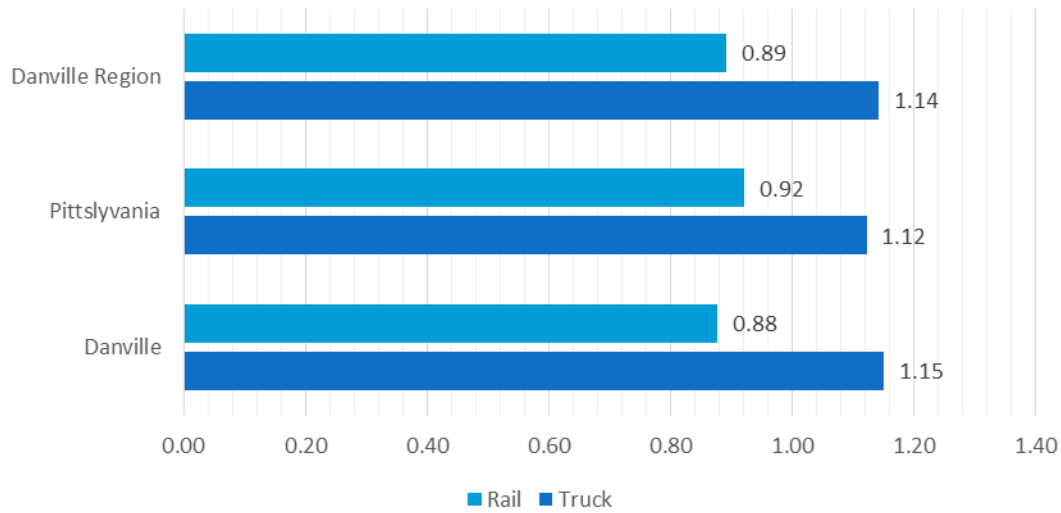
In the Danville Region, an estimated 88% of the dollar value of all goods that are moved through the region are moved by truck. Rail is the second most important mode, carrying around 11% of the total dollar value of goods. For both jurisdictions in the region, trucks are the primary means of moving goods. (Refer to Figure 26).



*Figure 26: Comparison of Freight Modal Dependence*

Source: TranSearch, 2012

Location quotients are used to compare the prominence of freight modes between the Danville Region, and the state as a whole. The Danville Region relies on trucks for freight movement 1.14 times more than the does the state as a whole. Rail and air transportation for goods is more common for the state on average than it is for the Danville Region. This reflects the greater density of freight rail lines in other portions of the state. It also reflects the relatively large distance – over a two hour drive – to Richmond International Airport from the Danville Region. (Refer to Figure 27).



*Figure 27: Location Quotient by Mode of Freight Travel*  
 Source: TranSearch, 2012

## Top Commodities

Other commodities accounts for the largest share of exported commodities, based on value, in the Danville Region. This accounts for over \$1 billion in imports and \$759 million exports for the Danville Region. Overall, the Danville Region imported \$3 billion worth of goods and exported \$2.8 billion worth of goods, resulting in \$200 million dollars of net exports in 2012. (Refer to Figures 28 and 29).

### Inbound Commodities, by Value (\$M)

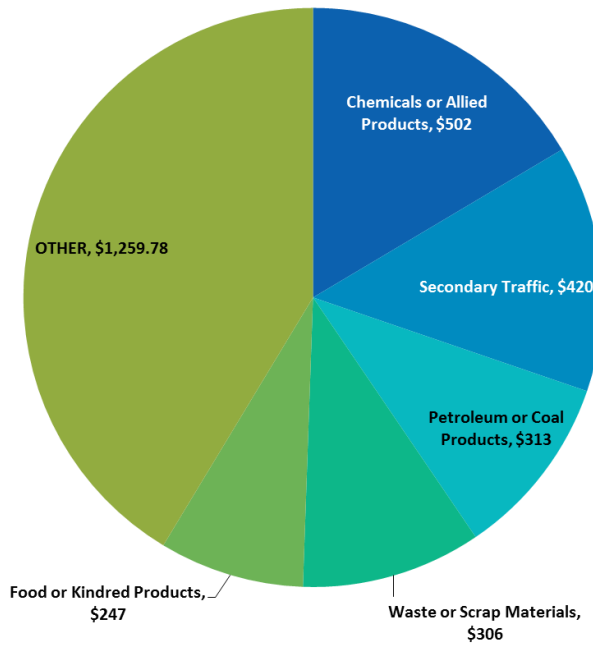


Figure 28: Top Freight Values by Commodities.  
Source: TranSearch, 2012

### Outbound Commodities, by Value (\$M)

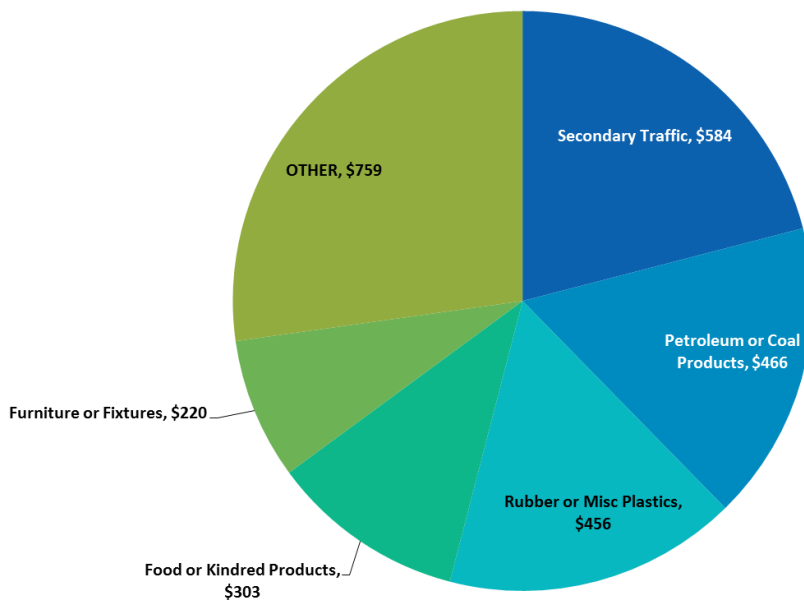
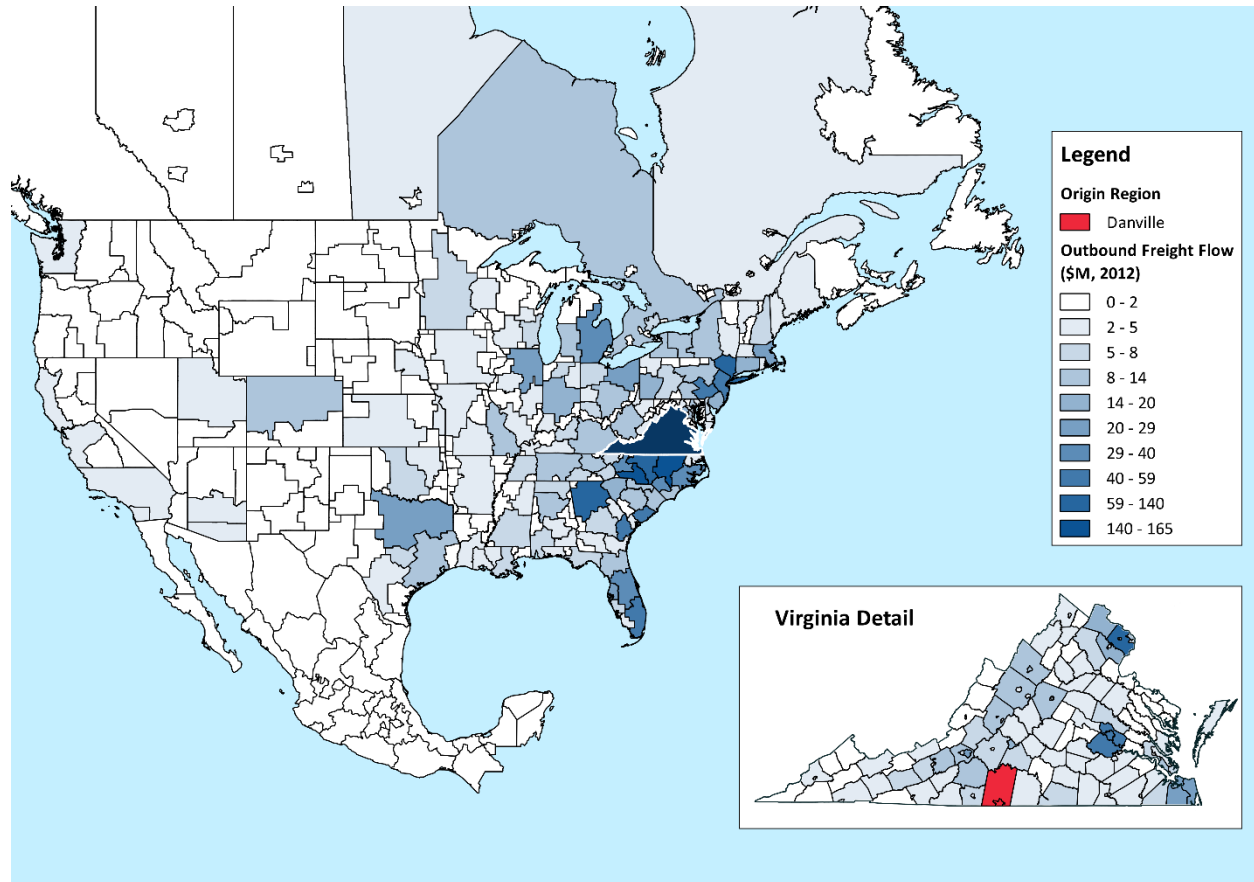


Figure 29: Top Freight Values by Commodities.  
Source: TranSearch, 2012

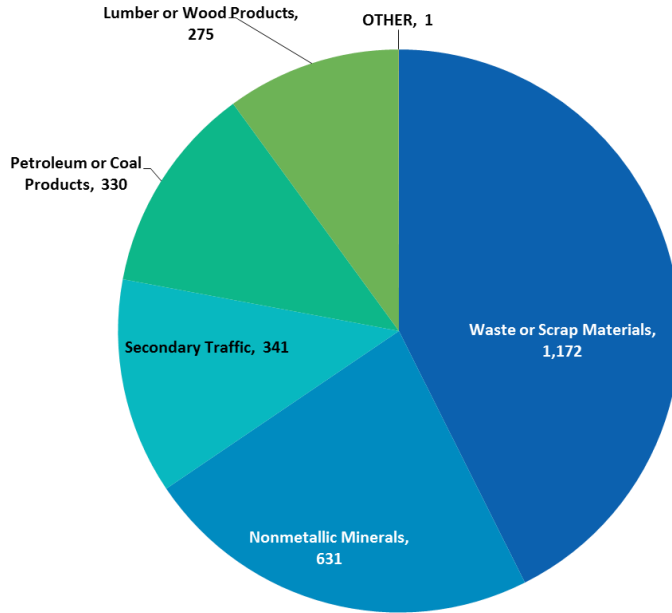
The Southeast Region, as defined by the Bureau of Economic analysis, is the most important destination for freight from the Danville Region. In 2012, over \$1 billion of freight was exported to the Southeast Region from the Danville Region. Freight movements to the Mideast Region are responsible for the next highest value, accounting for \$383.5 million worth of goods. (Refer to Figure 30).



*Figure 30: Top Freight Values by Region.*  
 Source: TranSearch, 2012

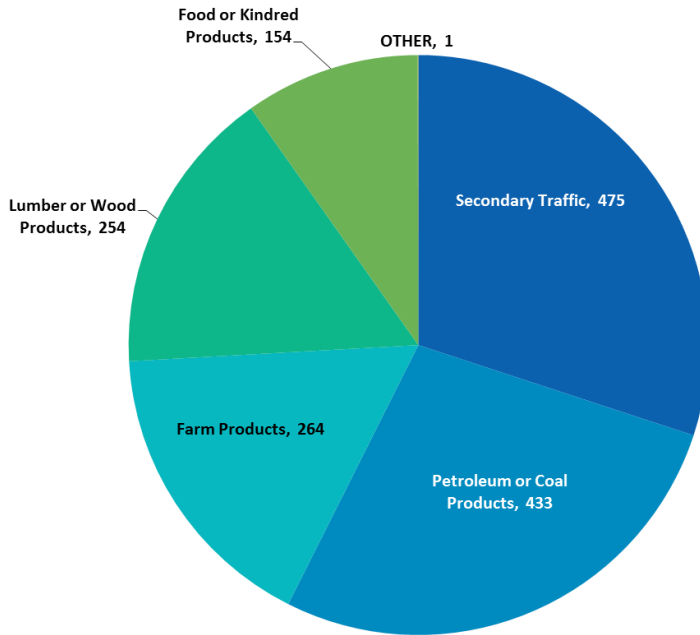
When freight movements were analyzed by weight, waste or scrap materials was the largest share inbound tonnage for the region, accounting for over one million tons of inbound commodities. Secondary traffic accounts for the highest tonnage of outbound commodities. (Refer to Figure 31 and 32).

**Inbound Commodities, by Weight (000s of tons)**



*Figure 31: Top Commodities by Weight - Inbound.*  
Source: TranSearch, 2012

**Outbound Commodities, by Weight (000s of tons)**



*Figure 32: Top Commodities by Weight - Outbound.*  
Source: TranSearch, 2012

## 4. Needs PROFILE

### A. Introduction

Based on the overall approach to the VMTP Needs Assessment, Transportation Needs will be identified as deficiencies or gaps in the transportation conditions that are most critical to each region’s key future industries, with an emphasis on attracting and retaining the future workforce and supporting Virginia businesses’ goods movement needs. The key economic and transportation conditions have been identified in the Economic and Transportation profiles above. Economic and transportation linkages are discussed at length in the Regional Network Needs Assessment Introduction.

The Needs Assessment relates current transportation conditions and deficiencies to key future industries and economic profiles. The Needs Assessment, however, does not propose specific projects to address the Transportation Needs in each region, since this should be done by MPOs, localities and other nominating entities when they put forward projects for potential funding programs, including those subject to HB2 screening. Instead, the VMTP Transportation Needs Assessment is intended to identify a set of regional Transportation Needs in order to be able to compare proposed projects to Needs. The Needs Assessment also uses a spatial analysis for the region to provide observations about specific corridors, travel markets, and activity centers in addition to the regional profiles that will provide more detail regarding specific areas within the region around which some of the transportation needs are focused.

Needs have been identified based on both stakeholder input and on the analysis of economic and transportation conditions. In the first round of Regional Forums, held in May, 2015, the transportation and economic conditions were presented to groups of regional stakeholders. Following this, a discussion was held with the stakeholders to connect the transportation conditions to desired economic futures and begin identifying potential Needs.

These Needs were categorized into a series of five very broad types of Capacity Needs:

1. Corridor Reliability/Congestion
2. Network Connectivity
3. Transportation Demand management
4. Modal Choice
5. Walkable/Bikeable Places

Non-Capacity Needs (i.e. Safety, Operations and State of Good Repair Needs) were also recorded when they were identified from stakeholder input, although these were not the focus of the Regional Networks Needs Assessments. The potential Needs identified in the first Forum were analyzed by the OIPI teams against the economic and transportation data that was assembled for each region and, where data was found to support the proposed Needs, these Needs were included and documented. In addition, the OIPI team analyzed all the overall assembled data for each region in order to identify additional Needs not identified in the Forum, to assemble a more complete picture of potential Transportation Needs in each region, with a particular focus on attracting and retaining the 21<sup>st</sup> century workforce needed for each region’s 2025 economy.



## B. Economic and Transportation Needs Correlation

The Study Team conducted a number of research efforts aimed at identifying key correlations between industries and their transportation needs, as described further in the introductory document, [VMTP 2025 Needs Assessment: Regional Networks Introduction](#). These included national research of industry trends in workforce needs and goods movement needs and a national survey of site selection professionals conducted by the Southeastern Institute of Research. Based on the findings of this research, the following table outlines the key correlations between three broad industry sectors (Local, Knowledge and Freight sectors) and their general transportation needs. It should be noted that the table does not reflect that these industry sectors always have these and only these transportation needs. Individual industry types and individual business needs for transportation will vary and the table only represents where there were apparent correlations between industry sectors and basic categories of transportation needs.

*Table 10: Economic and Transportation Correlation. Source: Summary correlations based on national research and survey of national Industry Site Selection Professionals conducted by Study Team.*

<b>Economic and Transportation Correlation Table</b>			
	<b>Local Sector</b>	<b>Knowledge Sector</b>	<b>Freight Sector</b>
<b>Highway Access</b>	HIGH	HIGH	HIGH
<b>Passenger Reliability</b>	MED	HIGH	MED
<b>Bottleneck Relief</b>	MED	HIGH	HIGH
<b>Freight Reliability</b>	MED	MED	HIGH
<b>Freight Accessibility</b>	MED	LOW	HIGH
<b>Network Connectivity</b>	HIGH	HIGH	MED
<b>Transportation Demand Management</b>	LOW	MED	MED
<b>Modal Choice</b>	HIGH	HIGH	MED
<b>Transit Access</b>	MED	HIGH	MED
<b>Active Transportation Options</b>	MED	MED	LOW
<b>Walkable Places</b>	MED	HIGH	LOW

The above table of correlations was used to identify potential categories of Transportation Needs in the region by linking prominent regional economic sectors with anticipated Needs and comparing these to the general transportation conditions that currently exist, as described below.

## C. General Regional Needs

As discussed in the Economic Profile previously in this document, when the 2025 Future Economic Profile was estimated for the Danville Region, it showed a relatively equal distribution among the freight and local economic sectors (49% freight and 40% local), with a smaller segment of the knowledge sector (11%).

Since the sector shares of regional economic output are expected to remain unchanged in 2025, the focus is on improving current transportation issues. The economic and transportation correlations for the knowledge industry sector particularly point to improving modal choice, transit access and walkable places. The local economic sector also has important correlations with transit accessibility to support workforce access to these kinds of jobs. The freight economic sector needs access to reliable modes of transportation to move goods quickly and on-time. Therefore, transportation needs should include expanding mode choice as well as corridor reliability.

The identified transportation need of expanding mode choice includes better transit access, both within the region's economic activity centers and between the centers. Fixed route transit exists in the region only in and around the City of Danville. However, the continued importance of the local-based sectors would benefit from both additional fixed route transit in the region and additional demand-response rural transit to provide better workforce access.

Another identified transportation need is corridor reliability for major arteries in the region, namely US Route 58 and US Route 29. While congestion in the region is minimal, bottlenecks and limited network capability constrains the reliability which is detrimental for on time deliveries of goods. Freight movement is also inhibited in other parts of the region where freight traffic must rely on secondary roads that are not designed for this type of traffic.

The above represent general transportation needs for the region based on an analysis of its economic sectors and projected growth. More specific needs from a more detailed spatial analysis of the economic and transportation conditions in the region are described below.

## D. Spatial Analysis of Regional Network Needs

### Summary of Needs

Potential needs were also developed by analyzing the economic and transportation data in the region from a spatial standpoint. This analysis included the potential needs identified by stakeholders in the first Regional Forums, as well as new needs that emerged from the spatial analysis of the data. These needs were categorized into a series of very broad types of capacity needs as described above. The spatial analysis of needs consists of a map of needs, a table of identified Needs, and a findings of needs

that summarizes the economic and transportation findings to support each identified Need. Each of these is summarized below.

To assist with the understanding of the map and table of needs described below and the relationship of these needs to the Corridors of Statewide Significance and the Urban Development areas, please refer to the following legend of icons.

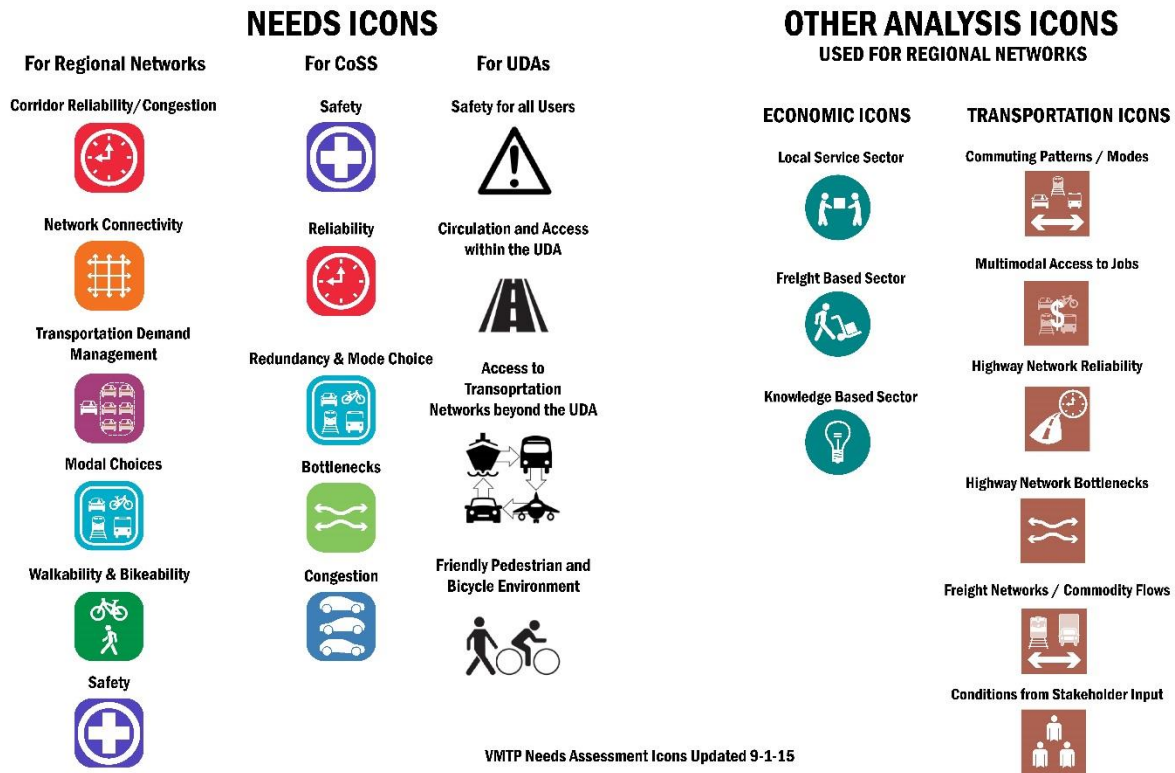


Figure 33. VMTP Needs Icons

## Map of Needs

The map below summarizes the regional transportation needs according to activity centers and corridors. The needs are summarized and color coded by general category. Each of the needs is also numbered and keyed to the Finding of Needs table.

## Findings of Needs

The table below lists each of the identified transportation needs in the region, and describes the basis for each need in terms of economic and transportation findings and data. The analysis of regional network transportation Needs for the region was compiled into a table that identifies the following findings of need:

1. Category of Need
2. General Description of Need

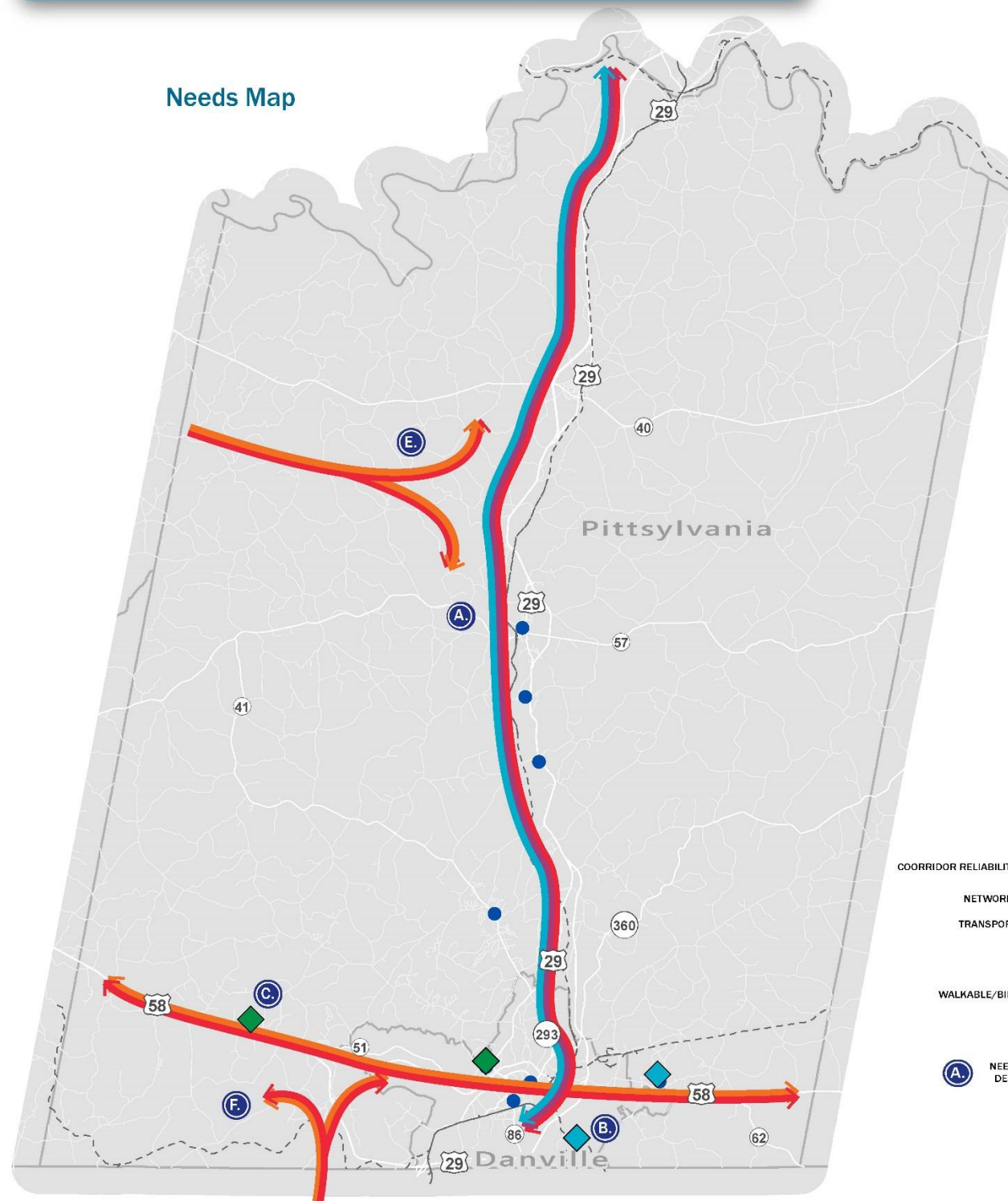
3. Economic findings to support need
4. Transportation findings to support need

The findings to support the determination of need generally came from the statewide datasets of economic and transportation conditions summarized above. However, in cases where the statewide data is not of a fine enough grain or level of detail to accurately determine a need, it was supplemented by locally obtained data from studies or plans. It is important to note that local plans and studies were not used to identify proposed projects as needs, but only for supporting data to make an objective determination of need.

Figure 34. Summary Needs Map for Danville Region

## Danville Region Needs Summary







### Needs Map



### Needs Table

<b>A. US 29 Corridor Reliability</b>	The US 29 corridor serves as a major artery for the region. The corridor handles significant commute, thru, and freight traffic; serving multiple activity centers throughout the region. The corridor is currently underserved by transit, park-n-ride and transportation demand management programs.
<b>B. Expand Modal Choices</b>	The Danville Transit system currently serves the urban core of the region, covering areas on both sides of the Dan River, reaching multiple employment destinations, shopping centers, and medical and educational facilities. There are still a few major employers and activity centers that exist just beyond the reach of Danville Transit.
<b>C. US 58 Corridor Reliability</b>	The US 58 corridor serves as a major artery for the region. The corridor handles significant commute, thru, and freight traffic; serving multiple activity centers throughout the region. Compared to other parts of Virginia, congestion is not a major issue in the Danville region. However, there are network bottlenecks that create safety and operational concerns due to high traffic volumes and limited network capacity.
<b>D. Walkable/Bikeable Places</b>	The Danville region is largely auto-centric and is generally underserved by alternative modes of transportation. A lack of active transportation infrastructure creates safety concerns and reinforces reliance on vehicular travel.
<b>E. Western Pittsylvania Network Connectivity</b>	Freight traffic originated in western Pittsylvania County need greater network connectivity and reliable access to US 29 and Route 40. Freight traffic regularly use winding secondary roads to avoid busy intersections, which creates some safety and reliability issues. There is a need to improve freight reliability and network connectivity to alleviate these issues.
<b>F. Southern Danville Freight and Interstate Network Connectivity</b>	Local input and empirical evidence suggests that the Danville region is closely linked with both passenger and freight activity in North Carolina. Promoting network connectivity in the southern part of the region will ensure successful interstate traffic flows and economic competitiveness.

Table 11: Findings of Needs

A. US 29 Corridor Reliability	
NEED	 <p>The US 29 corridor serves as a major artery for the region. The corridor handles significant commute, thru, and freight traffic; serving multiple activity centers throughout the region. The corridor is currently underserved by transit, park-n-ride and transportation demand management programs.</p>
ECONOMIC	 <p>The corridor serves the major activity centers of Downtown Danville, Gretna, Chatham and others. These centers include local serving, knowledge based and freight dependent industries. As a result, peak traffic times include significant commuter traffic. Increased transit and TDM services can help provide multimodal options for commuters and increase reliability for all users.</p>
TRANSPORT.	 <p>There are few congestion and delay issues in Danville. However, there are several bottlenecks along the US 29 corridor that create reliability issues, particularly in the PM peak period. This highlights the need for alternative travel options for commuters.</p>
B. Expand Modal Choices	
NEED	 <p>The Danville Transit system currently serves the urban core of the region, covering areas on both sides of the Dan River, reaching multiple employment destinations, shopping centers, and medical and educational facilities. There are still a few major employers and activity centers that exist just beyond the reach of Danville Transit.</p>
ECONOMIC	 <p>Transit access supports local serving and knowledge based industries and regional activity centers. Some of the most notable locations just outside the operating limits of Danville Transit include the Cane Creek activity center and Goodyear, one of the region's largest employers.</p>
TRANSPORT.	 <p>Transit accessibility data indicates that the urban core of the Danville region is served well by the existing transit system. However, outside of the urban core, accessibility to jobs via transit is lacking and commute times generally increase. Providing modal choices to commuters and residents increases regional accessibility and creates redundancies in the transportation network.</p>

### C. US 58 Corridor Reliability

NEED



The US 58 corridor serves as a major artery for the region. The corridor handles significant commute, thru, and freight traffic; serving multiple activity centers throughout the region. Compared to other parts of Virginia, congestion is not a major issue in the Danville region. However, there are network bottlenecks that create safety and operational concerns due to high traffic volumes and limited network capacity.

ECONOMIC



Connects several activity centers in the region, of all types; including Cane Creek, Danville Regional Medical Center, and Brosville.

TRANSPORT.



Some of the region's worst reliability hot spots and bottlenecks occur along US 58. Primarily, reliability issues as traffic enters and exits the urban center of Danville. Improved reliability is key to serving the multiple activity centers and employment destination along the corridor.

### D. Walkable/Bikeable Places

NEED



The Danville region is largely auto-centric and is generally underserved by alternative modes of transportation. A lack of active transportation infrastructure creates safety concerns and reinforces reliance on vehicular travel.

ECONOMIC



The Brosville and Danville Mall activity centers include an elementary school and public library, and multiple shops, markets and restaurants.

TRANSPORT.



The major issues in these areas of the region are modal conflicts, safety concerns and congestion. Providing dedicated infrastructure for all users can alleviate these issues.

## E. Western Pittsylvania Network Connectivity

NEED



Freight traffic originated in western Pittsylvania County need greater network connectivity and reliable access to US 29 and Route 40. Freight traffic regularly use winding secondary roads to avoid busy intersections, which creates some safety and reliability issues. There is a need to improve freight reliability and network connectivity to alleviate these issues.

ECONOMIC



Reliable access to major thru routes is of paramount importance to freight related industries.

TRANSPORT.



Regional input suggests that multiple freight movements originate in western Pittsylvania County. Regional data suggests that there is limited network connectivity and redundancy in this part of the region, as well as reliability and congestion issues on Route 57.

## F. Southern Danville Freight and Interstate Network Connectivity

NEED



Local input and empirical evidence suggests that the Danville region is closely linked with both passenger and freight activity in North Carolina. Promoting network connectivity in the southern part of the region will ensure successful interstate traffic flows and economic competitiveness.

ECONOMIC



Reliable access for both freight and passenger movement across jurisdictional and state boundaries is vital to the success of local serving, freight dependent and knowledge based industries.

TRANSPORT.



Commuter origin/destination data shows significant passenger flows between Virginia and North Carolina; particularly inflow of workers from North Carolina to the urban core in Danville. Local input indicates that industrial development, such as along Berry Hill Road and points south, will rely heavily on the network for freight movements.