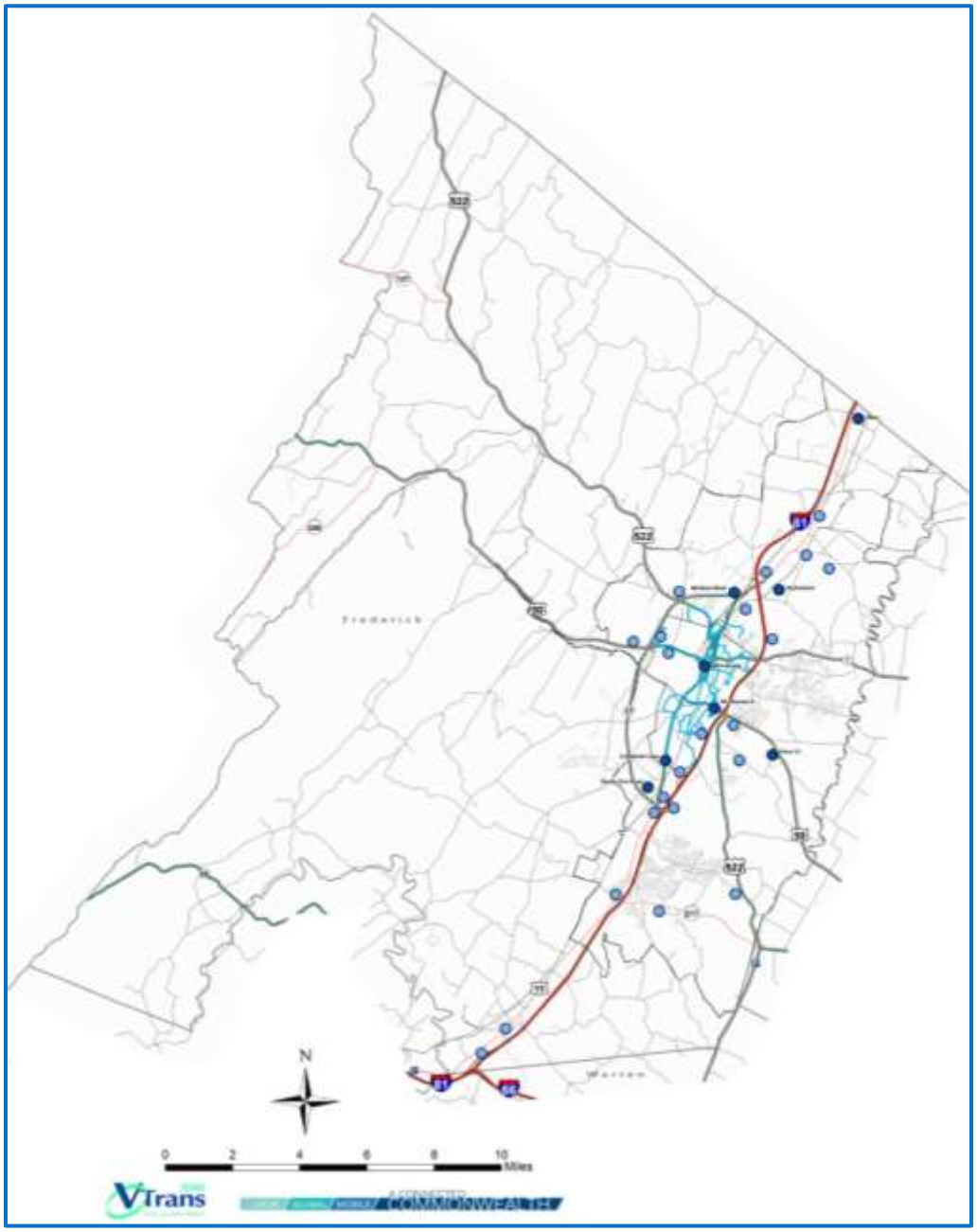
VMTP 2025 Needs Assessment

Regional Needs Profile



Winchester-Frederick Region

December 2015

1. NEEDS ASSESSMENT PURPOSE

The VMTP 2025 Needs Assessment is an essential element of the overall VTrans2040 Statewide Transportation Plan for Virginia. Based on the VTrans 2040 Vision and policy directives from the Governor's office, the VMTP 2025 Needs Assessment is based on two principal objectives of transportation policy with the aim of enhancing economic competitiveness. These are 1) to attract and retain the 21st century workforce, and 2) to support goods movement for Virginia businesses.

This document is one portion of the overall Needs Assessment for regional Networks that deals with the Needs Assessment for the Winchester-Frederick (WinFred) Region. There is a separate document entitled "VMTP 2025 Needs Assessment: Regional Networks Introduction," that 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 WinFred 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 WinFred regional Economic Profile, regional Transportation Profile, and regional Transportation Needs.

Defining a Regional Network

This portion of the Needs Assessment deals with a Regional Network. For the purposes of the VMTP Needs Assessment, the final determination of each Regional Network has been developed as part of the outreach process in working with each region. Additional information about how the regional Networks were defined is referenced in the introductory document, "VMTP 2025 Needs Assessment: Regional Networks Introduction."

The WinFred Region is defined as the City of Winchester and Rockingham County. However economic generators, economic attractors and commuting corridors located outside of but adjacent to this region that influence the economy or travel market of the WinFred Region were considered in the development of the Regional Needs Profile. These include:

- **Outside Economic Generators:** Virginia Inland Port (VIP), 7685 Winchester Road, Front Royal
- **Outside Economic Attractors:** Shenandoah, Warren, Fairfax and Loudoun Counties
- **Regional Commuting Corridors:** I-81 from Harrisonburg to Hagerstown, MD; I-66 from I-81 Jct to I-495 Jct; VA 7 from Winchester to Alexandria; US 522 from Berkeley Springs, WV to Front Royal; and US 50 from Romney, WV to Winchester

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 analyzing 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.

OIPI consultants used available data from state and national sources, as well as input from WinFred Region stakeholders to identify an overall current economic profile for the region. The components of the current economic profiles layer 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 US Census, the current population in the state of Virginia is 8,185,867 (**Table 1**). By the year 2025, the Commonwealth of Virginia's population is projected to increase by between 1 million, to 1.5 million. Statewide per-capita incomes are expected to rise 21 percent from 44,765 to 54,226.

Table 1: Statewide Population Projections

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

Source: 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.

Regional Demographics

The WinFred Region is forecasted to experience steady population growth over the next decade. The county as a whole may experience an increase in population by 34 percent by 2025 (**Table 2**) where as the City of Winchester is projected to have a slight increase in population of only 6 percent by 2025.

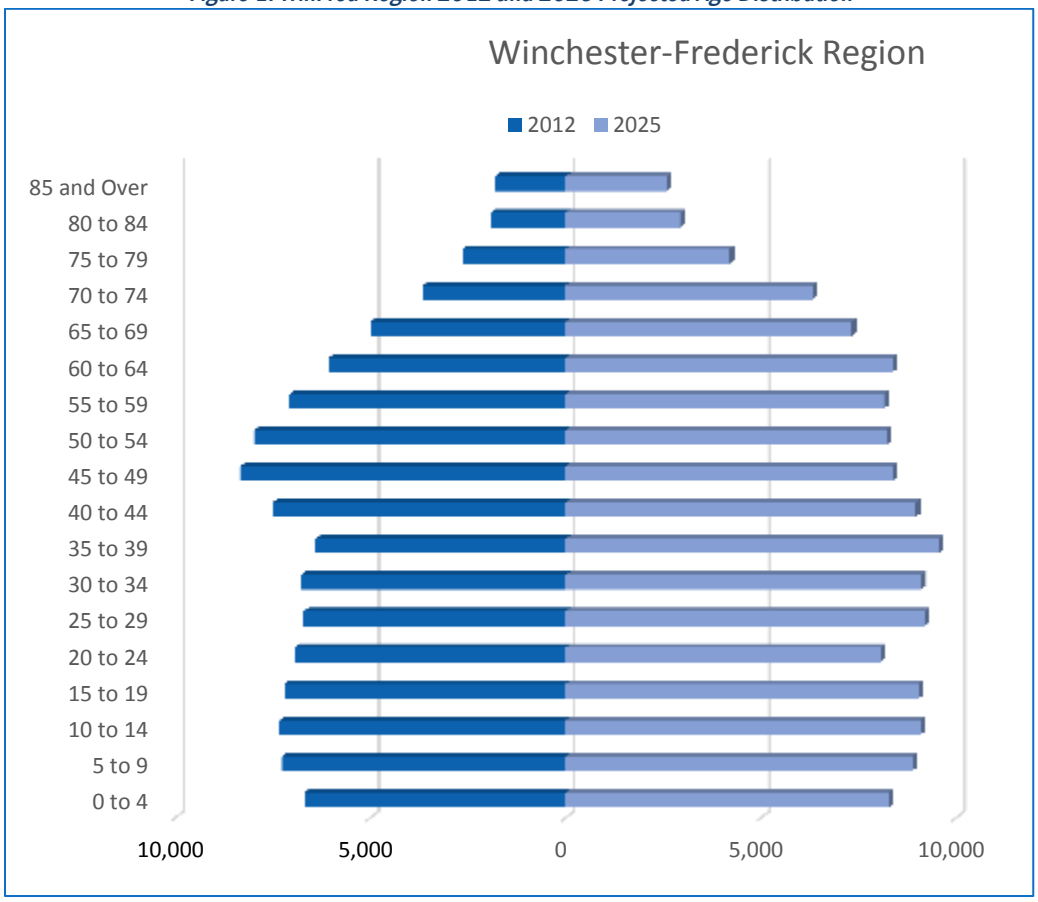
Table 2: WinFred Region County and City Population Projections

Jurisdiction	2012	2025	% Change (2012-2025)
Frederick County	80,317	108,019	34.5%
City of Winchester	26,881	28,632	6.5%

Source: US Census Bureau. Weldon Cooper Center for Public Service, Demographics Research Group; Intercensal Estimates for Virginia, Counties, and Cities: 2010-2012, Charlottesville, Virginia, January 27, 2014, www.coopercenter.org; Accessed between January-August, 2014.

Figure 1 illustrates the age distribution for the WinFred Region in 2012 and the projected age distribution for 2025. Population growth is projected to be accompanied by a demographic shift, with a higher percentage of the population between the ages of 25 and 44.

Figure 1: WinFred Region 2012 and 2025 Projected Age Distribution



Source: Woods & Poole Economics, Incorporated. 2014 State Profile District of Columbia, Maryland, and Virginia. Washington DC. 2014.http://www.woodsandpoole.com. Accessed June 18, 2014.

C. Current Industry Strengths

Economic drivers in the region are predominantly centered on local-serving industries. These include health care, retail trade, public administration and other services (e.g. personal care services like barbershops and salons; and religious, grant making, civic, and professional organizations like churches and social advocacy groups). However, manufacturing – a freight-dependent industry – is a major employer in the region, as well as the most significant contributor to the region's output. The following economic measures were used to analyze the strength and characteristics of the current regional economy in the WinFred Region.

Top Industries by Output

Public Administration is the strongest industry by economic output (**Table 3**) followed closely by the Manufacturing industry.

Table 3: WinFred Region Current Industries by Output, 2012

Top 5 Industries	Output ($M)	% of Output
Public Administration	$2,483	19%
Manufacturing	$2,205	17%
Retail Trade	$2,034	15%
Wholesale Trade	$1,917	15%
Health Care	$1,067	8%

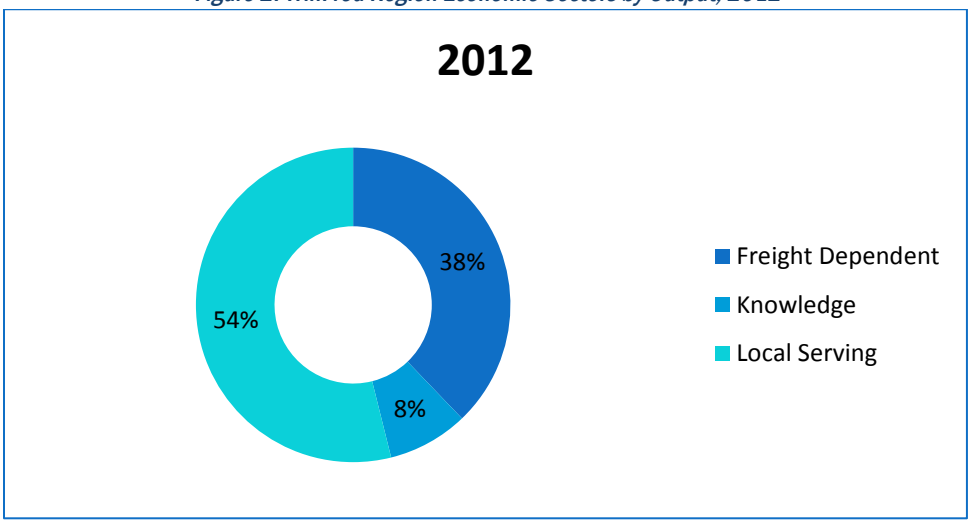
Source: IHS Global Insight Business Market Insights (BMI) Data & Forecasts, 2012.

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.

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 WinFred Region, **Figure 2** provides a summary of the predominance of each economic cluster, as analyzed by a methodology developed by the OIPI consultants and used in all regional analyses throughout the State. In 2012, the local serving industries were the predominant industries by output in the region at over 54 percent. In terms of transportation characteristics and needs the Local Services economic cluster is typically characterized by different peak commute times; customer traffic; trip-chaining destinations; and truck deliveries.

Figure 2: WinFred Region Economic Sectors by Output, 2012



Source: IHS Global Insight Business Market Insights (BMI) Data & Forecasts, 2012.

Top Industries by Employment

In the WinFred Region, the top industries by employment are Health Care, Retail Trade and Manufacturing (**Table 4**).

Table 4: WinFred Region Top Industries by Employment, 2014

Top 5 Industries	Number of Jobs	% of Workforce
Health Care	8,484	16%
Retail Trade	7,794	15%
Manufacturing	6,691	13%
Educational Services	4,832	9%
Accommodation/Food Service	4,822	9%

Source: JobsEQ, 2014 courtesy of Frederick County Economic Development Authority.

Table 5 lists the current top employers in the WinFred Region. The Frederick County School Board is the largest employer in the region with 2,100 workers followed by Winchester Medical Center at 1,800 workers.

Table 5: WinFred Region Current Top Employers

Employers	Employees
Frederick County School Board	2,100
Winchester Medical Center	1,800
Rubbermaid Commercial Products	1,300
Wal-Mart	865
Frederick County	800

Source: 2012 InfoUSA data, supplemented with 2014 WinFred MPO data.

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. The WinFred Region's employment in Manufacturing is 1.41 times the nation the national average (**Table 6**).

Table 6: WinFred Region Current Top Industries by Location Quotient, 2014

Top Industries	Location Quotient
Manufacturing	1.42
Retail Trade	1.31
Utilities	1.18
Transportation/Warehousing	1.13
Health Care	1.11

Source: JobsEQ, 2014 courtesy of Frederick County Economic Development Authority.

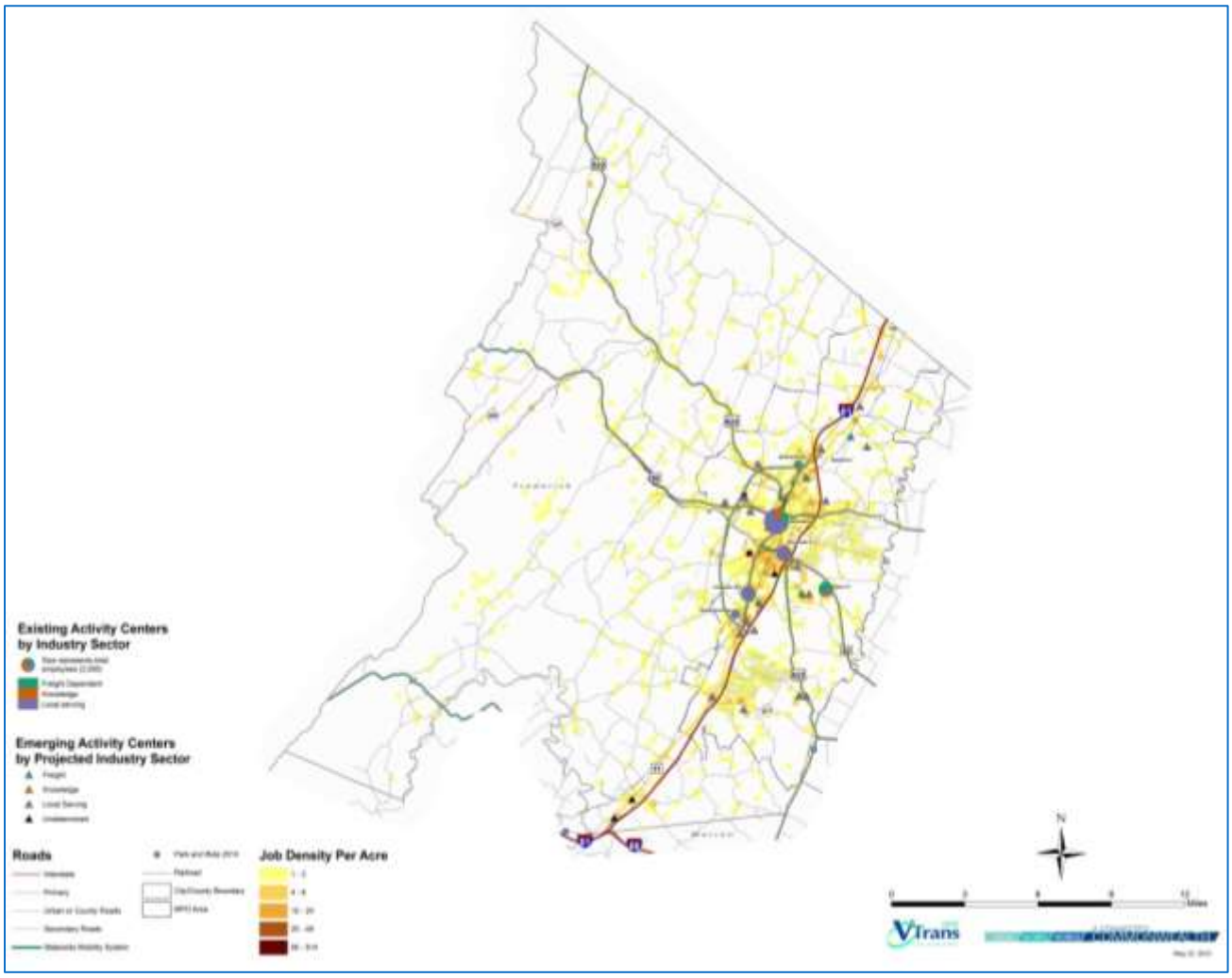
D. Activity Center Analysis

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. The Activity Centers were then revised, refined, or amended after discussing economic conditions with regional stakeholders. **Figure 3** below shows the job density per acre in a color range from yellow to dark brown.

Once the 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 Serving, Freight Dependent, and Knowledge Based 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**).

Regional stakeholders also identified locations where emerging activity centers are projected to develop over the next ten years and provided feedback on which economic cluster is anticipated. These are depicted on the **Figure 3** as triangles.

Figure 3: WinFred Region Existing and Emerging Activity Center Employment by Industry Sector



Source: InfoUSA data, Regional Stakeholder Input.

E. Forecasted 2025 Industry Strengths

Through a series of work sessions with the WinFred Region stakeholders, OIPI consultants 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 the WinFred Region's economic future, but to allow input from stakeholders to affirm or modify these basic economic forecasts according to regional desires.

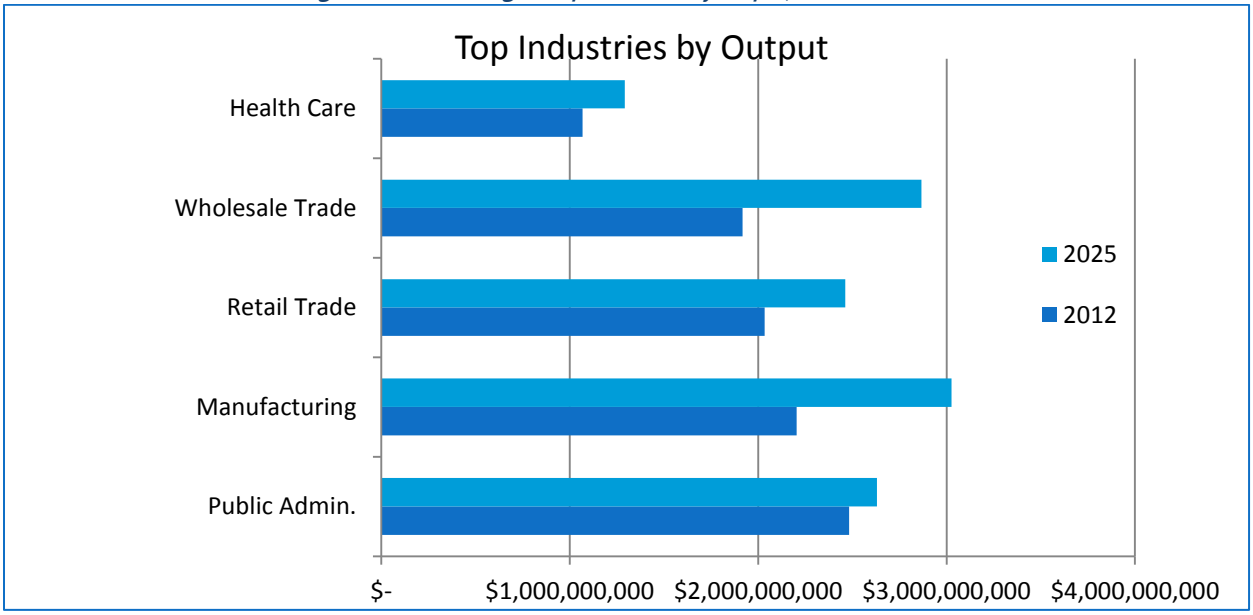
The future economic profiles were used as the basis for determining future transportation needs to support the future economic vision in the WinFred Region. The basic economic datasets that were compiled include:

- Current Top Industries by Workforce, Output and Location Quotient
- Future Growth Industries
- Activity Center profiles

- Top Employers and Locations
- Economic Development Priorities

Figure 4 compares the top five industries by economic output in 2012 with forecasted growth by 2025. Most of the forecasted high-growth in economic output is in freight dependent industries, Wholesale Trade and Manufacturing. The remaining three top industries are local serving and are forecasted to see moderate growth through 2025.

Figure 4: WinFred Region Top Industries by Output, 2012 and 2025

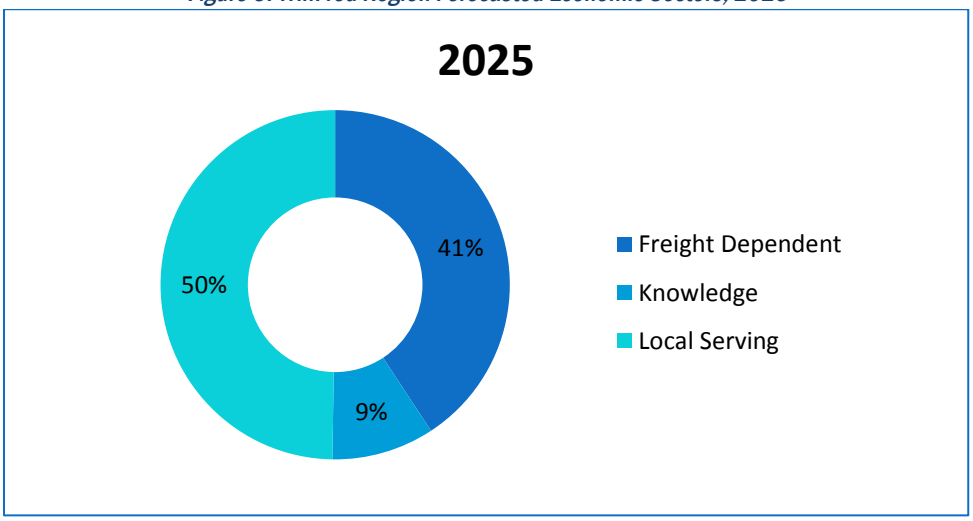


Source: IHS Global Insight Business Market Insights (BMI) Data & Forecasts, 2012.

Forecasted Economic Sectors

Figure 5 illustrates the summary of the forecasted economic clusters in the WinFred Region for 2025. Local serving industries will still be the predominant economic sector by output in the region at 50 percent.

Figure 5: WinFred Region Forecasted Economic Sectors, 2025



Source: IHS Global Insight Business Market Insights (BMI) Data & Forecasts, 2012.

Forecasted Industries by Employment

Forecasted top industries by employment for the region are listed in **Table 7**. Public Administration is expected to be the dominant industry with 18 percent of the workforce. Of the top five industries by employment, 64 percent of the workforce are for local serving industries and 10 percent of the workforce is for the freight dependent Manufacturing industry.

Table 7: WinFred Forecasted Top Industries by Employment, 2025

Top 5 Industries	Number of Jobs	% of Workforce
Public Administration	11,397	18%
Health Care	9,508	15%
Retail Trade	6,823	11%
Manufacturing	6,401	10%
Accommodation/Food Service	6,029	10%

Source: IHS Global Insight Business Market Insights (BMI) Data & Forecasts, 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 WinFred 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 WinFred Region:

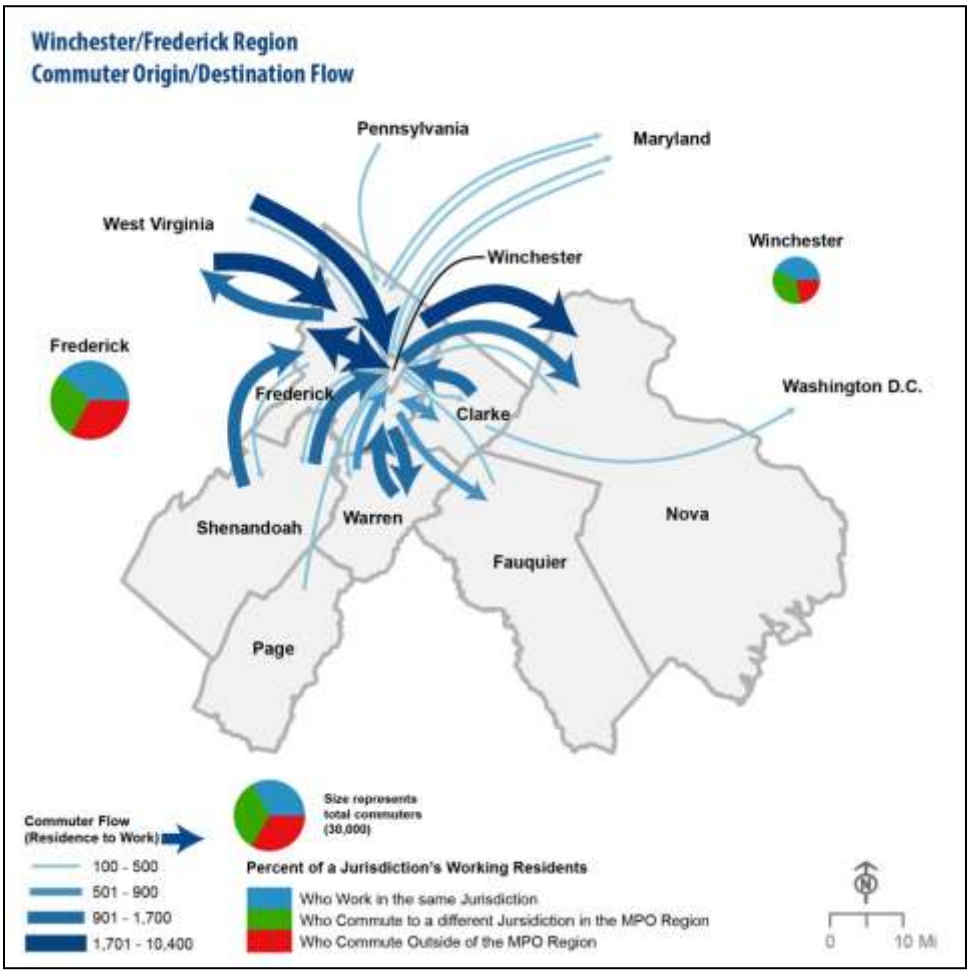
- Commuting Patterns
- Accessibility to Employment
- Roadway Measures
- Freight Measures

B. Commuting Patterns

Regional Commuting Patterns

Figure 6 illustrates the commuting patterns within and among the WinFred Region localities between 2009 and 2013. The WinFred Region is a net exporter of workers. While Frederick County itself is the biggest attractor of locally-originated work trips, Fairfax and Loudoun counties to the east are the second and third largest, respectively. The remainder of commuters working in Frederick County live in surrounding rural counties in Virginia and West Virginia, with the largest origin being Berkeley County, WV, followed by Shenandoah and Warren Counties in Virginia. The pie charts indicate that about a third of Frederick County's working residents work outside the region.

Figure 6: WinFred Region Commuting Patterns



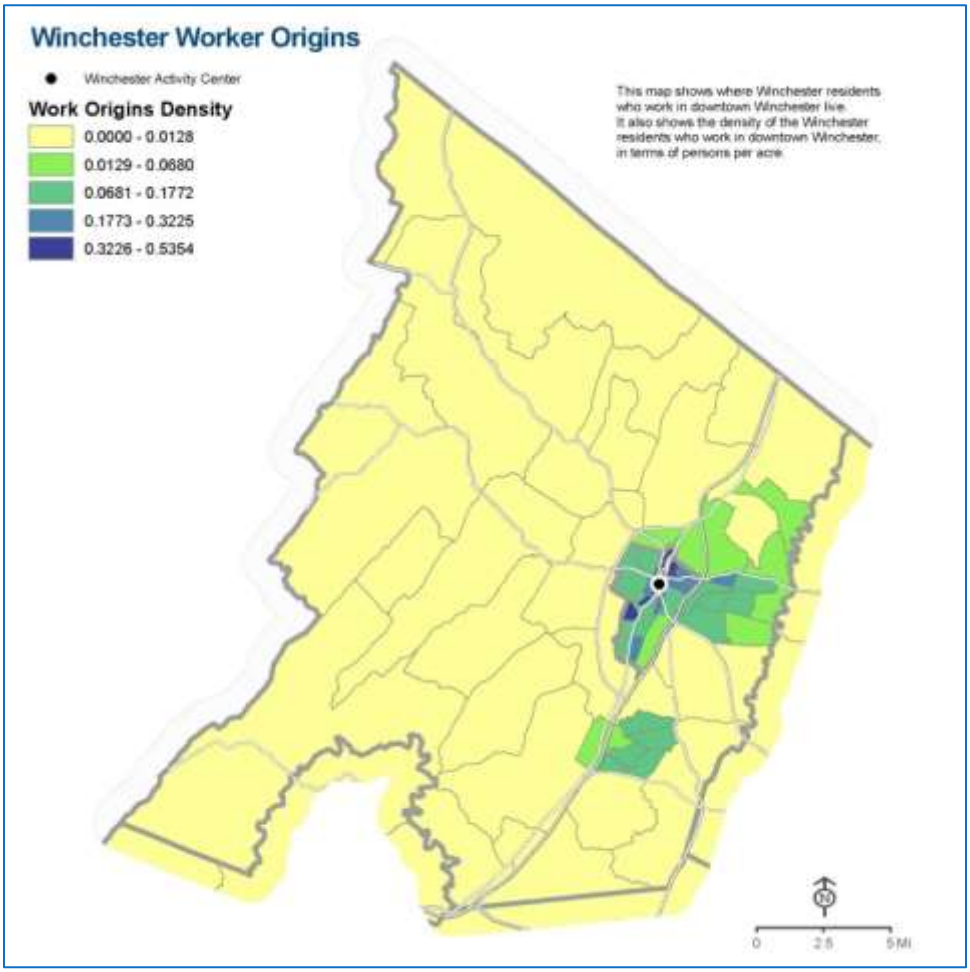
Source: American Community Survey: Residence County to Workplace County Flows for the United States and Puerto Rico Sorted by Residence Geography: 2006-2010.

Activity Center Commuting Patterns

Equally important to the formation of a regional transportation profile for the WinFred Region was the analysis of commuting patterns between Activity Centers. **Figures 7, 8 and 9** below provide insights into the commuting patterns for three of the Activity Centers in the WinFred Region. Block groups are symbolized on a color scale from dark to light blue, with the darker shades representing the block groups with the largest number of commuters to the Activity Center analyzed within that map.

As shown on **Figure 7**, Winchester receives commuters mostly from within the City of Winchester and along VA 7.

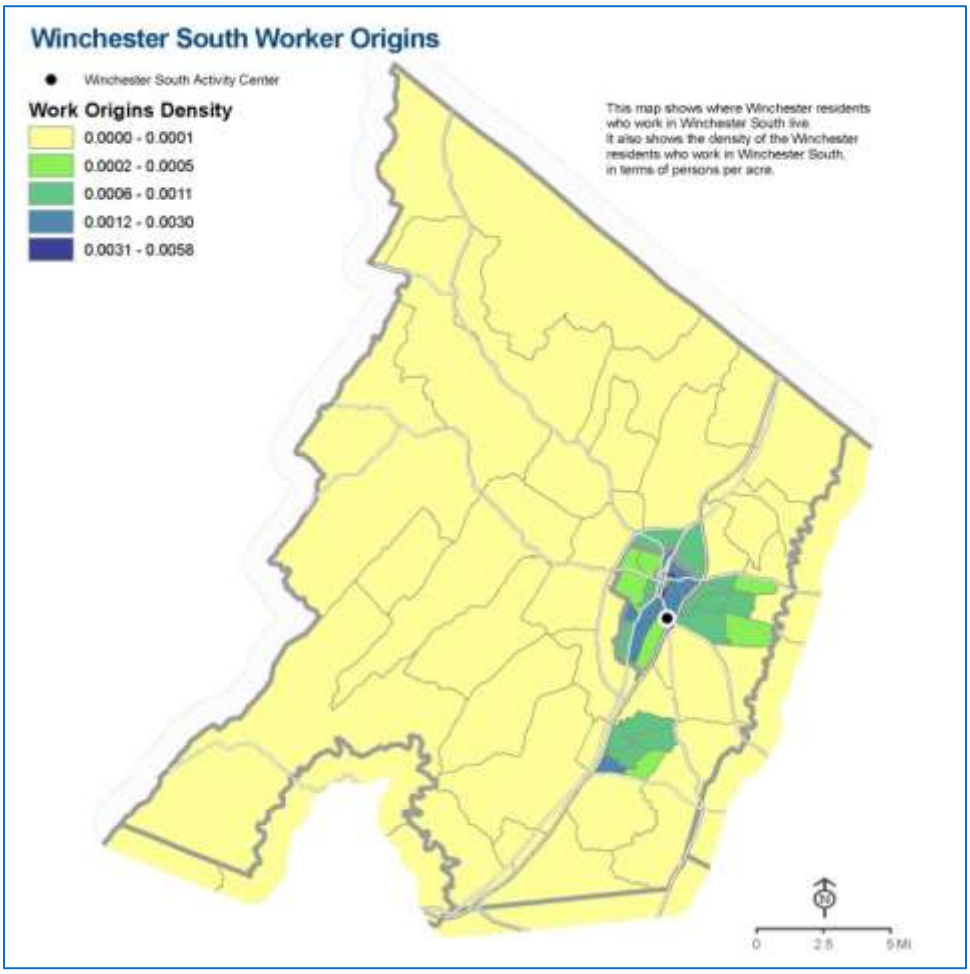
Figure 7: Commuting Patterns to Winchester Activity Center



Source: Longitudinal Employer-Household Dynamics (LEHD) program which uses Unemployment Insurance earnings data and the Quarterly Census of Employment and Wages (QCEW) data to create statistics on employment, earnings, and job flows at detailed levels of geography and industry and partially synthetic data on workers' residential patterns, http://lehd.ces.census.gov/.

The Winchester South activity center receives most of its commuters from the City of Winchester as well as in between VA 7 and US 50 east of I-81 and the interchange of I-81 and VA 277 (**Figure 8**).

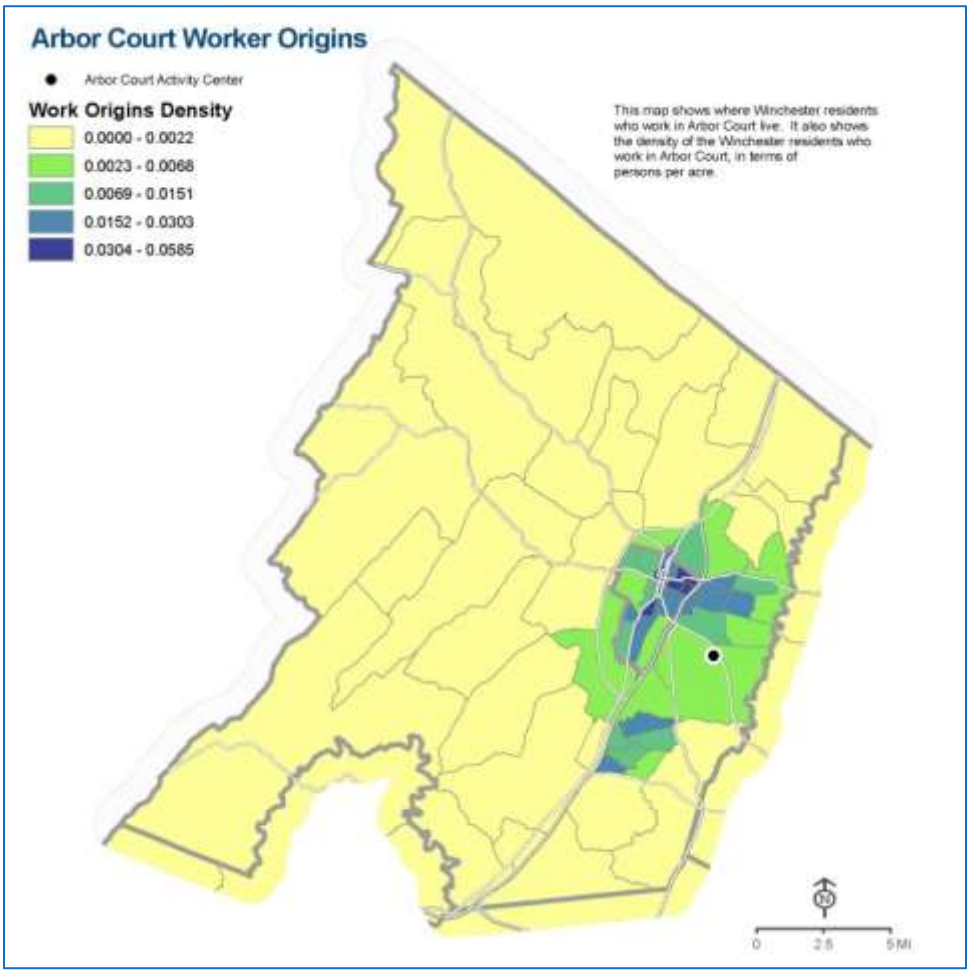
Figure 8: Commuting Patterns to Winchester South Activity Center



Source: LEHD, http://lehd.ces.census.gov/.

Figure 9 shows that a majority of commuters to the Arbor Court activity center originate from the City of Winchester as well as in between VA 7 and US 50 east of I-81 and the interchange of I-81 and VA 277.

Figure 9: Commuting Patterns to Arbor Court Activity Center

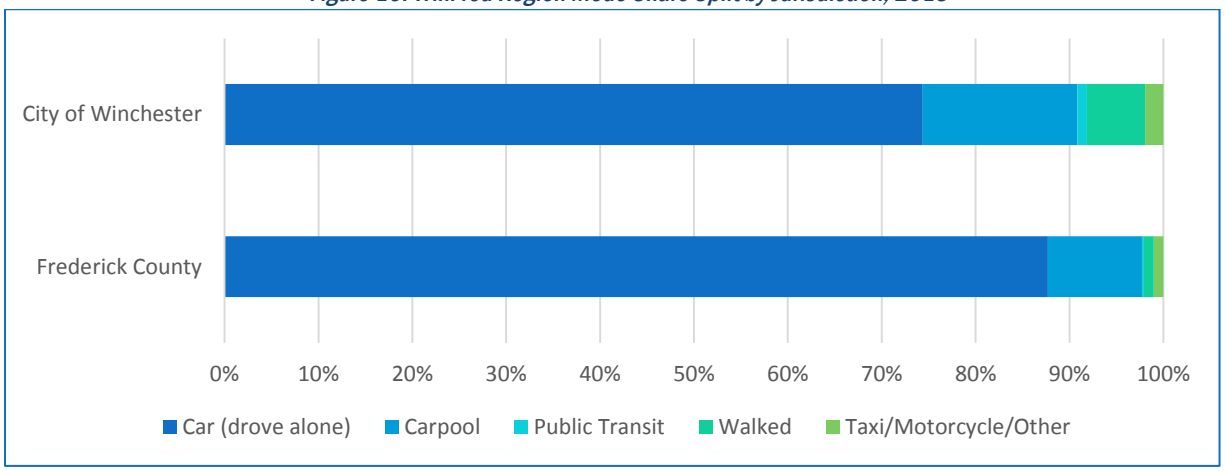


Source: LEHD, http://lehd.ces.census.gov/.

Mode Choice

In the WinFred Region, the majority of commuters drive alone to work. While there is some variation between jurisdictions, cars are used between 72 and 84 percent of the time. For all jurisdictions, carpooling is the second most popular option, accounting for 9 percent in Frederick County and 16 percent for the City of Winchester (**Figure 10**).

Figure 10: WinFred Region Mode Share Split by Jurisdiction, 2013



Source: US Census Bureau, 2009-2013 American Community Survey 5-Year Estimates.

Average Commute Times

The average commute time in the WinFred Region ranges from 22 to 30 minutes among the two jurisdictions (**Table 8**).

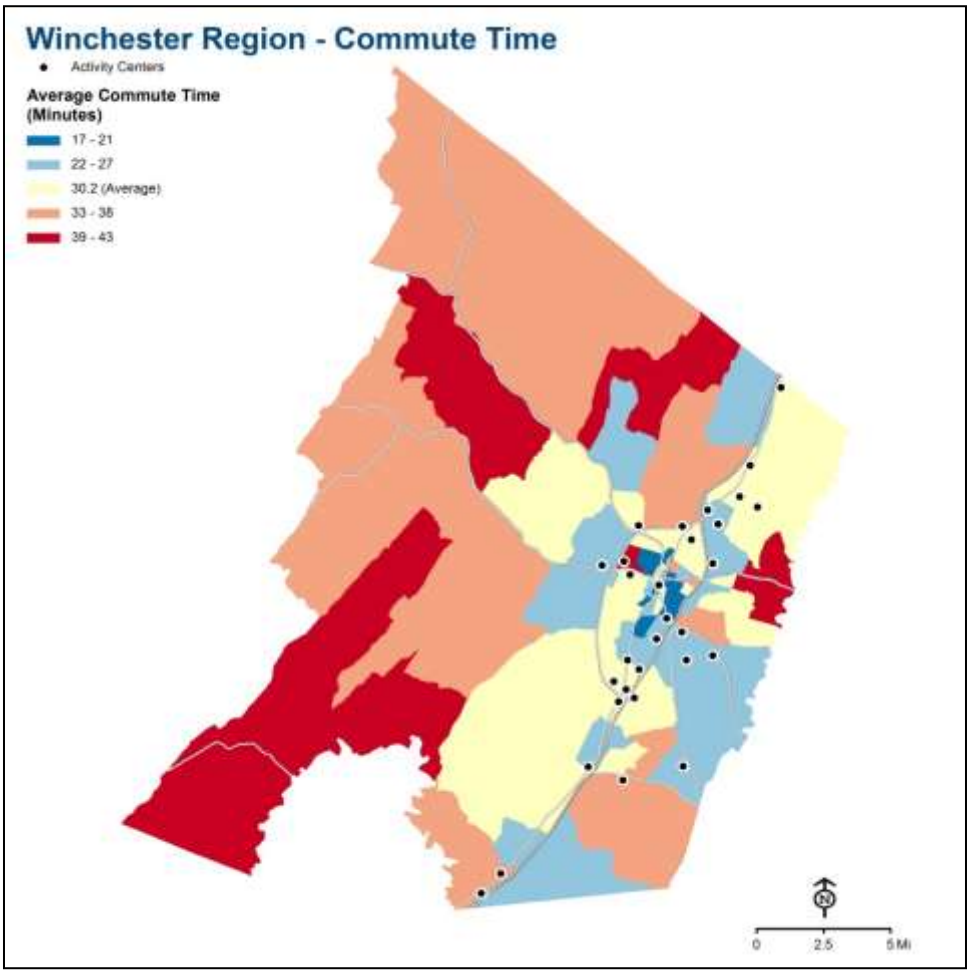
Table 8: WinFred Region Mean Commute Time by Jurisdiction, 2013

Jurisdiction	Mean Commute Time (Minutes)
City of Winchester	22.3
Frederick County	30.3

Source: US Census Bureau, 2009-2013 American Community Survey 5-Year Estimates.

Figure 11 provides a closer look at where longer commutes originate. In the rural areas of the county, commute times are above average for the region as a whole, as these areas have fewer jobs in close proximity and less access to transportation networks than more developed areas. The average commute time is 30 minutes which isn't surprising as the region is a net exporter of commuters.

Figure 11: WinFred Region Average Commute Times, 2013



Source: US Census Bureau, American Community Survey 2013, 5-Year Estimates.

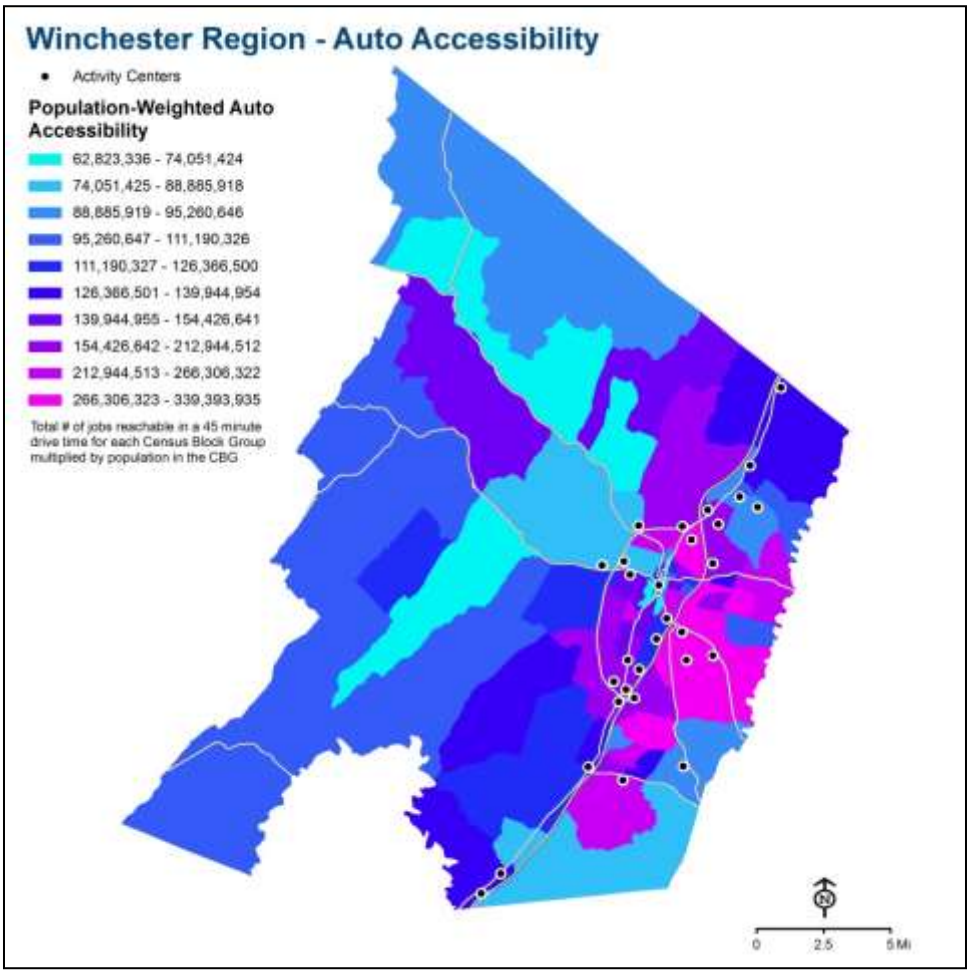
C. Accessibility to Employment

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 WinFred 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. Closer jobs and higher density census block groups are weighted more than jobs further away and less dense census block groups. The areas with the highest level of auto accessibility exist to the east of I-81 and the City of Winchester (**Figure 12**). Even the most rural areas of the region are within a 45-minute drive of jobs.

Figure 12: WinFred Region Auto Accessibility

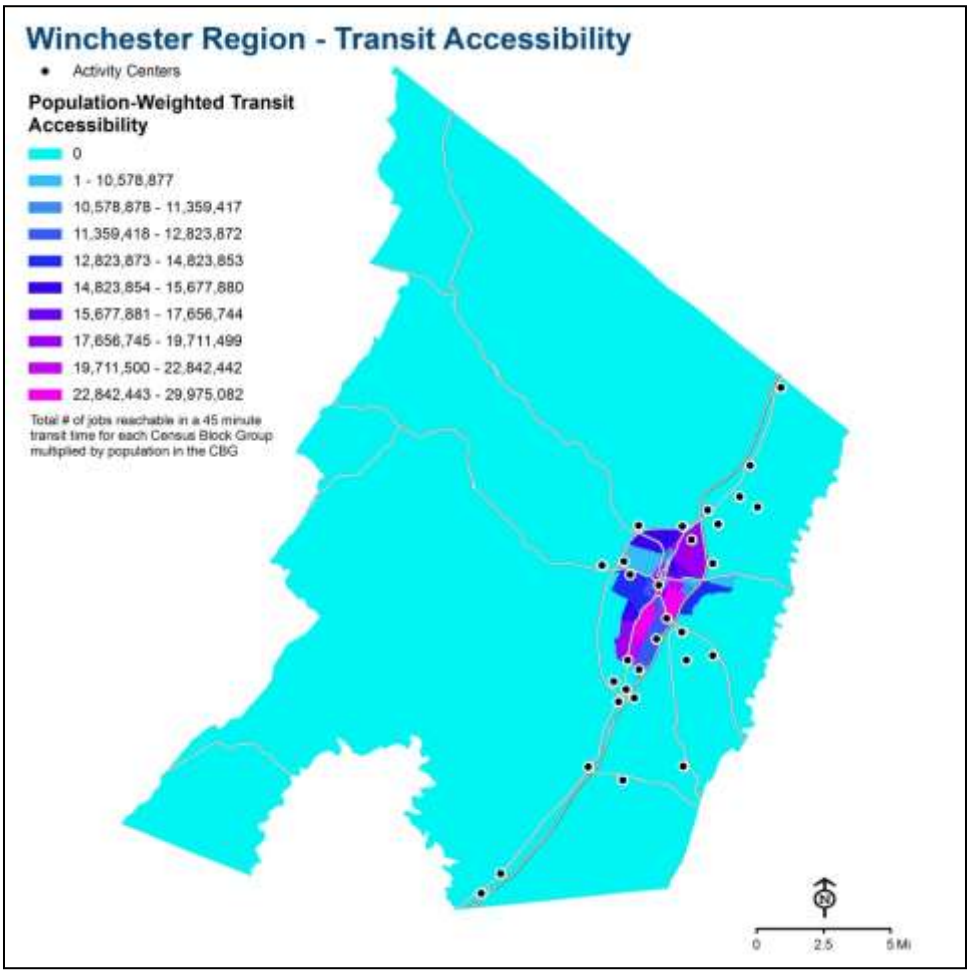


Source: GIS Network analysis of the distance-weighted employment accessible from each census block group along a Navteq roadway network using roadway speeds developed from FHWA HERE data. InfoUSA Business Data, 2012 was used to calculate employment locations.

Transit Accessibility

Figure 13 illustrates the total number of jobs reachable in a 45-minute transit time for each census block group multiplied by population within that census block group. The fixed-route transit options in the WinFred Region are limited to within the City of Winchester. 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.

Figure 13: WinFred Region Transit Accessibility

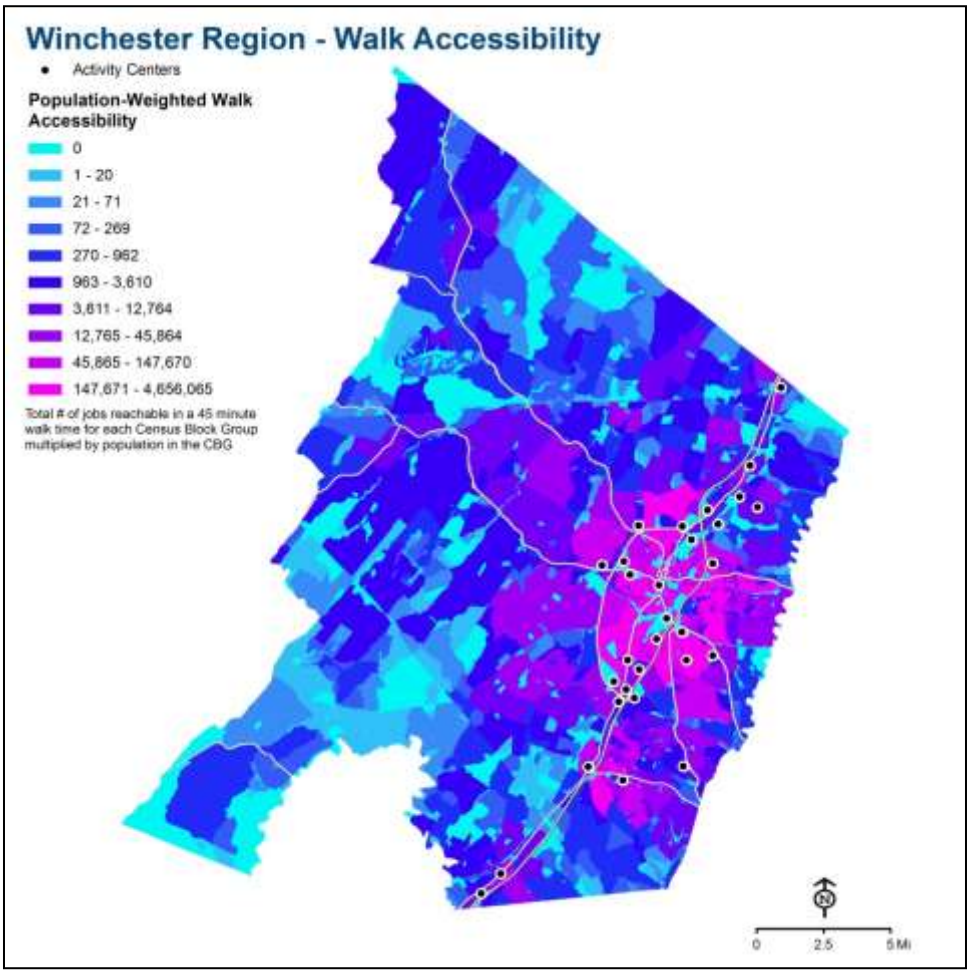


Source: GIS Network analysis of the distance-weighted employment accessible from each census block group along a Navteq roadway network using General Transit Feed Specification (GTFS) transit data and including walk time to and from stations. InfoUSA Business Data, 2012 was used to calculate employment locations.

Walk Accessibility

Figure 14 reveals a regional pattern of mixed use development in communities where residents live within walking distance of thousands of jobs and/or the services represented by those jobs. The City of Winchester scored the highest, as was expected. The high variability within even the highest scoring areas reflects the significance of land use and job density in determining walk accessibility.

Figure 14: WinFred Region Walk Accessibility

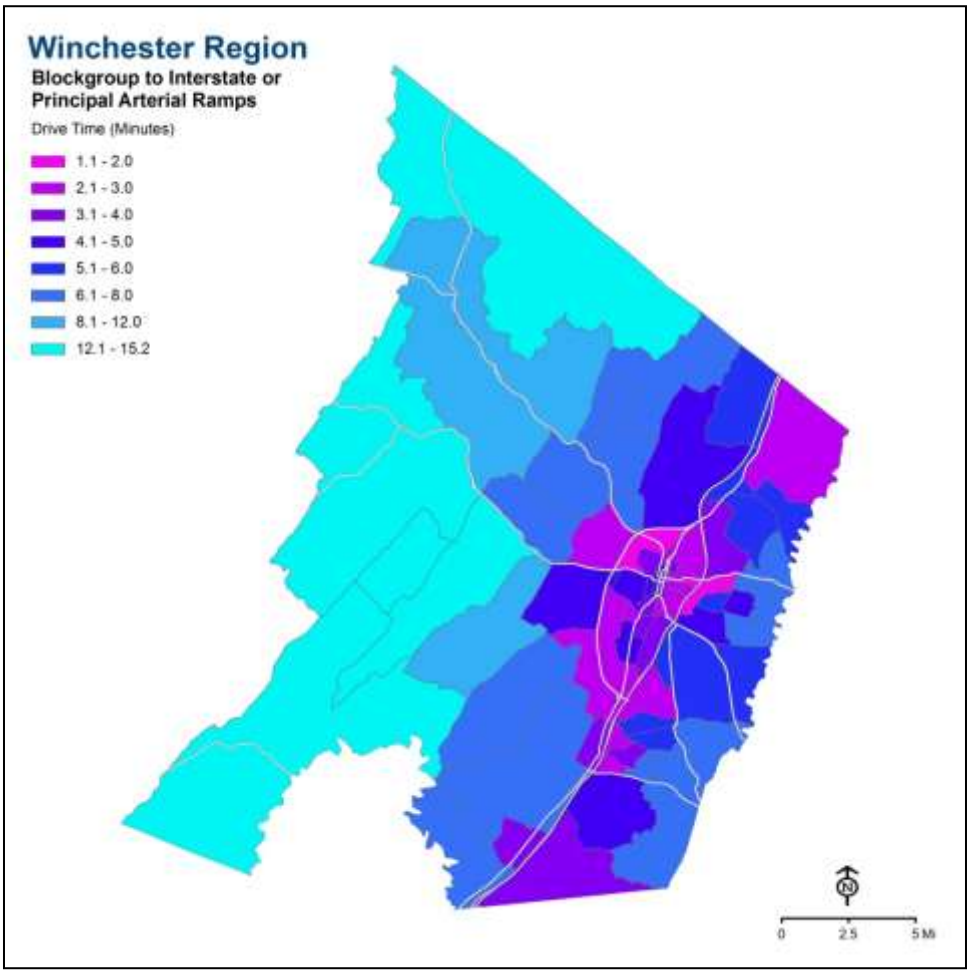


Source: GIS Network analysis of the distance-weighted employment accessible from each census block group along a Navteq roadway network using roadway characteristic data to interpolate walkability. InfoUSA was used to calculate employment locations.

Freight Accessibility

In addition to railways, I-81 is the major corridor 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. In the WinFred Region the shortest drive times are found along I-81, US 11, US 50 and VA 57. Even the most rural parts of the region are within a 15-minute drive of a highway interchange (**Figure 15**).

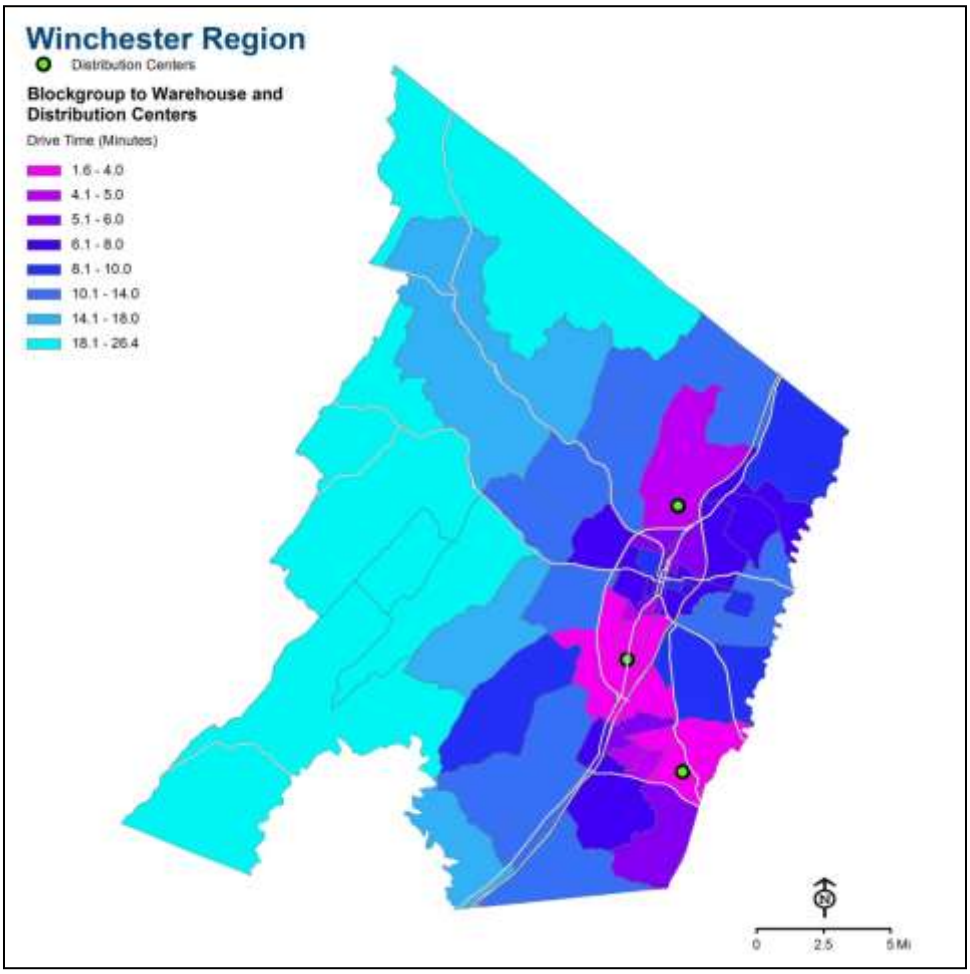
Figure 15: WinFred Region Access to Interstate and Principal Arterial Ramps



Source: GIS analysis conducted using US Census Boundary Files, ramps from Navteq database.

The location of warehouses and distribution centers is another important factor in the level of freight accessibility for the region. Access to warehouse and distribution centers is greatest within the southern portion of Winchester and southeast of the city around VA 37, along I-81 and US 522 (**Figure 16**).

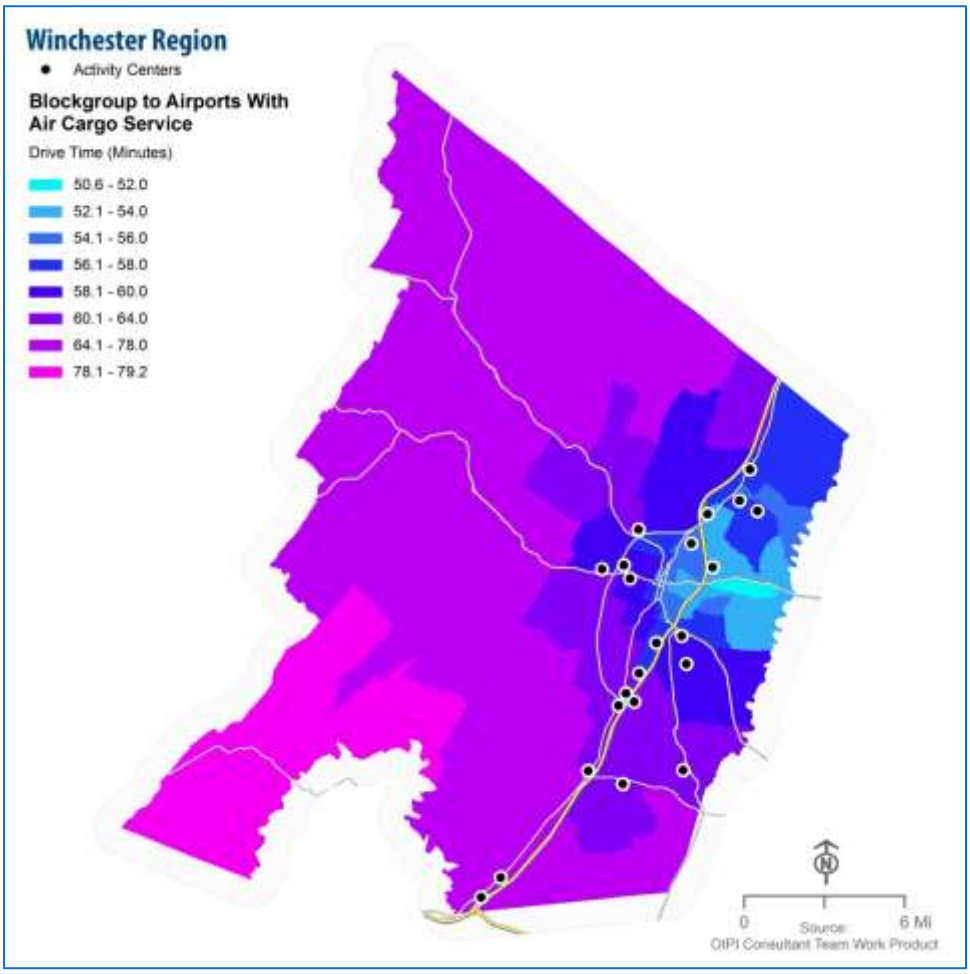
Figure 16: WinFred Region Access to Warehouses & Distribution Centers



Source: GIS analysis conducted using US Census Boundary Files and Virginia Office of Intermodal Planning and Investment data on Warehouse and Distribution Center Locations.

Figure 17 displays proximity to commercial service airports that handle air cargo, which is important for some types of freight distribution. In general, the WinFred Region is within a 50 minute to 80 minute drive to the closest airport that handles air cargo.

Figure 17: WinFred Region Access to Airports with Air Cargo Service



Source: GIS analysis conducted using US Census Boundary Files and location of airports with air cargo service.

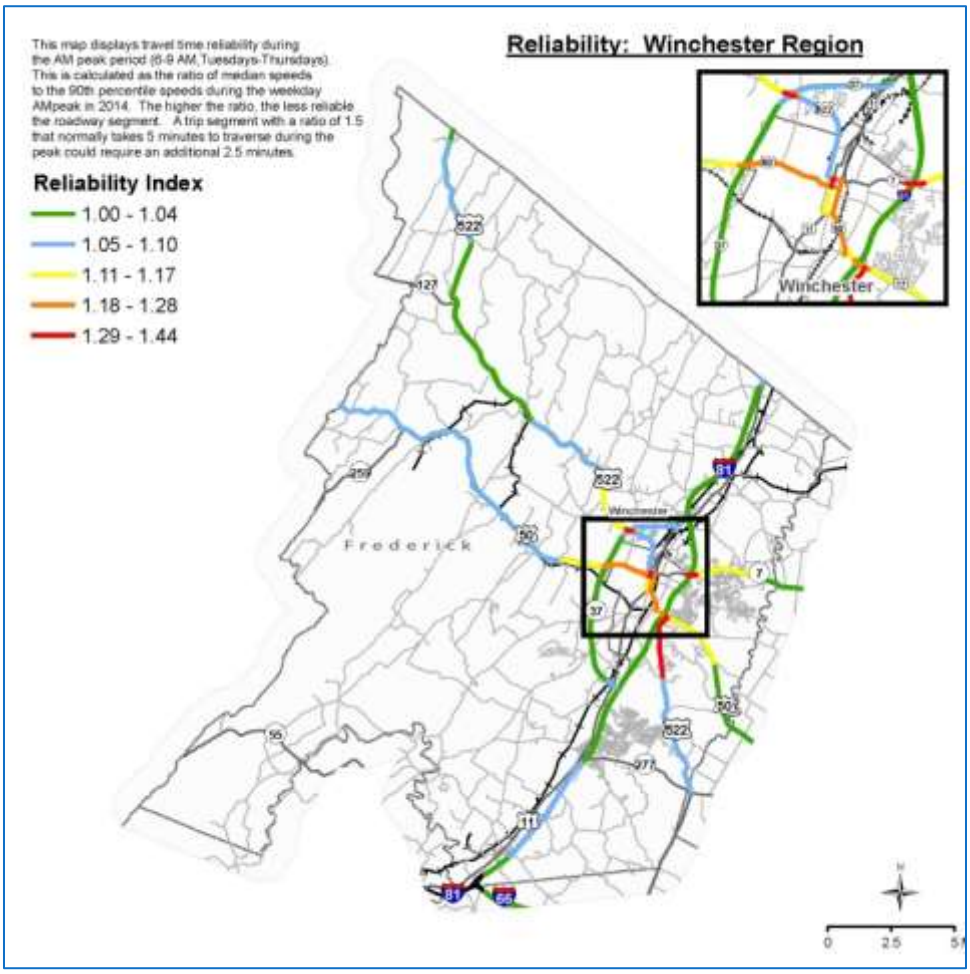
D. Roadway Measures

This assessment identified the transportation conditions in the WinFred 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 18** below, is defined as the ratio of the 80th percentile travel time during the weekday AM peak period in 2014. Overall, scores indicate that travel time is very reliable for the corridors with available data. A portion of US 522 south of the city has a slightly higher travel time reliability index compared with the other corridors analyzed, however, it equates to a few minutes of additional travel time.

Figure 18: WinFred Region Travel Time Reliability

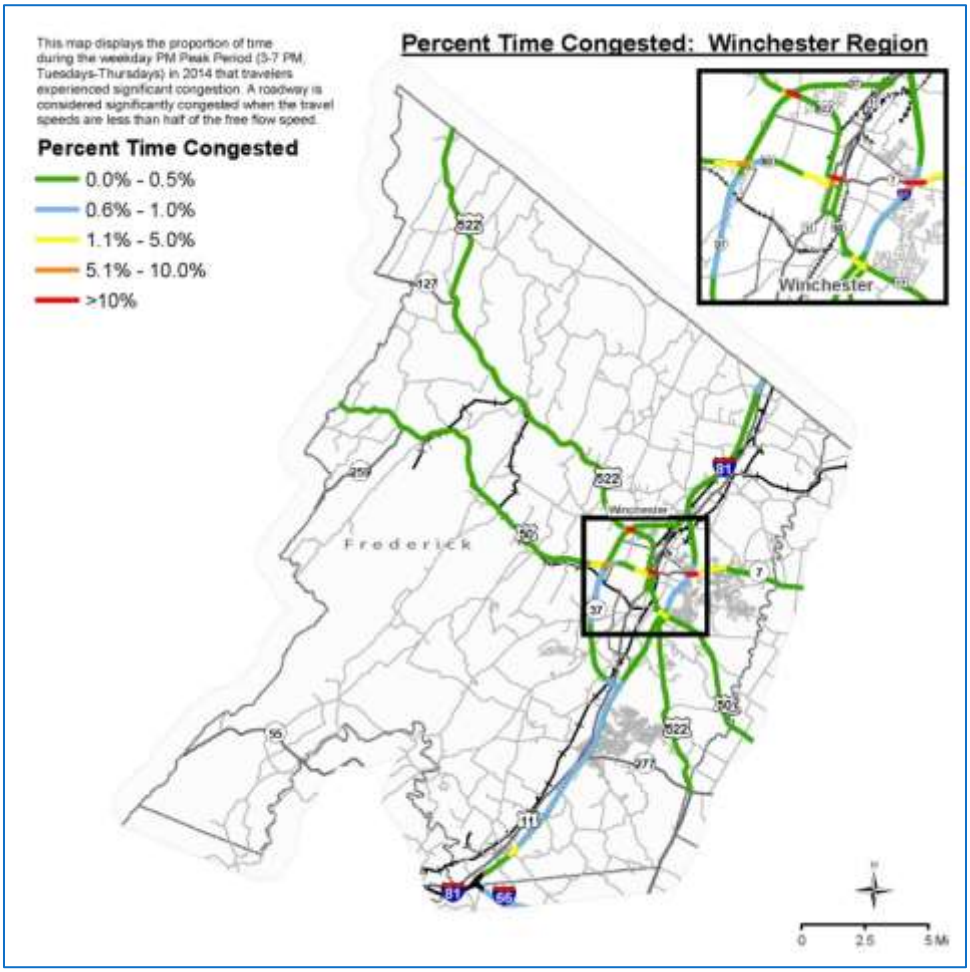


Source: INRIX Data and Virginia Department of Transportation
Note: the Reliability Index is based on a statewide scale which may skew the scores for the WinFred Region based on the travel time reliability in other regions throughout the state.

Percent of Time Congested

Percent of time congested is an important determinant of roadway Level of Service. The percentage of time congested was calculated for evening peak times in 2014. According to the analysis, a majority of the corridors analyzed are congested less than 1 percent of the time (**Figure 19**). A few intersections along US 50/VA 7 and US 522 experience slight congestion.

Figure 19: WinFred Region Percent of Time Congested

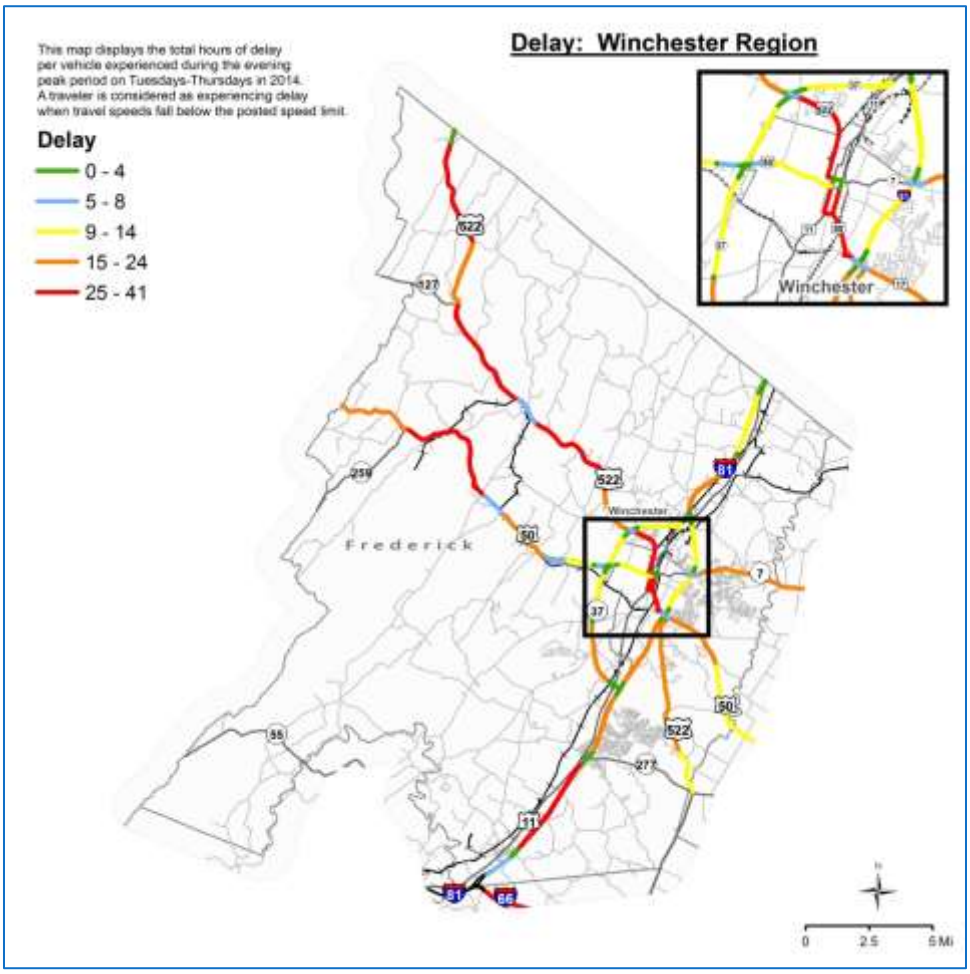


Source: INRIX Data and Virginia Department of Transportation.

Travel Time Delay

Travel time delay is defined as the total hours of delay per vehicle during weekday evening peak times in 2014. If travel speeds fall below the posted speed limit, a trip is considered delayed. In the WinFred Region, the most significant delays occurred along portions of I-81, US 522, and US 50 (**Figure 20**).

Figure 20: WinFred Region Travel Time Delay

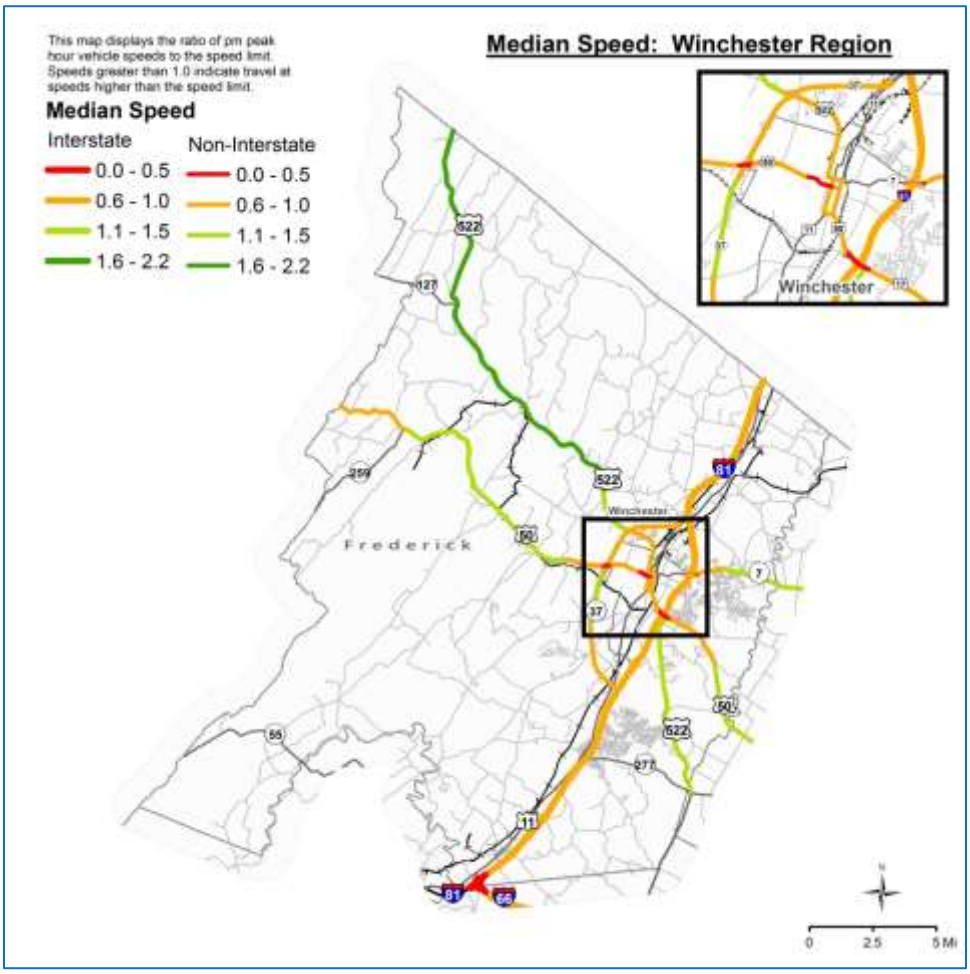


Source: INRIX Data and Virginia Department of Transportation

Median Speeds

The median speed map (**Figure 21**) displays the ratio of pm peak hour vehicle speeds to the speed limit for both interstate and non-interstate corridors in 2014. Speeds greater than 1.0 indicate travel at speeds higher than the speed limit. The I-81 corridor and portions of US 50 and VA 37 experience median speeds of less than 1.0.

Figure 21: WinFred Region Median Speeds



Source: INRIX Data and Virginia Department of Transportation

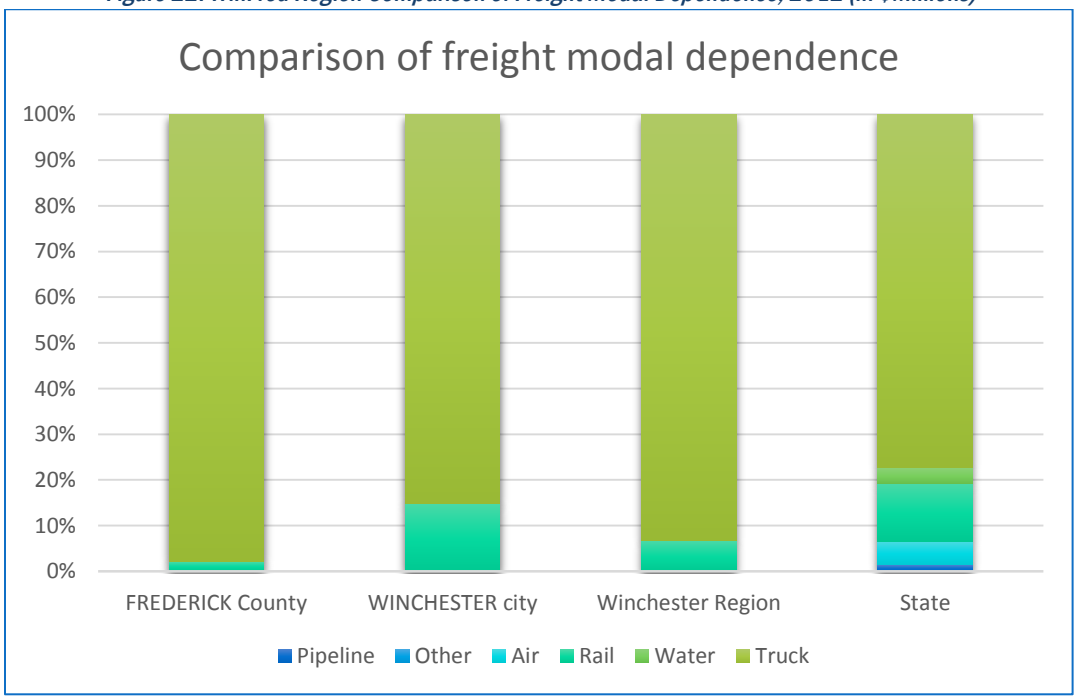
D. Regional & Local Commodity Flows

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 WinFred Region, over 90 percent of the dollar value of all goods that are moved through the region are moved by truck (**Figure 22**). The region does not utilize pipeline, air, or water freight modes. In comparison to Frederick County, the City of Winchester has the larger dependence on rail service at over 10 percent, but the region as a whole is not nearly as dependent on rail service.

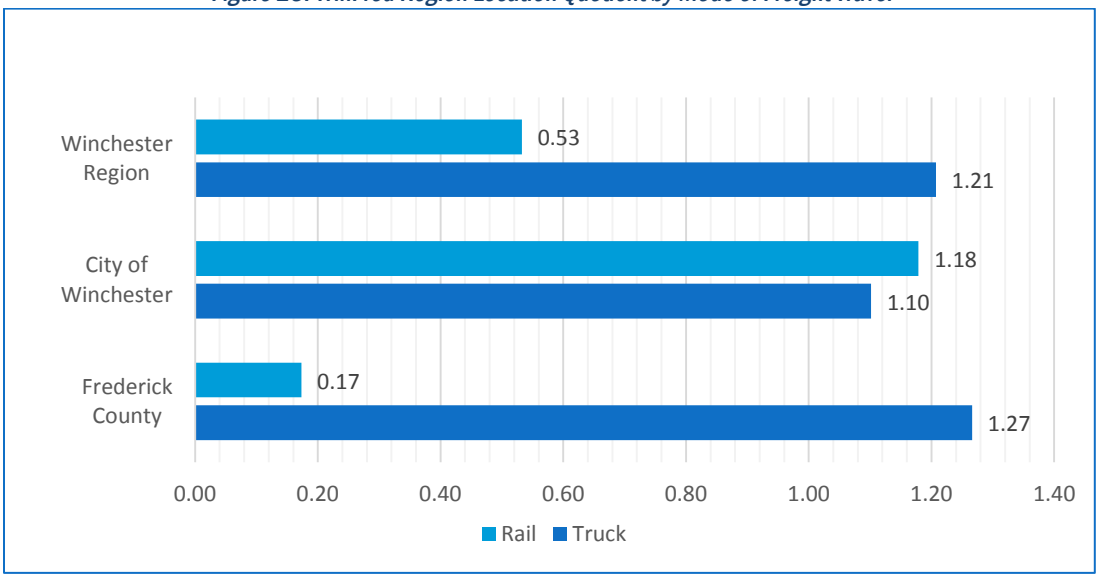
Figure 22: WinFred Region Comparison of Freight Modal Dependence, 2012 (in $Millions)



Source: TranSearch, 2012.

Location Quotients are used to compare the prominence of freight modes between the WinFred Region, and the State as a whole. The WinFred Region relies on rail for freight movement only 0.53 times and on trucks for freight movement 1.21 times more than the State does as a whole (**Figure 23**).

Figure 23: WinFred Region Location Quotient by Mode of Freight Travel

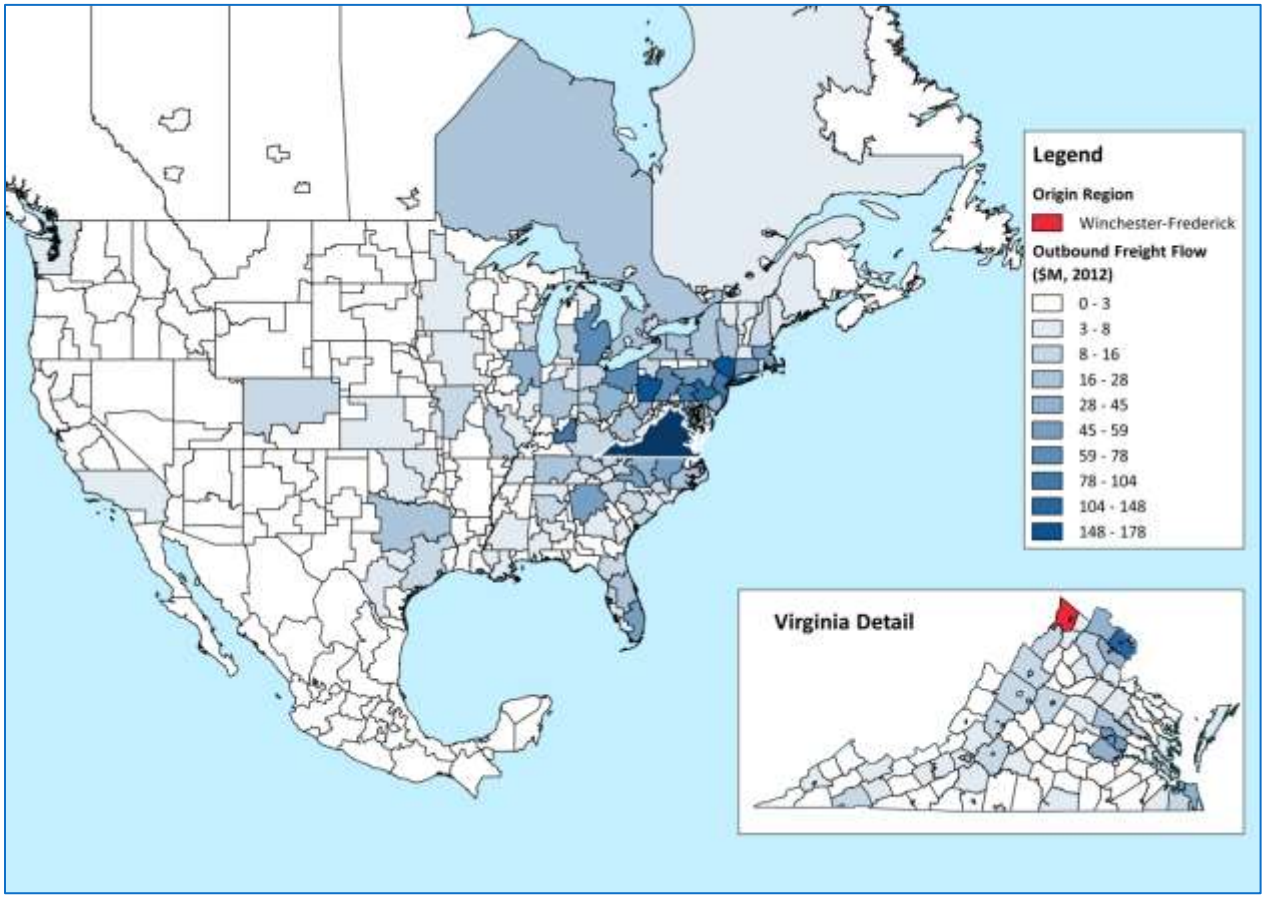


Source: Transearch, 2012.

Top Commodities

Outbound locations for freight by value from the WinFred Region in 2012 are shown in **Figure 24**. A majority of the freight in terms of value originating in the region is destined for counties in West Virginia and Pennsylvania.

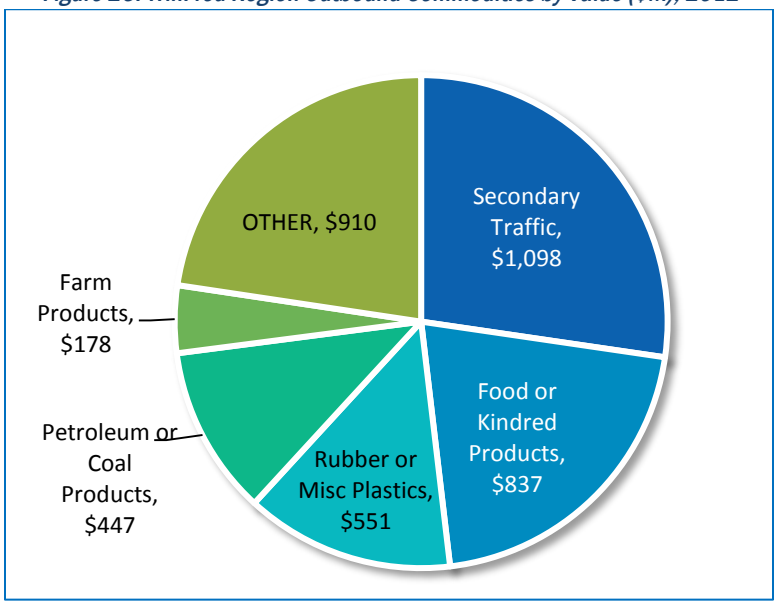
Figure 24: Outbound Freight Flow from the WinFred Region, 2012



Source: Transearch, 2012.

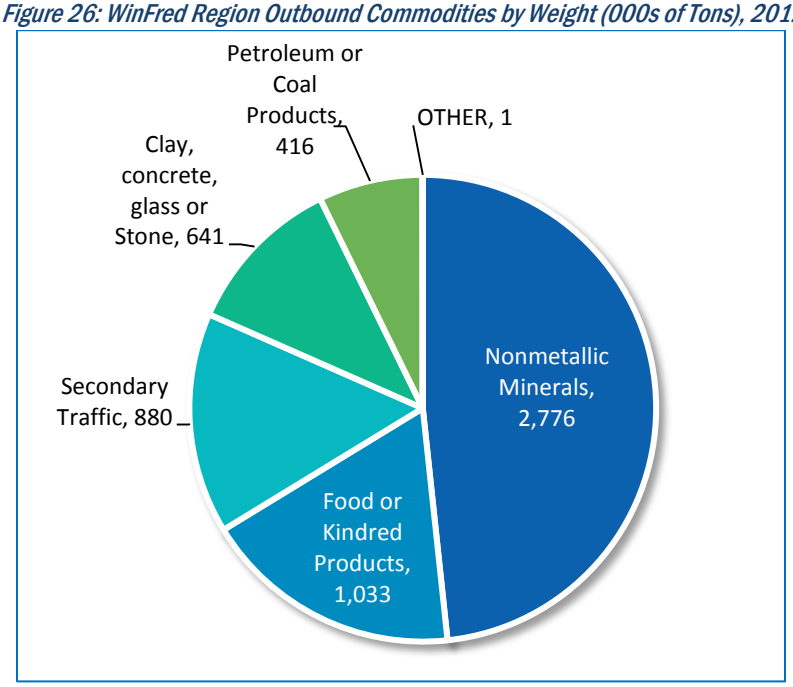
Figures 25 and 26 summarize the value and tonnage of commodities that originated in the WinFred Region in 2012. The largest commodity in terms of value is secondary traffic products. The other category includes all the remaining commodities less than the top five shown in **Figure 25** so it does not accurately represent one of the largest commodity. The largest commodity by weight was nonmetallic minerals at 42 percent of the total commodities by weight.

Figure 25: WinFred Region Outbound Commodities by Value ($M), 2012



Source: Transearch, 2012.

Figure 26: WinFred Region Outbound Commodities by Weight (000s of Tons), 2012

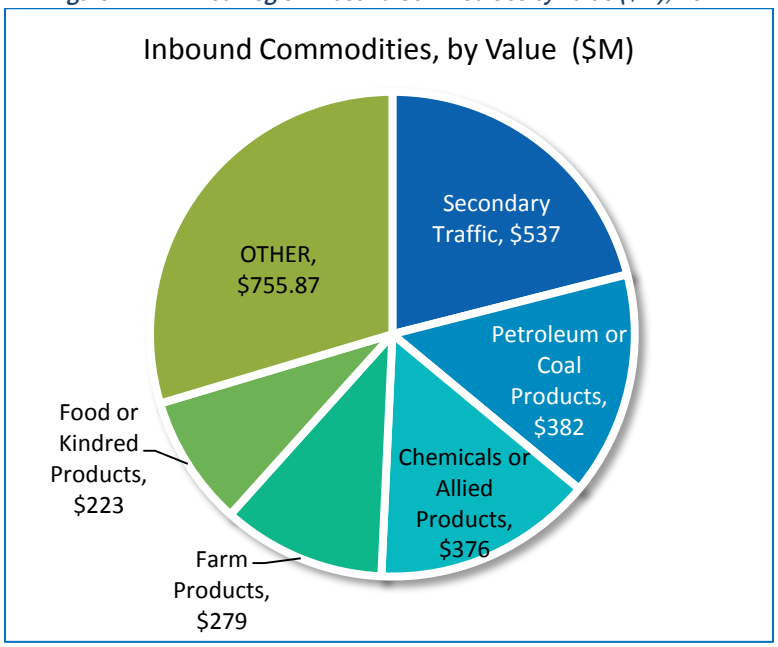


Source: Transearch, 2012.

Figures 27 and 28 summarize the value and tonnage of commodities that were destined for the WinFred Region in 2012. The largest commodity in terms of value is secondary traffic at over 25 percent. Secondary traffic includes warehouse and distribution center, rail intermodal drayage to and from ramp,

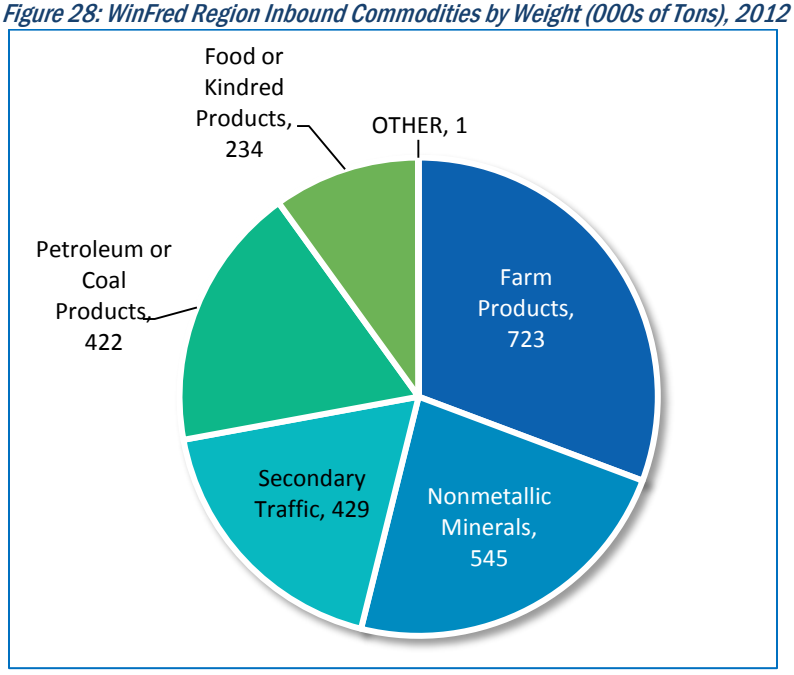
and air freight drayage to and from airport. The largest commodity by weight was farm products at 23 percent.

Figure 27: WinFred Region Inbound Commodities by Value ($M), 2012



Source: Transearch, 2012.

Figure 28: WinFred Region Inbound Commodities by Weight (000s of Tons), 2012



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. The key economic and transportation conditions have been identified in the Economic and Transportation profiles above and key correlations have been described above as Economic and Transportation Linkages.

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 WinFred 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 (Passenger and Freight Reliability, Bottleneck Relief, Modal Choice and Walkability), as well as general Non-Capacity Needs (i.e. Safety, Operations and State of Good Repair Needs). 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 21st century workforce needed for each region's 2025 economy.

B. Economic and Transportation Needs Correlation

The OIPI consultant team conducted a number of research efforts aimed at identifying key correlations between industries and their transportation needs. 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 **Table 9** only represents

where there were apparent correlations between industry sectors and basic categories of transportation needs.

Table 9: Economic and Transportation Correlation

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

Source: Summary correlations based on national research and survey of national Industry Site Selection Professionals conducted by OIPI Consultant Team.

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 above, when the 2025 Future Economic Profile was estimated for the WinFred Region, it showed a predominance among the Local Serving economic sector at 50 percent. The Freight Depending economic sector accounts for 41 percent of the economy with Knowledge-based industries accounting for 9 percent of the economic output. As outlined in the Economic and Transportation Correlation table above, the Local sector priority transportation needs include highway access, passenger reliability, network connectivity, access to transit and modal choice.

In addition, the local input received in the outreach to regional stakeholders and in local plans such as the Comprehensive Economic Development (CEDS) plan for the region indicate a strong desire to continue to support the manufacturing sector, particularly with respect to goods movement needs, but also to support the expected growth of the health care, high tech and tourism industries with the need for reliable commuting and additional modal travel options.

This translates into transportation needs such as freight and passenger reliability on the region's primary corridors, I-81, US 522, US 340, and US 11. It also indicates the need for addressing any bottlenecks along these corridors to further support reliable travel for both commuters and goods movement as well as provide improved modal choices and transportation demand management for commuters. In addition, key corridors US 11, US 522, and US 50 support multiple existing and emerging activity centers in the region as important commuter routes and serve economic growth in the City of Winchester.

The forecasted growth in the Local Serving economic sector for this region brings the potential for additional transportation needs such as walking, bicycling and transit accessibility to support workforce access to these kinds of jobs. Therefore, transportation needs in the region should include expanding modal choices, both within the region's economic activity centers, and between the centers. The expansion of the residential communities and local serving industries would benefit from both intraregional and interregional fixed route transit as well as additional transportation demand management programs to provide better workforce access. Further support for the Local Serving sector would also come from enhanced walkable and bikeable places.

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

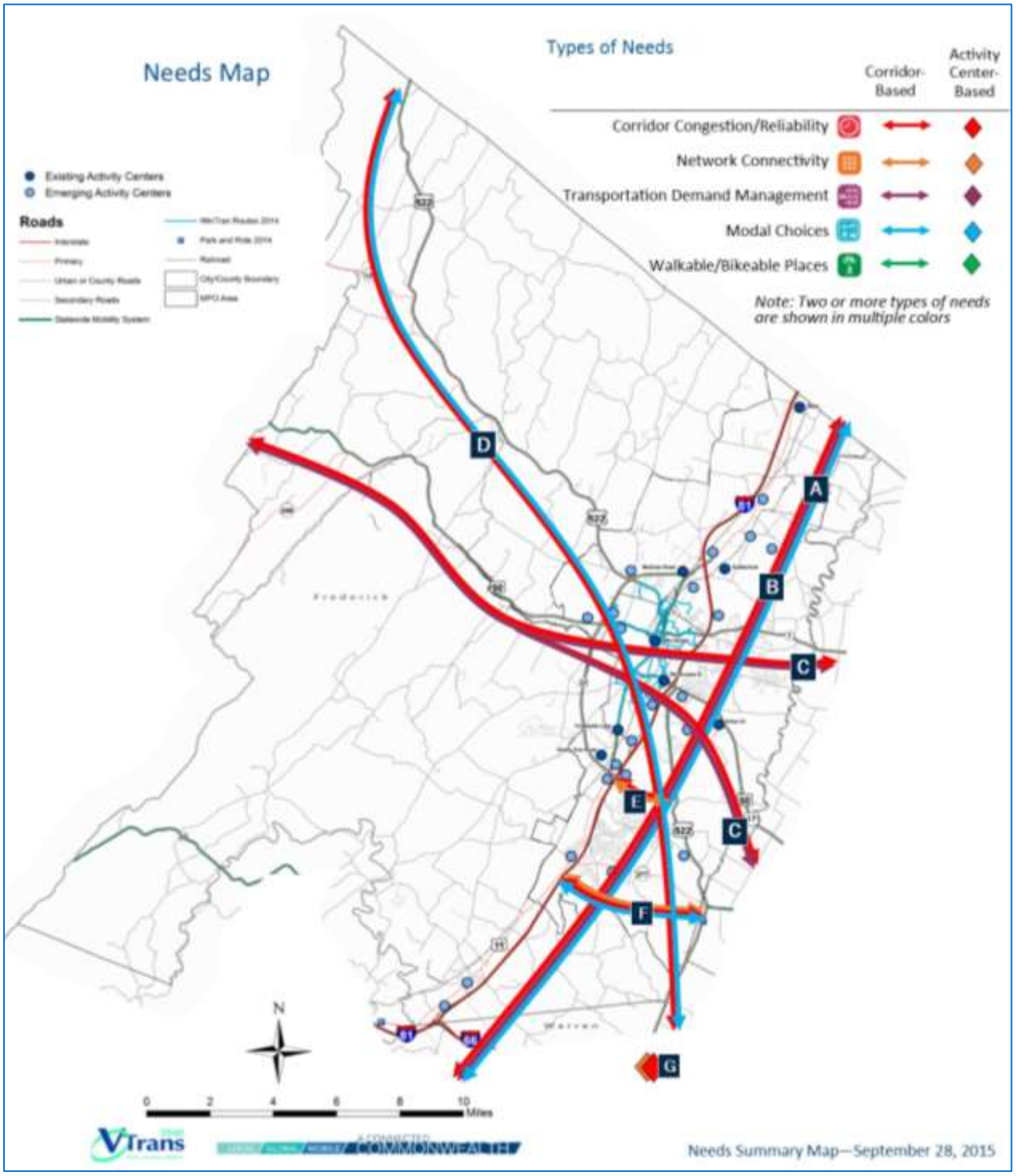
Summary of Needs

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.

Map of Needs

The map below (**Figure 29**) 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.

Figure 29: Summary Needs Map for the WinFred Region



Findings of Needs

Table 10 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:

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 in the economic and transportation profiles. 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 30: Transportation Icons for Needs Assessment

Table 10: Findings of Needs for the WinFred Region

A.	**I-81 Corridor and Interchanges**	
Need		**The I-81 corridor is the principal high volume, high mobility artery in the region and serves interstate, regional and local travel. It accommodates demand from both commuter and freight and connects West Virginia to other parts of Virginia. There is a need for to mitigate inconsistent travel times for passengers and freight near interchanges at exits 323, 317, 315, 313, 310 and 307. Transportation demand management services and modal choices are needed within the corridor to improve commutes and access to recreational and tourist destinations.**
Economic		There are a number of existing and emerging activity centers along the I-81 corridor that serve local, freight dependent, and knowledge based industries for both goods movement and commuter traffic. The corridor is an essential and high-priority corridor for freight movement. It connects activity centers of all types and supports tourism.
Transportation		I-81 has intermittent passenger and freight reliability and bottleneck issues at multiple interchanges in the region. Additional modal choices for passenger service for inter-regional travel markets are vital to support the regional economy. Multimodal access to jobs is lacking. This is a freight gateway corridor.

B.	**US 11 Corridor**	
Need		**The US 11 corridor is a north/south artery running parallel to I-81. Multiple passengers and freight-serving activity centers are located along and near the corridor. Improved passenger and freight reliability, modal choices and transportation demand management services are needed. Transit is also needed between the areas south of Winchester to Middletown.**
Economic		There are a number of existing and emerging activity centers along the US 11 corridor that serve local, freight dependent, and knowledge based industries for both freight and commuter traffic.
Transportation		Major connector between several activity centers and alternative travel corridor when I-81 is congested due to incidents. Multimodal access to jobs is lacking. This is a freight corridor.

C. US 50/US 17/VA 7 Corridor

Need

The US 50/US 17/VA 7 corridor is an east/west artery connecting towns in West Virginia to the Cities of Winchester and Leesburg. US 50/US17 south of I-81 connects the City of Winchester to Waterloo. Improved passenger and freight reliability is need along the corridor. Transportation demand management services for commuters from West Virginia to the WinFred Region and for commuters from the WinFred Region to Fairfax County are also needed.

Economic

Connects the local serving existing activity centers in Winchester, freight dependent Arbor Court activity center, and several emerging activity centers.

Transportation

There is intermittent congestion along the corridor. As a commuting corridor, there is a need for transportation demand management.

D. US 522/US 340 Corridor

Need

The US 522/US 340 corridor is a north/south artery connecting towns in West Virginia to the City of Winchester, Front Royal and the Virginia Inland Port (VIP). Improved passenger and freight reliability is needed along the corridor. The northern portion of US 522 from the City of Winchester accommodates high volumes of freight traffic bound for West Virginia and the mid-west from other parts of Virginia as well as commuters from WV bound for the WinFred region. The southern portion of the corridor from the city serves a high volume of freight traffic to and from the VIP and inter-regional commuter traffic.

Economic

Supports the local serving existing activity centers in Winchester and serves as a freight corridor to the Virginia Inland Port.

Transportation

There is a lack of multimodal access to jobs and intermittent backups causing congestion. Passenger and freight reliability is needed in the corridor.

E. Extension of VA 37 to US 522

Need

The extension of VA 37 to US 522 is a priority project in Frederick County's long range transportation plan. The partially-funded project would increase access to the Virginia Inland Port, by creating an additional connection and an alternative to I-81 Exit 313. It would also serve the emerging local serving Crosspoint activity center. Improved passenger and freight reliability as well as network connectivity are needed.

E. Extension of VA 37 to US 522

Economic

Supports the freight generating Virginia Inland Port as well as the emerging local serving Crosspoint activity center.

Transportation

Will relieve the truck traffic headed north on US 522 through the City of Winchester. There is a lack of connectivity in the area for the emerging activity center near Crosspoint. Need is identified in the Frederick County Long Range Transportation Plan.

F. VA 277 Corridor

Need

The VA 277 corridor serves as an east/west connector from I-81 to US 522. It provides access to the Virginia Inland Port as well as a regional high school, a regional recreation park, a regional shopping destination, and an emerging activity center. Improved freight and passenger reliability, modal choices, and network connectivity are needed.

Economic

Supports freight access to the Virginia Inland Port. A regional high school, regional recreation park and primary retail shopping area are located along the corridor.

Transportation

There are modal conflicts for freight, local congestion, and lack of multimodal access for passengers along the corridor.

G. Virginia Inland Port

Need

The VIP is a freight generator located just outside the Win-Fred Region in Warren County. Improved network connectivity is needed from the port to the freight dependent activity centers in the region and beyond.

Economic

The VIP is a large freight generator outside of the WinFred Region that relies on freight corridors within the WinFred Region such as US 522/US 340 and VA 277.

Transportation

Improved network connectivity in the region will improve the mobility as well as passenger and freight reliability in the southeastern portion of the region.

H. Various Activity Centers

Need

Access to transit in the region is limited to within the City of Winchester. Multiple existing and emerging activity centers serve local industries as well as regional outdoor recreation destinations and lack connectivity to transit, pedestrian and bicycle facilities. Improved modal choices, transportation demand management services, network connectivity, corridor reliability, and enhanced walkable/bikeable places are needed.

Economic

Supports local serving and knowledge based industries in major activity centers such as Winchester, Winchester South, and Creekside Lane; as well as multiple emerging local serving activity centers in the region.

Transportation

Existing connections between and within activity centers lack efficient modal choices. Improved walkable and bikeable places would enhance existing communities. Improved transit access and transportation demand management services for commuters are needed.

I. Various Freight Dependent Activity Centers

Need

The emerging freight dependent activity centers in the region will need improved passenger and freight reliability on nearby travel corridors.

Economic

Supports existing and emerging freight dependent activity centers.

Transportation

Existing connections between and within existing and emerging freight dependent activity centers lack efficient freight access.

J. Regional Transit Access and Transportation Demand Management

Need

Increased opportunities for regional transit and transportation demand management services are needed for commuters to and from West Virginia and neighboring counties.

Economic

Supports multimodal access to jobs within and outside the region.

Transportation

Approximately 30 percent of commute trips from the City of Winchester and Frederick County travel to areas outside the region, while approximately 35 percent of commute trips ending in the City of Winchester and Frederick County originate from outside the region. Opportunities for regional transit access and transportation demand management services for inter-regional commuters are needed.