CAMBRIDGE SYSTEMATICS

Frederick County Freight and Land Use Plan

Frederick County, Maryland

technical

appendix

prepared for

Frederick County as part of the Transportation/Land-Use Connections Program (Metropolitan Washington Council of Governments)

prepared by

Cambridge Systematics, Inc.

with

Partners for Economic Solutions

June, 2011

www.camsys.com

technical appendix

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date

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Task 2: Existing Conditions

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memorandum

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report

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1.0 Existing Conditions

1.1 FACTORS INFLUENCING FREIGHT DEMAND AND LAND USE

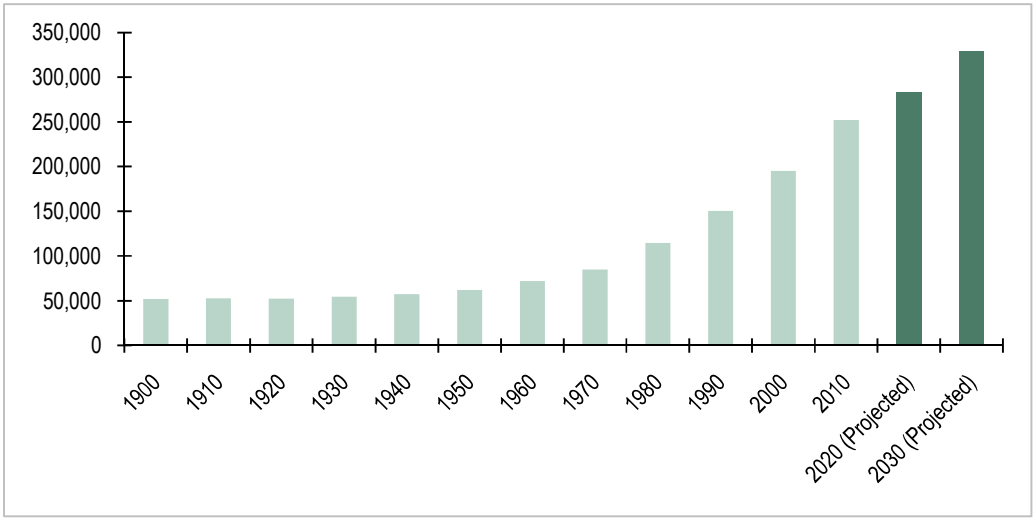
Situated at the northwestern edge of the Washington-Baltimore metropolitan region, Frederick County, Maryland is a fast-growing county of 225,000 residents with a dynamic economic base. Because of its proximity to Washington-Baltimore and direct Interstate access via I-70 and I-270, the County is becoming an increasingly important distribution center serving the demands of more than eight million regional residents.

This section describes the factors influencing freight demand and land use in the county, including population growth and economic activity.

Population

Over the past decade, the population of Frederick County has grown at faster rate than the state as a whole. The County's population grew by nearly 30 percent between 2000 and 2010 and increased by over two-thirds between 1990 and 2010. The population is projected to increase an additional 16 percent between 2010 and 2030. The County's population growth is attributable to a combination of factors, including shifting urban and suburban commuting patterns to the Washington and Baltimore Metropolitan areas as well as economic growth in the manufacturing, distribution, and service industries within the County. The figure below demonstrates the population growth in Frederick County over the last 100 years.

Figure 1.1 Frederick County Historical Population



Note: Projections based on 2000 census data.

Employment

According to the Maryland Department of Labor, Licensing, and Regulation, Frederick County was one of only nine counties in the state that experienced positive job growth between 2005 and 2009 and currently has an unemployment rate nearly one percent lower than the state as a whole (6.5 percent). This is substantially lower than the current U.S. unemployment rate and demonstrates the strength of the diversified economic base of the county.[1] The County has experienced tremendous growth in employment during the last two decades, the civilian labor force increasing by over 45 percent and the number of private, non-farm business establishments in the county increasing by over 60 percent.[2] The employment within the County is projected to increase substantially by 2030, nearly 34 percent between 2010 and 2030, and almost 50 percent between 2010 and 2040.[3] The forecast employment growth for the county is much higher than the state average (10 percent between 2010 and 2030) and highlights the need for coordinated transportation and land use planning to accommodate future demand. This is compared to an over 26 percent employment growth within the

[1] At the time of writing the U.S. unemployment rate was 9 percent.

[2] USA Counties, Frederick Census Statistics, http://censtats.census.gov/cgi-bin/usac/usatable.pl.

[3] Maryland State Data Center Projections.

Metropolitan Washington region between 2010 and 2030.[4] Coordinated planning is especially important for freight transportation as freight demand is directly related to the levels of personal consumption of people who live and work in the region.[5]

Freight-Related Business Activity

Another key driver of freight demand is the location and growth of freight-oriented businesses. Because this evaluation is designed in part to determine the demand for freight-oriented businesses in Frederick County, it is important to differentiate manufacturing, industrial, and transportation firms from retail establishments and other similar businesses. Businesses in Frederick County associated with "freight movement" include manufacturing, mineral extraction, agriculture/forestry, and transportation operations such as trucking, and wholesale trade. Based on the information available from the Frederick County Economic Development Department business database, there are nearly 1,000 freight-oriented businesses within the County. Most are small businesses with less than 20 employees (83 percent of the total) with a large proportion dedicated to manufacturing (including light manufacturing) at 32 percent of the total and wholesale trade at nearly 40 percent of the total.

Table 1.1 Freight-Oriented Firms in Frederick County

	Types of Freight-Oriented Firms							
Employee Range	Agriculture/ Forestry	Mining	Contractors/ Electric, Gas, Sanitation	Manufac-turing	Trans-portation	Wholesale Trade	Total	Percent Freight-Oriented Firms
<20	4	6	191	225	34	322	782	83%
20-100	0	2	17	58	7	44	128	13%
>100	1	1	3	21	3	8	37	4%
Total	5	9	211	304	44	374	947	100%

Note: List includes extracted firms from Frederick County database and is current as of January 2011. Specific numbers should be confirmed with County Economic Development Staff

Each of these sectors were identified by the State of Maryland Department of Labor, Licensing and Regulation in their quarterly employment reporting of "goods-producing industries" (natural resources and mining, construction, and manufacturing), and "service-providing industries" of trade, transportation, and utilities. Businesses within these sectors are reliant on the freight transportation

[4] Growth Trends to 2030: Cooperative Forecasting in the Washington Region, Fall 2007. https://www.commuterconnections.com/uploads/pub-documents/z1dfVw20080117203640.pdf

[5] FHWA Quick Response Freight Manual.

system – especially daily truck movement – to support their profitable operations. Within the County, these industries are involved in a wide variety of freight-intensive activities, including the extraction of raw materials (e.g., sand and stone), production of agricultural commodities (e.g., dairy), and the distribution of consumer products and other commodities to locations around the region. As major employers, these businesses play a strong role in the Frederick County economy.

In addition to traditional freight traffic generators (i.e., heavy industry, warehousing, and trade), Frederick County is home to a growing cluster of biotechnology firms. These firms, bolstered by the research activities of Fort Detrick, utilize flex/industrial office and light manufacturing space and will require additional land and space in the future. Data from Frederick County's Office of Economic Development estimates that 73 bioscience companies are currently located in the county, contributing to the development of new businesses with specialization in light manufacturing of pharmaceuticals and genetic development, among other industries.

Recessionary Effects and Economic Recovery

In 2009, the number of jobs associated with all goods producing industries of natural resources and mining, construction, and manufacturing accounted for 18 percent of the County total. Including trade and transportation services, the proportion of County jobs associated with freight-related industries is nearly 40 percent of the total jobs in the County.[6] When compared to data from 2005, these industries have declined by about 6-7 percent, with most of the decline accounted for from lost construction jobs as a result of the housing bust and subsequent economic downturn. The number and proportion of mining, trade, and manufacturing jobs remain very similar between 2005 and 2009. The total proportion of freight-related industry jobs in the greater Metropolitan Washington region in 2005 was only about 24 percent.[7] As the national economic recovery continues, the County can expect to experience increased in employment in industries related to trade and development such as manufacturing, mining, and construction and experience a corresponding increase in freight demand and associated congestion.

[6] Maryland Department of Labor, Licensing, and Regulation

[7] Enhancing Consideration of Freight in Regional Transportation Planning, Cambridge Systematics, 2007. Based on 2005 analysis.

Figure 1.2 Freight-Oriented Business Proportion of Employment, 2005

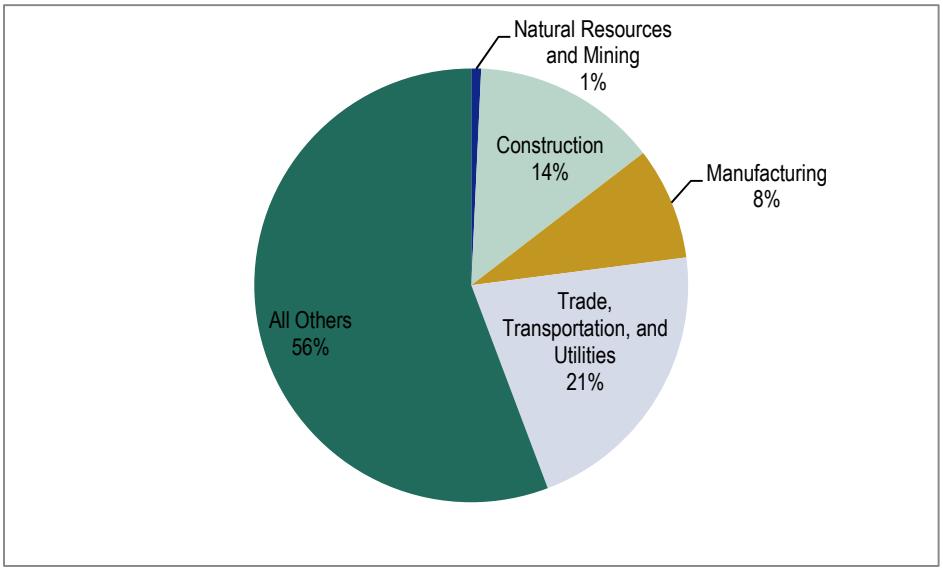
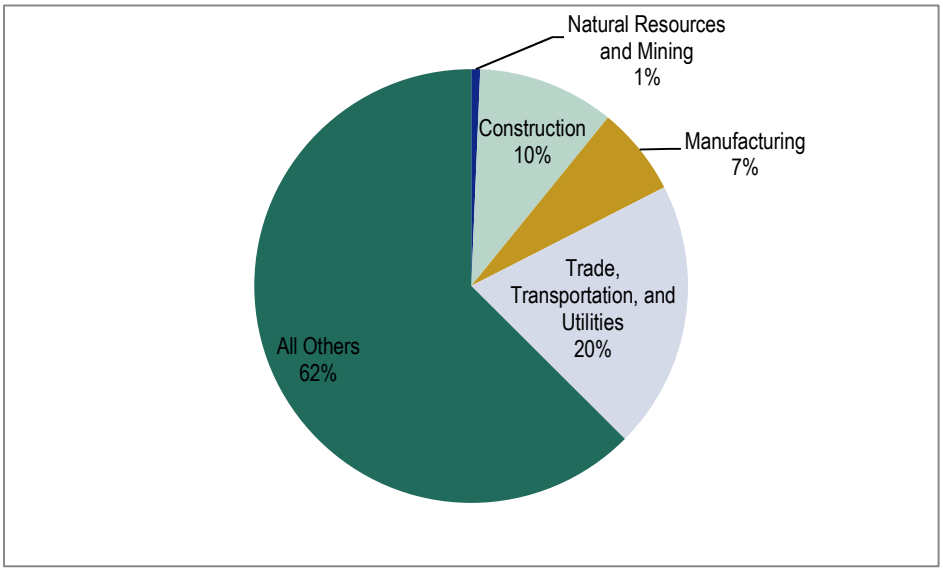


Figure 1.3 Freight-Oriented Business Proportion of Employment, 2009



Freight-Related Employment Outlook

To estimate the future impacts of freight-related businesses on the transportation system, the County utilizes a regional traffic model developed by the Metropolitan Washington Council of Governments. The model contributes to long-range transportation planning activities by assigning truck trips (i.e., freight-oriented traffic) to the transportation network. The traffic volumes reported by the model are primarily based on levels of industrial employment which serves as proxy for the location of freight-oriented businesses (including employment in manufacturing, extractive industries, and warehousing and distribution). The model helps the County identify where future growth might challenge existing infrastructure and land use provision.

According to the model outputs and other forecast information, over the next 25 years, industrial employment in Frederick County is expected to grow substantially (over 37 percent). This is compared to a growth of about 33 percent within the region as a whole.[8] Much of the growth in Frederick County will occur along key freight transportation corridors, including I-70, I-270, and U.S. Route 15 and along the CSX Transportation (CSXT) Mainline rail corridor along the southern border of the County as shown in the following maps.[9] Based on existing zoning assumptions, much of the growth in industrial employment will remain concentrated in the established industrial areas. However, there is expected to be growth throughout the County. In certain areas (i.e., south of Point of Rocks and east of the City of Thurmont) with more pronounced growth, there is limited existing industrial land currently designated. Evaluating the efficacy of the existing highway and rail infrastructure as well as the existing location and capacity of industrial land to support future industrial development will be a key consideration of the Freight and Land Use plan.

[8] Metropolitan Washington Council of Governments Traffic Model

[9] Frederick County traffic model displaying industrial employment by refined Traffic Analysis Zone (TAZ).

Figure 1.4 Industrial Employment, 2005

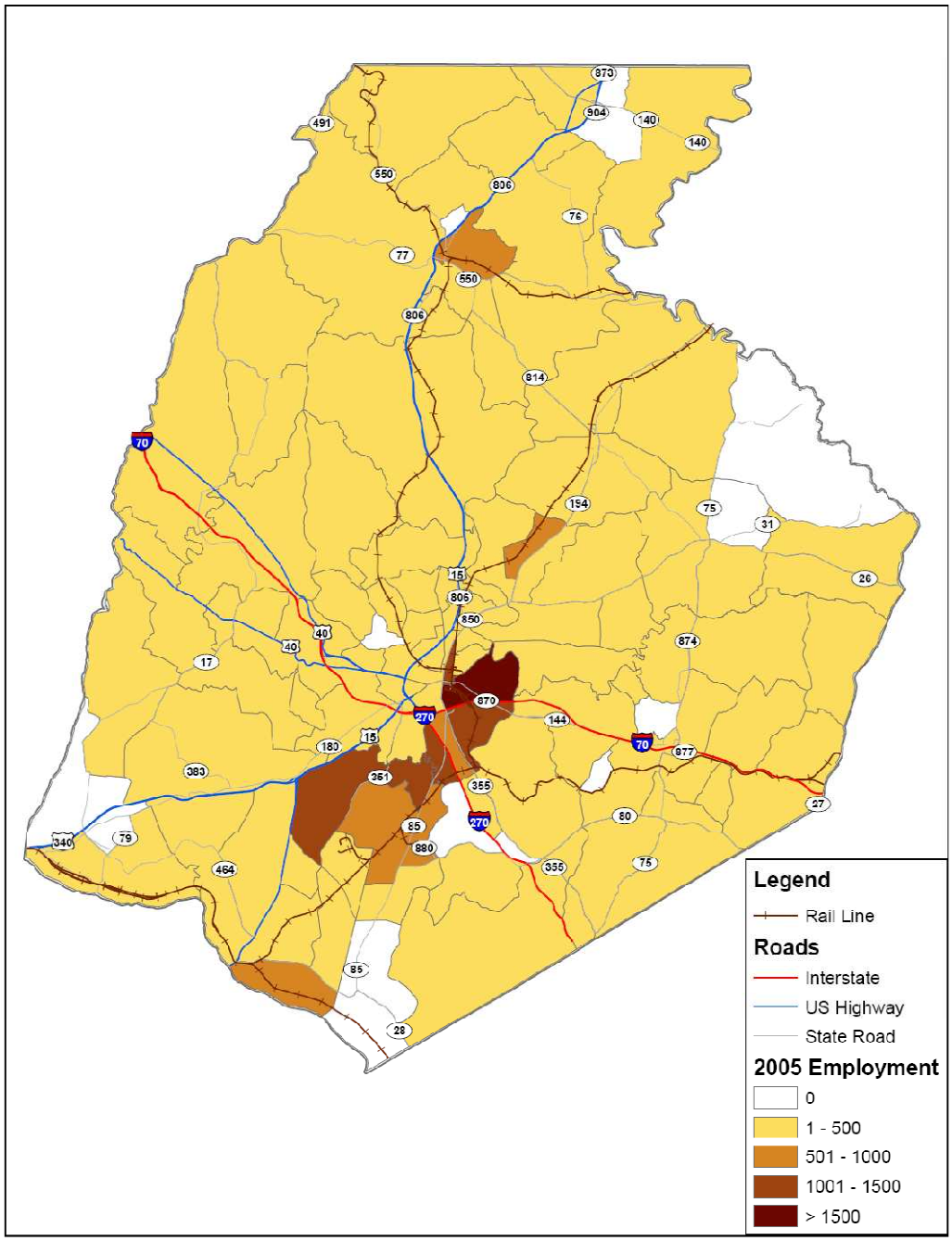
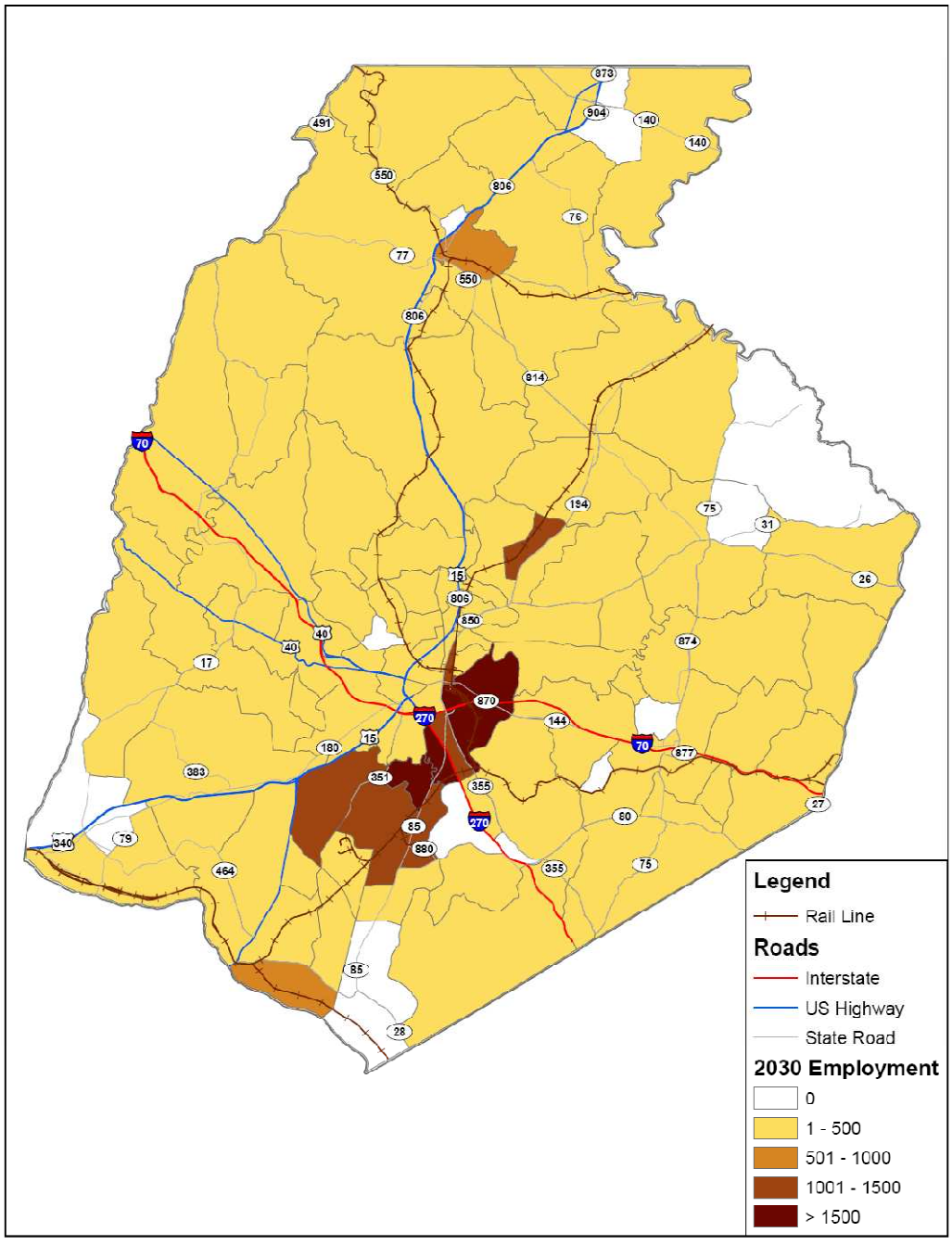


Figure 1.5 Industrial Employment, 2030



Income

Another factor affecting freight demand is household income. Frederick County is home to one of the most highly educated populations in the United States and the per capita income level in the County is just below the Maryland average and nearly 15 percent higher than the national average.[10] The State of Maryland has the largest percentage of technical or professional workers in the workplace (25.7 percent) in the United States, as well as the largest proportion of doctoral scientists and engineers as a percentage of total employment (0.98 percent), and is first among the states in the percentage of population 25 and over with a graduate or professional degree (15.7percent). The greater Washington, D.C. metropolitan area – including the District of Columbia and Northern Virginia which Frederick County freight-related businesses also serve – have similarly high education and income levels. These higher wages are correlated with increased consumption of goods, from food to energy. This increases demand for freight across all modes, resulting in increasing congestion and pressures on the freight-oriented land use supply.

Congestion on the Transportation Network

As described above, population, economic, and income growth all drive increased freight demand and contribute to congestion on Frederick County's transportation system. Recently, growth of these demand factors has outpaced the supply of transportation capacity. In the future, the gap between existing and planned transportation capacity and vehicle miles traveled (VMT) will grow wider. In a recent presentation, the State of Maryland Department of Transportation's Blue Ribbon Commission revealed that between 1990 and 2008, there was a 17 percent increase in state population and a 36 percent increase in VMT. During that same period, the State added just eight percent to its highway capacity, leading to increasing levels of congestion.[11] With limited resources to build new transportation capacity, it becomes especially important to identify the most effective transportation infrastructure improvement strategies and land use planning to accommodate freight growth.

Site Selection

Industrial firms choose Frederick County for their business location because it has many of the key site selection attributes sought by industrial developers. Some of these attributes include good truck and rail access, large parcel size, adequate utility connections, and general acceptance of industrial operating con-

[10] USA Counties, Frederick Census Statistics, http://censtats.census.gov/cgi-bin/usac/usatable.pl.

[11] Presentation to the Blue Ribbon Commission on Maryland Transportation Funding, http://www.mdot.maryland.gov/planning/brc.

ditions (impact of noise, odor, and outdoor storage). Throughout much of the County, such as the MD 85/355 corridor south of Frederick, along U.S. 15 between Frederick and Thurmont, and along I-70 east of Frederick, freight-oriented businesses are clustered together adjacent to major transportation facilities. The ability of industrial firms to expand their business (including locating ever larger parcels that meet the criteria described above) is a major consideration in location decisions and may present additional challenges for meeting future industrial land use demand.

1.2 COMMODITY FLOW FREIGHT MOVEMENT

In order to identify the recent and future trends in freight flows in the County, the consulting team utilized the TRANSEARCH® Insight database developed by IHS Global Insight for the Maryland Department of Transportation. The database contains freight flows for trucks, rail, water movements, and air cargo movements at major airports. For Frederick County, the team analyzed truck and rail data with a base year of 2006 and a future forecast year of 2035.

Total Freight Flows (Internal, Inbound, Outbound, Through)

In 2006, motor carriers and railroads moved over 188 million tons of freight over the highways and railways of the county. This represents approximately 29 percent of total Maryland highway and rail tonnage (meaning that 29 percent of freight tonnage in Maryland utilized at least a portion of Frederick County's transportation network). Trucks move the vast majority of tonnage in the county (84 percent compared to 16 percent for rail). Because trucks are the dominant mode for goods movement in the County, the findings of the report will focus on land use/transportation strategies to improve the efficiency and safety of truck movements and to nurture and improve rail mode share.

Through Flows

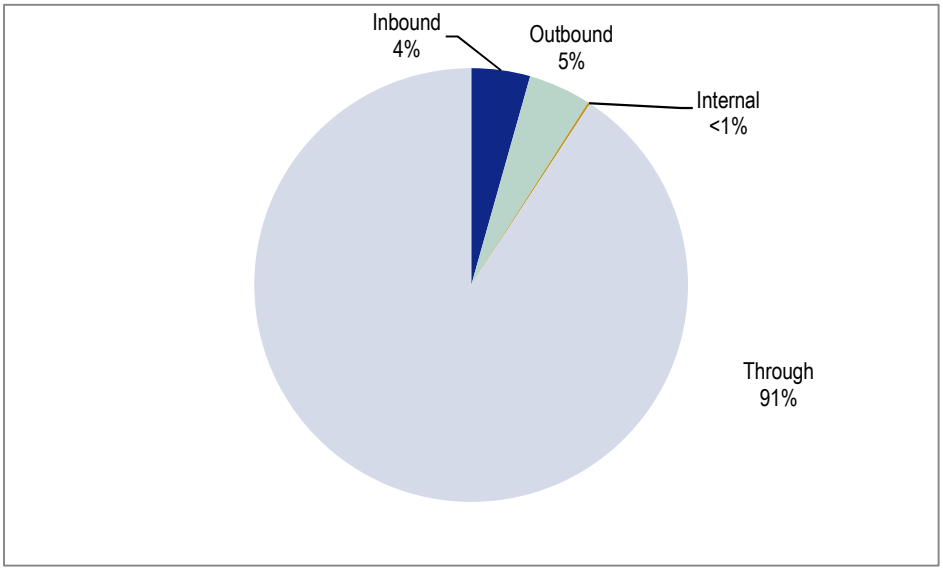
The vast majority of the goods movement in the county is "through" movement – which is movement without an origin or destination in the County. Through movement accounts for 91 percent of the County total truck and rail tonnage. The percentage of through traffic in Frederick County is higher than the statewide total (56 percent[12]) and shows that the County – while becoming an increasingly important destination and origin of freight – is still predominantly a "transit" point en route to other markets. This share of through traffic is also much higher than the Metropolitan Washington Region total of 59 percent.[13] Approximately 89 percent of truck tonnage and about 98 percent of rail tonnage

[12]Maryland Statewide Freight Plan, 2009.

[13] National Capital Region Freight Plan, 2010. Based on FAF2 forecasts from 2002.

moves through the County. The following graphic shows the relative shares of through, inbound, outbound, and internal flows and illustrates the majority share of through movements.

Figure 1.6 Proportion of Goods Movement by Truck and Rail, 2006



Inbound and Outbound Flows

Frederick County ships a slightly higher share of freight tonnage outbound (8.8 million tons in 2006) than it receives inbound (8.2 million tons). This is largely due to the production and extraction of heavy-tonnage commodities within the County, including quarried clay, concrete, glass, and stone and non-metallic materials, which amounts to a large proportion (over 70 percent) of outbound commodities. Relatively small proportions (less than 1 percent) of outbound commodities are shipped by rail.

A large proportion of the inbound shipments are composed of "secondary traffic" with nearly one-third of the total inbound tonnage. Secondary traffic is largely comprised of distribution and warehousing activities focused on consumer products and is often containerized. Clay, concrete, glass, and stone, and nonmetallic minerals also account for a large proportion of inbound tonnage (over 25 percent), with nearly all of those commodities shipped by truck. Rail inbound tonnage accounts for less than nine percent of the total and is predominantly composed of metallic ores (possibly used in the processing of aggregates) and about 60 thousand tons of lumber serving the building product distributors in the County.

Internal Flows

A small proportion of total freight movements in the County are internal – meaning that the origin and destination of the trip are within the County boundaries. The top internal moves are for clay, concrete, glass, and stone, and non-metallic minerals with 55 percent and 32 percent of the total tonnage, respectively. There are also small amounts of internal truck flows in farm products and secondary traffic. All internal freight tonnage in the County is moved by truck. There are no internal rail moves.[14]

Top Commodities and Trading Partners

Overall, the top three major commodities shipped by truck in Frederick County include nonmetallic minerals, secondary traffic, and food or kindred products, the three accounting for about 45 percent of total truck tonnage and nearly 40 percent of total tonnage, including rail. The top three commodities for rail include coal, non-metallic minerals and chemicals or allied products, accounting for nearly 54 percent of the total rail tonnage, with through rail traffic of coal amounting to nearly 38 percent of the total rail tonnage.

Individual counties and Cities within the State of Maryland play a major role in trade with Frederick County. In 2006, inbound and outbound trade within the State of Maryland account for nearly 40 percent of the total tonnage. The County's top three external trading partners (outside of the State of Maryland) included the States of Virginia and Pennsylvania, and States within Census Region 3 (Indiana, Illinois, Michigan, and Ohio). The three trading external partners also account for nearly 40 percent of total inbound and outbound freight flows in 2006, with the top external trading partner, the State of Virginia accounting for about 18 percent. Over four-fifths of freight flows to and from Virginia are outbound flows. Inbound and outbound freight flows with the State of Pennsylvania are nearly equal. Over 25 percent of Frederick County freight movement is between the County and the Baltimore-Washington metro area.[15] The single greatest regional trading partner is Baltimore County, Maryland with nearly one-million tons of truck and rail freight traded between that County and Frederick County.

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[14] There are no internal rail moves identified in the TRANSEARCH database, however discussions with Maryland Midland Railway indicate that there may be a marginal amount of internal rail flows in stone and aggregates on the railroad.

[15] This excludes the Washington Metro area counties in Northern Virginia, which are included in the Virginia statewide totals. The Washington-Baltimore Metro described here area includes: Baltimore County, Baltimore City, Anne Arundel County, Carroll County, Harford County, Howard County, Montgomery County. Prince George's County, and the District of Columbia

Future Freight Flows

In order to inform land use and transportation planning decisions, the team analyzed future freight flow trends to monitor shifts in commodities, modes, and industries through 2035. Through this analysis, the team found that overall freight tonnage is expected to increase by nearly 115 percent to over 400 million tons by 2035. Inbound and internal flows are expected to increase the greatest proportion of 238 and 244 percent, respectively. The following table summarizes current and future freight flows in the County.

Table 1.2 Frederick County Freight Flows by Direction

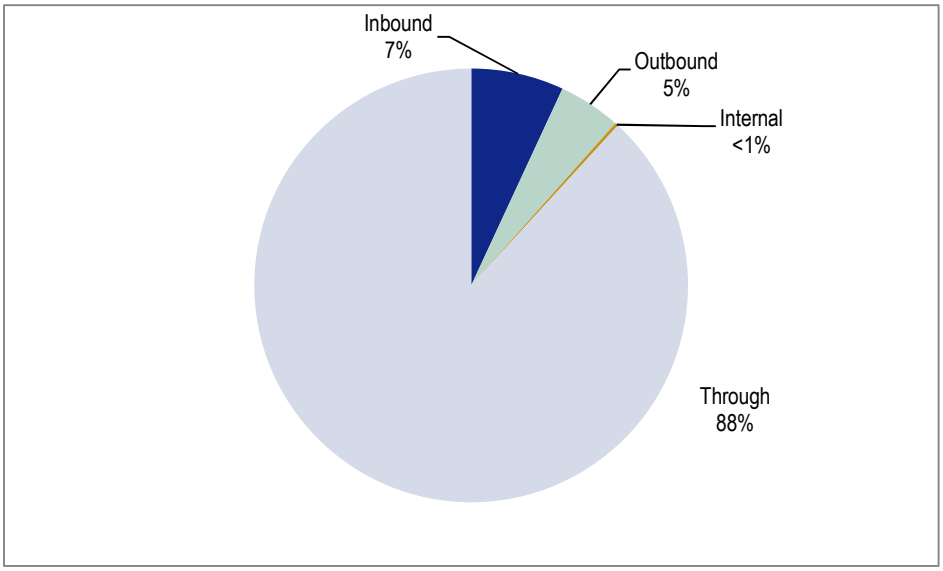
Direction	2006 Tons	Percent of Total	2035 Tons	Percent of Total	Percent Increase
Inbound	8,271,590	4%	27,970,126	7%	238%
Internal	320,303	0%	1,101,552	0%	244%
Outbound	8,818,513	5%	18,727,701	5%	112%
Through	171,094,788	91%	356,088,031	88%	108%
Total	188,505,193	100%	403,887,410	100%	114%

By 2035, truck tonnage will increase by 119 percent and rail tonnage will increase by 88 percent during the same period. While both truck and rail will experience significant growth, the rail mode share will fall by two percentage points with trucking accounting for 86 percent and rail about 14 percent of the total future tonnage. This growing modal imbalance, in addition to promoting air quality, congestion, and cost benefits associated with rail should lead the County, MPO, and State to work with railroads, shippers, and localities to implement strategies to boost rail mode share.

Through Flows

Most of the total increase in tonnage by 2035 is attributable to growth in through flows (86 percent of the increase). Overall proportions of freight flows are expected to remain consistent between 2006 and 2035, with a proportional increase of three percent in inbound flows with a lower proportion of through flows.

Figure 1.7 Proportion of Goods Movement by Truck and Rail, 2035



Inbound and Outbound Flows

By 2035, Frederick County is expected to receive a much higher share of freight tonnage inbound (28 million tons in 2035) than it ships outbound (19 million tons). This largely reflects substantial growth in the importation of secondary traffic into the County (increase of over 10 million tons or 400 percent by 2035). The inbound and outbound flows in heavy-tonnage commodities, including clay, concrete, glass, and stone and non-metallic materials, are expected to increase by 6.3 million and 2.7 million tons, respectively. Outbound shipments of clay, concrete, glass, and stone are expected to increase by over 150 percent.

The gap between future inbound and outbound flows demonstrates will shift the current trade surplus of four percent (Frederick County businesses ship more outbound goods than they receive) to a trade deficit of 30 percent by 2035, mostly driven by increased consumption by Frederick County's growing population.

Internal Flows

Internal freight flows in Frederick County are expected to increase substantially by 2035, but will remain less than one percent of the total. Major increases in internal moves of clay, concrete, glass, and stone account for nearly three-fourths of the 250 percent increase in internal flows.

Top Commodities and Trading Partners

In 2035, inbound and outbound trade between Frederick County and Counties and Cities within the State of Maryland account for about 40 percent of total tonnage, a similar proportion to 2006. The three main external trading partners (outside of Maryland), the States of Virginia and Pennsylvania and states within

Census Region 3 account for about 35 percent of total inbound and outbound freight flows in 2035, a slightly lower proportion than in 2006. The rest of Frederick County's top 10 trading partners remain relatively consistent between the 2006 and 2035. Only one "new" Top 10 trading partner is added in 2035, Montgomery County, Maryland, with an increase in inbound and outbound tonnage of nearly 175 percent. Baltimore City and Baltimore County, Maryland remain key trading partners with over five-million inbound and outbound tons in 2035 (up from 1.8 million in 2006). The share of trade between the County and the Baltimore-Washington metro area is expected to increase to over 28 percent by 2035, indicating a growing role for regional freight flows.

Certain commodities are expected to increase at a much more substantial rate than others between 2006 and 2035. Rail flows in coal are expected to increase by over 11 million tons (over 100 percent) and truck flows in secondary freight traffic are expected to increase by nearly 300 percent by 2035. Truck flows in secondary traffic are expected to overtake nonmetallic minerals as the number one commodity shipped in 2035. Substantial increases in machinery (39 million tons), and secondary traffic (54 million tons), account for nearly half of the trucking tonnage increases in 2035. Major growth in the flows of certain commodities and substantial shifts in directionality of freight flows by 2035 provides a strong impetus for evaluating future potential land use opportunities and constraints. The following section provides additional detail on the existing and future freight flows in Frederick County.

1.3 FREIGHT FACILITIES UTILIZATION

Frederick County lies at the intersection of several major highways and rail corridors connecting major metropolitan areas. Two interstate highways run through the County, Interstate 70 traveling between Baltimore, Maryland and points west and Interstate 270 which runs between Montgomery County, just north of Washington D.C., and the City of Frederick. Additionally, U.S. highways 15, 340, and 40 and Maryland state highways 85, 355, and 75 are important freight routes.

In addition to the County's highway infrastructure, CSXT operates over two mainlines – the Metropolitan Subdivision (Washington, D.C. to Point of Rocks, Maryland) and the Old Main Line (Baltimore, Maryland to Point of Rocks, Maryland). The Maryland Midland Railway, a short-line carrier, serves major freight customers in the County and provides linkages to the CSXT Class I network.

Truck Flows

Truck traffic flows within the County are expected to increase substantially by 2030. The truck traffic projections for Frederick County are based on the Metropolitan Washington Council of Governments (MWCOG) model.[16] Efforts are currently underway through the County Planning Department to refine the traffic analysis zone (TAZ) structure for Frederick County to provide a more detailed assessment of local street traffic flows. The traffic model inputs are based on existing and future land use assumptions and employment growth projections, which together are used to determine the generation of vehicle trips. The vehicle type is a major component of the model, with trucks represented distinctly from autos. According to the model, under existing conditions, the heaviest flows of truck traffic occur on I-70 (greater than 8,000 trucks per day). Two other highways, I-270 and U.S. 15 also experience heavy flows (greater than 5,000 trucks per day). These corridors are among those expected to experience substantial growth in truck volumes between the present day and 2030.

Currently, while many of the truck flows are concentrated on the major highways and Interstates, several Maryland state highways carry a large number of trucks, mostly as local access to freight businesses and between manufacturers, other shippers, and mining operations and the Interstate and U.S. highway system. Some of these major highways include Maryland Routes 85, 351, and 355, south of the City of Frederick, and Maryland Route 75 near the community of New Market to the east of Frederick City. Figure 1.8 displays the truck route system, the most appropriate routes for trucks within the County based on state and Federal roadway designations. Figures 1.9 and 1.10 display the truck flows in Frederick County.

As demonstrated in Figure 1.9, the heaviest truck flows in the county (depicted in blue bandwidth for 2005 flows) are on interstates I-70 and I-270, and state highways U.S. 15 and U.S. 340. In the future, truck traffic will continue to be concentrated on these facilities and they will accommodate even greater numbers of trucks (shown in red bandwidth[17]). With predicted growth in truck VMT, several additional facilities, including MD 85, MD 351, and MD 194 will join the ranks of the major truck routes of the County. Truck traffic is expected to increase on these smaller highway facilities primarily due to the growth in industrial employment near Walkersville and within the existing MD 355/MD 85 industrial land use cluster south of Frederick.

Figure 1.10 displays the percentage growth of daily truck traffic between 2005 and 2030 on Frederick County highways and illustrates not only the role of major highway facilities in accommodating truck traffic but also the growing role that smaller state highway facilities are expected to play in regional trade. Truck traf-

[16]The base year for the MWCOG model is 2005 with a projection out to 2030.

[17]Note the additional volume level of the red bandwidth (2030) of >11,000 trucks/day.

fic growth is expected on nearly every major highway facility in the County with some of the largest volume growth on I-70, I-270, and U.S. 15. For the freeway segments on I-70 between I-270 and the Washington County Line that currently have the highest truck volumes in the County (greater than 5,000 trucks per day), volumes are expected to increase between 50-70 percent.

As congestion and delay increases within the urbanized areas in Frederick County, truckers may be prompted to use alternate routes. Connector roadways between major interstates or U.S. highways are expected to experience substantial growth by 2030. The segments with the highest percentage growth include MD 806, connecting MD 850 and U.S. 15, just north of the City of Frederick and MD 80 connecting MD 85 and I-270. These connectors are expected to increase from a very low base (less than 100 trucks per day) to as many as 500-600 trucks per day.

Figure 1.8 Truck Route Network in Frederick County

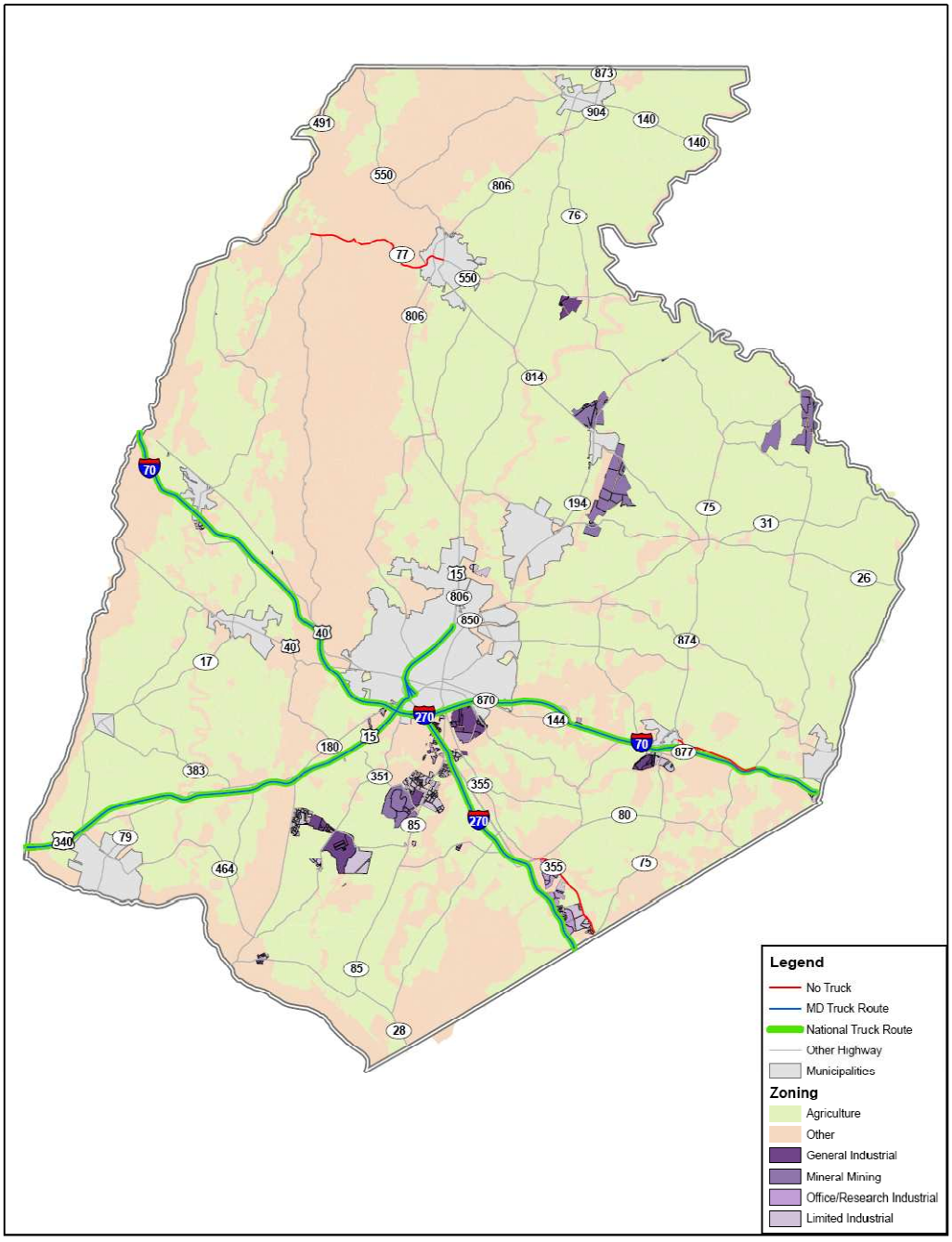


Figure 1.9 Existing and Future Truck Flows in Frederick County

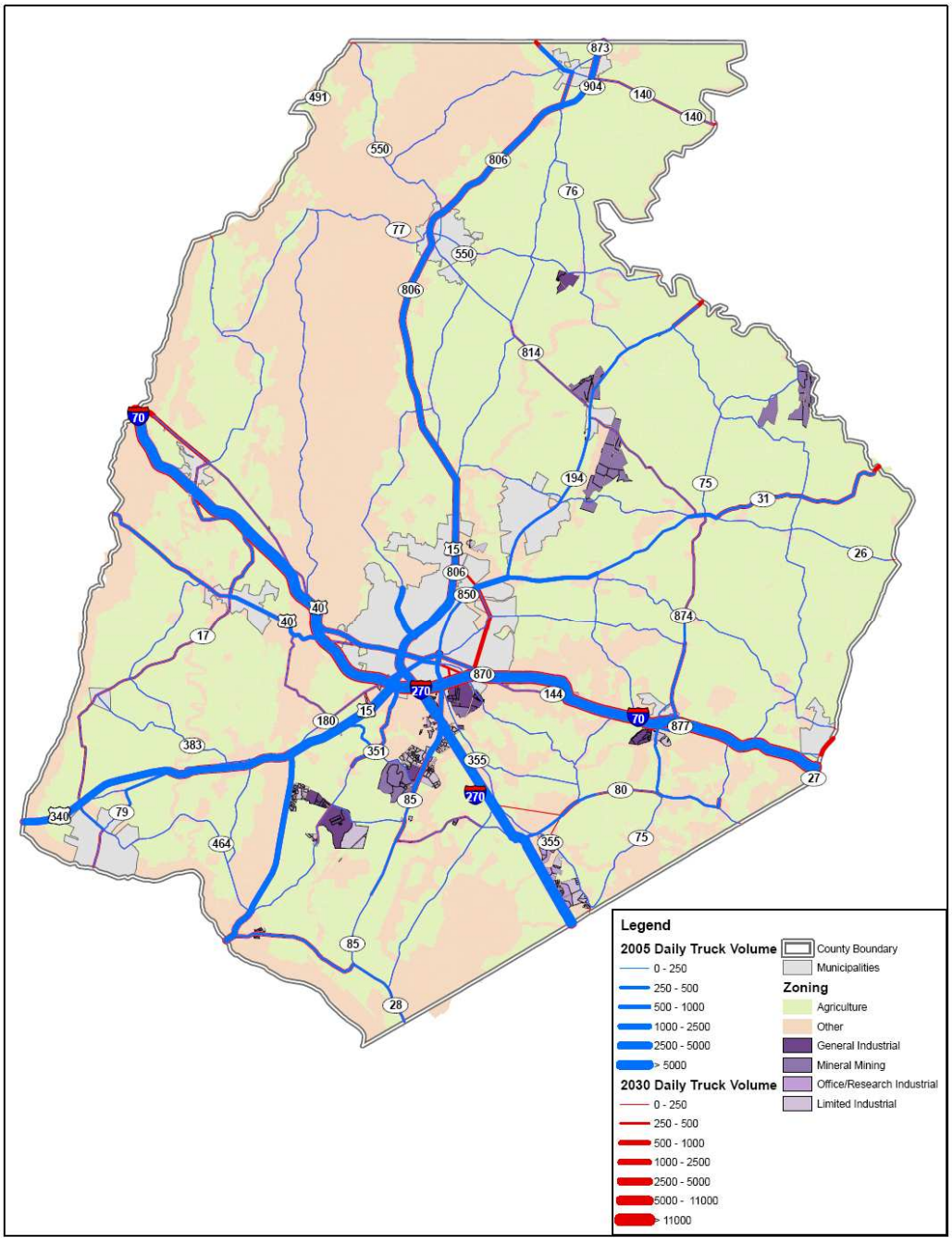
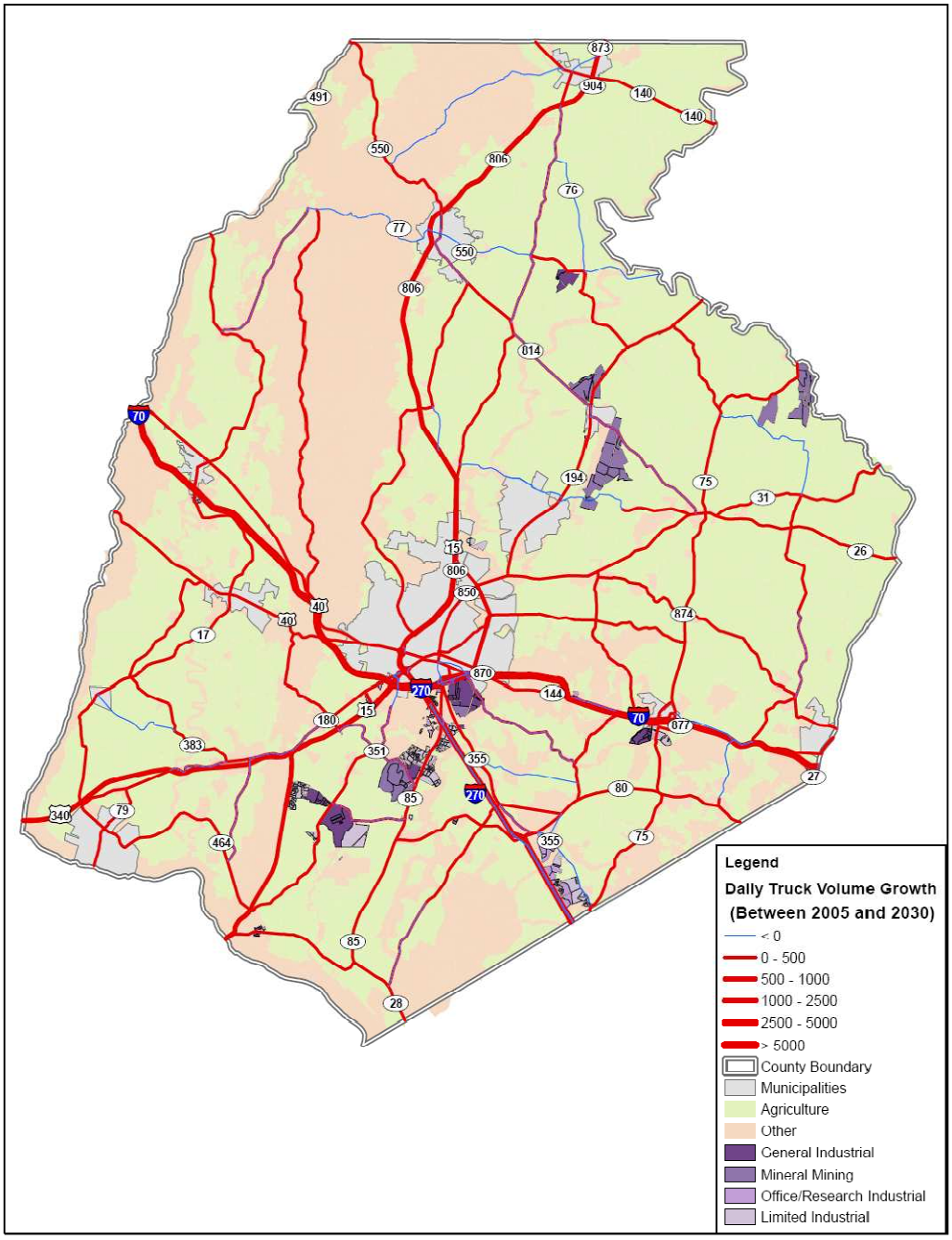


Figure 1.10 Daily Truck Volume Growth Between 2005 and 2030



Freight Rail

Freight rail plays a critical role as part of the freight transportation system throughout the United States. The rail mode is most competitive with truck in the movement of certain types of very heavy, bulk commodities, commodities traveling very long distances, or shipments with less-time sensitivity. The use of rail for moving freight increased substantially during the 2000s due in part to rising global trade combined with freight railroad expansion into new markets such as intermodal trade. Intermodal rail traffic has quadrupled over the last 25 years and increased by about a third during the past decade.[18] Domestic economic growth during the same period led to increases in consumption commodities such as coal and bulk food products, key rail commodities.

Freight Rail Infrastructure

Freight rail can play a crucial role in a balanced freight transportation system as rail can carry as much cargo as 280 trucks and with it remove those trucks from the highways with air quality, congestion, and cost benefits.[19] It can also provide an opportunity for shippers to utilize an alternative mode of transportation for serving their customers. There are two major freight railroads currently operating in Frederick County, the Class I railroad CSXT, whose mainline runs along the southern and western edge of the County and the Maryland Midland Railway, a Class III shortline railroad operating 63 miles of track in Frederick and Carroll Counties in Maryland.[20]

CSXT owns and operates about nearly 500 miles of track within the State of Maryland and close to 50 miles within Frederick County.[21] The Metropolitan Subdivision, which connects Washington, D.C. to Point of Rocks and continues to Pittsburgh, PA, Ohio, and eventually Chicago, Illinois, runs along the Potomac River in the County. This line is a major component of CSXT's National Gateway project which will ultimately provide double-stack train service from mid-Atlantic ports to freight distribution centers in the Midwest. CSXT's Old Main Line connects Baltimore with Point of Rocks via Frederick. A spur off the Old Main Line near Route 355 is owned by the State of Maryland and is used primarily for MARC commuter rail access to Downtown Frederick.

Maryland Midland Railway currently serves between 10-20 businesses in the state, including major customers in Frederick and Carroll Counties, LaFarge,

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[18] AAR: http://www.aar.org/~/media/aar/Background-Papers/An-Overview-of-U.S.-Freight-RRs.ashx.

[19] Ibid.

[20] Maryland Department of Business and Economic Development Freight Rail Facts and Stats.

[21] Ibid.

Congoleum, and Lehigh Cement, which has an ownership stake in the railroad.[22] Currently, intermodal opportunities largely elude Maryland Midland Railway, however there are connections between the Maryland Midland and CSXT at Highfield and Emory Grove in Frederick County.

A third railroad in Frederick County, the Walkersville Southern railroad was granted permission by the State to operate a heritage railroad for three miles north of Frederick City towards Walkersville.[23] The line served by Walkersville Southern is currently not being used for freight. CSXT also operates the Maryland Area Regional Commuter (MARC) trains serving passenger stations in Brunswick and Point of Rocks in the southwestern part of the County and downtown Frederick via Frederick Junction, just north of the I-270/MD 85 interchange.

Local Freight Rail Operations

There are several freight businesses within Frederick County that currently utilize rail access for their operations, mostly bulk commodity manufacturers and mining operations, such as BlueLinx (a construction materials distributor) and Lehigh Cement (a cement manufacturer).[24] The major intermodal freight producers in the County, including large distribution centers such as Costco and Toys R Us, currently do not use rail for their operations.

Existing and potential rail shippers in the County face financial and operational hurdles to improved rail access. Local rail shippers depend on access to the rail network via a spur or siding off the main line and some sort of switching mechanism, to transfer the trains back and forth from the mainline track. Customers are typically responsible for the improvements that can cost hundreds of thousands or even millions of dollars, including construction of a siding (including ballast and several hundred feet of track), manual or electronic switches, signage, and storage areas. Additionally, internal business operations need to be optimized to load or unload cargo from rail cars. Many customers in the County may desire the freight shipment flexibility associated with both truck and rail access, but cannot afford the initial capital cost of the improvements.

Figure 1.11 displays the ownership of the rail corridors within Frederick County, with CSXT and Maryland Midland Railway the main providers. Figure 1.12 displays the current rail freight volumes in Frederick County. CSXT rail freight flows are by far the heaviest in the County with between 10 and 40 MGT per mile

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[22] Maryland Freight Rail Facts: http://www.choosemaryland.org/factsstats/pages/freightrail.aspx.

[23] The line for the Walkersville Southern Railroad (WS) is owned by the Maryland Department of Transportation (MDOT) and WS operates the line under lease from the Maryland Transit Administration (MTA)

[24] Phone interviews with Canam Steel and Bluelinx in February 2011.

on the Old Main Line between Baltimore and Frederick, 40-60 MGT mile on the Metropolitan Subdivision on the County's southern border, and over 60 MGT per mile once the two CSXT lines merge at Point of Rocks.[25] Although Maryland Midland does serve some key freight customers in Frederick County, the tonnage is marginal compared to CSXT.

[25] Rail freight traffic density is measured in millions of gross tons/mile/year (MGT). U.S. Bureau of Transportation Statistics, National Transportation Atlas Database.

Figure 1.11 Existing Rail Lines by Owner in Frederick County

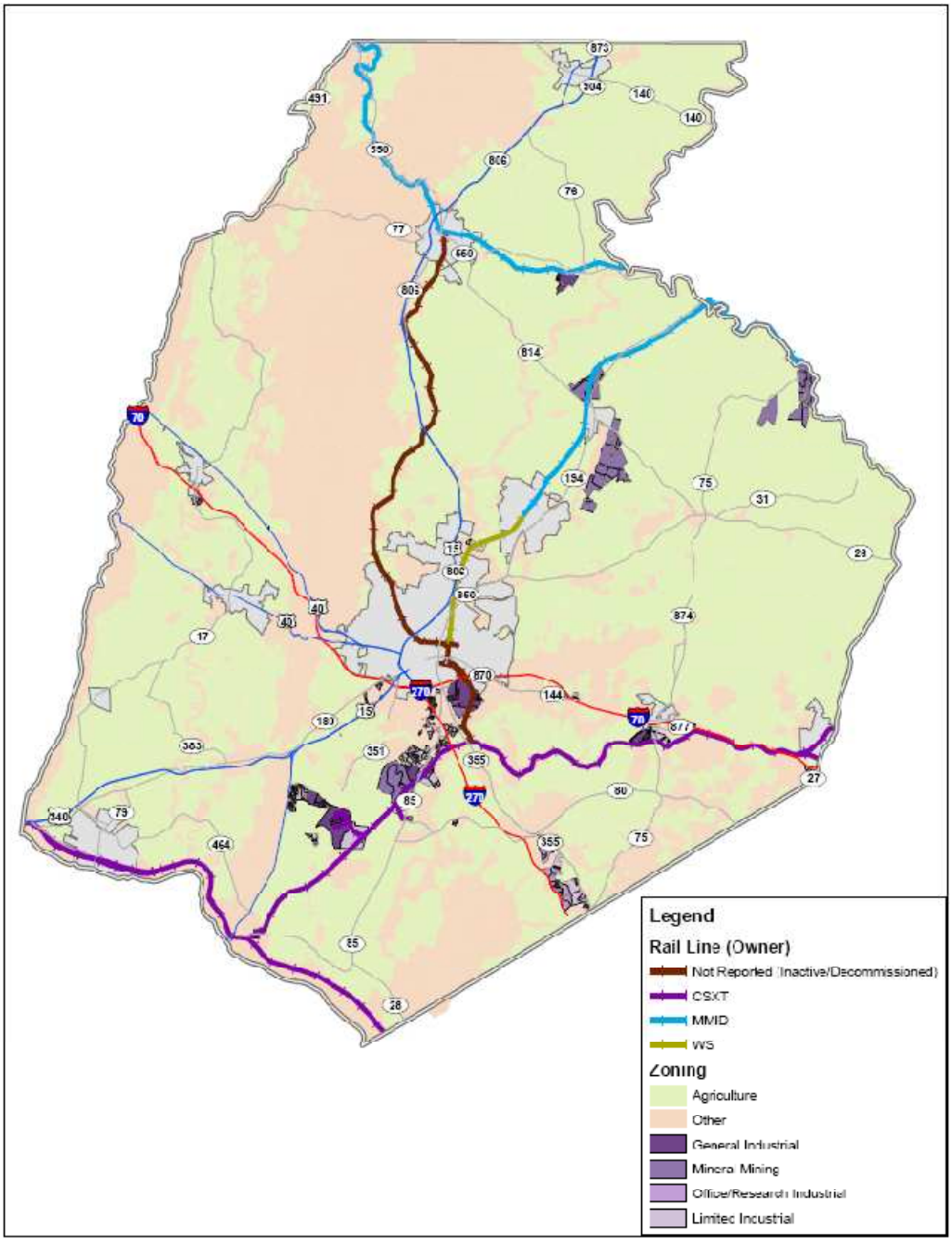
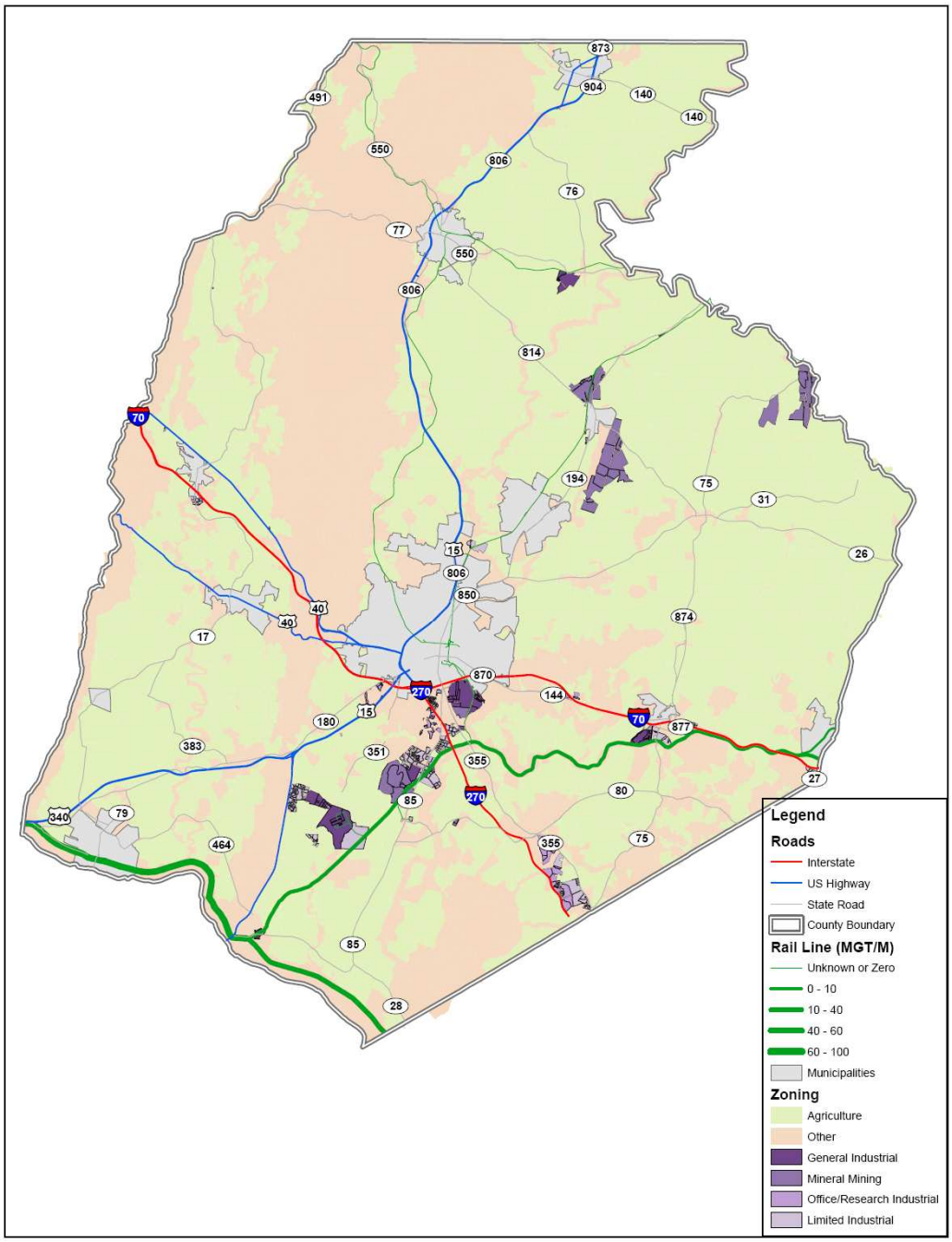


Figure 1.12 Existing Rail Flows in Frederick County



Air Freight in Frederick County

The Frederick Municipal Airport (FDK), located about two miles from the center of downtown Frederick, is available for air freight service. Designated as a General Aviation reliever airport for BWI, National, and Dulles Airports by the FAA, over 350 businesses utilize the airport on an annual basis.[26] There are a variety of plans, studies, and projects underway to expand the operational capacity of the airport, from the construction of an Air Traffic Control Tower to the expansion of runways and improvement of the terminal building. These improvements may provide the opportunity for the airport to capture future growth in air freight traffic of time-sensitive and very high-value commodities. The Frederick Airport Park, a 160-acre property on the east side of the airport is currently being developed as office, research and development, warehouse, and industrial flex space and may provide additional opportunities for freight-oriented growth and connections between air cargo and trucking.[27] Effective land use planning will be needed to accommodate the growth of the air cargo market and support services, while providing economic benefits from air freight.

1.4 FREIGHT OPERATIONS ISSUES

Through data analysis, field reconnaissance, and initial outreach, the study team and Frederick County have identified several important freight operations issues that affect the current and future freight system. These issues, including high-way interchanges with high truck-crash rates, truck parking issues, and major highway congestion, inhibit the growth potential of freight-oriented businesses within the County. Recognizing and mitigating these issues through effective land use and transportation planning will have a major effect on improving the future prospects for the County to continue to attract high value freight-oriented businesses in the future.

Safety

Truck safety is an important aspect of freight transportation planning. According to information provided by the Maryland State Highway Administration (SHA), eight percent of total crashes in Frederick County are related to large vehicles such as trucks and buses[28] and large vehicles were involved in 15 percent of all fatal crashes in the County. The higher fatality rate for truck and large vehicle crashes is often associated with the difference in weight and force of the two vehicles (the truck being heavier and exerting more

[26] Frederick County Airports http://www.cityoffrederick.com/cms/page/index.php?id=44.

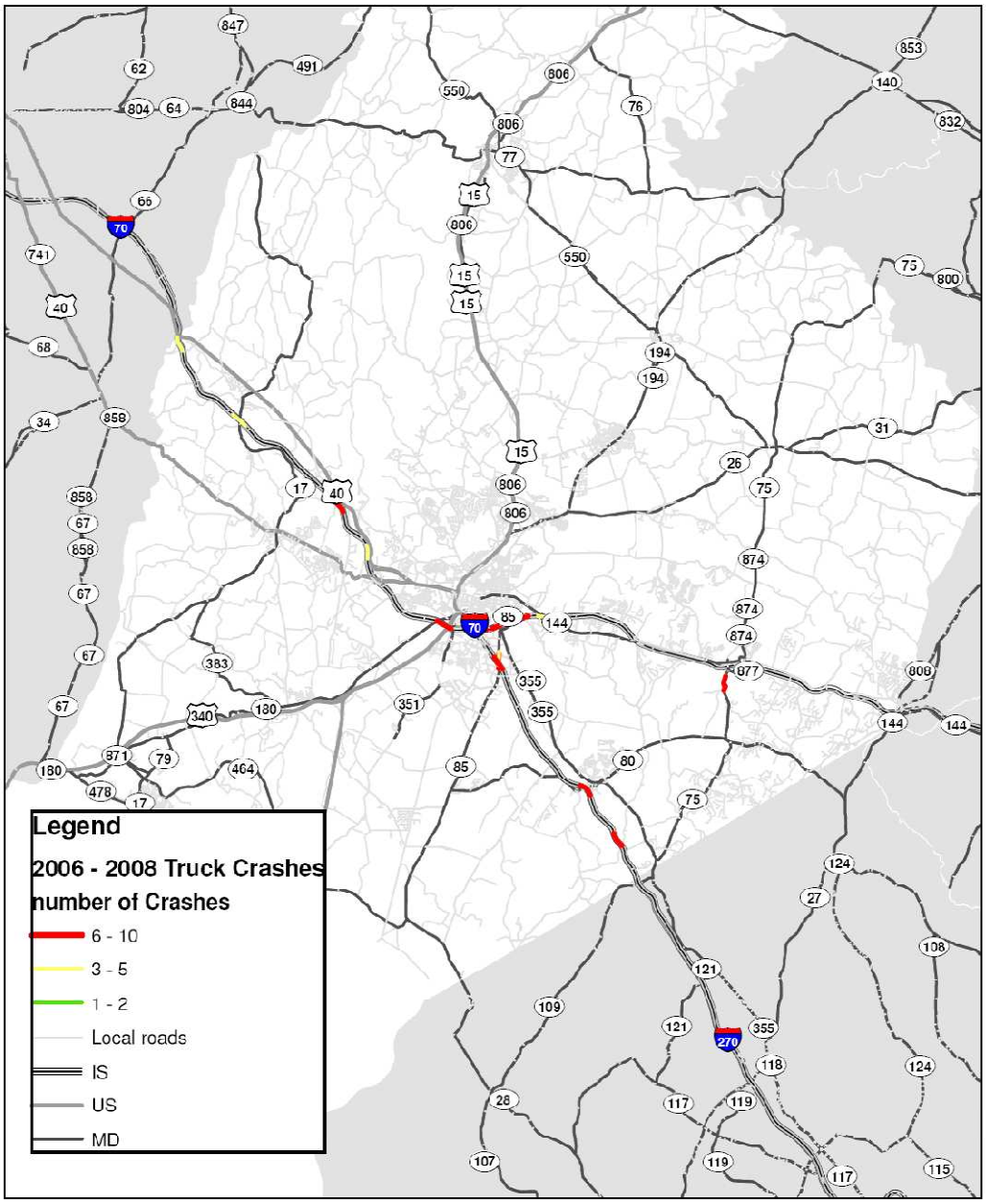
[27] http://www.realtycap.com/fact_sheets/frederick_airport.html.

[28] Maryland SHA Frederick County Crash Summary, 2008.

force). The following chart shows the location of truck crashed within the County over a three-year period and identifies the highway segments where physical or operational improvements may enhance safety outcomes.

Roadways with high truck volumes, such as I-270, have higher numbers of crashes. In particular, sections of Interstate highways I-70 and I-270 as well as MD 75 and 85 show half-mile sections of roadway with five or more truck involved crashes over the evaluation period. The proportion of crashes is positively correlated with increased vehicle miles traveled (VMT), however the crash rates on the Maryland routes are much higher than the interstate routes, with the segment on MD 75 near the I-70 interchange, accounting for seven truck crashes over the three-year period with an extremely high severity index rate of over 281 indicating a large number of fatal or other serious crashes. Figure 1.13 illustrates the location of heavy truck crashes in the County and shows that many heavy crash locations are also located near heavy concentrations of industrial land use, such as the area directly south of the MD 75/I-70 interchange. Identifying these conflict areas will be a key element for the County to develop policies to direct trucks or other goods movement vehicles to highway facilities best designed to accommodate them and improve access to those facilities.

Figure 1.13 Locations of Highway Truck Safety Issues in Frederick County



Source: Maryland SHA, three-year crash trends study.

Truck Parking

Truck Parking at the Travelodge near I-70/MD 355 Interchange

Another major freight operations issue in Frederick County is the lack of truck parking, which is increasingly scarce. Trucks currently use the County as a staging or rest point before embarking into the Baltimore or Washington metro areas. There are no commercial truck stops within the County limits and few within the Metropolitan Washington Region as a whole. Instead, the sites trucks currently use to park include a large parking lot behind the Travelodge on Monocacy Boulevard, just north of the I-70/MD 355 interchange, parking at the Maryland Welcome Centers on I-70E and I-70W, west of Myersville, as well as available space on highway access roads. A large proportion of trucks are also utilizing parking on the side of freeway interchanges and near on and off-ramps especially on the I-70 ramps near New Market and I-270 ramps south of Frederick). This leads to safety issues when motorists merging onto an off of freeway ramps have to avoid a truck parking along the side of interchanges and freeways.

Since there are no commercial truck stops within the County, goods movement vehicles either need to park along the side of the road or in a supportive business parking lot or else drive further from their origin or destination. Regulations limiting truck service hours, fuel costs, and delivery schedules make locating truck parking in the Frederick County area a difficult proposition. There is a truck weigh station off I-70 east of New Market that is owned by the Maryland State Highway Administration and staffed by members of the Maryland State Police Commercial Vehicle Enforcement Division; however it is not always available for truck parking because of security and other concerns. The area just east of the weigh station facility has limited truck parking that could be expanded but is currently being used for storage.[29]

[29] Freight and Land Use Plan public meeting comment from Barbara Windsor, Hahn Transportation, Inc, March 8, 2011.

Bottlenecks

Within Frederick County there are a number of areas where physical constraints contribute to a lack of efficiency in freight transportation operations. According to the State of Maryland Highway Needs Inventory for Frederick County, there are 10 projects on the primary list with cost estimates totaling over $2.5 billion dollars. Many of these projects are freeway or interchange reconstructions along major freight corridors I-70, I-270, U.S. 15, and U.S. 40. The secondary projects, with cost estimates totaling about $925 million include improvements on both major and minor freight corridors, including U.S. 15 and U.S. 40, and MD 75, MD 85, and MD 355.[30] Most of these projects are designed to alleviate bottlenecks and improve passenger and freight traffic operations and safety in Frederick County.

Effective land use planning and transportation coordination is key to preventing bottlenecks from inhibiting freight transportation operations within Frederick County. Other general bottlenecks that have been identified during the preliminary interview and preliminary outreach process are included in the following table. Recommendations for alleviating these bottlenecks in the context of freight transportation and land use improvements will be explored in the freight plan.

Restricted Clearance for Trucks Under CSXT Bridge on MD 75

[30] Maryland Highway Needs Inventory, 2008.

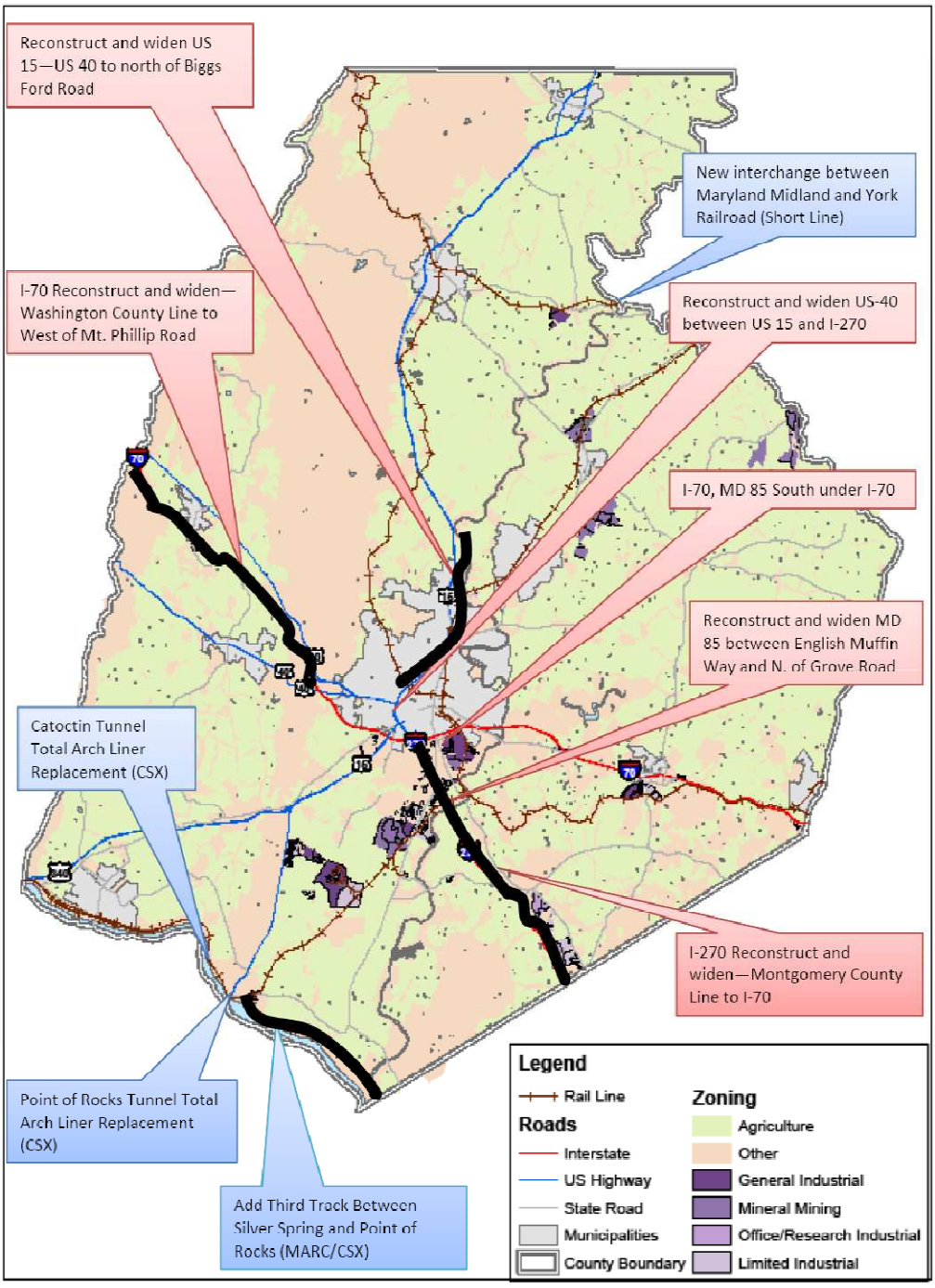
Table 1.3 Frederick County Summary of Freight Bottlenecks, As Reported by Stakeholders

Bottleneck Type	Where Reported
Weaving problems for both cars and trucks at the I-270/I-70/U.S. 15 interchange to the southwest of the City of Frederick	Public Outreach Meeting
U.S. 15/Hayward Road interchange backs up traffic northwest of the City of Frederick	Public Outreach Meeting
The acceleration and deceleration lanes from Southbound MD 40 to U.S. 15 may need to be lengthened to accommodate truck movement safely into and out of Frederick.	Public Outreach Meeting
Capacity limitations and traffic congestion on I-70, I-270, and U.S. 15 (four lanes each direction (eight total)). Congestion worst at urban interchanges.	Public Outreach Meeting
Freight rail delays due to MARC passenger rail service on the Brunswick line	Public Outreach Meeting
Difficult transition for trucks traveling from I-70 Westbound to I-270 Southbound, not a direct connection.	Stakeholder Interviews
East-West connectors between MD 85/MD 355/ and I-270 are very poor. Grove Road is currently the only straight across East-West connection between MD 85 and MD 355.	Stakeholder Interviews
Intersection of U.S. 15 and MD 28 not wide enough to handle very long truck loads. Trucks sometimes back up to navigate turn	Stakeholder Interviews
Passing lanes on U.S. 15 very difficult for trucks. Hilly terrain, short-passing areas, long queues for passenger vehicles following trucks.	Stakeholder Interviews
Access to the Costco from I-70 Exit 62 is sometimes very difficult for trucks because it is also the main commuter exit for local traffic. Trucks sometimes park on exit ramp as well.	Stakeholder Interviews
Low railroad bridge on MD 75 restricts truck movement	Stakeholder Interviews
MD 75 from New Market to Union Bridge is narrow and winding and there are no shoulders. Very difficult for trucks to navigate.	Stakeholder Interviews
Truck parking issues throughout the County. Sometimes park on side of roadway or freeway ramp inhibiting traffic flow and causing safety issues	Stakeholder Interviews
Stanford Industrial park (between U.S. 15 and Cap Stine Road has relatively poor freight access and narrow internal streets	Stakeholder Interviews

Existing Freight Projects

Planning efforts through the State of Maryland Department of Transportation and the MARC Commuter Rail and private railroads have yielded an additional list of long-range highway and rail projects within Frederick County that would help alleviate freight-specific bottlenecks within the area. Many of the highway projects were discussed in the previous section. The locations of these regional projects, described in the 2009 Maryland Statewide Freight Plan are identified in the following figure.

Figure 1.14 Existing Planned Freight Projects within Frederick County



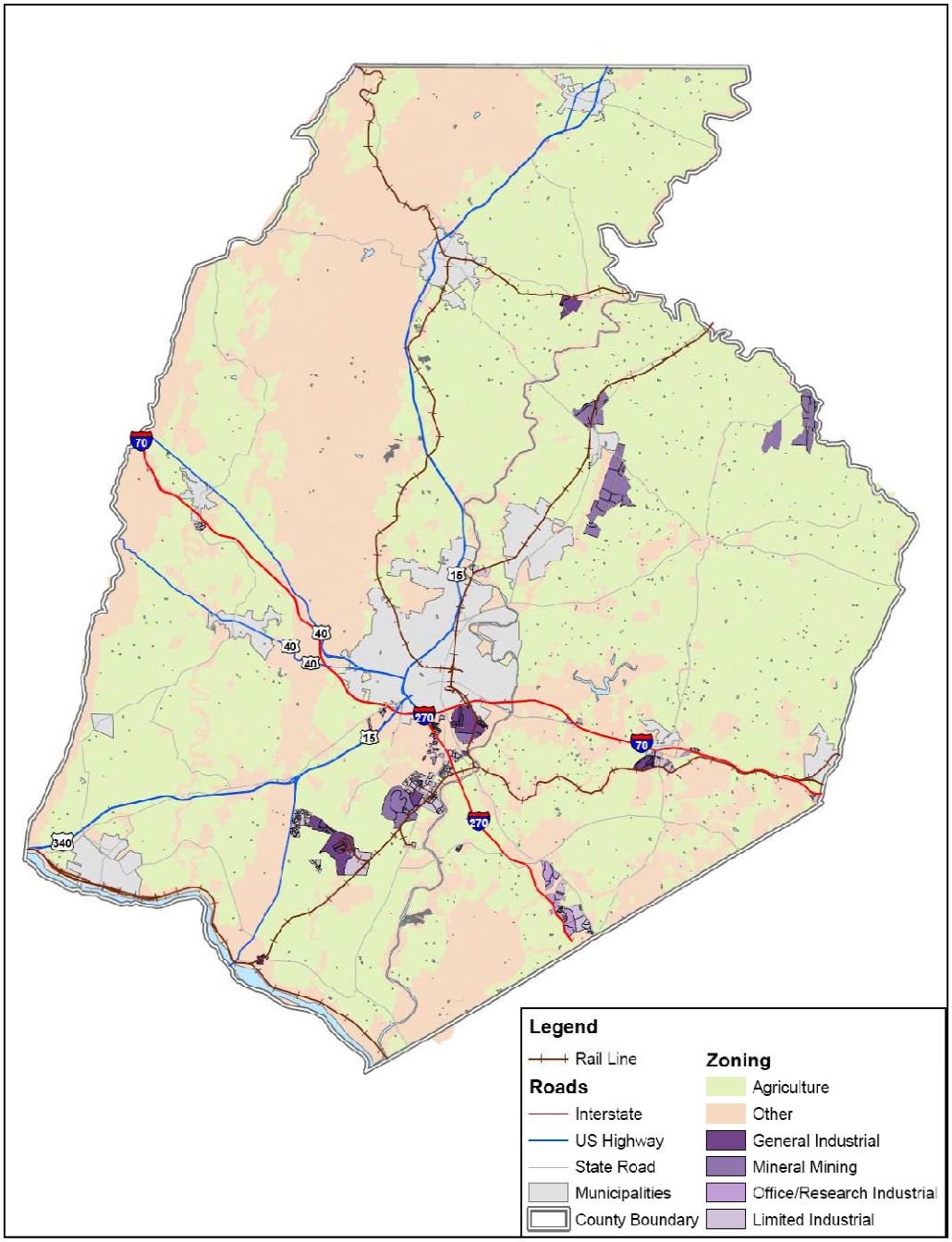
1.5 EXISTING AND FUTURE LAND USE

While Frederick County is primarily rural, there are large clusters of industrial business development with urbanized centers around the cities of Frederick and Brunswick. The County is geographically located an approximately equal distance between the Metropolitan areas of Washington D.C. and Baltimore, Maryland and provides transportation linkages and services to both Metro areas. Frederick County also benefits from its I-270 corridor location and business expansion from Montgomery County, Maryland to the south. The County is primarily agricultural and also includes large tracts of the Catoctin National Forest and the U.S. Army Garrison at Fort Detrick, north of the City of Frederick.

Since freight activity in Frederick County is generally associated with industrial operations, identifying the major locations, clusters, and corridors of industrial land use can help provide insight into centers of freight transportation activity. Figure 1.23 shows the industrial land use locations in Frederick County. This map was used as the base for displaying traffic flows and the locations of freight-oriented businesses in the County. Industrial land provides accommodation most of the businesses related to freight activity such as manufacturing processes, mining, and transportation and trade.

In Frederick County sections of older commercial truck corridors such as Maryland Route 85 and U.S. Route 15 and adjacent areas became commercial business park locations over the last decade. One successful example of this conversion is at the Riverside Corporate Research Park, where the National Cancer Institute (NCI) became an anchor for a research center. At the Riverside Corporate Research Park, the NCI operations include the Biopharmaceutical Development Program's Manufacturing Facility and Advanced Biomedical Computing Facility. West of U.S. Route 15 and South of Maryland Route 26 Worman's Mill and the Frederick Research Park (with 320 acres available) area present an opportunity for near-term commercial industrial growth. Additionally, the Frederick Innovative Technology Center, Inc (FITCI) assists start-up companies in the technology industries and is located in close proximity to both the CSXT rail line and Maryland Route 85. All of this development activity further enhances Frederick County's position as a bioscience cluster and may relate to the demand for associated manufacturing facilities. In the bioscience industries, manufacturing expertise and distribution networks do not need to be co-located with research and development operation. Frederick County will continue to serve and expand this market segment. It is import to note, that the need or requirement for rail access for these types of businesses is minimal at best, as most use trucks for distribution.

Figure 1.15 Industrial Land Use within Frederick County

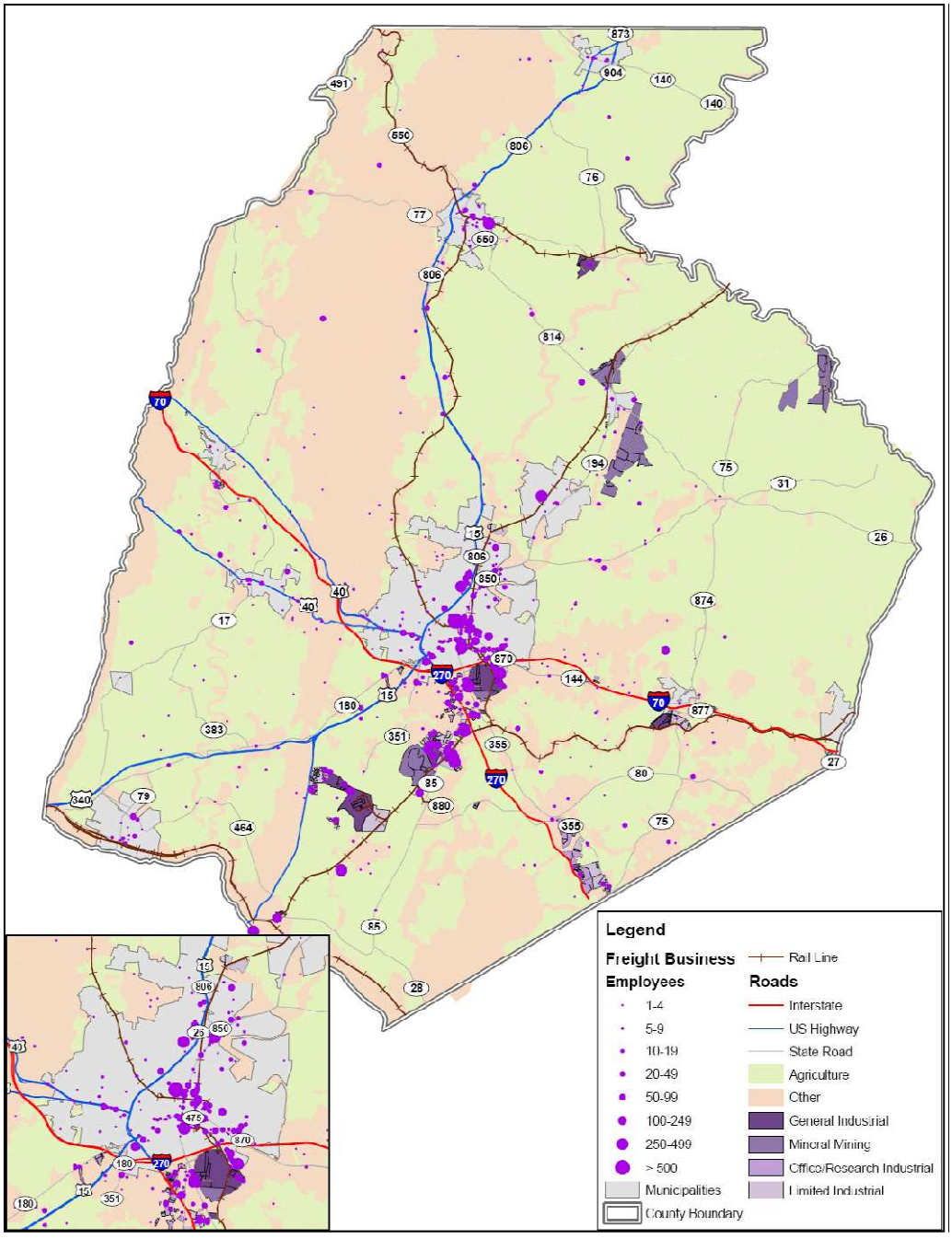


Freight Business Clusters

These clusters of industrial businesses concentrated along the major freight corridors within the County, including large proportions of businesses along I-270, I-70, and U.S. 15. There are also large proportions of freight-oriented businesses concentrated near the urban areas of the Cities of Frederick, and Brunswick, and the towns of Walkersville, Thurmont, and New Market. It clearly benefits freight businesses to locate in areas with good access to local and regional transportation facilities. The following map shows concentrations of freight-oriented businesses within the County, with large number of businesses located within the City of Frederick and along the key highway corridors of I-70, I-270, U.S. 15, and MD 85.

There are also several very large freight-oriented businesses within the county, including regional distribution centers for Costco and Toys R Us, major regional trucking companies, such as Ramar Moving, Hahn Transportation, and RF Kline, and mineral mining operations LaFarge and Lehigh Cement that manufacture and ship aggregates and cement products. These businesses have provided additional insight into specific freight and land use issues within the County. When observing the locations and concentrations of industrial zoning compared to the business clusters there is much overlap, however, there are some corridors (i.e., along I-70 east and west of the City of Frederick, U.S. 40 northwest of Frederick) where there are a number of freight-oriented businesses but little industrial land (i.e., near Point of Rocks along the CSXT mainline and south of I-70 just west of New Market) or vice versa (i.e., the Alcoa Eastalco site near Adamstown – very large area of underutilized industrial land). Looking at these two issues together helps paint the picture of the current freight-related land use and highlights some potential opportunity areas for better linking freight and land use.

Figure 1.16 Freight Business in Frederick County, by Number of Employees



The following map (Figure 1.17) displays the locations of certain types of businesses, likely more influenced by the location of existing transportation facilities rather than the availability of industrial land. Still, land use plays a major role in the location of freight-oriented businesses, with issues such as safety, noise, and air quality concerns playing into the decision-making process for business leaders and residents when choosing to locate near an existing or possible freight facility.

The freight businesses described in the map are based on an extraction from the overall Frederick County business database of the following businesses: Wholesale, Transportation, Mineral Extraction, and manufacturing. A comprehensive list is included in the appendix. Based on the extraction, a list of nearly 1,000 businesses was sorted into six main Standard Industrial Code (SIC) categories: agriculture/forestry (0-9), mining (10-14), manufacturing (20-39), transportation (40-47), and wholesale trade (50-59), and the combination of contractors, and electric, gas, and sanitation (15-17, 49). These categories conflate well to those SIC categories associated with freight-oriented businesses. Although there are varying degrees of freight activity associated with each of these categories, there is a clear connection between these industries and increased amount of trucking and rail transportation.

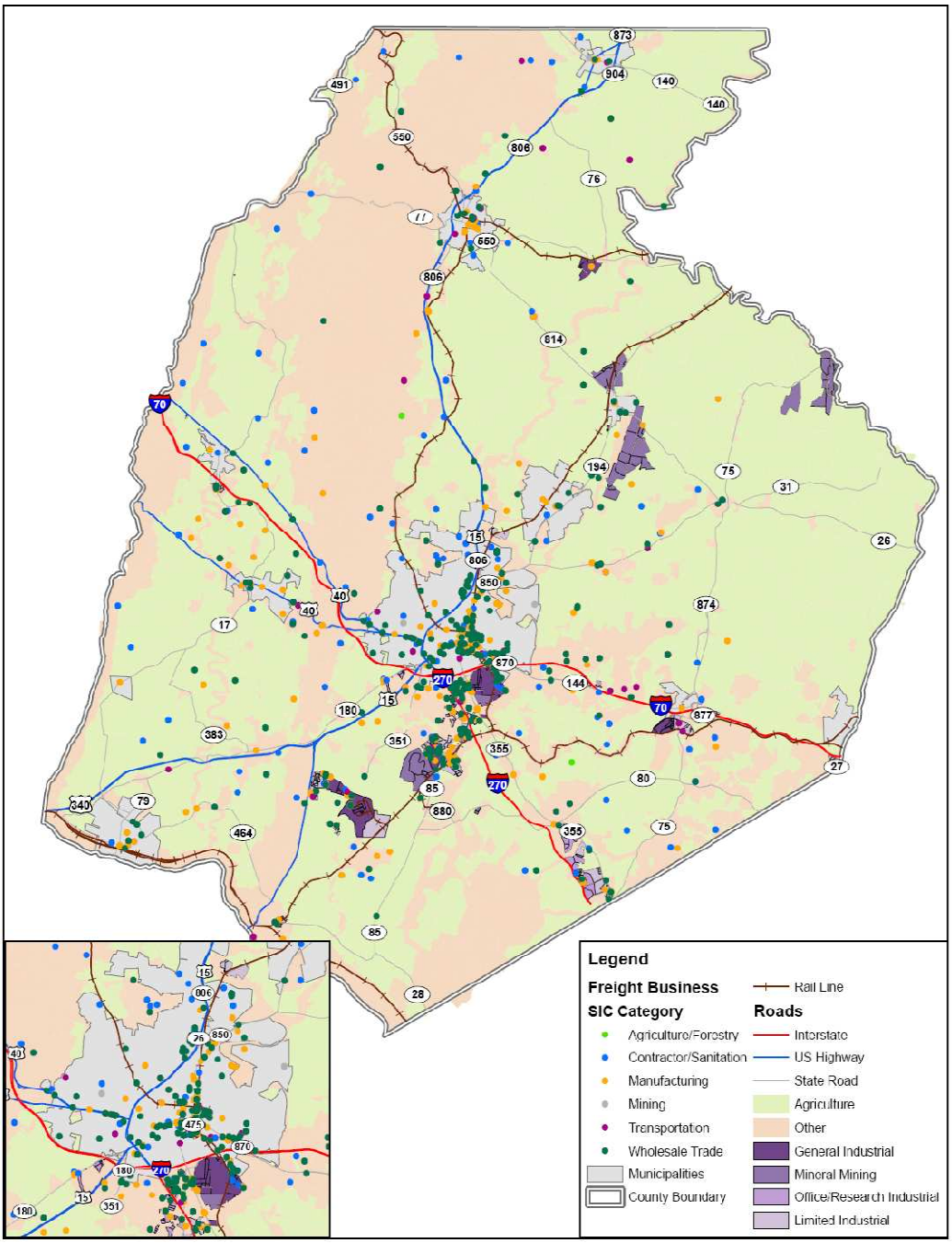
Key Freight/Land Use Conflict Areas

There are several areas in the County that have potential for causing freight and land use conflicts. Conflict areas include incompatible land uses with operations that cause noise, air quality, congestion, vibration, safety or other impacts. In Frederick County, much of the major industrial land use (supportive of freight transportation activities) is located within key transportation corridors and generally far away from neighborhoods and commercial businesses. The quarries south of the City of Frederick, for example are located off of major Maryland Highways 85 and 355 with little existing residential development immediately adjacent to freight businesses.

However, there are some areas within the County where encroachment of residential land use as a result of population and employment growth has strained the tenuous relationship between freight businesses and residential and commercial development. One example of a freight and land use conflict is a major freight business operation in Point of Rocks that abuts a residential development. Issues with noise and safety concerns have prompted residents to engage the freight business and caused the business to provide noise barriers and other improvements to mitigate the issues caused by freight operations.

Such freight and land use conflicts are ongoing and difficult to resolve and sometimes can cause consternation for land use planners who work to maintain the jobs and economic benefits of freight operations but want to accommodate residents and other businesses that might be negatively impacted by freight operations.

Figure 1.17 Freight Business in Frederick County (by type)



Land Use Policies

The land use policies in Frederick County (outside of incorporated municipalities) are under the purview of the Division of Community Development within the County government. The Planning & Zoning, Permitting and Development Review, and Economic Development departments comprise the division. The existing comprehensive plan ordinance and corresponding zoning map was adopted by County Commissioners on April 8, 2010. Total land uses include 17 different zoning districts, including four districts for industrial land use: general industrial, office/research industrial, limited industrial and mineral mining. Each individual incorporated municipality within the County is responsible for its own land use planning and zoning.

Currently the General Industrial, Office/Research Industrial, and Limited Industrial land uses are concentrated along the major highway corridors such as U.S. 15, I-70, and MD 85. Major mineral mining operations currently exist between MD 85 and MD 351 just south of the City of Frederick, directly east of MD 194 near Walkersville, and in the Union Bridge area off MD 75 in the northeast part of the county.

The County's Zoning Code defines the purpose of industrial zoning as follows:

- *The purpose of the industrial districts is to provide for the development of varied industrial uses that would supply needed employment opportunities for the county. Industrial development has inherent characteristics that require special attention and protection. Due regard must be given to industrial needs for adequate site locations with concentration on terrain, availability of water and sewer systems, transportation, and compatibility with surrounding development.*[31]

The definitions within the industrial zoning categories outline basic performance criteria for the zoning code as follows:

- The **Limited Industrial District (LI)** is intended *to provide adequate area for development of industrial uses whose operations have a relatively minor nuisance value and provides a healthful operating environment secure from the encroachment of residential uses and protected from adverse effects of incompatible industries.*
- The **General Industrial District (GI)** is intended *to provide areas for industries involving manufacturing or processing and for those industrial uses which cannot meet the performance criteria of the Limited Industrial District.*
- The **Mineral Mining District (MM)** is a *floating zone established for the purpose of providing for the development of needed mineral resources in areas where such resources exist subject to adequate safeguard for the conservation of the environment.*

[31] County Zoning Code Ordinance 1-19-5.250, Accessed 2/25/11

- The **Office/Research Industrial District (ORI)** is *intended to provide for the development of office, research, and limited manufacturing uses in high-visibility locations along major highways. Development in this district shall be characterized by an absence of nuisances in a clean and aesthetically attractive setting. This district shall permit limited manufacturing, fabrication or assembly operations which would, by nature of the product, or magnitude of production, be compatible with research, professional or business offices. Commercial uses shall be limited to those which are primarily oriented towards servicing those businesses located within the Office/Research Industrial District.*

Frederick County has made provisions for industrial land corridors to accommodate existing industrial growth and mineral extraction. To accommodate future growth, the County may need to explore additional expansion of location and extent of existing industrial zoning.

Future Growth Patterns

Current development trends and patterns suggest that growth will follow those Maryland Routes with direct access to I-270 and corridors that have immediate highway access. Even with the increasing price of gasoline, truck distribution operations offer the combination of most reliable and low-cost means for distributing high-value low-bulk materials and products. Therefore, excellent highway access is a critical location factor.

Both the industrial corridor near Walkersville east of Maryland 194 and along the shortline of the Maryland Midland railroad in Thurmont with linkages to the York Railroad present opportunities for future growth. These opportunities are contingent on development of local business access to the rail lines (installation of a spur) and negotiation of rates with the railroad. Rail frequency is also a key consideration. Many individual customers do not deal in large enough freight volumes to realize substantial-cost savings from rail. Further study of costs associated with local business access and potential frequencies of rail service may be necessary to assess the market demand for rail. Assuming reasonable rail access, this industrial area will continue to benefit from demand pressures for rail accessible bulk commodity transportation. As demand increases for rail to truck freight transportation Frederick County will becoming increasingly competitive. This northeastern section of the County already serves bulk commodity shippers and will continue to offer a strong market location for these users.

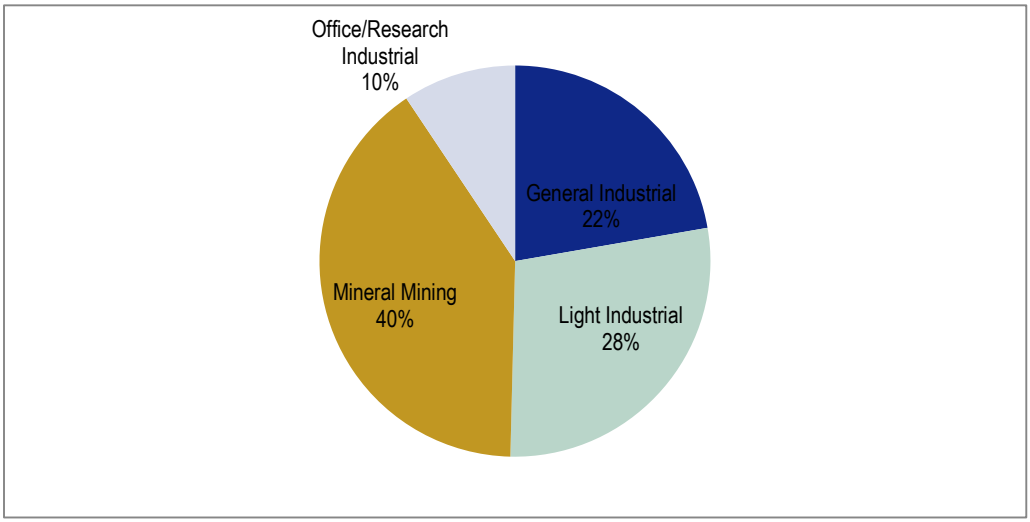
The cluster of industrial property surrounding the airport may experience growth. This location currently has in excess of 150 acres with appropriate zoning for expanding activity. Should the airport operations develop, additional industrial zoning may be necessary.

Volume of Industrial Land

According to the current zoning map for Frederick County, there are currently over 8,700 acres of industrial land in the County (not including municipal lands), representing just over two percent of the total land. The industrial land is

divided between four major industrial land use designations: Office/Research Industrial; General Industrial; Light Industrial; and Mineral Mining. Of these, mineral mining accounts for 40 percent of the existing industrial land in Frederick County.

Figure 1.18 Existing Industrial Land Use Distribution within Frederick County



Growth in Freight Supportive Land Use and County Freight Development

The County has been experiencing strong industrial growth in recent years as the major highway corridors allow for increased development. The regional industrial market continues to gain momentum as demand for other types of uses that command higher renters/prices force manufacturers and other industrial space users to relocate. The existing industrial sites throughout the broader market represent long-time owners and operators of light industrial manufacturing operations or older style business parks that place high value on interstate highway access. Frederick County represents an ideal location within the region for relocation of these types of manufacturing operations as the space is generally less expensive space in a less congested area, reducing the conflict with other users (most notably residential). In some instances manufacturers may leave the region altogether

Empty Industrial Flex Space near MD 85

but for those that stay in the area to remain competitive, Frederick County represents a prime opportunity.

The industrial space market within Frederick County serves distribution and warehouse operations, light to heavy manufacturing, and construction. Industrial/flex space within the entire County totals 17.4 million square feet, according to the Frederick County Office of Economic Development. The majority of this space, an estimated 10 million square feet, consists of warehouse space. Delta Associates estimates the amount of flex/industrial space built since 1988 to total 429,000 square feet as of December of 2010. Future plans for new flex/industrial space includes 370,000 square feet near Fort Detrick. Vacancy rates for standard industrial space range from 14 to 16 percent at the end of the 2010, compared with 20 to 22 percent for Frederick County flex space.

A survey of available industrial space for lease indicated that rents ranged from just below $3.00 per square foot to $11.00 per square foot per year. This represents a range of building types for older buildings with access to rail to newer distribution warehouse operations along major highways. Upon closer examination those properties with rail access in older buildings do not command rents above $4.00 square foot. While a premium may exist for rail access, it is specific to users requiring rail service for their operations.

1.6 CONCLUSION

Because of its strategic location within the Washington-Baltimore metropolitan area and because of its growing population and economy, Frederick County, Maryland is becoming an increasingly important location for freight-oriented businesses. These trends will place greater demands on the existing transportation system and will require coordinated planning. The following findings summarize the existing conditions report and will inform the strategies and recommendations for the Freight and Land Use Plan.

Key Findings – Population, Economy and Freight Business

- The population of Frederick County increased by over 30 percent the last 10 years and is expected to continue to go at a much higher rate between 2010 and 2030 (34 percent) than the State average (10 percent).
- The State of Maryland and Frederick County are home to one of the most highly educated populations in the United States. Higher education is positively correlated with higher incomes (typical college graduates earn about 66 percent more over their working lives than typical high school graduates)[32], and thus increased consumption and the demand for goods (freight).

[32] Baum, Sandy and Kathleen Payea, Education Pays, 2010. Report updated annually with new statistics. Figure based on 2009 U.S. Census.

- Freight-oriented businesses already play a major role in the Frederick County economy with about 40 percent of the total non-farm employment (including construction). This is compared to less than 35 percent for the state as a whole.
- There are nearly 1,000 freight-oriented businesses in the County according to the Economic Development Department Database, including: manufacturing, mining, transportation operations, wholesale trade, agriculture/forestry, and contractors/sanitation. The businesses are clustered within the Cities of Frederick and the unincorporated urbanized areas south of Frederick along MD 85 and I-270, and north of Frederick along U.S. 15 and U.S. 40 in addition to large clusters around Thurmont and Adamstown and along the CSXT and Maryland Midland Rail corridors.
- Many of these locations correlate with concentrations of freight-oriented (i.e., industrial land use), however there are several clusters of freight-oriented businesses (especially transportation and warehousing/trade) that are located near major highways that are not zoned industrial. This disconnect will be explored further in the opportunities and constraints evaluation.

Key Findings – Commodity Flows

- Freight tonnage is expected to increase by nearly 115 percent to over 400 million tons by 2035. Inbound and internal flows are expected to increase the greatest proportion of 238 and 244 percent, respectively.
- The top three major commodities shipped by truck in Frederick County include nonmetallic minerals, secondary traffic, and food or kindred products, the three accounting for about 45 percent of total truck tonnage and nearly 40 percent of total tonnage, including rail.
- Truck flows in secondary freight traffic are expected to increase by nearly 300 percent by 2035.
- Nonmetallic minerals are still expected to be the number one commodity shipped by truck in 2035; however the proportion of total tonnage is expected to decline from 21 to 15 percent.
- Rail flows in coal are expected to increase by over 11 million tons (over 100 percent) by 2035.
- Total truck tonnage is forecast to grow by 119 percent by 2035 while total rail tonnage will increase by 88 percent. Most of the increase is accounted for in through flows (86 percent of the increase), however inbound tonnage will increase by nearly 20 million tons and outbound by just under 10 million tons.

Key Findings – Infrastructure and Land Use

- Truck parking is a major issue throughout the County, both due to the overall number of trucks and the lack of parking areas, including rest and truck stops, weigh stations, and other facilities.
- There is very good transportation access in the County for north-south roadways; however there are limited numbers of east-west connections besides I-70 potentially causing truck mobility issues and conflicts on smaller local roads.
- In several locations, major industrial facilities abut residential or commercial land uses. This can potentially cause conflicts with noise and air quality complaints and access and safety issues for both trucks and passenger vehicles.
- Rail access is limited to a large number of industrial properties due in part to high-infrastructure costs and lack of demand.
- Only two percent of Frederick County land is zoned for industrial use and much of it is already utilized. Relatively few new industrial developments are available for expansion, but include Stanford Properties near Adamstown and the Intercoastal Development off I-70 in New Market which will continue to drive the need for expansion of freight transportation facilities.
- Many of the largest freight-oriented businesses in the County serve as regional distribution hubs, including Costco, Toys R Us, and Bluelinx that ship and receive freight from locations throughout the mid-Atlantic region and nationally.

2.0 Appendix – Commodity Flows

This appendix provides additional detail on the commodity flow analysis, including specific data on freight movements, origins, destinations, and modal flows.

Overview

Freight tonnage traveling inbound, outbound, internally in Maryland, and through Frederick County amounts to over 188 million tons in 2006 and is expected to grow by about 114 percent in 2035 (over 400 million tons). The directional distribution of freight is shown in Table 1.2.

Table 2.1 Frederick County Freight Flows by Direction

Direction	2006 Tons	Percent of Total	2035 Tons	Percent of Total	Percent Increase
Inbound	8,271,590	4%	27,970,126	7%	238%
Internal	320,303	0%	1,101,552	0%	244%
Outbound	8,818,513	5%	18,727,701	5%	112%
Through	171,094,788	91%	356,088,031	88%	108%
Total	188,505,193	100%	403,887,410	100%	114%

Mode Split

An analysis of TRANSEARCH data reveals that trucks carry the majority of freight tonnage in Frederick County. The mode share for truck and rail in 2006 is provided in the figure below. Note that water data queries resulted in zero results for Frederick County. Additionally, there is data reported for air cargo tonnage and value, however the quantities are insignificant compared to truck and rail. Mode shares are based on 2006 freight tonnage data. Given the predominant use of trucking in freight transportation within the County, the mode split is not expected to change significantly over the long-term as shown in Figures 1.8 and 1.9.

Figure 2.1 Freight Mode Share in Frederick County, 2006 (Tons)

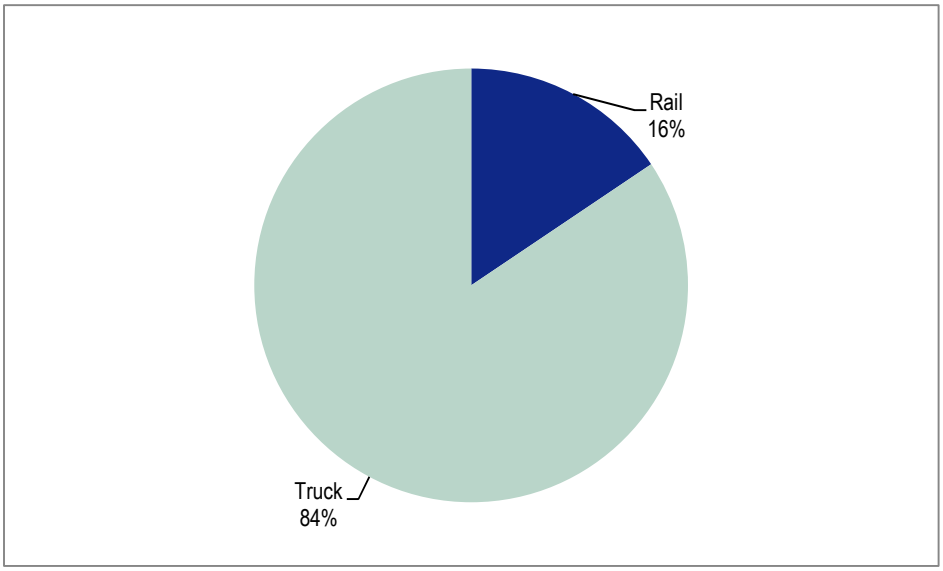
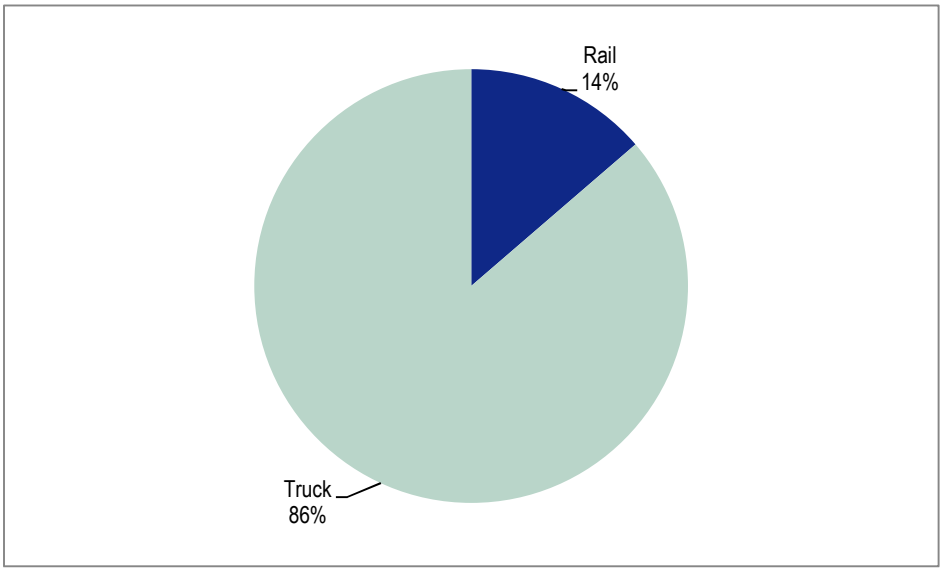


Figure 2.2 Freight Mode Share in Frederick County, 2035 (Tons)



Frederick County Top Commodities

The total top commodities (by tonnage) that move in, out, through, and internally within Frederick County by truck and rail are illustrated in Figure 1.8. Of the top 10 commodities, the two expected to experience the most growth by 2035 include secondary traffic, composed of consumer goods, warehousing and distribution materials with an increase of nearly 280 percent, and clay, concrete, glass, and stone, expected to increase by 124 percent. The most shipped

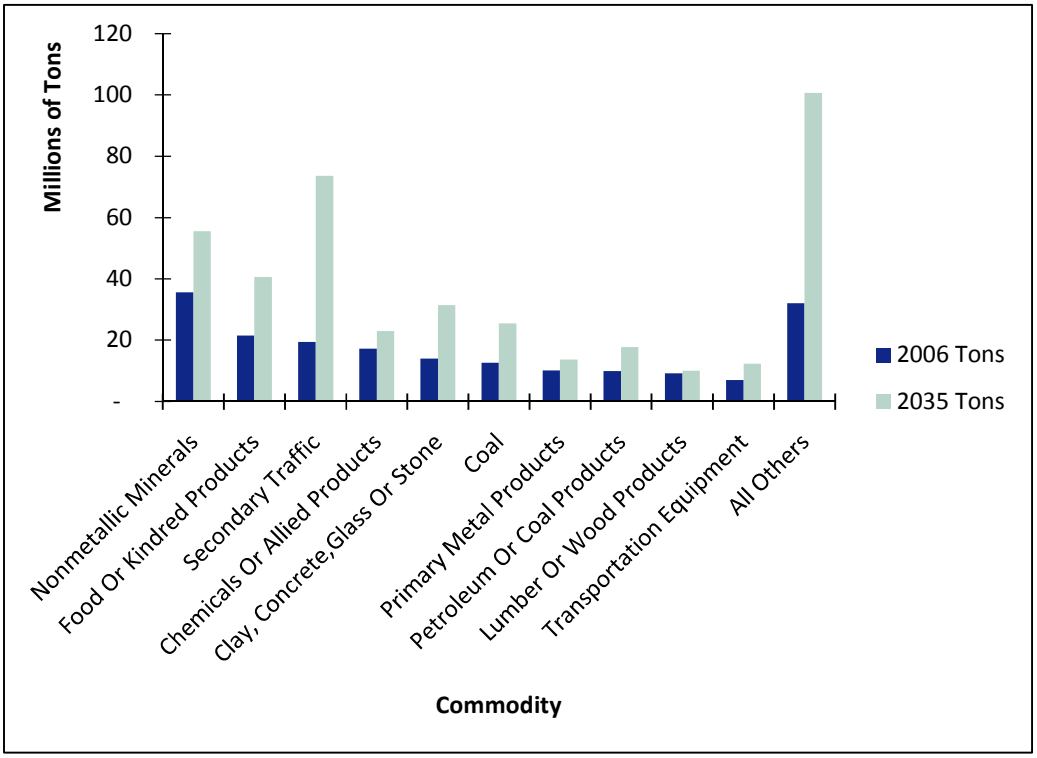
commodity in 2006, nonmetallic minerals, transported exclusively by truck, is expected to increase by a modest 56 percent by 2035. In 2006, the top commodity was non-metallic minerals (19 percent of total county tonnage). By 2035, the top commodity shifts to secondary traffic with over 18 percent of the total and non-metallic materials moving to second place (14 percent).

The top commodity being shipped in Frederick County, non-metallic minerals (including riprap and other aggregates, sand, and quarried stone)[33], is primarily shipped by truck with over 93 percent of the total tonnage. Food/kindred products (including meat, seed, and vegetable oils, among others) are also shipped by both truck and rail, but about 90 percent of the tonnage is shipped by truck. There is a similar proportion in 2035. Only one commodity in the top 10, coal, is primarily shipped by rail with 87 percent of the tonnage in 2006 and a similar proportion in 2035. Transportation equipment, the 10th most traded commodity in Frederick County has about three-quarters of the tonnage shipped by truck and one-quarter of the tonnage shipped by rail. The commodity expecting the largest tonnage increase in 2035, machinery is almost exclusively shipped by truck (98 percent in both 2006 and 2035). Overall increases in truck tonnage amount to about 119 percent of 2006 totals.

Coal accounts for over one-third of the total tonnage shipped by rail in Frederick County with 100 percent of the coal rail flows account for with through moves. Coal shipments by truck include around 10 percent as inbound freight, destined for locations within the County. Since the vast majority of overall freight tonnage in Frederick County is accounted for with through moves (over 91 percent of the total in 2006), the majority of commodities overall are dominated by through shipments. Nearly all the rail commodities shipped in Frederick County are composed of bulk commodities and concentrated in nonmetallic minerals, transportation equipment, chemicals, coal, and food. Although overall rail flows are expected to increase in 2035 by nearly 50 percent, the vast majority of rail freight gains (over 43 percent of the total increase) are in coal.

[33] Reference Guide for the 2008 Surface Transportation Board Carload Waybill Sample, RailInc Business Services Division, 2009.

Figure 2.3 Top Commodities Moved by Truck and Rail in Frederick County, (Inbound, Outbound, Through, and Internal), 2006 and 2035



Note: "All Others" includes an expected ten-fold growth in the commodity "machinery" in 2035.

Table 2.2 Frederick County's Top 10 Truck Commodities

Commodity	2006 Tons	Total Proportion (2006)	2035 Tons	Total Proportion (2035)	Percent Growth
Nonmetallic Minerals	32,939,471	21%	50,649,448	15%	54%
Secondary Traffic	19,410,439	12%	73,624,928	21%	279%
Food Or Kindred Products	19,409,205	12%	36,924,634	11%	90%
Chemicals Or Allied Products	15,002,207	9%	20,254,419	6%	35%
Clay, Concrete, Glass Or Stone	12,566,890	8%	28,622,866	8%	128%
Petroleum Or Coal Products	9,309,607	6%	16,915,932	5%	82%
Primary Metal Products	8,771,384	6%	11,922,210	3%	36%
Lumber Or Wood Products	8,512,611	5%	9,412,412	3%	11%
Pulp, Paper Or Allied Products	5,591,926	4%	8,088,567	2%	45%
Transportation Equipment	5,087,654	3%	9,525,010	3%	87%
All Others	22,540,553	14%	82,650,332	24%	267%
Total	159,141,947	100%	348,590,758	100%	119%

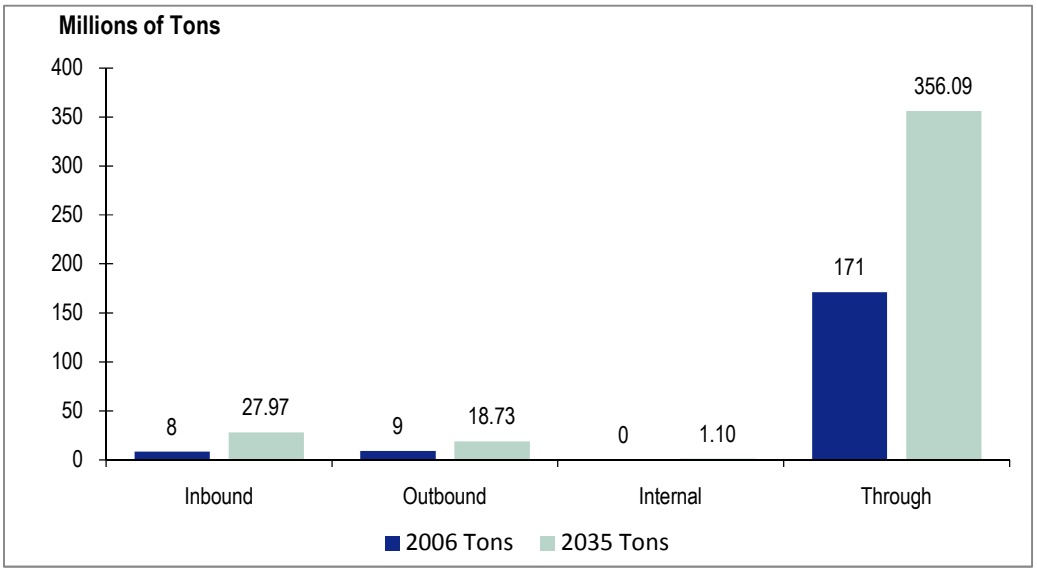
Table 2.3 Frederick County's Top 10 Rail Commodities

Commodity	2006 Tons	Total Proportion (2006)	2035 Tons	Total Proportion (2035)	Percent Growth
Coal	10,961,786	37%	21,984,469	40%	101%
Nonmetallic Minerals	2,652,791	9%	4,877,877	9%	84%
Chemicals Or Allied Products	2,177,951	7%	2,694,780	5%	24%
Food Or Kindred Products	2,095,874	7%	3,640,614	7%	74%
Transportation Equipment	1,937,906	7%	2,793,218	5%	44%
Misc Mixed Shipments	1,694,144	6%	4,918,425	9%	190%
Clay, Concrete, Glass Or Stone	1,458,983	5%	2,836,355	5%	94%
Primary Metal Products	1,404,455	5%	1,713,966	3%	22%
Pulp, Paper Or Allied Products	1,116,054	4%	1,557,163	3%	40%
Waste Or Scrap Materials	683,900	2%	2,342,462	4%	243%
All Others	3,179,401	11%	5,937,322	11%	87%
Total	29,363,246	100%	55,296,652	100%	88%

Frederick County Direction of Goods Movement Flows

The vast majority of freight traffic in Frederick County is accounted for with through movements (e.g., freight that passes through the County with an origin or destination outside the County), with over 90 percent of the total. Still, there is substantial tonnage moving inbound, outbound, and internally within the County, with inbound flows nearly equal to outbound flows in 2006 (8.2 million inbound tons, 8.8 million outbound tons. Inbound freight accounts for about 50 percent more freight than outbound flows in 2035 indicating a much faster rate of growth of inbound cargo. Major inbound commodities include secondary traffic, clay, concrete, glass, or stone, and nonmetallic minerals, the top three accounting for nearly 60 percent of the total inbound freight flows. Internal traffic is dominated by flows of clay, concrete, glass, or stone, and nonmetallic minerals the two commodities accounting for over 86 percent of the internal flows. Outbound trade is dominated by nonmetallic minerals and clay, concrete, glass, or stone, the two commodities accounting for over 70 percent of freight flows. Other major commodities outbound are farm products, and primary metal products.

Figure 2.4 Direction of Goods Movement by Truck and Rail, 2006 and 2035



The overall directional patterns apparent in 2006 are not forecast to change significantly in the long-term by 2035, because of the overwhelming predominance of through traffic, however, upon closer examination, there is expected to be a substantial increase in the proportion of inbound flows. The proportion of outbound and internal traffic is expected to remain consistent in 2035.

Figure 2.5 Proportion of Goods Movement by Truck and Rail, 2006

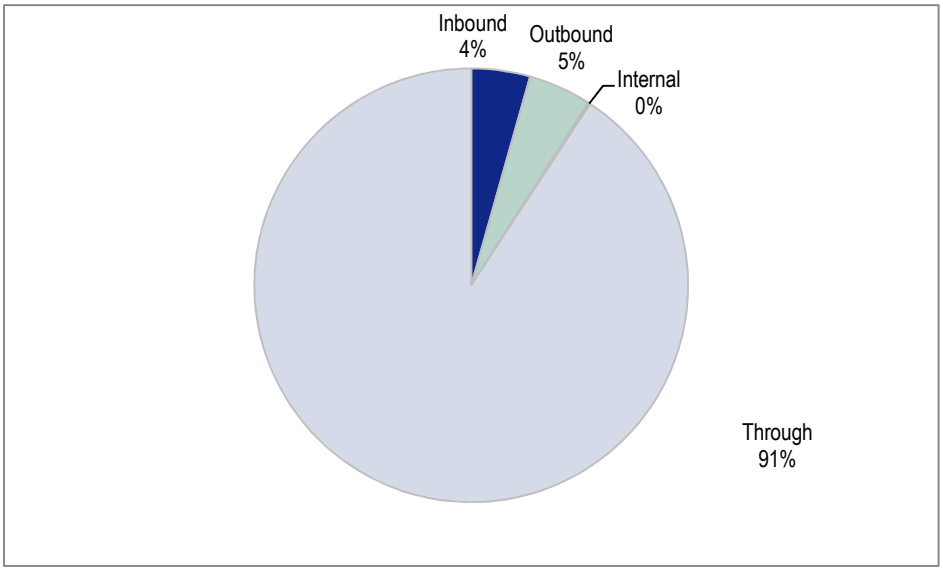
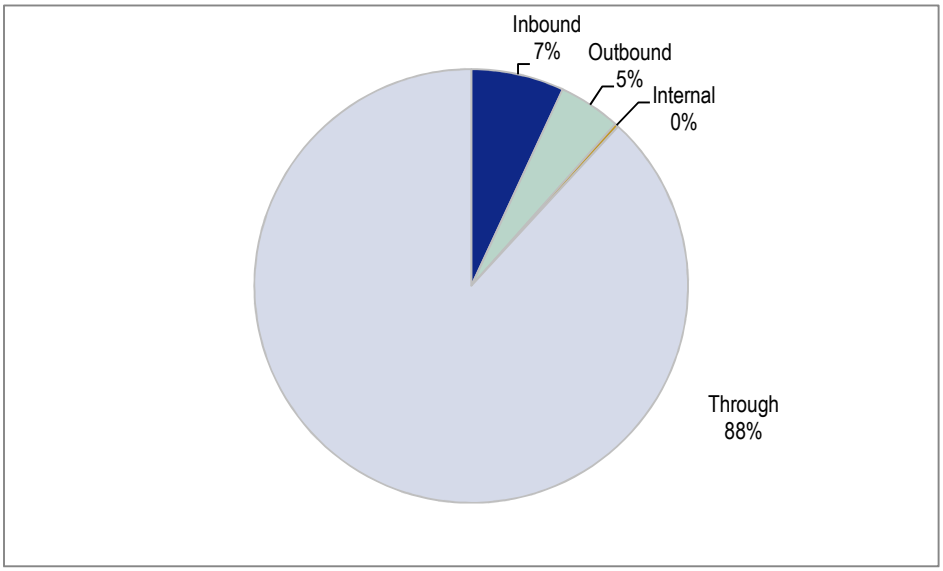


Figure 2.6 Proportion of Goods Movement by Truck and Rail, 2035



Frederick County, because of its current 52-48 percent outbound to inbound flow split, currently operates with a trade surplus of four percent (Frederick County businesses ship more outbound goods than they receive inbound goods). Because of the tremendous expected growth in inbound commodity flows, by 2035, that trade balance is expected to swing the opposite direction to a trade deficit of 30 percent by 2035. Major commodities responsible for the upswing in inbound flows include substantial relative growth in secondary traffic (truck), clay, concrete, glass, and stone (truck), and metallic ores (rail). The additional

expected secondary traffic (10.6 million tons) accounts for over half of the inbound tonnage increase by 2035. The trade surplus (2006) and deficit (2035) in Frederick County are displayed in Figures 1.14 and 1.15.

A weight-based commodity flow analysis is a fundamental component of any freight study, as the weight of shipped commodities is critical to understanding how freight vehicles utilize the transportation system. The value of commodities shipped can provide further insight into the economic activity associated with freight. The value of lower value commodities (e.g., bulk commodities such as minerals, ores, or chemicals) tracks similarly to the tonnage in the distribution. Higher value commodities such as secondary traffic (e.g., consumer products, etc.) often will affect the value of the distribution of the commodity flows.

Figure 2.7 Inbound and Outbound Truck and Rail Flows, 2007

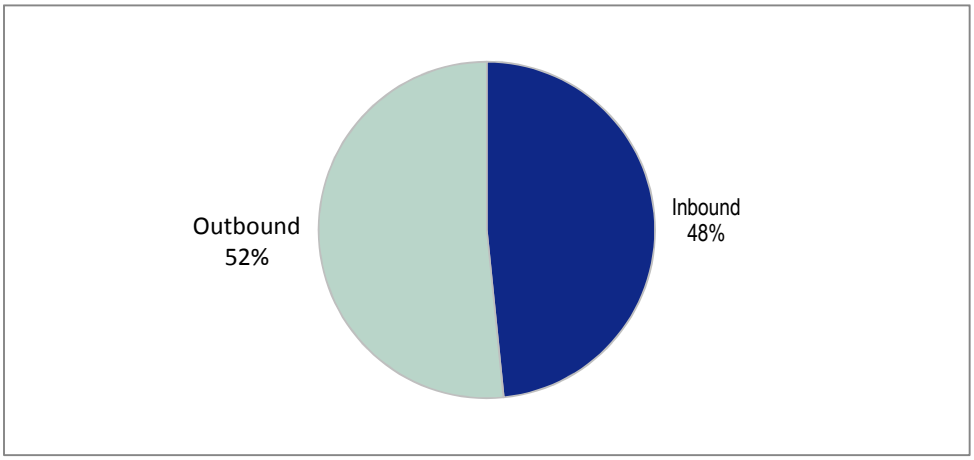


Figure 2.8 Inbound and Outbound Truck and Rail Flows, 2035

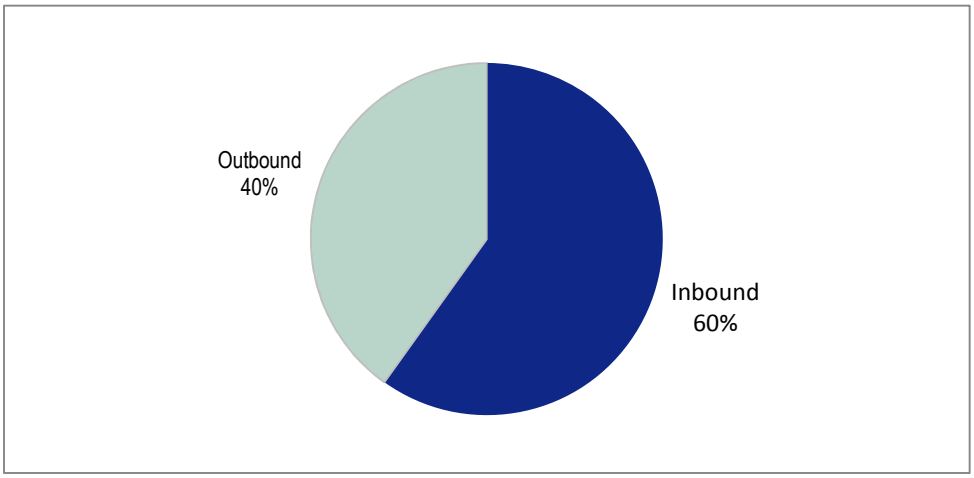


Table 2.4 Top 10 Inbound Commodities by Weight, Truck, and Rail

Commodity	2006 Truck Tons	2035 Truck Tons	Percent Growth	2006 Rail Tons	2035 Rail Tons	Percent Growth	Total 2006 Tons	Total 2035 Tons	Percent Growth
Secondary Traffic	2,659,724	13,284,495	399%			–	2,659,724	13,284,495	399%
Clay, Concrete, Glass Or Stone	1,142,011	3,731,061	227%	1,679	9,735	480%	1,143,690	3,740,796	227%
Nonmetallic Minerals	1,005,613	2,071,522	106%			–	1,005,613	2,071,522	106%
Petroleum Or Coal Products	490,042	1,104,013	125%	82,234	27,954	-66%	572,276	1,131,968	98%
Food Or Kindred Products	504,308	1,288,280	155%			–	504,308	1,288,280	155%
Metallic Ores			–	457,731	1,188,179	160%	457,731	1,188,179	160%
Lumber Or Wood Products	285,087	491,537	72%	61,863	69,882	13%	346,950	561,420	62%
Primary Metal Products	263,608	490,524	86%	10,331	9,938	-4%	273,939	500,462	83%
Chemicals Or Allied Products	262,819	510,468	94%	3,981	3,803	-4%	266,800	514,270	93%
Farm Products	239,202	411,391	72%			–	239,202	411,391	72%
All Others	789,041	3,228,525	309%	12,315	48,818	296%	801,356	3,277,342	309%
Total	7,641,455	26,611,816	248%	630,135	1,358,310	116%	8,271,590	27,970,126	238%

Table 2.5 Top 10 Outbound Commodities by Weight, Truck, and Rail

Commodity	2006 Truck Tons	2035 Truck Tons	Percent Growth	2006 Rail Tons	2035 Rail Tons	Percent Growth	Total 2006 Tons	Total 2035 Tons	Percent Growth
Nonmetallic Minerals	3,790,542	5,393,126	42%			–	3,790,542	5,393,126	42%
Clay, Concrete, Glass Or Stone	2,390,486	6,062,687	154%			–	2,390,486	6,062,687	154%
Farm Products	514,999	468,341	-9%			–	514,999	468,341	-9%
Primary Metal Products	501,218	976,376	95%	13,212	21,496	63%	514,430	997,871	94%
Food Or Kindred Products	400,492	1,016,414	154%			–	400,492	1,016,414	154%
Secondary Traffic	290,922	1,355,908	366%			–	290,922	1,355,908	366%
Lumber Or Wood Products	263,463	203,596	-23%			–	263,463	203,596	-23%
Machinery	163,892	1,797,396	997%			–	163,892	1,797,396	997%
Petroleum Or Coal Products	128,094	51,045	-60%	4,794	928	-81%	132,888	51,973	-61%
Rubber Or Misc Plastics	109,297	240,040	120%				109,297	240,040	120%
All Others	242,769	1,083,587	346%	4,332	56,762	1,210%	247,101	1,140,349	361%
Total	**8,796,174**	**18,648,516**	**112%**	**22,339**	**79,185**	**254%**	**8,818,513**	**18,727,701**	**112%**

Frederick County's Trading Partners

Trading partners for Frederick County include top origins for flows into the County, as well as top destinations for flows outside the County. Many state trading partners have been consolidated into Census Regions to better reflect regional trade flows. The identification of trading partners can help Frederick County better determine specific routing for major freight flows as well as reveal where existing and future trading relationships should be cultivated between jurisdictions. These Census Regions utilized in the TRANSEARCH analysis are defined below.

Table 2.6 Frederick County's Geographic Trading Partners: U.S. Census Regions

Census Division	Comprising States	
Census Region 1	Connecticut	New Hampshire
New England	Maine	Rhode Island
	Massachusetts	
Census Region 2[a]	New York	
Middle Atlantic		
Census Region 3	Indiana	Michigan
East North Central	Illinois	Ohio
Census Region 4	Iowa	Nebraska
West North Central	Kansas	North Dakota
	Minnesota	South Dakota
	Missouri	
Census Region 5[b]	Florida	North Carolina
South Atlantic	Georgia	South Carolina
Census Region 6	Alabama	Mississippi
East South Central	Kentucky	Tennessee
Census Region 7	Arkansas	Oklahoma
West South Central	Louisiana	Texas
Census Region 8	Arizona	Montana
Mountain	Colorado	Utah
	Idaho	Nevada
	New Mexico	Wyoming
Census Region 9	Alaska	Oregon
Pacific	California	Washington
	Hawaii	

[a] Excludes New Jersey and Pennsylvania, which were broken out separately.

[b] Excludes Delaware, Maryland, Virginia, West Virginia, and Washington, D.C., which were broken out separately.

The tables below exhibit the major trading partners for Frederick County in 2006 and 2035, respectively. In 2006, the County's top three trading partners include the States of Virginia and Pennsylvania, and States within Census Region 3 (Indiana, Illinois, Michigan, and Ohio), accounting for nearly 40 percent of the total freight flows. In 2035, the top three trading partners are expected to remain the same, however the proportion of tonnage for the three declines to 35 percent.

Table 2.7 Frederick County's Top Trading Partners (Inbound and Outbound Tonnage), 2006

Trading Partner	Total Tonnage	Percent Total	Originating Tonnage (To Study Region)	Percent Total	Terminating Tonnage (From Study Region)	Percent Total
Virginia	3,105,190	18%	525,328	6%	2,579,861	29%
Pennsylvania	2,604,936	15%	1,386,841	17%	1,218,095	14%
Census Region 3	1,091,109	6%	754,337	9%	336,772	4%
Baltimore County, Maryland	964,526	6%	633,465	8%	331,060	4%
Baltimore city, Maryland	856,532	5%	499,124	6%	357,408	4%
Anne Arundel County, Maryland	768,142	4%	670,787	8%	97,355	1%
Census Region 7	654,090	4%	525,451	6%	128,639	1%
Census Region 5	619,118	4%	369,292	4%	249,825	3%
Washington County, Maryland	618,831	4%	378,483	5%	240,347	3%
West Virginia	593,273	3%	307,182	4%	286,091	3%
All Others	5,214,357	31%	2,221,300	27%	2,993,058	34%
Total	17,090,102	100%	8,271,590	100%	8,818,513	100%

Source: TRANSEARCH.

Table 2.8 Frederick County's Top Trading Partners (Inbound and Outbound Tonnage), 2035

Trading Partner (2035)	Total Tonnage	Percent Total	Originating Tonnage (To Study Region)	Percent Total	Terminating Tonnage (From Study Region)	Percent Total
Virginia	6,742,706	14%	1,812,383	6%	4,930,323	26%
Pennsylvania	6,274,749	13%	4,224,268	15%	2,050,481	11%
Census Region 3	3,638,703	8%	2,594,412	9%	1,044,291	6%
Baltimore city, Maryland	2,641,531	6%	2,026,110	7%	615,421	3%
Baltimore County, Maryland	2,497,412	5%	2,006,196	7%	491,216	3%
Anne Arundel County, Maryland	2,491,596	5%	2,259,571	8%	232,025	1%
Census Region 5	1,807,924	4%	977,453	3%	830,471	4%
Census Region 7	1,723,917	4%	1,402,662	5%	321,255	2%
Washington County, Maryland	1,655,393	4%	1,126,087	4%	529,306	3%
Montgomery County, Maryland	1,511,820	3%	301,522	1%	1,210,298	6%
All Others	15,712,075	34%	9,239,460	33%	6,472,615	35%
Total	46,697,827	100%	27,970,126	100%	18,727,701	100%

Source: TRANSEARCH.

The figures below display the top trading partners by tonnage for inbound and outbound truck and rail freight. In 2006, the County's top three inbound trading partners include the State of Pennsylvania, States within Census Region 3 (Indiana, Illinois, Michigan, and Ohio), and Anne Arundel County, Maryland, in southern Maryland accounting for about 34 percent of the total inbound freight flows. For outbound flows, the top three trading partners are the States of Pennsylvania and Virginia and Montgomery County, Maryland, directly to the South of Frederick County. The outbound flow of cargo is more concentrated to the key trading partners than inbound flows with the Top three outbound trading partners accounting for over 48 percent of the total freight flows in 2006. This proportion is expected to decrease to just over 44 percent in 2035, mostly due to increased outbound flows to a more diverse group of trading partners, mostly within Census Regions within the northeast and mid-Atlantic and other Maryland Counties.

Figure 2.9 Top 10 Trading Partners by Inbound Tonnage, 2006 and 2035

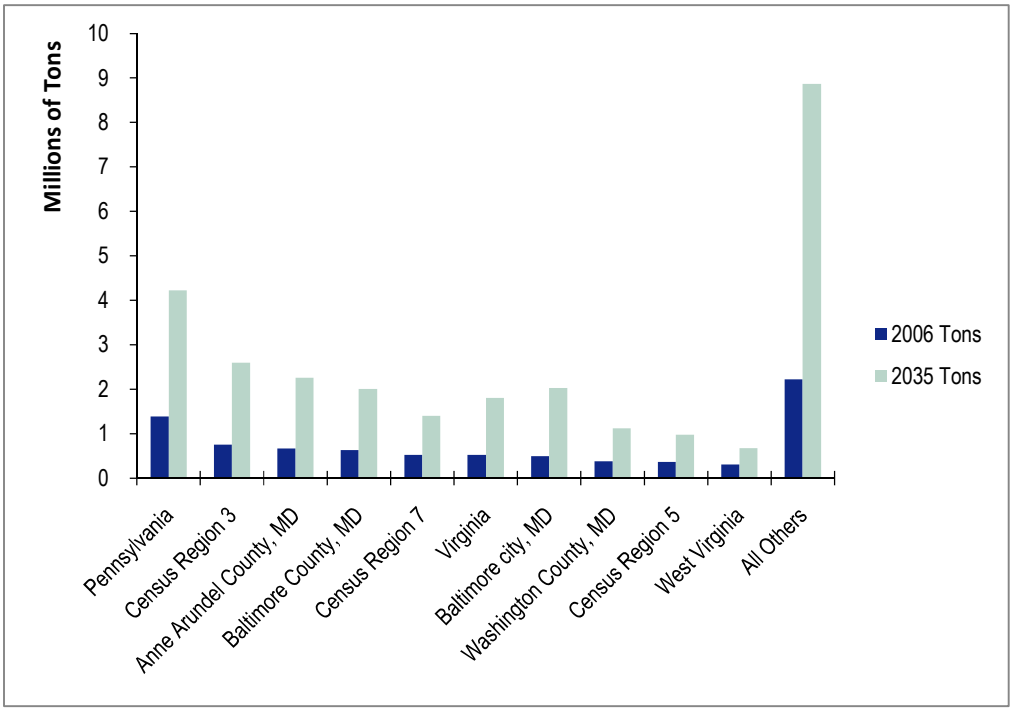
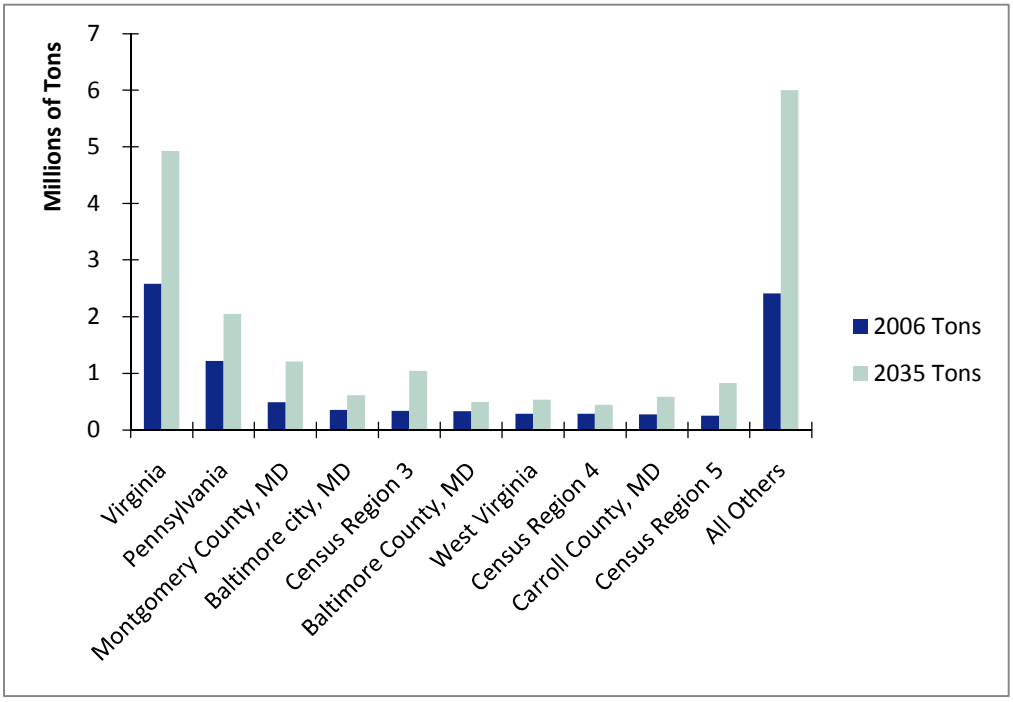


Figure 2.10 Top 10 Trading Partners by Outbound Tonnage, 2006 and 2035



B. Public Outreach Summary

CAMBRIDGE SYSTEMATICS

Frederick County Freight and Land Use Plan

Task 3: Outreach and Interview Summary

final

summary

prepared for

Frederick County as part of the Transportation/Land-Use Connections Program (Metropolitan Washington Council of Governments)

prepared by

Cambridge Systematics, Inc.

March, 2011

www.camsys.com

report

Frederick County Freight and Land Use Plan

Task 3: Outreach and Interview Summary

prepared for

Frederick County as part of the Transportation/Land-Use Connections Program (Metropolitan Washington Council of Governments)

prepared by

Cambridge Systematics, Inc.
4800 Hampden Lane, Suite 800
Bethesda, MD 20814

date

March, 2011

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1.0 Outreach Summary

In order to develop a stronger understanding of the freight and land use issues within the County, CS initiated a robust survey and public outreach program. This deliverable outlines the methodology used in public outreach and reports the findings and recommendations from the private sector freight stakeholders. This summary and findings will inform the final report and recommendations.

1.1 METHODOLOGY

Three major methods were employed to solicit information from key freight stakeholders in Frederick County. The methods were chosen in order to reach the broadest and most diverse audience and collect the most information. The following describes the elements of the outreach program.

Web Based Survey

Working with Frederick County, CS developed a web-based survey to collect data to validate and supplement Task 2 findings and to identify freight and land use needs and issues. To reach a broader group in the County and surrounding areas–– – including carriers, shippers, land developers, and other interests–– – the Frederick County Office of Economic Development propagated the survey via e-mail distribution to Department-selected companies and posting of the survey link on the Department's blog, OED / County Planning Division's websites, and via a County distributed press release. Additionally, the survey was handed out at the public meeting on March 8, 2011 and advertised during industry interviews.

The survey instrument was developed based on preliminary research of key issues in the county and with the expectation to quantify and compare business operations and land use challenges. It included questions on the following topics:

- General scope and scale of business operations
  - Type of goods or services provided and top commodities shipped and received
  - Major routes, average distances traveled for shipments, and shipment/delivery times
  - Transportation mode utilized for shipments (including rail access and why the business uses or does not use rail)
  - Number of units shipped (i.e., rail carloads or truckloads)
  - Location of suppliers

- Recommendations for transportation improvements (both infrastructure and policy) that would provide the most benefit to business operations
- General strategies (policy) that Frederick County could employ to make the County more attractive to freight-oriented businesses

Industry Interviews

Concurrent with the web survey, and based on the preliminary online responses, CS initiated phone interviews with between 15-20 key freight stakeholders, selected in consultation with the County. These stakeholders were selected based on a range of criteria including size of operations (largest and most influential freight stakeholders within the County), type of operations (cross-section of freight stakeholders including transportation providers for both truck and rail, and manufacturing, mineral mining, and warehousing/distribution operations) and location (businesses located throughout the County, not only in the City of Frederick, but also in Adamstown, Woodsboro, Buckeystown, Thurmont, New Market, etc).

Public Outreach Meeting

CS and County staff also initiated a stakeholder outreach meeting during the course of the survey period to promote additional dialogue with the private stakeholder community and discuss preliminary findings from Task 2—Existing Conditions. The meeting was held on March 8, 2011 in the City of Frederick, and included nearly 20 members of the freight community in Frederick County.

Table 1.1 Attendees of Public Meeting on March 8, 2011, Frederick County offices

Name	Organization
John B. Thomas	Frederick County Division of Planning
Dial Keju	Frederick County Division of Planning
Jim Gugel	Frederick County Division of Planning
Greg Jones	Frederick County Department of Public Works Office of Highways & Transportation
Tim Davis	City of Frederick Transportation Planning Department
Laurie Boyer	Frederick County Office of Economic Development
Sharon Daboin	CSX Maryland
Nick Colonna	City of Frederick Planning Department
Howard Levine	Ramar Moving & Storage
Barbara Windsor	Hahn Transport
Peter Pearre	Citizen
Rey Walker	Maryland State Highway Administration, Motor Carrier Division
Jerry Fouche	Richard F Kline Construction
Michael Cook	LaFarge North America

Meeting attendees included business owners, trucking firms, a freight railroad representative, interested citizens, City and County planners, Maryland State Highway Agency, and other interested stakeholders in the freight and land use planning within the County. Following a presentation introducing the purpose and scope of the Transportation/ Land-Use Connections (TLC) Program Freight Transportation and Land Use project, an introduction of the following preliminary freight and land use issues was presented:

- Truck Parking (e.g., truck access to Costco site from MD 75 and CSX railroad bridge)
- Truck Routing and Infrastructure Protection (e.g., truck access to Costco site from MD 75 and CSX railroad bridge)
- Access routes to/from major freight generators (e.g., Toys R Us Distribution Center in Frederick and Costco Distribution Center near New Market)
- Industrial rail access (e.g., rail spur to BlueLinx in Frederick)
- Access modes to/from major freight generators (e.g., Frederick Grain, Llc grain elevators)
- Industrial real estate opportunities (e.g., flex space near MD 85 and reuse of Eastalco site in Adamstown

The study team also presented some preliminary findings from the existing conditions evaluation, including the location of freight oriented businesses in the County, existing and future freight flows by mode, direction, and commodity, and existing and future truck traffic flows on major roadways. Meeting attendees had the opportunity to present freight and land use issues in the County, discussed below.

1.2 OUTREACH RESULTS

The outreach (surveys, interviews, and public meeting) effort yielded useful information from nearly 20 different private freight stakeholders representing mineral mining, farm operations, warehousing and distribution, manufacturing, and freight carriers (rail and truck). The table below displays the responding private companies from the outreach effort, type of business the companies represent, and location of the business.

The information collected through the surveys and interviews provided additional insight into shipping corridors within the County, freight transportation bottlenecks scale of operations, and transportation mode of choice for major shippers and carriers in Frederick County. These results will inform the recommendations for future land use planning efforts to promote improved freight and land use connections within the County.

Table 1.2 Businesses for Public Outreach

Organization	Type of Business	Location	Interview/Survey
Lehigh Cement	Aggregates/Cement/Stone	Union Bridge	Interview
SW Barrick and Sons	Aggregates/Cement/Stone	Woodsboro	Interview
LaFarge North America	Aggregates/Cement/Stone	Frederick	Interview & Survey
Frederick Grain, Llc	Farm/Food Products	Frederick	Interview
Misty Springs Farm	Farm/Food Products	Woodsboro	Survey
Canam Steel Corporation	Manufacturing	Point of Rocks	Interview
Transtech	Manufacturing	Adamstown	Interview
CSX Maryland	Railroad (Class I)	Frederick/Point of Rocks	Interview & Public Meeting
Maryland Midland Railroad (GWRR)	Railroad (Shortline)	Woodsboro/Union Bridge/Thurmont	Interview
Ramar Moving & Storage	Trucking	Frederick	Interview & Public Meeting
Hahn Transport	Trucking	New Market	Public Meeting
Richard F Kline Construction	Trucking	Frederick	Public Meeting
Costco Wholesale Warehouse	Warehousing/Distribution	New Market	Interview
BlueLinx (construction materials)	Warehousing/Distribution	Frederick	Interview
Toys R Us Distribution Center	Warehousing/Distribution	Frederick	Interview
Probuild (construction materials)	Warehousing/Distribution	Frederick	Interview
FoodPro	Warehousing/Distribution	Frederick	Survey
York Building Products	Warehousing/Distribution	Frederick	Interview & Survey

Note: Warehousing/Distribution category includes building supply companies

Freight Transportation Operations and Mode Choice

According to the interviews and surveys, most freight moves in the County are by truck. The use of trucks ranges from just a few trucks per day outbound and inbound to several hundred. For the mineral mining and aggregates operations, a strong seasonal nature of the business was reported whereby the peak season (summer) would typically have many times more trucks than during the off season. This peak season also applies to farming operations with Frederick Grain reporting a peak season in the summer and fall, with seed, grain, and fertilizer deliveries and sales contributing to transportation operations.

The customer base for most of these companies ranges from local shipments within Frederick County to national markets. However, the majority of shipments are regional for nearly all businesses interviewed (i.e., within 150-200 miles of the Frederick County facility). The businesses tend to use the most direct route to the neighboring regions for deliveries (i.e., U.S. 15 northbound to travel to Pennsylvania, I-270 to travel to Montgomery County and Washington DC, I-70 to travel to Baltimore, etc). In the case of the major wholesalers, Costco

and Toys R Us, much of their product received at the warehouse arrives in shipping containers via the Port of Baltimore or Port of Virginia.

Shippers in the County utilize either private (their own fleet) or for-hire trucks. Third-party logistics providers (3PLs) or the consignees of the shipments arrange the transportation. Some shippers indicated challenges with truckers arranged by outside companies being unfamiliar with County roadways and overshooting their target. Narrow local roads or state highways with no shoulders make doubling back or turning around very difficult.

Rail Access

Some shippers within the County use rail in conjunction with their trucking operations. All of the companies that use rail are located adjacent to an existing rail spur, and most have been using rail for many years. Some newer businesses that located where there was already a rail spur (such as Probuild) use the rail for regular shipments of heavy, bulk commodities (such as lumber or plywood), most appropriate for the mode. Other companies, such as LaFarge have existing rail spurs but do not use rail because significant capital investments are needed to upgrade loading equipment and/or on-site infrastructure to become rail-viable. In general, the cost of rail infrastructure can prohibit some shippers from using the mode. For example, discussions with both the Class I and shortline railroads indicate that the cost of installing or upgrading rail spurs, if they have fallen out of service or have become obsolete with modern freight rail operations can range from several hundred thousand dollars to well over $1 million dollars. These costs include appropriate switches, track, and ballast. Making matters more difficult are the costs associated with maintaining the rail infrastructure which can erode thin profit margins on certain products. For example, the operations manager at Probuild, indicated that they pay several thousand dollars every few months for rail maintenance.

For businesses like retailers that rely on tightly-synchronized supply chains to maintain just-in-time deliveries, local freight rail service is not a viable transport option. For these businesses, the local switching service in Frederick County is not frequent enough and does not provide intermodal service. Instead, large retailers utilize rail to ship products in containers, often from maritime gateways, to regional intermodal centers where trucks dray the goods to their Frederick County facilities. For example, Toys R Us does not utilize the rail spur at its Frederick County warehouse but utilizes rail at some of its Pennsylvania locations for intermodal shipments. The company said that if business demand warranted it they might consider utilizing the rail in Frederick. The traffic volume does not currently justify the cost to update internal operations to efficiently interface with the rail.

Maryland Midland Railway and CSXT provided an interesting perspective indicating that although they would appreciate the opportunity to add additional freight customers in the County, currently, there is very little industrially zoned land adjacent to rail (especially east of the town of Frederick.)

Alternatively, existing farmland could be zoned industrial just east of the NVR property in Thurmont to take advantage of great rail access. There also should be additional industrial land zoned adjacent to U.S. 15, north of Frederick.

Railroads and businesses alike recommended implementing a similar program to the states of Virginia, Pennsylvania, and North Carolina, among others where public funds are used to help promote rail access by provide grants and loans to businesses to install rail connections. In the public outreach meeting, as well as through discussions with the railroads, it was mentioned that freight rail capacity in the County needed to be maintained to give businesses the opportunity to be served by rail. There are some fears that commuter rail operations will overwhelm the freight capacity, especially on the MARC Brunswick line.

Transportation Bottlenecks

During the public meeting, stakeholders outlined a variety of bottlenecks on the existing freight transportation system. A review of the most current Maryland Highway Needs Inventory of many of these bottlenecks, indicates that many of the identified facilities are already identified to be improved over the long term years (e.g., I-70 west of the City of Frederick, I-270 South of the City of Frederick to the County line, U.S. 15 from I-70 to the state line).[1] Additionally, many of the local highway facilities identified by the stakeholders as being deficient (i.e., MD 28, MD 75, MD 85, MD 351) have improvement projects within the HNI, however these projects are mostly dedicated to reconstruction and not expansion or reconfiguration.

Two highway issues that were raised repeatedly in the interviews, as well as the public meeting is the efficacy of MD 75 for large trucks and the interchanges between U.S. 15/I-70/and I-270 southeast of Frederick City. In the case of MD 75, the issue with truck clearance beneath the CSX railroad bridge south of New Market is well documented. North of I-70, the highway continues as a circuitous, narrow roadway and the trucks that use the facility, including the major of trucks carrying stone and cement from the Lehigh facility. The interviewee from Lehigh recommended improvements to the facility including realignment, widening (for additional capacity), and the addition of shoulders to improve safety. Other major bottlenecks discussed in the public outreach meeting and during the surveys and interviews are included in the following table. This list includes improvements to several local roads that should be highlighted as requiring further study, in addition to specific highway and freeway interchanges. One of the major benefits to the outreach process is identifying the needs of local businesses in the County.

[1] Primary highways for the State of Maryland Highway Needs Inventory for Frederick County (revised 2008)

Table 1.3 Frederick County Summary of Freight Bottlenecks (as reported by stakeholders)

Bottleneck Type	Where Reported
Weaving problems for both cars and trucks at the I-270/I-70/U.S. 15 interchange to the southwest of the City of Frederick	Public Outreach Meeting
U.S. 15/Hayward Road interchange backs up traffic northwest of the City of Frederick	Public Outreach Meeting
The acceleration and deceleration lanes from Southbound MD 40 to U.S. 15 may need to be lengthened to accommodate truck movement safely into and out of Frederick.	Public Outreach Meeting
Capacity limitations and traffic congestion on I-70, I-270, and U.S. 15 (4 lanes each direction (8 total)). Congestion worst at urban interchanges.	Public Outreach Meeting
Freight rail delays due to MARC passenger rail service on the Brunswick line	Public Outreach Meeting
Difficult transition for trucks traveling from I-70 Westbound to I-270 Southbound, not a direct connection.	Stakeholder Interviews
East-West connectors between MD 85/MD 355/ and I-270 are very poor. Observed vehicles using Mall Loop Road (Within the Mall itself) as a major connector. Grove Road is currently the only straight across East-West connection between MD 85 and MD 355. There is some light industrial property off Grove Road West of MD 85.	Stakeholder Interviews
Intersection of U.S. 15 and MD 28 not wide enough to handle very long truck loads. Trucks back up to get around corner causing delays and safety issues	Stakeholder Interviews
Passing lanes on U.S. 15 very difficult for trucks. Partial access control on highway. Hilly terrain, short passing areas, long queues for passenger vehicles following trucks. High accident incidence because of slow moving vehicles.	Stakeholder Interviews
Access to the Costco from I-70 Exit 62 is sometimes very difficult for trucks because it is also the main commuter exit for local traffic. Trucks sometimes park on exit ramp as well.	Stakeholder Interviews
Low railroad bridge on MD 75 that restricts truck movement	Stakeholder Interviews
MD 75 near Union Bridge is a deficient highway. The road is narrow and winding and there are no shoulders. Dump trucks and outbound pneumatic bulk trailers sometimes roll and/or are involved in accidents	Stakeholder Interviews
Truck parking issues throughout the County. Sometimes park on side of roadway or freeway ramp inhibiting traffic flow and causing safety issues.	Stakeholder Interviews
Waste Energy Facility off English Muffin Way contributes to dozens of truck trips/day. Limited access to site and narrow roads	Stakeholder Interviews
Stanford Industrial park (between U.S. 15 and Cap Stine Road has relatively poor freight access and narrow internal streets	Stakeholder Interviews
Real issues with trains stopping when passing through Geoffrey Way industrial park where Toys R Us is located. Trucks cannot cross the tracks to get to the facility. Sometimes have to wait 3-4 hours for train to continue	Stakeholder Interviews
LaFarge has a concern with a project currently underway that is intending to improve highway access in front of quarry. This improvement may require the reorganization of traffic pattern within the quarry.	Public Outreach Meeting

Recognizing that bottleneck improvements are not overnight solutions, most freight oriented businesses in the County employ other operational methods to reduce the impacts of delays. For example, most businesses interviewed for this study utilize a system to alter freight delivery times. Most freight-oriented businesses have set pick-up and delivery times ranging from 5-7 in the morning to 4-6 in the evening. Some businesses even utilize 24 delivery dispatches or are available to be called for special gate times. Since the highway congestion is worst in the mornings and evenings, most freight operators encourage their deliveries to arrive either before the morning rush hour (7-9am) or afterwards. This is especially important for freight-oriented businesses whose products or services are time sensitive, such as the delivery of building stone to a job site before the start of the workday.

Land Use Challenges

Several businesses in the County identified freight transportation and land use "issues" during the outreach component of this study. These issues ranged from resident complaints as a result of operations to a difficulty in carrying on operations at their current location. One business having difficulties at their current site expressed major challenges in finding available land for expansion of their operations. This particular business is oriented toward truck traffic and neighbors and perspective property sellers seem uninterested in having a larger trucking company as a neighbor. This business noted that it was important to educate people on the benefits of freight transportation.

Most of the freight-oriented businesses interviewed and surveyed do not have direct neighbors where there are incompatible interests (truck noise, manufacturing operations). Some, such as Frederick Grain receive periodic complaints from neighbors but have not had to adjust operations as the trucks that are disturbing the neighbors are using public roads and highways.

Similar to other businesses focused on mineral mining operations, LaFarge deals with community issues including mitigation of dust and dirt from plant operations and track out dirt (spreading dirt and mud onto public roadways). LaFarge currently uses dedicated water and sweeper trucks to keep the dust down and to prevent track out. They also typically try to run the plant when weather is appropriate for operations. (i.e., not too windy).

1.3 OTHER KEY FINDINGS

In many ways, the interviews and survey responses validated the observations made by the study team during the Frederick County site visit and through discussion at the stakeholder meeting. Generally, there is a high level of satisfaction from major freight stakeholders in the County on the efficiency and access provided by the freight transportation system and its linkages with the existing land use. Many interviewees and survey respondents had no complaints and only recommended that the County continue working with the State

Highway Administration to improve the general flow of traffic on the major highways and keep them informed of major construction projects or land use changes that directly affect their access or operations.

Although, many major freight stakeholders are satisfied with the current freight transportation operations in the County, stakeholders consistently identified several cross-cutting issues that should be addressed. These findings will inform the recommendations for the freight and land use plan.

Truck parking

Nearly all the stakeholders interviewed cited truck parking as one of the major challenges for freight transportation in the County. This is an issue for both short-term (quick delivery and turn around) and long-term (overnight) parking. Truckers have adapted to the limitations in County truck parking by utilizing the sites at some of the major big-box retailers south of the City of Frederick (i.e., Walmart), parking along the ramps of major highways, or more institutionalized truck parking arrangements with a property owner with available space (Travelodge). There are two major challenges with meeting truck parking demand. The first challenge is the overall lack of truck parking facilities in the County. The second is the timing of when drivers need to rest according to commercial vehicle operation rules. Since drivers cannot, by law, exceed their log hours, when their drive time is up, they need to find a place to park. Making a long drive to a commercial truck stop outside of Frederick County is not generally an option and the drivers need to find more convenient locations.

Some freight-oriented businesses have taken proactive approaches to dealing with the truck parking challenge. Toys R Us indicated that with their large on-site for truck parking facility; they encourage truckers making deliveries who need to rest to use their site, since it is safe and does not affect other transportation operations elsewhere in the County. The site is guarded and the trucks are allowed to stay as long as they need. Other stakeholders such as the Costco warehouse educated the truckers that there was no parking available on-site and they should plan their visits no more than 2 hours before their delivery appointment. Costco confirmed that there is an existing truck weigh station off I-70 east of New Market but that it is not typically utilized by trucks.

Deficiencies of Key Freight Transportation Facilities

Congestion on key freight facilities in Frederick County is a major concern for freight stakeholders. Some of the major highways in the County used by trucks have severe congestion problems including I-70, I-270, U.S. 15, MD 75, and MD 85, with the interstates especially bad during the rush hours in the morning and evening. Other major challenges with freight transportation include service for trucks on major access routes (difficult turns onto on- and off-ramps, weaving required between interchanges, or local roads or roundabouts with insufficient turning radii).

Expansion Opportunities

Many freight oriented businesses have sufficient space for their operations and are very interested in future expansion (e.g., Costco, Toys R Us). Some businesses however, such as certain trucking companies, expressed difficulties in locating appropriate space for expansion. There is a general sense among survey and interview respondents that the County needs additional tracts zoned to freight oriented land uses in the County and that freight operations are best kept segregated from other types of land uses (i.e., commercial, residential). Frederick County has done a relatively good job to date consolidating freight-oriented businesses but needs to continue to promote the advantages of warehousing, distribution, and manufacturing facilities and provide enough land for the growth of the these industries.

1.4 APPENDIX

Figure 1.1 Freight and Land Use Plan surveymonkey.com Survey Instrument

1. General Business Information

As an initial evaluation of the freight and land use conditions in Frederick County, Cambridge Systematics is conducting a brief online survey of business owners, shippers, carriers, and customers in the County. This effort will help us better understand how private companies utilize the regional transportation system for moving goods. Additionally, we hope to improve opportunities to consider freight needs within local planning efforts and thus improve the business environment in Frederick County. Your survey responses will help the County, MWCOG (Metropolitan Washington Council of Governments), and the State provide better transportation services and coordinate land use.

The results of this survey will be used to help identify and develop solutions as part of the freight and land use planning process. Unless permission is provided, no specific company or contact names will be used in the documentation as a result of this effort. We do not expect the survey respondents to divulge any information which they are uncomfortable discussing or would in any way negatively affect business operations. However, the more detailed the information provided, the better the plan will be and the more specific the recommendations.

The following survey should not take more than 15-20 minutes to complete. If you are unsure of a response but feel you can make an educated guess, please do so. We may follow-up with respondents if additional clarification is needed on a particular response.

1. Please include your business information (optional).

Business Name:

Address:

City/Town:

State:

ZIP:

Email Address:

Phone Number:

2. Number of Employees on Site?

- ◯ 1-19
- ◯ 20-49
- ◯ 50-99
- ◯ 100-199
- ◯ >200

3. What types of goods or services do you provide?

- [ ] Retail Trade
- [ ] Professional Services
- [ ] Agriculture
- [ ] Restaurant
- [ ] Construction
- [ ] Arts and Entertainment
- [ ] Information Technology
- [ ] Manufacturing
- [ ] Biotech
- [ ] Hospitality
- [ ] Transportation and Warehousing
- [ ] Financial Services
- [ ] Wholesale Trade
- [ ] Government
- [ ] Non-profit
- [ ] Healthcare
- [ ] Other (please describe)

4. If applicable, please list the top three products or commodities that you ship and the top three that you receive.

Ship 1:

Ship 2:

Ship 3:

Receive 1:

Receive 2:

Receive 3:

5. Please estimate the volume or number of units of your average size shipment (i.e. total truckloads, total cubic feet, rail carloads).

6. Where do the majority of your deliveries originate?

- ◯ Locally, within Frederick County
- ◯ Outside Frederick County but within the State of Maryland, Washington DC or Northern Virginia
- ◯ Outside the State of Maryland, Washington DC or Northern Virginia
- ◯ Don't know

7. Where do the majority of your shipments terminate?

- ◯ Locally, within Frederick County
- ◯ Outside Frederick County but within the State of Maryland, Washington DC or Northern Virginia
- ◯ Outside the State of Maryland, Washington DC or Northern Virginia
- ◯ Don't know

2. Transportation Operations

8. If available, what is the approximate average length of haul for your shipments (truck or rail)?

- ◯ <50 miles
- ◯ 50-200 miles
- ◯ 200-500 miles
- ◯ >500 miles

9. What approximate time of day are the majority of your shipments sent?

- ◯ 6am-9am
- ◯ 9am-3pm
- ◯ 3pm-7pm
- ◯ all other hours

10. What approximate time are the majority of deliveries received?

- ◯ 6am-9am
- ◯ 9am-3pm
- ◯ 3pm-7pm
- ◯ all other hours

11. If available, what are the major roadways (in Frederick County) used for shipments from and deliveries to your facility? (check all that apply)

- ☐ I-70
- ☐ I-270
- ☐ MD 85
- ☐ MD 355
- ☐ MD 26
- ☐ MD 75
- ☐ US 15
- ☐ US 340
- ☐ Other (please specify)

12. What mode of transportation do you use for shipping (check all that apply)?

- [ ] Truck
- [ ] Rail
- [ ] Air
- [ ] Water
- [ ] Intermodal (both truck and rail)
- [ ] Other

13. On average, how many loads do you ship per day or week?

Truck loads?	
Rail cars?	
Other shipments (i.e. air cargo)?	

14. On average, how many loads do you receive per day or week?

Truck loads?	
Rail cars?	
Other shipments (i.e. air cargo)?	

15. Do you have access to on-site rail?

- ◯ No
- ◯ Yes

16. If so, do you use it?

- ◯ No
- ◯ Yes

17. If you do have access to rail and do not use it, why not?

18. Describe the benefits (if any) your facility could experience with rail access.

19. What strategies could help enhance rail access for businesses in Frederick County?

3. Constraints and Advantages of Location

20. How does your business benefit from the transportation options at its current location? (choose all that apply)

- [ ] Lower shipping costs
- [ ] Proximity to complementary businesses (i.e. suppliers)
- [ ] Other (please describe)

21. If you receive complaints from neighbors or customers as a result of your business operations? (i.e. noise, traffic, etc), please describe.

22. What are the major transportation constraints impacting your operations?

23. Please briefly describe any bottlenecks or areas of congestion affecting your business.

24. Please indicate specific location of bottleneck/congestion described in the previous question.

25. When do bottlenecks occur? (check all that apply)

- [ ] AM Peak
- [ ] PM Peak
- [ ] Both

Other Times (please describe)

26. Do you alter freight arrival/delivery times due to AM/PM peak bottlenecks?

- ◯ No
- ◯ Yes, (if yes, how?)

27. What transportation improvements (infrastructure or policy) would provide the greatest benefit to your operations?

28. What could Frederick County do to make the County more attractive to business?

C. Opportunities for Freight Facilities (Technical Memorandum)

Memorandum

To: Donald Ludlow
Cameron Millard
Cambridge Systematics

From: Abigail B. Ferretti
Partners for Economic Solutions, LLC

Date: May 20, 2011

Re: Frederick County Freight Analysis

Introduction

The following memorandum provides a review of existing market conditions for industrial space within Frederick County, focusing on opportunities to develop freight facilities with the goal of fostering economic development and jobs while minimizing negative community impacts. This analysis provides an estimate of future land needs for freight-related industries.

Methodology

The following list outlines our methodology.

1. **Reviewed employment growth projections for Frederick County**
   The Metropolitan Washington Council of Governments (MWCOG), in close coordination with member jurisdictions, prepares population, household and employment projections for each jurisdiction. Frederick County's projections reflect the existing development pipeline, zoning limitations and environmental considerations (such as forest conservation areas or other undevelopable land). These employment estimates are used for traffic modeling purposes and represent a good baseline for projected growth. The analysis focused on net job growth from 2010 to 2030.

2. **Assessed any outliers or potential problems with current employment growth projections**
   An initial review of current employment projections – to determine if the figures were reasonable and appropriate given current regional and Frederick County specific market and real estate trends – resulted in relatively few adjustments. These adjustments reflect the need to incorporate a portion of office employment growth estimates in addition to industrial employment growth estimates. These new office employees will occupy space located on industrially zoned land.

3. **Separated employment growth projections by industry and industrial growth corridors**

In the Existing Conditions report, the consultant team determined that freight activity in Frederick County is generally associated with industrial operations. These industrial operations typically include manufacturing, construction and raw material mining. However, these users typically have not sought properties with rail access in Frederick County. After an identification of the major locations, clusters, and corridors of industrial land use the team reviewed these areas to understand the potential growth and the impact on centers of freight transportation activity. The analysis focused on projections of industrial job growth as opposed to office and retail employment, though there is some overlap between office and industrial uses with flex and R&D users locating in industrial areas. These corridors span both the City of Frederick and Frederick County.

4. **Assigned industrial employment estimates to sub sectors (raw material/mining, construction, warehouse/distribution and manufacturing)**
   These estimates of sub sector employment growth reflected a review of different data sets in addition to MWCOG's employment projections– Maryland Department of Labor, Licensing and Regulation and County Business Patterns employment breakdowns for Frederick County. Only specific sections of Frederick County have land suitable for mining activity, requiring an adjustment to these industrial categorizations.

5. **Estimated land needed to support employment growth**
   Depending on the specific industry, the ratio of jobs to square feet of industrial space varies greatly. By applying industry standards for the amount of building space per employee specific to each subsector, we determined the need for industrial space. For manufacturing the ratio applied was 500 square feet per employee compared to 2,000 square feet per employee for warehouse / distribution. To determine total build-out for each sector, we applied an average floor area ratio (FAR) of 0.25, based on typical industry standards of 0.3 FAR for flex and 0.2 FAR for manufacturing.

6. **Utilized GIS mapping to match projections with zoning and development activity**
   To estimate the available industrial acreage, we reviewed existing zoning and the amount of developed land to determine the amount of available land (in acres) in each industrial freight growth corridor. In some areas this highlighted the need to expand the amount of industrially-zoned land to accommodate growth; in other areas, it revealed an excess amount of industrial zoning, considering employment growth projections.

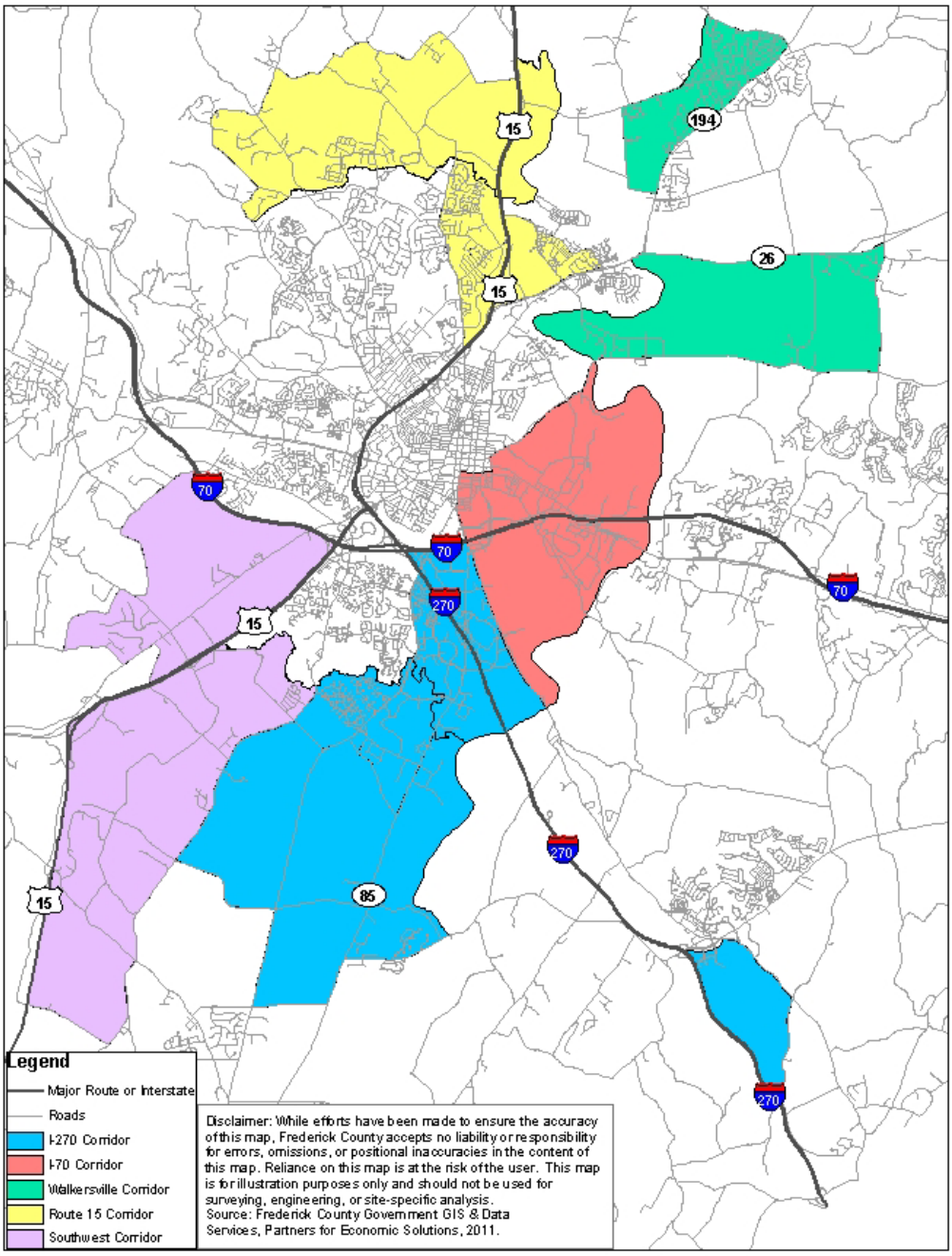
7. **Reviewed current County zoning designation for specific freight growth corridors**
   Zoning throughout the county reflects a series of different land uses. The available undeveloped land within the county consists of more than industrially zoned property but excludes resource conservation areas. GIS maps with current zoning and transportation analysis zone boundaries were used to compare projections and evaluate the existing zoning categories to determine if and where adjustments were necessary

Market Conditions Impacting Industrial Growth Corridors

PES profiled the market conditions for industrial business growth in Frederick County and the region. Industrial development tends to cluster around infrastructure supported corridors with excellent access to rail. Our analysis reviewed the physical assets of specific corridors, development pipeline and real estate location trends to select the five corridors best able to accommodate future industrial growth. The plans for development along the corridor and the potential for future growth relate to these specific growth corridors with existing infrastructure, which include

- I-270,
- I-70,
- Southwest Corridor, south of I-70, along Maryland Route 340/ Route 15,
- Route 15 north of Frederick City, and
- Walkersville/Maryland/Midland Railway Corridor.

Industrial Growth Corridors



Industrial space within Frederick County totals 2.2 million square feet, according to REIS, with an 18-percent vacancy rate. The amount of occupied industrial space increased with the positive direct absorption of 101,000 square feet in 2009, but returned to negative net absorption for 2010[1].

[1] Absorption is the change in the amount of occupied space. Absorption reflects net figures by calculating the amount of contractions against expansions and new leases.

Table 1. Industrial Space Trends, Frederick County, 2005-2010							
Year	Total Square Feet	New Construction	Vacant Square Feet	Occupied Square Feet	Occupancy Rate	Net Absorption	Average Rent[1]
Annual							
2005	1,721,000	52,000	79,000	1,642,000	95.4%	N/A	$17.09
2006	1,808,000	87,000	51,000	1,757,000	97.2%	115,000	$18.48
2007	1,938,000	130,000	163,000	1,775,000	91.6%	18,000	$19.00
2008	2,201,000	263,000	491,000	1,710,000	77.7%	(65,000)	$19.29
2009	2,201,000	0	390,000	1,811,000	82.3%	101,000	$19.55
2010	2,201,000	0	396,000	1,805,000	82.0%	(6,000)	$19.20
2005-2010 Change							
Amount	480,000		317,000	163,000	-13.4%		$2.11
Percent	26.5%		621.6%	9.3%	-13.8%		11.4%

[1]Average triple net rent, excluding taxes, utilities and janitorial.

Sources: REIS; Partners for Economic Solutions, 2011.

Industrial space users choose business sites based on accessibility (both truck and rail access), adequate utilities, acceptance of industrial operating conditions (impact of noise, odor and frequently outdoor storage) and the ability to get workers and customers to their business. They also consider the potential operating costs associated with a particular location, the land, building, taxes and other costs. The industrial space market within Frederick County serves distribution and warehouse operations, light to heavy manufacturing, construction and R&D uses. Frederick County's position at the crossroads of Interstates 270 and 70 allows construction contractors and other businesses to easily dispatch trucks to Baltimore, Washington, and outside the State of Maryland to Pennsylvania, Ohio, and West Virginia. Although Frederick County has excellent rail access, few companies seek properties with rail.

Both the City of Frederick and Frederick County offer space at rents lower than competitive markets, such as Montgomery County, averaging one-quarter to one-third less per square foot.

The economic downturn negatively impacted the construction industry, leaving unoccupied Class C and B space in excess of current demand. Interviews with area brokers revealed that industrial space rents for $6 to $8 triple net (NNN) per square foot[2], due in part to the overhang of existing vacant Class B and C space. Classing of commercial space helps to properly evaluate existing supply by differentiating buildings by physical condition and operating performance. Class A represents those buildings that command the highest rents and Class C represents those properties in average condition receiving lower than average rents.

These properties do not provide the same level of access and often have less desirable building formats, such as columns spacing, low-ceilings or lack of truck docks. Most manufacturers and distribution companies prefer modern industrial buildings on one floor with ample truck docks, clear-span construction space, redundant sources of power and

[2] Commercial market rents reflect the Triple Net Rents (NNN). A Triple Net Rent requires the tenant to pay for taxes, insurance and maintenance as well as rent and utilities.

telecommunications and the flexibility to expand at the current location. Increasingly, distribution/warehouse companies are seeking warehouses with ceilings at least 28 feet high to allow for stacking and mechanical retrieval of goods.

Flex/office space blurs the line between office and industrial land uses. Flex space is a single-story structure with a combination of office, warehouse and/or showroom space designed for flexibility to meet the tenants' needs. It is typically equipped with truck docks to facilitate loading. The flex/office market does not provide Class A office space but rather offers lower rents, easy access and surface parking. These flex/office buildings tend to command higher rents than traditional industrial space ranging from $9 to $12 per square foot as of the first quarter of 2011, depending in part on how much of the space is finished for office users.

For those zoning categorizes that allow flex office and or mixed-use commercial development, current market trends make it more favorable to use this land for office development. In general, office development provides better returns to property owners/ developers. Throughout the nation there are examples of office development crowding out light industrial users. Some jurisdictions do not allow such uses as a matter of right in industrial zones so as to prevent this inherent market conflict. It appears that in the past Frederick County has allowed these types of uses to move into light industrial zoned properties. This may have occurred as a result of the natural business development of the formerly industrial land or the acceptance of a 'non-conforming use'. This type of trend should be monitored carefully to determine if the County's previous precedents will impede its ability to keep up with market trends. In Frederick County the connection with Fort Dietrich attracted the National Cancer Institute (NCI) and companies associated with National Institute of Standards and Technology (NIST). The Urbana community continues to capture large office tenants including federal Social Security Administration, Fannie Mae and Banner Life Insurance Company.

For Frederick County, recent development activity shows an emerging bioscience cluster, which may relate to the demand for associated manufacturing facilities or low-cost industrial flex or R&D space to support Montgomery County's bioscience cluster at the Shady Grove Life Sciences Center. In the bioscience industries, manufacturing expertise and distribution networks do not need to be co-located with research and development operation. Frederick County will continue to serve and expand this market segment. Many of the county's new research and development (R&D) users remain in the southern portion of Frederick County only willing to expand into specific sections of Frederick City, such as Riverside Research Park north of the airport, but no further north.

Industrial Growth Corridor Conclusions

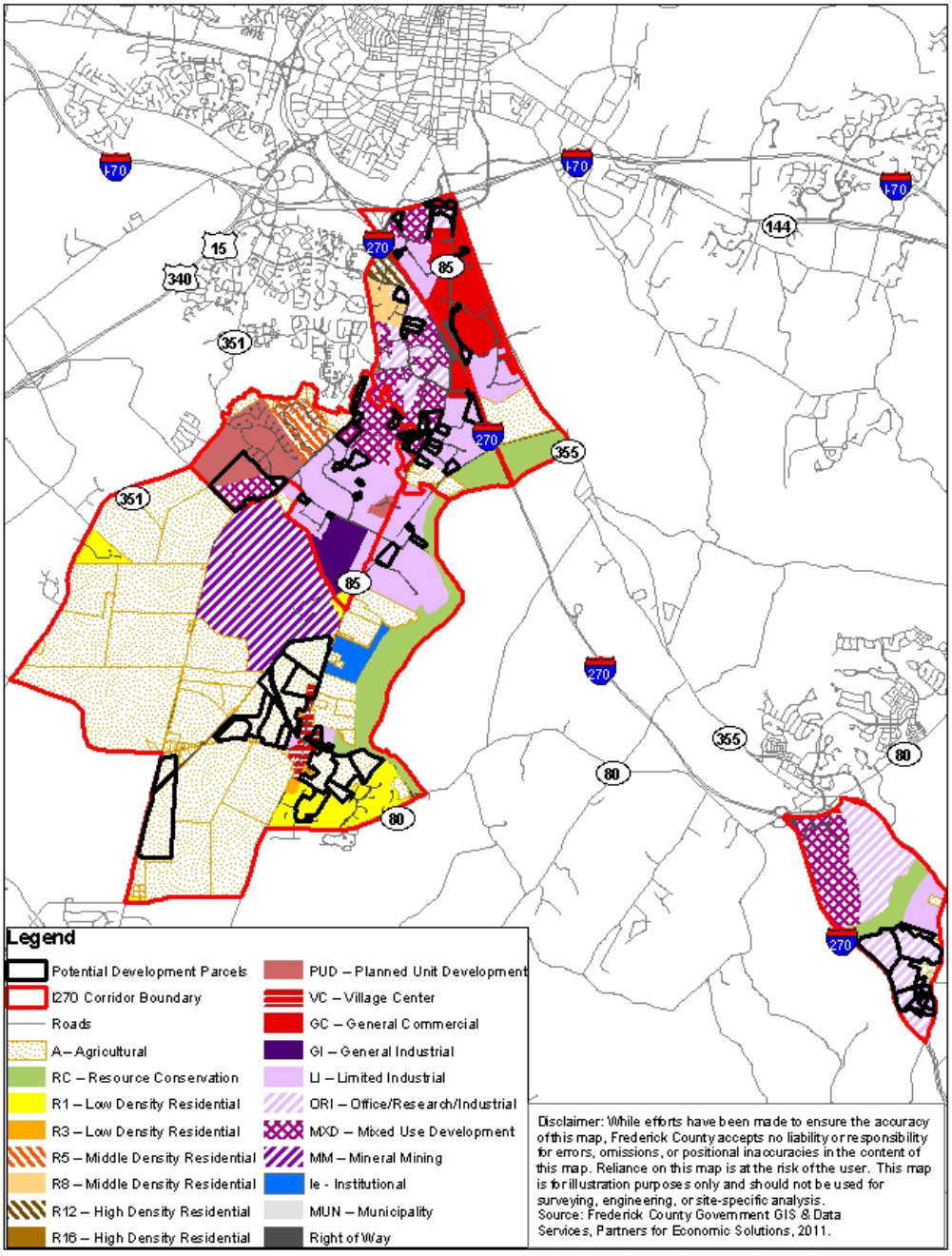
For each industrial growth corridor, projected employment growth by subsector was matched with available acreage to estimate build-out capacity. Maps associated with each growth corridor show the County's current zoning for these areas, as well as potential development parcels. This initial analysis highlights potential refinements to current land use codes or areas requiring future study.

I-270

The Interstate-270 corridor will continue to gain momentum as a bioscience hub with the addition of more R&D firms occupying building or land with existing light industrial zoning (including limited industrial and office, research and industrial). This growth corridor has mixed-use commercial zoning, accounting for more than 100 acres or approximately 12 percent of total available land area. This zoning category allows a more diverse base of businesses and often promotes highly desirable amenities and features for more traditional office users. The increased traffic and rapid suburban development further north in Frederick County help to position the southern section of the I-270 corridor because of its proximity to points further south. The southern section of I-270 avoids the delays and congestion of I-70, other parts of I-270 and other bottlenecks.

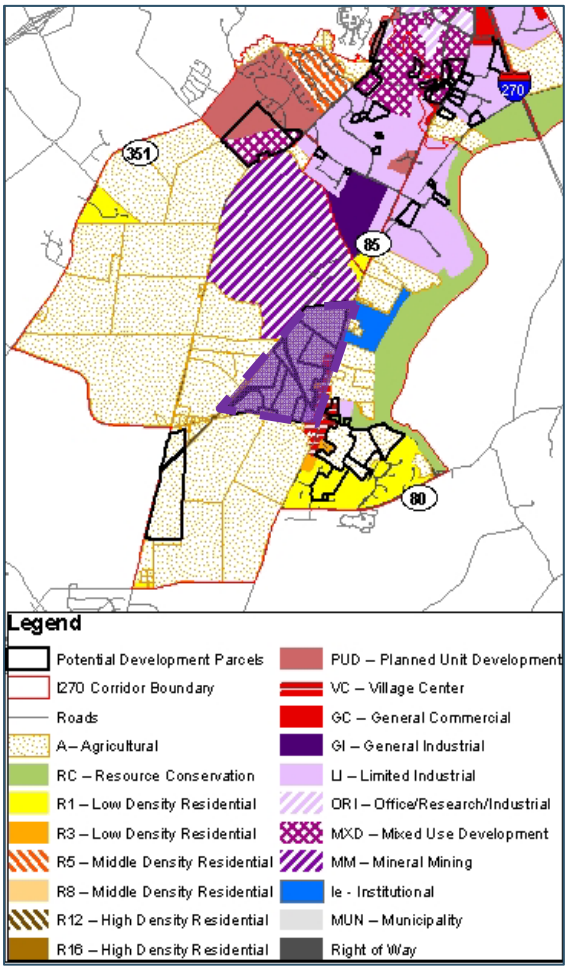
Throughout the entire corridor, growth will include the development of approximately 50 to 70 acres. This development will consist primarily of warehouse and distribution space and flex office for R&D/tech manufacturing, with only two percent for construction-related activity.

I-270 Corridor Development Opportunities



West of Maryland 85 along Buckeystown Pike, zoning provides for mineral and mining extraction uses, as several stone quarry operations exist along this section of the I-270 corridor. With necessary access to the rail line already in place, future development may occur. Initial estimates of this area suggest roughly 500 acres suitable for development that is currently zoned agricultural. However, the approximately 60 acres needed to accommodate industrial employment growth over the next 20 years can currently be met with the 260 acres of industrially-zoned undeveloped land that exists within the corridor.

The following map depicts the area to be reviewed more closely for a possible land use change to allow for future growth in the raw materials and mining subsector.



Represents potential area for future raw material/ mining opportunities

I-70

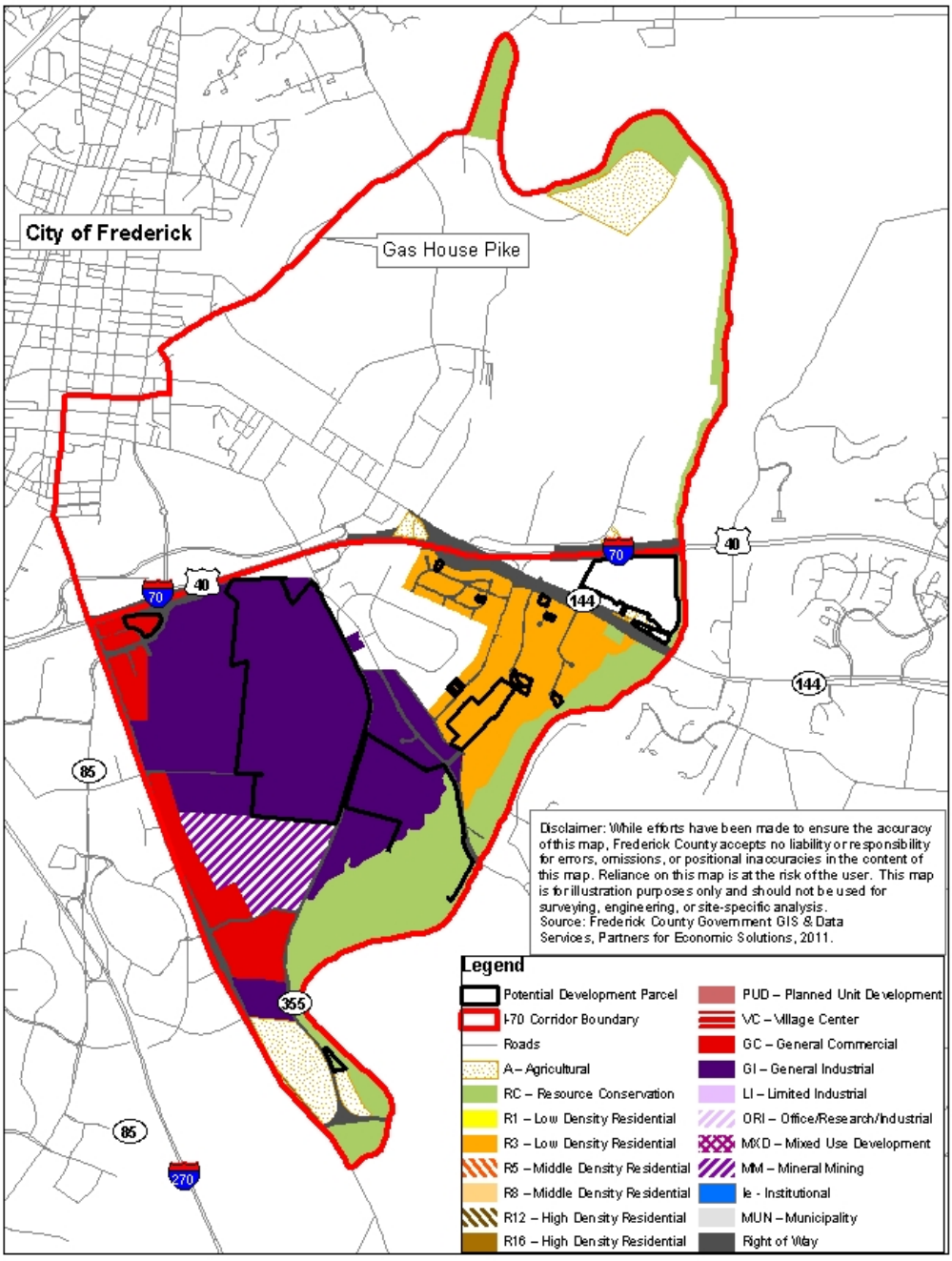
Interstate 70 serves as the major east-west route, bringing traffic west from Baltimore City through Baltimore, Howard, and Carroll counties. I-70 eventually provides access to points further west in Maryland, such as Hagerstown. For years the development pattern along the I-70 corridor expanded from the I-270 and I-70 intersection. As this area became more heavily built-out with the addition of the Francis Scott Key Mall and nearby airport, industrial growth was priced out of the I-270 and I-70 intersection pushing further east along US 40 and I-70. The corridor also includes a major mining operation in the southwest section of Maryland Route 355.

Future growth in the Frederick region will be attracted to the remaining sites close-in at the crossroads of I-270 and I-70. Riverside Research Park, located in Frederick City adjacent to the defined Industrial Growth Corridor, offers the best opportunity with more than 1.4 million square feet of future developable commercial space. The site's good location, access and infrastructure, with a fully leased 400,000 square-foot inventory, will attract much of the corridor's R&D growth in the next 10 years. In the mid- to long-term,

development near the airport and surrounding property will serve the needs of future employment growth for other industrial space.

Data from County Business Patterns and local broker interviews suggest that the types of users interested in industrial space for this growth corridor will include construction, warehouse and distribution after the overhang of vacant space is absorbed in another 24 to 32 months. The construction industry tends to be more price-sensitive and will not be a likely user of research park space within the city. A review of undeveloped land suggests that Frederick County's 350 acres of industrial zoned land within this growing area will go well beyond meeting current and future needs for the next 20 years. Initial estimates suggest approximately 30 acres necessary to meet future demand.

I-70 Corridor Development Opportunities



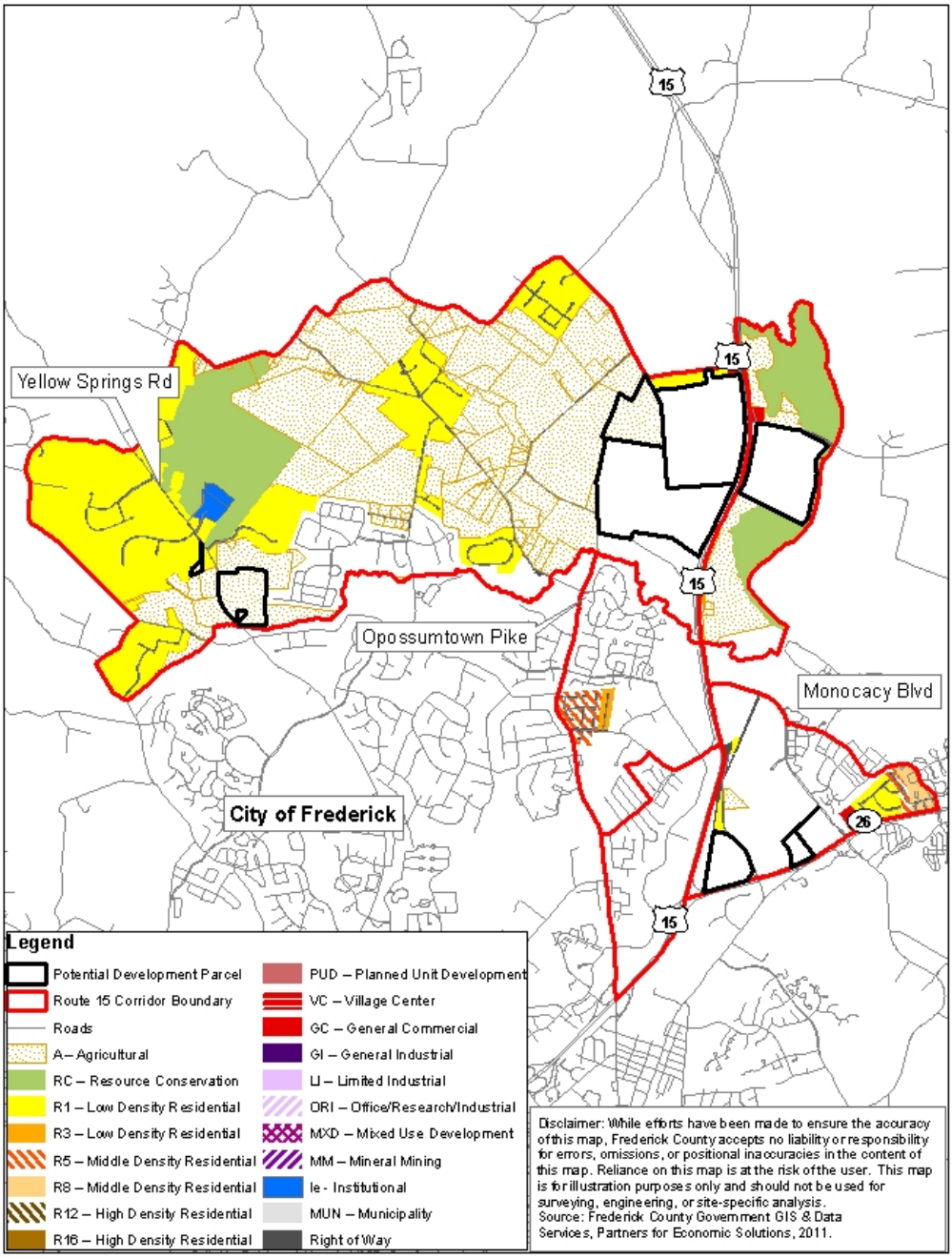
Route 15 Corridor - North of Frederick City

The greatest residential pressure within the Industrial Growth Corridors exists in the Route 15 corridor, outside of Frederick City and Fort Dietrich. This once agricultural

landscape has a series of new single-family developments north of the city, which typically do not prove to be good neighbors to industrial users. This corridor offers a direct route from Frederick City and via Maryland Route 340 from West Maryland to Pennsylvania, making it a popular truck route. Industrial development of the properties that border Route 15 seems reasonable. However, the pressure to convert to more profitable land uses, such as residential development, presents clear challenges. Growth projections suggest the addition of 500 net new industrial jobs and demand for predominately warehouse/ distribution space. Initial estimates suggest approximately 20 acres necessary to meet future demand.

Future development will require changes to existing agricultural land to meet growing needs for industrial space. Redeveloping properties that offer visibility and good access for new industrial users at Worman's Mill and on Frederick City annexed land along Route 15, would create new opportunities for the county.

Route 15 Corridor Development Opportunities



Note: Development parcels shown without zoning designation are located within the City of Frederick. The parcels to the west of U.S. 15 are zoned mixed-use in the zoning map for Frederick City and manufacturing/office to the east of U.S. 15. The southern-most parcels are zoned institutional.

Within the City of Frederick this growth corridor suffers from competing interests as industrial traffic conflicts regularly with residents and employees. The County and City need to coordinate efforts to adapt and/ or upgrade the intersections and roadways to make clear the right of way and yield hierarchy,

Southwest Corridor

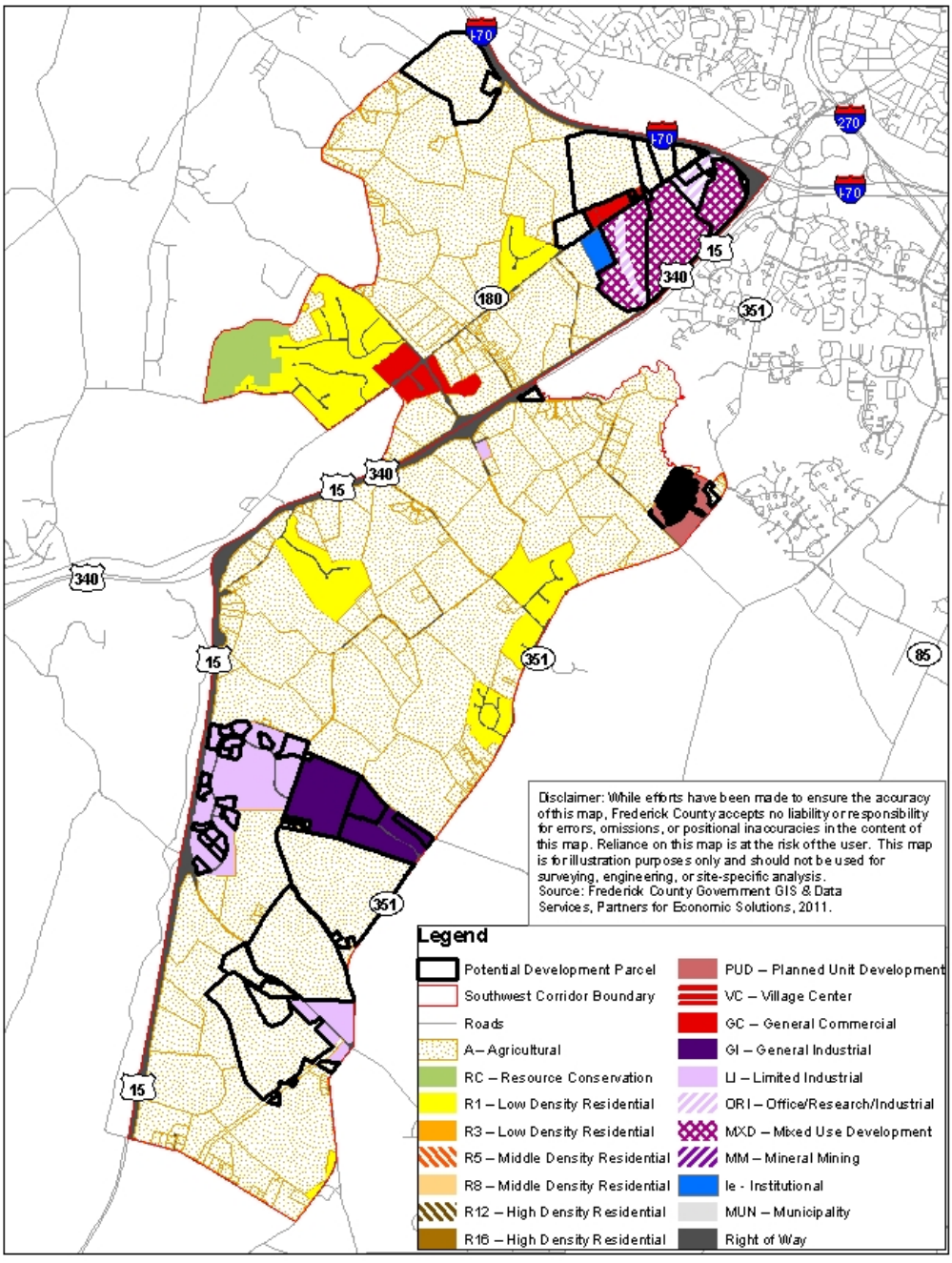
The Southwest Industrial Growth corridor runs along Maryland Route 340/15, a popular truck and travel route to West Virginia as well as into the City of Frederick. This heavily traveled route presents a large number of available properties for industrial growth, including the Stanford Business Park and other flex/industrial properties offered at reduced rates compared to the I-270 corridor.

Industrially zoned property between the Southwest Corridor and I-270 corridor consists of more than 1,400 acres owned by Alcoa, an international corporation. Within this property, Alcoa operated the Eastalco plant on approximately 350 acres along Manor Woods Road until it closed in 2005. The property is almost exclusively surrounded by agricultural land with the exception of a large parcel of industrial businesses that support agriculture across Buckeystown Pike to the west of the Eastalco plant. A quick literature search revealed interest from the State Department to redevelop the property and locate a training facility on the site. This type of reuse opportunity would certainly benefit the community as an anchor for job creation and redevelopment of a potential 'brownfields' site. Other alternatives for reuse of the property for industrial activity would require a specific user interested in rail access and willing to be located off the major truck routes.

Growth in this industrial sector will remain consistent with other development trends with a potential for mixed-use development where Route 15 intersects with I-70. This location presents many advantages for mixed-use commercial, which will drive up land prices and rents. More traditional warehouse/distribution and perhaps manufacturing operations are more likely to locate further south in this corridor. It is anticipated that manufacturing-related development could account for 65 percent of new growth in the next 20 years, estimated at about 10 acres by 2030.

The amount of available land for industrial development suggests a limited need to change the land use. While this is true for the corridor as a whole, the undeveloped agricultural parcels close to the I-70 and Route 15 interchange present better industrial sites with less potential to disrupt established residential neighborhoods. For this corridor it will be important to consider changes to these parcels rather than to expect industrial development to occur further north in the Route 15 corridor given market preferences for locations south of the city.

Southwest Corridor Development Opportunities

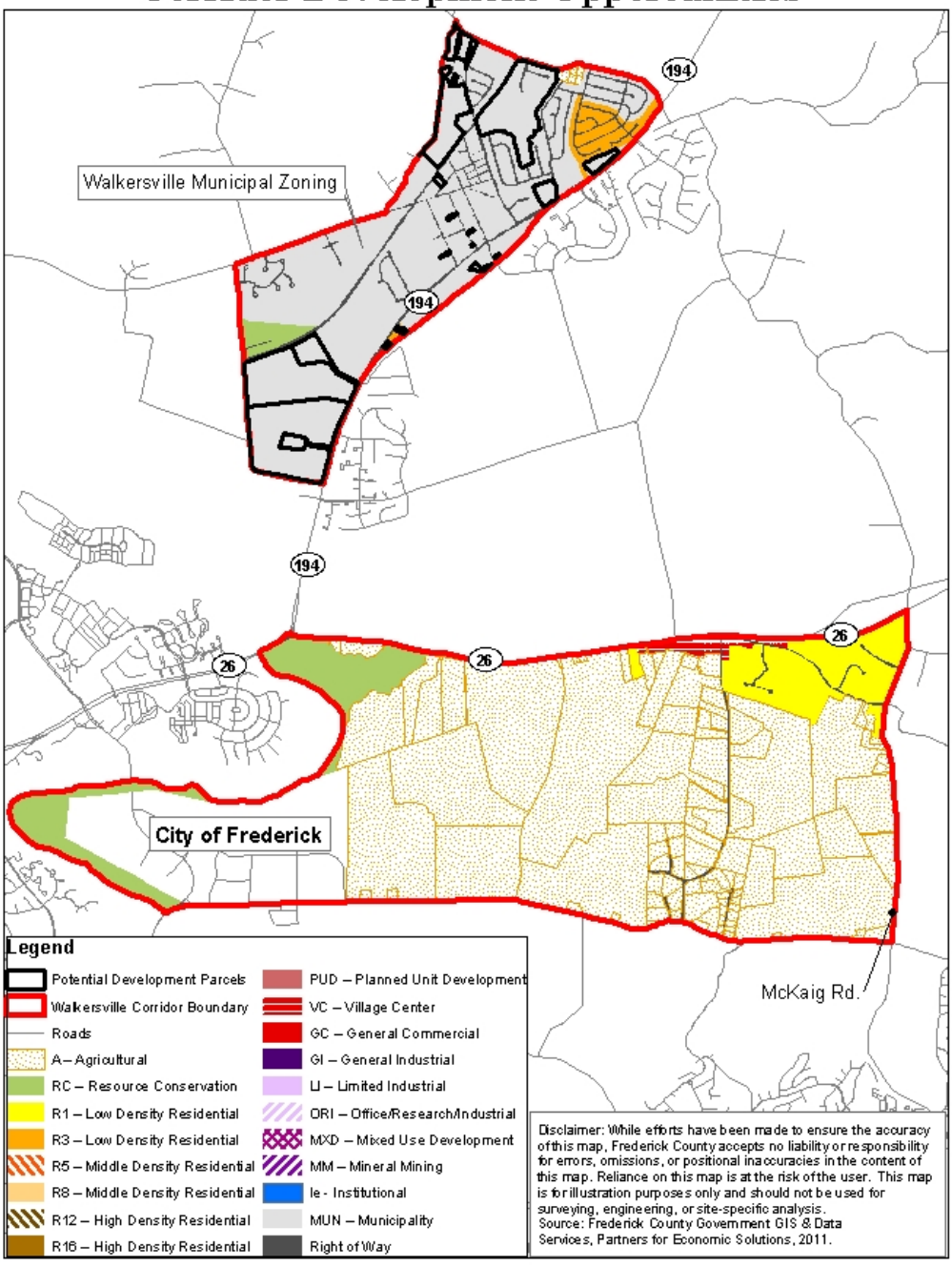


Walkersville/Maryland/Midland Railway Corridor

The Town of Walkersville presents one of the best locations within Frederick County for a concentration of mining activity and raw material production and distribution. Maryland Route 355 parallels the I-270 corridor. Construction contractors and distribution companies interested in easy I-70 access drive development in the area with concentrations along I-70 / US 40 between Maryland Route 355 and the airport. The industrial activity along South East Street in the City of Frederick presents the most favorable locations for industrial development.

Unfortunately, infrastructure failures and much needed but unfunded upgrades for Maryland Routes 26 and 194 and US 15 limit future development within this area. It will be important to maintain land in this section of Frederick County for light manufacturing and raw materials/ mining activity. Most of the area in Walkersville slated for industrial growth, estimated at 33 acres, is currently zoned by the Town of Walkersville for industrial uses and would need few changes to parcels to accommodate additional industrial space close to town. This area will need 40 to 50 acres for industrial development over the next 20 years, while the greater Route 194 and 26 corridors will need an additional 30 acres of industrial land. To meet this need, the County could rezone agricultural land along Route 194 not far from the rail.

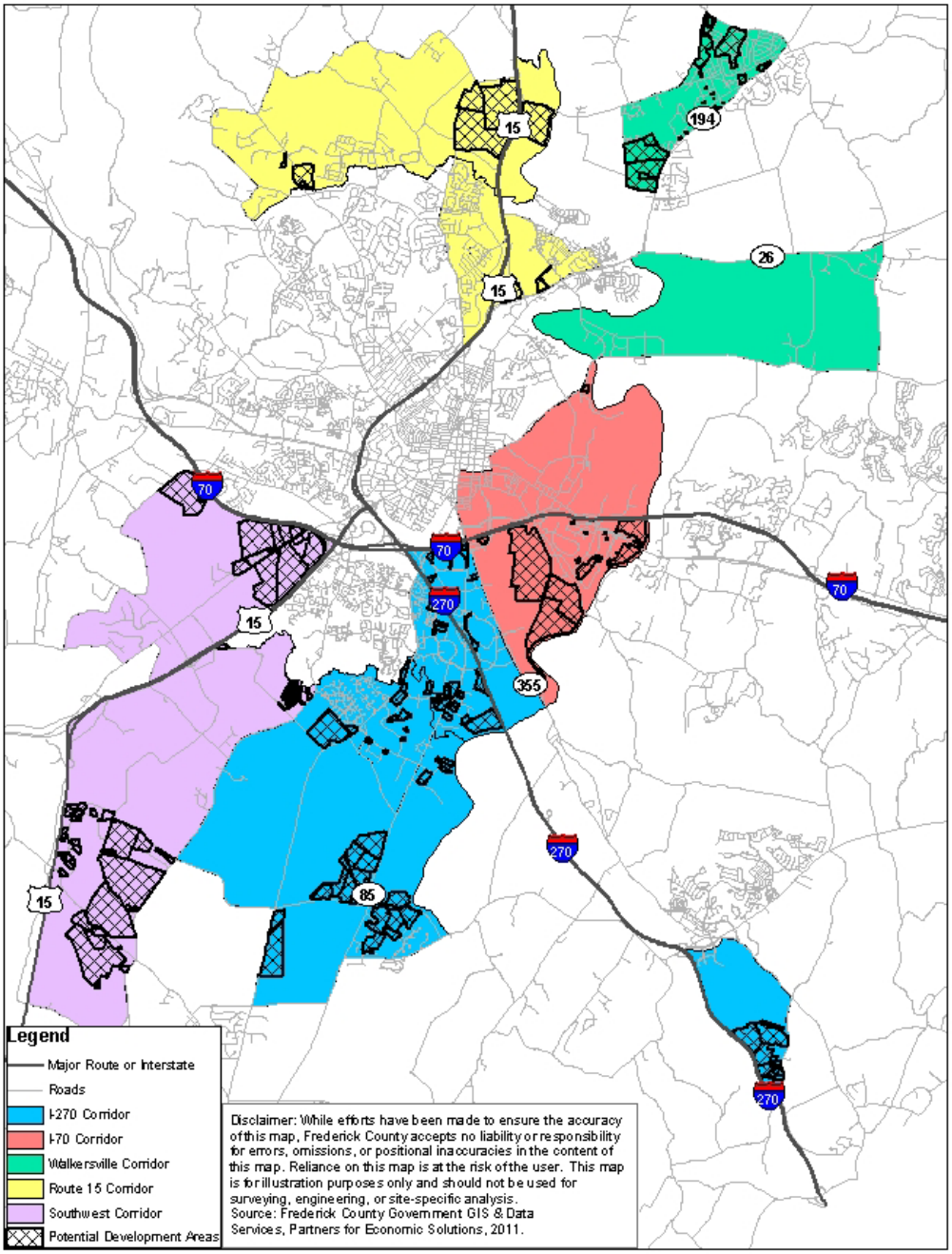
Walkersville/Maryland/Midland Railway Corridor Development Opportunities



Conclusions

Over the next 20 years Frederick County needs approximately 200 acres designated for industrial uses to meet future demand. Generally, Frederick County has an adequate supply of industrial zoned land. The following map shows underutilized parcels potentially suitable for industrial development.

Potential Development Areas



The evolution of development over time, in particular along the Route 15, 40, 340 and Maryland 85 corridors, shows the shift from light industrial to other uses. In some instances non-industrial uses may have been non-conforming uses. Some industrial users may have added rentals, sales, repairs and office space over time, resulting in land use changes.

Some development pressure exists to convert industrial land to other uses in the I-270 and Route 15 North corridors. The Interstate 270 corridor has an ample supply of industrially zoned land. Development for flex/office users may limit the availability of sites for freight-oriented businesses. Further review of specific parcels in these two corridors will be needed to assure sufficient industrial land exists to meet future demand. It is important to note that employment projections resulted in conclusions for 20 years of growth, but planning efforts need to extend for at least 40 years to allow for long-term growth.

Developable Acreage Calculations by Industrial Growth Corridor

Industrial Growth Corridor	Total Existing Acres	Estimated Undeveloped / Non-Resource Conservation Area Acreage					Acreage Needed to Support Employment Growth
			Undeveloped Industrial Zoning				
		Total Acres Undeveloped	Acres Zoned General Industrial	Acres Zoned Limited Industrial	Acres Zoned Office/ Research/ Industrial	Total Acres with Industrial Zoning	
I-270 Corridor	8,940	880	0	100	160	260	60
I-70 Corridor	3,950	390	350	0	0	350	30
Route 15N (North of City)	5,350	1,050	0	0	0	0	20
Walkersville	4,470	3,060	0	0	0	30 [1]	80
Southwest Corridor	8,050	1,260	130	100	0	230	10
Total Growth	**30,760**	**6,640**	**480**	**200**	**160**	**840**	**200**

Note: The disaggregation to TAZs reflects county-wide industry breakdowns and obscures differences in industry make-up on the TAZ level. Without ES202 data on jobs by industry by TAZ, accurate estimates at the TAZ level are not possible, therefore data should be considered at the corridor level.
[1] The Walkersville Industrial Growth Corridor contains no Industrially-zoned Undeveloped County land. However, approximately 30 acres of Undeveloped land within the Town of Walkersville is already zoned for Industrial development.
Source: Partners for Economics Solutions, 2011.

Area brokers currently receive few inquiries from parties interested in access to rail as a deciding factor for locating in Frederick County excluding mineral mining companies. While it is likely that these users represent a smaller portion of demand, the amount of property with good access to other truck routes and rail continues to diminish over time. Long-term land use policies should seek to protect properties with rail access as energy prices rise and encourage greater dependence on rail. Most important will be rail-served sites with good highway access in the I-70 and Southwest corridors.

Truck-based freight generates some localized impacts in the county, including congestion on the major interstates, highways and state routes.

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D. *Truck Modeling Tools Summary*

MWCOG/TPB Travel Demand Forecasting Model Freight Applications for Frederick County

Overview

The Metropolitan Washington Council of Governments (MWCOG) develops travel demand forecasts for the Washington Region. These forecasts include estimates for residents and non-residents trips by vehicle type including private automobile, public transportation, and medium and heavy truck. Medium truck refers to FHWA Class 5 vehicles and heavy truck refers to FHWA Classes 6 through 13. Within MWCOG, the National Capital Region Transportation Planning Board (TPB) is responsible for the development, application, and maintenance of the travel demand forecasting model. This model covers the MWCOG region as well as parts of adjoining jurisdictions from neighboring regions including the George Washington Region Council (GWRC) and the Baltimore Metropolitan Council (BMC).

The current regional travel demand forecast model is Version 2.2. This model set includes explicit trip rates for medium and heavy trucks. The original rates were developed based on survey data from 1968. There have been limited updates over time, but the rates essentially remain unchanged and there has been not been any extensive validation of the truck trip rates since their original development.

Cambridge Systematics, Inc. has developed an application tailored for Frederick County that supplements the TPB model set. This application uses the final trip tables from the TPB model and disaggregates those in Frederick County to a finer subzone system. In the TPB Version 2.2 model, the County is represented by 30 zones. In the subzone application developed for the County, Frederick County is represented by 136 subzones while all other jurisdictions retain the same zone structure. This requires that land use data (including population, households, and employment by type) be available at this finer subzone scale. Trips in both models are separated into four purposes (HBW, HBS, HBO, and NHB).

The subzone application splits all of the trip tables from the Version 2.2 model into the finer zone structure for the County and then assigns the trips to the more detailed network. Factors are developed to split each of larger zones into the constituent subzones based on population and employment data on a subzone basis. In this application, trips associated with shopping will only be allocated to subzones that have retail employment. The current TPB model includes separate trip tables for medium and heavy trucks. The truck tables are split using the same factors as the non-home based trips.

Applications

The use of the TPB Version 2.2 travel demand forecasting model and the subzone assignment application developed for Frederick County should allow Frederick County planning staff the ability to evaluate the impacts of future transportation network and land use changes on truck traffic.

Validation

A validation effort is necessary whenever a subarea or sector plan is conducted for a specific area within Frederick County. Validation provides an understanding of the model's level of accuracy. Understanding this level of accuracy is important in evaluating model results for future years and comprehending possible shortcomings of the forecast. This effort should focus on validation of base year traffic volumes on major roadway facilities in the study area. Where trucks comprise a major component of traffic volumes, then truck volumes also need to be a focus of the validation work.

If issues arise with the validation, possible solutions include reviewing the land use inputs for accuracy and reviewing the highway network coding. If the correct number of vehicles is being estimated in the area, but the assigned volumes on key routes are not within the acceptable ranges for the validation, another potential solution is to add in more detail to the roadway network. If the number of vehicles being estimated in the study area is low or high, reviewing the land use inputs might provide a solution. Given the limitations of the trip generation model for truck trips, applying factors to the truck trip tables may be an acceptable method to better represent truck traffic if the estimated volumes do not validate well.

Special Generators

The coarseness and corresponding limitations of the truck trip generation model may not accurately represent specific commercial uses and the truck volumes associated with these sites. Often times in travel demand forecasting models, freight traffic is represented by a special generator. However, it is possible to develop truck trips for a specific subzone by using the County's subzone assignment application. In this case, County staff would follow this process:

1. Identify the specific site and which subzone in which it will be located.

2. Develop separate truck trip generation rates for the site. In some cases, truck trip rates for a similar site or from a national reference can be used. The use of ITE trip generation or truck trip generation rates from the *Quick Response Freight Manual* may also be suitable.

3. The additional truck trips need to be incorporated into the trip tables. Unless specific data is available about the distribution of these trips (i.e., this site will exclusively serve another facility to the west on I-70), these new trips should follow the distribution represented in the model.

4. The revised trip tables can be assigned to the network and analysis completed.

The model applies factors to divide the daily trip tables into three periods: morning peak, evening peak, and off-peak. However, these factors are validated for the entire region, and may not be applicable to Frederick County or a specific roadway facility. Therefore, it is advisable that when adding the trips to the trip table, the focus should be on total daily trips. The time period specific tables are useful in terms of the assignment process, but are not useful in terms of evaluating results. If time period specific analysis is required, local count data from the facilities in question should be used to develop more accurate time period factors.

Version 2.3 Model

Currently MWCOG/TPB are working to develop a revised travel demand forecasting model. The model is supposed to be ready for use by the fall of 2011. This model includes several updates and improvements over the Version 2.2 model including an improved freight model for heavy and medium trucks. The new Version 2.3 model has estimated truck trip rates based on synthesized truck count data. A matrix fitting procedure was used to take the surveyed truck count data and synthesize a truck trip table for a base year. The trip table was then used to develop truck trip rates.

The Version 2.3 model also includes five employment categories for trip generation, as opposed to four in the previous version of the model. The new category is for non-retail trips. The model includes additional trip purposes which should better capture non-home based trips. Version 2.3 is also calibrated on household survey data collected in 2007/2008 and includes a new more complex mode choice model. In addition, Version 2.3 includes a much finer zone system; Version 2.2 has 2,191 zones while Version 2.3 will have 3,722 zones, with 130 zones in Frederick County. In the near future, the Version 2.3 model may allow Frederick County to increase the number of subzones used in the subzone model.