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Beyond the Legion Bridge: An Evaluation of the Transportation Connections between Montgomery and Fairfax Counties

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Abstract

Since the completion of the American Legion Memorial Bridge in 1962, Montgomery County, Maryland, and Fairfax County, Virginia have each transformed from mostly rural counties into the two largest and wealthiest jurisdictions in the Washington region. In spite of these changes the Legion Bridge remains the only direct transportation link between the two counties. The absence of transit service or alternate road connections between Montgomery and Fairfax have continued to burden the bridge and its approaches with increased traffic and congestion, likely discouraging the movement of people and goods between the two counties. Recent studies of potential improvements to the bridge have demonstrated that even large-scale investments to increase the bridge's capacity would only have modest effects on reducing congestion. As such, future connectivity improvements between Montgomery and Fairfax will require a broader range of interventions, potentially including transit, managed lanes, alternate routes for trucks and commuters, and trip reduction strategies.

Introduction: 50 Years of Growth and Change

Over the past 50-plus years Montgomery County, Maryland, and Fairfax County, Virginia, have grown up together, transforming from quiet rural communities to bedroom suburbs to major urban centers. Today Montgomery and Fairfax are the two largest and wealthiest jurisdictions in the Washington DC Metropolitan Area (WMA). They collectively account for 36 percent of the metro area's population, 36 percent of its jobs, and 44 percent of its personal income. The two counties each outpace the metro area in terms of household income, home values, and levels of educational attainment.

Table 1
Comparison of Montgomery, Fairfax, and Washington DC Metropolitan Area

Item	Montgomery	Fairfax*	WMA
Population, 2012	1,004,709	1,118,602	5,860,342
Full-Time, At-Place Jobs, 2011	447,238	581,120	2,896,522
Total Personal Income (\$Billion), 2011	\$69.1	\$78.1	\$338.5
Median Household Income, 2011	\$92,909	\$105,797	\$86,680
% of Adults Age 25+ w/Bachelor's	57%	59%	50%
Median Home Sale Price, April 2013	\$402,550	\$447,500	\$372,550

*Does not include the independent cities of Fairfax or Falls Church

Source: Bureau of the Census; Bureau of Labor Statistics; Bureau of Economic Analysis; RealEstate Business Intelligence, LLC

As Montgomery and Fairfax have grown and changed over the past half-century, the transportation networks both within each county and between the counties and the surrounding region have evolved. On a regional level the Metrorail system has greatly improved mobility, but it mostly moves people into and out of DC, and not around suburban areas. The region's road network has expanded as well, with the Departments of Transportation in Maryland and Virginia both having spent billions of dollars to build new highways and arterials and expand existing facilities.

One thing that has changed little is the American Legion Memorial Bridge. The bridge, which carries the Capital Beltway (Interstate 495) over the Potomac River, is the only direct transportation connection between Montgomery and Fairfax counties. When it opened as the Cabin John Bridge in 1962 the bridge had six travel lanes; it was expanded to ten lanes in 1992 (eight through lanes, two exit lanes)¹. Through all of the growth and change that has occurred in Montgomery and Fairfax the bridge has continued to serve as the only connection between the two counties.

In recent years business and political leaders on each side of the river have discussed the potential for new and/or better connections between Montgomery and Fairfax. Ideas have included:

- Further widening of the Legion Bridge, including dedicated bus/BRT lanes in either direction;

¹ "Transportation Across the American Legion Bridge," Ronald F. Kirby, July 25, 2012

- The construction of a new “Techway” to connect I-270 and the Dulles Toll Road, with a bridge crossing west of the Legion Bridge;
- Expanding the I-495 HOT lanes into Maryland;
- Mitigating bottlenecks at interchanges on either side of the bridge; and
- Building a rail transit connection between Bethesda and Tysons Corner.

Many of these projects would be transformative, reshaping land use and development patterns and altering the daily transportation decisions made by millions of people. Whichever combination of interventions is ultimately selected—or not selected—will set Montgomery and Fairfax on a course for the next 50 years, much as the Legion Bridge itself did.

This report examines the underlying factors that guide the daily transportation choices made by individuals around the region and offers commentary about the types of improvements that would address these factors. The intent of the report is to provide additional data and insight into the current and future inter-county transportation needs in Montgomery and Fairfax counties.

Changes in Population, Employment, and Traffic

When the Cabin John Bridge opened to traffic in 1962 Montgomery and Fairfax counties were transitioning from rural areas into bedroom communities, and their cumulative population was about 600,000. Though the two counties have developed into major population and employment centers with more than two million residents and one million jobs, the bridge remains the only direct route between them. There is not even any direct transit service between Montgomery and Fairfax—a Metrobus line that operated over the bridge from 1998 to 2003 was discontinued due to low ridership², in large measure because the buses did not have dedicated lanes and had to suffer through the same traffic congestion as private vehicles.

Figure 1. The Legion Bridge Corridor

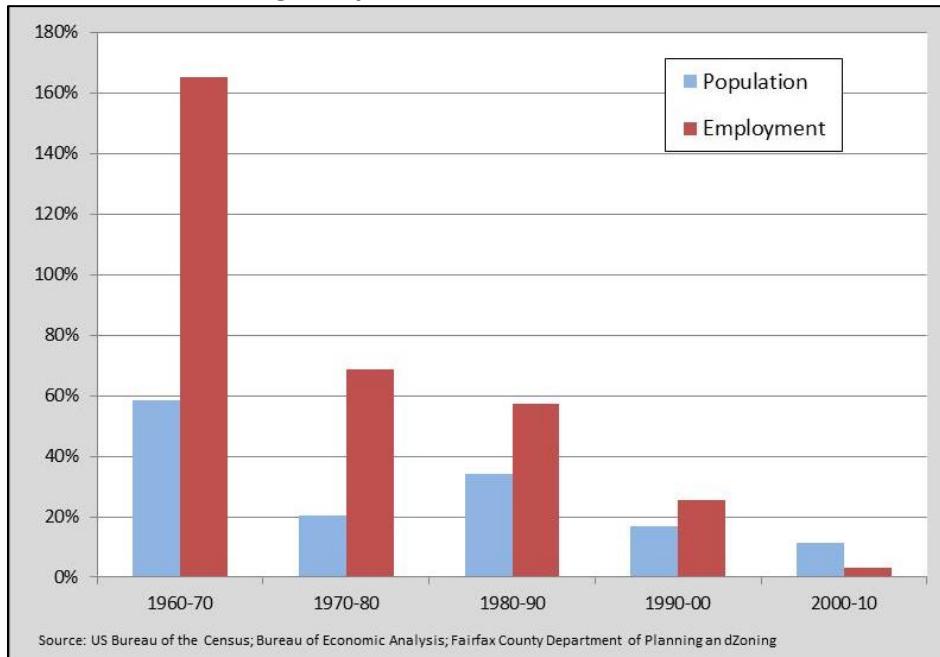


The bridge opened for traffic in the midst of the post-World War II suburban boom. In 1950 the two counties were largely rural, with most of their 263,000 people clustered around the borders of the District of Columbia, Arlington, and Alexandria. Between 1950 and 1960 each county more than doubled in population, adding a total of 353,000 more residents, and then the two counties added nearly a million residents between 1960 and 1990.

² Kirby, op. cit.

By 1990 each county had more residents than the District of Columbia, and Montgomery and Fairfax accounted for 40 percent of all residents in the Washington metro area. During this era the two counties began to emerge as employment centers as well, with the development of “edge cities” like Bethesda, White Flint, Silver Spring, and the I-270 corridor in Montgomery, and Tysons Corner, Fair Oaks, and Reston in Fairfax. By 1990 Montgomery and Fairfax counties were home to more than 1.5 million residents and about 900,000 jobs (BEA).

Figure 2
Population and Employment Growth Rates by Decade
Montgomery & Fairfax Counties, 1960-2010



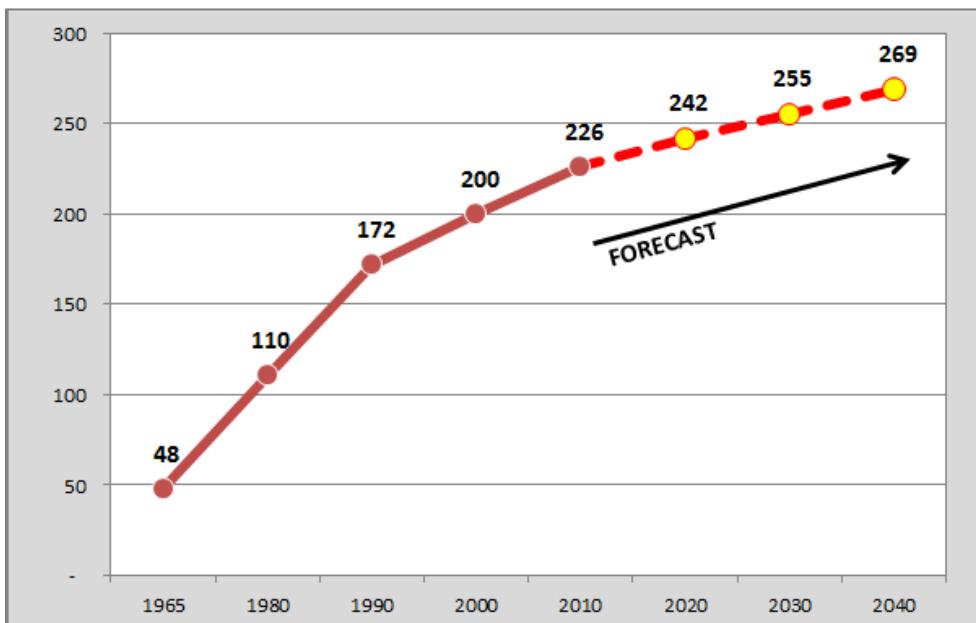
Note: Fairfax County does not include the independent cities of Fairfax or Falls Church

Source: Bureau of the Census; Bureau of Economic Analysis; Fairfax County Dept. of Planning & Zoning

This combination of employment and population growth generated ever more traffic on the Legion Bridge. From 1965 to 1990 the number of cars traveling over the bridge each day increased from 65,000 (MWCOG) to 172,000 (VDOT), a growth rate of 164 percent, which was in line with the total population growth of 155 percent from 1960 to 1990.

Two factors suggest that traffic volumes should have stabilized since 1990. First, the completion of the Metro Red and Orange lines to Shady Grove and Vienna/Fairfax in the mid-1980s created new options for residents of Montgomery and Fairfax to commute into the District of Columbia or Arlington. Second, population and employment growth rates have slowed considerably in the two counties since 1990. Between 1960 and 1990 the number of jobs in the two counties increased by 600 percent and their cumulative population increased 150 percent. From 1990 to 2000 the growth rates were 25 percent for employment and 17 percent for population. These rates both declined between 2000 and 2010, with employment only growing by three percent and population by 11 percent.

Figure 3
Average Annual Daily Traffic (AADT)
American Legion Memorial Bridge, 1965-2040 (000s)



Source: Metropolitan Washington Council of Governments; Virginia Dept. of Transportation

Since 2000 traffic counts on the American Legion Memorial Bridge have increased at a faster rate than either population or employment in the two counties. From 2000 to 2010 the average number of cars traversing the bridge each day increased from 172,000 to 226,000, a 13 percent growth rate. The Metropolitan Washington Council of Governments (MWCOG) projects an additional 19 percent increase in traffic to 2040, which would put the future traffic count at about 269,000.

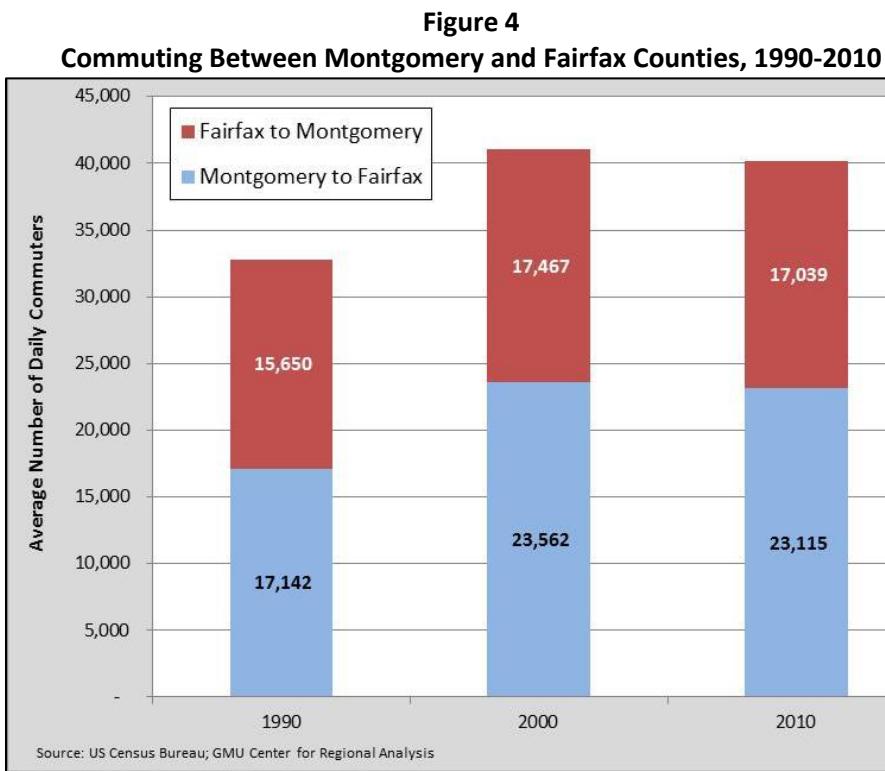
There are four potential theories that may explain why traffic increased at a faster rate than did population or employment:

- Changes in employment in each jurisdiction have reshuffled their commuting patterns
- The number of commuters using the Legion Bridge to get from one area to another within the region is increasing.
- Commuters from rapidly growing fringe counties are using the bridge to commute to jobs in Montgomery or Fairfax
- The number of non-commuter trips over the bridge has increased due to and increased population of retirees and other adults not in the labor force

These theories are examined below.

Theory 1: Employment changes have altered commuting patterns

From 1990 to 2010 Fairfax County outperformed Montgomery County in terms of job growth. The number of jobs in Fairfax (including Fairfax City and Falls Church) increased by 159,000. During the same period Montgomery only added 67,000 jobs. This disparity was even more pronounced from 2000 to 2010 when Fairfax added another 40,000 jobs, while Montgomery actually lost about 4,000 jobs.



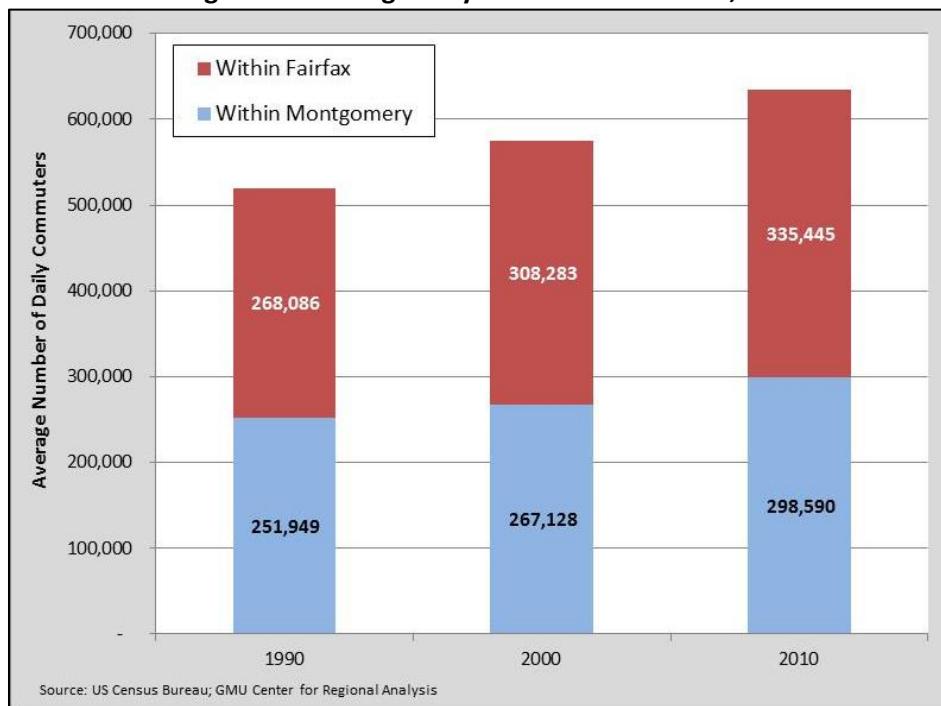
Note: Fairfax includes the independent cities of Fairfax and Falls Church

Source: Bureau of the Census; GMU Center for Regional Analysis

Commuting patterns have generally tracked with job growth. In 1990, of the 33,000 daily commuters between the counties, 52 percent lived in Montgomery and worked in Fairfax. From 1990-2010 the total number of daily commuters between the counties increased 22 percent to 40,000, with the Montgomery resident share increasing to 58 percent.

The disparity in job growth was consistent with changes to commuting patterns between 1990 and 2000. The number of people commuting from Montgomery to Fairfax increased 38 percent between 1990 and 2000, compared with a 12 percent growth rate in the number commuting from Fairfax to Montgomery. However, to employment and commuting patterns since 2000 seem contradictory. While employment changes from 2000-2010 would predict an increase the number of commuters from Montgomery to Fairfax, the number of people commuting from Montgomery to Fairfax actually declined during the decade. The number of commuters from Fairfax to Montgomery also declined, but this is not surprising, given the employment losses in Montgomery.

Figure 5
Commuting Within Montgomery and Fairfax Counties, 1990-2010



Note: Fairfax includes the independent cities of Fairfax and Falls Church

Source: Bureau of the Census; GMU Center for Regional Analysis

While commuting between Montgomery and Fairfax counties has been on the decline, the numbers of people commuting within each county has been on the rise. In 1990, about 520,000 residents of Montgomery and Fairfax counties worked in their home counties. This number increased in both jurisdictions during each of the past two decades; by 2010, more than 634,000 people stayed within their home counties to go to work each day. The changes were similar in each county: the number of Montgomery residents also working in Montgomery increased by 19 percent, while Fairfax's in-county commuter figure increased by 25 percent.

Another issue related to commuting is how commuters are actually traveling over the bridge. Surveys of household travel behavior conducted in 2008 by MWCOG found that more than 90 percent of daily commuters using the bridge are in single-occupancy vehicles³. With no bus service and no carpool/HOV lanes available over the bridge, there is presently no incentive for commuters to consider alternatives to traveling alone in their cars, no matter how unpleasant the drive may be.

Finding: The bi-directional decline in commuting between Montgomery and Fairfax counties, coupled with increases in intra-county commuters, suggests that traffic congestion around the American

³ Kirby, op. cit.

Legion Memorial Bridge has discouraged people from traveling between the two jurisdictions each day.

Theory 2: More commuters are using the bridge as an alternative route

The western portion of the Capital Beltway is not alone in the Washington region in its status as a highly congested corridor. Congestion and delays are common along many other commuter routes in the region; as such, commuters may be looking for alternatives to their daily struggles.

Three such routes are: 1) the approaches to the District of Columbia from Montgomery County (Clara Barton Parkway/Canal Road, River Road, Connecticut Avenue, etc.); 2) the northern segment of the Capital Beltway between I-95 and I-270; and 3) the southern segment of the Beltway, including the Woodrow Wilson Bridge.

The first group of routes concerns Montgomery residents who work in DC, Arlington, or Alexandria, who may take the Legion Bridge to the George Washington Memorial Parkway instead of traveling through DC. There has been very little increase in number of Montgomery County residents working in these three locations over the past 20 years. In 1990, a total of 116,000 Montgomery residents commuted to DC, Arlington, or Alexandria; in 2010, the number had only increased to 120,000. Given the availability of transit options to Montgomery residents commuting to these locations, it is likely that the net increase in drivers using the Legion Bridge for this purpose has been modest.

The other two routes are affected by those commuting between Prince George's County and either Montgomery or Fairfax. The primary users of these routes would be residents of southern Prince George's who work in Bethesda or the I-270 corridor or residents of northern Prince George's who work in Tysons Corner or the Dulles Corridor. While the numbers of Prince George's residents commuting to both Montgomery (+3,299) and Fairfax (+2,900) did increase between 1990 and 2010, the share of these individuals using the Legion Bridge is probably small, as most either used the northern segment of the Beltway (to Montgomery) or the Woodrow Wilson Bridge (to Fairfax).

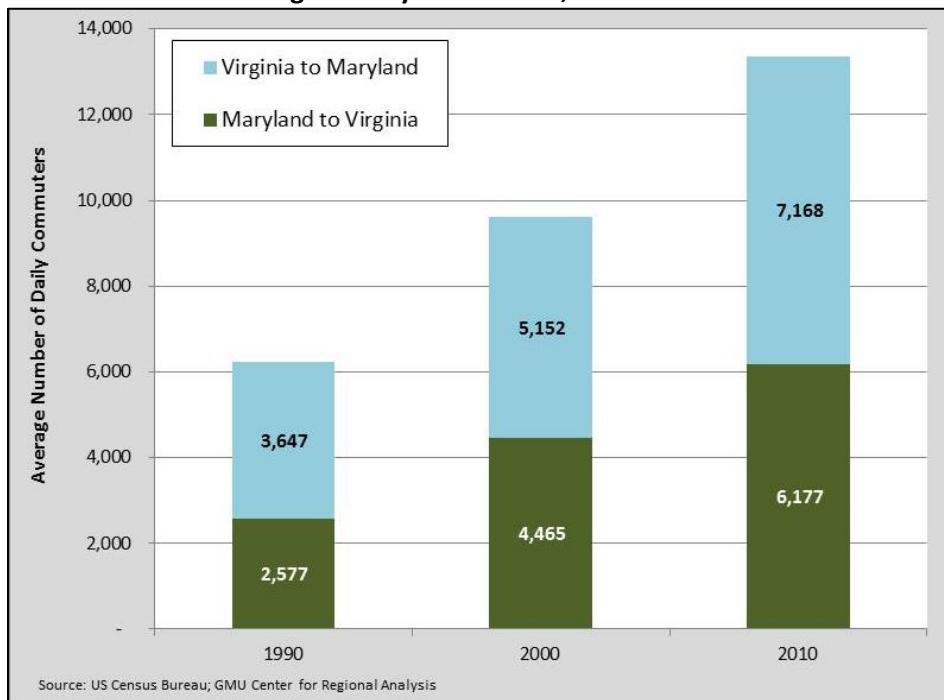
A caveat to this issue is the effects of the construction projects involving the section of the Beltway between the I-95/I-395 "Mixing Bowl" interchange and the Wilson Bridge. This segment of the Beltway was consistently under construction for more than a decade, with work just being completed in 2013. The upheaval caused by this construction may have caused some commuters to avoid the area and instead go the other direction around the Beltway, thus increasing traffic counts on Legion Bridge. This theory may have some credence, as the traffic count on the Legion Bridge did decrease by 2,000 cars from 2010 to 2011, but that only represents a 0.8 percent decline in traffic volume.

Finding: There has been very little increase in the number of commuters who are likely to be using the Legion Bridge as an alternative to other congested routes.

Theory 3: Residents of fringe counties are using the bridge to go to work

Commuter traffic over the Legion Bridge is not limited to those traveling between Montgomery and Fairfax counties. Many Montgomery residents who work in Arlington, Alexandria, or downtown Washington, travel over the bridge to get on the George Washington Memorial Parkway, and many Fairfax residents use the bridge to access the Clara Barton Parkway to travel into DC. However, the number of Montgomery and Fairfax residents working in both the District of Columbia and Arlington actually declined between 1990 and 2010, and substantial shares of these residents use public transit.

Figure 5
Fringe County Commuters, 1990-2010



Source: Bureau of the Census; GMU Center for Regional Analysis

Another source of traffic on the Legion Bridge is among those using it to commute from or to “fringe” areas like Frederick County in Maryland, or Loudoun or Prince William counties in Virginia⁴. Figure 5 summarizes changes from 1990 to 2010 in the commuting flows between the following counties:

- Virginia to Maryland: Fairfax-Frederick, Loudoun-Montgomery, and Prince William-Montgomery;
- Maryland to Virginia: Montgomery-Loudoun, Montgomery-Prince William, and Frederick-Fairfax.

From 1990 to 2010 the total number of daily commuters on these routes more than doubled, increasing from 6,224 to 13,345 (+7,121 daily commuters). Among this group the share of Maryland residents

⁴ Trips between Loudoun/Prince William and Frederick are excluded; these commuters are assumed to use the US 15/Point of Rocks Bridge.

increased from 41 percent in 1990 to 46 percent in 2010. The individual routes with the greatest increases were Loudoun-Montgomery (+2,241), Frederick-Fairfax (+1,848), Montgomery-Loudoun (+1,612), and Prince William-Montgomery (+1,031).

The growing impact of fringe commuters on Legion Bridge traffic is best illustrated by examining the ratio of this group to Montgomery-Fairfax commuters. In 1990 the ratio of Montgomery-Fairfax commuters to fringe commuters was five-to-one; by 2010 it was three-to-one.

Finding: The number of fringe commuters has clearly had a significant impact on traffic increases on the Legion Bridge since 1990.

Theory 4: Non-commute trips are on the rise

MWCOG estimates that about 25 percent of all trips over the Legion Bridge are not made as part of commuter trips⁵. Non-commute trips include several general categories: work-related trips during the workday, non-work errands during the workday, trips made at non-work times, and trips made by those who are not working.

Trips made during the workday are very difficult to measure. Work-related trips cover a variety of purposes: office workers attending meetings, tradespeople traveling to job sites, delivery drivers on their routes, etc. As such growth in these trips is more or less dependent on the total number of jobs in the area, not other factors. Non-work errands tend to be local in nature, so it is unlikely that the Legion Bridge is heavily used for this purpose, as there are no major employment centers located in the immediate vicinity of the bridge—the cores of Tysons Corner and Bethesda are both about five miles away. Trips made at non-work times are also difficult to quantify, as they are a function of the locational relationships among population, shopping, dining, and recreational activities.

The only component of non-commuter traffic that can be easily quantified is trips made by people who do not work, which are likely correlated with the total number of trips made by non-workers.

⁵ Kirby, op. cit.

Table 2
Population not in the Labor Force, 2000 and 2010

	Montgomery				Fairfax			
	2000	2010	Change	% Chg	2000	2010	Change	% Chg
Age 16-64	119,482	111,872	(7,610)	-6%	140,288	142,704	2,416	2%
Age 65+	78,514	89,686	11,172	14%	61,336	81,722	20,386	33%
Total	197,996	201,558	3,562	2%	201,624	224,426	22,802	11%

Source: 2010 American Community Survey, 1-Year Averages; 2000 Decennial Census

From 2000 to 2010 the population not in the labor force in Montgomery and Fairfax counties only increased by about seven percent (Table 2), compared with the overall population growth rate of 11.4 percent. All of the growth in non-labor force population was among those aged 65 or older; the number of people in the two counties age 16-64 not in the labor force actually declined between 2000 and 2010.

Finding: There has been little, if any, effect of increased trips by those not working on overall traffic crossing the Legion Bridge.

Traffic Congestion

While traffic counts and commuting patterns document the sheer volume of vehicles that travel over the American Legion Memorial Bridge at different times of day, they do not provide a full picture of how easy or difficult it is for drivers to make use of the bridge. This missing piece is filled in by the use of traffic congestion measures.

The entire 41-mile segment of I-495 that forms the western portion of the Capital Beltway from I-95 in Prince George's County, Maryland to I-95/I-395 in Fairfax County is consistently rated as one of the most congested highway corridors in the U.S. The Texas Transportation Institute (TTI) reports the following about I-495's peak-period congestion⁶:

- Its Buffer Time Index is 144, meaning that 144 percent of extra time must be allotted for to ensure an on-time arrival (e.g., if a trip takes 20 minutes with no traffic, an extra 29 minutes should be allotted to arrive on time).
- Its Planning Time Index is 4.29, which means that commuters expect their trips to take 429 percent longer during rush hour and thus anticipate that a 20-minute off-peak trip would take 86 minutes during rush hour.
- The Travel Time Index for the corridor is 2.06, which means that the actual length of a 20-minute off-peak trip is 41 minutes at peak period.
- Its annual morning peak congestion cost is \$95 million, the highest in the nation.

⁶ "2011 Congested Corridors Report," Texas Transportation Institute

These figures combine to make I-495 TTI's number 27 most "reliably unreliable" highway segments in the U.S., and the least reliable highway segment⁷ in the core of the Washington region.

The section of I-495 on either side of the American Legion Memorial Bridge is its most problematic portion, as several highways and arterials converge on I-495 on either side of the bridge. The traffic count approaching the bridge increases far more on the approach from the Virginia side, with the traffic count jumping by 50,000 vehicles from the segment south of the George Washington Memorial Parkway to the segment north of the Parkway (Table 4).

Table 4
Current Average Annual Daily Traffic Counts:
Interstate 495, Vicinity of American Legion Memorial Bridge

From	To	AADT	
I-270 Spur	River Road	222,233	MARYLAND
River Road	Clara Barton Pkwy	214,744	
Clara Barton Pkwy	GW Memorial Pkwy	226,000	LEGION BRIDGE
GW Memorial Pkwy	Georgetown Pike	176,000	VIRGINIA
Georgetown Pike	Dulles Toll Road	194,000	
Dulles Toll Road	Chain Bridge Road	165,000	

Note: Maryland data are from 2012, Virginia data are from 2011

Source: Maryland Department of Transportation, Virginia Department of Transportation

These traffic patterns create bottlenecks at the bridge. The Maryland Department of Transportation (MDOT) reports⁸ that the segment of the I-495 Inner Loop between the bridge and the I-270 spur has a bottleneck impact factor⁹ of 6.5, more than three times higher than any other Maryland segment of the Beltway. The need to accommodate 50,000 additional vehicles merging onto I-495 at the bridge helps explain why there are more severe recurring delays on the Inner Loop than the Outer Loop. Since far more vehicles are merging onto the Inner Loop (northbound) section, the congestion is worse.

Since 1993 MWCOG has studied congestion around the Legion Bridge via its Skycomp aerial surveying system. These data reinforce the notion that congestion is far worse on the Inner Loop (northbound) than the Outer Loop (southbound). During the morning peak period there are two discrete areas with mild congestion: the merge point of I-495 and the I-270 spur, and immediately south of the bridge itself before the exits for the GW Parkway and Georgetown Pike. The afternoon peak is a different story, with a solid line of congestion extending from the I-495/I-270 split over the bridge and south to the Dulles Toll Road. Average peak period speeds on this segment are in the range of 15-25 mph¹⁰.

⁷ The segment of I-70 west of Frederick ranks as the number 11 most unreliable segment.

⁸ "2012 Maryland State Highway Mobility Report,"

⁹ Defined by MDOT as "multiplication of total number of bottleneck occurrences by their average duration and by their average length."

¹⁰ Kirby, op. cit.

Congestion on I-495 also impacts the flow of trucks moving goods across the bridge. MWCOG estimates that 6.5 percent of vehicles that use the bridge each day are heavy trucks, moving more than \$800 billion worth of goods between Maryland and Virginia. Due to congestion, most truck trips take place between 10:00 a.m. and 3:00 p.m. During these hours, an average of about 900 trucks per hour use the bridge; at off-peak times; the average is about 700 during the morning and afternoon peak periods¹¹. The reduction in truck traffic during the peak periods is a hindrance to the movement of goods necessary for interstate commerce.

A final contributor to congestion is through travel. MWCOG estimates that about 30 percent of the vehicles crossing the Legion Bridge are through-travelers who use the bridge to pass through the Washington region.

Potential Interventions

In 2009 Maryland and Virginia's transportation staffs came together to evaluate potential solutions to improve mobility along the 14-mile stretch of I-495 and I-270 between the northern terminus of the HOT lanes on the Virginia side and the I-370/MD-200 interchange in Maryland¹². The study considered short-, medium-, and long-term improvements for the corridor. The proposed short- and medium- term improvements such as restriping, use of the shoulders as travel lanes, implementing reversible lanes, and converting existing HOV lanes on I-270 to managed lanes were found to be mostly unviable or ineffective. The only viable solution was restriping, and this would come with elevated safety risks, as it would reduce travel lanes from 12- to 10-foot widths across the bridge.

The long-term improvements that would have the greatest impact on reducing congestion all included the widening of the Legion Bridge by 34 feet and by the highways on either side of the bridge by 32 to 68 feet. The costs of these long-term improvements were estimated to be between \$1.04-2.65 billion. Among the long-term alternatives considered the most effective all included extending the existing managed lanes into Maryland. However, even in the best-case scenario these improvements would only reduce the number of failing road segments during the afternoon peak period from nine to four by 2030.

It is evident from the West Side Mobility Study that the universe of available alternatives for reducing congestion or increasing capacity over the Legion Bridge, including the most expensive and disruptive projects, would only partially solve the problem.

¹¹ Kirby, op. cit.

¹² "West Side Mobility Study," November 2009

Key Findings

- When the American Legion Memorial Bridge was completed in the early 1960s Montgomery and Fairfax counties were suburban bedroom communities with about 600,000 residents and few jobs. Today they are home to more than two million residents and one million jobs.
- The average traffic using the American Legion Memorial Bridge has increased from 48,000 vehicles per day in 1965 to 226,000 today, and is forecasted to increase to 269,000 by 2040.
- Traffic volume increases were largely in step with population and employment growth in Montgomery and Fairfax County until 2000, but since then, growth in bridge traffic has outstripped population or employment growth in the two counties.
- The number of people commuting each day between Montgomery and Fairfax counties has declined since 2000, suggesting that traffic congestion around the bridge has become a deterrent to commuter flow.
- There have been significant increases since 1990 in the numbers of commuters using the bridge to travel to or from the “fringe” counties of Loudoun, Frederick, and Prince William.
- The number of people residing in Montgomery and Fairfax counties who are not in the labor force has shown modest growth, suggesting that non-workers have not had a major impact on traffic increases.
- The congestion on and around the Legion Bridge is among the worst in the U.S., not just the Washington region; the influx of northbound vehicles merging from the George Washington Memorial Parkway is a major contributor to the bridge-area bottleneck.
- While large-scale improvements costing more than \$1 billion would ease congestion somewhat on and around the Legion Bridge, several segments of I-495 will remain in a state of failure regardless of these improvements.

Conclusions and Considerations

The transportation systems that serve Montgomery and Fairfax counties have grown and evolved in many ways over the past 50 years. Today, both jurisdictions have robust networks of highway, surface street, rail, bus, and bicycle infrastructure that connect communities and employment centers within their borders, with the core of the Washington region, and with neighboring suburban counties. To their credit, state and county officials serving both jurisdictions have continually proven willing to make investments in major infrastructure projects of all modes.

In spite of this commitment to investing in transportation, the stalemate over how to address the issue of connectivity between Montgomery and Fairfax counties has yet to be resolved. As a result the physical link between the two counties remains limited to a single bridge and several miles of congested highway segments on either side of it. Worse yet, multi-billion dollar investments to improve this corridor would have only modest impacts on the situation. It is clear that the two states and two counties will not be able to meet their future connectivity needs simply by continuing to squeeze capacity out of the American Legion Memorial Bridge and the highways and roads that feed it.

An effective and comprehensive approach to improving connectivity between Montgomery and Fairfax counties is therefore merited, and must account for the following issues:

- Direct transit connections are needed between Tysons Corner and Bethesda. These two centers are already two of the largest employment and commerce hubs in the metro area, and plans for both areas envision all future growth to be in the form of transit-oriented development around their Metrorail stations.
- The number of “horseshoe” commuters that use the Legion Bridge to commute from Frederick to Fairfax or from Loudoun or Prince William to Montgomery is continuing to grow. Serving these populations will require more direct and/or efficient options for these travelers, which could include a mixture of modes.
- Any solution will need to involve the reduction of vehicle trips during peak periods. In the short term this can be accomplished by encouraging carpooling, vanpooling, transit use, alternative work hours, and telecommuting. In the long term it will require concentrating both residential and commercial development around transit and shared-ride facilities to ensure that more people can get to and from work without driving in single-occupancy vehicles. Though both counties are already aggressively pursuing such transit-oriented development policies, the success of these policies will depend upon having better inter-county transit connections.
- The impacts of heavy truck traffic on the bridge need to be addressed. On the one hand, the movement of goods in trucks is essential to the economies of both states and counties. On the other hand neither county has much of a manufacturing or warehousing base, so most goods passing over the bridge are either passing through or are coming from industrial facilities in other locations to retailers in each county. For through trucks, potential alternative routes and/or bypasses need to be examined. For trucks with final destinations in each county, further study is warranted of how and when these goods are moved.

- Attention is needed to understand why commuters who live in Montgomery County use the bridge to access the George Washington Parkway to commute to jobs in the District of Columbia or Arlington instead of using transit. There may be low-cost solutions such as transit incentives, commuter buses or vanpools that could limit bridge traffic from these commuters.

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