Sage Policy Group, Inc.

The Prospective and Likely Economic Implications of the US 29 BRT System

Submitted by:

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Submitted to:

The Montgomery County Department of Transportation

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Projected Economic Impacts of the US 29 BRT SYSTEM

Executive Summary

This Sage Policy Group, Inc. report estimates the economic impacts associated with the prospective development and operation of Montgomery County's US 29 Corridor Bus Rapid Transit System (BRT-29). Impact estimates are supplied at both county and state levels. The study team used IMPLAN economic modeling software, which embodies multipliers specific to the local economy, to generate all estimates of economic impact. Certain parameters are subject to alteration in the context of the ongoing development of the proposed endeavor.

Principal Analytical Findings

Development Phase

- Total costs for developing (planning and construction) the BRT-29 will be in excess of $65 million;
- The development phase will support 447 jobs within Montgomery County and 531 jobs statewide, measured in job-years (statewide economic impacts encompass county level impacts – these impacts are not additive);
- These jobs will be associated with more than $32 million in labor income in Montgomery County and $37 million statewide;
- Business sales during the project's development phase will total $83 million countywide and $94 million statewide.

Operational Phase

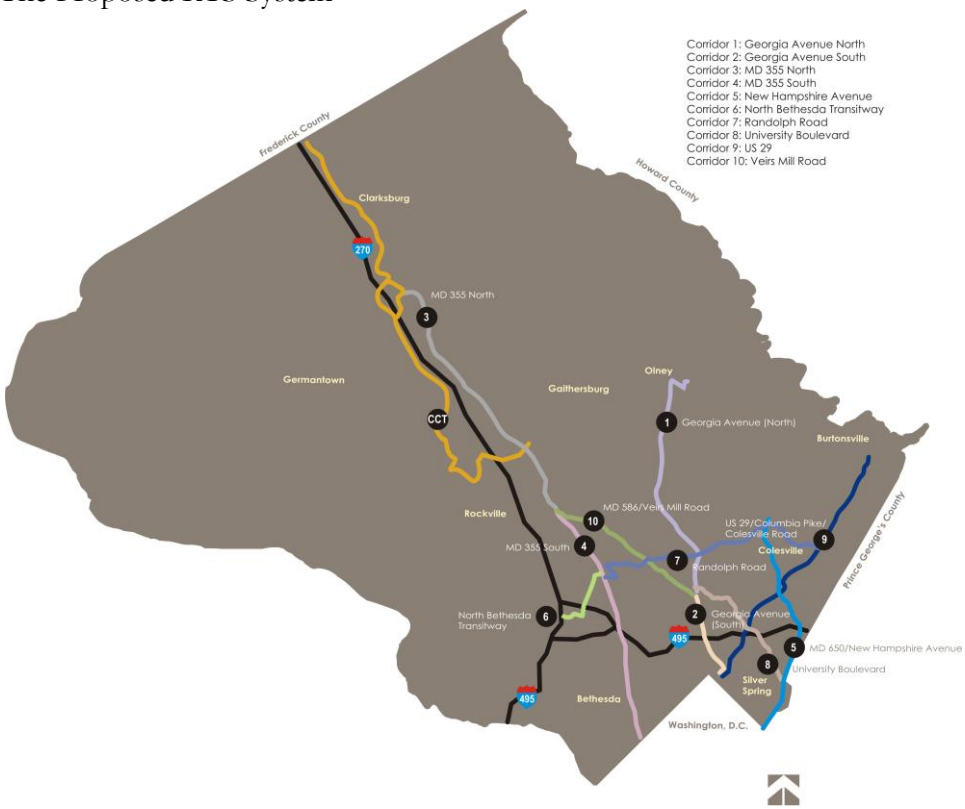
- Annual operating costs will be in the range of $5.2 million measured in 2016 dollars;
- The operational phase will support 85 permanent jobs within Montgomery County and 130 jobs within Maryland;
- These jobs will be associated with annual labor income of roughly $4.1 million countywide and $6.5 million statewide;
- Annual business sales will be bolstered by $9.4 million in Montgomery County and by $13.4 million statewide;
- Development of the White Oaks Science Gateway depends heavily upon the presence of BRT-29 and its capacity to enhance mobility. BRT-29 could unleash the development of more than 5,300 additional dwelling units in a highly active part of the county and lead to the construction of 7 million square feet of commercial space – space that could accommodate more than 20,000 jobs.

Introduction

This Sage Policy Group (Sage) report examines the economic impacts associated with the implementation and operation of Montgomery County's US 29 Corridor Bus Rapid Transit (BRT) System. Sage, an economic and policy consultancy located in Baltimore, Maryland, conducted this assessment of the economic impacts of this potential project. To generate estimates of impact, the study team used IMPLAN economic modeling software. The appendix to this report provides insight into the IMPLAN model and key definitions.

The line of interest can be seen in dark blue below (Corridor 9), stretching from Silver Spring in the southwest to Burtonsville in the northeast. In 2015, Sage quantified the impacts associated with the full build-out of the proposed complete rapid transit system (RTS), as pictured in Exhibit 1. This report analyzes the implications of a single corridor – US 29.

Exhibit 1: The Proposed RTS System



RTS stations will function like Metrorail stations, providing pre-boarding ticketing and platforms allowing direct access to RTS vehicles. Exhibit 2 provides a preliminary mapping of stations along the corridor examined for this analysis.

Exhibit 2: US29 BRT (planned)

Phase I: Impacts of Developing BRT-29

- Employment, Income, and Business Sales

Total costs for BRT-29 development (planning and construction) are estimated at $65.2 million, of which a bit more than half is represented by roadway improvements ($33 million). This cost estimate encompasses a variety of other development components, including buses ($13 million), bus stop improvements ($8.2 million), design and installation of transit signals ($860,000), bicycle and pedestrian improvements ($2.355 million), marketing and outreach ($1.25 million), system planning and design ($6.5 million). Capital cost estimates have been refined over time, with significant cost savings already identified. The Montgomery County Department of Transportation (MCDOT) supplied Sage with key input data, and notes that certain cost estimates remain subject to change.

Local companies and the local labor force will contribute significantly to supplying goods and services. However, the study team presumes that the buses will be manufactured elsewhere since the local economy does not include bus manufacturing capacity. Local companies may be able to supply other key technologies, however, including fare collection and automatic vehicle location technology as well as computer assisted design. In order to generate conservative estimates of impact, the study team has presumed that these technology-driven services will also be sourced elsewhere. To the extent that these services are sourced from Montgomery County enterprises, this study will have supplied estimates of impact that are too small.

In total, project implementation will support approximately 447 full- and part-time jobs[1] in Montgomery County with associated income of roughly $32.2 million per annum. These tallies encompass both direct and secondary jobs supported during development. The study team estimates that approximately 258 jobs will be directly associated with project development while the remaining jobs will take the form of indirect (business-to-business transactions) and induced (household spending) impacts. The implementation phase will also support approximately $83.6 million in augmented sales of goods and services by county businesses during the development period. Note that these impacts are expected to transpire over the course of the development phases. For instance, should development require four years, each of those years would be associated with an average of 112 positions supported per year.

Statewide economic impacts, which embody countywide impacts, are larger by definition. Approximately 531 jobs generating more than $37 million in income would be supported statewide during the development phase. Business sales statewide will be boosted by roughly $95 million. Exhibit 3 supplies relevant summary detail.

Exhibit 3: Economic Impacts: Implementation Phase (one-time impacts)

	Jobs	Labor Income (millions of 2015 dollars)	Business sales (millions of 2015 dollars)
Montgomery County			
Direct effects	258	$20,375,086	$53,716,132
Indirect effects	83	$5,973,049	$13,919,785
Induced effects	106	$5,865,437	$16,026,199
Total	**447**	**$32,213,572**	**$83,662,116**
Maryland			
Direct effects	275	$22,315,890	$53,573,725
Indirect effects	116	$7,387,804	$21,152,997
Induced effects	140	$7,462,823	$20,235,437
Total	**531**	**$37,166,517**	**$94,962,159**
Note: Figures may not add due to rounding.			

Source: Sage

[1] Annual job equivalents or job years. For instance, were one individual to work on the project for two years, this would count as two jobs.

Phase II: Impacts of Operating BRT-29

- Economic Impacts

Once the US 29 BRT system becomes operational, a set of ongoing, permanent economic and fiscal impacts occurs. As reflected in Exhibit 4, the ongoing operation of the bus line will support roughly 85 full-time equivalent positions (FTEs) per year within Montgomery County. These positions will be associated with more than $4 million in labor income. BRT operations will augment local business sales by approximately $9.4 million per annum. Statewide employment would be bolstered by 130 FTEs. Those jobs would be associated with labor income approaching $6.5 million. Statewide business sales would be augmented by more than $13.4 million. Unlike development phase impacts, these impacts are annual and for purposes of this discussion last into economic perpetuity.

Exhibit 4: Economic Impacts: Operational Phase (ongoing impacts)

	Jobs (FTEs)	Labor Income (millions of 2015 dollars)	Business sales (millions of 2015 dollars)
Montgomery County			
Direct effects	60	$2,350,226	$5,163,134
Indirect effects	13	$1,088,347	$2,294,473
Induced effects	13	$716,069	$1,953,851
Total	**85**	**$4,154,642**	**$9,411,458**
Maryland			
Direct effects	81	$3,574,867	$5,163,134
Indirect effects	22	$1,608,569	$4,425,139
Induced effects	27	$1,306,208	$3,821,640
Total	**130**	**$6,489,644**	**$13,409,913**
Note: Figures may not add due to rounding.			

Source: Sage

Evaluating Implications for Accelerated Development in Montgomery County

- Accelerating Development Represents the Primary Source of Economic Impact

A 2015 Sage report entitled "Montgomery County's RTS: Leveraging Mobility for Economic Growth" evaluated the broader impacts of a prospective rapid transit system on Montgomery County's economy. That study identified planning areas within Montgomery County and estimated the development potential linked to each rapid transit corridor. BRT-29 is associated with and would serve four such planning areas: the Silver Spring CBD Sector Plan, Four corners, the White Oak Science Gateway, and Burtonsville Commercial Crossroads Neighborhood Plan.

Two of these plans (White Oak Science Gateway and the Burtonsville Commercial Crossroads Neighborhood Plan) are associated with highly detailed quantification of development potential. As reflected in Exhibit 5, these two planning areas are associated with more than 9,000 residences and more than 43,000 net new commercial space-using jobs. This latter estimate is based on a ratio of 3,000 jobs per million square feet of commercial space.

Of the four planning areas reflected in Exhibit 5 and the two master-planned areas for which data are available, only the White Oak Science Gateway depends directly upon the existence of BRT-29. These economies to be unleashed by rapid transit in Montgomery County are highlighted in our 2015 report.

Exhibit 5: Direct Economic Impacts associated with Development of BRT-29 Planning Areas

Master Plans	Dwelling Units	Commercial Space (millions of SF)	Commercial Space Using Jobs
White Oak Science Gateway	8,570	13.4	39,144
Burtonsville Commercial Crossroads Neighborhood Plan	600	1.4	4,200
Silver Spring CBD Sector Plan	Not quantified		
Four Corners	Not quantified		

Source: Montgomery County Planning Department

Development of the White Oak Science Gateway depends heavily upon the presence of the BRT-29 component of the broader planned rapid transit system. Exhibit 6 below supplies an indication of the level of economic activity dependent upon BRT-29.

Exhibit 6. Development Potential Clearly or Reasonably Linked to the RTS System

Master Plan	*Clearly linked to RTS*		*Reasonably linked to RTS*	
	Dwelling Units	*Commercial Space (millions of SF)*	*Dwelling Units*	*Commercial Space (millions of SF)*
White Oak Science Gateway – BRT – 29	5,360	7.0	2,353	5.1

Sources. Montgomery County Planning Department, City of Gaithersburg, City of Rockville

Conclusion

This study provides some additional statistical detail for Montgomery County and State of Maryland policymakers as well as for an array of other stakeholders. Total costs for developing the BRT-29 (planning and construction) will be in excess of $65 million. The development phase will support 447 full- and part-time jobs in Montgomery County associated with $32 million in labor income. Local business sales will be bolstered by more than $83 million despite the presumption that the buses and key technology services will be sourced from other communities.

Annual operating costs will be in the range of $5.2 million measured in 2016 dollars. Maintaining and operating BRT-29 will support 85 permanent jobs within Montgomery County associated with $4.1 million in annual worker income. Local business sales will be bolstered by $9.4 million. However, the major impact comes in the form of accelerated development. Development of the White Oaks Science Gateway depends heavily upon the presence of BRT-29 and its capacity to enhance mobility. BRT-29 could unleash the development of more than 5,300 additional dwelling units in a highly active part of the county and lead to the construction of 7 million square feet of commercial space – space that could accommodate more than 20,000 jobs.

Appendix

IMPLAN is an economic impact assessment software system. The system was originally developed and is now maintained by the Minnesota IMPLAN Group (MIG). It combines a set of extensive databases concerning economic factors, multipliers and demographic statistics with a highly refined and detailed system of modeling software. IMPLAN allows the user to develop local-level input-output models that can estimate the economic impact of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships.

There are two major components to IMPLAN: data files and software. An impact analysis using IMPLAN starts by identifying expenditures in terms of the sectoring scheme for the model. Each spending category becomes a "group" of "events" in IMPLAN, where each event specifies the portion of activity allocated to a specific IMPLAN sector. Groups of events can then be used to run impact analysis individually or can be combined into a project consisting of several groups. Once the direct economic impacts have been identified, IMPLAN can calculate the indirect and induced impacts based on a set of multipliers and additional factors.

Secondary benefits can be segmented into two types of impacts, indirect and induced. Indirect benefits are related to the business-to-business transactions that take place due to increased demand for goods and services that accompanies augmented investment and business operations. Impacted businesses sell everything from office furniture and copiers to computer and graphic design services. Induced benefits are created when workers directly or indirectly supported by increased economic activity spend their earnings in the local economy. Indirect and induced benefits together comprise total multiplier effects.

The hallmark of IMPLAN is the specificity of its economic datasets. The database includes information for five-hundred-and-twenty-eight different industries (generally at the three or four digit Standard Industrial Classification level), and twenty-one different economic variables. Along with these data files, national input-output structural matrices detail the interrelationships between and among these sectors. The database also contains a full schedule of Social Accounting Matrix (SAM) data. All of these data are available at national, state, and county levels.

Another strength of the IMPLAN system is its flexibility. It allows the user to augment any of the data or algorithmic relationships within each model in order to more precisely account for regional relationships. This includes inputting different output-to-income ratios for a given industry, different wage rates, and different multipliers where appropriate. IMPLAN also provides the user with a choice of trade-flow assumptions, including the modification of regional purchase coefficients, which determine the mix of goods and services purchased locally with each dollar in

each sector. Moreover, the system also allows the user to create custom impact analyses by entering changes in final demand.

A final advantage of IMPLAN is its credibility and acceptance within the profession. There are more than five hundred active users of IMPLAN databases and software within federal and state governments, universities, and among private sector consultants. The following list provides a sampling of IMPLAN users.

Sample of IMPLAN Users:

Academic Institutions

Alabama A&M University
Auburn University
Cornell University
Duke University
Iowa State University
Michigan Tech University
Ohio State
Penn State University
Portland State University
Purdue University
Stanford University
Texas A&M University
University of California – Berkeley
University of Wisconsin
University of Minnesota
Virginia Tech
West Virginia University
Marshall University/College of Business

Federal Government Agencies

Fed. Emergency Man. Agency (FEMA)
US Dep't of Agriculture, Forest Service
US Dep't of Ag., Econ Research Service
US Dep't of Int., Bureau of Land Mgmt.
US Dep't of Int., Fish and Wildlife Serv.
US Dep't of Int., National Parks Service
US Army Corps of Engineers

State Government Agencies

MD Dep't of Natural Resources
California Energy Commission
Florida Division of Forestry
Illinois Dep't of Natural Resources
New Mexico Department of Tourism
South Carolina Employment Security
Utah Department of Natural Resources
Wisconsin Department of Transportation

Private Consulting Firms

Coopers & Lybrand
Batelle Pacific NW Laboratories
Boise Cascade Corporation
Charles River Associates
CIC Research
BTG/Delta Research Division
Deloitte & Touche
Ernst & Young
Jack Faucett Associates
KPMG Peat Marwick
Price Waterhouse LLP
Sage Policy Group, Inc.
SMS Research
Economic Research Associates
American Economics Group, Inc.
L.E. Peabody Associates, Inc.
The Kalorama Consulting Group
West Virginia Research League