

**UNDERSTANDING THE FISCAL IMPACTS OF  
TRANSIT-ORIENTED DEVELOPMENT (TOD)  
PROJECTS IN NORTHERN VIRGINIA AND  
MARYLAND**

**Prepared for**

**The Urban Land Institute**  
*Baltimore-Washington, DC Transit-Oriented Development (TOD)*  
*Product Council*  
**Baltimore, Maryland**

**Prepared by**

**Dean D. Bellas, Ph.D.**  
**President**  
**Urban Analytics, Inc.**  
**Alexandria, Virginia**

**October 21, 2015**

## Table of Contents

1. Executive Summary .....	4
Fiscal Impact Findings of TOD Projects .....	4
Fiscal Impact Findings of non-TOD Projects .....	6
Revenues Generated within a Region .....	7
2. Introduction.....	8
3. General Characteristics of TOD versus non-TOD Projects .....	9
Number of Units .....	9
Average Household Size.....	9
Average Number of School-age Children per Unit .....	11
Median Household Income per Unit.....	12
Median Age Range of Residents.....	12
Average Number of Cars .....	13
Method of Transportation to Work.....	14
Average Commuting Time to Work .....	15
Residence Prior to Moving to Current Apartment Building .....	17
4. General Characteristics of the Four TOD Projects Selected.....	18
Fairfax County, Virginia: “The Shelby” .....	18
City of Rockville, Maryland: “The Alaire” .....	18
City of Baltimore, Maryland: “The Fitzgerald” .....	19
Anne Arundel County, Maryland: “The Village at Odenton Station” .....	20
5. Fiscal Impact Findings of the Four TOD Projects Selected .....	20
Fairfax County, Virginia.....	21
City of Rockville, Maryland .....	21
City of Baltimore, Maryland.....	21
Anne Arundel County, Maryland .....	22
6. Understanding Cross-Jurisdictional Fiscal Impacts.....	22
Revenues Generated within a Region .....	22
Fiscal Impact across Regions.....	23
7. Conclusion and Recommendations for Future Research .....	25
Appendix	
Fiscal Impact Methodology .....	28
Fiscal Impact Model .....	28
Limiting Conditions .....	30
Data Limitations.....	31
Contact Information .....	31
About the Author .....	31
Acknowledgements.....	32

## List of Tables

Table 1-1: Fiscal Impact Summary of Four Selected TOD Projects .....	5
Table 1-2: Fiscal Impact Summary if Four Selected TOD Projects were <u>non</u> -TOD .....	6
Table 3-1: Sample Size of Existing TOD versus non-TOD Projects Analyzed .....	10
Table 3-2: Average Household Size and Average Number of School-age Children .....	11
Table 3-3: Median Household Income and Median Age Range of Residents per Unit ....	12
Table 3-4: Average Number of Cars per Unit .....	13
Table 3-5: Method of Transportation to Work .....	15
Table 3-6: Average Commuting Time to Work.....	16
Table 3-7: Residence Prior to Moving to Current Apartment Building .....	17
Table 4-1: Residential and Non-residential Building Program – Four TOD Projects .....	19
Table 6-1: Revenues Generated within a Region .....	23
Table 6-2: Fiscal Impact across Regions .....	24
Appendix Table A-1: Revenues by Source Multipliers – Fairfax County, VA.....	33
Appendix Table A-2: Baseline Service Level Multipliers – Fairfax County, VA.....	34
Appendix Table A-3: Revenues by Source Multipliers – City of Rockville, MD.....	35
Appendix Table A-4: Baseline Service Level Multipliers – City of Rockville, MD .....	36
Appendix Table A-5: Revenues by Source Multipliers – City of Baltimore, MD .....	37
Appendix Table A-6: Baseline Service Level Multipliers – City of Baltimore, MD.....	38
Appendix Table A-7: Revenues by Source Multipliers – Anne Arundel County, MD.....	39
Appendix Table A-8: Baseline Service Level Multipliers – Anne Arundel County, MD.....	40
Appendix B: Eleven Weaknesses in Fiscal Impact Modeling (1930s – mid-1990s).....	41

## List of Figures

Figure 1-1: Net Fiscal Impact per Unit of Residential Units (TOD vs. non-TOD) .....	7
Figure 1-2: Revenues Generated within a Region .....	8

## **1. Executive Summary**

A *fiscal impact* analysis estimates the type and dollar amount of new tax revenues generated by a new or existing development project (at full build-out and occupancy) and the estimated expenditures required to provide public services to the existing or new community. In most jurisdictions in the Baltimore-Washington, DC metropolitan area, these revenues may include (*but are not limited to*) real estate taxes, personal property taxes, sales taxes (either directly paid to the jurisdiction or received through intergovernmental transfers from the state to the locality), utilities (consumer) taxes, transient occupancy taxes, revenues from licenses, fees, permits, fines, forfeitures and charges for services, miscellaneous and other local taxes, and various intergovernmental transfers (revenue sharing) to the jurisdiction from the federal government and the state. Estimated expenditures for public services in most of these jurisdictions may include (*but are not limited to*) general government administration, judicial administration, planning and zoning, public safety, public works, health and welfare, community development, parks, recreation and culture, miscellaneous, and public school education. Four TOD projects were selected for an in-depth fiscal impact analysis and the findings of this analysis are presented in this report.

### **Fiscal Impact Findings of TOD Projects**

The findings presented in this report indicate that the fiscal benefits to the various jurisdictions analyzed are substantial. In layman's vernacular, the four TOD projects analyzed not only "pay their own way", they also subsidize existing residential land uses that generate an annual net fiscal deficit (or burden) to those jurisdictions. The findings of the fiscal impact analysis are shown in Table 1-1 and are as follows:

- **Fairfax County, Virginia** – "*The Shelby*": The total net annual fiscal benefit to Fairfax County was found to equal an estimated \$364,946 reflecting the generation of revenues totaling \$1,117,400 with associated expenditures totaling \$752,454. Alternatively stated, The Shelby was estimated to generate \$1.49 in tax and non-tax revenues to Fairfax County in FY2014 for every \$1.00 in public services that the County expended in the provision of public services to the residents at The Shelby;
- **City of Rockville, Maryland** – "*The Alaire*": The total net annual fiscal benefit to the City of Rockville was found to equal an estimated \$45,868 reflecting the generation of revenues totaling \$388,817 with associated expenditures totaling \$342,949. The Alaire was estimated to generate \$1.13 in tax and non-tax revenues to the City of Rockville in FY2014 for every \$1.00 in public services that the City expended in the provision of public services to the residents and workers at The Alaire;
- **City of Baltimore, Maryland** – "*The Fitzgerald*": The total net annual fiscal benefit to the City of Baltimore was found to equal an estimated \$941,053 reflecting the generation of revenues totaling \$1,726,045 with associated expenditures totaling \$784,992. The Fitzgerald was estimated to generate \$2.20 in tax and non-tax revenues to the City of Baltimore in FY2013 for every \$1.00 in public services that

the City expended in the provision of public services to the residents and workers at The Fitzgerald; and

- Anne Arundel County, Maryland** – “*The Village at Odenton Station*”: The total net annual fiscal benefit to Anne Arundel County was found to equal an estimated \$157,456 reflecting the generation of revenues totaling \$816,912 with associated expenditures totaling \$659,456. The Village of Odenton Station was estimated to generate \$1.24 in tax and non-tax revenues to the County in FY2014 for every \$1.00 in public services that the County expended in the provision of public services to the residents and workers at The Village at Odenton Station.

**Table 1-1**  
**Fiscal Impact Summary<sup>1</sup>**  
**Residential and Non-residential Land Uses**  
**Four TOD Projects Selected**  
**Virginia and Maryland**

<i>Aggregate</i>	<b>The</b>	<b>The</b>	<b>The</b>	<b>The Village at</b>
<b>Residential</b>	<b>Shelby<sup>2</sup></b>	<b>Alaire<sup>3</sup></b>	<b>Fitzgerald<sup>4</sup></b>	<b>Odenton Station<sup>5</sup></b>
Annual Revenues Generated	\$ 1,117,400	\$ 371,660	\$ 1,531,898	\$ 705,321
Annual Expenditures Demanded	\$ 752,454	\$ 333,684	\$ 707,891	\$ 590,185
Annual Revenue Surplus (Deficit)	\$ 364,946	\$ 37,976	\$ 824,007	\$ 115,136
<i>Aggregate</i>				
<b>Non-residential</b>				
Annual Revenues Generated	\$ -	\$ 17,157	\$ 194,147	\$ 111,591
Annual Expenditures Demanded	\$ -	\$ 9,265	\$ 77,101	\$ 69,271
Annual Revenue Surplus (Deficit)	\$ -	\$ 7,892	\$ 117,046	\$ 42,320
<b>Total - All Land Uses</b>				
Annual Revenues Generated	\$ 1,117,400	\$ 388,817	\$ 1,726,045	\$ 816,912
Annual Expenditures Demanded	\$ 752,454	\$ 342,949	\$ 784,992	\$ 659,456
Annual Revenue Surplus (Deficit)	\$ 364,946	\$ 45,868	\$ 941,053	\$ 157,456
<i>Per-Unit</i>				
<b>Residential only</b>	<b>The</b>	<b>The</b>	<b>The</b>	<b>The Village at</b>
	<b>Shelby</b>	<b>Alaire</b>	<b>Fitzgerald</b>	<b>Odenton Station</b>
Annual Revenues Generated	\$ 4,656	\$ 1,332	\$ 5,571	\$ 3,001
Annual Expenditures Demanded	\$ 3,135	\$ 1,196	\$ 2,574	\$ 2,511
Annual Revenue Surplus (Deficit)	\$ 1,521	\$ 136	\$ 2,997	\$ 490

Source: Urban Analytics, Inc.

**Note:**

<sup>1</sup> These are the revenue and expenditure figures that are estimated to have been generated (*on an annual basis*) had the four TOD projects selected for analysis been fully built-out and occupied in FY 2014. Revenues and expenditures are based on each jurisdiction's [Comprehensive Annual Financial Report](#) (CAFR). <sup>2</sup>Fairfax County, VA. <sup>3</sup>City of Rockville, MD. <sup>4</sup>City of Baltimore, MD. <sup>5</sup>Anne Arundel County, MD.

Fiscal Impact Findings of non-TOD Projects

An analysis of the general socio-economic characteristics of 42 TOD and non-TOD projects in Virginia and Maryland comprising 9,546 apartment units found that the resident population and school-age children characteristics of TOD and non-TOD projects are quite different. *If the four TOD projects* selected for analysis in this report had not been located at or near a transit rail station, the fiscal impact findings of these four projects on their respective jurisdictions would have been substantially lower. These projects are estimated to have generated between \$0.77 and \$1.35 in tax and non-tax revenues to their respective jurisdictions for every \$1.00 in public services demanded by the residents and workers in those projects. These findings are presented in Table 1-2.

**Table 1-2**  
**Fiscal Impact Summary<sup>1</sup>**  
**Residential and Non-residential Land Uses**  
**If the Four Projects Selected were non-TOD Projects**  
**Virginia and Maryland**

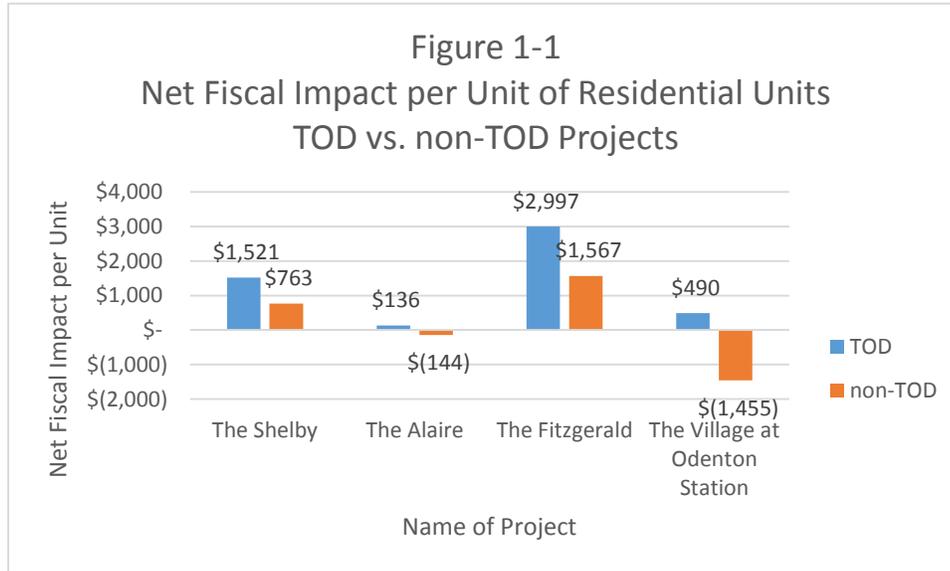
<i>Aggregate</i>	<b>The</b>	<b>The</b>	<b>The</b>	<b>The Village at</b>
<b>Residential</b>	<b><u>Shelby</u><sup>2</sup></b>	<b><u>Alaire</u><sup>3</sup></b>	<b><u>Fitzgerald</u><sup>4</sup></b>	<b><u>Odenton Station</u><sup>5</sup></b>
Annual Revenues Generated	\$ 1,136,105	\$ 458,304	\$ 1,933,565	\$ 881,998
Annual Expenditures Demanded	\$ 952,961	\$ 498,590	\$ 1,502,500	\$ 1,224,047
Annual Revenue Surplus (Deficit)	\$ 183,144	\$ (40,286)	\$ 431,065	\$ (342,049)
<i>Aggregate</i>				
<b>Non-residential</b>				
Annual Revenues Generated	\$ -	\$ 17,157	\$ 194,147	\$ 111,591
Annual Expenditures Demanded	\$ -	\$ 9,265	\$ 77,101	\$ 69,271
Annual Revenue Surplus (Deficit)	\$ -	\$ 7,892	\$ 117,046	\$ 42,320
<b>Total - All Land Uses</b>				
Annual Revenues Generated	\$ 1,136,105	\$ 475,461	\$ 2,127,712	\$ 993,589
Annual Expenditures Demanded	\$ 952,961	\$ 507,855	\$ 1,579,601	\$ 1,293,318
Annual Revenue Surplus (Deficit)	\$ 183,144	\$ (32,394)	\$ 548,111	\$ (299,729)
<i>Per-Unit</i>				
<b>Residential only</b>	<b>The</b>	<b>The</b>	<b>The</b>	<b>The Village at</b>
<b>Residential only</b>	<b><u>Shelby</u></b>	<b><u>Alaire</u></b>	<b><u>Fitzgerald</u></b>	<b><u>Odenton Station</u></b>
Annual Revenues Generated	\$ 4,734	\$ 1,643	\$ 7,031	\$ 3,753
Annual Expenditures Demanded	\$ 3,971	\$ 1,787	\$ 5,464	\$ 5,208
Annual Revenue Surplus (Deficit)	\$ 763	\$ (144)	\$ 1,567	\$ (1,455)

Source: Urban Analytics, Inc.

**Note:**

<sup>1</sup> These are the revenue and expenditure figures that are estimated to have been generated (*on an annual basis*) if the four projects selected for analysis were non-TOD projects and had been fully built-out and occupied in FY 2014. Revenues and expenditures are based on each jurisdiction's Comprehensive Annual Financial Report (CAFR). <sup>2</sup>Fairfax County, VA. <sup>3</sup>City of Rockville, MD. <sup>4</sup>City of Baltimore, MD. <sup>5</sup>Anne Arundel County, MD.

The net fiscal impact per-unit is compared to the per-unit TOD findings and graphically shown in Figure 1-1. The four TOD projects analyzed clearly “pay their own way” over non-TOD projects which contain higher resident adult and school-age children populations.

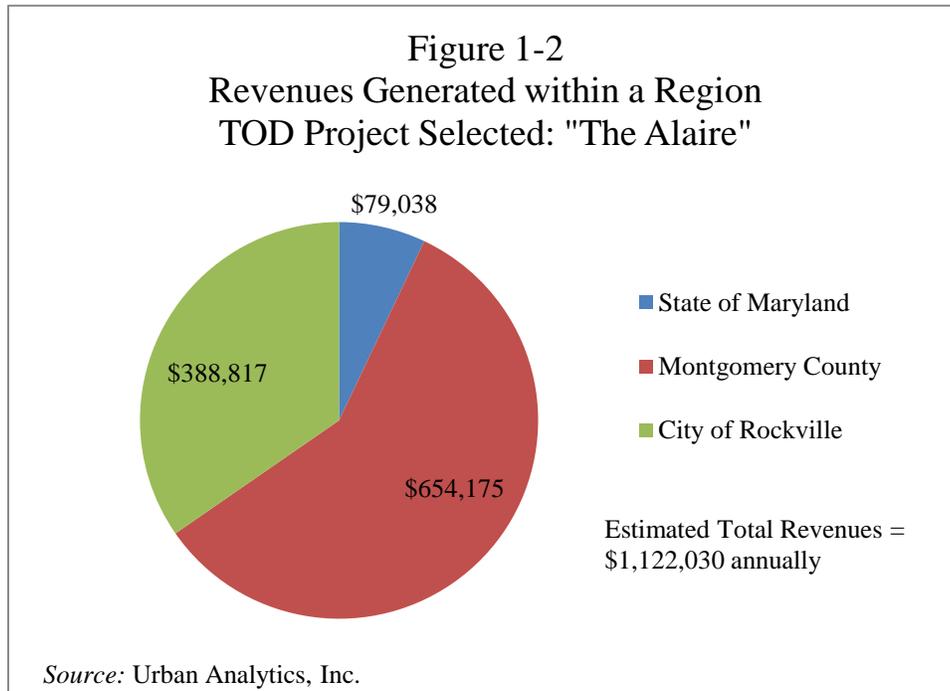


Source: Urban Analytics, Inc.

### Revenues Generated within a Region

The fiscal impact findings presented in this report are specifically for the four jurisdictions selected for analysis. However, there are also cross-jurisdictional fiscal impacts. To illustrate these additional fiscal impacts, cross-jurisdictional revenues for one TOD project, The Alaire, are shown in Figure 1-2. In Maryland, cities and towns typically receive some level of public services directly from counties, and some services directly from the state. These services are supported, in part, from real estate taxes collected from real property in the cities and towns.

The estimated annual revenues generated to the City of Rockville, Montgomery County, and the State of Maryland associated with the residential and non-residential land uses at The Alaire in fiscal year 2014 are presented in Figure 1-2 and also in Table 6-1. In addition to the estimated \$388,817 that The Alaire generates in gross revenues to the City of Rockville, The Alaire is also estimated to generate an additional \$654,175 to Montgomery County and \$79,038 to the State of Maryland on an annual basis.



In the remainder of this report, the findings shown in Tables 1-1 and 1-2 and in Figures 1-1 and 1-2 are discussed in greater detail.

## **2. Introduction**

There is a perception among various stakeholders that TOD projects pose more of a fiscal burden on the budgets of local jurisdictions than non-TOD projects. Specifically, three major concerns are often argued by opponents of TOD projects. These concerns are: (1) the higher fiscal burden on the local public school system; (2) the increased fiscal burden on local public safety departments (police, fire, EMS, and sheriff); and (3) the larger fiscal burden on the overall cost to provide public services to these projects. As TOD projects generally are designed to be higher-density land uses, the argument is that increased total population (with accompanying public school-age children) will result in a greater net fiscal deficit (or burden) on a jurisdiction's budget compared to a traditional non-TOD project with lower total population density.

The general characteristics of TOD and non-TOD units in 42 projects throughout Virginia and Maryland were analyzed and are presented in section three of this report. A case study of four TOD projects selected for an in-depth fiscal analysis was prepared and the general characteristics of those projects are shown in section four. Three development projects were in Maryland and one was in Virginia. The net fiscal impact findings of those four TOD projects were estimated and the findings are presented in section five. The findings of the analysis were compared and summarized in the executive summary.

### **3. General Characteristics of TOD versus non-TOD Projects**

Data on 42 projects comprising 9,546 existing TOD and non-TOD apartment units in the Virginia counties of Arlington and Fairfax, and Montgomery County, Maryland were collected and analyzed. These three counties host some of the most active rail stations in the Washington Metropolitan Area Transit Authority (WMATA) system and have an extensive bus system feeder network. These three counties alone have a combined population of 2.39 million, reflecting 40 percent of the estimated 5.95 million people in 2013 in the Washington, DC metropolitan statistical area.<sup>1</sup> Within the 9,546 unit sample size, nine socio-economic characteristics were identified and analyzed.<sup>2</sup> The findings on these nine characteristics are presented in the following sections.

#### Number of Units

The number of apartment projects analyzed in the sample size was almost evenly divided between Virginia and Maryland. Of the 9,546 apartment units, 5,388 (or 56.4 percent) were located in Virginia and the remaining 4,158 units (or 43.6 percent) were located in Maryland. Of the 5,388 apartment units in Virginia, 2,422 units (or 45 percent) were identified as TOD projects and were located at or near nine Metrorail stations. Of the 4,158 apartment units in Maryland, 1,417 units (or 34 percent) were identified as TOD projects and were located at or near three Metrorail stations. Sample-size data on these apartment units are presented in Table 3-1.

#### Average Household Size

Data on the average household size of the 9,546 TOD and non-TOD units are presented in Table 3-2. In Arlington County, the average household size of TOD projects is 1.24 people per unit or 14.5 percent less than the average household size of 1.45 people per unit for non-TOD units. In Montgomery County, the average household size is 1.60 people per unit or 16.2 percent less than the average household size of 1.91 people per unit in the non-TOD units. In Fairfax County, the average household size for TOD units is 1.75 people per unit or 8 percent greater than the average household size of 1.62 people per unit in the non-TOD units.

---

<sup>1</sup>Source: U.S. Census Bureau

<sup>2</sup>The 9,546 unit sample size reflects 7.3 percent of the total estimated 130,847 apartment units contained in apartment buildings with 50 or more units in Arlington, Fairfax and Montgomery counties. Total estimated apartment units and non-TOD apartment units in the sample size reflect all quality classes. TOD units in the sample size reflect Class A apartments. *Source of estimated units:* U.S. Census Bureau, 2013 American Community Survey 1-Year Estimates; Delta Associates.

**Table 3-1**  
**Sample Size of Existing TOD versus non-TOD Projects Analyzed**  
**Virginia and Maryland**  
**2015**

County	Type	Projects Analyzed	Number of Units	Average Year Built	Transit Station
<b>Virginia</b>					
Arlington	non-TOD	2	431	1994	None. Located on Columbia Pike.
Arlington	TOD	8	1,353	2001	1 Ballston, 1 Clarendon, 2 Court House, 1 Rosslyn, 1 Crystal City, 1 Pentagon City, 1 National Airport
Fairfax	non-TOD	11	2,535	1995	None. Various locations.
Fairfax	TOD	<u>3</u>	<u>1,069</u>	2008	1 Vienna, 2 Dunn Loring
<i>Subtotal</i>	non-TOD	13	2,966		
<i>Subtotal</i>	TOD	<u>11</u>	<u>2,422</u>		
<i>Total</i>		24	5,388		
<b>Maryland</b>					
Montgomery	non-TOD	12	2,741	1998	None. Mostly clustered in northern MoCo, Germantown/Gaithersburg area.
Montgomery	TOD	<u>6</u>	<u>1,417</u>	2001	1 Wheaton, 3 White Flint, 2 Bethesda
<i>Subtotal</i>	non-TOD	12	2,741		
<i>Subtotal</i>	TOD	<u>6</u>	<u>1,417</u>		
<i>Total</i>		18	4,158		
<i>Grand Subtotal</i>	non-TOD	25	5,707		
<i>Grand Subtotal</i>	TOD	<u>17</u>	<u>3,839</u>		
<i>Grand Total</i>		42	9,546		

Source: The Bozzuto Group; Urban Analytics, Inc.

When compared to the average renter-occupied household size in each county in 2010, both the TOD and non-TOD units analyzed have substantially smaller average household sizes. In 2010, the average renter-occupied household size in Arlington County was 1.95 people per unit, 2.68 people per unit in Fairfax County, and 2.47 people per unit in Montgomery County. The fact that both the TOD and non-TOD units analyzed in the sample have average household sizes significantly less than the average renter-occupied household size in each county may be attributable to either the smaller square foot size of the apartments analyzed, the higher monthly rental cost of these units, a lifestyle choice or some combination of these and other factors. The significance of the smaller average household sizes for both the TOD and non-TOD units in the 9,546 unit sample will be reflected in the net fiscal impact findings section of this report.

**Table 3-2**  
**Average Household Size and Average Number of School-age Children per Unit**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

County	Type	Projects Analyzed	Number of Units	People per Unit	Average Number of School-age Children per Unit (ages 0-18) <sup>1</sup>
<i>Virginia</i>					
Arlington	non-TOD	2	431	1.45	0.01
Arlington	TOD	8	1,353	1.24	0.02
Fairfax	non-TOD	11	2,535	1.62	0.14
Fairfax	TOD	3	1,069	1.75	0.12
<i>Maryland</i>					
Montgomery	non-TOD	12	2,741	1.91	0.35
Montgomery	TOD	6	1,417	1.60	0.14

Source: The Bozzuto Group; Urban Analytics, Inc.

Note:

<sup>1</sup>Includes children in the 0-5 age group. The number of school-age children in this group not available.

#### Average Number of School-age Children per Unit

The smaller average household size figures shown in Table 3-2 is also reflected in the smaller average student generation factor (average number of school-age children per unit) in both the TOD and non-TOD projects. In Arlington County, the average student generation factor is 0.01 per unit for non-TOD units (or 1 student for every 100 units) compared to 0.02 per unit for TOD units.<sup>3</sup> In Fairfax County, the average student generation factor is 0.14 children per non-TOD unit and 0.12 per TOD unit. While the TOD and non-TOD units analyzed for both Arlington County and Fairfax County reflect a minor difference in the number of children per unit, the difference between TOD and non-TOD units in Montgomery County is quite large. The average student generation factor for non-TOD units in Montgomery County is 0.35 children per unit or 2.5 times greater than the average student generation factor of 0.14 children per TOD unit. Of the jurisdictions in the Washington, DC metropolitan area that provide public education services, the cost of providing public education usually ranks either first or second highest among the list of all public services provided in each jurisdiction. The lower average student generation factors for the TOD projects analyzed will result in a lower per-unit public education cost in the fiscal impact findings section of this report.

<sup>3</sup>This may be simply a function of the small sample size of non-TOD projects analyzed in Arlington County.

Median Household Income per Unit

With the exception of Arlington County, the median household income per unit for the TOD projects was substantially higher than (greater than 10 percent) the non-TOD units. In Table 3-3, the median household income per unit is shown. In Fairfax County, the median household income for the TOD units is \$106,631 or 12.7 percent higher than the non-TOD units at \$94,598 per unit. In Montgomery County, the median household income for the TOD units is \$116,892 or 39.7 percent higher than the non-TOD units at \$83,662 per unit. In Arlington County, the median household income for the TOD units is \$92,105 or 17.6 percent lower than the non-TOD units at \$111,729 per unit.<sup>4</sup>

**Table 3-3**  
**Median Household Income and Median Age Range of Residents per Unit**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

County	Type	Projects Analyzed	Number of Units	Median Household Income	Median Age Range
<i>Virginia</i>					
Arlington	non-TOD	2	431	\$111,729	31 - 40
Arlington	TOD	8	1,353	\$92,105	31 - 40
Fairfax	non-TOD	11	2,535	\$94,598	31 - 40
Fairfax	TOD	3	1,069	\$106,631	26 - 30
<i>Maryland</i>					
Montgomery	non-TOD	12	2,741	\$83,662	31 - 40
Montgomery	TOD	6	1,417	\$116,892	31 - 40

Source: The Bozzuto Group; Urban Analytics, Inc.

Median Age Range of Residents

In Table 3-3, the median age range of residents per unit is presented. All projects in all counties (with the exception of the TOD units in Fairfax County) reported a median age range of 31 – 40 years old. In Fairfax County, the median age range of residents in the TOD units was 26 – 30 years old. It is not clear whether the higher median age range of 31 – 40 years reflects a lifestyle choice or whether this age range reflects a housing affordability issue. Further research is needed to understand whether the median age range in the 9,546 unit sample size is an indicator of a future trend or whether this is simply an anomaly in the sample size.

<sup>4</sup>All household income figures reported in current dollars.

Average Number of Cars

In Table 3-4, the average number of cars per unit and the average ratio of cars per unit is presented. In Arlington County, the ratio of cars per unit was 1.26 for the non-TOD units compared to 0.79 for the TOD units. In Fairfax County, the ratio of cars per unit was 1.30 for the non-TOD units compared to 1.32 for the TOD units. In Montgomery County, the ratio of cars per unit was 1.30 for the non-TOD units compared to 1.06 for the TOD units.

**Table 3-4**  
**Average Number of Cars per Unit**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

County	Type	Projects Analyzed	Number of Units	Number of Cars	Ratio of Cars per Unit <sup>1</sup>
<i>Virginia</i>					
Arlington	non-TOD	2	431	544	1.26
Arlington	TOD	8	1,353	1,074	0.79
Fairfax	non-TOD	11	2,535	3,288	1.30
Fairfax	TOD	3	1,069	1,409	1.32
<i>Maryland</i>					
Montgomery	non-TOD	12	2,741	3,576	1.30
Montgomery	TOD	6	1,417	1,501	1.06
<i>By Category Type</i>					
	non-TOD	25	5,707	7,408	1.30
	TOD	<u>17</u>	<u>3,839</u>	<u>3,984</u>	<u>1.04</u>
	Total	42	9,546	11,392	1.19

Source: The Bozzuto Group; Urban Analytics, Inc.

Note:

<sup>1</sup>Weighted average ratio.

On average, the ratio of cars per unit in the 9,546 unit sample size was 1.30 for non-TOD units compared to 1.04 per unit for the TOD units. With the exception of the Arlington County TOD projects, it seems like America's love affair with the automobile holds true among both non-TOD and TOD apartment dwellers in the sample size. The fact that slightly more than one car per unit (1.04) on average among all TOD units analyzed might be an indication that there are insufficient walkable amenities currently located around TOD projects (e.g., lack of residentially serving retail land uses, houses of worship, arts and entertainment attractions, baseball, soccer and football fields, etc.). On the other hand, the

fact that there is at least one car per TOD unit might be another confirmation that changes in consumer behavior is generational. While the average age in the sample size (Table 3-3), average household size (Table 3-2), and average number of children per unit (Table 3-2) appear to indicate a generational lifestyle choice among residents in TOD units, more research needs to be conducted into why the average number of cars per unit continues to exceed one in all counties and in both project types except Arlington County TOD projects.

#### Method of Transportation to Work

In Table 3-5, the method of transportation to work as reported by the residents in the TOD and non-TOD projects analyzed is presented. The locational advantage of living in a TOD apartment building is clearly demonstrated from an analysis of the data. In Arlington County, 27.43 percent of the residents in TOD projects used public transportation to get to work compared to only 9.95 percent of residents in non-TOD projects. In Fairfax County, 16.6 percent of the residents in TOD projects used public transportation to get to work compared to only 4.77 percent of residents in non-TOD projects. In Montgomery County, 17.8 percent of the residents in TOD projects used public transportation to get to work compared to only 3.08 percent of residents in non-TOD projects.

Overall, the percentage of residents residing in TOD apartment projects that took public transportation to work exceeded those residents in non-TOD projects by a factor of almost 5 to one, with 20.2 percent of residents in TOD projects taking public transportation compared to 4.2 percent in non-TOD projects. Among the non-TOD projects, 83.95 percent of residents in the Arlington County units took their own vehicle to work followed by Fairfax County with 72.3 percent of residents in those respective units. Arlington County has been promoted as one of the most walkable counties in the country. Thus, it was interesting to find that among both the non-TOD and TOD projects, the percentage of residents in the Arlington County units who walked to work ranged between 1.77 percent and 3.21 percent. To the casual observer, one might have presumed that the percentage of residents walking to work would have been higher.

**Table 3-5**  
**Method of Transportation to Work**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

County	Type	Public Transportation	Take own Vehicle	Walk	Carpool	Other <sup>1</sup>	Total
<i>Virginia</i>		<i>Percentage of Residents by Category Type<sup>2</sup></i>					
Arlington	non-TOD	9.95%	83.95%	1.77%	0.48%	3.85%	100.00%
Arlington	TOD	27.43%	56.83%	3.21%	1.13%	11.40%	100.00%
Fairfax	non-TOD	4.77%	72.30%	1.41%	0.37%	21.15%	100.00%
Fairfax	TOD	16.60%	62.95%	1.60%	0.75%	18.10%	100.00%
<i>Maryland</i>							
Montgomery	non-TOD	3.08%	62.45%	0.88%	0.63%	32.96%	100.00%
Montgomery	TOD	17.80%	58.15%	2.68%	0.35%	21.01%	100.00%
<i>By Category Type</i>							
	non-TOD	4.20%	67.86%	1.15%	0.51%	26.27%	100.00%
	TOD	20.20%	59.31%	2.49%	0.70%	17.30%	100.00%
<i>Sample Size</i>		10.11%	64.70%	1.65%	0.58%	22.96%	100.00%

Source: The Bozzuto Group; Urban Analytics, Inc.

**Note:**

<sup>1</sup>Includes retired, unemployed, student (primary, secondary or post-secondary), works at home, does not work, did not respond, and cross-coded responses (by respondent).

<sup>2</sup>May not total 100% due to rounding.

Average Commuting Time to Work

In Table 3-6, the average commuting time to work as reported by the residents in the TOD and non-TOD projects analyzed is presented. The average commuting time is reported in 15-minute increments. While the data reported in Table 3-5 reflect a specific selection (e.g., public transportation versus personal vehicle), the data reported in Table 3-6 tend to reflect an imprecise measurement. That is, regardless of the method of transportation to work, the average commute time is not exact (it may change every day) and is based on self-reported estimates by residents.

**Table 3-6**  
**Average Commuting Time to Work**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

		<i>Minutes (in 15-minute increments)</i>							
County	Type	1-15	16-30	31-45	46-60	61+	Other <sup>1</sup>	Total	
<i>Virginia</i>		<i>Percentage of Residents by Category Type<sup>2</sup></i>							
Arlington	non-TOD	34.99%	46.87%	5.94%	0.64%	0.96%	10.59%	100.00%	
Arlington	TOD	34.26%	29.93%	9.20%	6.65%	2.79%	17.16%	100.00%	
Fairfax	non-TOD	29.20%	31.01%	9.13%	2.24%	1.00%	27.43%	100.00%	
Fairfax	TOD	21.68%	41.64%	11.00%	1.66%	0.32%	23.71%	100.00%	
<i>Maryland</i>									
Montgomery	non-TOD	23.94%	21.61%	10.40%	3.94%	1.53%	38.58%	100.00%	
Montgomery	TOD	24.75%	30.51%	12.84%	2.55%	1.14%	28.22%	100.00%	
<i>By Category Type</i>									
non-TOD		26.80%	27.06%	9.59%	3.03%	1.27%	32.23%	100.00%	
TOD		26.51%	33.92%	11.20%	3.45%	1.35%	23.58%	100.00%	
<i>Sample Size</i>		26.69%	29.59%	10.19%	3.18%	1.30%	29.04%	100.00%	

Source: The Bozzuto Group; Urban Analytics, Inc.

Note:

<sup>1</sup>Includes retired, unemployed, student (primary, secondary or post-secondary), works at home, does not work, did not respond, and cross-coded responses (by respondent).

<sup>2</sup>May not total 100% due to rounding.

While the average commuting time by all residents in the non-TOD unit category is about evenly split between the 1-15 minute (26.8 percent) and the 16-30 minute (27.06 percent) increments, residents on average in the TOD unit category estimate that it takes 16-30 minutes to travel to work (33.92 percent of respondents) followed by the 1-15 minute increment (26.51 percent of respondents). Interestingly, residents in the Fairfax County TOD projects (41.64 percent of respondents) and the Montgomery County TOD project (30.51 percent of respondents) reported that it takes them between 16-30 minutes on average to commute to work while fewer residents in the corresponding non-TOD projects reported that it took them that same amount of time to commute to work. It would be beneficial and informative if the average commuting time could be cross-tabulated to the method of

transportation to work to compare average commuting time by public transportation versus taking one's own vehicle to work, however, that data does not currently exist in the 9,546 unit sample size analyzed.

Residence Prior to Moving to Current Apartment Building

In Table 3-7, the immediate past residence of residents prior to moving to their current apartment building is presented. For both non-TOD and TOD projects, slightly more than two-thirds of residents (68.73 percent) moved to their current apartment building from another apartment building. Approximately one-quarter of residents (23.88 percent) moved to their current apartment building from a house. Six percent of residents moved directly to their current apartment building from their parents' house, and the remaining residents (about 1.4 percent) moved directly to their current residence straight from college.

**Table 3-7**  
**Residence Prior to Moving to Current Apartment Building**  
**Existing TOD versus non-TOD Projects**  
**Virginia and Maryland**  
**2015**

County	Type	Apartment	House	College	Parents	Total
<i>Virginia</i>		<i>Percentage of Residents by Category Type<sup>1</sup></i>				
Arlington	non-TOD	80.26%	15.57%	0.48%	3.69%	100.00%
Arlington	TOD	73.63%	16.39%	3.09%	6.89%	100.00%
Fairfax	non-TOD	68.22%	24.95%	1.34%	5.50%	100.00%
Fairfax	TOD	68.50%	22.42%	1.87%	7.21%	100.00%
<i>Maryland</i>						
Montgomery	non-TOD	66.90%	26.10%	0.84%	6.15%	100.00%
Montgomery	TOD	67.25%	25.89%	1.32%	5.54%	100.00%
<i>By Category Type</i>						
non-TOD		68.28%	24.97%	1.02%	5.73%	100.00%
TOD		69.50%	22.03%	2.01%	6.46%	100.00%
<i>Sample Size</i>		68.73%	23.88%	1.39%	6.00%	100.00%

Source: The Bozzuto Group; Urban Analytics, Inc.

Note:

<sup>1</sup>May not total 100% due to rounding.

In the Washington, DC metropolitan area, the gap between the average value of market-rate *for-sale* housing and market-rate *for-rent* housing is large across the region, especially in the three counties analyzed. The depth and breadth of the last U.S. recession (December 2007 to

June 2009) might be one reason why almost 30 percent (29.88 percent) of residents moved to their current residence from either a house or from their parents' houses. However, the household income data reported in Table 3-3 indicate that the median household income in both the non-TOD and TOD units is relatively high. Thus, the fact that almost 70 percent (68.73 percent) of residents moved to their current apartment building from another apartment building might be an indicator of generational lifestyle choice, and not about affordability.

#### **4. General Characteristics of the Four TOD Projects Selected**

The analysis of the 9,546 apartment units was conducted to develop an understanding of the general characteristics of TOD and non-TOD projects in Northern Virginia and Maryland. In this section, four specific TOD projects were selected to calculate the fiscal impact of these projects on their respective host jurisdictions. The four jurisdictions selected were Fairfax County, Virginia, and the City of Rockville, City of Baltimore, and Anne Arundel County, all in Maryland. These four jurisdictions each have a unique set of fiscal operating revenue and expenditure characteristics, which affect the estimated net fiscal impacts of TOD projects on their budgets. In other words, a proposed or existing TOD project would generate different fiscal impacts if its building program characteristics were replicated in each of the jurisdictions analyzed in this report.<sup>5</sup> Building program data<sup>6</sup> on the four TOD projects selected for the project-specific fiscal impact analysis are presented in Table 4-1.

##### Fairfax County, Virginia: “The Shelby”

The Shelby is a 240-unit apartment building located approximately one-half mile from the Huntington Metrorail station in Fairfax County. Residents can walk to the station or take public busses. The average assessed real estate value of The Shelby is \$250,000 per unit. Average household size is 1.56 people per unit or 42 percent less than the average household size of 2.68 people per unit for renter-occupied housing units in Fairfax County, Virginia as of the 2010 Census. The average student generation factor at The Shelby is 0.07 school-age children per unit or 42 percent less than the average student generation factor of 0.12 children per TOD apartment unit in Fairfax County and 85 percent less than the average student generation factor of 0.45 per housing unit across all housing units in Fairfax County in school year 2013-2014. The mean average household income at The Shelby is \$88,955 per unit. There are no retail land uses at The Shelby.

##### City of Rockville, Maryland: “The Alaire”

The Alaire is a 279-unit apartment building located approximately one-quarter mile from the Twinbrook Metrorail station in the City of Rockville. The average assessed real estate value of The Alaire is \$241,000 per unit. Average household size is 1.54 people per unit or 33

---

<sup>5</sup>The net fiscal impact of one TOD project (“The Alaire”) as if it were developed in four different jurisdictions is illustrated in section 6.

<sup>6</sup>Due to the lead time required to analyze and prepare this report, the building program data on these four TOD projects were collected between February 1<sup>st</sup> and April 30<sup>th</sup> of 2015. Estimated average real estate assessed values reported in Table 4-1 (and other project-specific data described in this section) reflect this time period.

percent less than the average household size of 2.31 people per unit for renter-occupied housing units in the City of Rockville, Maryland as of the 2010 Census. The average student generation factor at The Alaire is 0.06 school-age children per unit or 57 percent less than the average student generation factor of 0.14 children per TOD apartment unit in Montgomery County and 86 percent less than the average student generation factor of 0.42 per housing unit across all housing units in Montgomery County<sup>7</sup> in school year 2013-2014. Data on the mean average household income at The Alaire were not available. There are 14,800 square feet of retail space at The Alaire that is estimated to support 33 full-time equivalent (FTE) jobs.

**Table 4-1**  
**Residential and Non-Residential Building Program Data**  
**Four TOD Projects Selected**  
**Virginia and Maryland**

	<b>Total</b>	<b>Average</b>	<b>Total</b>	<b>Estimated</b>	<b>Estimated</b>
	<b>Units<sup>7</sup></b>	<b>Real Estate</b>	<b>Real Estate</b>	<b>Population<sup>7</sup></b>	<b>Children<sup>7</sup></b>
		<b>Assessed Value<sup>5</sup></b>	<b>Assessed Value<sup>5</sup></b>		
<b>Residential Uses</b>					
<sup>1</sup> The Shelby	240	\$250,000	\$ 60,000,000	374	17
<sup>2</sup> The Alaire	279	\$241,000	\$ 67,239,000	431	18
<sup>3</sup> The Fitzgerald	275	\$169,000	\$ 46,475,000	345	16
<sup>4</sup> The Village at Odenton Station	235	\$147,500	\$ 34,662,500	398	33
		<b>Avg. Real Estate</b>	<b>Total</b>		<b>Estimated</b>
	<b>Total</b>	<b>Assessed Value<sup>5</sup></b>	<b>Real Estate</b>		<b>FTE Jobs<sup>6,7</sup></b>
	<b>Sq. Ft.</b>	<b>per Sq. Ft.</b>	<b>Assessed Value<sup>5</sup></b>		<b>Supported</b>
<b>Non-Residential Uses</b>					
<i>Retail Space</i>					
The Shelby	0	n/a	n/a		0
The Alaire	14,800	\$225.00	\$ 3,330,000		33
The Fitzgerald	23,728	\$265.00	\$ 6,287,920		53
The Village at Odenton Station	57,995	\$150.00	\$ 8,699,250		129

*Source:*

*Building Program Data:* Insight Property Group; JBG; The Bozzuto Group; DOLBEN; Urban Analytics, Inc.

*Assessed and Market Value Data - Retail Space:* Review of third-party market research reports and assessment data from LoopNet.com; CBRE; Lipman Frizzell & Mitchell, LLC; Valbridge Property Advisors, Municipal & Financial Services Group, LLC; and the Maryland State Department of Assessments & Taxation (MD SDAT).

*Note:*

- <sup>1</sup> Location: Fairfax County, Virginia. Developer: Insight Property Group
- <sup>2</sup> Location: City of Rockville, Maryland. Developer: JBG
- <sup>3</sup> Location: City of Baltimore, Maryland. Developer: The Bozzuto Group
- <sup>4</sup> Location: Anne Arundel County, Maryland. Developer: DOLBEN
- <sup>5</sup> Current dollars.
- <sup>6</sup> FTE = full-time equivalent jobs
- <sup>7</sup> At full build-out and occupancy.

City of Baltimore, Maryland: “The Fitzgerald”

The Fitzgerald is a 275-unit apartment building located adjacent to the Mt. Royal Avenue Light Rail Station and 0.4 miles from Penn Station (Amtrak) in the City of Baltimore. The average assessed real estate value of The Fitzgerald is \$169,000 per unit. Average household

<sup>7</sup>Montgomery County provides public education services for the City of Rockville.

size is 1.25 people per unit or 46 percent less than the average household size of 2.31 people per unit for renter-occupied housing units in the City of Baltimore, Maryland as of the 2010 Census. The average student generation factor at The Fitzgerald is 0.06 school-age children per unit or 81 percent less than the average student generation factor of 0.32 per housing unit across all housing units in the City of Baltimore in school year 2012-2013. Data on the mean average household income at The Fitzgerald were not available. There are 23,728 square feet of retail space at The Fitzgerald that is estimated to support 53 full-time equivalent (FTE) jobs.

Anne Arundel County, Maryland: “The Village at Odenton Station”

The Village at Odenton Station is a 235-unit apartment building located adjacent to the Odenton MARC Rail Station in Anne Arundel County. The average assessed real estate value of The Village at Odenton Station is \$147,500 per unit. Average household size is 1.70 people per unit or 32 percent less than the average household size of 2.49 people per unit for renter-occupied housing units in Anne Arundel County, Maryland as of the 2010 Census. The average student generation factor at The Village at Odenton Station is 0.14 school-age children per unit or 64 percent less than the average student generation factor of 0.39 per housing unit across all housing units in Anne Arundel County in school year 2013-2014. The median average household income at The Village at Odenton Station is \$105,053 per unit. There are 57,995 square feet of retail space at The Village at Odenton Station that is estimated to support 129 full-time equivalent (FTE) jobs.

## **5. Fiscal Impact Findings of the Four TOD Projects Selected**

There are two objectives of this fiscal impact analysis. The first objective is to measure the expenditure demand that the four TOD projects selected for analysis would place on the general fund operating accounts of the counties and cities in which they are located. The second objective is to measure revenues that will be generated to those counties and cities at full build-out and occupancy of these selected TOD projects. The net fiscal impact of these projects reflects the net increase in fiscal revenues that will be generated by the new residents, workers and land-uses associated with each TOD community minus the estimated expenditures required by those counties and cities to provide public services to these new residents and workers. These revenue and expenditure flows are different for each type of land use development in each county and city.

A fiscal impact simulation model was used in this analysis and the model was re-calibrated to reflect the most recently reported annual audited financial statements of operating revenues and expenditures for each county and city. A summary of actual operating revenues and expenditures for each county and city is shown in Appendix Tables A-1 through A-8. A detailed discussion of the methodology employed to estimate the fiscal impact on each respective county and city from the four TOD projects selected for analysis is presented in the appendix section of this report.

### Fairfax County, Virginia

The estimated annual fiscal flows associated with all residential and non-residential land uses in Fairfax County, Virginia in fiscal year 2014 are presented in Appendix Tables A-1 and A-2. Based on an examination of all potential local revenue sources and associated expenditures allocated to the residential land uses at The Shelby TOD project, the total net annual fiscal benefit to Fairfax County was found to equal an estimated \$364,946 reflecting the generation of revenues totaling \$1,117,400 with associated expenditures totaling \$752,454. Alternatively stated, The Shelby was estimated to generate \$1.49 in tax and non-tax revenues to Fairfax County in FY2014 for every \$1.00 in public services that Fairfax County expended in the provision of public services to the residents at The Shelby. These findings are shown in Table 1-1.

### City of Rockville, Maryland

The estimated annual fiscal flows associated with all residential and non-residential land uses in the City of Rockville, Maryland in fiscal year 2014 are presented in Appendix Tables A-3 and A-4. Based on an examination of all potential local revenue sources and associated expenditures allocated to the residential and non-residential land uses at The Alaire TOD project, the total net annual fiscal benefit to the City of Rockville was found to equal an estimated \$45,868 reflecting the generation of revenues totaling \$388,817 with associated expenditures totaling \$342,949. Alternatively stated, The Alaire was estimated to generate \$1.13 in tax and non-tax revenues to the City of Rockville in FY2014 for every \$1.00 in public services that the City expended in the provision of public services to the residents and workers at The Alaire. These findings are shown in Table 1-1.

### City of Baltimore, Maryland

The estimated annual fiscal flows associated with all residential and non-residential land uses in the City of Baltimore, Maryland in fiscal year 2013 are presented in Appendix Tables A-5 and A-6. Based on an examination of all potential local revenue sources and associated expenditures allocated to the residential and non-residential land uses at The Fitzgerald TOD project, the total net annual fiscal benefit to the City of Baltimore was found to equal an estimated \$941,053 reflecting the generation of revenues totaling \$1,726,045 with associated expenditures totaling \$784,992. Alternatively stated, The Fitzgerald was estimated to generate \$2.20 in tax and non-tax revenues to the City of Baltimore in FY2013 for every \$1.00 in public services that the City expended in the provision of public services to the residents and workers at The Fitzgerald.<sup>8</sup> These findings are shown in Table 1-1.

---

<sup>8</sup>The City of Baltimore's FY2013 real estate tax rate was more than double the other three jurisdictions analyzed yet its expenditures for public school education on a per student basis was at least 60 percent less than the other jurisdictions with public education expenditures. In this report, public education expenditures reflect the *direct* contribution to the local school system from each jurisdiction analyzed. Contributions to the local school system from state, federal and other sources are not included. This is because the purpose of this report is to estimate the net fiscal impacts to the jurisdictions *only* and not to the state or the federal government.

### Anne Arundel County, Maryland

The estimated annual fiscal flows associated with all residential and non-residential land uses in Anne Arundel County, Maryland in fiscal year 2014 are presented in Appendix Tables A-7 and A-8. Based on an examination of all potential local revenue sources and associated expenditures allocated to the residential and non-residential land uses at The Village of Odenton Station TOD project, the total net annual fiscal benefit to Anne Arundel County was found to equal an estimated \$157,456 reflecting the generation of revenues totaling \$816,912 with associated expenditures totaling \$659,456. Alternatively stated, The Village of Odenton Station was estimated to generate \$1.24 in tax and non-tax revenues to the County in FY2014 for every \$1.00 in public services that the County expended in the provision of public services to the residents and workers at The Village at Odenton Station. These findings are shown in Table 1-1.

## **6. Understanding Cross-Jurisdictional Fiscal Impacts**

Since the 1930s, there has been an incorrect axiomatic conclusion drawn by the findings of fiscal impact models that residential land uses generate a net fiscal deficit (or burden) on the budgets of local jurisdictions while non-residential land uses generate a net fiscal surplus (or benefit).<sup>9</sup> This incorrect conclusion is often extended across jurisdictions and regions. That is, the error of drawing the wrong conclusion from the findings of a fiscal impact analysis in one jurisdiction and applying it universally to all jurisdictions across regions is prevalent. Prior to 1980, this conclusion was promulgated, in part, simply due to the lack of high-speed, cost-efficient computational ability to run complex sensitivity analyses in the models that had been constructed to date. During the 1980s and 1990s, the ever-changing taxable base and annual changes in the local tax and fee structure of counties and cities across the country coupled with changing levels of public services provided by local jurisdictions added another element to fiscal impact modeling; variations in underlying model assumptions driven by changes in economic and non-economic conditions at the federal, state, county and city levels. In this section, cross-jurisdictional impacts are discussed and an analysis of one TOD project is presented.

### Revenues Generated within a Region

In Virginia, cities are independent of counties. In Maryland, cities and towns typically receive some level of public services directly from counties, and some level of public services directly from the state. These services are supported, in part, from real estate taxes collected from real property in the cities and towns. The estimated annual revenues generated to the City of Rockville, Montgomery County, and the State of Maryland associated with the residential and non-residential land uses at The Alaire in fiscal year 2014 are presented in Table 6-1.

---

<sup>9</sup>Please see Appendix B for a detailed discussion of the eleven weaknesses in fiscal impact modeling from the 1930s to the mid-1990s.

**Table 6-1**  
**Revenues Generated within a Region<sup>1</sup>**  
**Residential and Non-residential Land Uses**  
**TOD Project Selected: "The Alaire"**  
**Virginia and Maryland**

<i>Aggregate</i>	<b>City of</b>	<b>Montgomery</b>	<b>State of</b>	
<b>Residential</b>	<b>Rockville, MD</b>	<b>County, MD</b>	<b>Maryland</b>	<b>Total</b>
Annual Revenues Generated				
Real Estate Revenues	\$ 196,338	\$ 623,306	\$ 75,308	\$ 894,952
All other Revenues	\$ 175,322	\$ -	\$ -	\$ 175,322
Total	\$ 371,660	\$ 623,306	\$ 75,308	\$ 1,070,274
<i>Aggregate</i>				
<b>Non-residential</b>				
Annual Revenues Generated				
Real Estate Revenues	\$ 9,724	\$ 30,869	\$ 3,730	\$ 44,323
All other Revenues	\$ 7,433	\$ -	\$ -	\$ 7,433
Total	\$ 17,157	\$ 30,869	\$ 3,730	\$ 51,756
Grand Total	\$ 388,817	\$ 654,175	\$ 79,038	\$ 1,122,030

Source: Urban Analytics, Inc.

**Note:**

<sup>1</sup> These are the revenue figures that are estimated to have been generated (*on an annual basis*) had "The Alaire" TOD project been fully built-out and occupied in FY 2014 based on the City of Rockville's [Comprehensive Annual Financial Report](#) (CAFR).

In addition to the estimated \$388,817 that The Alaire generates in gross revenues to the City of Rockville, The Alaire is also estimated to generate an additional \$654,175 to Montgomery County and \$79,038 to the State of Maryland on an *annual* basis.

Fiscal Impact across Regions

Are the fiscal impact findings of a TOD project in one jurisdiction the same in other jurisdictions? A proposed or existing TOD project should generate different fiscal impacts in other jurisdictions because all jurisdictions provide both different *types* of public services and different *levels* of public services, relative to the amount of tax and non-tax fee revenues that these jurisdictions collect annually. In Table 6-2, the fiscal impact of The Alaire TOD project was estimated for the other three jurisdictions, in addition to the City of Rockville where this project is located. Holding the building program characteristics of The Alaire constant (i.e., utilizing the same number of units, retail square feet, market values, average household sizes, and average number of children per unit), The Alaire TOD project was programmed through the fiscal impact model constructed for each jurisdiction.

Table 6-2

**Fiscal Impact across Regions<sup>1</sup>**  
**Residential and Non-residential Land Uses**  
**TOD Project Selected: "The Alaire"**  
**Virginia and Maryland**

<i>Aggregate</i>	<b>Fairfax</b>	<b>City of</b>	<b>City of</b>	<b>Anne Arundel</b>
<b>Residential</b>	<b>County, VA</b>	<b>Rockville, MD</b>	<b>Baltimore, MD</b>	<b>County, MD</b>
Annual Revenues Generated	\$ 1,267,025	\$ 371,660	\$ 2,121,941	\$ 1,045,976
Annual Expenditures Demanded	\$ 850,527	\$ 333,684	\$ 877,573	\$ 482,950
Annual Revenue Surplus (Deficit)	\$ 416,498	\$ 37,976	\$ 1,244,368	\$ 563,026
<i>Aggregate</i>				
<b>Non-residential</b>				
Annual Revenues Generated	\$ 64,851	\$ 17,157	\$ 107,613	\$ 39,040
Annual Expenditures Demanded	\$ 27,712	\$ 9,265	\$ 48,006	\$ 17,720
Annual Revenue Surplus (Deficit)	\$ 37,139	\$ 7,892	\$ 59,607	\$ 21,320
<b>Total - All Land Uses</b>				
Annual Revenues Generated	\$ 1,331,876	\$ 388,817	\$ 2,229,554	\$ 1,085,016
Annual Expenditures Demanded	\$ 878,239	\$ 342,949	\$ 925,579	\$ 500,670
Annual Revenue Surplus (Deficit)	\$ 453,637	\$ 45,868	\$ 1,303,975	\$ 584,346
<i>Per-Unit</i>				
<b>Residential only</b>	<b>Fairfax</b>	<b>City of</b>	<b>City of</b>	<b>Anne Arundel</b>
<b>Residential only</b>	<b>County, VA</b>	<b>Rockville, MD</b>	<b>Baltimore, MD</b>	<b>County, MD</b>
Annual Revenues Generated	\$ 4,541	\$ 1,332	\$ 7,606	\$ 3,749
Annual Expenditures Demanded	\$ 3,048	\$ 1,196	\$ 3,145	\$ 1,731
Annual Revenue Surplus (Deficit)	\$ 1,493	\$ 136	\$ 4,461	\$ 2,018

Source: Urban Analytics, Inc.

**Note:**

<sup>1</sup> These are the revenue and expenditure figures that are estimated to have been generated (*on an annual basis*) had "The Alaire" TOD project been fully built-out and occupied in each of the jurisdictions in FY 2014. Revenues and expenditures are based on each jurisdiction's Comprehensive Annual Financial Report (CAFR).

The findings shown in Table 6-2 indicate that the residential net fiscal impact of The Alaire was estimated to range from a low of \$136 per unit annually in the City of Rockville to a high of \$4,461 per unit annually in the City of Baltimore. The low net fiscal impact per unit estimated for the City of Rockville *should not* be interpreted by the reader that The Alaire TOD project demands more public services from the City of Rockville versus the other jurisdictions *nor should* it be interpreted that The Alaire does not generate sufficient tax and non-tax fees annually to the City relative to the other jurisdictions. Each jurisdiction has its own unique set of operating revenue and expenditure flows<sup>10</sup> which affect the estimated net fiscal impacts of TOD projects on their budgets. In all four jurisdictions, The Alaire generates more revenues to the jurisdiction than the cost to provide public services in those jurisdictions to the residents of The Alaire. This TOD project "pays its own way" and subsidizes other residential land uses that do not.

<sup>10</sup>See Appendix Tables A-1 through A-8 for operating revenues and expenditures in each jurisdiction.

## **7. Conclusion and Recommendations for Future Research**

The findings presented in this report indicate that the fiscal benefits to the various jurisdictions analyzed are substantial. In layman’s vernacular, the four TOD projects analyzed not only “pay their own way”, they also subsidize existing residential land uses that generate an annual net fiscal deficit (or burden) to those jurisdictions.

### Conclusion

The conclusions drawn from the findings presented in this report are as follows:

- An analysis of the general socio-economic characteristics in a sample size of just under 10,000 apartment units in Virginia and Maryland found that the population and school-age children characteristics of TOD and non-TOD projects are quite different;
- For the apartment units in TOD designated projects located at or near a transit rail station, these projects generated between \$1.13 and \$2.20 in tax and non-tax revenues to their respective jurisdictions for every \$1.00 in public services that those jurisdictions expended in the provision of public services to the residents and workers in those TOD projects;
- *If the four TOD projects* selected for analysis in this report had not been located at or near a transit rail station, then these projects are estimated to have generated fewer revenues - - between \$0.77 and \$1.35 in tax and non-tax revenues to their respective jurisdictions - - for every \$1.00 in public services demanded by the residents and workers in those projects;
- The four TOD projects analyzed clearly “pay their own way” while the results were mixed for non-TOD projects which contain higher average household sizes per unit (in both adult and school-age children populations);
- The empirical evidence of the data analyzed disproves the perception among various stakeholders that TOD projects pose more of a fiscal burden on the budgets of local jurisdictions than non-TOD projects; and
- The major concerns often argued by opponents of TOD projects cannot be supported by the data analyzed.
  - The argument that a higher fiscal burden exists on the local public school system is false as student generation factors per unit are *lower* in TOD projects than in non-TOD projects;
  - The argument that a higher fiscal burden exists on the overall cost to provide public services (e.g., public safety, public works, parks and recreation, etc.) to residents and workers in these projects is false as average household sizes in TOD units are *lower* than in non-TOD projects.

## Recommendations

Recommendations for future research into this subject matter include the following:

- Conducting this fiscal impact analysis in the *close-in suburbs* of other major cities of the country with large rail transit systems (such as Boston, New York, and Chicago). Are the findings of the analysis of TOD projects unique to the Baltimore-Washington, DC area or can they be replicated in other large urban areas?
- The cost of providing public education usually ranks either first or second highest among the list of all public services provided by counties and cities. Lower average student generation factors for the TOD projects analyzed in the Baltimore-Washington, DC area resulted in a lower *per-unit* public education cost in the fiscal impact findings. Are the lower student generation factors in the TOD projects analyzed unique to the Baltimore-Washington, DC area or does this also occur in TOD projects in other large urban areas?
- It is not clear whether the median age range of 31 – 40 years reflects a generational or lifestyle choice or whether this age range reflects a housing affordability issue for the TOD projects in the Baltimore-Washington, DC area. Further research is needed to understand whether this median age range is an indicator of a future trend or whether this is simply an anomaly in the sample size analyzed.
- The cost of parking (especially structured parking) continues to increase, especially in urban areas. Given that local planning departments are allowing for fewer parking spaces per unit in the goal of encouraging residents to take public transportation, additional research needs to be conducted into why the average number of cars per unit continues to exceed one per household in the TOD apartment projects.
- Some jurisdictions in the Baltimore-Washington, DC metropolitan area require that proposed new TOD apartment projects set-aside a percentage of the planned new units as affordable and workforce housing units. From both a policy and fiscal perspective, it would be informative to both public officials and the real estate community to conduct additional analyses of the effect on the overall fiscal impact to a jurisdiction of TOD rental units in a proposed project when those units are priced at both the market-rate and the below-market rate

## Appendix

## **Fiscal Impact Methodology**

In the field of urban planning and real estate development, a fiscal impact model estimates revenue and expenditure flows at the local government level generated by various residential and non-residential land-uses. Since the 1930s, there has been an incorrect conclusion drawn by the findings of fiscal impact models that new residential land uses generate a net fiscal deficit (or burden) on the budgets of local jurisdictions while all new non-residential land uses generate a net fiscal surplus (or benefit). This incorrect conclusion has historically been supported by two overarching errors in fiscal impact modeling: (1) weaknesses in the mathematical construction of these models; and (2) weaknesses in the underlying assumptions used to construct these models. In Appendix B, a detailed description of eleven weaknesses inherent in fiscal impact models developed between the 1930s and the mid-1990s is discussed in greater detail.

### **Fiscal Impact Model**

In order to accurately identify and quantify the distinct fiscal flows within counties, cities and towns, a fiscal impact model was developed by Dr. Bellas that allocates local revenues and expenditures by land use category including distributions across different types of residential and non-residential land uses. Distributing these revenue and expenditure flows involves a two-step process: first, allocating revenues and expenditures between residential and non-residential land uses; and second, developing coefficients to distribute these revenue and expenditures by land-use sub-sector by their direct sources or beneficiaries. In every jurisdiction, the underlying basis for analyzing revenues and expenditures is the local government's third-party audited financial statements (not their proposed or adopted budgets).

In this report, the basis for the fiscal impact analysis of the four TOD projects was the individual Comprehensive Annual Financial Report (CAFR) for fiscal year 2014 for each jurisdiction.<sup>11</sup> The audited revenues and expenditures reported in each CAFR by source and department were allocated between those public operating revenues generated and those public service operating expenditures demanded by residential and non-residential uses according to a detailed examination of each jurisdiction's actual collected revenues and spending patterns in fiscal year 2014. The allocation of fiscal revenues and expenditures were calibrated by the fiscal impact model to the demographic and economic characteristics of each jurisdiction. The residential share of each category of operating revenues (i.e., the share of revenues generated by local residents as opposed to local businesses) and operating expenditures (i.e., the share of the provision of expenditures for public services to local residents as opposed to local businesses) was converted to a per capita equivalent to facilitate the calculation of fiscal flows associated with each residential land use analyzed. The non-residential share of each category of operating revenues and expenditures was converted to a

---

<sup>11</sup>The fiscal analyses conducted in this report occurred during April of 2015. The CAFR for fiscal year end 2013 was used for the City of Baltimore as the City had not yet released to the public the CAFR for FYE 2014. For all jurisdictions analyzed in this report, fiscal year 2015 had not yet ended. Typically, the jurisdictions release their audited financial statements to the public about six months after the end of the fiscal year.

per job equivalent to facilitate the calculation of non-residential fiscal flows from office, retail, industrial, and other non-residential development.

Actual operating revenues and expenditures in each jurisdiction for FY 2014 as well as the allocation factors used to distribute these operating revenues and expenditures for each major line-item category are shown in Appendix Tables A-1 and A-8. The allocation factors calculated by the fiscal impact model for each jurisdiction are based on a detailed analysis of municipal data provided by each jurisdiction's various departments. For example, in Appendix Table A-1, a detailed analysis of revenues in Fairfax County, Virginia from sales taxes indicated that 79.8 percent of these revenues were generated by the occupants of residential land uses while the remaining 20.2 percent was generated by workers associated with non-residential land uses. Likewise, this same detailed level of analysis was performed for each jurisdiction's operating expenditures for public services. In Appendix Table A-2, for example, an analysis of general government administration expenditures in Fairfax County indicated that 65.91 percent of these expenditures were attributed to providing services to the residential sector and 34.09 percent to the non-residential sector.<sup>12</sup>

The mathematical approach used in the fiscal impact model assumes that each person living or working in each jurisdiction has access to that jurisdiction's services and therefore potentially shares from the benefits of these services. This expenditure allocation is not based on the actual utilization of public services by specific individuals but rather reflects equal access to and availability of these services to all residents and persons working in that jurisdiction. The findings derived in this report are based on an analysis of average costs, not marginal costs. By using average expenditure and revenue multipliers in this analysis and not adjusting revenue sources and expenditure demands to reflect the income structure of existing and future residents of a community or the actual utilization rate of specific services, the actual revenue forecast is likely to be understated and the actual demand for public services and programs is likely to be overstated.

In an analysis of average revenues and expenditures, it is common for the reader to wonder why the marginal costing approach to estimating revenues and expenditures is not utilized. The answer is two-fold. First, there is a data collection problem with the marginal costing approach. While the revenue and expenditure multipliers have been localized in the fiscal model to reflect the socio-economic characteristics of each jurisdiction, it is important to note that not all local data needed to minimize the margin of error in the simulation estimates (in the marginal costing approach) are available from each jurisdiction or through published third-party data sources. The lack of local data requires the analyst to use either regional or national data. This leads to the second problem with the marginal costing approach; a tendency for the analyst to incorrectly develop assumptions based on a limited data set, generally resulting in a larger error in the estimate of the multipliers. Thus, the marginal approach to estimating revenues and expenditures is often based on assumptions that tend to overstate the revenue estimates and understate the expenditure estimates. In the fiscal impact

---

<sup>12</sup>Although it is an acceptable practice in fiscal impact modeling to allocate 100 percent of public education services to the residential sector, a very strong argument can be made that the non-residential land-use sector should bear their fair share of these public education services.

simulation model, however, where specific revenues and expenditures could be identified and assigned based on either actual use, income or values, the estimates were calculated based on those specific data.

### **Limiting Conditions**

The findings of the fiscal impact analyses presented in this report assume the full build-out and occupancy of each of the four TOD projects. The fiscal impact model developed by Dr. Bellas and used by Urban Analytics, Inc., is a simulation model, not a predictive model. The model simulates the financial conditions of counties, cities and towns across the United States based on third-party, audited financial statements prepared for a given point in time and always in the past. The basis for the analysis and the findings presented in this report is each jurisdiction's Comprehensive Annual Financial Report (CAFR) for fiscal year 2014.<sup>13</sup> The methodology employed in the fiscal impact model is land-use and price-point sensitive, and these variables are subject to change as market conditions change. The model is also sensitive to persons per unit, school-age children per unit, and the number of square feet per worker. These variables are often based on third-party generated sample data when the absence of actual data exist. Additionally, the model is subject to project-specific socioeconomic conditions at a given point in time. The estimated net annual fiscal surplus generated by the four TOD projects (at full build-out and occupancy) assumes that fiscal year levels-of-service provided by each jurisdiction and the fiscal year tax base and tax rates in the fiscal year analyzed remain constant. If tax rates or levels of services are changed in future years, then respective revenue and expenditure estimates would also change. Similarly, if assessments change at a rate exceeding the rate of inflation, then the value of the taxable base for calculating revenues would also change. For the purposes of this analysis, all of these values are held constant as if the four TOD projects selected existed as part of the tax base in the fiscal year analyzed.

All work undertaken in this report was conducted by Urban Analytics, Inc., in an objective and independent fashion. The results (findings) of the analyses conducted are based solely on the circumstances as Urban Analytics, Inc., sees them, as derived from research and analyses conducted by Urban Analytics, Inc., or third parties. The findings presented in this report were not contingent upon any predetermined or favorable results (findings) by Urban Analytics, Inc., or the Urban Land Institute. When third-party data were utilized in the analysis and preparation of this report, Urban Analytics, Inc., relied upon such data in the formulation of all analyses and did not independently verify the accuracy of such third-party data. All information contained in the report which was furnished by others was assumed to be true, correct and reliable. Urban Analytics, Inc., assumes no responsibility for the accuracy of information provided by others. The evaluation and estimation of fiscal impacts was based on historical audited financial data as reflected in each jurisdiction's Comprehensive Annual Financial Report (CAFR) for the fiscal year analyzed and other non-audited data from third parties as of the fiscal year analyzed. Due to the principles of simulation, change and anticipation, the fiscal impact estimates are only valid for the fiscal year analyzed. The opinions and findings contained in the report are those of Urban

---

<sup>13</sup>Ibid footnote 11.

Analytics, Inc., and no responsibility is accepted by Urban Analytics, Inc., and its employees for the results of actions taken by others based on the information contained therein.

### Data Limitations

The findings in this report are subject to the quality of the data provided by each jurisdiction and other third-party sources. When analyzing the data provided by each jurisdiction, it was readily discerned that conflicting and contradictory data were provided in various documents. When such third-party data were utilized in the analysis and preparation of this report, Urban Analytics, Inc., relied upon such data in the formulation of all analyses and did not independently verify the accuracy of such third-party data. All information contained in the report which was furnished by others was assumed to be true, correct and reliable. Urban Analytics, Inc., assumes no responsibility for the accuracy of information provided by others.

### Contact Information

*Author:* Dean D. Bellas, Ph.D.

*Mailing Address:* Urban Analytics, Inc.  
Post Office Box 877  
Alexandria, Virginia 22313-0877

*Telephone:* 703.780.8200  
*Fax:* 703.780.8201

*Web Site:* [www.UrbanAnalytics.com](http://www.UrbanAnalytics.com)

*Email - #1:* [Dbellas@UrbanAnalytics.com](mailto:Dbellas@UrbanAnalytics.com)  
*Email - #2:* [Dbellas101@aol.com](mailto:Dbellas101@aol.com)

### About the Author

Dean D. Bellas, Ph.D., is president of Urban Analytics, Inc., an Alexandria, Virginia-based real estate and urban planning consulting firm providing urban development analytical services to public, private, and institutional-sector clients. Consulting services include fiscal and economic impact studies, market research and economic base analyses, real estate asset management, real estate development economics, and project feasibility studies. Since 1996, Dr. Bellas has provided consulting services in Arizona, California, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Virginia, West Virginia, Wisconsin, and the District of Columbia. Dr. Bellas has analyzed the fiscal impact on over 18,500 residential units and over 39.2 million square feet of non-residential space. The total estimated value of all land-uses analyzed is over \$5.7 billion. In addition, Dr. Bellas has authored or co-authored over sixty-five research reports on the fiscal and economic impact of real estate development. Dr. Bellas has been a consultant to the Department of the Treasury and to the State Department.

In addition to Urban Analytics, Dr. Bellas is also an adjunct faculty member in the Real Estate Development concentration within the School of Architecture and Planning at the Catholic University of America where he teaches or has taught Real Estate Finance, Real Estate Investment, Urban Economics, and Asset Management and Strategic Planning. Previously, he has been an adjunct faculty member in the School of Professional Studies in Business and Education at the Johns Hopkins University, and an adjunct faculty member in the School of Management at George Mason University. Dr. Bellas has also taught candidates for the CFA designation on behalf of the Washington Society of Investment Analysts.

Dr. Bellas received a Bachelor of Science in Business Administration from Western New England University with a concentration in Finance (1982), a Master of Urban and Regional Planning from the George Washington University (1993), and his Doctorate in Public Policy with a concentration in regional economic development policy at George Mason University (2005). His doctoral dissertation was entitled, *“Fiscal Impact Simulation Modeling: Calculating the Fiscal Impact of Development.”* His research interests include regional and local developmental growth patterns, economic and fiscal impact effects of real estate development on municipal government, and economic development policy. Dr. Bellas is a member of the National Economists Club, and of Lambda Alpha International, an honorary society for the advancement of land economics. He is a full member of the Urban Land Institute. Dr. Bellas sits on ULI’s national *Public Development and Infrastructure Council*, regionally on the ULI Baltimore-Washington, DC *Transit – Oriented Development (TOD) Council*, and locally on ULI’s Washington District *Regionalism Initiatives Council*. Dr. Bellas was the economic advisor to the Southeast Fairfax Development Corporation Board of Directors in calendar year 2012. He was appointed to the Board of Directors for the 2013 – 2014 term by Supervisor Jeffrey C. McKay (Lee District, Fairfax County, Virginia).

### **Acknowledgements**

The author would like to thank Michele L. Whelley of M. L. Whelley Consulting, LLC (immediate past chairwoman) and David Kitchens of Cooper Carry (current chairman) of the ULI *Baltimore-Washington, DC Transit-Oriented Development (TOD) Product Council* for their assistance, guidance and support in the preparation of this report. The author would also like to thank the following people for providing the building program data on the various projects analyzed:

1. Brad Coker with The Bozzuto Group
2. Keith Corriveau with DOLBEN
3. Mark Franceski with The Bozzuto Group
4. Anthony Wolf Greenberg with The JBG Companies
5. Samantha Roser with The JBG Companies
6. Rebecca E. Snyder with Insight Property Group, LLC

Dr. Bellas and Urban Analytics, Inc., were not compensated for this report. The analyses conducted and the findings presented in this report were independently conducted by Urban Analytics, Inc., and Dr. Bellas.

Understanding the Fiscal Impacts of Transit-Oriented Development (TOD) Projects in Northern Virginia and Maryland (October 21, 2015)

Appendix Table A-1  
Revenue by Source Multipliers  
Fairfax County, Virginia  
FYE June 30, 2014

Category	2014 Revenues <sup>1</sup>	Allocation Factor		Contribution Margin			
		Resident	Non-Res.	Residential		Non-Residential	
<b>1 Real Estate</b>							
Residential	\$1,796,657,921	100.0%	0.0%	\$1,796,657,921	55.88%		
Non-Residential	\$457,900,896	0.0%	100.0%			\$457,900,896	47.21%
<b>2 Personal Property</b>	\$360,182,306	56.6%	43.4%	\$203,791,149	6.34%	\$156,391,157	16.12%
<b>3 Sales Tax</b>	\$261,431,180	79.8%	20.2%	\$208,569,795	6.49%	\$52,861,385	5.45%
<b>4 Utilities (Consumer)</b>	\$46,044,610	65.8%	34.2%	\$30,301,958	0.94%	\$15,742,652	1.62%
<b>5 BPOL</b>	\$156,102,850	0.0%	100.0%	\$0	0.00%	\$156,102,850	16.09%
<b>6 Other Local Taxes</b>	\$31,296,981 <sup>2</sup>	60.7%	39.3%	\$19,000,397	0.59%	\$12,296,584	1.27%
<b>7 Licenses, Fees, Permits</b>	\$63,886,989	70.2%	29.8%	\$44,861,444	1.40%	\$19,025,545	1.96%
<b>8 Fines &amp; Forfeitures</b>	\$16,817,313	75.6%	24.4%	\$12,707,162	0.40%	\$4,110,151	0.42%
<b>9 Use of Money</b>	\$23,784,489	65.9%	34.1%	\$15,676,357	0.49%	\$8,108,132	0.84%
<b>10 Charges for Services</b>	\$350,307,621	79.8%	20.2%	\$279,440,389	8.69%	\$70,867,232	7.31%
<b>11 Miscellaneous</b>	\$1,696,428 <sup>3</sup>	94.9%	5.1%	\$1,610,589	0.05%	\$85,839	0.01%
<b>12 Recovered Costs</b>	\$10,790,166	98.3%	1.7%	\$10,605,654	0.33%	\$184,512	0.02%
<b>13 Intergovernmental</b>	\$608,250,967	97.3%	2.7%	\$592,010,666	18.41%	\$16,240,301	1.67%
<b>Total</b>	\$4,185,150,717			\$3,215,233,481	100.00%	\$969,917,236	100.00%
				Contribution Margin: 76.82%		23.18%	

Note:

- 1 Operating revenues (General Fund and Nonmajor Governmental Funds). Does not include Capital Project Fund revenues.
- 2 Includes Occupancy, Tobacco, Other.
- 3 Includes Recovered Costs, Gifts, Donations, Contributions, Developers' Contributions, and Other.

Source:

Fairfax County [Comprehensive Annual Financial Report](#) (CAFR) for the FYE June 30, 2014  
Urban Analytics, Inc., Alexandria, Virginia ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

Understanding the Fiscal Impacts of Transit-Oriented Development (TOD) Projects in Northern Virginia and Maryland (October 21, 2015)

Appendix Table A-2  
Baseline Service Level Multipliers  
Fairfax County, Virginia  
FYE June 30, 2014

Category	2014 Expenditures <sup>1,2,3</sup>	Allocation Factor		Contribution Margin				
		Resident	Non-Res.	Resident		Non-Res.		
1 Gen. Government Admin.	\$176,657,132	65.91%	34.09%	\$116,434,716	3.18%	\$60,222,416	12.19%	
2 Judicial Administration	\$51,917,925	73.89%	26.11%	\$38,362,155	1.05%	\$13,555,770	2.74%	
3 Public Safety	\$795,498,508	68.77%	31.23%	\$547,064,324	14.94%	\$248,434,184	50.29%	
4 Public Works	\$253,584,502	71.74%	28.26%	\$181,921,521	4.97%	\$71,662,980	14.51%	
5 Health and Welfare	\$561,648,247	96.51%	3.49%	\$542,046,723	14.80%	\$19,601,524	3.97%	
6 Parks, Recreation and Cultural	\$93,921,899	93.80%	6.21%	\$88,094,046	2.41%	\$5,827,854	1.18%	
7 Community Development	\$309,727,599	75.87%	24.13%	\$234,990,330	6.42%	\$74,737,270	15.13%	
8 Non-Departmental	\$0	65.91%	34.09%	\$0	0.00%	\$0	0.00%	
9 Education	\$1,912,558,174	100.00%	0.00%	\$1,912,558,174	52.23%	\$0	0.00%	
<b>Total</b>	<b>\$4,155,513,987</b>			<b>\$3,661,471,989</b>	<b>100.00%</b>	<b>\$494,041,998</b>	<b>100.00%</b>	
					Contribution Margin:		88.11%	11.89%
<b>Summary</b>								
Total Revenues	\$4,185,150,717	100%		\$3,215,233,481	76.82%	\$969,917,236	23.18%	
Total Expenditures	\$4,155,513,987	100%		\$3,661,471,989	88.11%	\$494,041,998	11.89%	
Net Surplus (Deficit)	\$29,636,730	0%		(\$446,238,508)	-11.29%	\$475,875,238	11.29%	

Note:

- 1 Operating expenditures (General Fund and Nonmajor Governmental Fund) only. Does not include Capital Project Fund expenditures.
- 2 Includes Capital Outlays reported within General Fund.
- 3 Includes Debt Service (apportioned).

Source:

Fairfax County Comprehensive Annual Financial Report (CAFR) for the FYE June 30, 2014.  
Urban Analytics, Inc., Alexandria, Virginia ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

**Appendix Table A-3**  
**Revenue by Source and Land-Use Allocation**  
**City of Rockville, Maryland**  
**FYE June 30, 2014**

Category	2014 Revenues <sup>1</sup>	Allocation Factor		Contribution Margin			
		Res.	Non-Res.	Residential	Non-Residential		
<b>1 Real Estate Taxes</b>							
Residential	\$25,671,687	100.0%	0.0%	\$25,671,687	50.08%		
Non-Residential	\$7,266,069	0.0%	100.0%			\$7,266,069	29.22%
<b>2 Business Pers. Property Taxes</b>	\$3,381,305	0.0%	100.0%	\$0	0.00%	\$3,381,305	13.60%
<b>3 Income Taxes</b>	\$13,023,794	100.0%	0.0%	\$13,023,794	25.40%	\$0	0.00%
<b>4 Gas/Motor Vehicles Taxes</b>	\$1,601,681	44.6%	55.4%	\$714,510	1.39%	\$887,171	3.57%
<b>5 Hotel Taxes</b>	\$927,307	0.0%	100.0%	\$0	0.00%	\$927,307	3.73%
<b>6 Admission/Amusement Taxes</b>	\$1,036,536	96.0%	4.0%	\$995,075	1.94%	\$41,461	0.17%
<b>7 Licenses, Fees, Permits</b>	\$3,179,708	2.0%	98.0%	\$64,481	0.13%	\$3,115,227	12.53%
<b>8 Fines &amp; Forfeitures</b>	\$3,236,025	70.2%	29.8%	\$2,270,719	4.43%	\$965,306	3.88%
<b>9 Interest (Use of Money)</b>	\$282,866	44.6%	55.4%	\$126,187	0.25%	\$156,679	0.63%
<b>10 Charges for Services</b>	\$6,184,270	44.6%	55.4%	\$2,758,803	5.38%	\$3,425,467	13.78%
<b>11 Other Revenues</b>	\$6,198,813	44.6%	55.4%	\$2,765,290	5.39%	\$3,433,523	13.81%
<b>12 Intergovernmental-Fed/State</b>	\$2,023,451	70.2%	29.8%	\$1,419,856	2.77%	\$603,595	2.43%
<b>13 Intergovernmental-County</b>	\$2,116,671	68.8%	31.2%	\$1,455,423	2.84%	\$661,248	2.66%
<b>Total</b>	\$76,130,183			\$51,265,824	100.00%	\$24,864,359	100.00%
				Contribution Margin:		67.34%	32.66%

**Source:**

City of Rockville, MD [Comprehensive Annual Financial Report](#) (CAFR) for the FYE June 30, 2014  
 Urban Analytics, Inc. ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

**Note:**

<sup>1</sup> Includes General Fund Revenues, Debt Service Revenues, and Other Governmental Funds Revenues.

**Appendix Table A-4  
Baseline Service Level Allocation Factors  
City of Rockville, Maryland  
FYE June 30, 2014**

Category	2014 Expenditures <sup>1,2</sup>	Allocation Factor		Contribution Margin			
		Res.	Non-Res.	Resident		Non-Res.	
1 General Government Admin.	\$17,460,110	44.6%	55.4%	\$7,788,955	15.99%	\$9,671,155	44.09%
2 Community Development	\$5,462,480	82.8%	17.2%	\$4,522,934	9.28%	\$939,547	4.28%
3 Public Safety	\$13,961,357	63.9%	36.1%	\$8,917,119	18.31%	\$5,044,238	23.00%
4 Public Works	\$8,967,166	44.6%	55.4%	\$4,000,253	8.21%	\$4,966,913	22.65%
5 Health and Welfare	\$0	97.1%	2.9%	\$0	0.00%	\$0	0.00%
6 Parks, Recreation & Culture	\$24,461,579	96.0%	4.0%	\$23,483,116	48.21%	\$978,463	4.46%
7 Com. Dev. Blck Grnts (CDBG)	\$332,864	0.0%	100.0%	\$0	0.00%	\$332,864	1.52%
8 Con. of Natural Resources	\$0	80.2%	19.8%	\$0	0.00%	\$0	0.00%
9 Education	\$0	100.0%	0.0%	\$0	0.00%	\$0	0.00%
<b>Total</b>	<b>\$70,645,557</b>			<b>\$48,712,376</b>	<b>100.00%</b>	<b>\$21,933,181</b>	<b>100.00%</b>
				Contribution Margin:	68.95%		31.05%

<b>Summary</b>		<b>C.M<sup>3</sup></b>		<b>C.M<sup>3</sup></b>	
Total Operating Revenues	\$76,130,183	\$51,265,824	67.34%	\$24,864,359	32.66%
Total Operating Expenditures	<u>\$70,645,557</u>	<u>\$48,712,376</u>	<u>68.95%</u>	<u>\$21,933,181</u>	<u>31.05%</u>
Net Surplus (Deficit)	\$5,484,626	\$2,553,448	-1.61%	\$2,931,178	1.61%

**Source:**

City of Rockville, MD [Comprehensive Annual Financial Report \(CAFR\)](#) for the FYE June 30, 2014  
Urban Analytics, Inc. ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

**Note:**

- 1 Includes General Fund Expenditures, Debt Service Expenditures, and Other Governmental Funds Expenditures.
- 2 Debt Service and Capital Outlays apportioned across expenditure categories.
- 3 Contribution Margin.

Understanding the Fiscal Impacts of Transit-Oriented Development (TOD) Projects in Northern Virginia and Maryland (October 21, 2015)

**Appendix Table A-5  
Revenue by Source and Land-Use Allocation  
City of Baltimore, Maryland  
FYE June 30, 2013**

Category	2013 Revenues <sup>1</sup>	Allocation Factor		Contribution Margin			
		Res.	Non-Res.	Residential		Non-Residential	
<b>1 Real Estate Taxes</b>							
Residential	\$524,818,651 <sup>3</sup>	100.0%	0.0%	\$524,818,651	38.78%		
Non-Residential	\$174,939,550 <sup>3</sup>	0.0%	100.0%			\$174,939,550	35.13%
<b>2 Business Pers. Property Taxes</b>	\$37,527,861 <sup>3</sup>	0.0%	100.0%	\$0	0.00%	\$37,527,861	7.54%
<b>3 Income Taxes</b>	\$276,111,000 <sup>2</sup>	100.0%	0.0%	\$276,111,000	20.40%	\$0	0.00%
<b>4 Highway User Revenues</b>	\$120,113,279 <sup>3,4</sup>	64.3%	35.7%	\$77,220,827	5.71%	\$42,892,452	8.61%
<b>5 Hotel Taxes</b>	\$20,003,154 <sup>3</sup>	0.0%	100.0%	\$0	0.00%	\$20,003,154	4.02%
<b>6 Utilities (Consumer)</b>	\$66,142,505 <sup>3</sup>	66.0%	34.0%	\$43,654,053	3.23%	\$22,488,452	4.52%
<b>7 Licenses, Fees, Permits</b>	\$40,572,000 <sup>2</sup>	70.2%	29.8%	\$28,469,372	2.10%	\$12,102,628	2.43%
<b>8 Fines &amp; Forfeitures</b>	\$29,445,000 <sup>2</sup>	70.2%	29.8%	\$20,661,557	1.53%	\$8,783,444	1.76%
<b>9 Interest (Use of Money)</b>	\$17,430,000 <sup>2</sup>	64.3%	35.7%	\$11,205,747	0.83%	\$6,224,253	1.25%
<b>10 Charges for Services</b>	\$44,146,000 <sup>2</sup>	70.2%	29.8%	\$30,977,248	2.29%	\$13,168,752	2.64%
<b>11 Miscellaneous Revenues</b>	\$133,072,000 <sup>2,5</sup>	64.3%	35.7%	\$85,551,989	6.32%	\$47,520,011	9.54%
<b>12 Intergovernmental-Federal</b>	\$163,356,000 <sup>2</sup>	70.2%	29.8%	\$114,626,905	8.47%	\$48,729,095	9.79%
<b>13 Intergovernmental-State/Other</b>	\$203,485,000 <sup>2</sup>	68.8%	31.2%	\$139,916,286	10.34%	\$63,568,714	12.77%
<b>Total</b>	\$1,851,162,000			\$1,353,213,635	100.00%	\$497,948,365	100.00%
				Contribution Margin:	73.10%		26.90%

**Source:**

City of Baltimore, MD Comprehensive Annual Financial Report (CAFR) for the FYE June 30, 2013  
Urban Analytics, Inc.

**Note:**

<sup>1</sup> Includes General Fund revenues, Grants Revenue Fund revenues, and Nonmajor Funds revenues.

<sup>2</sup> Actual

<sup>3</sup> Actual (apportioned across revenue categories based on historical average annual distribution).

<sup>4</sup> Includes gas tax, titling tax, and vehicle registration fees.

<sup>5</sup> Includes State Shared Revenues (\$128,707,000) and Miscellaneous Revenues (\$4,365,000).

Understanding the Fiscal Impacts of Transit-Oriented Development (TOD) Projects in Northern Virginia and Maryland (October 21, 2015)

**Appendix Table A-6  
Baseline Service Level Allocation Factors  
City of Baltimore, Maryland  
FYE June 30, 2013**

<u>Category</u>	<u>2013 Expenditures</u> <sup>1,2</sup>	<u>Allocation Factor</u>		<u>Contribution Margin</u>			
		<u>Res.</u>	<u>Non-Res.</u>	<u>Resident</u>	<u>Non-Res.</u>		
<b>1 General Government Admin.</b>	\$261,067,037 <sup>5</sup>	64.3%	35.7%	\$167,839,998	11.94%	\$93,227,039	19.29%
<b>2 Public Service</b>	\$49,913,389	69.3%	30.7%	\$34,584,987	2.46%	\$15,328,402	3.17%
<b>3 Public Safety</b>	\$668,002,461	71.1%	28.9%	\$474,949,750	33.80%	\$193,052,711	39.95%
<b>4 Public Works</b>	\$161,206,427 <sup>4</sup>	74.3%	25.7%	\$119,760,254	8.52%	\$41,446,172	8.58%
<b>5 Health and Welfare</b>	\$132,663,949	97.1%	2.9%	\$128,816,694	9.17%	\$3,847,255	0.80%
<b>6 Parks, Recreation &amp; Culture</b>	\$76,157,328 <sup>3</sup>	96.0%	4.0%	\$73,111,035	5.20%	\$3,046,293	0.63%
<b>7 Economic Development</b>	\$129,297,552	0.0%	100.0%	\$0	0.00%	\$129,297,552	26.76%
<b>8 Conservation of Health</b>	\$137,586,670	97.1%	2.9%	\$133,596,656	9.51%	\$3,990,013	0.83%
<b>9 Education</b>	\$272,568,188	100.0%	0.0%	\$272,568,188	<u>19.40%</u>	\$0	<u>0.00%</u>
<b>Total</b>	<u>\$1,888,463,000</u>			<u>\$1,405,227,563</u>	<u>100.00%</u>	<u>\$483,235,437</u>	<u>100.00%</u>
				Contribution Margin:	74.41%		25.59%

<u>Summary</u>		<u>C.M.<sup>5</sup></u>	<u>C.M.<sup>5</sup></u>
Total Operating Revenues	\$1,851,162,000	\$1,353,213,635	73.10%
Total Operating Expenditures	<u>\$1,888,463,000</u>	<u>\$1,405,227,563</u>	<u>74.41%</u>
Net Surplus (Deficit)	(\$37,301,000)	(\$52,013,927)	-1.31%

**Source:**

City of Baltimore, MD [Comprehensive Annual Financial Report](#) (CAFR) for the FYE June 30, 2013  
Urban Analytics, Inc.

**Note:**

- <sup>1</sup> Includes General Fund expenditures, Grants Revenue Fund expenditures, and Nonmajor Funds expenditures.
- <sup>2</sup> Debt Service (\$93,555,000) and Capital Outlays (\$8,765,000) apportioned across expenditure categories.
- <sup>3</sup> Includes Libraries (\$30,179,000).
- <sup>4</sup> Includes Highways and Streets (\$83,091,000) and Sanitation & Waste Removal (\$69,381,000).
- <sup>5</sup> Contribution Margin.

Understanding the Fiscal Impacts of Transit-Oriented Development (TOD) Projects in Northern Virginia and Maryland (October 21, 2015)

**Appendix Table A-7  
Revenue by Source and Land-Use Allocation  
Anne Arundel County, Maryland  
FYE June 30, 2014**

Category	2014 Revenues <sup>1</sup>	Allocation Factor		Contribution Margin			
		Res.	Non-Res.	Residential	Non-Residential		
<b>1 Real Estate Taxes</b>							
Residential	\$515,245,009 <sup>2</sup>	100.0%	0.0%	\$515,245,009	50.01%		
Non-Residential	\$148,217,531 <sup>2</sup>	0.0%	100.0%			\$148,217,531	71.99%
<b>2 Business Pers. Property Taxes</b>	\$17,250,900	0.0%	100.0%	\$0	0.00%	\$17,250,900	8.38%
<b>3 Income Taxes</b>	\$435,870,098	100.0%	0.0%	\$435,870,098	42.30%	\$0	0.00%
<b>4 Highway User Fees</b>	\$3,480,389	68.0%	32.0%	\$2,365,620	0.23%	\$1,114,769	0.54%
<b>5 Hotel Taxes</b>	\$12,449,650	0.0%	100.0%	\$0	0.00%	\$12,449,650	6.05%
<b>6 Local Sales Taxes</b>	\$19,067,125	79.8%	20.2%	\$15,215,566	1.48%	\$3,851,559	1.87%
<b>7 Licenses, Fees, Permits</b>	\$16,536,662	70.2%	29.8%	\$11,608,737	1.13%	\$4,927,925	2.39%
<b>8 Fines &amp; Forfeitures</b>	\$820,289	70.2%	29.8%	\$575,843	0.06%	\$244,446	0.12%
<b>9 Interest (Use of Money)</b>	\$1,247,957	68.0%	32.0%	\$848,236	0.08%	\$399,721	0.19%
<b>10 Charges for Services</b>	\$19,198,264	86.4%	13.6%	\$16,589,220	1.61%	\$2,609,044	1.27%
<b>11 Other Revenues</b>	\$27,575,688	68.0%	32.0%	\$18,743,195	1.82%	\$8,832,493	4.29%
<b>12 Intergovernmental</b>	\$8,682,827	70.2%	29.8%	\$6,092,740	0.59%	\$2,590,087	1.26%
<b>13 Miscellaneous</b>	\$10,582,316	68.0%	32.0%	\$7,192,800	0.70%	\$3,389,516	1.65%
<b>Total</b>	\$1,236,224,705			\$1,030,347,064	100.00%	\$205,877,641	100.00%
				Contribution Margin:	83.35%		16.65%

**Source:**

Anne Arundel County, MD [Comprehensive Annual Financial Report](#) (CAFR) for the FYE June 30, 2014  
Urban Analytics, Inc. ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

**Note:**

<sup>1</sup> Includes General Fund Revenues only.

<sup>2</sup> Includes Recordation and Transfer taxes (\$77,535,100).

**Appendix Table A-8  
Baseline Service Level Allocation Factors  
Anne Arundel County, Maryland  
FYE June 30, 2014**

<u>Category</u>	<u>2014 Expenditures</u> <sup>1,2</sup>	<u>Allocation Factor</u>		<u>Contribution Margin</u>			
		<u>Res.</u>	<u>Non-Res.</u>	<u>Resident</u>	<u>Non-Res.</u>		
<b>1 General Government Admin.</b>	\$90,299,748	68.0%	32.0%	\$61,376,739	5.57%	\$28,923,009	20.96%
<b>2 Community Development</b>	\$9,222,405 <sup>3</sup>	77.7%	22.3%	\$7,163,964	0.65%	\$2,058,441	1.49%
<b>3 Public Safety</b>	\$278,588,194	71.1%	28.9%	\$198,076,206	17.98%	\$80,511,988	58.35%
<b>4 Public Works</b>	\$43,489,971	68.0%	32.0%	\$29,560,133	2.68%	\$13,929,838	10.10%
<b>5 Health and Welfare</b>	\$47,779,042	97.1%	2.9%	\$46,393,450	4.21%	\$1,385,592	1.00%
<b>6 Parks, Recreation &amp; Culture</b>	\$41,207,029	96.0%	4.0%	\$39,558,748	3.59%	\$1,648,281	1.19%
<b>7 Judicial Administration</b>	\$25,155,365	73.9%	26.1%	\$18,587,299	1.69%	\$6,568,066	4.76%
<b>8 Code Enforcement</b>	\$12,664,531	76.7%	23.3%	\$9,711,162	0.88%	\$2,953,369	2.14%
<b>9 Education</b>	\$691,107,908	100.0%	0.0%	\$691,107,908	<u>62.74%</u>	\$0	<u>0.00%</u>
<b>Total</b>	\$1,239,514,193			\$1,101,535,609	100.00%	\$137,978,584	100.00%
				Contribution Margin:	88.87%		11.13%

<u>Summary</u>		<u>C.M.<sup>4</sup></u>	<u>C.M.<sup>4</sup></u>
Total Operating Revenues	\$1,236,224,705	83.35%	\$205,877,641 16.65%
Total Operating Expenditures	\$1,239,514,193	<u>\$1,101,535,609</u> <u>88.87%</u>	<u>\$137,978,584</u> <u>11.13%</u>
Net Surplus (Deficit)	(\$3,289,488)	(\$71,188,545) -5.52%	\$67,899,057 5.52%

**Source:**

Anne Arundel County, MD Comprehensive Annual Financial Report (CAFR) for the FYE June 30, 2014  
Urban Analytics, Inc. ([www.UrbanAnalytics.com](http://www.UrbanAnalytics.com))

**Note:**

- <sup>1</sup> Includes General Fund expenditures only.
- <sup>2</sup> Debt Service apportioned across expenditure categories.
- <sup>3</sup> Includes Land Use and Development.
- <sup>4</sup> Contribution Margin.

## APPENDIX B

### Eleven Weaknesses in Fiscal Impact Modeling (1930s – mid-1990s)

The purpose of fiscal impact modeling and analysis is to estimate the fiscal implications of various land uses on the financial health of local governments (e.g., counties cities and towns). Since the 1930s, there has been an incorrect axiom in fiscal impact modeling that residential land uses generate a net fiscal deficit (or burden) on the budgets of local jurisdictions while non-residential land uses generate a net fiscal surplus (or benefit). This axiom has historically been supported by two overarching errors in fiscal impact modeling: (1) weaknesses in the mathematical construction of these models; and (2) weaknesses in the underlying assumptions used to construct these models.

For his doctoral dissertation, *“Fiscal Impact Simulation Modeling: Calculating the Fiscal Impact of Development”*, Dr. Bellas developed a fiscal impact model that is a methodological improvement over existing fiscal impact models (both in construct validity and in mathematical computation). An extensive literature review in the field of fiscal impact analysis revealed that all fiscal impact models developed between the 1930s and the mid-1990s have eleven methodological weaknesses inherent in their underlying assumptions and model construction. These eleven major shortcomings common to all existing models during this time period are as follows:

1. They fail to adequately allocate the generation of local revenues between people (existing residents and newcomers) and workers (jobs filled by residents and by commuters);
2. They fail to adequately allocate the beneficiaries of local expenditures between people (existing residents and newcomers) and workers (jobs filled by residents and by commuters);
3. They fail to adequately distribute the sources of public revenues by various land use types (e.g., single family detached, single family attached, multifamily, retail, office, industrial and manufacturing, other);
4. They fail to adequately distribute public service level expenditures by land-use type;
5. They fail to adequately estimate the revenues generated and the services demanded by land-use sub-sector. Examples of these sub-sectors include:
  - a. Revenues generated and services demanded by visitors conducting business and tourists;
  - b. Revenues (direct and indirect) generated and services demanded by governmental entities (federal, state and local) and from non-profit (tax-exempt) institutions; and
  - c. Revenues generated and services demanded from limited

consumption by certain land-users, such as residents who own seasonal or vacation housing or university students who place limited demands on public services yet spend dollars in the local economy.

6. They fail to adequately differentiate between the capital expenditures required to build public infrastructure (e.g., roads, schools, playgrounds) and the repayment of the bonds (debt service) required to finance these public infrastructure improvements;
7. They fail to adequately identify the relationship between new and existing residential land uses and residentially associated retail and non-retail service sector land uses and employment;
8. They often incorrectly mix some aspects of average costing and marginal costing techniques in the analysis, resulting in a mixed interpretation of the findings;
9. They lack the ability to determine whether per capita levels-of-service provided by local governments are decreasing because local governments provide services more efficiently over time or increasing because excess revenues from new development allows local governments (especially rural governments) to provide more urbanized public services;
10. They fail to calculate the cross-over point from where residential land uses switch from generating a net fiscal deficit to a net fiscal surplus for various land-use types (the break-even point by type of land-use). Fiscal impact analyses for a site-specific project tend to calculate the break-even point but fiscal impact models designed to calculate the fiscal impact of the comprehensive plan fail to calculate the cross-over point where the revenues from new development offset revenues from existing development; and
11. They have limited dynamic features in their design and construction. There are limits to their functional capability to conduct sensitivity analysis on the independent variables. They lack the ability to forecast fiscal revenues and expenditures from existing development, new growth, and external shocks.

A consistent, underlying theme in fiscal impact analysis is the failure to address non-property tax revenues generated by residents (both existing and new) and expenditures (for services) demanded by non-residential land uses. The model developed by Dr. Bellas corrects for all eleven weaknesses identified as existing in fiscal impact models from the 1930s to the mid-1990s. The members of his doctoral committee included Dr. Stephen S. Fuller of George Mason University, Dr. Alice Rivlin (the former vice chair of the Federal Reserve Board

under Dr. Alan Greenspan), the late Dr. John Petersen of George Mason University (and a national expert in municipal bond financing), and Dr. Darrene Hackler (formerly with George Mason University and now currently with the University of California, Davis).

**Last Page of Report.**  
**(The remainder of this page intentionally left blank.)**