Pellissippi Parkway Extension (SR 162): Economic and Fiscal Impacts Analysis

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Executive Summary

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA) is proposing to extend and construct Pellissippi Parkway (State Route 162) from its current terminus at SR 33 to SR 73 (U.S. 321 or Lamar Alexander Highway) in Blount County. This report examines the economic and fiscal impacts of the project.

Summary of Findings – Economic Impacts Analysis

The economic impact analysis assesses the direct, indirect, and induced effects of the one-time demand for construction labor and materials needed to implement the project alternatives.

Key findings of this analysis include:

- Alternative C is expected to generate the greatest economic benefits to both Blount County and the rest of the state of Tennessee. Under Alternative C, 1,467 jobs would be created across the state, which would generate $49.4 million in labor income and $164.7 million in economic output statewide. Alternative C would likely generate 4.7 percent more jobs, income, and output than Alternative A and 178.1 percent more of each metric than Alternative D.

- Roughly 59 percent of the jobs, 57 percent of the income, and 65 percent of the output generated by each alternative would occur in Blount County, with the largest benefit accruing to the construction, retail trade, and health care sectors.

Summary of Findings – Induced Development Analysis

- By the year 2020, the Four-Lane Build Alternatives, compared to the No-Build Alternative is forecast to generate time savings of roughly 16% per trip along the corridor. This predicted change in accessibility -- in combination with an analysis of other factors that shape the magnitude and location of growth -- suggests that implementation of the Four-Lane Build Alternative has moderate to strong potential to spur land use change in the study area.

- As travel times between Blount and Knox Counties and Blount County and Oak Ridge decrease due to the extension, developers can be expected to position themselves to capitalize on the improvements in accessibility by adding more residential and nonresidential space in the study area than would otherwise occur without the project.

- A summary of the range of new residential and nonresidential development that is likely to be induced by the extension of the Pellissippi Parkway is presented below. Induced development estimates are presented as ranges to reflect the considerable variability and uncertainty underlying the forecasts.

Summary of Induced Development Program (sq. ft.)

Dwelling Units (HH)	Office	Retail	Hotel	Total
68 – 123	19,800 – 36,000	11,000 – 19,800	2,600 – 4.700	**33,400 – 60,500**

Summary of Findings – Fiscal Impacts Analysis

The fiscal impact analysis estimates the net positive or negative fiscal implications of induced growth forecast in the study area on the operating and capital budget of Blount County. The analysis examines the fiscal effects of two development scenarios:

- 2020 Business as Usual Case. This concept represents a "business as usual" future that would reasonably be expected to occur if a significant portion of the induced growth occurs outside designated growth areas. In the BAU scenario, it is assumed that only 20% of development would take place inside the limits of designated growth areas (incorporated lands and lands within urban growth boundaries), and 80% of development would be concentrated outside of designated growth areas. This case is associated with a higher cost of county services for each new unit of residential development.

- 2020 Smart Growth Case. This concept represents a future where most new residential and nonresidential development will be focused inward towards designated growth areas generally reflecting the objectives and guidelines of the Blount County Conceptual Land Use Plan. In the smart growth scenario it is assumed that 80% of new residential development would take place in designated growth areas, and the remaining 20% of new development would occur outside of these areas. This scenario decreases the costs associated with providing residential services as seen earlier.

A summary of the fiscal impacts at project buildout (Year 2020) is provided below.

Summary of Fiscal Impact of Induced Development Program for Base and Smart Growth Scenarios

Scenario: Base			
Revenue Category	**Gross Revenue**	**Cost of Public Services**	**Net Revenue Impact**
Residential Property Collections (Outside Growth Areas)	$45,000	$55,000	($10,000)
Residential Property Collections (Inside Growth Areas)	$33,000	$29,000	$4,000
Commercial Property Collections (Inside Growth Areas)	$3,000	$1,000	$2,000
Tangible Personal Property	$26,000	$6,000	$19,000
Property Tax Subtotal	**$107,000**	**$91,000**	**$15,000**
Residential Sales Tax Collections	$23,000	-	$23,000
Office/Commerical Sales Tax Collections	$6,000	-	$6,000
Sales Tax Subtotal	**$29,000**	**-**	**$29,000**
Hotel Tax	**$8,000**	**$400**	**$7,600**
Totals	**$144,000**	**$91,400**	**$51,600**
Scenario: Smart Growth			
Revenue Category	**Gross Revenue**	**Cost of Public Services**	**Net Revenue Impact**
Residential Property Collections (Outside Growth Areas)	$11,000	$14,000	($3,000)
Residential Property Collections (Inside Growth Areas)	$132,000	$116,000	$16,000
Commercial Property Collections (Inside Growth Areas)	$3,000	$1,000	$2,000
Tangible Personal Property	$26,000	$6,000	$19,000
Property Tax Subtotal	**$172,000**	**$137,000**	**$34,000**
Residential Sales Tax Collections	$23,000	-	$23,000
Office/Commerical Sales Tax Collections	$6,000	-	$6,000
Sales Tax Subtotal	**$29,000**	**-**	**$29,000**
Hotel Tax	**$8,000**	**$400**	**$7,600**
Totals	**$209,000**	**$137,400**	**$70,600**

- At buildout, both the business as usual ("BAU") and smart growth development scenarios are projected to generate a positive fiscal benefit to the County. In other words, both

development scenarios would generate more revenues to the County than they demand in costs for operations and capital improvements.

- In both development scenarios, property taxes represent the smallest category of net revenues likely to accrue to the County, with the largest contributor being sales tax revenues from the expenditures of new residents and employees. Hotel taxes and Tangible personal property taxes are expected to be the same in both scenarios.

- The disparity in net revenue between the Base and Smart Growth scenarios occurs as a result of differences in the costs of providing services to residential development within and outside of designated growth areas (incorporated lands and lands within urban growth boundaries) in the study area. In the smart growth case, the majority of development takes place within designated growth areas with a lower per-unit cost of services, whereas the BAU case places more development on parcels outside designated growth areas, which based on recent empirical evidence, typically results in higher per-unit cost of services.

1. Introduction

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA) is proposing to extend and construct Pellissippi Parkway (State Route 162) from its current terminus at State Route (SR) 33 to SR 73 (U.S. 321 or Lamar Alexander Highway) in Blount County. TDOT and FHWA are preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) to identify and evaluate the environmental effects of the proposed project and to identify measures to minimize impacts. As part of the preparation of the EIS, an Economic and Fiscal Impact Analysis has been prepared and is reported in this document.

2. Description of Alternatives

Based on the results of public input during the 2007 and 2008 public meetings and comment periods, participating agency comments and concurrence process, and an environmental screening analysis, TDOT has determined the alternatives that will be carried forward, refined and evaluated in the Draft EIS (DEIS). The alternatives that are being carried forward in the DEIS are the subject of this analysis. The alternatives are:

- No-Build Alternative
- Alternative A – New Four-Lane Roadway
- Alternative C – New Four-Lane Roadway
- Alternative D – Upgraded Two-Lane Network

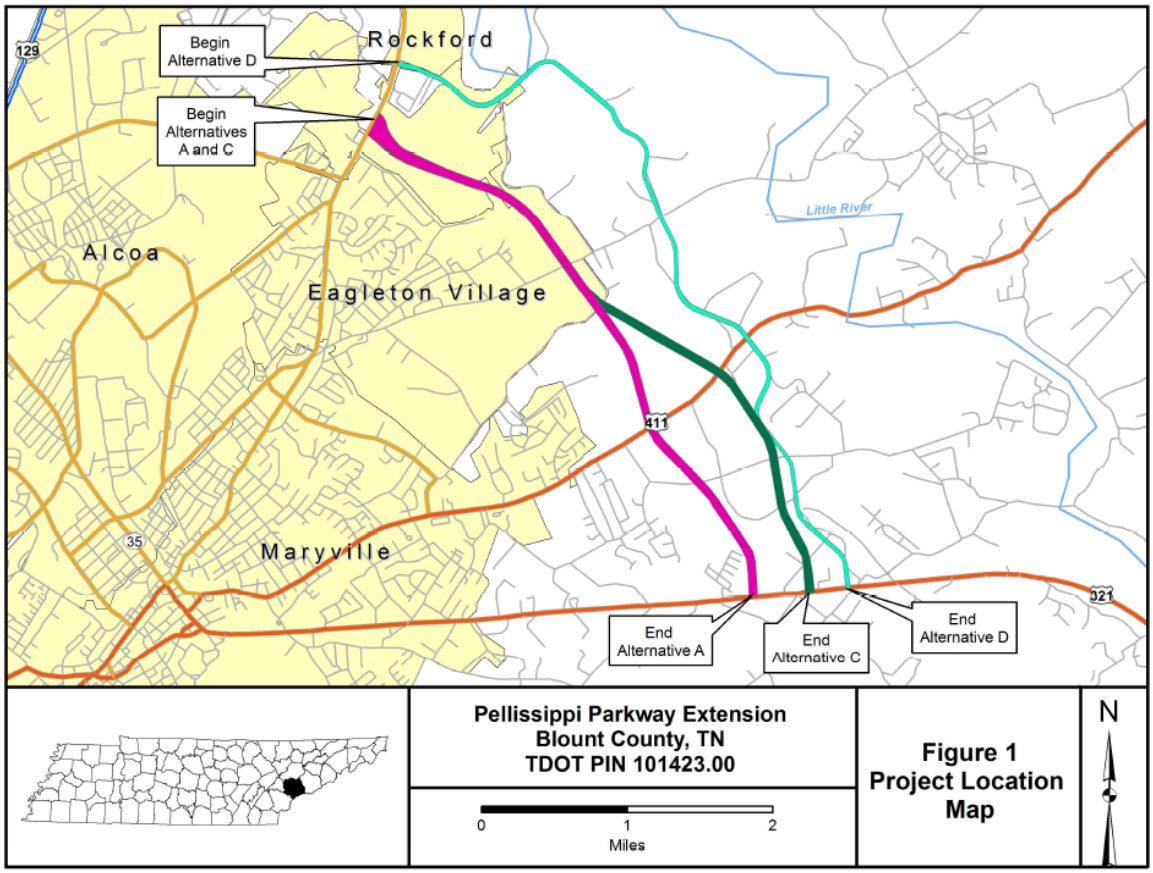
2.1 No-Build Alternative

The No-Build Alternative would not extend Pellissippi Parkway beyond its existing terminus at SR 33. No improvements would be made to the I-140 / SR 33 interchange. Other projects that are included in the Knoxville Region Long Range Transportation Plan (LRTP) (2005 to 2030) may be constructed if their project-specific planning, environmental and design studies are carried forward. This includes the Relocated Alcoa Highway (LRTP #82, new 6-lane road from Hunt Road to Singleton Station Road by 2104), and the LRTP # 609 Southern Loop Connector, a new 2-lane road from US 321 to Topside Road with a horizon year of 2030.

2.2 Build Alternative – New Four-Lane Roadway

Under the Build Alternative, the existing Pellissippi Parkway would be extended from SR 33 to US 321, as a four-lane divided roadway, with interchanges at SR 33, US 411 and US 321. The two alternate alignments under consideration for the DEIS, Alternative A and Alternative C, are presented in Exhibit 1 and described in the *Pellissippi Parkway Extension Traffic Operations Technical Report*. Both Alternative A and C would add approximately 4.5 miles to the existing freeway within Blount County.

Exhibit 1: Build Alternatives to be Evaluated in the DEIS



2.3 Build Alternative – Upgraded Two-Lane Network

Alternative D proposes to upgrade a two-lane network of existing roads to serve as a two-lane connection between SR 33 and US 321. This concept emerged during the course of this study based on discussions with the public about travel needs and environmental concerns. This upgraded network was seen as a way to improve some of the currently deficient two-lane roads in the study area and provide a more direct connection between SR 33 and US 321 east of Maryville without having a new freeway-type facility. A route using portions of existing Sam Houston School Road, Peppermint Road, Hitch Road, and Helton Road was identified. Under this alternative, now referred to as Alternative D, an improved two-lane roadway with adequate shoulders would be constructed using the existing roadway alignment where possible, while straightening curves and realigning intersections and using new location to provide a continuous route with a 50 mile per hour design speed. The length of this corridor is approximately 5.77 miles.

3. Economic Impacts Analysis

To determine the economic effects of the three proposed Pellissippi Parkway Build Alternatives, an input-output based economic impact modeling approach was employed by the PB team. PB utilized RIMS II economic multipliers from the US Bureau of Economic Analysis as a foundation for the economic impact model employed for this study. RIMS II is an input-output model that determines the impacts of increases in final demand on employment, earnings, and economic

output within a specified geographic region [1]. Using the RIMS II model, changes in demand can be specified at the industry level and the national, state or county level, allowing the multipliers to effectively capture the effects of local development projects such as the Pellissippi Parkway expansion in Blount, Tennessee.

Standard economic multipliers, produced by input-output models such as RIMS II, estimate three kinds of impacts resulting from changes to an economy: 1) direct; 2) indirect; and 3) induced impacts. Each impact is defined as follows:

- **Direct** changes to an economy usually represent new spending by households, businesses, or governments due to changes in household income or wealth, firm attraction or expansion, or new government initiatives.
- **Indirect** impacts result from the inter-industry purchases necessary to support an increase in production for an industry experiencing new demand for its goods or services. The level of inter-industry trade within a given county or state determines the size of the indirect impact in that region.
- **Induced** effects stem from the re-spending of wages earned by workers affected at the direct and indirect activity within the specified geographic area. In other words, if an increase in demand occurs in a certain region for certain goods or services produced by a local firm, the employees of that firm will spend some proportion of their increased earnings at local shops, restaurants, etc.

To estimate the economic impacts of the Pellissippi Parkway expansion alternatives, the cost of each of the three alternatives was assumed to represent an increase in demand for construction services (one of the 20 industries in the RIMS II model) in Blount County. The three alternative measures of new one-time demand for construction services were then applied to the RIMS II multipliers for the construction industry in Blount County to determine the employment, output and earnings effects of the proposed project[2].

The two tables in Appendix A contain results of the economic impact analysis for Blount County. Because the Pellissippi Parkway expansion project represents an increase in demand for construction services, the construction industry is estimated to receive the largest economic benefits from the project. Each of the other industries in Blount County also benefit from the expansion project, and the level of benefit is based on the quantity of goods and services each industry must supply to create an additional dollar of construction services output.

In addition to measuring the effects of the Pellissippi Parkway expansion on the Blount County economy (shown in Exhibit 2), the PB team quantified the economic impacts that would accrue to the rest of the state due to the expansion project. These impacts reflect the inter-county trade that occurs to supply industries in Blount County with the goods and services they need to increase production. The degree of these out-of-county benefits depend on the size and composition of the local economy for a given county. Counties that have large, diverse workforces and a broad industry base often rely less on inter-county trade to support local production than smaller, less diverse county economies. As shown in the Exhibit A-2 in Appendix A, Blount is relatively dependent on inter-county trade to support local production due to its small

[1] RIMS II information can be found at www.bea.doc.gov/bea/regional/rims/

[2] Because the estimated costs the proposed expansion alternatives were calculated based on 2008 construction costs, the estimates were deflated to 2006 dollars to match the RIMS II multipliers, which were computed based on 2006 data. To deflate each alternative, an index of construction costs from the Engineering News Record was used. The ENR construction cost index is computed using a weighted 20-city average of relevant labor rates, steel prices, cement prices, and lumber prices.

population density. As such, roughly 40% of the total statewide increase in employment due to the Parkway expansion is estimated to occur outside of Blount County.

4. Fiscal Impacts Analysis

For purposes of the Fiscal Impact Analysis, the Four-Lane Build Alternatives were compared to the No-Build alternative. The fiscal impacts of the Upgraded Two-Lane Network alternative on Blount County are not assessed as part of this study, primarily because this alternative - with its more limited expansion and therefore more limited growth inducing effects - is unlikely to have as significant an impact on the operating and capital budget of Blount County as the Four-Lane Build alternatives. Furthermore, since the Four-Lane Build Alternatives A and C differ only in alignment, it is not expected that the alternatives' growth and fiscal impacts would be very different from one another.

The section is divided into two parts: Part 4.1 assesses the increment of new development anticipated within the study area as result of the New Four-Lane Roadway Build Alternatives (hereafter referred to as Build Alternatives). Part 4.2 summarizes the fiscal impacts of that new development on the operating and capital budget of Blount County and describes key assumptions and methodologies for estimating revenues and expenditures.

4.1 Induced Development

Evaluating the long-term fiscal impacts of the Build Alternatives requires an understanding of the increment of new residential and nonresidential development that may be induced with the construction of the proposed project. Induced development (or indirect land use) impacts are defined as those land use impacts spurred by the proposed project that occur later in time and removed in distance, but are still reasonably foreseeable.[3] For this project, induced development impacts may be more specifically defined as those impacts that may result from the Build Alternative outside of the construction footprint of the proposed highway extension corridor.

Estimating induced development from transportation expansion is an evolving art more than it is a science. Federal agencies such as the Council on Environmental Quality (CEQ) and the Federal Highway Administration (FHWA), while attempting to provide guidance, have concluded in position papers that there is no one correct way, nor a prescribed specific technique or method that must be used, to conduct such analysis.[4]

For this analysis, a combination of qualitative and quantitative methodologies is used to estimate the increment of new residential and nonresidential development that may be induced by the year 2020 for the Four-Lane Build Alternatives. The techniques employed herein are described in the most recent guidance on induced development, and both the quantitative and qualitative methodologies are explained in detail in Subsections 5.1.3. [5]

[3] Council of Environmental Quality Regulations Implementing NEPA (National Environmental Policy Act), 1986. 40 CFR, Parts 1500-1508.

[4] Louis Berger and Associates, 1998. *Guidance for Estimating the Indirect Effects of Proposed Transportation Projects, Report 403*. National Cooperative Highway Research Program, Transportation Research Board, National Research Council, National Academy Press, Washington, D.C.

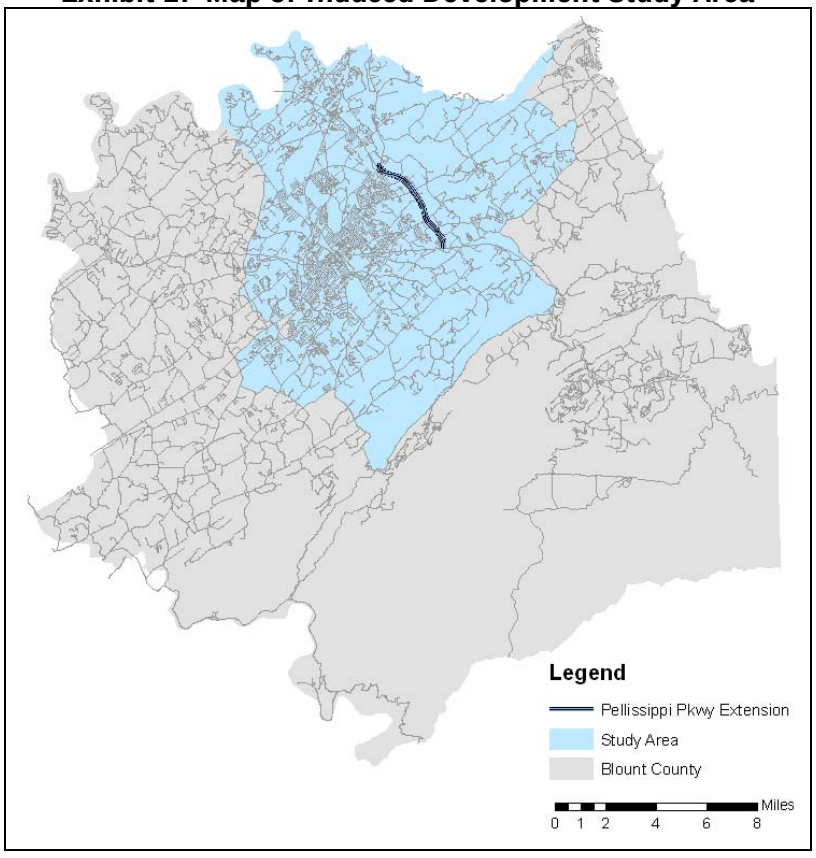
[5] American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment, 2007. *Forecasting Indirect Land Use Effects of Transportation Projects, NCHRP Project 25-25, Task 22*

4.1.1 Study Area

The geographic boundaries of the induced development study area are shown in Exhibit 2. The study area extends across portions of Alcoa, Maryville, Louisville, Rockford and unincorporated areas of Blount County. Because induced development effects are further removed from the project than direct impacts, the geographic limits for this analysis reach beyond the primary project study area used in other sections of the EIS. The study area boundary extends roughly 5 miles beyond the midpoint of proposed project corridor in all directions.

The induced development study area was determined, in part, based on a review of forecast travel time savings for selected Transportation Analysis Zones (TAZs) in the region under the Build Alternatives, and, in part, based on land markets research. Research shows the land-value premium associated with proximity to suburban roads erodes fairly rapidly beyond several miles, suggesting the impact zones of roads generally extend out several miles.

Exhibit 2: Map of Induced Development Study Area



4.1.2 Time Frame

The time frame of analysis was determined based on recent empirical findings that the time between when transportation capacity is actually added and when induced development occurs is

likely on the order of two to three years. The proposed project is expected to open to traffic some time after 2014 according to the TPO.[6] Since the opening date is unknown at this time, this analysis assumes the road will open sometime between 2015 and 2017. Hence, the fiscal effects of induced development are estimated in year 2020 – the year in which full build out is expected to occur.

4.1.3 Methodology

This section describes the two principle techniques used to evaluate the potential effects of the Pellissippi Parkway Extension on development patterns in the study area.

First, a qualitative evaluation of the probable magnitude of induced development was conducted using *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements (2001)* prepared for the Oregon Department of Transportation (hereafter referred to as ODOT Guidance). Among the guidance documents reviewed in *Forecasting Indirect Land Use Effects of Transportation Projects, NCHRP Project 25-25, Task 22* (2007) (hereafter referred to as NCHRP Guidance), the ODOT guidance was found to be among the best with respect to qualitative analysis of factors influencing the extent of induced development effects.

Second, induced travel and development elasticity parameters from prior empirical studies – in combination with Federal Highway Administration's (FHWA) *Spreadsheet Model for Induced Travel Estimation* (SMITE) – were applied to move from a qualitative assessment of induced development to a quantitative estimate of the increment of new development (i.e., number of housing units and commercial floor space) that is likely to be spurred by the Four-Lane Build Alternatives.

4.1.4 Qualitative Assessment

Qualitative Assessment Approach

The eight-step process described in the ODOT Guidance was used to qualitatively assess the potential for induced development effects from the Pellissippi Parkway Extension Build Alternatives. See that report for full citations of literature review, case studies, and estimates of impacts. Almost all of the text that follows comes from the ODOT Guidance or the NCHRP Guidance, which restates the ODOT Guidance with modifications to make the concepts transferable to other states.

The underlying logic of the ODOT Guidance is as follows:

1. What does the transportation project do to highway performance (accessibility, travel-time, volume, mobility, and safety) that is different from what that performance would be without it?
2. How do those changes in travel performance influence factors that help shape development patterns?
3. What other factors influence development patterns?
4. Given the possible changes in development patterns and other factors, the expected magnitudes of those changes, and the relative importance of those changes, what is the qualitative assessment of the indirect land use impacts of the project?

[6] Personal communication with staff at the Knoxville Transportation Planning Organization (TPO).

According to the ODOT guidance, the key variables that might contribute to changes in local development patterns in response to a change in travel-time from a highway improvement include:

- **Change in accessibility**. This qualitative assessment is based on the premise that projects that improve accessibility (evidenced by changes in travel times, volumes and mobility) can impact the quantity, timing and location of development. This is typically the most important variable.

- **Expected growth**. If the forecast is for no population and employment growth, then the highway improvement is less likely to have an indirect impact on development trends. The project, however, may affect the distribution of development within the study area. In contrast, a growing city will demand new development: the greater the growth rate, the greater the pressure to develop where good access and services are available.

- **Land supply**. How does the volume of vacant, buildable land in the study area compare to anticipated growth? The more limited the supply, the more likely that improved access will contribute to pressure for zoning changes in the study area.

- A**vailability of other services**. Access alone is not sufficient to trigger development: other key public facilities like sewer and water may need to be available to the study area at a reasonable cost. If they are, improvements in access are more likely to support land use change. The potential for suburban development is not necessarily dependant upon sewer and water connections: densities upwards of a half acre can be achieved using wells and septic, depending on health department regulations.

- **Other market factors**. Where has growth been going? How does this trend correspond with current plans and zoning? Is access (travel time) or other factors limiting conditions on development in the study area?

- **Public policy.** All the previous factors are indicators of the potential for land use change; most are market driven. But for that potential to result in change it must be allowed. What policies exist on the books to offer resistance to potential land use change?

The analysis of indirect land use impacts uses data from the following sources:

- Outputs of the Knoxville Regional Travel Demand Model, including changes in travel times for selected TAZs and Average Daily Traffic (ADT) under the No-Build and Build Alternatives
- County property tax assessment data that allowed for an assessment of vacant, buildable lands
- Transportation Analysis Zone (TAZ) level population, household and employment forecasts for 2030
- GIS layer of geographical boundary of Blount County, City of Alcoa and City of Maryville
- Land use and zoning plans, policies and regulations, including zoning standards, urban growth plans, urban growth boundaries and property tax rates, Some of the studies that were examined in this process were:
    - Blount County Policies Plan, Revised and Adopted September 25, 2008
    - 1101 Growth Plan, Plan Review Workshop Presentation, Blount County Planning Commission, August 2007
    - Blount County Zoning Regulations, September 2006
    - Blount County Growth Strategy, Hunter interests Inc.

- Comprehensive Economic Development Study 2008-2009 Update by the ETDD (East Tennessee Development District)
- 2005-2030 Knoxville Regional Long-Range Transportation Plan
- Alcoa Comprehensive Plan
- Maryville Comprehensive Plan

Qualitative Assessment

Exhibit 3 summarizes the qualitative assessment of variables that may contribute to measurable changes in development patterns in response to the project. Column three represents one way (per the ODOT Guidance) that variables can be measured and interpreted to get a qualitative assessment of the potential for land use change that a transportation project may create.

A description of key findings and data sources with respect to each key variable is provided below.

Change in accessibility. As noted above, change in accessibility measures due to the project are important for understanding the benefits offered by the project and its potential to induce development. The proposed project would not only impact travel times of travelers on the Parkway but also on alternate routes as traffic redistributes over the network to absorb the additional capacity and accessibility provided by the new link.

Currently the Parkway acts as a spinal corridor linking central Blount County with West Knoxville as well as Oak Ridge, two primary trip attractors outside the boundary of Blount County. The corridor also connects west Knoxville and Oak Ridge with the Knoxville Airport on US 321 in Alcoa. The proposed extension would improve traffic flow within the northeast quadrant of the study area by providing a speedy connection to Knox County and the Oak Ridge area. In addition, the Parkway would also provide a critical link on the southeast to Cades Cove and Townsend, the entrance to the Great Smoky Mountain National Park and facilitate tourist traffic by allowing them to bypass congested downtown Maryville. [7]

One measure of accessibility is Level of Service. Exhibit 4 provides the projected Level of Service (LOS) in the Build versus the No-Build Scenarios for the proposed alternatives for corridor improvement. The LOS analysis was obtained from the report entitled SR 162 (Pellissippi Parkway Extension) Traffic Operations Technical Report, prepared by PB. The report uses 2035 as the analysis forecast year instead of 2030. Hence, the table represents LOS in 2035.

The LOS in the Build scenario on the parkway is marginally better than the No-Build Alternative in 2015. However, that improvement in LOS is expected to largely erode by 2035.

A second measure of accessibility is travel times savings. To facilitate comparison between the Build and No-Build scenarios, it was assumed that in the absence of the Parkway extension, travelers would look for the next best alternatives on the adjacent arterial roads. Based upon current traveler behavior this route (shown in Exhibit 5) was approximated to be the section of East Lamar Alexander Parkway west of the proposed terminus of the I-140 extension up around S. Washington St. and though Route 33 to the current terminus of I-140 on Route 33 (and in the reverse direction for traffic going south from the current terminus of the Parkway extension).[8]

This alternate route is estimated to be 3.5 miles longer and about 8 minutes slower than the Parkway extension in 2020.

[7] Hunter Interests, *Blount County Growth Strategy*, 2005

[8] The alternative route was assumed based upon discussions with a Senior Transportation Engineer at Knoxville TPO.

Exhibit 3 Qualitative Assessment Matrix

Change	Data sources	If value is...	...then potential for land-use change is probably...
Change in accessibility *Measured as change in travel time or delay, if available. Otherwise, assessment of v/c or change in access*	Knoxville Regional Travel Demand Model and interviews with TPO staff.	Less than a couple minutes of time savings for an average trip, or no change in v/c 2-5 minutes 5-10 minutes More than 10 minutes	None to very weak Weak to moderate Strong Very strong
Expected growth *Measured as population, employment and household for Blount County, Alcoa and Maryville*	2030 population and employment forecasts. Same forecast used to model both build and no-build alternative	Average annual growth rate (population/employment) of less than 1% 1% - 2% 2-% - 3% Over 3%	None to very weak Weak to moderate Strong Very Strong
Land supply *Measured as years of supply of vacant, buildable land zoned for residential use*	Blount County Tax Assessment Database	More than 20-year supply of all land types, all sub-areas 10 to 20-year supply Less than 10-year supply Less than 10-year supply and specific identified problems in the study area	None to very weak Weak to moderate Strong Very strong
Availability of other services *Measured number of people or employees that can be served; or barriers to service provision*	Local planning documents, Interviews with local planners and engineers Other reports generated as part of the highway project evaluation	Key services not available and difficult to provide Not available and can be provided Not available, easily provided and programmed Available now	None to weak Weak to moderate Strong Very strong
Other factors that impact the market for development	Local planning documents Socioeconomic and ROW reports generated as part of the highway project evaluation Assessment data,	Weak market for development Weak to moderate market Strong market Very strong market	None to very weak Weak to moderate Strong Very strong
Public policy	Local planning documents Interviews with local officials, local planners, reps of neighborhood or interest groups, state agency planners	Strong policy, strong record of policy enforcement and implementation Weak policy, weak enforcement No policy, weak enforcement	None to very weak Moderate to strong Very strong

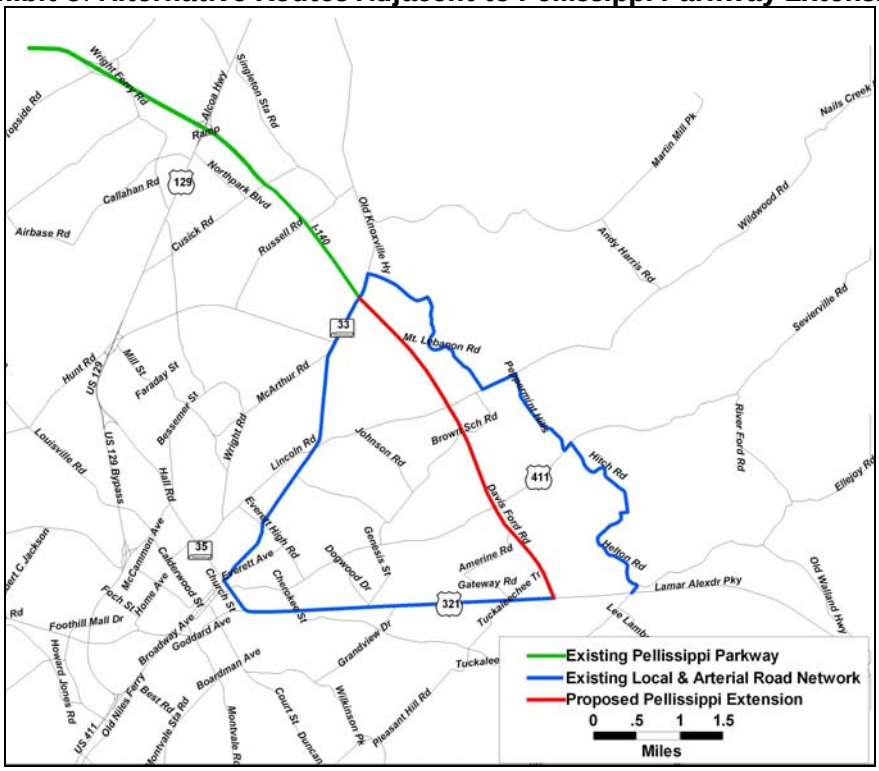
Exhibit 4: Alternative Corridors Level of Service Analysis

Route	Section	Begin Milepoint	End Milepoint	Existing	2015 No-Build	2035 No-Build	2015 Build	2035 Build
Pellissippi Parkway (Build Alternatives A/C)	1	Topside Rd MP 0.810	Alcoa Hwy (SR 115/US 129) MP 2.240	C	D	F	D	F
	2	Alcoa Hwy (SR 115/US 129) MP 2.240	Relocated Alcoa Highway MP 3.240	A	B	D	B	C
	3	Relocated Alcoa Highway MP 3.240	E. Broadway/Old Knoxville Hwy (SR 33) MP 4.710	A	C	F	D	F
	4	E. Broadway/Old Knoxville Hwy (SR 33)	US 411 (SR 35)	Not Determined	Not Determined	Not Determined	C	F
	5	US 411 (SR 35)	Lamar Alexander Pkwy (SR 73/US 321)	Not Determined	Not Determined	Not Determined	B	D
	6	Lamar Alexander Pkwy (SR 73/US 321)	End of Study Area	Not Determined	Not Determined	Not Determined	Not Determined	A
Sam Houston School Rd/Peppermint Rd/Hitch Rd/Helton Rd (Alternative D)	1	SR 33	North of Wildwood Rd	E	Not Determined	Not Determined	E	E
	2	North of Wildwood Rd	Wildwood Rd	E	Not Determined	Not Determined	E	E
	3	Wildwood Rd	Sevierville Rd	E	Not Determined	Not Determined	E	F
	4	Sevierville Rd	North of Lamar Alexander Pkwy	D	Not Determined	Not Determined	E	E
	5	North of Lamar Alexander Pkwy	Lamar Alexander Pkwy	C	Not Determined	Not Determined	E	E

LOS E - F
LOS A - D
Speed <45, Not Analyzed

Source: *SR 162 (Pellissippi Parkway Extension) Traffic Operations Technical Report,* 2008

Exhibit 5: Alternative Routes Adjacent to Pellissippi Parkway Extension



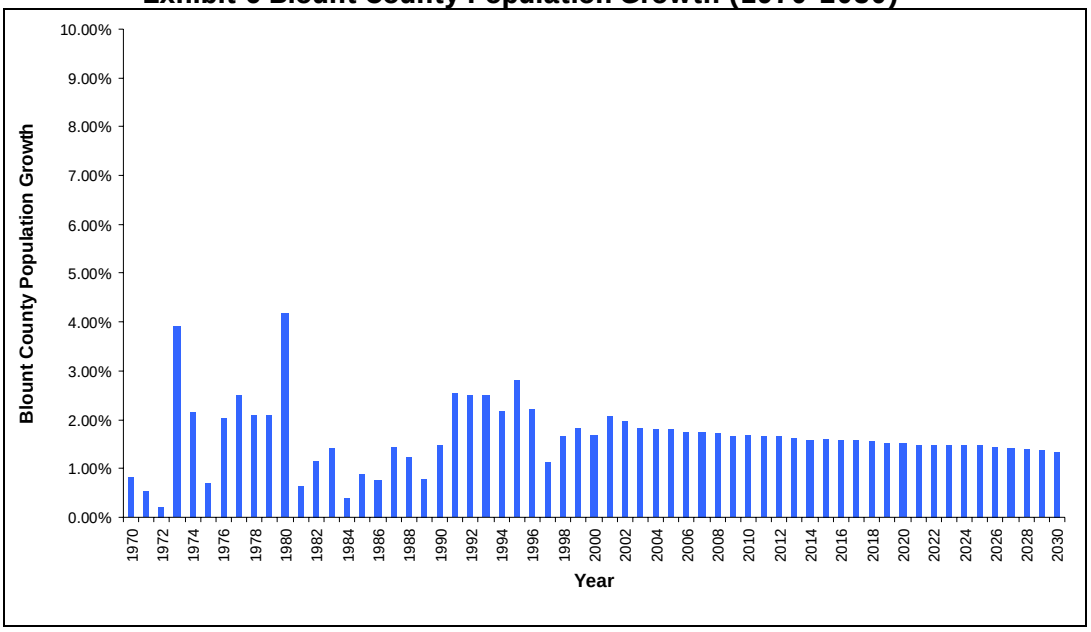
Source: Knoxville Regional TPO, PB

As presented in the Quantitative Assessment section, by 2030 the Build Alternatives, compared to the No-Build Alternative would lead to regionwide savings of approximately 1,300 Vehicle Hours of Travel (VHT), with about 800 VHT saved to just the trips using the Pellissippi corridor.[9] This would translate into time savings of about 16% per trip along the corridor. It is noteworthy here that some accessibility benefits may be felt by trip originating and ending outside of the study area as well. However in the quantitative evaluation, benefits are distributed based upon Vehicle Miles Traveled (VMT) and not upon individual trips. It is unlikely that significant benefits are felt on VMTs beyond the study area since travel time impacts diminish as we go farther from the epicenter of the improvement. It is equally unlikely that all trips within the study area accrue exactly similar benefits and hence an average over the study area is considered a better metric to judge net overall travel time benefits.

Based upon these findings, it is reasonable to expect that changes in accessibility under the Four-Lane Build Alternatives have a moderate to strong potential to induce growth in the study area.

Expected Growth. Population growth in Blount County has been steady, increasing at an average annual growth rate of 1.72% since 1970. BFS projects that this growth trend will continue at an average annual growth rate of 1.58% from 2009 through 2030. (See Exhibit 6)[10]

Exhibit 6 Blount County Population Growth (1970-2030)



To compare expected growth in the County to the induced development study area, PB relied on a second set of socioeconomic forecasts obtained from the Knoxville Regional Transportation Planning Organization (TPO). Exhibit 7 presents TPO's population forecast for the study area and Blount County, as a whole. The study area is forecast to grow at a slightly lower average annual growth rate (AAGR) of 1.3% compared to the County as a whole (1.9%).

[9] Knoxville Regional Travel Demand Model; SMITE estimate
[10] BFS data, Knoxville TPO

Exhibit 7 TPO Population Forecast (2005 and 2030)

Forecast Zone	2005 Population	2030 Population	Percent Change	AAGR
Study Area	80.323	106,600	32.7%	1.3%
Blount County	116,610	171,907	47.4%	1.9%

Similarly, the number of jobs in the study area is forecast to grow at a slightly lower Average Annual Growth Rate (1.5%), compared to the County (1.8%). (See Exhibit 8)

Exhibit 8: TPO Employment Forecast (2005 and 2030)

Forecast Zone	2005 Employment	2030 Employment	Percent Change	AAGR
Study Area	51,490	71,110	38.1%	1.5%
Blount County	55, 894	81,035	45.0%	1.8%

A substantial portion of new jobs in the study area are attributed to the construction of Pellissippi Place, a research and development park that is being built on a 450-acre tract of land where Pellissippi Parkway (I-140) intersects with Old Knoxville Highway (S.R. 33). The first construction phase of Pellissippi Place broke ground in November 2008, with the business and research component of development projected to open in 2010. TPO estimates that Pellissippi Place will create 7,383 new jobs by 2030. TPO's analysis assumes 1.2 million sq ft of research & development, 450 hotel rooms, 400,000 sq ft of office, 250 residential units (loft condominiums) and 1.2 million sq ft of retail; and applies on Institute of Transportation Engineers (ITE) trip generate rates for various uses.

Collectively, the socioeconomic growth forecasts indicate weak to moderate potential to facilitate induced development in the study area.

Land Supply. PB conducted a GIS-based buildable land analysis to understand how the volume of vacant, buildable land in the study area compares to anticipated growth. This analysis focuses on lands that have an improvement value equal to $5,000 or less and are classified as Residential, Commercial, Industrial, Farm or Agricultural in the Blount County Real Estate Assessment Database[11]. Lands that are not currently served by water and wastewater infrastructure are included in the buildable lands inventory. Simply because such lands have limited or no infrastructure currently does not mean that necessary capacity or new infrastructure may not be provided sometime in the future.

Importantly, this analysis is a tool to help gauge the balance between land supply and demand. Further specific local analysis of the study area would be required, including an assessment of site specific environmental constraints, infrastructure capacity and zoning before actual land supply and build-out potential can be determined.

Based upon the analysis parameters outlined above, PB has preliminarily identified approximately 14,700 acres within study area that could accommodate future growth. Exhibit 9 presents the location of the identified vacant, buildable lands in the study area, and Exhibit 10 provides a break down of the vacant lands by property class.

[11] The property class field in the Assessment Database indicates current uses – not zoning. However, in the absence of zoning information by parcel, PB relies on the property class as a proxy for zoning, which assumes that current uses are consistent with current zoning.

Exhibit 9: Location of Vacant, Buildable Parcels in the Study Area

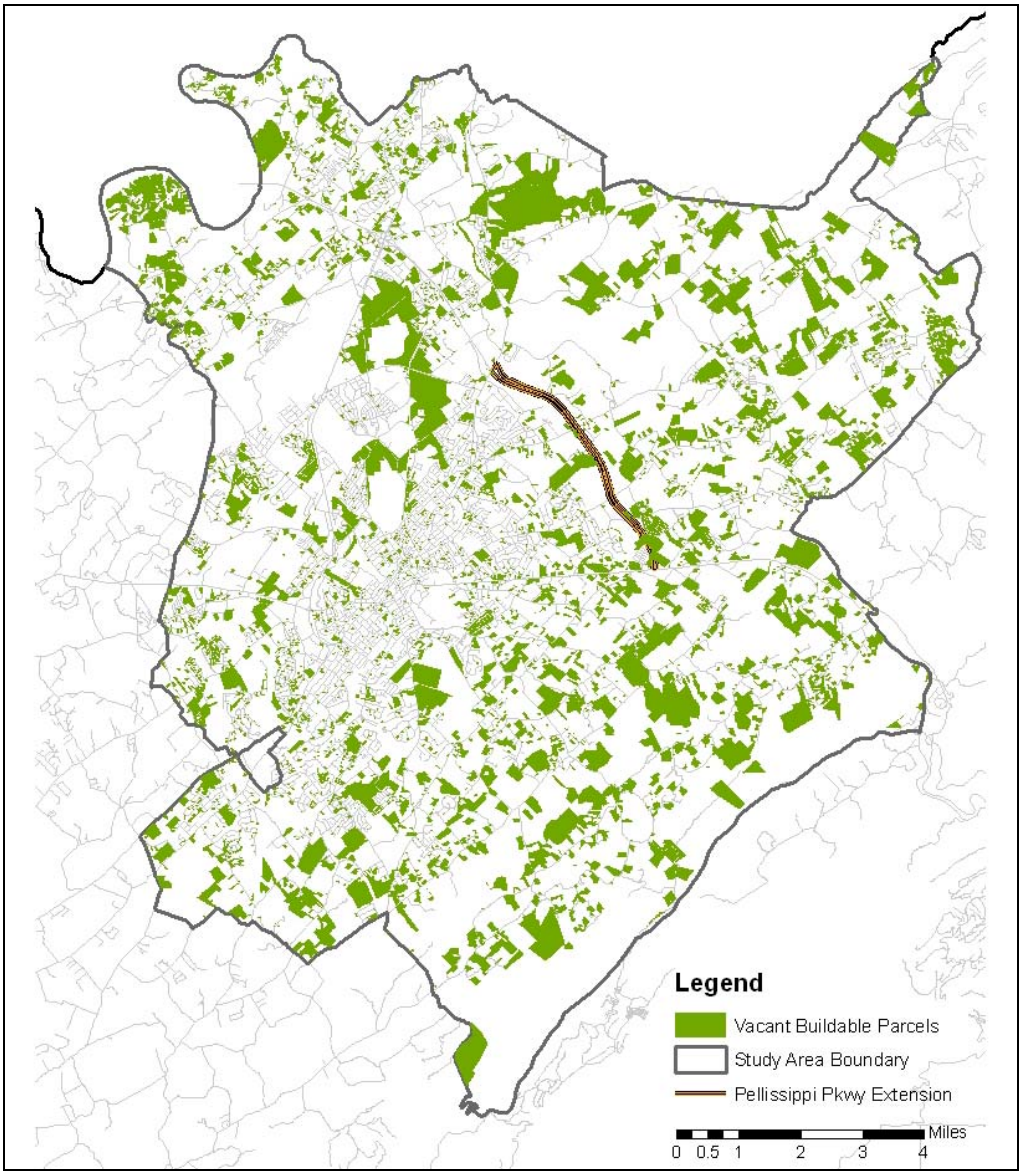


Exhibit 10 Vacant, Buildable Lands by Property Class

Property Class	Acreage	No. of Parcels
Agriculture	6,627	196
Commercial	400	229
Farm	1,934	82
Industrial	56	17
Residential	8,739	6,010
Total	17,756	6,534

Residential Land Conversion Assumptions

According to TPO's 2030 household forecasts, the study area is expected to grow by roughly 400 households per year. Assuming one residential unit per residential parcel yields a 15-year supply of residential land. This order of magnitude estimate is likely a conservative estimate as some residential class lands may be able to accommodate more than 1 residential unit. Additionally, other lands within the study area may also be appropriate to serve future development. For example, this analysis does not examine the potential of redevelopment and infill opportunities on previously developed lands (i.e., lands with an Improvement Value greater than zero.[12]

Commercial Land Conversion Assumptions

Between 2005 and 2030, nearly 19,000 new jobs are expected to be added to the study area. TPO estimates that roughly 50% or 9,500 of those jobs will be in commercial sectors (retail/finance, insurance, and real estate/service). Assuming an average .18 FAR, these new jobs will result in roughly 336,000 square feet (approximately 8 acres) of new commercially developed land in total. Given the more than 400 acres of vacant commercial land in the study area, the availability of commercial land is not a potential constraint to growth.

Based on these findings, land supply has a very weak potential to facilitate induced growth in the study area.

Availability of Other Services. In most cases, transportation improvements alone do not induce significant growth: other public facilities (especially sewer, water and other utilities) must also be available at a reasonable cost. This analysis focuses on potential sewer service constraints due to the limited nature of information on water and power service availability in the study area

Sewer Service

According to the Blount County Growth Strategy (hereafter, Growth Strategy), the vast majority of unincorporated areas of the study area lack public sewer service.[13] The vast majority of residential parcels in the unincorporated portions of the study area are served by small collection systems with on-site treatment units (septic systems). And the County does not intend to extend public sewer service outside of the Urban Growth Boundaries (UGB) of incorporated municipalities.[14]

When developers build on new land within an UGB, it is their responsibility to pay for the new sewer system throughout the subdivision, although the City will extend its sewer 100 feet toward the subdivision if needed.[15] When the development is complete, the developer transfers

[12] It is important to note that environmental constraints have not explicitly been accounted for in this buildable lands analysis. While including environmental constraints would reduce the supply of buildable land, this decrease in land supply would likely be offset by increases in density contemplated for large-scale planned developments such as Pellissippi Place.

[13] Hunter Interests Inc., 2005. The Blount County Growth Strategy. Blount County Technical Memorandum #11. Wastewater Treatment Alternatives

[14] Ibid.

[15] Hunter Interests Inc., 2005. The Blount County Growth Strategy. Blount County Technical Memorandum #11. Wastewater Treatment Alternatives

ownership of the subdivision's sewer lines to the City. As reported in the Growth Strategy, city sewer extensions are determined mainly by where development is anticipated to go. For example, sewer is being extended to the planned interchanges around the Pellissippi Parkway Extension.[16]

Given that sewer service could be extended to serve areas outside of the UGBs, the availability of septic systems is considered to have weak to moderate potential to facilitate induced growth.

Public policy. Blount County Planning Commission's Policies' Plan focuses largely on preserving the rural and suburban residential nature of the larger part of the County. While medium and low density residential development is encouraged, commercial development is prescribed to be allowed only by exception along major corridors and key intersections. The plan emphasizes preserving the rural, small town and natural character of the County, encourages mixed use development and seeks to direct growth towards centers.

The Conceptual Land-use Plan goes further and defines the type of development (commercial, industrial residential, rural) and lays down the expectations of potential shape of each of these land uses. For instance commercial development is expected in the plan to be allowed to grow as needed, while industrial development is expected to be concentrated around cities of Alcoa and Maryville. This plan is generally considered easier to read and is in line with the zoning ordinance.

However, a review of historical building permit trends between 2005 and 2007 suggests that despite the smart growth policies of the County, new residential growth outside municipal boundaries is occurring at a far more rapid pace than within those city limits. As presented in Exhibit 11, on average about 75% of new development over the past three years has occurred in the unincorporated portions of Blount County as compared to Alcoa and Maryville.

Exhibit 11 New Privately Owned Residential Building Permits by Jurisdiction (U.S. Census Bureau)

Residential Building Permits	2005	2006	2007
Alcoa	20	39	28
Maryville	209	163	155
Unincorporated	676	667	513

Based on this housing trend, it is likely that current land use controls will have a moderate to strong potential to facilitate induced development.

Qualitative Assessment Findings

The findings of the qualitative assessment are summarized below in Exhibit 12:

[16] Ibid.

Exhibit 12 Assessment of Induced Development Indicators

Change	Conditions	Potential for land use change in the study area
Change in accessibility	16% time savings per trip	Moderate to strong
Expected growth	1%-2%	Weak to moderate
Land supply	14-year supply of residential, more than 20-year supply of commercial	Very weak
Availability of other services	Sewer: Not available everywhere and can be provided, and septic options are available	Weak to moderate
Public policy	Market pressures continue to steer growth to unincorporated areas, despite smart growth policies and controls	Moderate to strong

By the year 2020, the Four-Lane Build Alternatives, compared to the No-Build Alternative is forecast to generate time savings of roughly 16% per trip along the corridor. This predicted change in accessibility -- in combination with an analysis of other factors that shape the magnitude and location of growth -- suggests that implementation of the Four-Lane Build Alternative has moderate to strong potential to spur land use change in the study area.

4.1.5 Quantitative Assessment

Quantitative Assessment Approach

To quantify the increment of new development that may be induced by the project, the incremental travel generated by provision of the new roadway capacity was estimated (hereafter, induced travel demand). The Knoxville Regional Travel Demand Model does not explicitly account for induced travel.[17] In order to impute induced travel effects, PB post-processed Vehicle Miles of Travel (VMT) and speed outputs of the Knoxville Model using FHWA's *Spreadsheet Model for Induced Travel Estimation* (SMITE). [18]

The SMITE model estimates increase in travel due to highway expansion through an iterative cause-effect process. The model is based on the premise that increases in speed due to added capacity lead to more travel that, in turn, acts as a deterrent to travel since more traffic implies decreased speeds due to greater congestion. Several recent EIS studies of proposed road

[17] In addition, the traffic forecast runs for the Build and No-Build Alternatives rely on the same base demographic forecasts.

[18] For the "Build" scenario, only alternatives A and C, involving the construction of a 4-lane Pellissippi Parkway extension were considered. The Vehicle miles results of scenario A and C were close enough to be approximated as a single build scenario.

improvements have relied upon SMITE to estimate the combined effect of all induced travel. This was the case with the proposed I-93 improvement proposed for Manchester, New Hampshire. A description of SMITE is provided in Appendix B.

SMITE relies on travel demand elasticity results from a limited set of studies, some of which have been critiqued in more recent reviews. [19] [20] To address this shortcoming, the result of a "meta-analysis" of induced travel elasticities, which relies on averages of elasticity results from multiple empirical studies, was imputed in SMITE in lieu of the model's default elasticity parameters.[21] For purposes of this analysis, a travel demand elasticity estimate of -0.63 was used.

Indirect land use effects are only one source of induced travel. To accurately measure induced development one must net out the other sources of induced travel. Recent research in California has advanced our understanding of how the indirect effects of road expansion get expressed in terms of shorter-term behavioral shifts in travel (e.g., by route and mode) versus longer-term structural shifts in land use (i.e., indirect land use effects). Cervero (2003) examined 24 California freeway expansion projects across fifteen years to sort out the various sources of induced travel.[22] Findings from this study were used to forecast the potential number of new average daily trips (ADT) attributable to indirect land use shifts.

Finally, new vehicle trips attributed to longer-term land use shifts were attributed to households based upon trip purpose distributions obtained from the Knoxville TPO East Tennessee Household Travel Survey, 2008. Subsequently, home based trips were converted into households based on an average household trip rate assumption. [23] To estimate induced retail, office and hotel development, the ratio of households to (a) retail trade employment; (b) finance, insurance, and real estate (FIRE) employment; and (c) service employment were derived from the Knoxville TPO 2030 forecasts. Each respective households to jobs ratio was then multiplied by the total number of new households to yield the number of forecasted new jobs in each employment category.

Quantitative Assessment

Based on the elasticity parameters described above, the SMITE model estimated overall induced travel in 2020 to be 66,863 vehicle-miles.[24] With an average trip length of 7.5 miles, the extension of the Parkway would likely generate 8,915 additional individual trips in the study area.

However, this number includes trips induced by factors other than long-term land use shifts. Induced travel can be manifest in various forms. Some of the traffic gains spawned by a new or improved road are *behavioral* shifts and some are due to *structural* changes (i.e. land use shifts).

[19] The elasticity values represent proportional change in demand (e.g., VMT) as a function of proportional changes in capacity or travel times, controlling for other factors.

[20] Noland, R. and Lem, L. "A review of the evidence for induced travel and changes in transportation and environmental policy in the US and the UK." In *Transportation Research Part D: Transport and Environment Vol. 7*, Issue1. Elsevier (2002), pp. 1-26.

[21] Meta-analysis results from Uri Avin, Robert Cervero, et.al., *Forecasting Landuse effects of Urban Transportation Projects*, prepared for AASHTO Standing Committee on Environment, 2007

[22] Cervero, R. "Road Expansion, Urban Growth, and Induced Travel: A Path Analysis." *In Journal of the American Planning Association, Vol. 69, No. 2*. American Planning Association, Chicago (2003), pp. 145-163.

[23] Knoxville Regional Transportation Planning Organization. October 2008. 2008 East Tennessee Household Travel Survey, Final Report. Available at http://www.knoxtrans.org/plans/travsur2008.pdf

[24] See Appendix A for details regarding the SMITE process

Included in the former category are trips that were formerly suppressed, switches in routes and times of travel in response to increased capacity, and modal shifts. Longer term land use changes, on the other hand, are *structural* in that they represent people and firms locating to exploit the accessibility benefits created from road improvements.[25]

Cervero's (2003) study of 24 California freeway expansion projects brackets the range of induced travel attributable to long-term land use shifts at 0%-18%. Based on the results of the qualitative assessment (See Exhibit 12), it is our view that a 10%-18% range, i.e. 892 to 1,605 trips is a reasonable range in the context of the Pellissippi Parkway Extension.

Induced Residential Development. According to the Knoxville TPO 2008 East Tennessee Household Travel Survey, 2008, Home-Based trips constituted nearly 67% of the total surveyed trips. Given this distribution, we can infer that between 598 and 1,075 trips of the roughly 892 to 1,605 induced trips are attributable to new households. According to the same survey the observed vehicle trip rate per household was 8.73. This trip rate and the addition of 598 to 1,075 daily vehicle trips suggest that approximately 68 to 123 to new households would likely be spurred from the proposed project

Induced Commercial Development. Using data obtained from Knoxville TPO regarding the ratio of households to retail; service; and FIRE employment, and holding this job/housing balance constant, 60,500 sq ft of induced commercial space is attributed to the project in total. More specifically, this would likely result in 36,000 sq. ft. of induced office space, 19,800 sq. ft. of induced retail space, and 4,700 sq. ft. of induced hotel space.

Retail, service and FIRE (finance, insurance and real estate) jobs are estimated based on the split of employment types in the 2030 TAZ data. For hotel employment, it is assumed that hotel jobs would constitute around 12% of service and FIRE employment.[26] In order to estimate square footage of development from new jobs, metrics for square feet per employee were used. The analysis assumes 400 sq ft per employee for retail development, 275 sq ft per employee for office development, and 600 sq ft per employee for hotel development.

Quantitative Assessment Findings

Based upon the above analysis, the Pellissippi Parkway Extension would likely induce development in the study area. Induced development is estimated at between 68 and 123 new households and between 33,400 and 60,500 sq. ft. of office, retail and hotel space. (See Exhibit 13).

Exhibit 13: Summary of Induced Commercial Development (sq. ft.)

Dwelling Units (HH)	Office	Retail	Hotel	Total
68	19,800	11,000	2,600	**33,400**
123	36,000	19,800	4,700	**60,500**

As noted earlier, the process of forecasting induced development from transportation capacity improvements is more art than science. Considerable knowledge gaps surrounding induced travel and subsequent development remain. For instance, we know relatively little about how induced development varies between by type of facility and where new residential and commercial development is likely to go within a given jurisdiction. Additionally, multiple factors -

[25] Cervero, *Road Expansion, Urban Growth and Induced Travel- Path Analysis*, APA Journal, 2003.
[26] http://web.utk.edu/~tourism/presentations/Blount-Co-7-10-07.pdf The Importance of Tourism to the Blount Co. Economy

such as, changes in fuel prices, unemployment and other variables - could mask or completely offset the predicted induced development effects of the proposed project.

Understanding these limitations, induced development estimates are presented as ranges to reflect the considerable variability and uncertainty underlying the forecasts.

4.2 Fiscal Impact Analysis

Part 4.2 presents the results of the Fiscal Impact Analysis and describes the methodology and key assumptions used in the Fiscal Impact Model. The starting point of our analysis is the high end of the range of induced development forecast for the study area. Because of the uncertainty of the phasing, the fiscal effects of the induced development are evaluated at full build-out, which is forecast to occur in 2020. Revenues and expenses have been estimated in constant 2009 dollars. Thus, none of the estimates herein depend directly on future growth in wages or property values.

The fiscal impact analysis estimates the net positive or negative fiscal implications of induced growth forecast in the study area on the operating and capital budget of Blount County. The analysis examines the fiscal effects of two development scenarios:

- 2020 Business as Usual Case. This concept represents a "business as usual" future that would reasonably be expected to occur if a significant portion of the induced growth occurs outside designated growth areas. In the BAU scenario, it is assumed that only 20% of development would take place inside the limits of designated growth areas (incorporated lands and lands within urban growth boundaries), and 80% of development would be concentrated outside of designated growth areas. This case is associated with a higher cost of county services for each new unit of residential development.

- 2020 Smart Growth Case. This concept represents a future where most new residential and nonresidential development will be focused inward towards designated growth areas generally reflecting the objectives and guidelines of the Blount County Conceptual Land Use Plan. In the smart growth scenario it is assumed that 80% of new residential development would take place in designated growth areas, and the remaining 20% of new development would occur outside of these areas. This scenario decreases the costs associated with providing residential services as seen earlier.

While the amount of development forecasted under the two scenarios is held constant, the smart growth case draws from prior empirical studies to estimate how revenues and costs may differ from the BAU case with respect to the following characteristics:

- Land use mix
- Number of school children per household
- Public infrastructure costs for incremental units
- Cost of county services for marginal units of development

The analysis focuses on the County budget because it represents revenues and expenditures for the largest portion of the government services provided in Blount County. The study does not analyze services provided by the cities of Maryville and Alcoa.

The assumptions used in developing the Fiscal Impact Model are based on a number of sources including the 2008 County of Blount Consolidated Annual Financial Report (CAFR), governmental

and real estate trade data sources, interviews with County staff, as well as PB's experience in comparable jurisdictions.

4.2.1 Fiscal Impact Methodology

This section lays out the basic methodology used to estimate the fiscal implications of the two induced development scenarios. The approach consists of the following three steps:

Step 1: Estimate Additional Gross Revenues

Gross operating revenues were forecast for the following major tax categories: real property, business tangible, sales, and hotel. The forecasts were developed using a variety of techniques, depending on the revenue source as described below.

Step 2: Net Out Operating and Capital Expenditures

The amount of each gross revenue source that is needed to fund County services was estimated by applying the implied Cost of Community Service (COCS) ratios reported in the Blount County COCS report prepared by American Farmland Trust as well as findings from recent empirical studies on the cost implications of implementing various smart growth practices. Cost of Community Services (COCS) studies are a case study approach used to determine the fiscal contribution of existing local land uses.[27]

Step 3: Determine Net Fiscal Effects

Net fiscal effects were determined based on a comparison of the revenues that may be collected in connection with that new development and the costs of providing public services to the induced development program.

4.2.2 Blount County Revenue Assumptions

This section describes the methodology and assumptions used to forecast gross revenues of selected Blount County sources; including additional property taxes from commercial and residential real estate, local sales taxes from purchases by new employees and residents of County, and hotel/motel taxes from new rooms. Exhibit 14 provides a summary of each revenue source under the BAU and smart growth scenarios. Several revenue sources are not forecast because they are not expected to generate significant net new revenues. The following sections give a more detailed explanation of forecasted revenues, along with their associated estimating factors and assumptions.

[27] Blount County, Tennessee, Cost of Community Services Study, American Farmland Trust, 2006.

Exhibit 14: Revenues Summary, Blount County Fiscal Impact Model

Scenario: Base			
Revenue Category	**Gross Revenue**	**Cost of Public Services**	**Net Revenue Impact**
Residential Property Collections (Outside Growth Areas)	$45,000	$55,000	($10,000)
Residential Property Collections (Inside Growth Areas)	$33,000	$29,000	$4,000
Commercial Property Collections (Inside Growth Areas)	$3,000	$1,000	$2,000
Tangible Personal Property	$26,000	$6,000	$19,000
Property Tax Subtotal	**$107,000**	**$91,000**	**$15,000**
Residential Sales Tax Collections	$23,000	-	$23,000
Office/Commerical Sales Tax Collections	$6,000	-	$6,000
Sales Tax Subtotal	**$29,000**	**-**	**$29,000**
Hotel Tax	**$8,000**	**$400**	**$7,600**
Totals	**$144,000**	**$91,400**	**$51,600**
Scenario: Smart Growth			
Revenue Category	**Gross Revenue**	**Cost of Public Services**	**Net Revenue Impact**
Residential Property Collections (Outside Growth Areas)	$11,000	$14,000	($3,000)
Residential Property Collections (Inside Growth Areas)	$132,000	$116,000	$16,000
Commercial Property Collections (Inside Growth Areas)	$3,000	$1,000	$2,000
Tangible Personal Property	$26,000	$6,000	$19,000
Property Tax Subtotal	**$172,000**	**$137,000**	**$34,000**
Residential Sales Tax Collections	$23,000	-	$23,000
Office/Commerical Sales Tax Collections	$6,000	-	$6,000
Sales Tax Subtotal	**$29,000**	**-**	**$29,000**
Hotel Tax	**$8,000**	**$400**	**$7,600**
Totals	**$209,000**	**$137,400**	**$70,600**

Real Property Tax Revenue

Real property is defined by statute to include land, structures and improvements on land, certain mobile homes and machinery and equipment affixed to the land. Real property tax forecasts are based on estimates of the net assessed value added to tax rolls as a result of induced development. In Tennessee, property is classified based on its use and assessed as follows:

- Residential Land - 25% of its market value
- Residential Improvements - 25% of its market value
- Commercial Property - 40% of its market value

In Fiscal Year 2007-2008, annual property tax in Blount County was $2.23 per $100 of assessed valuation.[28]

Residential Assessed Value Increase. The increase in appraised value attributable to new residential development on land outside designate growth areas is forecast at $54,750 per acre. For residential development on parcels inside designated growth areas, the value is forecasted at $160,289 per acre. This per-acre value was computed as the difference between the average per-acre appraised value of improved and unimproved residential land in the study area for each sub-area (See Table 1-1 in Appendix C).[29] The per-acre value is then multiplied by the projected acreage of new housing attributable to induced development. To compute net assessment amount, the total forecast increase in appraisal value is multiplied by 25 percent. Finally the

28 Tennessee Comptroller of the Treasury, Division of Property Assessment. http://www.comptroller1.state.tn.us/PAnew/CountyAssessmentSummary.asp?c=005

29 For purposes of this analysis, unimproved parcels are defined as having an assessed improvement value of zero.

property tax rate is applied to the net assessment amount to determine total residential property tax attributable to the new development.

Commercial Assessed Value Increase. The increase in appraised value generated by new commercial development is forecast at $5.03 per square foot of commercial land. This value was calculated as the difference between the average per-square foot appraised value of improved and unimproved commercial land in the study area. Total commercial property tax was derived in a similar manner as described for residential development, and is presented in Table 1-1. Since it is assumed that all commercial development will take place on parcels inside designated growth areas in both the smart growth and BAU Scenarios, there is no per-acre value differential by sub-area as in the residential case.

Tangible Person Property Tax Revenue

In Tennessee, tangible personal property tax is paid by all partnerships, corporations, other business associations not issuing stock and individuals operating for profit as a business or profession.[30] In order to estimate revenue from tangible personal property taxes the most recent ratio of tangible personal property tax collections to commercial real property tax collections in Blount County was used. According to the Tennessee Comptroller's Division of Property Assessments[31], the ratio of tangible to real commercial property was roughly 21% in 2008. The amount of real property tax collections multiplied by 21% yields an estimate of tangible personal property increases associated with induced commercial development.

Local Option Sales Tax Revenue

Sales tax estimates are based on the proceeds from retail purchases made by the residents and employees of the new development. The County levies a local sales tax equaling 2.25 percent of total taxable sales.

It is assumed that households living in the new residential units spend 25 percent of their total household income taxable items, and that 75 percent of these expenditures will be captured by retailers in Blount County. These proportions are based on data from the U.S. Bureau of Labor Statistics and national consumer expenditure studies. Household incomes are estimated based on per capita income statistics reported for Blount County by the East Tennessee Development District and assume an average household population of 2.5 residents.

For residential development, revenue from local sales tax was estimated by, first determining the ratio of aggregate household income of new development to aggregate household income in the County, and then multiplying that ratio by current local sales tax revenues. This calculation assumes that new residents will have a similar incomes and expenditure patterns as current residents.

Retail and office workers that result from new commercial development will also spend money in the County, generating additional sales tax revenues. To avoid double-counting employees who live in Blount County and would have made their taxable purchases in the County already, it is assumed that 40 percent of the new workers will commute to work from other Counties (consistent with the Knoxville Regional Transportation Organization 2008 East Tennessee Household Travel Survey), that these employees spend approximately $2,800 per year on taxable items during the work day, and that 75 percent of these expenditures will be captured by

[30] Tennessee Code Annotated (TCA) 67-5-903

[31] http://www.comptroller1.state.tn.us/PAnew/SA.asp?W=08&c=5&t=0&s=0.

retailers in Blount County. These proportions were based on data from the International Council of Shopping Centers and the U.S. Bureau of Labor Statistics.

Revenue Sources Excluded from the Model

The County's Adopted Business Plan includes a number of revenue sources that are not expected to be significantly affected by induced development in the study area. For instance, the fiscal model does not include projections for other own source revenues, including fines, forfeits and penalties, licenses and permits and other local taxes (i.e. bank excise taxes); nor does it include additional intergovernmental revenues (i.e., state sales tax, income tax, motor vehicle tax, etc.) that may increase as result of induced development.

4.2.4 Blount County Expenditure Assumptions

While induced development in the study area will generate new revenues, there also will be additional costs to serve this development. The costs include, but are not limited to, police services, local road and highway costs, and public education for K-12 students. This section describes the methodology and assumptions used to net out operating and capital costs from gross local tax receipts.

COCS are not held constant across growth scenarios. Rather, there is abundant evidence suggesting that the cost of community services for incremental development varies depending on the density and/or location of new property within a given jurisdiction. Property developed closer to town centers, or generally more dense areas, is associated with a lower COCS as a result of increased efficiencies associated with providing services in these areas. Recent empirical findings from a compilation of earlier smart growth studies entitled "Understanding Smart Growth Savings", by Todd Litman of the Victoria Transport Policy Institute,[32] suggests that building in smart growth areas can yield a 40% reduction in service costs compared to a more rural or less dense location.

For the BAU case, the COCS ratios reported in the Blount County COCS Study (2006) were directly applied to determine net local tax receipts. According to the Study, for each $1 of revenue generated in Fiscal Year 2005, the costs of county services provided by property type are as follows:

- Residential (Base Case) – $1.23
- Residential (Smart Growth) – $0.88
- Commercial/Industrial - $0.25

Stated differently, the COCS Study found that for every tax dollar earned:

- BAU Case residential property costs the county $0.23
- Smart Growth residential property returns $0.22 to the county
- Commercial/Industrial property returns $0.75 to the county

For the smart growth case, residential COCS are reduced by 40% per the findings of the "Understanding Smart Growth Savings" study. According to the study, these cost savings mostly accrue as a result of more efficient distribution of services to developments which are more "compact" (meaning densely built or populated). Some examples are mail collection/distribution, garbage collection, school busing etc. Another way in which compact development provides cost savings is with respect to the increased efficiency of provision of interactive public services.

[32] http://www.vtpi.org/sg_save.pdf

These activities are characterized by people and/or materials which should be co-located for the service to be provided most efficiently. Examples cited by the report are emergency services, colleges and universities, retail centers, etc.

APPENDIX A

ECONOMIC IMPACT ANALYSIS TABLES

Exhibit A-1: Economic Impacts in Blount County for each Expansion Alternative

Output Effects (construction-induced economic output, 2006$) - Blount County

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	103,033,588	131,605	263,210	361,914	47,404,136	3,816,546	2,599,200	5,632,696	1,467,396	921,235	1,895,113	3,467,793	1,566,100	651,445	572,482	217,148	2,526,817	144,766	1,342,371	1,191,026	26,860,589
Alternative C	107,858,857	137,768	275,537	378,863	49,624,167	3,995,283	2,720,925	5,896,486	1,536,117	964,379	1,983,865	3,630,197	1,639,444	681,953	599,292	227,318	2,645,153	151,545	1,405,237	1,246,804	28,118,524
Alternative D	38,788,354	49,544	99,089	136,247	17,845,913	1,436,789	978,503	2,120,503	552,421	346,811	713,440	1,305,496	589,579	245,245	215,518	81,748	951,254	54,499	505,353	448,377	10,112,023

Output Effects (construction-induced economic output, 2006$) - Blount County

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	103,033,588	131,605	263,210	361,914	47,404,136	3,816,546	2,599,200	5,632,696	1,467,396	921,235	1,895,113	3,467,793	1,566,100	651,445	572,482	217,148	2,526,817	144,766	1,342,371	1,191,026	26,860,589
Alternative C	107,858,857	137,768	275,537	378,863	49,624,167	3,995,283	2,720,925	5,896,486	1,536,117	964,379	1,983,865	3,630,197	1,639,444	681,953	599,292	227,318	2,645,153	151,545	1,405,237	1,246,804	28,118,524
Alternative D	38,788,354	49,544	99,089	136,247	17,845,913	1,436,789	978,503	2,120,503	552,421	346,811	713,440	1,305,496	589,579	245,245	215,518	81,748	951,254	54,499	505,353	448,377	10,112,023

Income Effects (construction-induced earned income, 2006$) - Blount County

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	26,900,071	26,321	78,963	46,062	18,674,756	684,346	717,247	1,802,989	434,297	111,864	440,877	111,864	769,890	210,568	355,334	111,864	1,342,371	59,222	401,395	486,939	32,901
Alternative C	28,159,855	27,554	82,661	48,219	19,549,332	716,396	750,838	1,887,427	454,636	117,103	461,524	117,103	805,945	220,429	371,975	117,103	1,405,237	61,996	420,194	509,743	34,442
Alternative D	10,126,887	9,909	29,727	17,341	7,030,358	257,631	270,017	678,759	163,497	42,113	165,974	42,113	289,835	79,271	133,770	42,113	505,353	22,295	151,111	183,314	12,386

Exhibit A-2: Economic Impacts in the Rest of Tennessee for each Expansion Alternative

Employment Effects (# new FTEs) - Rest of Tennessee

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	576	8	1	2	138	74	22	58	16	10	24	24	31	2	30	15	50	9	33	27	4
Alternative C	603	8	1	2	144	77	23	61	17	11	25	25	33	3	31	16	52	9	34	28	4
Alternative D	217	3	0	1	52	28	8	22	6	4	9	9	12	1	11	6	19	3	12	10	1

Income Effects (construction-induced earned income, 2006$) - Rest of Tennessee

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	20,326,399	131,605	65,803	184,247	4,573,275	3,487,534	1,164,705	1,395,013	671,186	480,358	1,309,470	533,000	1,651,643	164,506	783,050	414,556	1,954,335	190,827	513,260	625,124	32,901
Alternative C	21,278,325	137,768	68,884	192,876	4,787,451	3,650,862	1,219,250	1,460,345	702,619	502,855	1,370,795	557,962	1,728,993	172,210	819,722	433,970	2,045,860	199,764	537,297	654,400	34,442
Alternative D	7,652,141	49,544	24,772	69,362	1,721,670	1,312,928	438,468	525,171	252,677	180,837	492,967	200,655	621,783	61,931	294,790	156,065	735,735	71,839	193,223	235,336	12,386

Income Effects (construction-induced earned income, 2006$) - Rest of Tennessee

Expansion Alternatives	TOTAL ALL INDUSTRIES	1. Agriculture, forestry, fishing, and hunting	2. Mining	3. Utilities	4. Construction	5. Manufacturing	6. Wholesale trade	7. Retail trade	8. Transportation and warehousing	9. Information	10. Finance and insurance	11. Real estate and rental and leasing	12. Professional, scientific, and technical services	13. Management of companies and enterprises	14. Administrative and waste management services	15. Educational services	16. Health care and social assistance	17. Arts, entertainment, and recreation	18. Accommodation and food services	19. Other services	20. Household
Alternative A	20,326,399	131,605	65,803	184,247	4,573,275	3,487,534	1,164,705	1,395,013	671,186	480,358	1,309,470	533,000	1,651,643	164,506	783,050	414,556	1,954,335	190,827	513,260	625,124	32,901
Alternative C	21,278,325	137,768	68,884	192,876	4,787,451	3,650,862	1,219,250	1,460,345	702,619	502,855	1,370,795	557,962	1,728,993	172,210	819,722	433,970	2,045,860	199,764	537,297	654,400	34,442
Alternative D	7,652,141	49,544	24,772	69,362	1,721,670	1,312,928	438,468	525,171	252,677	180,837	492,967	200,655	621,783	61,931	294,790	156,065	735,735	71,839	193,223	235,336	12,386

APPENDIX B

SMITE MODEL ESTIMATION RESULTS

APPENDIX B: SMITE MODEL ESTIMATION RESULTS

This Appendix summarizes the results of some trial runs of the Federal Highway Administration's (FHWA) "Spreadsheet Model for Induced Travel Estimation" (SMITE) that have been conducted by VHB. Patrick DeCorla-Souza and Harry Cohen in their paper titled Accounting for Induced Travel in Evaluation of Urban Highway Expansion suggest that "the SMITE spreadsheet can be used at a sketch planning level of an analysis to estimate the potential effects of induced travel".

Two of the principal input variables for SMITE are 1) the elasticity of travel demand and 2) the ratio of freeway traffic to arterial traffic. Because much of the current debate and ongoing research is focused on quantifying the level of elasticity, it is important to recognize that any result from the spreadsheet is only as good as the input elasticity. Similarly, the ratio of freeway traffic to arterial traffic is somewhat subjective as the extent of the influence area can vary widely.

In conducting the analysis of induced travel due to the Pellissippi Parkway extension project, certain modifications were made to the SMITE model. They primarily stem from the premise that SMITE was built to estimate induced travel due to roadway capacity expansion and requires a base traffic to be on the roadway to estimate the share of traffic diverted form other parallel routes. However since this is a roadway extension project, it was assumed that the existing network of local and arterial roads in the same alignment serve the market that would be otherwise served by the extension, should it be built. The modifications are as noted below:

- The elasticity of demand was changed from -0.50 to 0.63 for the for the corridor level and to -0.75 for the region-wide impacts.
- Initial freeway and arterial speeds were obtained from the travel demand model instead of using SMITE's default procedure for calculating speeds. The speed on the freeway portion was calculated to be the average speed for a traveler on the existing portion of the freeway and that on the alternative routes to the Parkway extension.

Exhibit B-1: SMITE Model Application

PART 1: 'APPLICATION TO ESTIMATE INDUCED VMT IN A FREEWAY CORRIDOR

Alternative Forecasts for "Base" Travel

		2030
	Assumed Elasticity of Demand w.r.t. Travel Time	-0.63
INITIAL CONDITIONS		
Travel Demand		
A1	Initial daily VMT (all fac. classes)	398,718
A2	Percent on freeways	49%
A3	Percent on arterials	51%
A4	Initial freeway VMT	246,747
A5	Initial arterial VMT	204,144

Conditions Before Improvement (Freeway)		
B1	Initial AADT/C ratio for freeways	6.190
B2	Initial freeway hourly capacity (in VMT)	39,862
B4	Initial freeway speed	46.05
B5	Initial freeway VHT	5,358
Conditions Before Improvement (Arterials)		
B6	Initial AADT/C ratio for arterials	4.480
B7	Initial arterial hourly capacity (in VMT)	45,568
B9	Initial arterial speed	33.11
B10	Initial arterial VHT	6,166
Conditions Before Improvement (Corridor)		
B11	Total corridor VHT	11,524
B12	Avg corridor speed (mph)	34.60
B13	Avg corridor travel time per mile	0.03

FREEWAY ANALYSIS

Initial Conditions After Improvement		
C1	Percent increase in freeway hourly capacity	0.750
C2	Freeway hourly capacity after impr. (VMT)	69,759
C3	Initial AADT/C ratio for freeways	3.54
C5	Initial freeway daily delay (hrs/1000 VMT)	0.55
C6	Initial freeway speed	58.07
C7	Initial freeway VHT	4,249
C8	VMT diverted from arterials	59,405
C9	Initial freeway VMT after improvement	306,152
C10	Initial freeway ADT/C with diverted traffic	4.39
C12	Freeway daily delay with diver.(hrs/1000 VMT)	0.67
C13	Freeway avg. speed after impr., with diversion	57.67
C14	Freeway VHT with diver., for previous travelers	4,279
C15	Added VMT from diversion (in thousands)	59
C16	Previous VMT(in thousands)	247
C17	Incr. in delay (hrs) to previous VMT due to diver.	29
C18	Added delay (hrs) to prev. VMT/1000 added VMT	0.49

Alternative Forecasts for "Base" Travel

		2030
Induced Travel		
D1	Initial freeway daily VHT	5,358
D2	Freeway daily VHT after impr for prev. users	4,279

D3	Time savings to prev.users initially	1,080
D4	Induced freeway VMT	38,543
	D3/{(C18/1000)-[1/(Elasticity of demand*C13)]}	
D6	Final freeway daily VMT	344,695
D7	Percent change in daily freeway VMT	39.70%
	Time Savings to Prior Travelers	
F1	Final freeway AADT/C ratio, with induced VMT	4.94
F2	Freeway daily delay after impr.(hrs/1000 VMT)	0.70
F3	Freeway avg. speed after impr., with ind. VMT	57.57
F4	Freeway daily VHT to prev. users, with ind. VMT	4,286
F5	Time savings to previous users, with ind. VMT (hrs)	1,072
F6	Time savings to previous users, per VMT(min.)	0.26
	Time Savings to Diverted (Previous Arterial) Travelers	
G1	Diverted freeway VMT	59,405
G2	Time savings per diverted VMT(min)	0.13
G3	Total time savings to diverted freeway users (hrs)	129.08
	Time Savings to Induced Travelers	
G6	Induced freeway VMT	38,543
G7	Time savings per induced VMT(min)	0.13
G8	Total time savings to induced freeway users (hrs)	83.75

ARTERIAL ANALYSIS

	Conditions Before Improvement	
H1	Initial AADT/C ratio for arterials	4.333
H2	Initial arterial hourly capacity (in VMT)	47,114
H3	Initial arterial daily delay (hrs/1000 VMT)	25.01
H4	Initial arterial speed	33.11
H5	Initial VHT for undiverted arterial VMT	4,371
	Initial Conditions After Improvement	
I1	VMT shifted from arterial system	59,405
I2	VMT remaining after shift	144,738
I3	Arterial ADT/C ratio after shift	3.07
I4	Arterial delay (hrs/1000 VMT) after shift	23.99
I5	Total arterial delay savings (initial)	1,425.33
I6	Average speed initially	36.51
I7	Arterial VHT after impr.for undiverted travelers	3,964
I8	Reduction in VMT(in thousands)	59
I9	Undiverted VMT(in thousands)	145
I10	Reduction in delay (hrs) to undiverted VMT	407

I11	Delay red.(hrs) to undiver. VMT/1000 diver. VMT	6.85

Alternative Forecasts for "Base" Travel

		2030
Induced Travel		
I12	Induced arterial VMT I5/{(I11/1000)-[1/(Elasticity of demand*I6)]}	28,320
I13	Final arterial daily VMT	173,059
I14	Percent change in daily arterial VMT	-15.23%
I15	Initial total corridor VMT, before improvement	398,718
I16	Final total corridor VMT, after improvement	517,754
I17	Percent change in corridor VMT	22.99%
Time Savings to Prior Travelers		
J1	Final arterial AADT/C ratio, with induced VMT	3.67
J3	Arterial avg. speed after impr., with ind. VMT	36.51
J4	Arterial daily VHT to prev. users, with ind. VMT	3,964
J5	Initial arterial daily VHT of previous users	4,371
J6	Time savings to previous users, with ind. VMT (hrs)	407
J7	Time savings to previous users, per VMT(min.)	0.17
J8	Value of time	$12.75
J9	Total value of time saved	$5,190
Time Savings to Induced Travelers		
K1	Induced arterial VMT	28,320
K2	Time savings per induced VMT(min)	0.08
K3	Total time savings to induced arterial users (hrs)	39.83

COMPUTATIONS TO CHECK CORRIDOR DEMAND AND PRICE ELASTICITIES

Alternative Forecasts for "Base" Travel

		2030
Demand Elasticity Check (Corridor)		
M1	Freeway VMT before	246,747
M2	Arterial VMT before	204,144
M3	Total VMT before	450,891
N1	Freeway VMT after	344,695
N2	Arterial VMT after	173,059
N3	Total VMT after	517,754

O1	Freeway VMT change	97,948
O2	Arterial VMT change	(31,085)
O3	Total VMT change	66,863
Q1	Freeway VHT before	5,358
Q2	Arterial VHT before	6,166
Q3	Total corridor VHT before	11,524
Q4	Avg corridor speed before	39.13
Q5	Avg corridor travel time per mile before	0.0256
R1	Freeway VHT after	5,987
R2	Arterial VHT after	4,740
R3	Total corridor VHT after	10,727
R4	Avg corridor speed after	48.26
R5	Avg corridor travel time per mile after	0.0207
S1	Percent change in travel time per mile	-18.93%
S2	Percent change in VMT	14.83%
S3	Corridor demand elasticity (check against input)	-0.78

Price Elasticity (Corridor)

T1	Freeway VMT before induced travel	306,152
T2	Freeway speed before induced travel	57.67
T3	Freeway VHT before induced travel	5,309
T4	Arterial VMT before induced travel	144,738
T5	Arterial speed before induced travel	36.51
T6	Arterial VHT before induced travel	3,964
T7	Total corridor VMT before induced travel	450,891
T8	Total corridor VHT before induced travel	9,273
T9	Avg corridor speed before induced travel	48.62
T10	Avg corridor travel time per mile before ind.travel	0.0206
T11	Avg corridor travel time per mile after	0.0207
T12	Percent change in travel time per mile	0.75%
T13	Percent change in VMT	14.83%
T14	Corridor price elasticity	0.0502

CHANGE IN DAILY VMT DUE TO EXPANSION OF FREEWAY CAPACITY

Alternative Forecasts for "Base" Travel

Freeway:

Initial VMT	246,747	
Diverted VMT	59,405	
Induced VMT	38,543	
Total VMT after improvement	344,695	
Percent change in VMT	39.70%	
Arterials:		
Initial VMT	204,144	
Diverted VMT	(59,405)	
Induced VMT	28,320	
Total VMT after improvement	173,059	
Percent change in VMT	-15.23%	
Corridorwide:		
Initial VMT	450,891	
Diverted VMT	0	
Induced VMT	66,863	
Total VMT after improvement	517,754	
Percent change in VMT	22.99%	
Assumed trip length	7.50	
Induced additional trips	8,915	
Assumed % of induced trips due to new development	20%	
Induced trips due to development		1,783

APPENDIX C

BLOUNT COUNTY FISCAL IMPACT MODEL

PROPERTY TAX CALCULATION

Table 1-1: Property Tax Calculation, Blount County Fiscal Impact Model

Item	Amount	Allocation Amount	Estimating Factor	Build Out	Project Total
RURAL					
Rural Residential Appraised Valuation					
Improved					
Total Improved Residential Appraised Valuation	607,705,000				
Acres of Improved Parcels	8,549				
Per Acre Appraised Valuation	71,081				
Unimproved					
Total Unimproved Residential Appraised Valuation	59,013,200				
Acres of Unimproved Parcels	3,614				
Per Acre Appraised Valuation	16,331				
Added Residential Appraised Value (acres)		$54,750	per acre of new residential dev.(1)	37	2,020,275
Rural Commercial Appraised Valuation					
Improved					
Total Improved Commercial Appraised Valuation	15,391,100				
Square Feet of Improved Parcels	15,940,117				
Per Square Foot Appraised Valuation	0.97				
Unimproved					
Total Unimproved Commercial Appraised Valuation	114,500				
Square Feet of Unimproved Parcels	489,875				
Per Square Foot Appraised Valuation	0.23				
Added Commercial Appraised Value (sq ft)		$0.73	per square foot of new commercial dev.	-	-
Rural Property Tax					
Total Residential Assessed Value		25%	of market value		505,069
Total Commercial Assessed Value		40%	of market value		-
Rural Property Tax Total	Res	$2.23	per $100 of assessed value		$11,263
	Commercial	$2.23	per $100 of assessed value		$0
	Total				$11,263

(1) Residential Build Out assumes a density of 1.5 acres per dwelling unit

Item	Amount	Allocation Amount	Estimating Factor	Build Out	Project Total
URBAN					
Urban Residential Appraised Valuation					
Improved					
Total Improved Residential Appraised Valuation	3,413,513,800				
Acres of Improved Parcels	16,468				
Per Acre Appraised Valuation	207,280				
Unimproved					
Total Unimproved Residential Appraised Valuation	238,076,600				
Acres of Unimproved Parcels	5,066				
Per Acre Appraised Valuation	46,992				
Added Residential Appraised Value (acres)		$160,289	per acre of new residential dev.(1)	148	23,658,622
Urban Commercial Appraised Valuation					
Improved					
Total Improved Commercial Appraised Valuation	965,104,300				
Square Feet of Improved Parcels	132,258,453				
Per Square Foot Appraised Valuation	7.30				
Unimproved					
Total Unimproved Commercial Appraised Valuation	38,323,600				
Square Feet of Unimproved Parcels	16,872,612				
Per Square Foot Appraised Valuation	2.27				
Added Commercial Appraised Value (sq ft)		$5.03	per square foot of new commercial dev.	60,492	304,018
Urban Property Tax					
Total Residential Assessed Value		25%	of market value		5,914,656
Total Commercial Assessed Value		40%	of market value		121,607
Urban Property Tax Total					
		$2.23	per $100 of assessed value		$131,897
		$2.23	per $100 of assessed value		$2,712

(1) Residential Build Out assumes a density of 1.5 acres per dwelling unit