TRIANGLE TRANSIT AUTHORITY
Regional Rail Project
Making the Case

The Triangle Regional Rail Project consists of a 12 station, 28.1 mile rail alignment from Ninth Street in Durham to the State of North Carolina Government Center in Raleigh. Triangle Transit Authority is proposing to construct the project to serve the rapidly growing Triangle region with a current population of approximately 1.2 million persons. The passenger rail project will be constructed within railroad rights-of-way and will serve the communities of Durham, Cary, and Raleigh.

Projections to the New Starts design year (2030) indicate that employment and population will grow at rates double the national average for both the region and the rail corridor. The region's transportation infrastructure is inadequate to accommodate future growth. For future users of the transportation network, the Regional Rail project will provide a superior alternative to either bus or automobile modes of transportation for intra-regional travel in the rail corridor.

Project Corridor

Several corridors in the central portion of the Triangle region experience significant traffic congestion, particularly the I-40 corridor connecting Raleigh to the cities of Cary and Durham, and the largest employment center in the region, the Research Triangle Park, before continuing west. The current and projected roadway congestion throughout this corridor has caused the region's leaders to consider major investments in alternative modes of transportation that will provide improved transportation service over the automobile.

Key demographic conditions drive the need for the development of a major investment alternative to the automobile in the corridor:

- Regional population and employment are concentrated in the rail corridor. Currently, 50% percent of the employment and 30% of the metropolitan region's population are located in the rail transit corridor.

- Projections are that population growth in the corridor will be nearly 48% over the next 25 years, or approximately 2% per year, nearly twice the projected national average rate of growth, which is approximately 1% per year.

- Projections are that employment growth in the corridor will be nearly 78% over the next 25 years, or approximately 3.1% per year.

Transportation Problems in the Corridor

The Regional Rail Project serves the major east-west corridor (the I-40 corridor) in the Triangle metropolitan area, and connects the Research Triangle Park, the region's major employment center, to Cary, Durham, and Raleigh.

- The total number of vehicle mile trips (VMT) in the region is expected to triple between 1995 and 2030,from 21.6 million vehicle mile trips to 68.4 million.

- The total number of trips on I-40 will increase by 62% between 1995 and 2030.

- Peak hour speed on I-40 is forecast to decrease from 36.7 mph to 26.7 mph between 1995 and 2030

Transit Improvements Service Intent and Concepts

The Baseline Bus service system and the Regional Rail project -- the proposed New Start project -- will connect many of the region's major employment centers with the region's most densely populated neighborhoods. The travel corridor is anchored by the region's two major urban centers – Raleigh, the state capital with its North Carolina State Government Center, on the east, and Durham on the west. Neighborhoods in Durham, southwest and downtown Raleigh, northwest and north Cary, are among the most densely populated neighborhoods in the region. One of the region's major employment centers, Research Triangle Park, is located in the center of the corridor between Raleigh and Durham. Other major employment centers along the travel corridor include Duke University and its world-renowned medical center, and North Carolina State University, each of which generates student, employee, and institutional/special event travel. The travel associated with the employment centers (home-based work) and major institutions (home-based university) are the principal markets affected by the congested roadway system and the resulting degradation to travel times and reliability for the bus transit system that operates over this roadway system.

The Baseline Bus service is designed to serve these travel markets with improved service frequencies with a combination of express /limited stop services connecting the major travel markets (Raleigh-Durham, Raleigh-Research Triangle Park, Durham-Research Triangle Park) and a local service serving all the significant markets/activity centers in the corridors. While the express bus services can operate at higher speeds over the highway (in-lieu of local roadways) for a portion of their routes, they must get off the highways and operate at slower speeds on the local roadways to access many of the major markets. The impact of local roadway routing and its effects on travel times and reliability, especially for through-trips, makes serving several of the activity centers, especially one of the major centers (North Carolina State University) particularly problematic.

The Rail Transit Project provides a fixed guideway facility through the center of this corridor connecting the major activity center and travel markets, and enables the transit service to operate with more direct service connections at improved travel speeds and reliability relative to the Baseline Bus.

Transportation Benefits of the Regional Rail Project

- Project benefits will accrue to residents of Western Wake County (27%), neighborhoods around North Carolina State University (16%), Durham (11%), and Raleigh (11%). The Regional Rail project will provide benefits to residents of these areas by avoiding congested highways going to the Research Triangle Park, Duke University and North Carolina State University.

- The Regional Rail project will connect many of the region's most densely populated neighborhoods with the region's major employment centers. Neighborhoods in Durham, southwest and downtown Raleigh, northwest and north Cary, are among the most densely populated neighborhoods in the region. Major employment centers, including the Research Triangle Park, Duke University and Medical Center, North Carolina State University, downtown Raleigh central business district and the State of North Carolina Government Center are directly served by the rail project with stations located in the heart of the employment centers.

- People benefiting most from the service will be going to Western Wake County (32%), Raleigh CBD (11%), Raleigh, non-CBD (11%), and the Research Triangle Park (11%) of total benefits. Within these areas, destinations accruing the most benefits from the project include IBM and the Imperial Center in RTP, Duke University in the Durham district and North Carolina State University in the Raleigh district.

Projected travel time differences between the Regional Rail Project, and the baseline bus alternative are significant for many trip segments in the rail corridor. Highlights include:

- Travel time for users of the baseline bus alternative from Durham to the North Research Triangle Park station is projected at 27 minutes, compared to 16 minutes for the New Starts (rail) project.

- Travel time for users of the baseline bus alternative from Raleigh to the Triangle Metro Center is projected at 48 minutes, compared to 27 minutes for the New Starts (rail) project.

- Travel time for the baseline alternative from Downtown Raleigh to Downtown Durham, nearly 28 miles, is calculated by the demand model as being 56 minutes (express bus) compared to 39 minutes for the rail service.

Further Benefits of the Regional Rail Project

- The employment centers noted above provide jobs for a variety of employees from a variety of income levels – from entry level, shift workers to senior level professionals. The Regional Rail service will be able to bring lower and moderate-income workers to employment centers, improving the employment options for many workers, particularly lower wage workers.

- The rail transit project is located near major regional activity centers. Several of the employment centers noted above also serve as activity centers during non-traditional working hours. Special events, sporting, community, and entertainment activities are frequently held in Downtown Raleigh, the Government Center, the State Fairgrounds, and venues near West Raleigh, NCSU, the Durham Bulls Complex and Durham/Duke University during the evening and weekends. The Rail Project will provide transportation alternatives and improved access to these locations during periods when large populations are concentrated and traffic congestion is high.

Template 1: Project Description

PROJECT DESCRIPTION TEMPLATE (Page 1)		
PROJECT NAME:	TTA Regional Rail System	
Participating Agencies		
Lead Agency	Name	Research Triangle Regional Public Transportation Authority (Triangle Transit Authority)
	Contact Person	Barbara Weigel, Sr. Transportation Planner
	Address	PO Box 13677
		RTP, NC 13787
	Telephone Number	(919) 485-7509
	Fax Number	(919) 485-7541
	Email	Bweigel@rideTTA.org
Metropolitan Planning Organization	Name	Durham-Chapel Hill-Carrboro MPO
	Contact Person	Mark Ahrendsen, TCC Chair
	Address	City of Durham, 101 City Hall Plaza
		Durham, NC 27701
	Telephone Number	(919) 560-4366
	Fax Number	(919) 564-4561
	Email	Mahrendsen@ci.durham.nc.us
Metropolitan Planning Organization	Name	Capital Area MPO
	Contact Person	Chip Russell, TCC Chair
		Town of Wake Forest, 401 Elm St.
	Address	Wake Forest, NC 27587
	Telephone Number	(919) 554-6140
	Fax Number	(919) 554-6195
	Email	crussell@ci.wakeforest.nc.gov
State Department of Transportation	Name	NC Department of Transportation
	Contact Person	David King, Deputy Secretary
	Address	PO Box 25201
		Raleigh, NC 27611-5201
	Telephone Number	(919) 733-2520
	Fax Number	(919) 733-9150
	Email	Ddking@dot.state.nc.us
Other Relevant Agencies	Name	
	Contact Person	
	Address	
	Telephone Number	
	Fax Number	
	Email	

PROJECT DESCRIPTION TEMPLATE (Page 2)		
Project Definition	Length (miles)	28.1 miles
	Mode/Technology	Diesel Multiple Units railcars (DMUs)
	Number of Stations	12
	List each station separately, including the number of park and ride spaces at each	Park and Ride lots at 100% design: Ninth Street – 268 West Raleigh - 189 Downtown Durham – 124 State Fairgrounds - 127 Alston Avenue/NCCU – 181 Downtown Raleigh - 269 North RTP – 70 Triangle Metro Center – 65* NW Cary – 420 Cary – 172 Total number of parking spaces: 1,885 * *200 additional spaces are located in the Regional Bus Transfer Center, adjacent to this Station*
	List each station with major transfer facilities to other modes	Downtown Durham Triangle Metro Center Downtown Raleigh Cary
	Number of vehicles/rolling stock	11 peak/14 total rail cars
Type of Alignment by Segment ***(Number of miles)***	Above grade	1.3 miles
	Below grade	0.7 miles
	At grade	26.1 miles
	Exclusive	28.1 miles
	Mixed Traffic	None
Current Status of Existing Right of Way	Ownership – who owns the right of way?	The NC Railroad (NCRR) corridor (9th Street to Downtown Raleigh) is owned by the State of North Carolina. TTA is licensed to operate the System within a portion of the NCRR corridor. CSX Transportation (CSXT) owns right-of-way from Downtown Raleigh northwards. TTA has purchased right-of-way from CSXT for operation of the in this portion of the corridor.
	Current Use: active freight or passenger service?	The NCRR corridor is in active use by both freight (14-23 trains/day) and Amtrak intercity passenger service (4-6 trains/day). The CSXT line has active freight service (4 trains/day).

PROJECT DESCRIPTION TEMPLATE (Page 3)			
Project Planning Dates	**Base Year**	**Opening Year**	**Forecast Year**
	1995	2009	2030
Capital Cost Estimate	2005 Constant dollars	$746,409,000 (includes finance charges)	
	Year of Expenditure	$809,918,000 (includes finance charges)	
Levels of Service	Headways		
	Weekday Peak	15 minutes	10 minutes
	Weekday Off-peak	30 minutes	20 minutes
	Weekday Evening	30 minutes	20 minutes
	Weekend	30 minutes	20 minutes
	Hours of Service		
	Weekday	6 AM to midnight	Same
	Weekend	6 AM to midnight	Same
Travel Demand Estimates	**Project Boardings**	**Opening Year**	**Forecast Year**
	Average Weekday	7,055	10,285
	Work Trips	N/A	N/A
	Peak Hour	5,344	6,194
	Annual	2,116,500	3,085,500
	Guideway Boardings[1]	**Opening Year**	**Forecast Year**
	Average Weekday	N/A	N/A
	Work Trips	N/A	N/A
	Peak Hour	N/A	N/A
	Annual	N/A	N/A
	Transit System Linked Trips[2]	**Opening Year**	**Forecast Year**
	Average Weekday	54,859	73,005
	Annual	16,457,700	21,901,500
	Annual New Riders	N/A	1,916,100
Linked Trips if Proposed System Operated with Current Land Use Patterns and Population/Employment[3]		**Build Alternative**	
Fare Policy Assumptions Used in Travel Forecasts[4]		Bus – $2.00, 1995$ Rail – zone fare structure, $1-3, 1995$	
Regional HBW User Benefits Attributable to the Lowest Income Strata [5]		1,883	

[1] Forecast boardings on the rail or other guideway system, if the New Starts project is an extension to such a system.

[2] Linked Trips refer to trips that begin at the trip origin and end at the FINAL destination. One linked trip could be composed of several unlinked trips. For example, driving to a park and ride, riding a commuter train, and taking a bus to the final destination is all one linked trip which is made up of three unlinked trips and two transit system boardings.

[3] Projet sponsor shall generate this estimate by running their regional travel demand model using the proposed project transit network, the existing highway network, and existing population and emplyment estimates. If the proposed project is within 5 years of the planned opening year, opening year estimates can substitute for this measure.

[4] Please summarize fare policy assumptions used for all regional transit services modeled in the forecast year. Attach this summary to Template 1.

[5] For informational purposes, please report the percentage and total number of regional home-based-work user benefits attributable to the lowest socio-economic strata (as defined by Inc.ome or auto availability) used in local travel forecasts, for the forecast year.

PROJECT DESCRIPTION TEMPLATE (Page 4)		
Project Planning and Development Schedule	*Project Schedule*	
	Insert anticipated or actual dates/durations	
	Planning Studies Initiated	Triangle Fixed Guideway Study – 1/92
	Planning Studies Completed	Triangle Fixed Guideway Study – 2/95
	LPA selected	10/25/95 – Recommendations for a Regional Transit Plan adopted by TTA Board of Trustees
	LPA included in the financially constrained long range plan	Durham-Chapel Hill-Carrboro MPO – 9/96 Capital Area MPO – 2/97
	included in Financially Constrained TIP	1997, 2004
	Initiation of DEIS	FTA approval to enter PE - 1/98 Notice of Intent published – 4/14/98
	Completion of DEIS	FTA approval for release - 4/4/2001 Federal. Register Notice – 5/18/2001 Comment period closed – 7/20/2001
	Initiation of FEIS	Fall 2001
	Completion of FEIS	Record of Decision issued 1-9-03; Final Design entry approval 2-28-03
	Public Referenda (where applicable)	NA
	Preliminary Engineering (duration – dates of beginning and ending)	1/98 - to 2/03
	Final Design (duration)	2-28-03 – current
	FFGA- submit request to award (duration)	November 2006 (6 months)
	Construction (duration)	43 months
	Testing (duration)	6 months
	Revenue Operations	December 2009

PROJECT DESCRIPTION TEMPLATE (Page 5)		
Project Management (continued)		
Project Manager	Name	Don Carnell, Assistant General Manager Planning & Engineering
	Address	PO Box 13787
		RTP, NC 27709
	Phone	(919) 485-7432
	Fax	(919) 485-7441
	Email	Dcarnell@ridetta.org
Agency CEO	Name	John D. Claflin, General Manager
	Address	PO Box 13787
		RTP, NC 27709
	Phone	(919) 485-7424
	Fax	(919) 485-7441
	Email	Jclaflin@ridetta.org
Key Staff: Overall New Starts Criteria	Name	Barbara Weigel, Sr. Transportation Planner
	Address	PO Box 13677
		RTP, NC 13787
	Phone	(919) 485-7509
	Fax	(919) 485-7541
	Email	Bweigel@rideTTA.org
Key Staff: Ridership Forecasts	Name	Joe Huegy, Sr. Transportation Planner
	Address	PO Box 13787
		RTP, NC 27709
	Phone	(919) 485-7416
	Fax	(919) 485-7441
	Email	jhuegy@rideTTA.org
Key Staff: Cost Estimates	Name	Greg Northcutt, Sr. Project Manger
	Address	PO Box 13787
		RTP, NC 27709
	Phone	(919) 485-7522
	Fax	(919) 485-7541
	Email	gnorthcutt@rideTTA.org
Key Staff: Environmental Documentation	Name	Barbara Weigel, Sr. Transportation Planner
	Address	PO Box 13677
		RTP, NC 13787
	Phone	(919) 485-7509
	Fax	(919) 485-7541
	Email	Bweigel@rideTTA.org
Key Staff: Land Use Assessment	Name	Barbara Weigel, Sr. Transportation Planner
		PO Box 13677
	Address	RTP, NC 13787
	Phone	(919) 485-7509
	Fax	(919) 485-7541
	Email	Bweigel@rideTTA.org

PROJECT DESCRIPTION TEMPLATE (Page 6)		
Project Management (continued)		
Key Staff: Financial Assessment	Name	Saundra Freeman, Assistant General Manager, Finance
	Address	PO Box 13677
		RTP, NC 13787
	Phone	(919) 485-7415
	Fax	(919) 485-7441
	Email	sfreeman@rideTTA.org
Key Staff: Project Maps	Name	Greg Northcutt, Sr. Project Manager
	Address	PO Box 13787
		RTP, NC 27709
	Phone	(919) 485-7522
	Fax	(919) 485-7541
	Email	gnorthcutt@rideTTA.org
Project Contractors		
Current Prime Contractor (GEC)	Name	Parsons Brinckerhoff Quade & Douglas Attention: David Harlan, Project Director
	Address	68 T.W. Alexander Drive or PO Box 14847
		Durham, NC 27709
	Phone	(919) 485-7575
	Fax	(919) 485-7549
	Email	harlan@ttarail.com
Current Subcontractors Transit Systems Design	Name	Booz Allen Hamilton, Inc. Attention: Damien Carey
	Address	430 Davis Drive, Suite 150
		Morrisville, NC 27560
	Phone	(919) 485-7557
	Fax	(919) 485-7549
	Email	carey@ttarail.com
Current Subcontractors Section Design	Name	Earth Tech, Inc. Attention: James W. (Bill) Jenkins, Jr.
	Address	701 Corporate Center Drive, Ste. 475
		Raleigh, NC 27607
	Phone	(919) 854-6200
	Fax	(919) 854-6259
	Email	Bill.jenkins@earthtech.com
Current Subcontractors Document Control	Name	LKG-CMC, Inc. Attention: Louise K. Garside
	Address	707 Wilshire Boulevard, Ste.3600
		Los Angeles, CA 90017
	Phone	(213) 892-0789
	Fax	(213) 892-1424
	Email	lgarside@lkgcmc.com

PROJECT DESCRIPTION TEMPLATE (Page 7)		
Project Contractors (continued)		
Current Subcontractors Section Design	Name	Rummel, Klepper & Kahl, LLP Attention: J. T. "Tommy" Peacock, Jr.
	Address	900 Ridgefield Drive. Suite 350
		Raleigh, NC 27609
	Phone	(919) 878-9560
	Fax	(919) 790-8382
	Email	tpeacock@rkkengineers.com
Current Subcontractors Section Design	Name	Stantec Consulting Service, Inc. Attention: Kenneth Smith
	Address	801 Jones Franklin Road, Ste. 300
		Raleigh, NC 27606
	Phone	(919) 851-6866
	Fax	(919) 851-7024
	Email	kwsmith@stantec.com
Current Subcontractors Section Design	Name	Stewart Engineering, Inc. Attention: Mike Krannitz
	Address	260 Town Hall Dr. Ste. C
		Morrisville, NC 27560
	Phone	(919) 380-8750 ext. 148
	Fax	(919) 380-8752
	Email	mkrannitz@stewart-eng.com
Current Subcontractors GeoTechnical Engineering	Name	Tierra Inc. Attention: Margaret Robertson, LG
	Address	2701 Rowland Road
		Raleigh, NC 27615
	Phone	(919) 871-0800
	Fax	(919) 871-0803
	Email	mrobertson@tierraeng.com
Current Subcontractors Section Design	Name	Wetherill Engineering, Inc. Attention: Edward G. Wetherill
	Address	559 Jones Franklin Road, Ste. 164
		Raleigh, NC 27606
	Phone	(919) 851-8077
	Fax	(919) 851-8107
	Email	ewetherill@wetherilleng.com
Current Subcontractors Section Design	Name	Wilbur Smith Associates Attention: Larry R. Goode
	Address	421 Fayetteville Street Mall, Suite 1303
		Raleigh, NC 27601
	Phone	(919) 755-0583
	Fax	(919) 832-8798
	Email	lgoode@wilbursmith.com

PROJECT DESCRIPTION TEMPLATE (Page 8)		
Project Contractors (continued)		
Current Subcontractors Cost Estimates	Name	Rohadfox Construction Control Services Corp Attention: Dr. Joy Rohadfox
	Address	1718 Peachtree St. N.W., Suite 481
		Atlanta, Georgia 30309
	Phone	404-532-1605
	Fax	404-532-1611
	Email	Joy.rohadfox@rccsc.net
Current Prime Contractor Rail Station Design (RSDC)	Name	Niles Bolton Associates Attention: Tom Williams, AIA
	Address	3060 Peachtree Rd, NW, Ste. 600
		Atlanta, GA 30305
	Phone	(404) 365-7600 or 364-9633
	Fax	(404) 364-0064
	Email	twilliams@nilesbolton.com
Current Subcontractor Station Design Architect	Name	The Freelon Group Attention: Todd Case, AIA
	Address	1005 Slater Rd, Ste. 200
		Durham, NC 27703
	Phone	(919) 941-9790
	Fax	(919) 941-0144
	Email	tcase@freelon.com
Current Subcontractor Station Design Architect	Name	Clearscapes, PA Attention: Steve Schuster, AIA
	Address	311-200 W. Martin St.
		Raleigh, NC 27601
	Phone	(919) 821-2775
	Fax	(919) 821-0804
	Email	Sschuster@clearscapes.com
Current Subcontractor Station Design Architect	Name	Gomes + Staub, PLLC Architects Attention: Dabney Staub, AIA
	Address	1100 Capital Boulevard
		Raleigh, NC 27603
	Phone	(919) 856-8817
	Fax	(919) 856-1745
	Email	Staub@gomes-staub.com
Current Subcontractor Station Design Architect	Name	Ellen Cassilly Architect Attention: Ellen Crozat-Cassilly
	Address	600 Foster Street
		Durham, NC 27701
	Phone	(919) 530-1149
	Fax	(919) 530-1718
	Email	ellen@ellencassillyarchitect.com

PROJECT DESCRIPTION TEMPLATE (Page 9)		
Project Contractors (continued)		
Current Subcontractor Civil, Utility, Structural, Traffic Engineers	Name	Kimley-Horn Associates, Inc. Attention: Stephanie Hachem, PE
	Address	3001 Weston Parkway or PO Box 33068
		Cary, NC 27513
	Phone	(919) 677-2092
	Fax	(919) 677-2155
	Email	stephanie.hachem@kimley-horn.com
Current Subcontractor Civil Engineers (DBE)	Name	CH Engineering PLLC Attention: Tom Hepler, PE
	Address	4601 Lake Boone Trail
		Raleigh, NC 27607
	Phone	(919) 788-0224
	Fax	(919) 788-0232
	Email	Thelper@ch-engr.com
Current Subcontractor Structural Engineers	Name	Lysaght & Associates Attention: Chuck Lysaght
	Address	120 Saint Mary's Street
		Raleigh, NC 27605
	Phone	(919) 833-0495
	Fax	(919) 833-7630
	Email	Chuck@lysaghtassociates.com
Current Subcontractor Landscape Architects (DBE)	Name	Susan Hatchell Landscape Architecture, PLLC Attention: Susan Hatchell, FASLA
	Address	743 West Johnson Street, Ste. E
		Raleigh, NC 27603
	Phone	(919) 838-9600
	Fax	(919) 838-9700
	Email	Hatchell@aol.com
Current Subcontractor Landscape Architects	Name	Coulter Jewel Thames PA Attention: Daniel Jewel, RLA, ASLA
	Address	111 West Main Street
		Durham, NC 27701
	Phone	(919) 682-0368
	Fax	(919) 688-5646
	Email	Djewell@cjtpa.com
Current Subcontractor Life Safety	Name	Rolf Jensen Attention: Craig Hofmeister
	Address	5540 Centerview Drive, Suite 200
		Raleigh, NC 27606
	Phone	(919) 424-3858
	Fax	(919) 424-3859
	Email	Chofmeister@rjagroup.com

PROJECT DESCRIPTION TEMPLATE (Page 10)		
Project Contractors (continued)		
Current Subcontractor Lighting Design	Name	Integrated Lighting Attention: Bernie Bauer
	Address	4241 Arrowhead Circle
		Westlake Village, CA 91362
	Phone	(805) 497-6604
	Fax	(805) 497-6684
	Email	Bbauer2@adelphia.net
Current Subcontractor Signage	Name	Apple Designs Attention: John Erhart
	Address	219 Boylan Ave.
		Raleigh, NC 27603
	Phone	(919) 838-4928
	Fax	(919) 838-4985
	Email	johnerhart@appledesigns.net
Current Subcontractor Structural Engineering	Name	Uzun & Case Attention: Larry McDowell
	Address	Atlantic Center Plaza, 1180 Peachtree St. NW Suite 1200
		Atlanta, GA 30309
	Phone	(678) 553-5204
	Fax	(678) 553-5270
	Email	lmcdowell@uzuncase.com
Current Subcontractor Mechanical, Electrical, Plumbing (MEP) Engineering	Name	The Wooten Company Attention: Bob Egan, PE
	Address	120 North Boylan Avenue
		Raleigh, NC 27603-1423
	Phone	(919) 828-0531
	Fax	(919) 683-3072
	Email	began@thewootencompany.com
Current Subcontractor Cost Estimating, Constructability Review	Name	Construction Control Services Corp Attention: Rod Rohadfox
	Address	411 West Chapel Hill Street, Suite 1004
		Durham, NC 27701
	Phone	(919) 682-5741
	Fax	(919) 683-3072
	Email	ccsc@ipass.net

Template 2: Certification of Technical Assumptions

LEAD AGENCY CERTIFICATION OF TECHNICAL ASSUMPTIONS IN THE DEVELOPMENT OF THE NEW STARTS CRITERIA SUBMISSION

As Chief Executive Officer of the **Triangle Transit Authority**, I understand that FTA's Reporting Instructions for Section 5309 New Starts Criteria, dated May 2005, establish common conventions for the development of information on proposed New Starts projects that are crucial to the fair and evenhanded evaluation of projects. These conventions include:

1. The horizon year used for the travel forecasts is 2025 or 2030.
2. The ridership forecasts are based on a single set of projections and policies consistent with the regional transportation plan and are held constant for the preparation of travel forecasts for the baseline and build alternatives, including:
    - land use, demographics, socio-economic characteristics, and travel patterns;
    - the highway network, except as modified for changes inherent to the build alternative (such as the conversion of traffic lanes to transit-only rights-of-way);
    - transit service policies regarding geographic coverage, span of service, and headways, modified where necessary to integrate transit guideways into the bus system;
    - pricing policies (fares, highway tolls, and parking costs); and
    - transit capacity provided given projected transit volumes, productivity standards, and loading standards.
3. The travel models used to prepare the forecasts have been developed and tested with the best available data on current conditions in the urban area, including:
    - Highway speed data collected in the year 2005;
    - Transit travel-time data collected in 1995;
    - Home-interview/travel-diary data collected in 1995; and
    - Transit on-board survey data collected in 1997/2005.
4. Except for the impacts of physical changes introduced by the alternatives themselves, the performance of the highway and transit systems is held constant between the baseline and build alternatives, including:
    - highway congestion levels;
    - transit operating speeds in mixed traffic; and
    - maximum access and egress distances to/from transit services, as well as representations of walking, waiting, and transfer times.
5. Transit-mode-specific constants describing the unmeasurable attributes of individual modes are either the same across all transit line-haul modes or are derived from ridership experience on existing transit modes in the metropolitan area, and have magnitudes that are within ranges that have been approved by FTA.
6. The definitions of the baseline and build alternatives are up-to-date, include all items known to be part of the proposed scopes, and specifically identify any remaining sources of uncertainty in the scope of the project.
7. The cost estimates for the baseline and build alternatives are up-to-date, are based on unit costs that apply to expected conditions during construction, and specifically identify remaining uncertainties in those unit costs.
8. Estimates of operating and maintenance costs for the baseline and build alternatives are based on current local experience, adjusted for differences in vehicle and service characteristics, and for any transit modes new to the system, are consistent with experience in similar settings elsewhere.
9. Annualization factors used to convert daily ridership and operating/maintenance costs into yearly totals are consistent with local experience and are the same for the baseline and build alternatives.

Therefore, I hereby certify that the Triangle Transit Authority (agency) has followed FTA's *Reporting Instructions for Section 5309 New Starts Criteria* (April 2005) in general, and the above-listed conventions in particular, in the preparation of this submission except for item(s) #6 above that the Triangle Transit Authority has discussed with FTA and that FTA has approved.

Chief Executive Officer

10/12/05

Date

Template 3: Transportation System User Benefits per Passenger Mile

Line	Variable	Value	Source/Calculation
1	Weekday Transportation System User Benefits (User Expenditure Savings in Hours) New Starts baseline vs. build alternative	5,107	Source: Output from SUMMIT software for change in User Expenditures between the New Starts baseline and build alternatives.
2	Annualization Factor	300	Source: Value that converts daily estimates to annual estimates.
3	Total Annual User Benefits (in hours)	1,532,100	Calculation: Multiply change in weekday User Expenditures in Hours (Line 1) by annualization factor (Line 2).
4	Total Annual User Benefits (in minutes)	91,926,000	Calculation: Multiply Total Annual User Benefits (Line 3) by 60
5	Annual Passenger Miles (weekday passenger miles on the New Start investment multiplied by the factor used in line 2)	23,669,400	Source: Forecast Project Passenger Miles from Regional Travel Forecasting Model
6	Total Transportation System User Benefits per Passenger Mile (in minutes)	3.88	Calculation: Divide Total Annual Transportation System User Benefits (Line 4) by Annual Passenger Miles (Line 5)

New Starts Report for FY 2007
October 2005

Documentation of Changes from 2004 Report

Template 3: User Benefit/Psgr Mile

The change in the user benefit/passenger mile from 2.7 in the 2004 report to 3.88 for this year is due to changes resulting from the redevelopment of the Triangle Regional Model.

Template 4. Mobility Improvements: Low Income Households Served

Census Tract	Number of Total Households	Number of Low-Income Households	Fraction of Tract within 1/2 mi. of New Start Project's Boarding Points	Number of Total HH's within 1/2 Mile of Boarding Points	Number of Low-Inc. HH's within 1/2 Mile of Boarding Points
For each station on New Starts Project					
Station 1: Ninth Street					
000301	1,025	204	0.019	19	4
000402	765	112	0.673	361	53
000500	1,774	665	0.428	727	273
000600	2,185	191	0.006	13	1
001501	128	117	0.287	7	6
001503	37	0	0.525	19	0
Subtotal	**5,914**	**1,289**	---	**1,147**	**337**
Station 3: Downtown Durham					
000302	1,692	238	0.006	10	1
000500	1,774	665	0.030	53	20
000700	1,356	208	0.216	293	45
000801	16	0	0.632	10	0
000802	410	66	0.617	253	41
001201	393	126	0.316	124	40
001503	37	0	0.000	0	0
Subtotal	**5,678**	**1,303**	---	**744**	**147**
Station 4: Alston Avenue/NCCU					
001001	1,623	704	0.137	222	96
001100	1,244	567	0.485	603	275
001202	329	142	0.240	79	34
001301	603	208	0.219	132	46
001400	1,249	518	0.386	482	200
Subtotal	**5,048**	**2,139**	---	**1,519**	**651**

Template 4. Mobility Improvements: Low Income Households Served

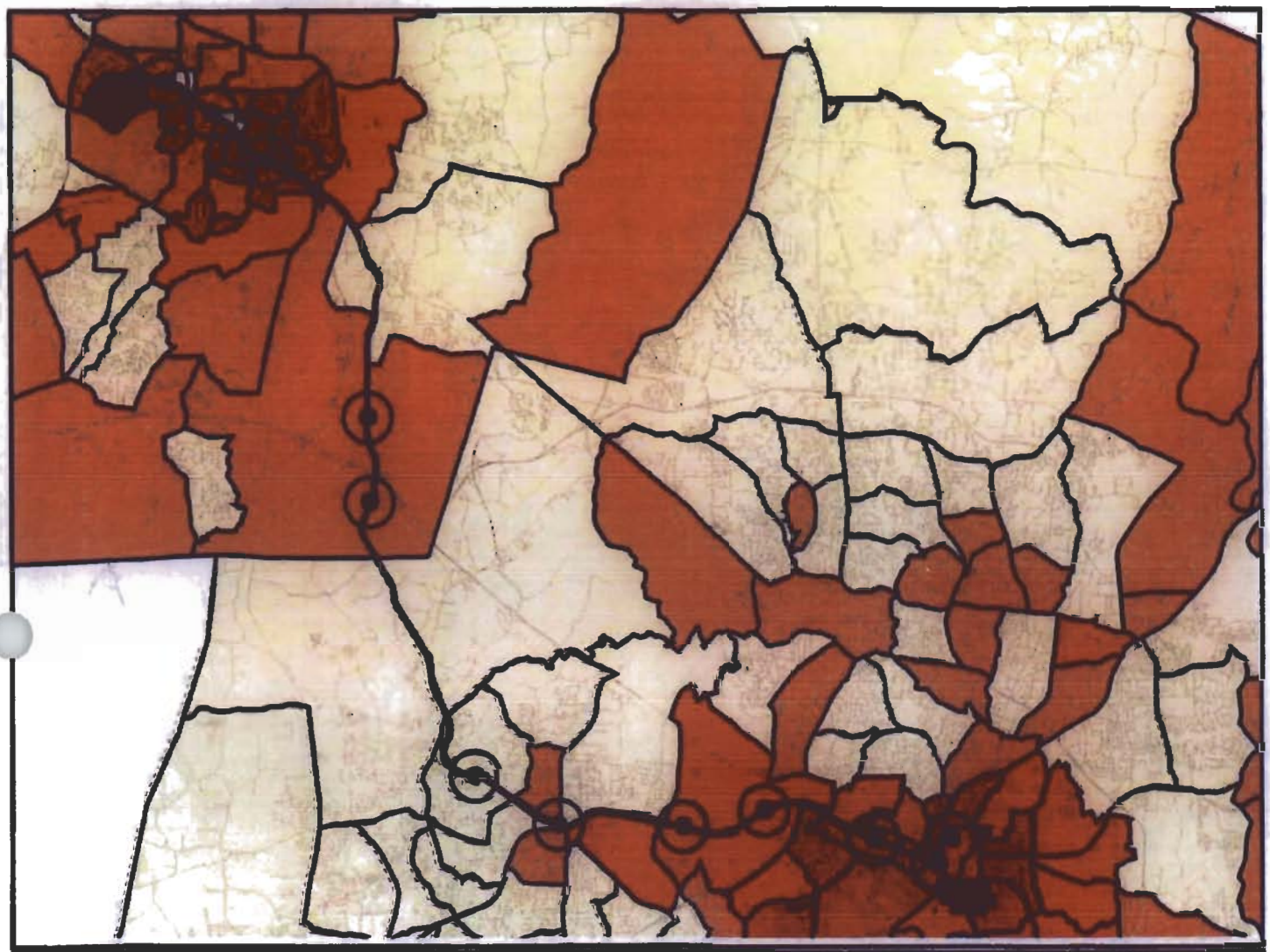
Census Tract	Number of Total Households	Number of Low-Income Households	Fraction of Tract within 1/2 mi. of New Start Project's Boarding Points	Number of Total HH's within 1/2 Mile of Boarding Points	Number of Low-Inc. HH's within 1/2 Mile of Boarding Points
Station 5: North RTP					
002014	2,392	162	0.034	81	6
Subtotal	**2,392**	**162**	**---**	**81**	**6**
Station 6: Triangle Metro Center					
002014	2,392	162	0.034	81	6
Subtotal	**2,392**	**162**	**---**	**81**	**6**
Station 7: NW Cary					
053514	2,337	92	0.173	404	16
Subtotal	**2,337**	**92**	**---**	**404**	**16**
Station 8: Downtown Cary					
053501	3,018	314	0.048	145	15
053506	2,011	56	0.001	2	0
053507	1,321	87	0.206	272	18
053510	3,131	127	0.019	59	2
053513	1,534	80	0.158	242	13
053515	2,156	29	0.057	123	2
Subtotal	**13,171**	**693**	**---**	**844**	**50**
Station 9: West Raleigh					
052401	758	115	0.075	57	9
052402	4,102	575	0.128	525	74
053501	3,018	314	0.005	15	2
053510	3,131	127	0.003	9	0
Subtotal	**11,009**	**1,131**	**---**	**606**	**84**

Template 4. Mobility Improvements: Low Income Households Served

Census Tract	Number of Total Households	Number of Low-Income Households	Fraction of Tract within 1/2 mi. of New Start Project's Boarding Points	Number of Total HH's within 1/2 Mile of Boarding Points	Number of Low-Inc. HH's within 1/2 Mile of Boarding Points
Station 10: State Fairgrounds					
052401	758	115	0.089	67	10
052402	4,102	575	0.119	488	68
Subtotal	**4,860**	**690**	**---**	**556**	**79**
Station 11: NC State					
051100	97	25	0.503	49	13
051200	1,663	178	0.152	253	27
051400	2,103	243	0.070	147	17
052302	2,231	509	0.020	45	10
052405	2,890	917	0.011	32	10
Subtotal	**8,984**	**1,872**	**---**	**525**	**77**
Station 12: Downtown Raleigh					
050100	642	106	0.670	430	71
050300	1,456	395	0.468	681	185
050400	595	124	0.184	109	23
050900	1,020	542	0.078	80	42
051000	1,177	155	0.769	905	119
051100	97	25	0.069	7	2
051200	1,663	178	0.068	113	12
052302	2,231	509	0.000	0	0
Subtotal	**8,881**	**2,034**	**---**	**2,325**	**454**
**(Stations 12 & 13 are clustered.)					
Station 13: Government Center					
Total for All Boarding Points	**70,666**	**11,567**	**---**	**8,833**	**1,905**

Note:	Source:	Source:	Source:	Calculation:	Calculation:
Attach map showing census tracts and transit system	U.S. Census Data: Total Households	U.S. Census Data: Households with "income below poverty level"	GIS or visual estimation	Number of Total Households * Fraction within 1/2 mile	Number of Low-Income Households * Fraction within 1/2 mile

Low-Income Households Percent by Census Tract



Legend

- Stations
- Phase I Regional Rail Line
- Streets
- Half Mile Radius Around Stations

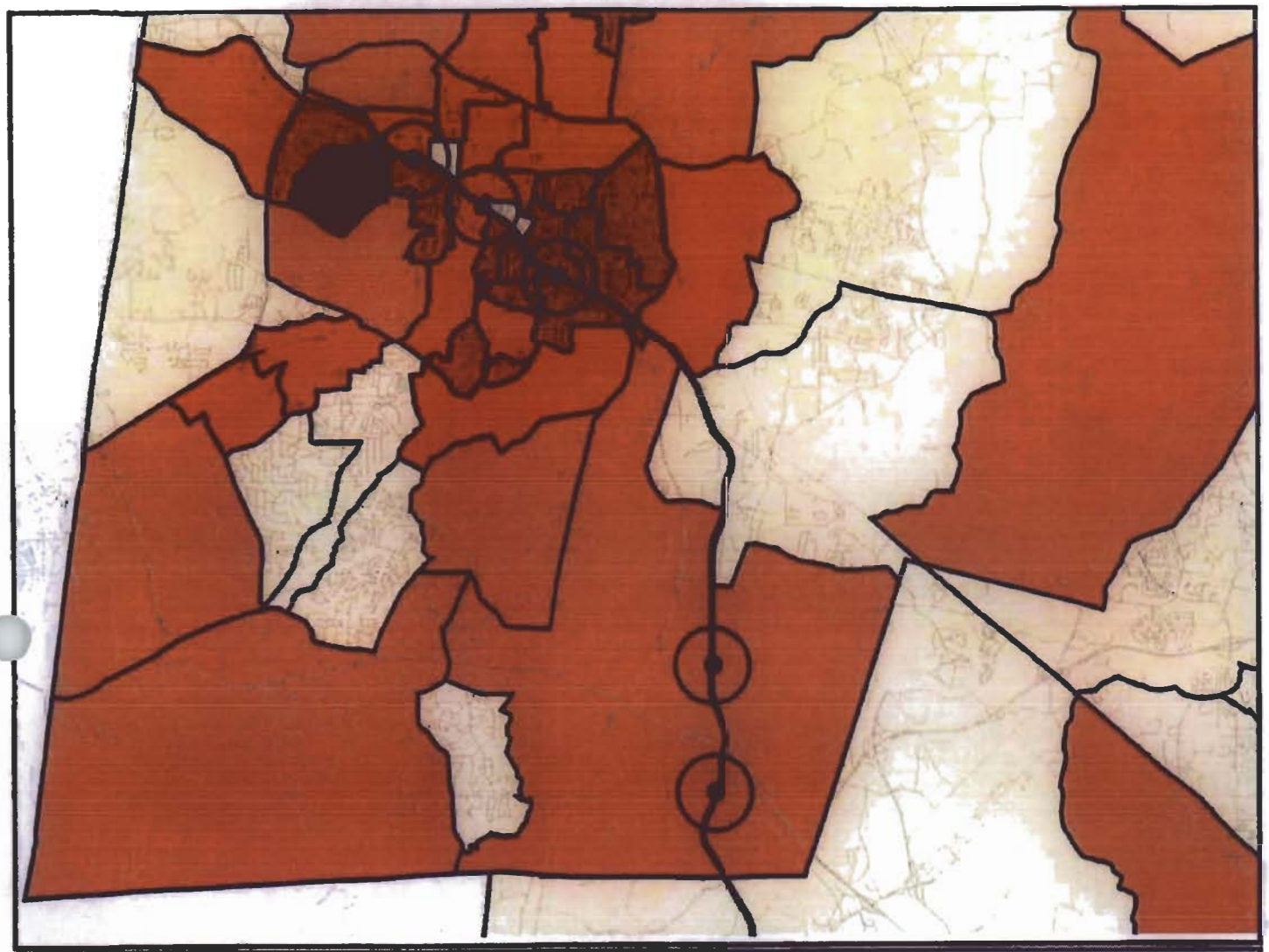
2000 Census Tracts - Percent Low Income Households

- 0 - 5
- 5.1 - 10
- 10.1 - 20
- 20.1 - 50
- 50.1 - 100

N
W E
S

6 0 6 12 Miles

Low-Income Households Percent by Census Tract



Legend

- Stations
- Phase I Regional Rail Line
- Streets
- Half Mile Radius Around Stations

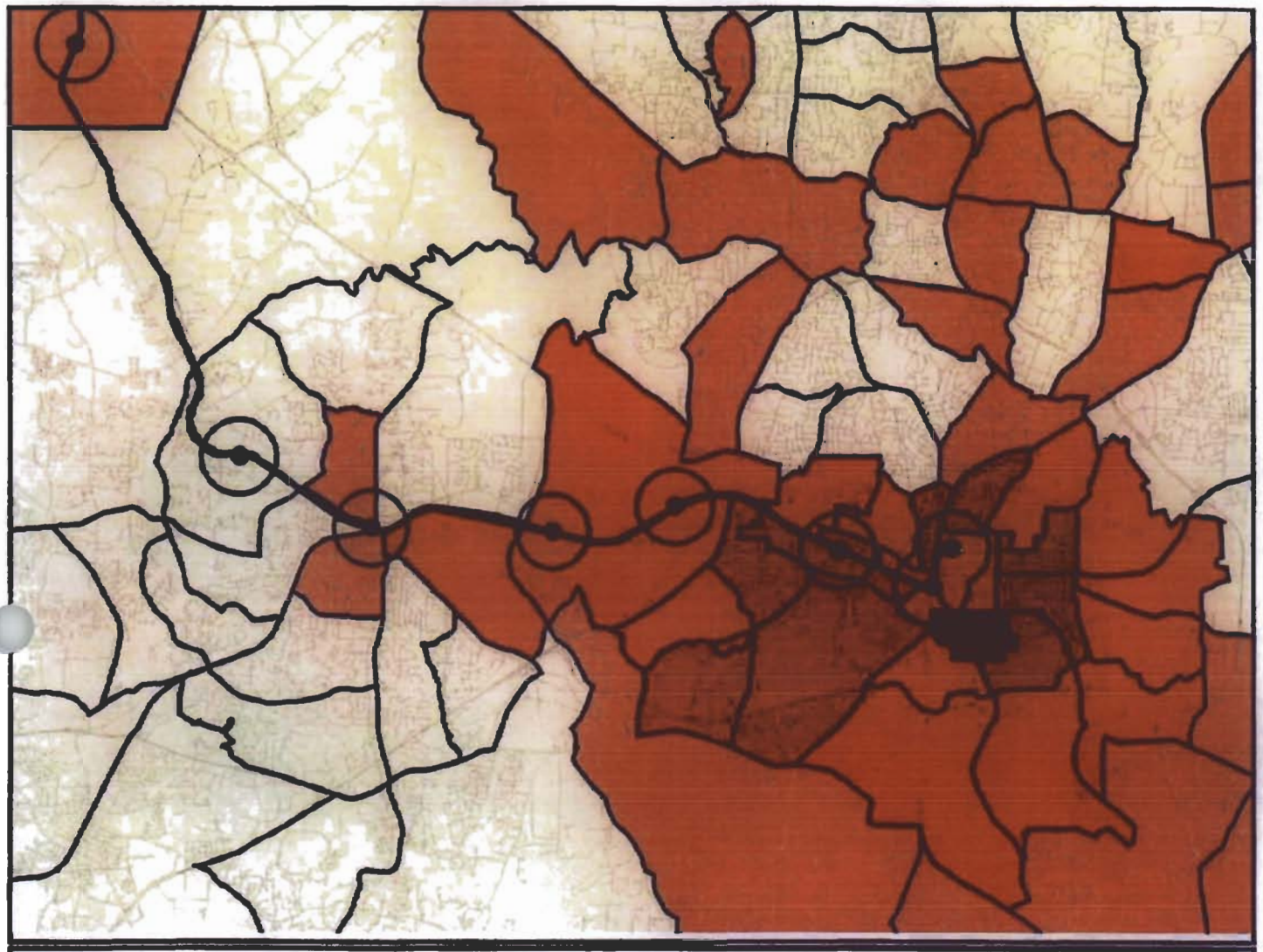
2000 Census Tracts - Percent Low Income Households

- 0 - 5
- 5.1 - 10
- 10.1 - 20
- 20.1 - 50
- 50.1 - 100

N
W E
S

4 0 4 8 Miles

Low-Income Households Percent by Census Tract



Legend

- Stations
- Phase I Regional Rail Line
- Streets
- Half Mile Radius Around Stations

2000 Census Tracts - Percent Low Income Households

- 0 - 5
- 5.1 - 10
- 10.1 - 20
- 20.1 - 50
- 50.1 - 100

N
W E
S

4 0 4 8 Miles

TEMPLATE 5 - EMPLOYMENT WORKSHEET

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
Station 1 Ninth St			
1827	80	0.170	14
1832	192	0.415	80
1833	1615	1.000	1615
1834	2351	1.000	2351
1835	122	0.501	61
1836	2	0.265	1
1837	54	0.923	50
1851	273	0.269	73
1852	2268	0.845	1917
1853	1015	0.992	1007
1854	192	0.055	11
1855	40	0.297	12
1856	1248	0.590	737
2128	308	0.022	7
Subtotal	**9,760**		**7,934**
Station 3 Dtn Durham			
1821	66	0.001	0
1822	242	0.049	12
1854	192	0.137	26
1855	40	0.230	9
1856	1248	0.011	14
1857	342	0.989	338
1858	583	1.000	583
1859	49	0.088	4
1860	10	0.919	9
1862	107	0.005	1
1863	58	0.411	24
1866	50	0.014	1
1921	364	0.219	80
1922	57	0.836	48
1923	132	0.372	49
1924	19	0.970	18
1925	174	1.000	174
1926	41	1.000	41
1927	468	1.000	468
1928	15	1.000	15
1929	116	1.000	116
1930	82	1.000	82
1931	755	1.000	755
1932	323	0.781	252
1947	189	0.024	5
1948	494	0.765	378
1949	944	1.000	944
1950	195	1.000	195
1951	238	1.000	238
1952	34	1.000	34
1953	25	1.000	25
1954	136	1.000	136
1955	20	1.000	20
1956	460	1.000	460
1957	435	1.000	435
1958	266	1.000	266
1959	40	1.000	40
1960	494	1.000	494
1961	287	1.000	287
1962	107	1.000	107
1963	143	1.000	143
1964	9	1.000	9
1965	92	0.683	63
1966	71	0.033	2

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
1967	254	0.405	103
1968	303	0.450	136
1969	288	0.633	182
1970	569	0.573	326
1971	1006	0.482	485
Subtotal	**12,632**		**8,632**
Station 4 Alston/NCCU			
1871	121	0.031	4
1872	219	0.979	214
1877	0	0.020	0
1878	140	0.853	119
1879	2	0.248	0
1880	46	1.000	46
1881	133	0.405	54
1882	98	0.901	88
1883	145	1.000	145
1884	207	1.000	207
1885	0	0.934	0
1886	0	0.029	0
1910	58	0.035	2
1913	700	0.571	400
1918	231	0.116	27
1978	241	0.153	37
1979	28	0.162	5
1980	40	0.691	28
1981	79	0.063	5
1982	100	0.380	38
1985	0	0.023	0
1988	102	0.293	30
1989	0	0.775	0
1990	20	0.987	20
1991	0	1.000	0
1992	10	1.000	10
1993	2	1.000	2
1994	4	1.000	4
1995	5	1.000	5
1997	17	1.000	17
1999	155	0.959	149
2000	147	1.000	147
2001	7	1.000	7
2002	1	1.000	1
2003	43	1.000	43
2004	8	1.000	8
2005	0	1.000	0
2006	2	1.000	2
Subtotal	**3,111**		**1,863**

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
Station 5 N RT Park			
2190	1036	0.000	0
2191	1790	0.131	234
2197	2621	0.000	1
2199	9371	0.653	6115
2200	3897	0.210	817
Subtotal	**18,715**		**7,167**
Station 6 Metro Center			
2181	1711	0.024	41
2183	8291	0.242	2006
2185	1503	0.018	27
2187	4312	0.368	1585
2190	1036	0.003	3
Subtotal	**16,853**		**3,661**
Station 7 NW Cary			
274	23	0.302	7
1273	435	0.316	137
1274	51	1.000	51
1275	4	0.338	1
1276	43	0.002	0
1296	1878	0.055	103
1297	694	0.553	383
Subtotal	**3,128**		**684**
Station 8 Dtn Cary Depot			
202	79	1.000	79
219	147	0.008	1
220	79	0.097	8
221	14	1.000	14
222	246	0.307	75
224	32	0.060	2
235	39	0.012	0
236	56	0.720	40
237	362	0.571	207
238	71	1.000	71
239	83	1.000	83
240	93	1.000	93
241	3	0.833	2
243	411	0.067	27
244	10	0.297	3
246	105	1.000	105
247	56	1.000	56
250	50	0.476	24
251	57	1.000	57
252	24	0.999	24
254	176	0.263	46
255	6	1.000	6
256	128	0.875	112
257	422	0.045	19
259	152	0.072	11
588	157	0.754	118
Subtotal	**3,058**		**1,285**

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
Station 9 W Raleigh			
192	1105	0.051	56
193	456	0.092	42
195	440	0.252	111
230	219	0.137	30
288	248	0.168	42
289	1366	0.528	722
290	232	0.704	163
292	0	0.191	0
Subtotal	**4,066**		**1,165**
Station 10 Fairgrounds			
180	558	0.024	13
181	3017	0.500	1509
189	567	0.325	185
190	0	0.809	0
191	285	0.170	49
293	925	0.065	60
Subtotal	**5,352**		**1,816**
Station 11 NCSU			
133	764	0.370	283
144	322	0.369	119
145	963	1.000	963
148	530	0.045	24
149	505	0.242	122
185	882	0.266	235
300	225	0.427	96
301	4012	1.000	4012
376	1254	0.676	848
Subtotal	**9,457**		**6,702**

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
Station 12&13 Raleigh/Govt. Ctr.			
1	488	1.000	488
2	3434	1.000	3434
3	585	1.000	585
4	361	1.000	361
5	337	0.941	317
6	133	0.006	1
12	569	1.000	569
13	321	1.000	321
14	326	0.509	166
16	231	1.000	231
17	298	1.000	298
18	129	1.000	129
19	314	1.000	314
20	429	1.000	429
21	1209	1.000	1209
22	20	0.921	18
23	33	0.043	1
24	133	1.000	133
25	87	1.000	87
26	150	1.000	150
27	564	1.000	564
28	796	1.000	796
29	797	1.000	797
30	724	1.000	724
31	2846	0.226	643
37	334	1.000	334
38	36	1.000	36
39	859	1.000	859
40	942	1.000	942
41	929	1.000	929
42	369	0.087	32
44	90	1.000	90
45	1282	0.962	1233
46	4321	0.761	3289
47	48	0.005	0
51	261	1.000	261
52	249	1.000	249
53	2435	0.092	224
57	90	0.612	55
58	1211	0.007	9
67	23	1.000	23
68	107	0.134	14
134	786	0.263	207
135	432	0.987	426
136	1220	0.363	442
137	127	0.723	92
138	150	1.000	150
139	333	0.875	292
140	794	0.578	459
142	191	0.721	138
143	728	1.000	728
305	28	0.171	5
306	1495	1.000	1495
307	145	1.000	145
308	227	1.000	227
309	1228	1.000	1228
310	5082	1.000	5082
311	375	1.000	375
312	300	1.000	300
313	155	1.000	155
314	4	0.069	0
315	3	0.179	1
316	3	0.104	0
338	459	0.854	392
339	40	0.092	4
341	302	0.195	59
342	346	0.187	65
372	436	0.636	277

Traffic Analysis Zone (TAZ)	Total Employment in TAZ	Fraction of TAZ within 1/2 mi. of New Starts Project's Boarding Points	Number of Total Jobs within 1/2 Mile of Boarding Points
For each station on New Starts Project			
373	547	0.247	135
374	263	0.002	1
Subtotal	**45,099**		**34,225**
Total for All Boarding Points	**131,231**		**75,135**
Note: Attach map showing TAZ's and transit system	Source: Regional travel demand model TAZ information file	Source: GIS or visual estimation	Calculation: Number of Jobs * Fraction within 1/2 mile

Template 6: Environmental Benefits Worksheet

Vehicle Class	Regional VMT/year (millions)		Emission Factor (g/mi)				Annual Emissions (tons)								Change in Emissions (tons per year)				Energy Consumption	Change in BTU/ year (millions)	CO2 Consumption	Change in CO2 Emissions/yea
							New Starts Baseline				New Starts Build				Build vs. Baseline				(BTU/Veh-mile)	New Starts Build vs. New Starts Baseline	(Tons CO2/ Million BTU)	New Starts Build vs. New Starts Baseline
	New Starts Baseline	New Starts Build	CO	NOx	VOC	PM-10	CO	NOx	VOC	PM-10	CO	NOx	VOC	PM-10	CO	NOx	VOC	PM-10				
Passenger Veh. (LDV/LDT)	68,444,315	66,363,716	12.85	0.68	0.79	0.909	967,557,148	66,260,723	59,484,058	68,444,315	966,700,496	66,202,057	59,431,392	68,383,716	-856,653	-58,666	-52,666	-60,599	6233	-377713567	0.0765	-28895087.86
Heavy-Duty Vehicle	4,106,659	4,103,023	7.49	4.84	1.47	1.22	33,838,146	21,866,039	6,641,132	5,511,687	33,808,187	21,846,679	6,635,252	5,506,807	-29,960	-19,360	-5,880	-4,880	22046	-80157933.24	0.0788	-6316445.139
Bus/Diesel	684,443	683,837	14.3	6.5	2.55	1.132	10,767,367	4,894,258	1,920,055	852,354	10,757,834	4,889,925	1,916,355	851,599	-9,533	-4,333	-1,700	-755	41655	-25242513.45	0.0788	-1989110.06
Bus/CNG							0	0	0	0	0	0	0	0	0	0	0	0	41655	0	0.0585	0
Bus/LPG							0	0	0	0	0	0	0	0	0	0	0	0	41655	0	0.0678	0
Bus/M85 or E85							0	0	0	0	0	0	0	0	0	0	0	0	41655	0	0.0785	0
Bus Electric																			41655	0	0.0665	0
Light or Heavy Rail/Electric																			77739	0	0.0665	0
Commuter Rail/ Diesel		1,590					0.00	0.00	0.00	0.00	63.13	7.21	3.43	0.36	63.13	7.21	3.43	0.36	95000	151,050	0.0788	11,903
Commuter Rail/Electric																			95000	0	0.0665	0
Total															(896,082)	(82,351)	(60,242)	(66,233)		(482,962,964)		(37,188,740)

Note:
Private vehicle classes should be consistent with regional travel forecasting model -- examples are shown here.

Source:
- Private vehicles from regional travel forecasting model
- Bus and rail from system operating plans

Source:
- Private vehicles from MOBILE or EMFAC
- Diesel bus from MOBILE HDDV
- Alt. fuel buses from diesel EF's and conversion factors given in text
- Rail calculated emission rates and fuel consumption rates as follows:
CO = 26.6 g/gal x .68 gal/mi = 18.2
Nox = 103 g/gal x .68 gal/mi = 70.5
VOC = 5.4 g/gal x .68 gal/mi = 3.7
PM-10 = 3.6 g/gal x .68 gal/mi = 2.5
If project sponsors are using a diesel locomotive with higher efficiency, project specific rail emission factors may be calculated (provide documentation).

Calculation:
= VMT (millions) * 1,000,000 * Emission Factor / 909,000 g/ton

Calculation:
= New Start Emissions - Baseline Emissions

Source:
Transportation Energy Data Book Edition 16
Note:
Transit agencies may provide their own estimates for transit vehicle BTU/mi factors(provide documentation)

Calculation:
= Change in VMT/year * BTU/veh-mi

Source:
Calculations by Cambridge Systematics, Inc. based on Energy Information Administration (1995) and Delucchi (1998).

Calculation:
= Change in BTU/year * Tons CO2/million BTU

DESIGNATION FROM EPA

8-hour ozone standard in Raleigh-Durham-Chapel Hill, with a June 2009 attainment date.

Template 7: Operating Efficiencies - Change in Operating Cost Per Passenger Mile

Line	Factor	Alternative		Comparison	Source/Calculation
		New Starts Baseline	New Starts Build	New Starts Build vs. Baseline	
1	System Annual Operating Cost (millions)	$ 21,531,930	$ 22,016,366		Source: Transit system operating costs, current and projected
2	System Annual Passenger-Miles (millions)	20,650,200	28,608,000		Source: Forecast system passenger-miles from regional travel forecasting model or other ridership projection model
3	Cost per Passenger-Mile ($/mi)	$ 1.043	$ 0.770	$ (0.273)	Calculation: Annual Operating Cost / Annual Passenger-Miles (Line 1/ Line 2)

Major Capital Project Costs - Main Worksheet (Rev. 2, Jun. 24, 2005)

Project	TTA Regional Rail	Today's Date	10/13/05
Location	Raleigh - Durham NC	Yr of Base Year Dollars	2005
Project ID	117		
Phase	N/A	Yr of Revenue Ops	2009
Contracting Method	Design Bid Build, Design Build (ROMF)	Forecast Year	2030
Number of Route Miles	28	Number of Stations	12

	Quantity	Base Year Dollars Total (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**28.16**	**210,327**	**$ 7,469**	**52%**	**28%**	**236,903**
10.01 Guideway: At-grade exclusive right-of-way	11.51	19,119	$ 1,661			
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0				
10.03 Guideway: At-grade in mixed traffic		0				
10.04 Guideway: Aerial structure	1.43	58,517	$ 40,921			
10.05 Guideway: Built-up fill	8.79	6,056	$ 689			
10.06 Guideway: Underground cut & cover	0.59	23,049	$ 39,066			
10.07 Guideway: Underground tunnel		0				
10.08 Guideway: Retained cut or fill	5.84	27,764	$ 4,754			
10.09 Track: Direct fixation		6,777				
10.10 Track: Embedded		0				
10.11 Track: Ballasted		63,741				
10.12 Track: Special (switches, turnouts)		5,305				
10.13 Track: Vibration and noise dampening		0				
20 STATIONS, STOPS, TERMINALS, INTERMODAL (12)	**12**	**6,733**	**$ 561**	**2%**	**1%**	**7,416**
20.01 At-grade station, stop, shelter, mall, terminal, platform	12	4,596	$ 383			
20.02 Aerial station, stop, shelter, mall, terminal, platform		0				
20.03 Underground station, stop, shelter, mall, terminal, platform		0				
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0				
20.05 Joint development		0				
20.06 Automobile parking multi-story structure		1,381				
20.07 Elevators, escalators		756				
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		**24,988**	**$ 887**	**6%**	**3%**	**24,989**
30.01 Administration Building: Office, sales, storage, revenue counting		1,554				
30.02 Light Maintenance Facility		17,509				
30.03 Heavy Maintenance Facility		0				
30.04 Storage or Maintenance of Way Building		490				
30.05 Yard and Yard Track		5,436				
40 SITEWORK & SPECIAL CONDITIONS		**103,485**	**$ 3,675**	**26%**	**14%**	**113,572**
40.01 Demolition, Clearing, Earthwork		6,250				
40.02 Site Utilities, Utility Relocation		32,151				
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		6,521				
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		1,792				
40.05 Site structures including retaining walls, sound walls		3,322				
40.06 Pedestrian / bike access and accommodation, landscaping		8,582				
40.07 Automobile, bus, van accessways including roads, parking lots		9,324				
40.08 Temporary Facilities and other indirect costs during construction		35,542				
50 SYSTEMS		**60,132**	**$ 2,135**	**15%**	**8%**	**67,095**
50.01 Train control and signals		24,710				
50.02 Traffic signals and crossing protection		20,719				
50.03 Traction power supply: substations		0				
50.04 Traction power distribution: catenary and third rail		0				
50.05 Communications		9,267				
50.06 Fare collection system and equipment		2,921				
50.07 Central Control		2,515				
Construction Subtotal (Sum Categories 10 - 50)		**405,665**	**$ 14,406**	**100%**	**54%**	**449,975**
60 ROW, LAND, EXISTING IMPROVEMENTS		**51,663**	**$ 1,835**		**7%**	**53,611**
60.01 Purchase or lease of real estate		46,787				
60.02 Relocation of existing households and businesses		4,877				
70 VEHICLES (14)	**14**	**53,625**	**$ 3,830**		**7%**	**53,625**
70.01 Light Rail		0				
70.02 Heavy Rail		0				
70.03 Commuter Rail		49,263				
70.04 Bus		0				
70.05 Other		0				
70.06 Non-revenue vehicles		711				
70.07 Spare parts		3,651				
80 PROFESSIONAL SERVICES		**168,441**	**$ 5,982**		**23%**	**175,828**
80.01 Preliminary Engineering		13,046				
80.02 Final Design		76,895				
80.03 Project Management for Design and Construction		24,852				
80.04 Construction Administration & Management		29,739				
80.05 Insurance		11,083				
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,818				
80.07 Surveys, Testing, Investigation, Inspection		2,873				
80.08 Agency Force Account Work		5,135				
90 UNALLOCATED CONTINGENCY		**10,000**			**1%**	**10,998**
Subtotal (Sum Categories 10 - 90)		**889,394**	**$ 24,461**		**93%**	**744,037**
100 FINANCE CHARGES		**55,664**			**7%**	**65,881**
Total Project Cost (Sum Categories 10 - 100)		**745,058**	**$ 26,458**		**100%**	**809,918**
YOE Construction Cost per Mile (X000)			$ 15,979			
YOE Total Project Cost per Mile (X000)			**$ 28,761**			
Base Year Soft Costs & Contingency/Construction (80 + 90) / (10 thru 50)			44%			

Major Capital Project Costs - Allocated Contingency (Rev. 2, Jun. 24, 2005)

Project	**TTA Regional Rail**	Today's Date	**10/13/05**
Location	Raleigh - Durham NC	Yr of Base Year Dollars	**2005**
Project ID	117		

	Base Year Dollars Cost without Contingency (X000)	Base Year Dollars Contingency (X000)	Base Year Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**197,610**	**12,717**	**210,327**
10.01 Guideway: At-grade exclusive right-of-way	17,963	1,156	19,119
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0	0	0
10.03 Guideway: At-grade in mixed traffic	0	0	0
10.04 Guideway: Aerial structure	54,979	3,538	58,517
10.05 Guideway: Built-up fill	5,690	366	6,056
10.06 Guideway: Underground cut & cover	21,655	1,394	23,049
10.07 Guideway: Underground tunnel	0	0	0
10.08 Guideway: Retained cut or fill	26,085	1,679	27,764
10.09 Track: Direct fixation	6,368	410	6,777
10.10 Track: Embedded	0	0	0
10.11 Track: Ballasted	59,887	3,854	63,741
10.12 Track: Special (switches, turnouts)	4,984	321	5,305
10.13 Track: Vibration and noise dampening	0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (12)	**6,352**	**381**	**6,733**
20.01 At-grade station, stop, shelter, mall, terminal, platform	4,336	260	4,596
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0
20.05 Joint development	0	0	0
20.06 Automobile parking multi-story structure	1,303	78	1,381
20.07 Elevators, escalators	713	43	756
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**23,630**	**1,358**	**24,988**
30.01 Administration Building: Office, sales, storage, revenue counting	1,480	74	1,554
30.02 Light Maintenance Facility	16,555	953	17,509
30.03 Heavy Maintenance Facility	0	0	0
30.04 Storage or Maintenance of Way Building	467	23	490
30.05 Yard and Yard Track	5,128	308	5,436
40 SITEWORK & SPECIAL CONDITIONS	**98,899**	**4,586**	**103,485**
40.01 Demolition, Clearing, Earthwork	6,033	217	6,250
40.02 Site Utilities, Utility Relocation	29,381	2,770	32,151
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	6,152	369	6,521
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	1,788	4	1,792
40.05 Site structures including retaining walls, sound walls	3,124	198	3,322
40.06 Pedestrian / bike access and accommodation, landscaping	8,194	388	8,582
40.07 Automobile, bus, van accessways including roads, parking lots	8,686	638	9,324
40.08 Temporary Facilities and other indirect costs during construction	35,541	1	35,542
50 SYSTEMS	**56,189**	**3,942**	**60,132**
50.01 Train control and signals	23,216	1,494	24,710
50.02 Traffic signals and crossing protection	19,466	1,253	20,719
50.03 Traction power supply: substations	0	0	0
50.04 Traction power distribution: catenary and third rail	0	0	0
50.05 Communications	8,439	828	9,267
50.06 Fare collection system and equipment	2,781	139	2,921
50.07 Central Control	2,286	229	2,515
Construction Subtotal (Sum Categories 10 - 50)	**382,680**	**22,984**	**405,664**
60 ROW, LAND, EXISTING IMPROVEMENTS	**51,663**	**0**	**51,663**
60.01 Purchase or lease of real estate	46,787	0	46,787
60.02 Relocation of existing households and businesses	4,877	0	4,877
70 VEHICLES (14)	**51,105**	**2,520**	**53,625**
70.01 Light Rail	0	0	0
70.02 Heavy Rail	0	0	0
70.03 Commuter Rail	46,917	2,346	49,263
70.04 Bus	0	0	0
70.05 Other	0	0	0
70.06 Non-revenue vehicles	711	0	711
70.07 Spare parts	3,477	174	3,651
80 PROFESSIONAL SERVICES	**168,441**	**0**	**168,441**
80.01 Preliminary Engineering	13,046	0	13,046
80.02 Final Design	76,895	0	76,895
80.03 Project Management for Design and Construction	24,852	0	24,852
80.04 Construction Administration & Management	29,739	0	29,739
80.05 Insurance	11,083	0	11,083
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	4,818	0	4,818
80.07 Surveys, Testing, Investigation, Inspection	2,873	0	2,873
80.08 Agency Force Account Work	5,135	0	5,135
90 UNALLOCATED CONTINGENCY	0	**10,000**	**10,000**
Subtotal (Sum Categories 10 - 90)	**653,890**	**35,504**	**689,394**

Major Capital Project Costs - Inflation Calculation to YOE (Rev. 2, Jun. 24, 2005)

Project **TTA Regional Rail**
Location Raleigh - Durham NC
Project ID 117
Phase N/A
Contracting Method Design Bid Build, Design Build (ROMF)
Number of Route Miles 28
Number of Stations 12
Yr of Base Year Dollars 2005
Yr of Revenue Ops 2009
Forecast Year 2030
Today's Date 10/13/05

Below, include costs to be incurred through the completion of the project or the fulfillment of the New Starts funding commitment, whichever is expected to occur later in time.

BASE YEAR DOLLARS (X$000)	Base Yr Dollars	2004 and before	Base Year 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Double-Check Total
10 GUIDEWAY & TRACK ELEMENTS (28 route miles)	$ 210,327	$ -	$ -	$ 41,357	$ 31,017	$ 82,713	$ 55,240								$ 210,327
20 STATIONS, STOPS, TERMINALS, INTERMODAL (12)	$ 6,733	$ -	$ 1,758	$ 554	$ 1,663	$ 1,108	$ 1,650								$ 6,733
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$ 24,988	$ -	$ -	$ 3,332	$ 14,993	$ 6,664	$ -								$ 24,989
40 SITEWORK & SPECIAL CONDITIONS	$ 103,485	$ -	$ 837	$ 44,356	$ 25,875	$ 22,178	$ 10,239								$ 103,485
50 SYSTEMS	$ 60,132	$ -	$ 1,250	$ 8,543	$ 22,728	$ 17,087	$ 10,523								$ 60,131
60 ROW, LAND, EXISTING IMPROVEMENTS	$ 51,663	$ 10,996	$ 15,796	$ 13,182	$ 11,689										$ 51,663
70 VEHICLES (18)	$ 53,625	$ -	$ -	$ 6,456	$ 29,050	$ 12,911	$ 5,208								$ 53,625
80 PROFESSIONAL SERVICES	$ 168,441	$ 69,429	$ 22,666	$ 30,535	$ 24,771	$ 15,267	$ 5,772								$ 168,441
90 UNALLOCATED CONTINGENCY	$ 10,000	$ -	$ -	$ 4,596	$ 4,933	$ 466	$ 5								$ 10,000
100 FINANCE CHARGES	$ 55,664	$ -	$ -	$ 618	$ 4,044	$ 9,883	$ 12,251	$ 8,316	$ 5,125	$ 4,715	$ 4,324	$ 4,263	$ 2,116	$ -	$ 55,664
Total Project Cost (Sum Categories 10 - 100)	$ 745,058	$ 80,425	$ 42,307	$ 153,529	$ 170,764	$ 168,277	$ 100,897	$ 8,316	$ 5,125	$ 4,715	$ 4,324	$ 4,263	$ 2,116	$ -	$ 745,058
		Below insert estimated inflation rates for each year. The YOE dollars will be calculated automatically.													
Inflation Rate			0.02500	0.03500	0.03500	0.03500	0.03500	0.03500							
Compounded Inflation Factor		1.00000	1.02500	1.06088	1.09801	1.13644	1.17621	1.21738	1.21738	1.21738	1.21738	1.21738	1.21738	1.21738	
YEAR OF EXPENDITURE DOLLARS (X$000)	YOE Dollars	2004 and before	Base Year 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
10 GUIDEWAY & TRACK ELEMENTS (28 route miles)	$ 236,903	$ -	$ -	$ 43,875	$ 34,057	$ 93,998	$ 64,974	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
20 STATIONS, STOPS, TERMINALS, INTERMODAL (12)	$ 7,416	$ -	$ 1,802	$ 588	$ 1,826	$ 1,259	$ 1,941	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$ 24,989	$ -	$ -	$ 3,332	$ 14,993	$ 6,664	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
40 SITEWORK & SPECIAL CONDITIONS	$ 113,572	$ -	$ 858	$ 47,056	$ 28,411	$ 25,204	$ 12,043	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
50 SYSTEMS	$ 67,095	$ -	$ 1,281	$ 9,063	$ 24,955	$ 19,418	$ 12,377	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
60 ROW, LAND, EXISTING IMPROVEMENTS	$ 53,611	$ 10,996	$ 15,796	$ 13,984	$ 12,835	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
70 VEHICLES (18)	$ 53,625	$ -	$ -	$ 6,456	$ 29,050	$ 12,911	$ 5,208	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
80 PROFESSIONAL SERVICES	$ 175,828	$ 69,429	$ 22,666	$ 32,394	$ 27,199	$ 17,350	$ 6,790	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
90 UNALLOCATED CONTINGENCY	$ 10,998	$ -	$ -	$ 5,046	$ 5,416	$ 530	$ 6	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
100 FINANCE CHARGES	$ 65,881	$ -	$ -	$ 656	$ 4,441	$ 11,231	$ 14,421	$ 10,124	$ 6,239	$ 5,740	$ 5,264	$ 5,190	$ 2,576		
Total Project Cost (Sum Categories 10 - 100)	$ 809,918	$ 80,425	$ 42,403	$ 162,450	$ 183,183	$ 188,565	$ 117,759	$ 10,124	$ 6,239	$ 5,740	$ 5,264	$ 5,190	$ 2,576	$ -	

Major Capital Project Costs - Project Schedule (Rev. 2, Jun. 24, 2005)

Project **TTA Regional Rail**
Location Raleigh - Durham NC
Project ID 117
Phase AA, PE, FD, CON, OPS
Contracting Method Design Bid Build, Design Build (ROMF)
Number of Route Miles 28
Number of Stations 12
Yr of Base Year Dollars 2005
Yr of Revenue Ops 2009
Forecast Year 2030
Today's Date **10/13/05**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alternatives Analysis																						
Formulating purpose & need statement																						
Planning, locational concepts for stations, rough screening																						
Developing a few alternatives, designing transit-land use connections																						
Conceptual engineering, cost est., scheduling, ridership forecasting																						
Developing DEIS																						
Selecting the Locally Preferred Alternative (LPA)																						
Including LPA in financially constrained long-range plan																						
Including LPA in financially constrained transp. improvement program																						
Submiting request / receiving FTA approval to enter PE																						
Preliminary Engineering																						
Designing build and baseline alternatives																						
Cost estimating, scheduling, ridership forecasting																						
Reviewing project, Value Engineering, Risk Assessment																						
Developing FEIS, receiving Record of Decision																						
Public Referenda (where appl)																						
Submit request / receive FTA approval to enter Final Design																						
Final Design																						
Development of design/contract documents for construction of LPA																						
Cost estimating, scheduling, ridership forecasting																						
Reviewing project, Value Engineering, Risk Assessment																						
Submit request / receive FTA approval for FFGA																						
Bid period and award																						
Construction																						
Submit request / receive FTA approval for LONP																						
Construction period																						
Training, start up, testing																						
Revenue Ops																						
Revenue Operations																						
Before and After Study: Two years post Rev Ops																						
Fulfillment of the New Starts funding commitment																						
Completion of project, close-out, resolution of claims																						
At right, indicate reasons for changes in durations from the previously submitted schedule.																						

Major Capital Project Costs - Funding Sources by Cost Category (Rev. 2, Jun. 24, 2005)

Project **TTA REGIONAL RAIL**
Location Raleigh - Durham NC
Project ID 117
Phase N/A
Contracting Method Design Bid Build, Design Build (ROMF)
Number of Route Miles 28
Number of Stations 12
Yr of Base Year Dollars 2005
Yr of Revenue Ops 2009
Forecast Year 2030
Today's Date **10/13/05**

Insert name of all fund sources, type of funds, grant number, etc. See *examples* at right.		Federal Section 5309	State CMAQ Railcars	State CMAQ Parking Garage	State CMAQ RTP Transit Center	State of NC Section 5309	Vehicle Rental Taxes	Bonding Income			Double-check Total
Grant Obligation Date		9/18/01	T.B.D.	1/17/01	1/17/01	11/2/04	N/A	N/A			
For each fund, indicate matching fund where applicable.		59.9 - Fed 20.0 - State 20.1 - Local	80 - State 20 - Local	80 - State 20 - Local	80 - State 20 - Local	59.9 - Fed 20.0 - State 20.1 - Local					
YOE Dollars Total (X$000)											
10 GUIDEWAY & TRACK ELEMENTS (route miles)	236,903	141,905	0	0	0	47,499	0	47,499	0	0	236,903
20 STATIONS, STOPS, TERMINALS, INTERMODAL (12)	7,416	4,442	0	0	2,334	0	0	640	0	0	7,416
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	24,989	14,968	0	1,406	0	3,604	0	5,010	0	0	24,988
40 SITEWORK & SPECIAL CONDITIONS	113,572	68,030	0	0	0	22,771	0	22,771	0	0	113,572
50 SYSTEMS	67,095	40,190	0	0	0	13,453	2,444	11,009	0	0	67,095
Construction Subtotal (Sum Categories 10 - 50)	**449,975**	269,535	0	1,406	2,334	87,327	2,444	86,929	0	0	449,975
60 ROW, LAND, EXISTING IMPROVEMENTS	53,611	32,113	0	0	0	10,749	10,749	0	0	0	53,611
70 VEHICLES (number)	53,625	32,121	8,000	0	0	2,752	10,752	0	0	0	53,625
80 PROFESSIONAL SERVICES	175,828	105,321	0	0	260	34,994	35,254	0	0	0	175,828
90 UNALLOCATED CONTINGENCY	10,998	6,803	0	0	0	822	2,527	847	0	0	10,998
Subtotal (Sum Categories 10 - 90)	**744,037**	445,893	8,000	1,406	2,594	136,643	61,725	87,776	0	0	744,037
100 FINANCE CHARGES	65,881	39,463	0	0	0	13,209	13,209	0	0	0	65,881
Total Project Cost (Sum Categories 10 - 100)	**809,918**	485,356	8,000	1,406	2,594	149,852	74,934	87,776	0	0	809,918
Percentage of Total Project Cost	100.0%	59.9%	1.0%	0.2%	0.3%	18.5%	9.3%	10.8%	0.0%	0.0%	

Major Capital Project Costs - Funding Source by Year (Rev. 2, Jun. 24, 2005)

Project **TTA REGIONAL RAIL**
Location Raleigh - Durham NC
Project ID 117
Phase N/A
Contracting Method Design Bid Build, Design Build (ROMF)
Number of Route Miles 28
Number of Stations 12
Yr of Base Year Dollars 2005
Yr of Revenue Ops 2009
Forecast Year 2030
Today's Date **10/13/05**

Total Project Cost in YOE Dollars		2004 and before	Base Yr 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
At right, insert costs from worksheet, Inflation Calculation to YOE. Below insert fund sources and amounts for each year.	$809,918	$ 80,425	$ 42,403	$162,450	$183,183	$188,565	$117,759	$ 10,124	$ 6,239	$ 5,740	$ 5,264	$ 5,190	$ 2,576	
Federal Transportation Funds 5309 New Starts	$485,356	$ 30,858	$ 22,469	$ 20,450	$ 31,500	$ 53,000	$ 58,000	$ 55,000	$ 55,000	$ 55,000	$ 55,000	$ 38,290	$ 10,789	
State Transportation Funds CMAQ	$ 12,000	$ -	$ 1,406	$ 1,390	$ 3,801	$ 4,151	$ 1,211	$ 41	$ -	$ -	$ -	$ -	$ -	
State 5309 New Starts	$149,852	$ 19,527	$ 10,695	$ 15,303	$ 32,527	$ 36,655	$ 24,835	$ 10,310	$ -	$ -	$ -	$ -	$ -	
Local Rental Tax	$ 74,934	$ 18,961	$ 8,485	$ 9,515	$ 9,405	$ 9,910	$ 9,145	$ 5,710	$ 3,803	$ -	$ -	$ -	$ -	
Local Bond Revenue	$ 87,776	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,250	$ 62,526	$ -	$ -	$ -	
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
	$ -													
Total Funds in YOE Dollars	$809,918	**$ 69,346**	**$ 43,055**	**$ 46,658**	**$ 77,233**	**$103,716**	**$ 93,191**	**$ 71,061**	**$ 84,053**	**$117,526**	**$ 55,000**	**$ 38,290**	**$ 10,789**	**$ -**

Note: Verify that costs match those on Inflation Calculation to YOE. Also verify that totals per type of fund on this sheet match Funding Sources by Category.

Notes:

Major Capital Project Costs - BUILD Annualized Cost (Rev. 2, Jun. 24, 2005)

Project	TTA REGIONAL RAIL	Today's Date	10/13/05
Location	Raleigh - Durham NC	Yr of Base Year Dollars	2005

	Quantity	Base Year Dollars Total (X000)	Spread proportionally Professional Services over Categories 10 through 50 (X000)	Spread Unallocated Contingency according to perceived Risks (X000)	Total with Professional Services and Unallocated Contingency spread (X000)	Years of Useful Life	Annualization Factor (based on 7% rate) [.07/1 - (1.07)^- no. yrs]	Annualized Cost = Total with Professional Services and Contingency spread x Ann. Factor (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**28.16**	**210,327**			**304,160**			**22,200**
10.01 Guideway: At-grade exclusive right-of-way	11.51	19,119	7,939	1,500	28,558	80	0.0703	2,008
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0	0		0	30	0.0806	0
10.03 Guideway: At-grade in mixed traffic	0.00	0	0		0	20	0.0944	0
10.04 Guideway: Aerial structure	1.43	58,517	24,297	2,500	85,314	80	0.0703	5,999
10.05 Guideway: Built-up fill	8.79	6,056	2,515		8,570	80	0.0703	603
10.06 Guideway: Underground cut & cover	0.59	23,049	9,570	1,000	33,619	70	0.0706	2,374
10.07 Guideway: Underground tunnel	0.00	0	0		0	70	0.0706	0
10.08 Guideway: Retained cut or fill	5.84	27,764	11,528	1,000	40,292	80	0.0703	2,833
10.09 Track: Direct fixation		6,777	2,814		9,591	30	0.0806	773
10.10 Track: Embedded		0	0		0	20	0.0944	0
10.11 Track: Ballasted		63,741	26,467	500	90,708	35	0.0772	7,006
10.12 Track: Special (switches, turnouts)		5,305	2,203		7,508	30	0.0806	605
10.13 Track: Vibration and noise dampening		0	0		0	30	0.0806	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**12**	**6,733**			**10,029**			**722**
20.01 At-grade station, stop, shelter, mall, terminal, platform	12	4,596	1,908	500	7,004	70	0.0706	495
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0		0	70	0.0706	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0		0	70	0.0706	0
20.05 Joint development	0	0	0		0	70	0.0706	0
20.06 Automobile parking multi-story structure	0	1,381	573		1,954	50	0.0725	142
20.07 Elevators, escalators	0	756	314		1,070	30	0.0806	86
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		**24,988**			**35,864**			**2,582**
30.01 Administration Building: Office, sales, storage, revenue counting		1,554	645		2,199	50	0.0725	159
30.02 Light Maintenance Facility		17,509	7,270	500	25,278	50	0.0725	1,832
30.03 Heavy Maintenance Facility		0	0		0	50	0.0725	0
30.04 Storage or Maintenance of Way Building		490	203		693	50	0.0725	50
30.05 Yard and Yard Track		5,436	2,257		7,693	80	0.0703	541
40 SITEWORK & SPECIAL CONDITIONS		**103,485**			**147,954**			**10,986**
40.01 Demolition, Clearing, Earthwork		6,250	2,595		8,846	100	0.0701	620
40.02 Site Utilities, Utility Relocation		32,151	13,350	1,000	46,501	100	0.0701	3,259
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		6,521	2,708		9,229	100	0.0701	647
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		1,792	744		2,536	100	0.0701	178
40.05 Site structures including retaining walls, sound walls		3,322	1,379		4,701	80	0.0703	331
40.06 Pedestrian / bike access and accommodation, landscaping		8,582	3,563		12,145	20	0.0944	1,146
40.07 Automobile, bus, van accessways including roads, parking lots		9,324	3,872		13,196	20	0.0944	1,246
40.08 Temporary Facilities and other indirect costs during construction		35,542	14,758	500	50,800	100	0.0701	3,560
50 SYSTEMS		**60,132**			**85,100**			**7,096**
50.01 Train control and signals		24,710	10,260		34,970	30	0.0806	2,818
50.02 Traffic signals and crossing protection		20,719	8,603		29,322	30	0.0806	2,363
50.03 Traction power supply: substations		0	0		0	40	0.0750	0
50.04 Traction power distribution: catenary and third rail		0	0		0	30	0.0806	0
50.05 Communications		9,267	3,848		13,114	20	0.0944	1,238
50.06 Fare collection system and equipment		2,921	1,213		4,134	20	0.0944	390
50.07 Central Control		2,515	1,044		3,559	30	0.0806	287
Construction Subtotal (Sum Categories 10 - 50)		**405,665**			**583,106**			**43,587**
60 ROW, LAND, EXISTING IMPROVEMENTS		**51,663**			**51,663**			**3,621**
60.01 Purchase or lease of real estate		46,787		0	46,787	100	0.0701	3,279
60.02 Relocation of existing households and businesses		4,877			4,877	100	0.0701	342
70 VEHICLES (number)	**14**	**53,625**			**54,625**			**4,862**
70.01 Light Rail	0	0			0	25	0.0858	0
70.02 Heavy Rail	0	0			0	25	0.0858	0
70.03 Commuter Rail	0	49,263		1,000	50,263	25	0.0858	4,313
70.04 Bus	0	0			0	12	0.1259	0
70.05 Other	0	0			0	12	0.1259	0
70.06 Non-revenue vehicles	0	711			711	12	0.1259	90
70.07 Spare parts	0	3,651			3,651	12	0.1259	460
80 PROFESSIONAL SERVICES		**168,441**						
80.01 Preliminary Engineering		13,046						
80.02 Final Design		76,895						
80.03 Project Management for Design and Construction		24,852						
80.04 Construction Administration & Management		29,739						
80.05 Insurance		11,083						
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,818						
80.07 Surveys, Testing, Investigation, Inspection		2,873						
80.08 Agency Force Account Work		5,135						
90 UNALLOCATED CONTINGENCY		**10,000**						
Subtotal (Sum Categories 10 - 90)		**689,394**	168,441	10,000	**689,394**			**52,070**

Major Capital Project Costs - BASELINE Annualized Cost (Rev. 2, Jun. 24, 2005)

Project	TTA Regional Rail	Today's Date	10/13/05
Location	Raleigh - Durham NC	Yr of Base Year Dollars	2005

	Quantity	Base Year Dollars Total (X000)	Spread proportionally Professional Services over Categories 10 through 50 (X000)	Spread Contingency according to perceived Risks (X000)	Total with Professional Services and Contingency spread (X000)	Years of Useful Life	Annualization Factor (based on 7% rate) [.07/1 - (1.07)^- no. yrs]	Annualized Cost = Total with Professional Services and Contingency spread x Ann.Factor (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	0.00	0			0			0
10.01 Guideway: At-grade exclusive right-of-way	0.00	0	0	0	0	80	0.0703	0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0	0	0	0	30	0.0806	0
10.03 Guideway: At-grade in mixed traffic	0.00	0	0	0	0	20	0.0944	0
10.04 Guideway: Aerial structure	0.00	0	0	0	0	80	0.0703	0
10.05 Guideway: Built-up fill	0.00	0	0	0	0	80	0.0703	0
10.06 Guideway: Underground cut & cover	0.00	0	0	0	0	70	0.0706	0
10.07 Guideway: Underground tunnel	0.00	0	0	0	0	70	0.0706	0
10.08 Guideway: Retained cut or fill	0.00	0	0	0	0	80	0.0703	0
10.09 Track: Direct fixation		0	0	0	0	30	0.0806	0
10.10 Track: Embedded		0	0	0	0	20	0.0944	0
10.11 Track: Ballasted		0	0	0	0	35	0.0772	0
10.12 Track: Special (switches, turnouts)		0	0	0	0	30	0.0806	0
10.13 Track: Vibration and noise dampening		0	0	0	0	30	0.0806	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	12	9,063			14,994			1,065
20.01 At-grade station, stop, shelter, mall, terminal, platform	12	7,747	3,521	1,549	12,817	70	0.0706	905
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0	0	70	0.0706	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0	0	70	0.0706	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0	0	70	0.0706	0
20.05 Joint development	0	0	0	0	0	70	0.0706	0
20.06 Automobile parking multi-story structure	0	1,189	540	238	1,967	50	0.0725	143
20.07 Elevators, escalators	0	127	58	25	210	30	0.0806	17
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		15,000			24,817			1,798
30.01 Administration Building: Office, sales, storage, revenue counting		0	0	0	0	50	0.0725	0
30.02 Light Maintenance Facility		15,000	6,817	3,000	24,817	50	0.0725	1,798
30.03 Heavy Maintenance Facility		0	0	0	0	50	0.0725	0
30.04 Storage or Maintenance of Way Building		0	0	0	0	50	0.0725	0
30.05 Yard and Yard Track		0	0	0	0	80	0.0703	0
40 SITEWORK & SPECIAL CONDITIONS		21,222			35,109			2,956
40.01 Demolition, Clearing, Earthwork		5,116	2,325	1,023	8,464	100	0.0701	593
40.02 Site Utilities, Utility Relocation		2,332	1,060	466	3,858	100	0.0701	270
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0	0	100	0.0701	0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		896	407	179	1,482	100	0.0701	104
40.05 Site structures including retaining walls, sound walls		552	251	110	913	80	0.0703	64
40.06 Pedestrian / bike access and accommodation, landscaping		4,812	2,187	962	7,961	20	0.0944	751
40.07 Automobile, bus, van accessways including roads, parking lots		7,514	3,415	1,503	12,432	20	0.0944	1,173
40.08 Temporary Facilities and other indirect costs during construction		0	0	0	0	100	0.0701	0
50 SYSTEMS		1,744			2,886			238
50.01 Train control and signals		0	0	0	0	30	0.0806	0
50.02 Traffic signals and crossing protection		1,500	682	300	2,482	30	0.0806	200
50.03 Traction power supply: substations		0	0	0	0	40	0.0750	0
50.04 Traction power distribution: catenary and third rail		0	0	0	0	30	0.0806	0
50.05 Communications		60	27	12	99	20	0.0944	9
50.06 Fare collection system and equipment		184	84	37	305	20	0.0944	29
50.07 Central Control		0	0	0	0	30	0.0806	0
Construction Subtotal (Sum Categories 10 - 50)		47,029			77,805			6,057
60 ROW, LAND, EXISTING IMPROVEMENTS		43,426			43,426			3,043
60.01 Purchase or lease of real estate		35,361		0	35,361	100	0.0701	2,478
60.02 Relocation of existing households and businesses		8,065		0	8,065	100	0.0701	565
70 VEHICLES (number)	45	21,020			21,020			2,646
70.01 Light Rail	0	0		0	0	25	0.0858	0
70.02 Heavy Rail	0	0		0	0	25	0.0858	0
70.03 Commuter Rail	0	0		0	0	25	0.0858	0
70.04 Bus	45	19,125		0	19,125	12	0.1259	2,408
70.05 Other	0	0		0	0	12	0.1259	0
70.06 Non-revenue vehicles	0	747		0	747	12	0.1259	94
70.07 Spare parts	0	1,148		0	1,148	12	0.1259	145
80 PROFESSIONAL SERVICES		21,372						
80.01 Preliminary Engineering		2,314						
80.02 Final Design		7,714						
80.03 Project Management for Design and Construction		3,086						
80.04 Construction Administration & Management		3,762						
80.05 Insurance		1,411						
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,543						
80.07 Surveys, Testing, Investigation, Inspection		771						
80.08 Agency Force Account Work		771						
90 UNALLOCATED CONTINGENCY		0						
Subtotal (Sum Categories 10 - 90)		132,847	21,372	9,404	142,251			11,747

Template 9: Cost Effectiveness - Incremental Cost per Hour in Transportation System User Benefits in the Forecast Year

		Column A	Column B	Column C	Column D	Column E	
		Alternative					
Line	Variable	New Starts Baseline	New Starts Build	Change	Annual Factor	Annual Total	Source/Calculation
1	Annualized Capital Cost (Constant 2005 dollars)	$ 11,747,000	$ 52,070,000	$ 40,323,000			Source: SSC Worksheet for the Build and Baseline Alternatives
2	Total Systemwide Annual Operating and Maintenance Cost (Constant 2005 dollars)	$ 21,531,930	$ 22,016,366	$ 484,436			Source: System-wide operating and maintenance cost estimates for the New Starts baseline and build alternatives (attach documentation).
3	Total Annualized Cost in Forecast Year (Constant 2005 dollars)	$ 33,278,930	$ 74,086,366	$ 40,807,436			Calculation Columns A and B: Sum of annualized capital costs (Line 1) and annual O&M costs (Line 2). Calculation Column C: Column B value minus Column A value.
4	Weekday User Benefits (expenditure savings in hours)			5,107	300	1,532,100	Source: Weekday user expenditure savings from SUMMIT software. Multiplying the weekday estimate (Column C) by the Annual factor (Column D) produces the annual estimate (Column E).
5	User Benefits from Off-Model Trips (Identify Source)					-	Source: If desired, calculate off-model user benefits. Annual factor is based on number of events for this special trip generator. Attach documentation. Multiplying the weekday estimate (Column C) by the Annual factor (Column D) produces the annual estimate (Column E).
6	User Benefits from Off-Model Trips (Identify Source)					-	Source: If desired, calculate off-model user benefits. Annual factor is based on number of events for this special trip generator. Attach documentation. Multiplying the weekday estimate (Column C) by the Annual factor (Column D) produces the annual estimate (Column E).
7	User Benefits from Off-Model Trips (Identify Source)					-	Source: If desired, calculate off-model user benefits. Annual factor is based on number of events for this special trip generator. Attach documentation. Multiplying the weekday estimate (Column C) by the Annual factor (Column D) produces the annual estimate (Column E).
8	Incremental User Benefits (hours)					1,532,100	Calculation: Sum annual user benefit estimates (sum Lines 4 thru 7 Column E)
9	Cost-Effectiveness - Incremental Cost ($) / User Benefits (hours)					$ 26.63	Calculation: Divide Incremental Annualized Cost (Line 3, Column C) by Incremental User Benefits (Line 8, Column E) for the New Starts build vs. New Starts baseline alternative.

New Starts Report for FY 2007
October 2005

Documentation of Changes from 2004 Report

Template 9: Incremental Cost/User Benefit

The change in this cost effective ratio from $20.68 to $26.63 is due to changes resulting from the redevelopment of the Triangle Regional Model.

Template 10: Cost Effectiveness - Incremental Cost per Incremental Passenger

Line	Factor	Alternative			Source/Calculation
		Baseline	New Start	New Start vs. Baseline	
1	Total Annual Ridership in Linked Trips (forecast year)	19,948,800	21,864,900		Source: Regional travel forecasting model (attach documentation of factors to annualize daily ridership, if applicable)
2	Incremental Annualized Cost (constant 2005 millions of dollars)			$ 40,807,436	Source: Line 3 from Template 9
3	Incremental Annual Ridership			1,916,100	Calculation: Subtract Total Annual Ridership (Line 1) for the New Starts baseline from New Starts build alternative
4	Cost-Effectiveness (Incremental Cost per New Rider)			$ 21.30	Calculation: Divide Incremental Annual Cost (Line 2) by Incremental Annual Ridership (Line 3)

New Starts Report for FY 2007
October 2005

Documentation of Changes from 2004 Report

Template 10: Incremental Cost/New Rider

The change from last year's incremental cost/new rider from $13.17 to $21.30 due to changes resulting from the redevelopment of the Triangle Regional Model.

Triangle Transit Authority

August 12, 2005 CIN: 051338

Kim Lieberman
Senior Transportation Planner
BMI-SG
8330 Boone Blvd, Ste. 400
Vienna, VA 22182-2624

VIA Federal Express

Dear Kim:

Enclosed are two binders comprising the templates related to the Land Use component of the Triangle Transit Authority's New Starts report for FY '07. Enclosed for your review are the following templates and supporting documentation:

Binder: *2005 New Starts – Land Use Templates 4, 5, 11 and 12*

Template 4: Mobility Improvements: Low Income Households Served
Template 5: Employment Worksheet
Template 11: Supplemental Land Use
Template 12: Quantitative Land Use Information

Binder: *2005 New Starts – Template 11 - Attachments*

We look forward to your review and assessment of the land use portion of the FY 2007 New Starts Report for the Triangle Regional Rail Project. Please contact me if you have any questions or comments.

Sincerely,

Barbara Weigel

Barbara Weigel, AICP
Senior Transportation Planner

Copy: Beth Day, FTA HQ (Templates and CD only)
Don Carnell (cover letter only)
Document Control

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Template 11: Supplemental Land Use Information and Supporting Documentation

Please note that only new or revised information from the 2004 submission is provided below. During the past several years, the TTA and the Triangle community have undergone extensive planning, policy, and project development in anticipation of the Regional Rail project. Much of the planning work has been documented in previous New Starts reports. Please refer to previous reports for background information from years prior to this submission. Note that background information from reports previous to the 2004 submission will include information on the 16-station project. The following information concerns the 12-station, 28-mile project, the scope of this year's submission.

Information Requested	Documentation Supporting Land Use Criterion
I. EXISTING LAND USE	
Existing corridor and station area development (population, employment, high trip generators)	See Template 12 for corridor area population, housing units, and employment. As noted in the 2004 submission, the base year statistics have changed from 1995 to 2002, and the project scope has changed. The scope for the year 2003 was 16 stations and 35 miles. Starting with the 2004 submittal, the project scope decreased to 12 stations and 28 miles in length. As with the 2004 submission the population and employment densities for the rail corridor are significantly greater than in previous submissions. Refer to previously submitted documents describing existing development include: • TTA's *Corridor Market Study* • Station area aerial photographs • Corridor land use survey (1998) • TTA's *Station Area Development Guidelines* (see Appendix B: Opportunities Assessment maps) • *Station Area Opportunities Analysis* (contains summaries of demographics of each station) • Fact sheets produced by the City of Raleigh for the West Raleigh, Fairgrounds, NC State, Downtown Raleigh, and Government Center Stations. • DRAFT, *Downtown West Gateway Small Area Plan*, dated June 28, 2004, presented to the Raleigh City Council on July 22, 2004, Prepared for the Downtown West Gateway Task Force by JDavis Architect, Consultants. **New documents (attached) describing existing development include:** • Raleigh Urban Design Center Downtown Development Map (CD ROM) • Development Tracking System -Excel spreadsheet tracking station area development (all stations)

Existing station area development character	The project scope has been revised to include 12 stations for construction and development along a 28-mile corridor. A summary of the existing station area development character for the 12 stations is reiterated here for reference. Refer to the 2003 New Starts report for additional background information. The stations along the corridor are referred to as "clusters" of stations identified for the communities where they are located. The clusters of stations and general characteristics are: <u>Durham Cluster</u> There are three Durham stations. One is located in the 9th Street/Duke East area. Ninth Street is lined with restaurants and shops serving Duke students and nearby residential areas. Mixed-use housing developments are under construction near this station. The second Durham station is located in downtown, which is experiencing a great deal of redevelopment. The American Tobacco Project, a 1.4 million SF, mixed-use, historic redevelopment that will radically change downtown, has recently opened. Other old tobacco buildings, such as Brightleaf Square, have already been converted to stores, restaurants and housing. The third Durham station is located near Alston Avenue, which is a major north/south arterial. To the north there is a large older, lower income neighborhood with block streets and traditional neighborhood design. A HOPE VI grant had been received to rebuild public housing in this area and rejuvenate the neighborhood, and construction is underway. North Carolina Central University and Durham Technical Community College are located to the south of the station, as are more neighborhoods. <u>RTP Cluster</u> Research Triangle Park (RTP) is a major regional employment center with world-renowned companies. Most of these companies have developed campus-like offices to house research facilities. The proposed North RTP station is adjacent to the IBM campus, which houses approximately 12,000 employees. Adjacent to the South RTP station, the Research Triangle Foundation and Craig Davis properties have pursued a high density, mixed use development, called Triangle Metro Center. TTA plans to relocate its transit hub to this site as well. Two large tracts of land were rezoned by Durham County in July 2004 to accommodate this development. This location is envisioned as the new "downtown" for RTP. The south RTP station site, or Triangle Metro Center station, is currently surrounded by offices and commercial uses at a middle level of density. An RFQ for a Master Developer has been released and three proposals are currently being reviewed. <u>Cary Cluster</u> The Cary cluster is comprised of two stations. The Town of Cary is a fast growing community located south and east of

	the Research Triangle Park. It experienced enormous population growth during the high tech boom of the 1990s. Many of its residents work in the high tech and research industries. The town is a highly educated, middle class community. It is also located central to the east-west axis connecting Raleigh, and Chapel Hill, and the north-south axis connecting Research Triangle Park and Durham. Two stations will be located in Cary. Northwest Cary station is in a suburban environment. Currently, newer commercial centers and planned communities surround the station. This area has the potential to become denser over time, as the Town of Cary is likely to create a new plan for this area to support transit oriented development and some undeveloped land exists. Downtown Cary is a traditional lively small town center. An Amtrak station, city hall, community center and Chamber of Commerce are all located in the heart of downtown. The Town of Cary has already adopted a Town Center Area Plan that proposes high-density housing and commercial development near the downtown rail station, while keeping the small town flavor. The Town Government Center is located in downtown Cary within walking distance of the downtown Cary station. Expansion and consolidation of the Town's operations and administrative offices in the downtown area are nearly complete. West Raleigh Cluster This cluster is comprised of the West Raleigh, Fairgrounds, and North Carolina State University stations. The area surrounding this cluster of stations contains the North Carolina State Fairgrounds, the RBC Arena, and North Carolina State University. These stations are easily accessible from Interstate 40. A large amount of light industrial uses and undeveloped land exists in this area now. However, the City of Raleigh has adopted a small area plan that covers the West Raleigh and Fairgrounds stations. The plan calls for high-density development around the stations. Additionally, the Stanhope Village Small Area Plan and the North Carolina State Physical Master Plan cover the North Carolina State station stop. Downtown Raleigh Cluster This cluster comprises two stations, the Downtown Raleigh and Government Center stations. Downtown Raleigh is a major employment center, serving as the home to North Carolina State Government. In recent years, the community has turned its attention to finding ways to improve the quality and character of the downtown area, which has been the focus of significant attention. In 2002, the City of Raleigh undertook a major planning initiative for the downtown, called "Liveable Streets". The plan identifies five major objectives and over 100 strategies to improve the quality and character of the downtown area. The result is that there is intense focus by the community in directing planning and development resources to implement the goals of the "Liveable Streets" program. The Regional Rail project is a key component of the development program for downtown

	Raleigh and numerous policies, programs and developments have been initiated to support the rail station areas. The area is also undergoing a transformation as new private investment is increasingly being located downtown. In recent years, two museums have opened and the performing arts center has been expanded. A number of high-density housing units have been built, and more are on the way. The Glenwood South area, located between the two downtown stations, has become a popular entertainment center, with numerous restaurants, bars, retailers and condominiums. Currently there is over one billion dollars of investment proposed, planned, or under construction in downtown Raleigh. Previously submitted documents describing existing station area development character include: • *The Phase I Regional Rail Draft Environmental Impact Statement Summary*: This report describes the project, its environs and its impacts. • *Station Planning Workbook:* This document, produced in November 1998, contains maps of station areas and describes the surrounding environs. • *Station Area Development Guidelines:* Undertaken as part of an assessment of the potential for more intense and transit-friendly development opportunities within the station areas, the guidelines provide a description and map of each station's existing land use and activities, as well as opportunities for future development and re-development. • Station area aerial photographs • 30% design drawings showing trackwork, stations, and footprints or surrounding buildings • Station site plans, showing trackwork, stations, zoning and footprints of surrounding buildings, dated July 2004. **New documents (attached) showing existing station area development character are:** • 100% design completion drawings showing track-work, stations, and footprints of surrounding buildings. • Stanhope Village Small Area Plan
Existing station area pedestrian facilities, including access for persons with disabilities	**New documents submitted:** • Refer to station site plans, dated July 2005 on CD-ROM. This submittal includes 100% design completion site plans as referenced above. Site plans for all 12 stations have been updated since the 2004 submission.

	Previously submitted documents describing existing parking include: • Station site plans, dated July 2004 • An evaluation of parking in downtown Cary (part of the Town Center Area Plan) • Station aerial photographs • *The Evaluation of the Parking Management Program for the City of Raleigh, North Carolina* • *Rail System Parking Management Study Consulting Services, RFP*, TTA Solicitation #4-011, February 16, 2004. **New documents submitted:** • Refer to station site plans, dated July 2005.

Information Requested	Documentation Supporting Land Use Criterion
II. TRANSIT SUPPORTIVE PLANS AND POLICIES a. Growth Management	
Concentration of development around established activity centers and regional transit	Each of the jurisdictions with planned regional rail stations has adopted plans that call for focusing growth and density in these established activity centers. <u>Durham</u> Durham has updated its comprehensive plan, which was submitted to the Planning Commission in June 2004 and adopted in February 2005. The designation of the regional rail station areas as Compact Neighborhoods remains a key component of the plan. The comprehensive plans also call for TTA's involvement in reviewing proposed zoning and land use amendments to help assess the impacts on station area development efforts. In addition to the comprehensive plan, the City of Durham has developed a Unified Development Ordinance (UDO), the first major rewrite of the city's land use regulations in 30 years. The UDO codifies the Compact Neighborhood zoning district, reduces parking requirements in compact urban districts, and enhances pedestrian accessibility to transit. See section 4.1, Establishment of Zoning Districts for additional information. Durham is currently hosting information and public comment sessions with the official public hearing set for August 29, 2005. Pending public comment the UDO may be adopted by November 2005. <u>Cary</u> The Town of Cary continues with implementation and of the Town Center Area Plan, approved in 2002. It is anticipated that a small area plan will be made for the Northwest Cary station, with a focus on increased densities and pedestrian orientation that is supportive of the rail station. <u>Raleigh</u> In April 2004, the City of Raleigh approved a Transit District Overlay ordinance that will guide development around TTA rail stations. A major component of the overlay district is to provide for increased densities in the transit core areas. The city hired Clarion Associates, LLC to prepare a TOD strategy and Comprehensive Plan amendments that complement the adopted TOD guidelines. Clarion will also develop Station Area Plans for the five rail stations in Raleigh. Meanwhile, the city continues to guide development in the downtown area in accordance with the goals of the Liveable Cities strategic plan. In addition, the city has developed, in conjunction with a steering committee comprised of TTA staff and other community representatives, a small area plan for the Downtown West neighborhood. The neighborhood lies to the south and east of the Downtown Raleigh TTA rail station. A major focus of the plan is to allow for increased densities within the transit core, and to provide for improved

	pedestrian accessibility to the station from the surrounding neighborhoods. Also adopted in April of 2004 was the Wake County Transportation Plan. The plan calls for greater concentration of development around established activity centers and regional transit and enhanced connectivity between activity centers. See pages 15-22 for additional information. Previously submitted plans that promote development around established activity centers and transit include: • *Building a Livable Future: Durham 2020 Comprehensive Plan* • *The Downtown Durham Master Plan* • *The Town of Cary Growth Management Plan* • Cary's *Town Center Area Plan* • *Vision 2020: Raleigh's Focus on the Future* • Raleigh's Urban Form Map • Raleigh's *Arena Small Area Plan* • Current condition fact sheets and a map of land use tiers from the Durham comprehensive plan update effort • A summary of Raleigh's Strategic Planning Initiative • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-48, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-49, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. **New submitted plans that promote development around established activity centers and transit include:** • Durham City/County Unified Development Ordinance (Draft, June 2005) • Wake County Transportation Plan: Collectors & Thoroughfares (April 2004)
Land conservation and management	<u>Durham</u> • The City-County of Durham recently updated its Comprehensive Plan. The revised plan was adopted on February 28, 2005. A chapter entitled "Conservation and Environmental" identifies numerous policies addressing land conservation and management in the City-County of Durham. • In addition to the comprehensive plan, Article 8 - Environmental Protection and Article 9 - Landscaping and Buffering in the Durham City/County UDO include enhanced environmental regulations with respect to land conservation and management.

	Cary • Since 2000, the Town of Cary has dedicated $12.5 million for open space acquisition. • In 2003, a Town Center Review Commission was established to make recommendations to the town council on site plans and development in the downtown area, for consistency with the Town Center Area Plan and Downtown Design Guidelines, adopted in August 2001. Raleigh • In February 2005 the Wake County Growth Management Strategy was adopted. The document includes policies from each municipality within Wake County on various growth management issues. For additional information see Section III – Summary of Strategy Implementation by Jurisdiction. Previously submitted reports that summarize land conservation and management efforts include: • *Building a Livable Future: Durham 2020 Comprehensive Plan* (see Urban Growth Area Boundary, p.33) • Durham's *Smart Growth Audit* • *Town of Cary Growth Management Plan* • *Town of Cary Open Space Plan and Historic Resources Plan* • *Wake County Land Use Plan* • Executive Summary of the *Wake County Growth Management Strategy* (draft) • Executive Summary of the *Wake County Consolidated Open Space Plan* (draft) • Selected sections of the *Draft Durham Comprehensive Plan,* prepared by the Durham City-County Planning Department and presented to the Planning Commission, April 27, 2004. The Comprehensive Plan was adopted in February 2005. **New reports (attached) that summarize land conservation and management efforts include:** • *Wake County Growth Management Strategy: Implementation Summary*, adopted in February 2005.
b. Transit Supportive Corridor Policies	
Plans and policies to increase station area development	Durham The Durham City/ County comprehensive plan was adopted February 28, 2005. TTA staff members served on the Plan's Steering Committee. The plan includes several policies and map designations for compact neighborhoods in the downtown areas. The plan policy of compact neighborhoods recommends appropriate land uses, parking requirements and development regulations which are now included in the Unified Development Ordinance, requiring compact, mixed use, transit-friendly, bike-friendly and pedestrian-friendly development.

	Durham Housing Authority has begun construction on a $35,000,000 development funded with HOPE VI Revitalization Grant. The grant enables the Authority to revitalize the Few Gardens public housing complex and surrounding 96 blocks. This area includes the Alston Ave/NCCU station, which is just over a ¼ mile from Few Gardens. The HOPE VI effort includes the demolition of 240 existing units and the construction of 425 new units throughout the neighborhood. Roadway, sidewalk and other infrastructure improvements are also part of the HOPE VI project. Cary As part of the implementation of Cary's land use plan, the town adopted a Town Center Area Plan in August 2001. This plan focuses on the area surrounding the downtown Cary station and promotes higher density, transit oriented development. The following steps have been taken this past year to implement the plan: • A Town Center Review Commission was established to review and make recommendations to the town council on site plans and development in the downtown, in accordance with the Town Center Plan and Design Guidelines. The Town of Cary anticipates creating a plan similar to the Town Center Area plan for the NW Cary station area. Raleigh The City of Raleigh has embarked on a strategy to increase the density of development around rail stations. In April the City Council adopted an amendment to the Comprehensive plan that establishes a TOD zoning overlay district. Station Area plans for all stations in Raleigh will be developed using the TOD guidelines documented in this new zoning district. TTA On July 5, 2005 TTA released a Request for Qualifications (RFQ) for a Master Developer or developers to plan and manage TOD development in and round the station areas. The selected developer(s) will oversee the complex development process for properties in and around the rail stations while adhering to TTA's TOD Station Area Guidelines. Previously submitted plans and policies to increase corridor and station area development: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • Excerpts from the zoning code pertaining to reduced set backs and increased density in station areas (Office and Institutional-Compact Neighborhood and Residential Multi-family-Compact Neighborhood zones)

	• *Land Regulation Discussion Series*: Volume 3 from Durham's Draft Unified Development Ordinance • The *Downtown Durham Master Plan* • The *HOPE VI Neighborhood Revitalization Master Plan* • Cary's *Town Center Area Plan* which includes design guidelines and a downtown market study • Raleigh's *Arena Small Area Plan* • TTA's *Corridor Market Study* • Durham's *Downtown Design Overlay District* • Raleigh's *Livable Streets Plan* • TTA's *Station Area Opportunities Analysis* • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-48, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-49, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Ordinance (2004) 596 TC 245, TC-14-03,* An Ordinance to Amend the City of Raleigh Zoning Code to Include a New Overlay Zoning District to Regulate Future Development on Properties Surrounding Designated Transit Station Locations, adopted April 6, 2004 by the Raleigh City Council.
Plans and policies to enhance transit-friendly character of station area development	<u>Durham</u> The Durham Comprehensive Plan has several policies supporting development around the Regional Rail stations in areas defined as Compact Neighborhoods. These areas are described as containing transit-oriented developments that include a mixture of land uses that are walkable, cyclist friendly, and have excellent accessibility to transit services. The Durham City/County UDO compact neighborhoods zoning district guides and facilitates walkable development in these more densely developed areas and emphasizes connectivity to adjacent land uses. <u>Cary</u> The Town of Cary continues to review plans submitted for approval in accordance with the objectives of the *Town Center Area Plan*, which considers many policies and objectives supportive of transit friendly character for the downtown Cary station. <u>Raleigh</u> The City of Raleigh has adopted a Transit District Overlay Ordinance that provides guidance for development in the areas surrounding the Regional Rail stations of West Raleigh, State Fairgrounds, and Government Center. Development near the Downtown Raleigh Station is guided by the *Liveable Streets* initiative and plans that were created

	for downtown Raleigh in 2002. TTA TTA worked closely with developers of the Triangle Metro Center station area to create a pedestrian friendly interface with the rail station and the TMC transit oriented development. TTA staff are reviewing Request for Qualifications (RFQ) submissions for a Master Developer or developers to plan and manage TOD development in and round the station areas. The selected developer will oversee the complex development process for properties in and around the rail stations while adhering to TTA's TOD Station Area Guidelines. Previously submitted plans and policies that enhance the transit friendly character of station areas include: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • Cary's *Town Center Area Plan* which includes design guidelines • *City of Raleigh Urban Design Guidelines for Mixed Use Neighborhoods and Villages* • Raleigh's *Arena Small Area Plan* • TTA's *Station Area Development Guidelines* • Durham's *Downtown Design Overlay District* • The *Durham Design Manual* • Raleigh's *Livable Streets* Plan • *City of Raleigh Ordinance (2004) 596 TC 245 TC-14-03*, which amends the City's zoning code to include a new overlay zoning district to regulate future development on properties surrounding designated transit station locations.
Plans to improve pedestrian facilities, including facilities for persons with disabilities	Durham The City of Durham Bicycle and Pedestrian Advisory Commission has reviewed the TTA station plans and continues to work with TTA to ensure that the station areas are walkable. Durham has also addressed improvements to pedestrian facilities in station areas with its transit and downtown design overlay districts. In addition, the Durham Design Manual addresses sidewalk design, street furnishings, lighting, and accessibility. The City of Durham is developing a comprehensive citywide pedestrian plan. Currently there is no accurate map that illustrates the city's sidewalk network and other pedestrian infrastructure. During July 2005 Durham held a series of five public workshops throughout the city to solicit feedback on pedestrian related policies and infrastructure. This plan will inventory all pedestrian facilities in the city and prioritize improvements. The plan completion is expected by March 2006. The campaign for public input is called *DurhamWalks* - www.durhamwalks.org. TTA staff met with members of the project team on August 1, 2005 to discuss

	improved pedestrian accessibility at transit stations. The Durham City/County UDO contains enhance standards for pedestrian facilities and infrastructure improvements. See section 12.4, Pedestrian and Bicycle Mobility for additional information. <u>Cary</u> The Town of Cary continues to review plans in compliance with ADA requirements and for consistency with the *Town Center Area Plan.* <u>Raleigh</u> The City of Raleigh continues to review plans in compliance with ADA requirements and for consistency with the *Liveable Streets* Strategic Plan for downtown Raleigh, which identifies strategies for improving pedestrian facilities, including facilities for persons with disabilities. <u>TTA</u> TTA has 100% design completion drawings for each station site. All the station designs currently meet or exceed ADA requirements. TTA has appointed an Accessible Services Advisory Committee, which will continue to provide input on the station designs. Previously submitted documents that describe efforts improve pedestrian facilities, including facilities for persons with disabilities include: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • *Cary Design Guidelines* • Cary's *Town Center Area Plan* and downtown design guidelines • *City of Raleigh Urban Design Guidelines for Mixed Use Neighborhoods and Villages* • Durham's *Downtown Design Overlay District* • The *Durham Design Manual* • Raleigh's *Livable Streets* Plan • TTA's 30% design drawings • Site plans, dated July 15, 2004 **New (attached) documents that describe efforts to improve pedestrian facilities, including facilities for persons with disabilities, include:** • Current station site plans dated July 2005. • DurhamWalks Public Participation Flyer • Stanhope Village Small Area Plan

Parking policies	Durham The Durham City/County draft UDO includes enhanced parking policies applicable to the rail stations at 9th Street, Downtown Durham, and Alston Avenue. Parking maximums are provided for off street parking helping to create the opportunity for more dense development around these station areas. See section 10.3 Required Parking in the UDO for additional information. Raleigh The City of Raleigh recently adopted a Transit Overlay District ordinance to govern development guidelines, including parking requirements, for the West Raleigh, Fairgrounds, and Government Center Station areas. TTA TTA is currently undergoing a parking study to determine appropriate parking policies for its station area parking lots. Previously submitted documentation of parking policies includes: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • Cary's *Town Center Area Plan* and associated parking evaluation • Durham's *Downtown Design Overlay District* • *Evaluation of Parking Management Program for the City of Raleigh, North Carolina* • TTA's 30% design drawings • *City of Raleigh Ordinance (2004) 596 TC 245 TC-14-03*, which amends the City's zoning code to include a new overlay zoning district to regulate future development on properties surrounding designated transit station locations. • *Rail System Parking Management Study Consulting Services, RFP*, TTA Solicitation #4-011, February 16, 2004.

c. Supportive Zoning Regulations Near Transit Stations	
Zoning ordinances that promote transit supportive development density in transit station areas	Durham As discussed previously, the Durham City/County UDO codifies the Compact Neighborhood zoning district, which promotes transit supportive development and enhance pedestrian accessibility to transit. Raleigh As referred to previously, the City of Raleigh recently adopted a Transit Overlay District ordinance to govern development guidelines, including parking requirements, for the West Raleigh, Fairgrounds, and Government Center Station areas. Previously submitted documentation of zoning ordinances that support increased development densities includes: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • Excerpts from the zoning code pertaining to reduced set backs and increased density in station areas (Office and Institutional-Compact Neighborhood and Residential Multi-family-Compact Neighborhood zones) • *Land Regulation Discussion Series:* Volume 3 from Durham's Draft Unified Development Ordinance • Durham's *Downtown Design Overlay District* • Excerpt from Cary's new LDO related to the *Town Center Area District* • *City of Raleigh Ordinance (2004) 596 TC 245 TC-14-03*, which amends the City's zoning code to include a new overlay zoning district to regulate future development on properties surrounding designated transit station locations. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-49, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-48, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004.
Zoning ordinances and design guidelines that enhance transit-oriented character of station area development and pedestrian access	Durham, Cary and Raleigh all have design guidelines. Durham and Cary have zones that allow mixed-use development that enhances the pedestrian environment (discussed above). TTA TTA has produced Station Area Design Guidelines that have been a helpful resource to the jurisdictions as they have developed their own guidelines. TTA uses these guidelines to educate property owners, developers, and the public at

	large about transit oriented development. Previously submitted zoning ordinances that enhance transit-oriented character of station area development and pedestrian access: • Durham's *Interim Transit Oriented Development-Compact Neighborhood Overlay District* • Excerpts from the zoning code pertaining to reduced set backs and increased density in station areas (Office and Institutional-Compact Neighborhood and Residential Multi-family-Compact Neighborhood zones) • *Land Regulation Discussion Series:* Volume 3 from Durham's Draft Unified Development Ordinance • *Cary Design Guidelines* • Cary's *Town Center Area Plan* and downtown design guidelines • *City of Raleigh Urban Design Guidelines for Mixed Use Neighborhoods and Villages* • Durham's *Downtown Design Overlay District* • Durham Design Manual • Excerpt from Cary's new LDO related to the *Town Center Area District* • *City of Raleigh Ordinance (2004) 596 TC 245 TC-14-03*, which amends the City's zoning code to include a new overlay zoning district to regulate future development on properties surrounding designated transit station locations. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-49, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-48, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *City of Raleigh Ordinance (2004) 596 TC 245 TC-14-03*, which amends the City's zoning code to include a new overlay zoning district to regulate future development on properties surrounding designated transit station locations.
Zoning ordinances that support reductions in parking	<u>Durham</u> • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-49, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004. • *Durham City-County Zoning Ordinance Amendment*, for rezoning, Zoning Case P 03-48, in reference to the rezoning of parcels for development of the Triangle Metro Center, approved by the Durham City-County Board of Commissioners on July 26, 2004.

	• *Durham City-County Unified Development Ordinance* (Draft, June 2005) Article 10- *Off Street Parking and Loading*.
d. Tools to Implement Land Use Policies	
Outreach to government agencies and the community in support of land use planning	Public involvement and coordination with government agencies has always been a key part of TTA's planning process. TTA routinely produces public outreach materials and gives presentations on transit-oriented development to community groups. The newest form of public outreach is provided in an e-newsletter called *NextStop*. The purpose of *NextStop* is to inform the public, specifically a group of key stakeholders, about the Regional Rail Project and its benefits to the community. The first publication was released in May 2005, and is published bi-monthly. TTA staff members serve on the Technical Coordinating Committees of the two Metropolitan Planning Organizations (MPO) in the area, and TTA coordinates on an ongoing basis with local government staffs on station planning and mitigation issues. In fall 2003 TTA held 29 public meetings for gathering input on the final station designs. TTA presents an annual report to the governing bodies of local communities which includes outreach on transit supportive land uses. Previously submitted documentation of public outreach and public outreach materials include: • *Triangle Fixed Guideway Study, Phase I/II Report* • *Recommendations for a Regional Transit Plan* • *Scoping Information Document* • *The Phase I Regional Rail Draft Environmental Impact Statement* (Executive Summary) • *Phase I Regional Rail System Community Workbook* • *Stakeholder Involvement Plan for the Phase I Regional Rail PE/EIS* • *Station Planning Workbook* • *A Guide to the Phase I Regional Rail System Preliminary Engineering and Environmental Impact Statement* • *On The Move* newsletter (sample copy) • Various brochures about the regional rail project **New documents of public outreach and public outreach materials include:** • *NextStop* – e-Newsletter of TTA, May 2005 and July 2005 • *YOUR RAIL*- Making the Connection, TTA brochure

Regulatory and financial incentives to promote transit supportive development	Several regulatory incentives are addresses in the discussion of zoning above. Durham The City-County comprehensive plan is currently being updated, and the draft report is available to the public for review. Several policies in the plan address land use policies that promote transit supportive development, and will be addressed when site development plans are submitted to the regulatory agencies of the city for review and permitting. Raleigh On September 30, 2004, the Raleigh Chamber of Commerce sponsored a regional forum on development around the regional rail stations. The forum featured area real estate developers, as well as developers of TOD projects in other cities. The Downtown West small area plan includes policies to support the creation of incentives for attracting development that is supportive of the downtown rail station. One of the five major objectives of the Liveable Streets initiative, the planning program that guides downtown development, is to improve the regulatory environment and process for development review and approval for projects in the downtown area. The city is currently embarking on a review of its development review process to support this initiative
Efforts to engage the development community in station area planning and transit supportive development	TTA staff has routinely met with developers and given presentations to real estate professionals to explain the opportunities associated with the regional rail system. On July 5, 2005 TTA released a Request for Qualifications (RFQ) for a Master Developer or developers to plan and manage TOD development in and round the station areas. The selected developer will oversee the complex development process for properties surrounding the rail stations while adhering to TTA's TOD Station Area Guidelines. On July 6, 2005 TTA held a pre-submittal conference to discuss the process with developers. On August 3, 2005 TTA received three qualified RFQ submissions and staff are currently reviewing submitted materials. On August 19th TTA will interview the applicants and recommend a Master Developer(s) to the Board of Trustees by August 24th. Raleigh As stated previously, TTA participated with the Raleigh Chamber of Commerce, on September 30, 2004, in sponsoring a regional forum on development around the regional rail stations. The forum featured area real estate developers, as well as developers of TOD projects in other cities. New documents (attached) illustrating efforts to engage the development community in station area planning and transit supportive development include:

	• TTA Request for Qualification 05-018 • *TTA Seeks Developers for Rail Station Sites* – TTA News Release, June 30, 2005 • *TTA Extends Response Period for Master Developer Submissions* – TTA News Release, July 14, 2005
Public involvement in corridor and station area planning	In fall 2003 TTA held a series of public meetings to receive input on the final station design features. Three cycles of meetings were held in Durham, Research Triangle Park, Raleigh, and Cary.

Information Requested	Documentation Supporting Land Use Criterion
III. PERFORMANCE AND IMPACTS OF LAND USE POLICIES **a. Performance of Land Use Policies**	
Demonstrated cases of developments affected by transit supportive policies	The Triangle Metro Center Station (previously called the South Park Station) in Research Triangle Park (which is in Durham County) is the focus of the first new, major transit oriented development along the regional rail corridor. The property owner, Research Triangle Foundation, has partnered with Craig Davis Properties, a locally based developer. Together they are planning a high-density, mixed-use development. TTA plans to locate its regional transportation hub at the site. This project was granted rezoning in part because it is located adjacent to a regional rail station. In addition, recent amendments to the zoning ordinance have allowed the project to have a greater density than allowed immediately after the rezoning. A project in Durham that is nearing completion and has benefited from zoning changes is the Wood Partners mixed use project. It consists of approximately 60 units to the acre (323 units total) within a ¼ mile of the 9th Street station. This project would not have been permitted without recent zoning changes in the station areas. The Request for Qualifications for a Master Developer is the result of collaborative transit supportive policies. See RFQ referenced in previous section.
Station area development proposals and status	Durham ➢ 9th Street/Duke East • Duke University and a private developer have constructed a neo-traditional neighborhood, called Trinity Heights. This development which encompasses 1½ city blocks is within a ½ mile of the 9th Street station site. • A new 225,00 s.f. office/retail building, called 9th Street North, has been developed on 9th Street within a ½ mile of the 9th Street station site. A second identical building is planned across the street. In July 2005 this project was 60% complete. ➢ Downtown Durham • The City of Durham is developing a multi-modal transportation center adjacent to the downtown Durham station. This multi-modal center will serve TTA, Amtrak, and local and intra-city bus passengers. • West Village is a successful mixed-use development located less than ¼ mile from the proposed Downtown Durham station. The five historic tobacco warehouses that make up West Village, built around

	the turn of the century, have been renovated into 243 loft style apartments and approximately 31,500 square feet of commercial space. • The developers of West Village obtained rezoning for two adjacent sites. This second phase of the development will add 77 condominiums, 375 loft style apartments, 164,000 square feet of office and lab space, a 462-space parking garage and 58,000 square feet of retail space including a new Amtrak station. As of July 2005, 134 residential units have been constructed. • The American Tobacco project is nearing completion and several occupants have moved in. The 16-acre project, which is within walking distance of the downtown Durham station, contains 620,000 square feet of office space, shops and restaurants and a proposed hotel. In 2005 The American Tobacco Company announced a proposal to begin adding a residential component to this project. To date more than 50% of office space is leased, several restaurants are in place and parking decks near the Durham Bulls Stadium are completed. Future tenants will include Duke University, Glaxo Smith-Kline, Compuware and the advertising firm of McKinney & Silver. ➢ Alston Avenue/NCCU • The Durham HOPE VI neighborhood revitalization effort focuses on a 96 block area adjacent to downtown and surrounding the Alston Ave/NCCU station and is under construction. The HOPE VI effort includes several components – a planning effort to coordinate the HOPE VI residential development with other public and private investments planned for the area, a residential development program and a community supportive services program. The 240-unit Few Gardens public housing complex has been demolished and the site is now ready for the construction of approximately 425 new units throughout the neighborhood. The 425 units will include both rental and homeownership opportunities. Overall, the HOPE VI effort will result in a net gain of 185 units within approximately ½ mile of the planned transit station. ➢ North Park – no new development at this time. ➢ Triangle Metro Center (South Park) ➢ A transit-oriented, mixed-use development and TTA transit center are proposed for this site, and master plan documents have been completed. The development site has expanded from 25 acres to nearly 200 acres. This property has been secured for TOD development through a joint venture between the Research Triangle Foundation and Craig Davis Properties. The development will include a new TTA

bus transfer center, a hotel and conference center, nearly 60,000 s.f. of retail space, 700,000 s.f . of office space, a grocery store, financial institutions and about 250 apartments and condominiums. The Triangle Metro Center development is expected to be completed in phases between 2005 – 2008.

Cary

- NW Cary – no new development at this time.
- Downtown Cary, ongoing developments include:
  - The Town has expanded its Town Hall Campus, which is adjacent to the station. This development project adds 100,000 square feet of office space and a new 480 to the Town Government Campus. The renovation of the old Town Hall and Council Chambers is near completion and is expected to open by December 2005. Space parking garage
  - The construction of two elderly rental residential buildings in the Highland Village development are complete and available units are occupied. Single-family units are currently under construction. The build out for this project includes a total of 258 residential units on 18 acres, all located within one mile of the downtown station. This development will also provide affordable units subsidized by the Town of Cary.
  - The Towns of Madison, a three-story townhouse project with 50 units constructed on 4 acres within ½ mile of the downtown station has been. The project is currently under construction and units are being occupied as they are completed.
  - A new downtown office and restaurant building, called the Westbrook Building has also been approved. This building will hug the street and have patio dining along the sidewalk.

Raleigh

- West Raleigh –Wolf Creek Apartments are complete and add 386 residential units in the station area. The Red Wolf Crossing apartments are just outside ½ mile of the station, add 33 units in residential density to the area. The Polovick Development plan is within ¼ mile of the station. This development will add 14,300 square feet of commercial and residential to the station area. Additionally, plans have been approved for a 168-acre mixed-use development approximately one mile from the station.
- State Fairgrounds – There are two new developments planned within ½ mile of the State Fairgrounds. Abbeygail's Closet is a commercial development of 22,500 sq. ft on nearly ½ acre. WestBorough Park is an office park development that includes 33,600 sq. ft of office space on 2.5 acres. Additionally, Powell Townes, a proposed mixed residential development within 1/2 mile of the station includes 28 units on 2.88 acres.

NCSU – no new development at this time, but the Stanhope Village Small Area Plan has been approved. This is a comprehensive development plan for the area that includes the NCSU station area.

- Downtown Raleigh
  - Over one billion dollars of investment is earmarked for development in downtown Raleigh, all of this development is planned within 1 mile of the downtown and government center stations.
  - The Fayetteville Street Renaissance includes the reopening of 3 blocks of Fayetteville Street to vehicular traffic. This corridor is within the station area and will include store-front enhancements, new retail establishments and residential developments. This project is under construction and is due to open by Fall 2008.
  - Several new attractions have been developed in downtown in recent years, adding to the draw of downtown. These include a new IMAX theater and a new Museum of Natural Sciences. An expansion to the Natural Sciences Museum is planned to add several thousand square feet to the facility with the addition of a 700 space parking deck, a new NC Dept of Environment and Natural Resources building, and a State Employees Credit Union. This new complex represents an investment of 98 million dollars.
  - The New Raleigh Convention Center and hotel are under construction and scheduled to open in Spring 2008. The new Convention Center will have 150,000 sq. ft of exhibit space, a 32,000 square foot ball room, 7000 sq. ft of office space and 17 meeting rooms totaling 30,000 sq. ft. Connected to the Convention Center will be a 400 room Marriott Hotel with 3 restaurants and 15,000 sq. ft of meeting space.
  - The Depot is a mixed-use development within ¼ mile of the station. When fully leased this development will include 16,000 sq. ft of retail, office, and a restaurant.
  - The City of Raleigh is developing an Intermodal Center adjacent to the downtown Raleigh station. This multi-functional transit center will accommodate passengers on TTA rail, Amtrak, high-speed rail, local bus service, inner-city bus service and taxis.
  - Downtown housing development is on the rise. There are over 2,500 multi-family units existing, planned or under construction. Four condominium projects in the Downtown Station were recently completed and are now occupied. These include 1001 Hillsborough (16 units), Bloomsbury Estate (68 units), The Dawson (52 units) with 3900 sq. ft of ground level retail, and The Metropolitan (36 units). Currently, there are 4 new residential developments underway in downtown Raleigh. These include 3

	new condominiums and 1 transitional density residential development. The Hudson (66 units with 26,000 sq. ft of retail), 222 Glenwood (119 units with 16,000 sq. ft of retail), The Quorum Center, currently under construction with 44 units and 1,000 sq. ft of retail, and Boylan Heights a transitional density development with 8 units. • Downtown housing just outside ½ mile of the station include The Palladium (66 units), Carlton Place, 80 units of affordable housing, and Gateway Park 84 units with a planned community center. ➢ Government Center • The Paramount a10-story mixed-use residential project with 84 units and 1,000 sq. ft of retail with structured parking spaces has been approved and is near completion. The project is within walking distance of the Government Center station. • The Glen a planned mid-rise residential development is also within walking distance of the Government Center station. This project will include 18 luxury condos with 2,000 sq. ft off retail space on the first floor. • Seaboard Station is an adaptive re-use project that will convert a warehouse district into 121,000 sq. ft of retail, office, grocery and restaurant space. This project is under construction. • Peace College is expanding its campus on a 3.5-acre site that will include a new 66-bed dormitory. • The recently completed Village at Pilot Mills is one of the largest downtown housing projects in decades with 105 new houses on a 12 acre site within walking distance of the State Government Center station. • The Raleigh Housing Authority has rebuilt the Halifax Court public housing project, which is within a ½ mile of the Government Center station. This project, which is now called Capitol Park, includes 209 residential units, 40% of the units are market rate and 60% of the units are subsidized. • Two new performing arts theaters have been added in recent years. <u>TTA</u> ➢ All stations ➢ As stated previously, the Master Developer selected by TTA will manage TOD development in and around the regional rail stations.
b. Potential Impact of Transit Project on Regional Land Use	
Adaptability of station area land for development	There are no apparent hindrances to the adaptability of the land around stations to be developed. Since the regional rail

	corridor travels through areas that are already highly developed, there are few reasons that land can not be developed or redeveloped. There are many opportunities for infill development. As referred to in the 2004 New Starts Report, infill opportunities have been documented in the Station Area Opportunities report produced by consultants for TTA, completed in May 2003. TTA continues to utilize the information in this report as a guide when working with local communities and developers on TOD related issues. TTA's consultants analyzed each station's potential for development based on market conditions and plans and regulations that support transit oriented development. They also examined key parcels in station areas and projected the development potential for each. The report illustrated various levels of suitable land for TOD within ½ mile of each station. Among the five station stops in Durham, the report indicates there are approximately 380 acres available for TOD sufficient to support 5,032 additional dwelling units and 4,280,000 sq. ft of commercial space. Among the two rail stops in Cary, the report documents 181.6 acres available for TOD supporting 2,715 dwelling units and 1,414,000 sq. ft of commercial development. In Raleigh, reported are 53.6 acres available for TOD supporting 2,806 dwelling units and 1,373,000 sq. ft of commercial space among five rail stations.
Corridor economic environment	TTA completed a Corridor Market Study (previously submitted) in 2002. This study was designed to help TTA and the local jurisdictions better understand the market forces and planning initiatives that will shape development around stations. The study included: • evaluation of existing market conditions; • evaluation of development trends; • baseline projections for the corridor and identification of policy variables that could influence level and location of development; • key issues affecting level and character of development; and, • analysis of existing land use controls. TTA continues to utilize information from this document in working with local communities on corridor economic development issues.

Information Requested	Documentation Supporting Land Use Criterion
IV. OTHER LAND USE CONSIDERATIONS (Optional)	
Otherwise unidentified circumstances, conditions, or constraints under which the transit agency operates and which influence local and regional land use policies, plans, and implementation	It is important to note that TTA does not control land use regulations around the stations. TTA has worked extensively with the local governments to create a unified vision of how the station areas should develop. All of the local jurisdictions with planned stations have made great efforts to work toward that vision.

Template 12: Quantitative Land Use Information

Population and Employment Data – Metropolitan Area, CBD, and Corridor			
Data	Base Year 2002	Forecast Year 2030	Growth (%)
Metropolitan Area			
Total Population	1,149,114	2,264,048	97.0%
Total Employment	679,212	1,376,871	102.7%
Central Business District[1]			
Total Employment	N/A	N/A	
Employment – Percent of Metropolitan Area	N/A	N/A	
Employment Density (e.g., employees/acre)	N/A	N/A	
Corridor			
Total Population	346,738	512,780	47.9%
Total Employment	343,853	611,382	77.8%
Population – Percent of Metropolitan Area	30.2	22.6	
Employment – Percent of Metropolitan Area	50.6	44.0	
Corridor Land Area (sq. mi.)	190.3	190.3	
Population Density (persons per sq. mi.)	1,822	2,696	
Employment Density (jobs per sq. mi.)	1,807	3,213	

Population and Employment Data -- Station Area (1/2-mile radius)[2]			
Data	Base Yr. 2002	Forecast Yr. 2030	Growth (%)
Total, All Station Areas (12 stations)			
Housing Units	9,690	20,240	108.9%
Population	19,023	42,603	124.0%
Employment	75,134	109,774	46.1%
Land Area (sq. mi.)	9.08	9.08	--
Housing Unit Density (units per sq. mi.)	1,067	2,817	164.0%
Population Density (persons per sq. mi.)	2,095	4,692	124.0%
Employment Density (persons per sq. mi.)	8,275	12,090	46.1%

[1] Optionally, employment for the largest activity center(s) served by the New Start project may be reported.

[2] See "Mobility Benefits" section for guidance on calculating station-area households and Appendix A for a sample methodology for estimating station area population, households, and employment.

Station Area 1[3] - 9th Street			
Housing Units	913	1,735	90.0%
Population	1,707	3,479	103.8%
Employment	7,934	10,224	28.9%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	1,170	2,225	90.2%
Population Density (persons per sq. mi.)	2,188	4,461	103.9%
Employment Density (persons per sq. mi.)	10,172	13,108	28.9%
Station Area 2 – Downtown Durham			
Housing Units	1,130	3,151	178.8%
Population	2,175	6,528	200.1%
Employment	8,632	14,630	69.5%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	1,449	4,040	178.8%
Population Density (persons per sq. mi.)	2,788	8,369	200.2%
Employment Density (persons per sq. mi.)	11,067	18,757	69.5%
Station Area 3 – Alston/NC Central			
Housing Units	1,892	2,551	34.8%
Population	4,943	6,363	28.7%
Employment	1,863	3,160	69.6%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	2,426	3,271	34.8%
Population Density (persons per sq. mi.)	6,337	8,157	28.7%
Employment Density (persons per sq. mi.)	2,388	4,051	69.6%
Station Area 4 – N RTP (IBM)			
Housing Units	0	0	0
Population	0	0	0
Employment	7,167	9,662	34.8%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	0	0	--
Population Density (persons per sq. mi.)	0	0	--
Employment Density (persons per sq. mi.)	9,188	9,662	5.2%

[3] Unlike previous years, reporting of data by individual station area is required.

Station Area 5 – S RTP/Triangle Metro			
Housing Units	12	367	2,500%+
Population	20	786	3,500%+
Employment	3,661	6,394	74.7%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	15	471	3,000%+
Population Density (persons per sq. mi.)	26	1,008	3,500%+
Employment Density (persons per sq. mi.)	4,694	8,198	74.6%
Station Area 6 – NW Cary			
Housing Units	612	1,103	80.2%
Population	1,036	2,155	108.0%
Employment	684	4,125	503.1%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	785	1,414	80.1%
Population Density (persons per sq. mi.)	1,328	2,763	108.1%
Employment Density (persons per sq. mi.)	877	5,289	503.1%
Station Area 7 – Cary Depot			
Housing Units	970	1,929	98.9%
Population	2,114	4,303	103.5%
Employment	1,285	6,351	394.2%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	1,244	2,473	98.8%
Population Density (persons per sq. mi.)	2,710	5,516	103.5%
Employment Density (persons per sq. mi.)	1,647	8,142	394.4%
Station Area 8 – West Raleigh			
Housing Units	846	1,348	59.3%
Population	1,899	3,043	60.2%
Employment	1,165	2,317	98.9%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	1,085	1,728	59.3%
Population Density (persons per sq. mi.)	2,435	3,902	60.2%
Employment Density (persons per sq. mi.)	1,494	2,971	98.9%
Station Area 9 – State Fairgrounds			
Housing Units	547	990	81.0%
Population	996	2,007	101.5%
Employment	1,816	2,964	63.2%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	701	1,270	81.2%
Population Density (persons per sq. mi.)	1,277	2,573	101.5%
Employment Density (persons per sq. mi.)	2,328	3,800	63.2%

Station Area 10 – NC State			
Housing Units	718	1,145	59.5%
Population	1,297	2,271	75.1%
Employment	6,702	7,717	15.1%
Land Area (sq. miles)	.78	.78	--
Housing Unit Density (units per sq. mi.)	560	893	59.5%
Population Density (persons per sq. mi.)	1,663	2,912	75.1%
Employment Density (persons per sq. mi.)	8,592	9,894	15.2%
Station Area 11 – Downtown Raleigh			
Housing Units	2,050	5,920	188.8%
Population	2,836	11,668	311.4%
Employment	34,225	44,355	29.6%
Land Area (sq. miles)	1.28	1.28	--
Housing Unit Density (units per sq. mi.)	1,602	4,625	188.7%
Population Density (persons per sq. mi.)	2,216	9,115	311.3%
Employment Density (persons per sq. mi.)	26,738	34,652	29.6%
***(Stations 11 & 12 are clustered.)*			
Station Area 12 – State Government			

Template 13: New Starts Project Finance Worksheet

PROJECT NAME: TTA Regional Rail			
Raw Capital Cost of Project in Constant 2005 $:	$689.394	**Raw Capital Cost of Project in YOE$:**	$744.037
Total Capital Cost of Project in Constant 2005 $ (including finance charges):	$746.409	**Total Capital Cost of Project in YOE $ (including finance charges, cost of PE and FD, and construction):**	$809.918
Section 5309 New Starts Funding Anticipated (YOE $):	$485.356	**Section 5309 New Starts Share of Project Cost (%):**	59.9%
Estimated Cost of Preliminary Engineering (YOE $):	$13.046	**Estimated Cost of Final Design (YOE $):**	$74.382
Total Finance Charges Included in Capital Cost (include only finance charges that are expected prior to either the revenue operations date or the fulfillment of the Section 5309 New Starts funding commitment):			$65.881

Capital Cost Non Section 5309 New Starts Share (Year of Expenditure)			
Other Federal Capital Funding (Non-5309 New Starts Funds such as FTA Section 5307, Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), Section 5309 Rail Modernization, etc.)	**Type of Funds**	**Dollar Amount**	**% of Total Capital Cost**
1) None			
2)			
3)			
4)			
State Capital Funding Sources (Funds provided by State agencies or State legislatures such as bonds, dedicated sales tax, annual legislative appropriation, transportation trust funds, etc.)	**Type of Funds**	**Dollar Amount**	**% of Total Capital Cost**
1) State Appropriation	Annual Appropriation	$149.852	18.5%
2) State CMAQ/Federal Share (Grant 1)	Annual Appropriation	$8.000	1.0%
3) State CMAQ/Federal Share (Grant 2)	Annual Appropriation	$4.000	0.5%
4)			
5)			

PROJECT NAME: TTA Regional Rail			
Local Capital Funding Sources (Municipal, City, County, Township, or Regional funding such as bonds, dedicated sales tax, annual legislative appropriation, regional transportation trust funds, etc.)	**Type of Funds**	**Dollar Amount**	**% of Total Capital Cost**
1) TTA Regional Taxes	Dedicated Taxes	$74.934	9.3%
2) Bond Proceeds	Bonds	$87.776	10.8%
3)			
4)			
5)			
6)			
Private Sector/In-kind match/Other (Donations of right-of-way, construction of stations or parking, or the provision of funding for the project from a non-governmental entity, business, or business association.)	**Type of Funds**	**Dollar Amount**	**% Total Capital Cost**
1)			
2)			
3)			
TOTAL NON-SECTION 5309 SHARE		**$324.562**	**40.1%**

PROJECT NAME: TTA Regional Rail			
New Starts Project Financial Commitment			
Other Federal Sources (Should correspond to sources listed on page 1)	**Specify Whether New or Existing Funding Source**	**Specify Status of Funds--Committed, Budgeted, or Planned (See reference notes below)**	**Identify Supporting Documentation Submitted to Verify Funding Source**
1) None			
2)			
3)			
4)			
State Sources (Should correspond to sources listed on page 1)			
1) State Appropriation	New	Committed	State FFGA/NC Moving Ahead
2) State CMAQ/Federal Share (Grant 1)	Existing	Budgeted	obligated in current grant
3) State CMAQ/Federal Share (Grant 2)	Existing	Budgeted	NC-90-X273
4)			
5)			
Local Sources (Should correspond to sources listed on page 1)			
1) TTA Regional Taxes	Existing	Committed	TTA Budget, TTA enabling legislation
2) Bond Proceeds	New	Budgeted	Financial analysis report
3)			
4)			
5)			
6)			
Private Sector/In-kind Match/Other (Should correspond to sources listed on page 1)			
1) None			
2)			
3)			

Reference Notes:

1. The following categories and definitions are applied to funding sources:

- **Committed:** Committed sources are programmed capital funds that have all the necessary approvals (legislative or referendum) to be used to fund the proposed project without any additional action. These capital funds have been formally programmed in the MPO's TIP and/or any related local, regional, or state CIP or appropriation. Examples include dedicated or approved tax revenues, state capital grants that have been approved by all required legislative bodies, cash reserves that have been dedicated to the proposed project, and additional debt capacity that requires no further approvals and has been dedicated by the transit agency to the proposed project.

- **Budgeted:** This category is for funds that have been budgeted and/or programmed for use on the proposed project but remain uncommitted, i.e., the funds have not yet received statutory approval. Examples include debt financing in an agency-adopted CIP that has yet to receive final legislative approval, or state capital grants that have been included in the state budget, but are still awaiting legislative approval. These funds are almost certain to be committed in the near future. Funds will be classified as budgeted where available funding cannot be committed until the Full Funding Grant Agreement (FFGA) is executed, or due to local practices outside of the project sponsor's control (e.g., the project development schedule extends beyond the TIP period).

- **Planned:** This category is for funds that are identified and have a reasonable chance of being committed, but are neither committed nor budgeted. Examples include proposed sources that require a scheduled referendum, reasonable requests for state/local capital grants, and proposed debt financing that has not yet been adopted in the agency's CIP.

PROJECT NAME: TTA Regional Rail		
Innovative Finance Methods (Unconventional sources of funding which may include TIFIA, Sta		
Innovative Funding Source	**Anticipated Funding Amount**	**Identify Supporting Documentation Submitted**
Joint Development	$65.000	Letter of Intent

Operating and Maintenance Cost Worksheet

Current Transit System Operating Characteristics (From National Transit Database. Otherwise, the baseline alternative transit system operating characteristics may suffice, provided that sufficient detail is provided)

Current Source of Operating Funds (Existing sources of funds used to support operating expenses of the transit system. These typically include a mixture of farebox revenues and State and Local funding sources.)	**Dollar Amount (millions)**	**Type of Funding Source** (Farebox revenues, advertising revenues, dedicated sales tax, annual legislative appropriation, regional transportation trust funds, property tax assessment, or any other potential local funding source)	**Annual/Dedicated** (Note whether the funds must be appropriated by legislative action or renewed ANNUALLY, or whether the funding is DEDICATED to transit system operating expenses independent of annual legislative action)
Passenger Revenue	$1.454	Farebox Revenue	Annual
FTA Sec 5307 Preventative Maintenance	$0.000	Federal Urbanized Area Formula Grant	Annual
State Maintenance Assistance Program	$2.528	Annual Legislative Appropriation	Annual
Tax Applied First to Operations	$4.009	Dedicated Tax Revenues	Dedicated
Other Transit Related	$0.879	Employer Subsidies, Advertising, Other Operating	Annual
Interest on Capital Reserve	$1.521	Interest Income	Annual
Total	**$10.390**		

PROJECT NAME: TTA Regional Rail			
Summary Data from the Proposed New Starts Project Operating Finance Plan			
New Starts Project Average Annual Operating Cost Forecast Year Dollar Amount (2030, YOE $):	$21.338	Total Transit System (including New Starts Project) Annual Operating Cost Forecast Year Dollar Amount (2030, YOE $):	$43.931
Proposed Sources of Operating Funds (Proposed sources of operating funds that are anticipated to support operating expenses of the transit system. These typically include a mixture of farebox revenues and State and Local funding sources)	**Dollar Amount (millions, YOE $)**	**Type of Funding Source**	**Annual/Dedicated**
Passenger Revenue	$13.710	Farebox Revenue	Annual
FTA Sec 5307 Preventative Maintenance	$7.629	Federal Urbanized Area Formula Grant	Annual
State Maintenance Assistance Program	$8.915	Annual Legislative Appropriation	Annual
Tax Applied First to Operations	$3.318	Dedicated Tax Revenues	Dedicated
Other Transit Related	$2.032	Employer Subsidies, Advertising, Other Operating	Annual
Interest on Capital Reserve	$8.327	Interest Income	Annual
Total	**$43.931**		
Transit System Operating Characteristics			
Current Systemwide Characteristics (Can be the same data as reported to the FTA for the National Transit Database)	**Number/Value**	**Future Transit System with New Starts Project** (Systemwide characteristics at completion of the New Starts Project)	**Number/Value**
Farebox Recovery Percent	13.99%	Farebox Recovery Percent	31.21%
Number of Buses	60	Number of Buses	50
Number of Rail Vehicles	0	Number of Rail Vehicles	15
Current Annual Passenger Boardings	1,106,074	Annual Boardings (Forecast)	5,910,187
Daily Passenger Boardings	3,687	Daily Boardings (Forecast)	19,701
Average Fare	$1.31	Average Fare	$2.32
Average Age of Buses	5.48	Revenue Miles of Service Provided	6,045,599
Average Age of Rail Vehicles	N/A	Revenue Hours of Service Provided	231,605
Revenue Miles of Service Provided	3,044,934		
Revenue Hours of Service Provided	123,052		

PROJECT NAME: TTA Regional Rail			
Prior State or Local Expenditures for Project Planning/ROW/Overmatch (Includes all funds expended by State or local government agencies for project planning, environmental studies, right-of-way purchases, or construction EXCLUDING funds allocated to match Federal funds to perform similar tasks)	**Project or Funding Type**	**Dollar Value**	**% of Total Costs**
1) None			
2)			
3)			
4)			
5)			

Prior State or Local Expenditures for Project Planning/ROW/Overmatch (Should correspond to those listed above)	**Identify Supporting Documentation Submitted**
1) None	
2)	
3)	
4)	
5)	

Previous New Starts Investments in the Region (Briefly describe previous New Starts major capital investments within the region. Include the project name and the amount and percent of Federal and Non-Section 5309 New Starts funding sources used for construction.)

Project Name	**Federal Funding Share**		**State/Local Funding Share**	
	Amount	**Percent**	**Amount**	**Percent**
None				

Triangle Transit Authority

Regional Rail System

Financial Analysis

Prepared by

AECOM Consult, Inc.

October 11, 2005

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LIST OF TABLES AND EXHIBITS

FINANCIAL ANALYSIS

This analysis examines the financial capacity of the Triangle Transit Authority (TTA) to construct and operate its Regional Rail System, consisting of a 28-mile Regional Rail system from Ninth Street in Durham to Government Center in Raleigh. This report supports TTA's submittal to the Federal Transit Administration (FTA), applying New Starts criteria to the proposed Regional Rail transit system, and is consistent with FTA's *Guidance for Transit Financial Plans* issued in June 2000 and subsequent guidance at New Starts Workshops.

While the federal fiscal year extends from October 1 through September 30, the State of North Carolina and, therefore, the Triangle Transit Authority conforms to a fiscal year beginning July 1 and extending through June 30. For clarity in presentation to local stakeholders and interested parties, information presented hereinafter relates to the July-June fiscal year. For example, FY 2007 refers to the period July 1, 2006 through June 30, 2007. All year references in this report refer to the TTA's fiscal year.

This financial analysis did not consider costs, resources, or funding strategies associated with bus service provided by entities other than TTA. During the development of the bus system included in the Regional Rail project, each local government and transit agency participated in the definition of future bus services. This work was done with the mutual understanding that the local and state funding sources that currently support local bus operations would cover additional capital and operating costs associated with new services or that the local governments or agencies that participated in bus service planning are committed to establishing new revenue sources, as needed.

This document begins with a discussion of the role of study participants and an overview of the financial planning process used in this analysis. Next, the assumptions and the results of the sources and uses of funds analysis are presented. This information shows how the Regional Rail project could be financed. Finally, an overview of risk factors that may affect the financial plan, and possible strategies for addressing these risks, are presented.

1. Role of Study Participants

The successful completion of this study required the continuing support and active and constructive participation of TTA and its consultants.

1.1 Triangle Transit Authority

TTA is a unit of local government in the Research Triangle region comprised of Wake, Durham, and Orange counties. The North Carolina (N.C.) General Assembly, the three counties, and municipalities of Durham, Cary, Chapel Hill, and Raleigh created the Authority in 1989. TTA is governed by a Board of Trustees consisting of 10 members appointed by the region's cities and counties, and three members appointed by the N.C. Secretary of Transportation. Its purpose is to develop the region's long-term public transportation plan and to finance and operate a regional multi-modal transportation system, including buses, vans, fixed guideways, and ridesharing activities.

Initially, operating funding for the transportation system came in the form of a vehicle registration tax. In 1991, the General Assembly enacted legislation allowing TTA to levy a tax of up to $5 per registered vehicle. The Special Tax Board, the Boards of County Commissioners of Wake, Durham, and Orange Counties, and the Authority's Board of Trustees approved a $5 vehicle registration tax. Collection of this tax began on January 1, 1992.

Also in early 1992, TTA secured a FTA grant to study the long-range public transportation needs of the tri-county region. This led to the *Triangle Fixed Guideway Study* (TFGS) which had as primary goal to build consensus among the various stakeholders regarding the desirability, feasibility, and location of a fixed

guideway system. The study examined light rail, regional rail, and HOV/busway alternatives. The study led to the adoption of *Recommendations for a Regional Transit Plan* by the TTA Board of Trustees in October 1995, which was subsequently incorporated in the region's long-term plan. The plan includes a regional rail system and expanded bus service. Regional Rail service will connect Durham, Research Triangle Park (RTP), Cary, and Raleigh. The system, planned to commence operation in fiscal year 2010, would be located within existing North Carolina Railroad and CSX rights-of-way, generally paralleling major regional highway facilities: NC-147 (Durham Freeway), Interstate 40, NC-54, and U.S. 1.

Subsequent phases of the Regional Transit Plan would extend transit service to North Raleigh and Duke Medical Center, and between Chapel Hill and Durham and Research Triangle Park. Direct rail connection to the airport would be considered as well in a subsequent phase. Other elements of the Regional Transit Plan include expanding regional bus and express services as well as shuttle and feeder bus services for the proposed rail line.

In 1997, the General Assembly enacted legislation permitting TTA to collect additional taxes providing a local match for federal and state grants directed towards the construction of a regional rail system. A tax of up to 5 percent on gross receipts of short-term private auto rentals was authorized. The Special Tax Board, the Boards of County Commissioners of Wake, Durham, and Orange Counties, and the Authority's Board of Trustees approved the maximum authorized tax following public hearings. Collection of this tax began on January 1, 1998. In 1999 the General Assembly enacted definitional changes which expanded the tax to trucks weighing less than 7,000 pounds.

TTA's current service delivery includes regional bus and ridesharing services. The regional bus service began operating in April 1993 with an initial fleet of 20 mid-size buses. In 1996 and 1997, four additional midsize and 20 large 37-passenger buses were added to the fleet, respectively. In 2002, service was upgraded through increased headways and the addition of express buses between regional nodes. TTA presently operates several routes providing peak hour regional service connecting Raleigh, Durham, Chapel Hill, and Cary with Research Triangle Park (RTP) and the Raleigh-Durham International Airport (RDU) as well as outlying communities of Apex and Garner. The service allows transfers to local transit systems. Currently, in addition to TTA, the region is supported by five other public transit agencies: Capital Area Transit (CAT) in Raleigh; C-Tran in Cary; Chapel Hill Transit (CHT); Durham Area Transit Authority (DATA); and Orange Public Transportation (OPT); and two university transit systems: Duke Transit and N.C. State Wolfline. The Authority also operates shuttle service within RTP and RDU with a fleet of 15 vans. In 1999 TTA opened an operations center and maintenance facility near RDU Airport.

In addition, TTA's ridesharing program includes a carpool matching service, a vanpool program, and a paratransit program that provides additional service for occasional as well as regular riders.

The Research Triangle region includes the municipalities of Chapel Hill, Durham and Raleigh. However, due to population growth, the region is gradually becoming a single area. Each municipality is home to a research university making up the three points of the Triangle. Raleigh, the largest city in the region, supports a number of government jobs generated by the State capital, in addition to being the home of North Carolina State University. Durham, which ranks second in size, has traditionally been a manufacturing center. This is where Duke University and Duke Medical Center, the region's largest single employer, are located. Finally, The University of North Carolina at Chapel Hill is located at the third point of the triangle.

Other major employment and population centers in the area include the Research Triangle Park (RTP) and the town of Cary. An employment center of over 38,000 jobs, RTP is located in the center of Research Triangle. Cary, located near Raleigh, has a population of about 111,000.

The Research Triangle has been very competitive in attracting service and light manufacturing jobs. It is expected that this trend will continue in the future. The population of TTA's catchment area is expected to grow from the 1990 census level of approximately 700,000 to 1.75 million in the year 2025.

While the Research Triangle region has traditionally been auto dependent, population growth and the resulting congestion have created the need for alternative transportation options.

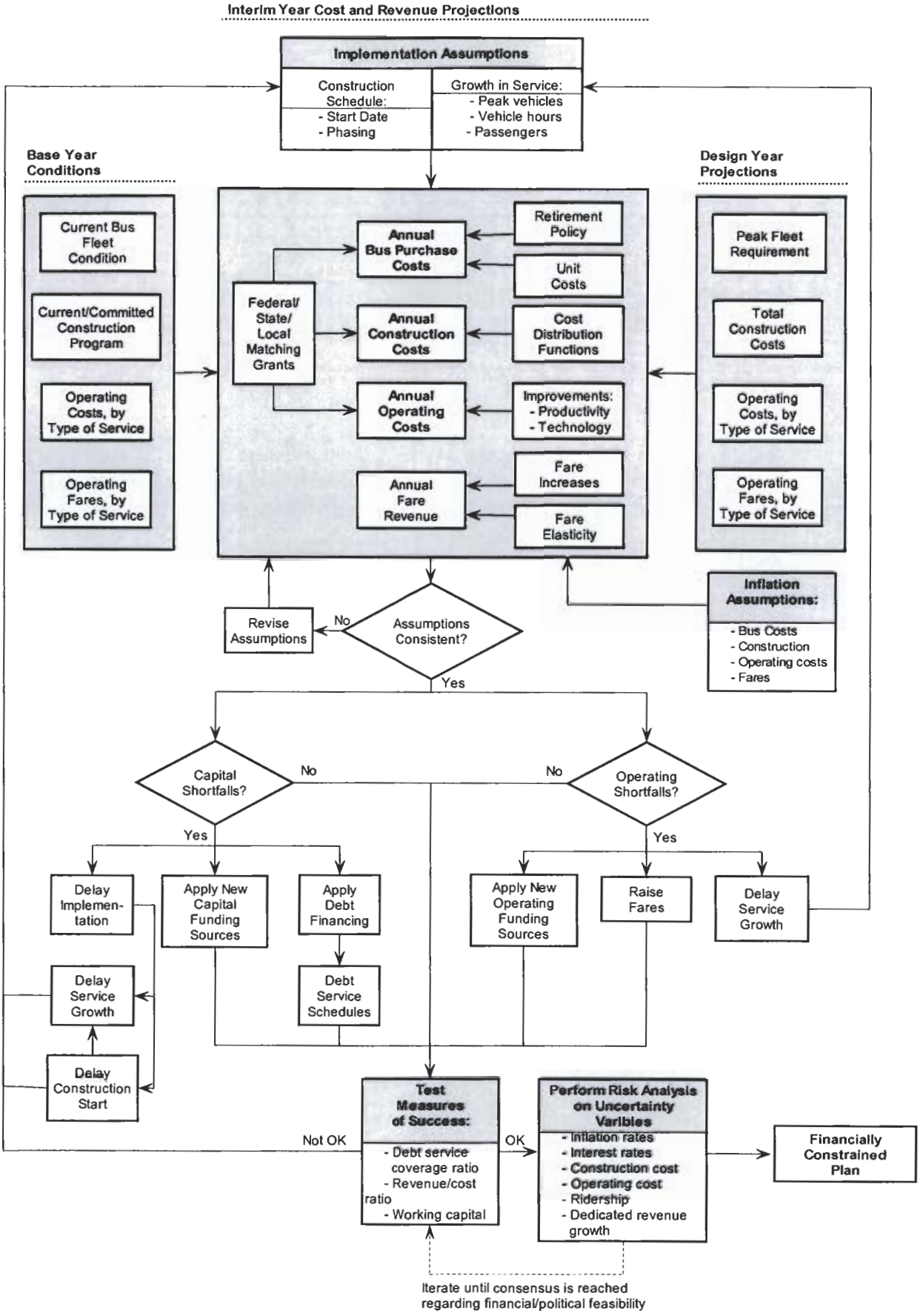
1.2 Consultant Team

This financial analysis was conducted by AECOM Consult which served as subcontractor to Parsons Brinckerhoff Quade & Douglas, Inc. earlier in the planning process and as direct consultant to TTA since the spring of 2003. AECOM Consult was responsible for the overall structuring of the financial analysis process, the development of the financial analysis model, the integration of projections of expenses and revenues, the development of key underlying assumptions, and the preparation of this report.

2. Financial Planning Process and Structure

The objective of the financial analysis is to project annual expenses and revenues, both capital and operating, over a 30-year period from 2005 to 2034 to examine the financial capacity of TTA to build and operate the Regional Rail project. Exhibit 1 summarizes the transportation financial planning process applied in the financial analysis. The process emphasizes a comprehensive approach to the integration of expenses and revenues, both capital and operating, for major transportation investments and was considered prudent given the magnitude of revenues to be applied.

Exhibit 1. Transportation Financial Planning Process



The following four major project components served as the basis for the description used in the analysis and the Regional Rail project costs and revenues:

1. Construction Program. Annual costs for the transit facilities construction program which include:

   - Total construction cost in base year dollars

   - Distribution of annual construction costs, which was used when advancing or delaying project construction assumptions.

2. Buses and Rail Car Fleets. Rail cars were assumed to be purchased based on the construction schedule of the Regional Rail project. Assuming a 40-year life for rail cars, vehicle replacements related to Regional Rail were not assumed for the analysis period. A projection of the annual cost for acquiring new and replacement buses to support regional bus service also was included. Bus purchase assumptions included:

   - Characteristics of the Existing Fleet. For each sub-fleet (buses of a specific manufacturer and purchase year), data regarding number of vehicles and anticipated retirement year

   - Committed Purchases. For programmed purchases, the number, size, cost, and anticipated retirement year of each planned new sub-fleet

   - Proposed Future Purchase Parameters. For all future sub-fleets, average bus costs, useful life, and spare bus requirements. Fleet size requirements were based on an operations analysis of the Regional Rail project and the proposed years of implementation.

3. Operating Costs. Incremental operating and maintenance costs associated with Regional Rail and supporting bus services.

4. Operating Revenues. Growth in fare revenue was projected based on growth in service and travel demand forecasts for the regional bus and rail networks.

The computation of costs and revenues was defined by two sets of project implementation assumptions:

- Construction Schedule. Including the start date and opportunities for construction phasing; and

- Implementation of Transit Service. Including the forecast growth in annual miles and hours of service and growth in fleet size that, in turn, would drive growth in new vehicle costs, operating and maintenance costs, and operating revenues.

The analysis is performed in year-of-expenditure (inflated) dollars so that debt financing computations, if required, could be accomplished. In addition to projecting a baseline rate of inflation, inflation assumptions were applied to construction and vehicle capital costs and for operating costs and revenues.

A sources and uses of funds analysis was then undertaken and the year-end balance was reviewed to determine in what years capital or operating fund shortfalls were predicted. For the purposes of the financial analysis, the following responses to shortfalls were considered:

- Potential Responses to Capital Funding Shortfalls.

   - Increase the Annual Amount of Capital Funding to the Project. If existing funding sources were inadequate, additional sources could be assumed. These sources could include: increasing the rate of taxation of an existing tax, assuming a new revenue source, extending the period of implementation of a dedicated revenue source, and/or assuming higher levels of grant funding from federal, state, or local sources.

- Apply Debt Financing. The first choice is pay-as-you-go financing, whereby available revenue sources fund the construction and implementation of the project. The second option is to finance the project in part by issuing long-term debt. The use of debt financing provides the ability to advance project implementation by borrowing against projected future revenue surpluses.

- Delay Service Growth and/or Delay Construction. Particularly in the case of financial plans relying on debt financing and dedicated funding sources, short-term delays in the implementation of new services and the construction of new facilities would result in a lower demand for available funds. This situation would increase the ability to finance on a pay-as-you-go basis and would reduce interest costs. Taking into account such delays in the capital and operating plan involved re-computation of the annual year cost and revenue projections, adhering to the same set of underlying assumptions regarding vehicle retirement policy, cost distribution functions, operating cost containment, and fare increases.

- Potential Responses to Operating and Maintenance Shortfalls.

  - Delay Service Growth. As with capital funding shortfalls, delays in the growth of transit service would result in less demand on available funds. Such delays also would result in lower annual operating and maintenance subsidies.

  - Increase the Amount of Non-Fare Box Funding Sources. Increased levels of non-fare box revenues would address the operating subsidy needs of the transit service. This could include higher revenues from dedicated sources, or the implementation of new or expanded non-fare box revenue sources (e.g., advertising, concessions, or joint development).

  - Increase Fare Assumptions. Increased fares could be assumed by using a higher target fare box recovery ratio. The use of a higher fare box recovery ratio, however, could reduce ridership.

The financial analysis took into account these potential remedies until no further capital and operating shortfalls remained. A series of financial feasibility tests were then examined to ensure that the financial plan for the Regional Rail project was feasible and (if debt financing is applied) acceptable to the capital markets. These tests included:

- Minimum Debt Service Coverage. This factor is defined as the ratio of current year dedicated revenues and interest earned on debt service reserve funds divided by current year debt service payments. Simply stated, it is the minimum acceptable value in each year across the 30-year analysis period of the ratio of projected tax revenue divided by projected debt service. This is a conventional measure of financial feasibility. Higher values are better. The debt structure in the financial analysis leverages both of TTA's dedicated revenue streams (the rental car tax and the vehicle registration fee) and projected Section 5309 New Starts grants. Under this financing structure, the following standards were observed: a minimum debt service gross coverage ratio of 2.00 before operating subsidy needs and a minimum net coverage of 1.00 after operating subsidy needs.

- Sufficient Year-End Balances. The financial analysis was structured to ensure that a positive cash balance was always maintained and that this balance equaled at least three months of operating expenses and three months of locally funded capital.

A financing scenario was examined for the Regional Rail project, based on a most likely set of cost and revenue projections, underlying policies on vehicle fleet management, implementation of construction projects, operating efficiencies, fares and fare box recovery, project implementation schedule, and inflation. Many uncertainties can affect this most likely scenario, however. These uncertainties include factors beyond the control of transportation agencies, their management and governing boards, and local governments (e.g., inflation and interest rates, construction and operating costs, ridership, and dedicated revenue growth).

3. Sources and Uses of Funds Analysis

3.1 Projected Capital Expenditures

Table 1 presents Regional Rail project capital costs in year-of-expenditure dollars. (Throughout the report, some table totals may differ because of minor rounding errors.) These costs include costs associated with Regional Rail construction, such as planning, design, construction, management, oversight, and start-up costs of the project. The costs reflect the physical features (i.e., alignment length, number of stations, number of rail cars, etc.) defined in Chapter 2 of the Final Environmental Impact Statement (FEIS) and shown in the design drawings in Volume 3 of the FEIS. These costs also include costs related to bus purchases and the construction of bus facilities. Throughout the analysis year-of-expenditure costs were estimated using inflation projections obtained from the August 2005 national forecasts by Economy.com, Inc.

Total construction costs were developed first for each major work element, including bridges, retaining walls, trackwork, signals, communications, yard and shop, stations, grade crossings, utility relocation, earthwork, roadway modifications, maintenance of traffic, existing railroad relocation, right-of-way and property acquisition, and design and construction administration. An implementation plan for construction was then developed using typical design and construction timeframes for the various elements, e.g., bridges take much longer to design and construct than parking areas for stations. The various elements of construction were then placed in a realistic construction sequence, e.g., bridges and/or track roadbed must be finished before the track can be installed. The implementation plan also divided the construction into multiple construction contracts, e.g., trackwork segments, yard and shop, and signals and communications. Annual costs were then created by adding the costs by year for the various elements in their sequence.

Table 1. Regional Rail Capital Costs

	Prior Years	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	Total
MILLIONS OF YEAR-OF-EXPENDITURE DOLLARS													
IOS ROW Acquisition/Real Estate	$ 9.086	$ 12.148	$ 13.875	$ 14.797	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 49.905
IOS Durham North Parking Garage	$ -	$ -	$ 1.758	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.758
IOS Demolition	$ -	$ -	$ 0.488	$ 2.066	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.553
IOS Railcars (Engineering + design)	$ -	$ -	$ 2.262	$ 4.787	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.048
IOS Railcars (manufacture, test + deli	$ -	$ -	$ 2.939	$ 8.045	$ 28.128	$ 6.754	$ -	$ -	$ -	$ -	$ -	$ -	$ 45.866
IOS Construction Total	$ -	$ 0.118	$ 9.211	$ 38.911	$ 173.765	$ 191.467	$ 13.404	$ -	$ -	$ -	$ -	$ -	$ 426.876
IOS ROMF	$ -	$ -	$ 3.122	$ 11.011	$ 8.353	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 22.486
IOS Professional Services	$ 57.948	$ 29.818	$ 16.762	$ 18.666	$ 25.710	$ 24.043	$ 14.597	$ -	$ -	$ -	$ -	$ -	$ 187.544
TOTAL	$ 67.034	$ 42.084	$ 50.416	$ 98.282	$ 235.956	$ 222.264	$ 28.001	$ -	$ -	$ -	$ -	$ -	$ 744.037
Finance Charges	$ -	$ -	$ -	$ 1.311	$ 7.570	$ 14.892	$ 13.950	$ 6.297	$ 6.180	$ 5.300	$ 5.228	$ 5.152	$ 65.881
GRAND TOTAL	$ 67.034	$ 42.084	$ 50.416	$ 99.593	$ 243.526	$ 237.156	$ 41.951	$ 6.297	$ 6.180	$ 5.300	$ 5.228	$ 5.152	$ 809.918

The financial analysis also addressed the costs to rehabilitate, replace, and maintain capital assets in a state of good repair. These costs are summarized in Table 2. Bus costs represent the costs for routine replacement of the current bus fleet. The life expectancy of existing large and small buses is assumed at 10 years, and at 12 years for all replacement buses. A 20 percent spare ratio was assumed. The financial analysis assumed that future bus purchases would have the same unit cost in 2005 dollars as the purchases presently under contract.

Other bus capital improvements are based on the FY03-08 capital budget, separating the program into one-time-only and recurring projects. Rail rehabilitation and replacement costs are 15 percent of variable rail operating costs and represent the funding of a reserve fund for future investment for rail infrastructure preservation.

Table 2a. Capital Improvement Program (2005-2014)

	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
MILLIONS OF YEAR-OF-EXPENDITURE (INFLATED) DOLLARS										
Signs, Benches, & Shelters, 2006-2020	$ -	$ 0.017	$ 0.012	$ 0.009	$ 0.009	$ 0.021	$ 0.013	$ 0.013	$ 0.013	$ 0.013
Signs, Benches, & Shelters, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Signs, Benches, & Shelters, no FTA Match	$ -	$ 0.030	$ -	$ 0.021	$ 0.025	$ -	$ -	$ -	$ -	$ -
Tools and Equipment, 2006-2020	$ -	$ 0.106	$ 0.109	$ 0.112	$ 0.115	$ 0.119	$ 0.122	$ 0.125	$ 0.129	$ 0.131
Tools and Equipment, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Paratransit Services, 2006-2020	$ -	$ 0.177	$ 0.181	$ 0.229	$ 0.232	$ 0.232	$ 0.184	$ 0.184	$ 0.230	$ 0.183
Paratransit Services, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Bus Technology, 2006-2020	$ -	$ -	$ 0.173	$ 0.204	$ 0.051	$ 0.046	$ 0.137	$ 0.134	$ 0.138	$ 0.140
Advanced Bus Technology, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Software, 2006-2020	$ -	$ 0.056	$ -	$ -	$ -	$ -	$ -	$ 0.066	$ -	$ -
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems I, 2006-2020	$ -	$ 0.127	$ 0.223	$ 0.541	$ 0.095	$ -	$ -	$ 0.278	$ 0.287	$ 0.292
Advanced Technology Systems I, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.204	$ -	$ -	$ -
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capital Projects 2005	$ 2.915	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL	$ 2.915	$ 0.512	$ 0.698	$ 1.115	$ 0.528	$ 0.418	$ 1.659	$ 0.800	$ 0.797	$ 0.759
MILLIONS OF BASE YEAR (2005) DOLLARS										
Signs, Benches, & Shelters, 2006-2020	$ -	$ 0.017	$ 0.011	$ 0.008	$ 0.008	$ 0.018	$ 0.011	$ 0.011	$ 0.011	$ 0.010
Signs, Benches, & Shelters, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Signs, Benches, & Shelters, no FTA Match	$ -	$ 0.029	$ -	$ 0.019	$ 0.023	$ -	$ -	$ -	$ -	$ -
Tools and Equipment, 2006-2020	$ -	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104
Tools and Equipment, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Paratransit Services, 2006-2020	$ -	$ 0.175	$ 0.173	$ 0.214	$ 0.210	$ 0.203	$ 0.158	$ 0.154	$ 0.186	$ 0.145
Paratransit Services, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Bus Technology, 2006-2020	$ -	$ -	$ 0.165	$ 0.190	$ 0.046	$ 0.040	$ 0.117	$ 0.112	$ 0.112	$ 0.112
Advanced Bus Technology, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Software, 2006-2020	$ -	$ 0.055	$ -	$ -	$ -	$ -	$ -	$ 0.055	$ -	$ -
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems I, 2006-2020	$ -	$ 0.125	$ 0.213	$ 0.505	$ 0.086	$ -	$ -	$ 0.232	$ 0.232	$ 0.232
Advanced Technology Systems I, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.033	$ -	$ -	$ -
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capital Projects 2005	$ 2.915	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL	$ 2.915	$ 0.506	$ 0.667	$ 1.040	$ 0.478	$ 0.366	$ 1.424	$ 0.669	$ 0.645	$ 0.604

Table 2b. Capital Improvement Program (2015-2024)

	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
MILLIONS OF YEAR-OF-EXPENDITURE (INFLATED) DOLLARS										
Signs, Benches, & Shelters, 2006-2020	$ 0.013	$ 0.014	$ 0.014	$ 0.014	$ 0.015	$ 0.015	$ -	$ -	$ -	$ -
Signs, Benches, & Shelters, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.015	$ 0.016	$ 0.016	$ 0.016
Signs, Benches, & Shelters, no FTA Match	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tools and Equipment, 2006-2020	$ 0.135	$ 0.139	$ 0.141	$ 0.144	$ 0.149	$ 0.152	$ -	$ -	$ -	$ -
Tools and Equipment, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.156	$ 0.160	$ 0.163	$ 0.166
Paratransit Services, 2006-2020	$ 0.184	$ 0.233	$ 0.234	$ 0.296	$ 0.300	$ 0.295	$ -	$ -	$ -	$ -
Paratransit Services, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.235	$ 0.236	$ 0.291	$ 0.232
Advanced Bus Technology, 2006-2020	$ 0.144	$ 0.148	$ 0.151	$ 0.155	$ 0.160	$ 0.163	$ -	$ -	$ -	$ -
Advanced Bus Technology, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.167	$ 0.172	$ 0.175	$ 0.178
Advanced Technology Software, 2006-2020	$ -	$ -	$ -	$ 0.077	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.088
Advanced Technology Systems I, 2006-2020	$ 0.300	$ 0.309	$ 0.314	$ 0.322	$ 0.332	$ 0.338	$ -	$ -	$ -	$ -
Advanced Technology Systems I, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.347	$ 0.357	$ 0.364	$ 0.371
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.541	$ -	$ -	$ -
Capital Projects 2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL	$ 0.777	$ 0.842	$ 0.855	$ 1.008	$ 0.955	$ 0.964	$ 2.461	$ 0.940	$ 1.008	$ 1.052
MILLIONS OF BASE YEAR (2005) DOLLARS										
Signs, Benches, & Shelters, 2006-2020	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ -	$ -	$ -	$ -
Signs, Benches, & Shelters, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.010	$ 0.010	$ 0.010	$ 0.010
Signs, Benches, & Shelters, no FTA Match	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tools and Equipment, 2006-2020	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ -	$ -	$ -	$ -
Tools and Equipment, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.104	$ 0.104	$ 0.104	$ 0.104
Paratransit Services, 2006-2020	$ 0.142	$ 0.175	$ 0.173	$ 0.214	$ 0.210	$ 0.203	$ -	$ -	$ -	$ -
Paratransit Services, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.158	$ 0.154	$ 0.186	$ 0.145
Advanced Bus Technology, 2006-2020	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ -	$ -	$ -	$ -
Advanced Bus Technology, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.112	$ 0.112	$ 0.112	$ 0.112
Advanced Technology Software, 2006-2020	$ -	$ -	$ -	$ 0.055	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.055
Advanced Technology Systems I, 2006-2020	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ -	$ -	$ -	$ -
Advanced Technology Systems I, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.232	$ 0.232	$ 0.232	$ 0.232
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.033	$ -	$ -	$ -
Capital Projects 2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL	$ 0.601	$ 0.634	$ 0.632	$ 0.728	$ 0.669	$ 0.661	$ 1.649	$ 0.612	$ 0.644	$ 0.659

Table 2c. Capital Improvement Program (2025-2034) & 30-Year Totals

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	Total
MILLIONS OF YEAR-OF-EXPENDITURE (INFLATED) DOLLARS											
Signs, Benches, & Shelters, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.203
Signs, Benches, & Shelters, 2021-2034	$ 0.017	$ 0.017	$ 0.017	$ 0.018	$ 0.018	$ 0.018	$ 0.019	$ 0.019	$ 0.020	$ 0.020	$ 0.246
Signs, Benches, & Shelters, no FTA Match	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.076
Tools and Equipment, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.927
Tools and Equipment, 2021-2034	$ 0.171	$ 0.174	$ 0.178	$ 0.182	$ 0.186	$ 0.189	$ 0.194	$ 0.197	$ 0.201	$ 0.205	$ 2.522
Paratransit Services, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.375
Paratransit Services, 2021-2034	$ 0.233	$ 0.292	$ 0.295	$ 0.373	$ 0.375	$ 0.368	$ 0.293	$ 0.291	$ 0.358	$ 0.286	$ 4.158
Advanced Bus Technology, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.944
Advanced Bus Technology, 2021-2034	$ 0.183	$ 0.186	$ 0.190	$ 0.195	$ 0.199	$ 0.203	$ 0.208	$ 0.211	$ 0.215	$ 0.220	$ 2.703
Advanced Technology Software, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.199
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ 0.100	$ -	$ -	$ -	$ -	$ 0.189
Advanced Technology Systems I, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.759
Advanced Technology Systems I, 2021-2034	$ 0.381	$ 0.387	$ 0.396	$ 0.405	$ 0.414	$ 0.422	$ 0.432	$ 0.439	$ 0.446	$ 0.457	$ 5.619
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.204
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.920	$ -	$ -	$ -	$ 3.461
Capital Projects 2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.915
TOTAL	$ 0.985	$ 1.056	$ 1.076	$ 1.174	$ 1.193	$ 1.301	$ 3.065	$ 1.157	$ 1.241	$ 1.187	$ 34.499
MILLIONS OF BASE YEAR (2005) DOLLARS											$ -
Signs, Benches, & Shelters, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.167
Signs, Benches, & Shelters, 2021-2034	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.010	$ 0.142
Signs, Benches, & Shelters, no FTA Match	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.072
Tools and Equipment, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.565
Tools and Equipment, 2021-2034	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 0.104	$ 1.460
Paratransit Services, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.736
Paratransit Services, 2021-2034	$ 0.142	$ 0.175	$ 0.173	$ 0.214	$ 0.210	$ 0.203	$ 0.158	$ 0.154	$ 0.186	$ 0.145	$ 2.403
Advanced Bus Technology, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.565
Advanced Bus Technology, 2021-2034	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 0.112	$ 1.565
Advanced Technology Software, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.166
Advanced Technology Software, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ 0.055	$ -	$ -	$ -	$ -	$ 0.111
Advanced Technology Systems I, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.021
Advanced Technology Systems I, 2021-2034	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 0.232	$ 3.253
Advanced Technology Systems II, 2006-2020	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.033
Advanced Technology Systems II, 2021-2034	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.033	$ -	$ -	$ -	$ 2.066
Capital Projects 2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.915
TOTAL	$ 0.601	$ 0.634	$ 0.632	$ 0.673	$ 0.669	$ 0.717	$ 1.649	$ 0.612	$ 0.644	$ 0.604	$ 24.239

3.2 Projected Operating Expenditures

Bus and rail operating costs were based on operating plans prepared for the Regional Rail project. Regional Rail operating costs were projected using a cost allocation model that distinguished between fixed costs, which are assumed unrelated to service levels, and variable costs directly associated with the principal rail transit cost drivers: route-miles, number of stations, peak-hour rail cars, revenue car-miles, and train-hours. Typical numbers of employees needed to provide the services proposed were determined based upon experience from other operating commuter and light rail systems. Local pay rates were then applied. Equipment needed was also estimated based upon other experienced systems. Table 3 summarizes the components of the Regional Rail operating cost model, including unit costs applied with 15-minute and 10-minute headways.

Table 3. Regional Rail Unit Operating Costs (2005 Dollars)

Driving Variable	15-MinuteHeadway	10-Minute Headway
Fixed Costs	$885,982	$987,084
Fleet Cars	$3,000	$3,000
Revenue Car-Miles	$2.31	$2.33
Revenue Train-Hours	$65.15	$65.02
Idle Train-Hours	$14.82	$14.82
Unlinked Passenger Trips	$0.05	$0.05
Track Miles	$34,193	$34,193
Total Stations	$93,095	$94,095
Maintenance Yards	$846,236	$845,405

Bus operating costs were projected using a cost allocation model that associated costs with the principal transit cost drivers: peak vehicles, revenue-hours, and revenue-miles. Table 10 presents these unit costs. The bus cost model was calibrated on the Fiscal Year 2005 actual financial statements. Bus fixed costs were assumed to grow with inflation. When Regional Rail system opens in FY09, a portion of TTA administrative cost is allocated to rail on the basis of revenue car miles, at a unit cost of $0.48 per mile. Table 4 summarizes the components of the bus operating cost model

Table 4. Bus Unit Operating Costs (2005 Dollars)

Driving Variable	Bus
Fixed costs	$1,878,863
Peak vehicles	$18,178
Vehicle revenue miles	$1.95
Vehicle revenue hours	$37.36

Paratransit operating costs were assumed to be $79.75 per service hour, and van pool operating costs were assumed to be $0.80 per revenue vehicle mile.

Exhibit 2, below, summarizes the growth in bus vehicle revenue hours over the 30-year analysis period. TTA operated 90,600 revenue hours of bus service in FY05 and has budgeted the same in FY06. Service is projected to remain at this level through FY10, when service is expected to grow slightly to 101,000 hours with a switch to an entirely large-bus fleet. Service is projected to remain at that level through FY16. From FY17 to FY22 service is projected to grow incrementally to 124,700 hours, the design year level-of-service, and level out. Peak vehicles and vehicle revenue miles are projected to grow proportionately.

Exhibit 2. Bus, Rail, and Paratransit Vehicle Revenue Hours (Millions)

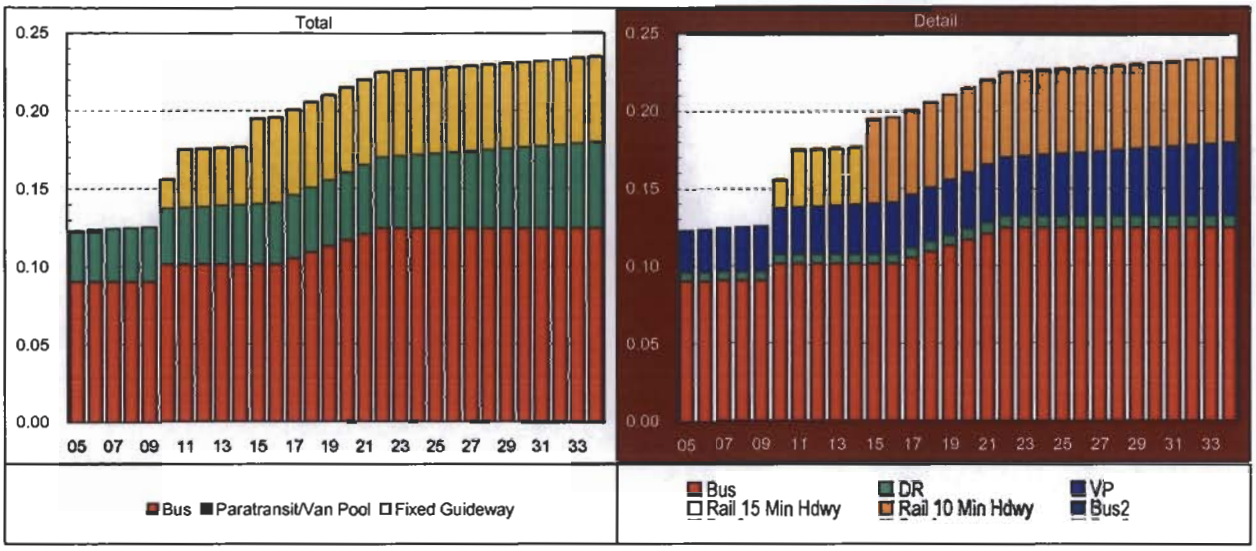


Exhibit 3, below, summarizes the growth rail operating cost drivers. The system opens with 12 stations and 28 route miles in late 2009, which represents a half-year of service in FY10. Peak cars, car revenue miles, and train revenue hours have two service levels: for the Initial Operating Segment (in FY10) and for 10-minute service (in FY15).

Exhibit 3. Regional Rail Level of Service

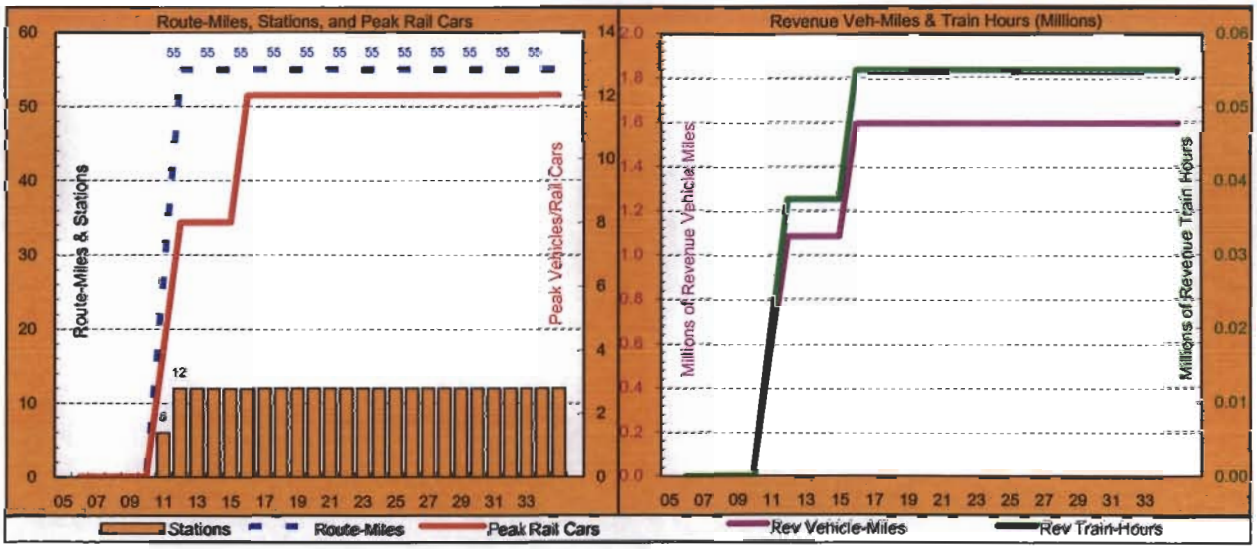


Table 5 summarizes the projections of design year operating costs for bus, Regional Rail, and Paratransit in 2005 and year-of-expenditure dollars.

Table 5. 2030 Operating Cost (Millions of Dollars)

	Millions 2005 $	Millions YOE $
Bus	$10.43	$18.93
Regional Rail	$11.76	$21.34
Paratransit	$0.59	$1.08
Van Pool	$1.43	$2.59
Total	$24.21	$43.93

3.3 Projected Capital Revenue Sources

The following funding sources were assumed in the financial plan:

- Federal Transit Administration (FTA) Grants.
  - Section 5309 New Starts. These discretionary funds are assumed to fund 59.9 percent of the capital cost of the Regional Rail project (including finance charges related to this project incurred prior to the 5309 New Starts funding commitment). While the statutory maximum federal participation for Section 5309 New Starts funds is 80 percent, the actual amount applied in recent New Starts projects has been considerably less. This has occurred because the demand for these funds significantly exceeds their availability, and projects with a lower percentage of federal participation are viewed more favorably for funding.

    If New Starts grants were to be received by TTA concurrent with expenditures, the peaked drawdown of construction expenditures (particularly for the segment of the project from Ninth Street to Government Center) would result in federal funds being received at a rate exceeding $100 million in the peak year. It is recognized that few New Starts projects have received annual appropriations at such a high rate and even a sustained flow of New Starts funded in excess of $75 million is not common. There is no regulation or formal guidance, however, regarding the rate of appropriation to expect. In this analysis, annual Full Funding Grant Agreement reimbursements are assumed capped at $55 million annually.

  - Section 5309 Bus Related. These discretionary funds are applied to the purchase of buses and bus-related assets, and are assumed to cover up to 80 percent of these costs for the Regional Rail project, subject to an annual cap of $3 million.

  - Federal Aid Formula Funds. In addition to Section 5309 New Starts and Bus Related funding, FTA provides financial support to TTA through the Section 5307 Urbanized Area Formula Funds. FTA is projected to provide Section 5309 Rail Modernization funds to TTA seven years after each segment of a new fixed guideway transit project enters service. TTA anticipates a total of $249.0 million from these funding programs in the next 30 years. (The estimated annual amounts of the formulas funding coefficients is shown in Tables 8 and 9) This is based on TTA's projected operating level of service indicators, the basis for which formula funds are disbursed to transit agencies, as well as a projection of formula grant coefficients.

    Formula grant coefficients were projected on the basis of a detailed analysis of the historical trends in federal formula grant programs, the trend in growth in transit level-of-service (basis upon which grants are apportioned to Urbanized Areas), and funding levels in the Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users (SAFETEA-LU) federal surface transportation program reauthorization which became law in August 2005. The projection assumes that current tiered system of Section 5307 Urbanized Area Formula Funds and Section 5309 Rail Modernization funding is continued throughout the 30-year period of analysis.

    In SAFETEA-LU, the average annual increase in Section 5307 Urbanized Area Formula Program disbursements is 6.2 percent, while the average annual increase in the Section 5309 Fixed Guideway Modernization Program is 6.3 percent, and generally tracks with growth in appropriations for these programs since the Intermodal Surface Transportation Efficiency Act (ISTEA) took effect in 1992. Growth in appropriations for the Urbanized Area Formula Program and Fixed Guideway Modernization Program between 1984 and 2009 (as legislated in SAFETEA-LU) is illustrated in Exhibits 4 and 5, respectively.

    Exhibit 6 illustrates the change in Section 5307 unit grant amounts over time. Between 1997 and 2004, the period of the expiring surface transportation authorization legislation, the

Transportation Equity Act for the 21st Century (TEA-21), all unit grant amounts averaged negative annual growth with the exception of the bus operations incentive grant[1].

At the same time that Congress plans to increase funds for these programs, trends indicate that the bases over which these funds are apportioned will grow as well. Exhibit 7 tracks the growth in revenue vehicle mile and incentive tier variables between 1984 and 2000, while Exhibit 8 shows the growth in fixed guideway route miles. Note that during reporting years 1991, 1992, 1993, and 1994, purchased transportation (PT) operating data was not reported to NTD. In addition, data from 1986 and 1987 are unreliable due to data collection issues, so these years are excluded from the graph as well as the formula funds analysis. Notwithstanding limited data during these periods, there is steady growth in most of these indicators, as illustrated in Exhibit 9. The coefficients associated with non-fixed guideway vehicle revenue miles, fixed guideway vehicle revenue miles, and fixed guideway directional route-miles reflect the growth in the quantity of service provided over time. The trend in the formula coefficients (adjusted for the overall appropriations of the 5307 and 5309 programs) and in the NTD data for these drivers was in general alignment in the year-to-year changes. Depending on the driver, the size of the bases over which the funds are apportioned grow at rates less than the growth in appropriations.

There has been a significant drop in the population and population times density coefficients in 2003, resulting from the growth in the size and number of Urbanized Areas (UZAs), as defined by the U.S. Census Bureau. It is assumed that similar reductions (about 19 percent) will occur again in 2013 and 2023 following decennial censuses.

[1] It should be noted that due to limitations in publicly available National Transit Database information, calculations of incentive tier funding by Urbanized Zone Area (UZA) are close but not exact, capturing passenger miles and operating costs of only the first three UZAs for agencies serving more than one UZA.

Exhibit 4. Section 9/Section 5307 Urbanized Area Formula Program: Growth in Appropriations, 1996-2009

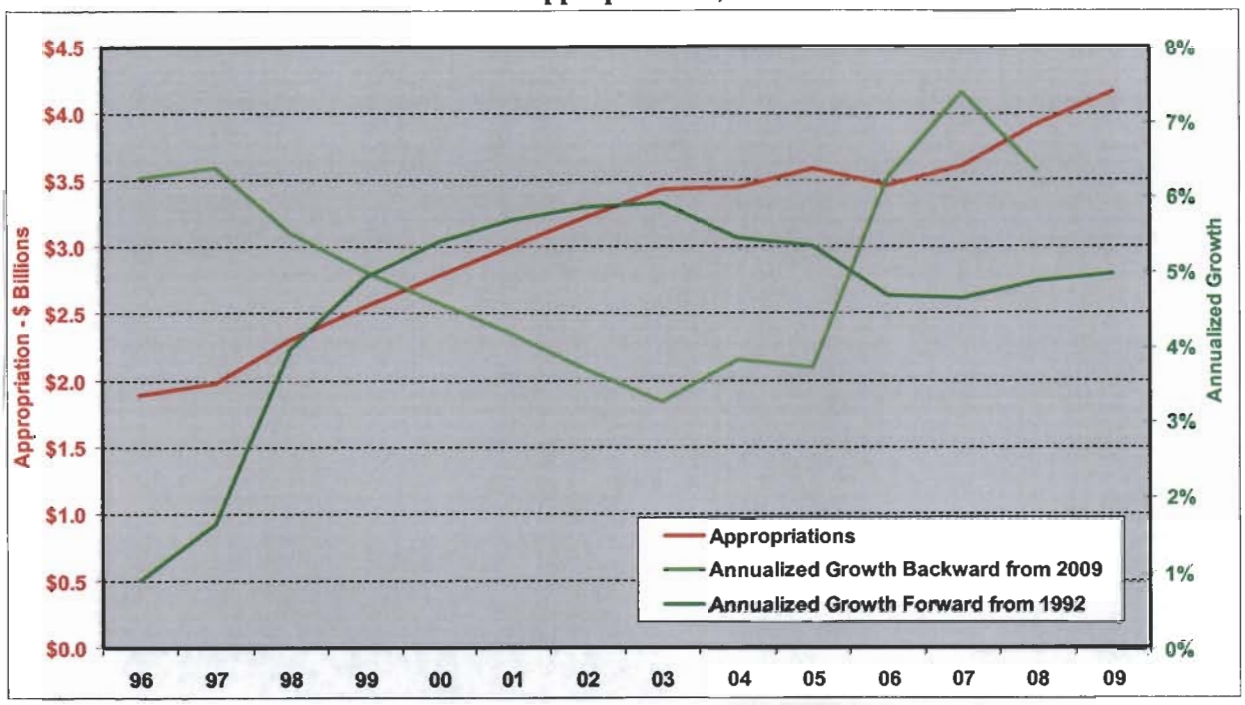


Exhibit 5. Section 3/Section 5309 Fixed Guideway Modernization Program: Growth in Appropriations, 1996-2009

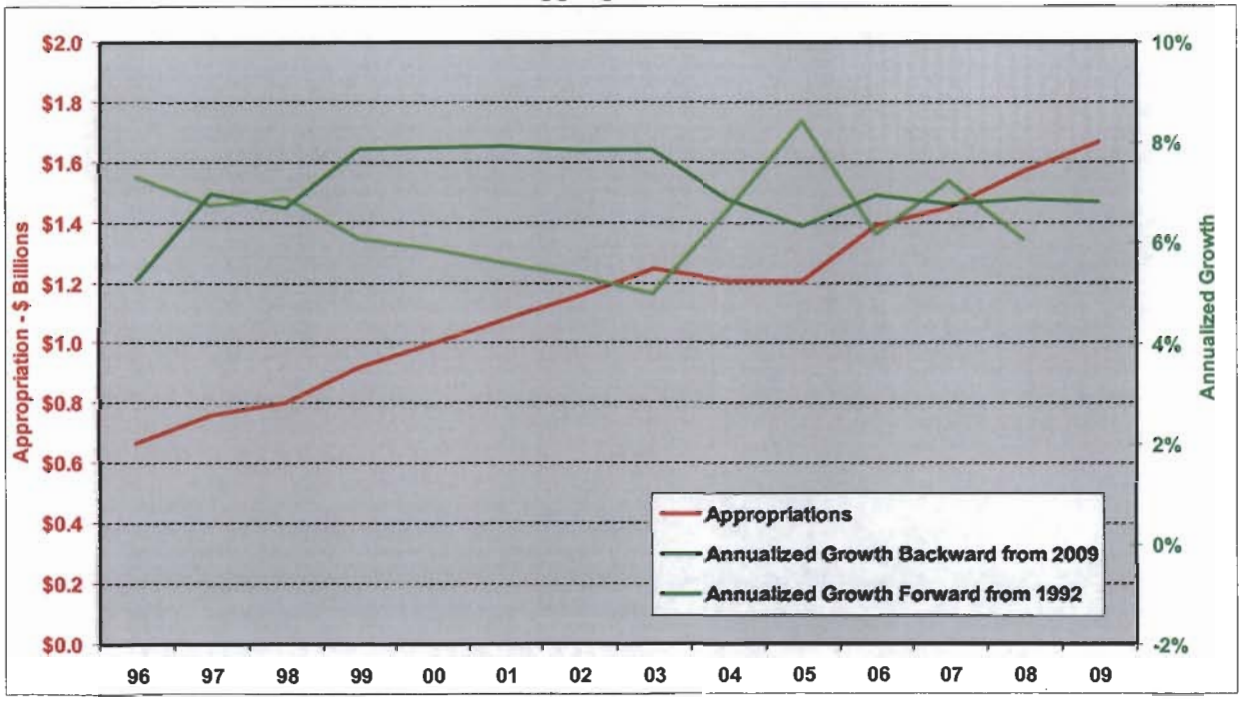


Exhibit 6. Annual Growth in 5307 Unit Grants Normalized for Program Growth, 1997-2004

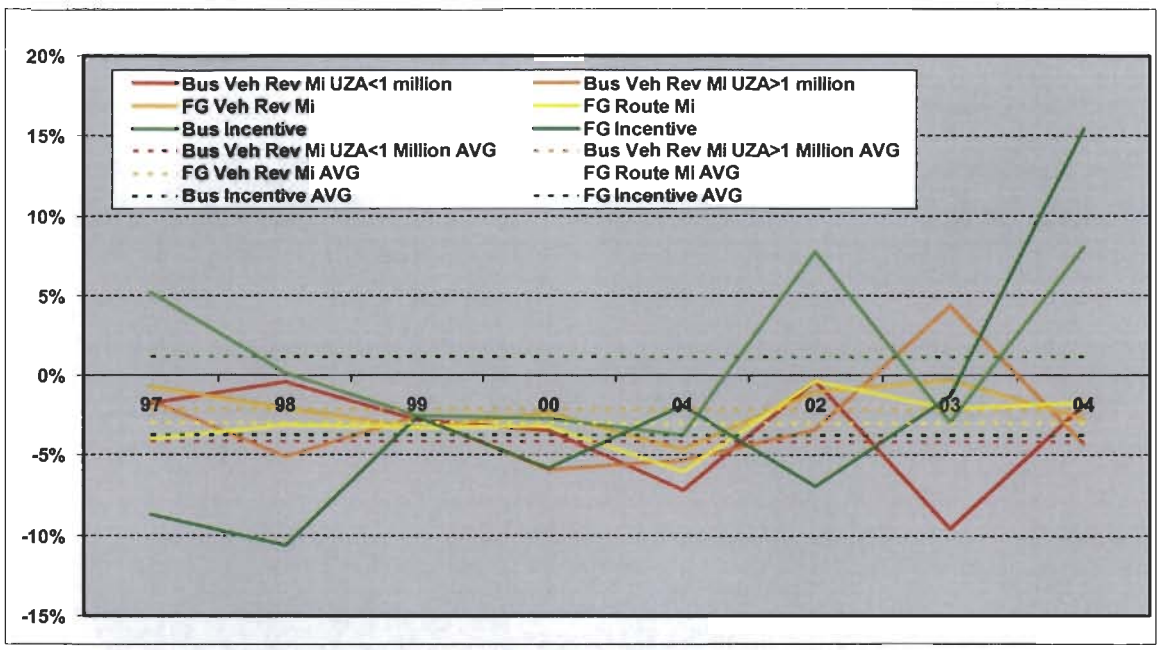


Exhibit 7. Trends in NTD Revenue Vehicle Mile and Incentive Tier Variables, 1984-2000

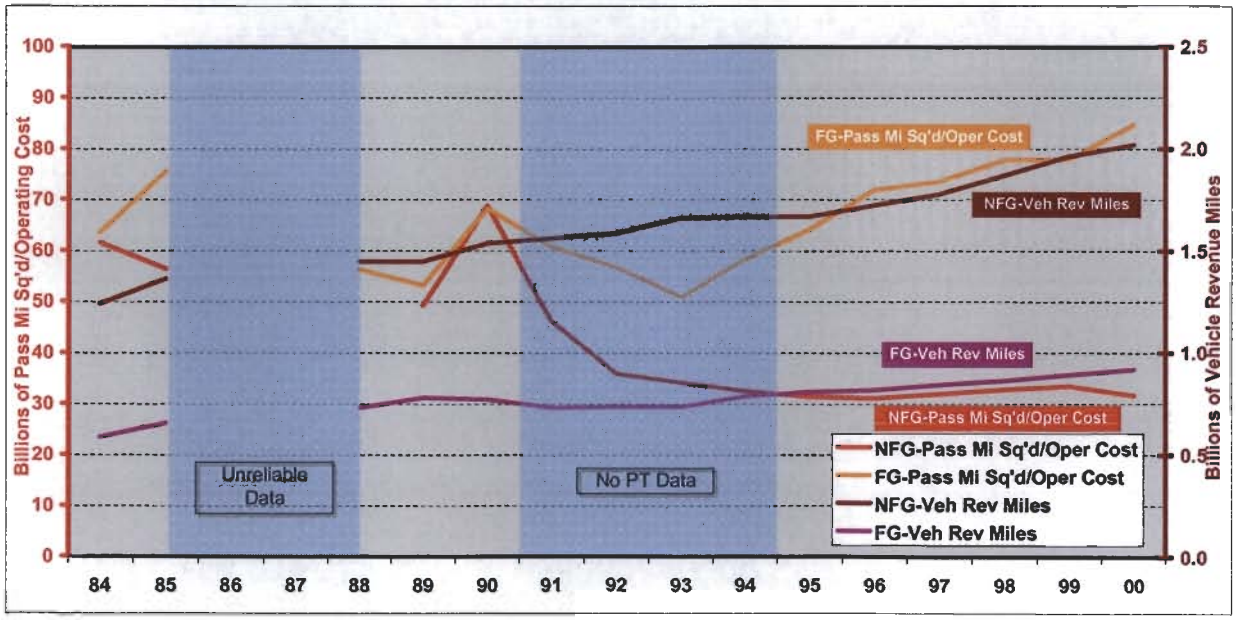


Exhibit 8. Trend in NTD Fixed Guideway Route Miles, 1984-2000

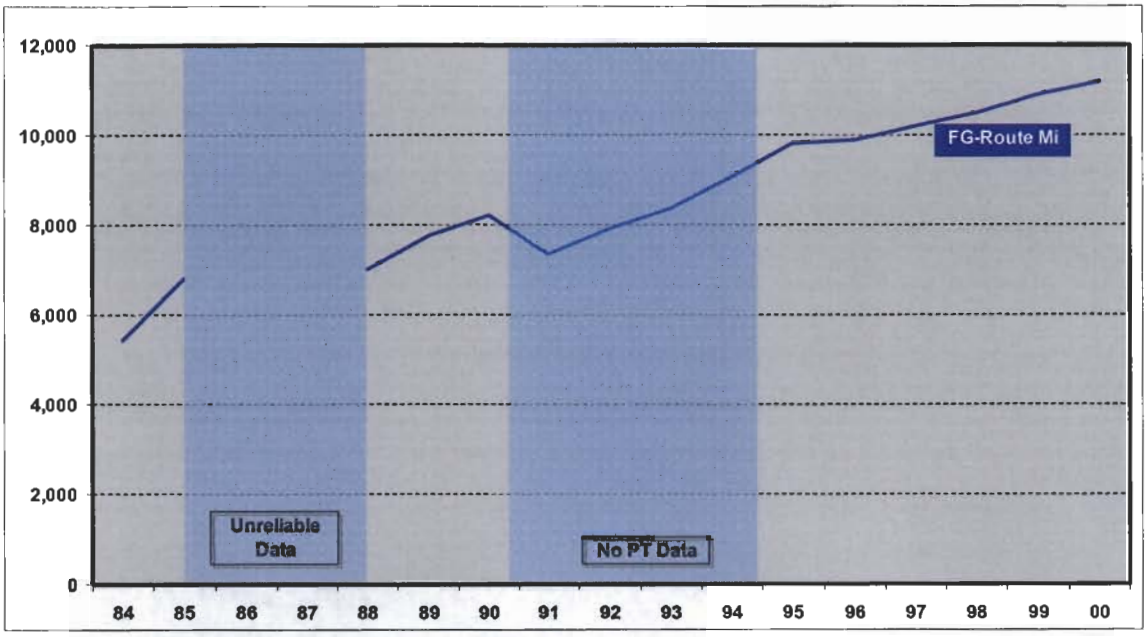
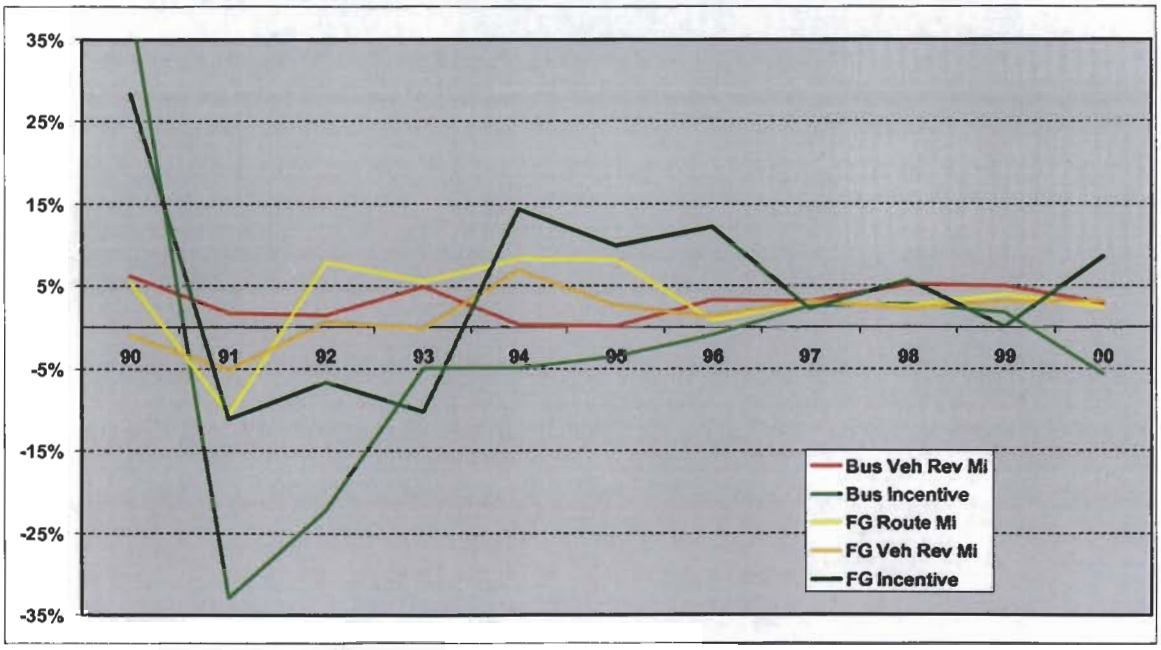


Exhibit 9. Annual Growth in 5307 Drivers as Measured in NTD, 1990-2000



The projected grant coefficients resulting from this analysis are reported in Tables 8 and 9.

Table 6. Section 5307 Urbanized Area Formula Program
Projected Grant Coefficients, 2005-2034

	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
$/Population	$2.773	$2.675	$2.783	$3.018	$3.210	$3.376	$3.549	$4.073	$4.282	$4.503	$4.735	$4.979	$5.235	$5.505	$5.788
$/Population x Density	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.002	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001
$/Bus Vehicle Revenue Mile	$0.538	$0.519	$0.540	$0.585	$0.623	$0.655	$0.689	$0.547	$0.575	$0.604	$0.636	$0.668	$0.703	$0.739	$0.777
$/Fixed GdwyVeh Rev-Mile	$0.611	$0.590	$0.613	$0.665	$0.708	$0.744	$0.783	$0.823	$0.865	$0.910	$0.957	$1.006	$1.058	$1.112	$1.170
$/Fixed Gdwy Rte-Mi ($000)	$34.32	$33.12	$34.45	$37.36	$39.74	$41.79	$43.94	$46.21	$48.59	$51.09	$53.72	$56.49	$59.40	$62.46	$65.67
$/Bus Pax-Mi^2/Op Cost	$0.007	$0.007	$0.007	$0.008	$0.008	$0.009	$0.009	$0.010	$0.010	$0.011	$0.011	$0.012	$0.013	$0.013	$0.014
$/Rail Pax-Mi^2/Op Cost	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001	$0.001
	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
$/Population	$6.087	$6.400	$6.730	$7.076	$7.441	$7.824	$8.227	$8.651	$9.097	$9.565	$10.058	$10.576	$11.121	$11.694	$12.296
$/Population x Density	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.003	$0.003	$0.003	$0.003	$0.003
$/Bus Vehicle Revenue Mile	$0.817	$0.859	$0.903	$0.950	$0.999	$1,050	$1,104	$1.161	$1.221	$1.284	$1.350	$1.420	$1.493	$1.570	$1.650
$/Fixed GdwyVeh Rev-Mile	$1.230	$1.293	$1.360	$1.430	$1.503	$1.581	$1.662	$1.748	$1.838	$1.933	$2.032	$2.137	$2.247	$2.363	$2.485
$/Fixed Gdwy Rte-Mi ($000)	$69.06	$72.61	$76.35	$80.29	$84.42	$88.77	$93.34	$98.15	$103.21	$108.53	$114.12	$119.99	$126.18	$132.67	$139.51
$/Bus Pax-Mi^2/Op Cost	$0.015	$0.015	$0.016	$0.017	$0.018	$0.019	$0.020	$0.021	$0.022	$0.023	$0.024	$0.025	$0.027	$0.028	$0.030
$/Rail Pax-Mi^2/Op Cost	$0.001	$0.001	$0.001	$0.001	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.002	$0.003

Table 7. Section 5309 Fixed Guideway Modernization Program
Projected Grant Coefficients, 2005-2034

		FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Tier 1	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Tier 2	$/Vehicle Revenue-Mile	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164
	$/Fxd Gdwy Dir Rte-Mile	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773
Tier 3	$/Vehicle Revenue-Mile	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006
	$/Fxd Gdwy Dir Rte-Mile	$168.8	$168.8	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830
Tier 4	$/Vehicle Revenue-Mile	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137
	$/Fxd Gdwy Dir Rte-Mile	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833
Tier 5	$/Vehicle Revenue-Mile	$0.078	$0.087	$0.092	$0.098	$0.105	$0.096	$0.088	$0.080	$0.073	$0.067	$0.061	$0.056	$0.051	$0.047	$0.043
	$/Fxd Gdwy Dir Rte-Mile	$2,492	$2,751	$2,924	$3,130	$3,332	$3,064	$2,818	$2,592	$2,384	$2,193	$2,017	$1,855	$1,707	$1,570	$1,444
Tier 6	$/Vehicle Revenue-Mile	$0.064	$0.071	$0.075	$0.080	$0.086	$0.078	$0.072	$0.065	$0.060	$0.055	$0.050	$0.046	$0.042	$0.038	$0.035
	$/Fxd Gdwy Dir Rte-Mile	$2,034	$2,246	$2,387	$2,555	$2,720	$2,501	$2,301	$2,116	$1,946	$1,790	$1,647	$1,515	$1,393	$1,281	$1,179
Tier 7	$/Vehicle Revenue-Mile	$0.500	$0.541	$0.563	$0.590	$0.614	$0.644	$0.676	$0.709	$0.744	$0.780	$0.818	$0.859	$0.901	$0.945	$0.991
	$/Fxd Gdwy Dir Rte-Mile	$15,901	$17,047	$17,594	$18,294	$18,910	$19,679	$20,480	$21,313	$22,180	$23,082	$24,021	$24,998	$26,015	$27,073	$28,174
Total	$/Vehicle Revenue-Mile	$0.949	$1.004	$1.036	$1.075	$1.111	$1.125	$1.142	$1.161	$1.183	$1.208	$1.236	$1.267	$1.300	$1.336	$1.375
	$/Fxd Gdwy Dir Rte-Mile	$33,202	$34,818	$35,679	$36,754	$37,735	$38,019	$38,373	$38,795	$39,285	$39,839	$40,459	$41,142	$41,888	$42,698	$43,571

		FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Tier 1	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Tier 2	$/Vehicle Revenue-Mile	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164	$0.164
	$/Fxd Gdwy Dir Rte-Mile	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773	$4,773
Tier 3	$/Vehicle Revenue-Mile	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006	$0.006
	$/Fxd Gdwy Dir Rte-Mile	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830	$168.830
Tier 4	$/Vehicle Revenue-Mile	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137	$0.137
	$/Fxd Gdwy Dir Rte-Mile	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833	$7,833
Tier 5	$/Vehicle Revenue-Mile	$0.039	$0.036	$0.033	$0.030	$0.027	$0.025	$0.023	$0.021	$0.019	$0.018	$0.016	$0.015	$0.013	$0.012	$0.011
	$/Fxd Gdwy Dir Rte-Mile	$1,328	$1,221	$1,123	$1,033	$950	$874	$804	$739	$680	$626	$575	$529	$487	$448	$412
Tier 6	$/Vehicle Revenue-Mile	$0.032	$0.029	$0.027	$0.025	$0.022	$0.020	$0.019	$0.017	$0.016	$0.014	$0.013	$0.012	$0.011	$0.010	$0.009
	$/Fxd Gdwy Dir Rte-Mile	$1,084	$997	$917	$843	$776	$714	$656	$604	$555	$511	$470	$432	$397	$365	$336
Tier 7	$/Vehicle Revenue-Mile	$1.040	$1.091	$1.144	$1.200	$1.259	$1.321	$1.386	$1.453	$1.524	$1.599	$1.677	$1.760	$1.846	$1.936	$2.031
	$/Fxd Gdwy Dir Rte-Mile	$29,320	$30,513	$31,754	$33,046	$34,390	$35,789	$37,245	$38,760	$40,337	$41,978	$43,685	$45,463	$47,312	$49,236	$51,239
Total	$/Vehicle Revenue-Mile	$1.417	$1.462	$1.510	$1.561	$1.615	$1.673	$1.733	$1.798	$1.866	$1.937	$2.013	$2.093	$2.177	$2.266	$2.358
	$/Fxd Gdwy Dir Rte-Mile	$44,506	$45,506	$46,569	$47,697	$48,891	$50,151	$51,480	$52,878	$54,347	$55,888	$57,505	$59,198	$60,970	$62,824	$64,761

- Local Funds, including State Funds.
  - NC DOT grants matching 5309 New Starts: NC DOT grants comprised of a legislative appropriation and state CMAQ funds will total $161.9 million of the construction cost of the Regional Rail project. Revenue is assumed to be accelerated in FY07 and FY08 and the balance appropriated proportionate to the Federal FFGA thereafter.
  - NC DOT grants matching Section 5309 Bus and Bus Related: NC DOT grants are assumed to match 10 percent of the cost of buses, and two CIP projects: tools and equipment and the 2005 technology capital project.
  - NC DOT grants matching Section 5307 Urbanized Area Formula Grants: NC DOT provides a small annual matching grant on federal Section 5307 Urbanized Area Formula Grants.
  - TTA Regional Taxes. TTA has two dedicated revenue sources. The first source is a $5.00 annual tax on registered motor vehicles. These revenues are assumed to grow with the baseline rate of inflation (the Consumer Price Index projection by Economy.com, dated August 2005). This

source funds all remaining Regional Rail project revenue needs not fulfilled by federal and state revenues and bond proceeds.

The second source is a five percent tax on rental vehicle receipts. Rental vehicle tax revenues are estimated using a regression model of the 12-month rolling average of TTA monthly receipts from July 1998 through May 2005. This revenue source is projected to grow with Raleigh-Durham MSA Disposable Personal Income (DPI) as projected by Economy.com in August 2005 and enplanements at RDU Airport as projected by John F. Brown Company, Inc in 2005. Monthly rental vehicle tax receipts have been volatile over the past four years. The regression examined various formulations; the best r-squared results occurred with the following regression:

Annual rental vehicle tax revenue = $200,515 + (DPI * 2.945E-06) + (Enplanements * 0.771)

- Interest income from year-end cash balances. Interest earnings are applied to the operating program, as interest income offsets TTA tax revenue that would otherwise be applied to operations, thus better leveraging dedicated revenues.

- Other Funds.
  - Joint Development. The $65 million shown over four years in this financial plan represents a planned initial return on the equity investment that TTA will make in a joint development partnership with its designated master developer, Cherokee Investment Group, LLP. The parties have agreed in concept to a development partnership that will include significant transit-oriented development at each of the 12 station sites on the 28-mile long regional rail system. The parties are currently negotiating the term sheet that will detail the legal and financial agreement between them.

Table 8 summarizes project capital funding sources, their respective share of total project capital cost funding.

Table 8. Sources of Capital Funding (YOE $ millions)

Sources of Funds	Total $ Millions	Total %
Federal Sources		
Section 5309 New Starts	$485.356	59.9%
Total Federal Funds	***$485.356***	***59.9%***
State and Local Sources		
State – Appropriation	$149.852	18.5%
State – CMAQ/Grant 1	$8.000	1.0%
State – CMAQ/Grant 2	$4.000	0.5%
Tax Revenue	$74.934	9.3%
Bond Proceeds	$87.776	10.8%
Total State and Local Funds	***$324.562***	***40.1%***
Total Project Budget	**$809.918**	**100%**

3.4 Projected Operating Revenue Sources

The following funding sources were assumed in the financial plan:

- Federal Transit Administration (FTA) Grants.
  - Section 5307 Urbanized Area Formula. As described above, these funds are based on projected service level, ridership, and operating costs. A portion of these funds are applied to preventative maintenance, effectively funding the TTA operating budget.

- North Carolina Department of Transportation (NCDOT). State operating assistance comes from the State Maintenance Assistance Program (SMAP). This program made $31.7 million available statewide in FY2005, and is allocated based on amount of service, use of service, the relative efficiency of providing the services, and the local commitment to funding service. Specifically, the funding is provided as follows:

  - $9.5 million (30% of total) based on vehicle revenue hours, but adjusted for performance relative to the statewide weighted average of unlinked passenger trips per vehicle revenue hour

  - $9.5 million (30% of total) based on passenger trips, but adjusted for performance relative to the statewide weighted average of net cost per unlinked passenger trip

  - $9.5 million (30% of total) based on the system's local share as a percentage of statewide local share commitment – the local share includes farebox revenue, other operating revenues and local government assistance to the system

  - $3.2 million (10% of total) based on allocating an equal share to each urban, small urban and regional transit system in the state

  The funding approach and funding amounts indicated above are based on the state FY 2005 budget. The approach and amount available could change in the future. The FY 2005 level of support is actually higher than the guaranteed level of support ($24.0 million) due to the availability of additional Highway Trust Fund dollars for the SMAP program. Funding for TTA in FY05 was $2.53 million, but TTA's guaranteed funding for FY06 is only $1.8 million.

Projected operating assistance from SMAP for TTA is assumed to grow proportionate to in bus and rail service revenue miles, unlinked passenger trips, and locally funded revenues (for each of the three major components of SMAP) and (beginning in FY06) with the size of SMAP statewide appropriations, which are assumed to grow with inflation.

- TTA Regional Taxes: As described above, TTA dedicated funding comes from a tax on registered vehicles and on rental cars. A portion of these revenues are applied to operations, the balance is applied as cash or for debt service to fund the capital program.
- Transit Related Revenues.
  - Passenger Revenues. Annual ridership and fare revenue were projected based on current experience and on modeled results for the opening and design years. Table 9 summarizes key ridership, cash fare, and average fare paid information. Given a fare increase in March 2005, the TTA cash fare averaged $1.67 in FY05 and the average fare paid per unlinked trip was $1.03, or 61.8 percent of the cash fare (38.2 percent discount). The travel demand analysis assumes that the current cash fare is $1.50 in 1995 dollars. This is $1.9085 in 2005 dollars; the average fare paid would be $1.1795 in 2005 dollars after the derived discount is applied. Thus, the current average fare paid is lower than the average fare paid assumed in the travel demand analysis.

    The travel demand analysis assumes the bus cash fare will be $2.00 in 1995 dollars when the IOS opens. It is assumed that the discount increases—i.e., the average fare is assumed to be a smaller share of the cash fare—when Regional Rail service begins. A cash fare of $2.00 in 1995 is equivalent to $2.5446 in 2005 dollars; the average fare paid in the design year is assumed to be $1.2733 in 2005 dollars or 50 percent of the cash fare.

    The travel demand analysis assumes a zonal fare system for rail, with fares ranging from $1.00 to $3.00 in 1995 dollars, depending on distance traveled. With the zonal fare structure, the average rail cash fare in the design year will be $1.45 in 1995 dollars. This is equivalent to $1.8448 in 2005 dollars; the average rail fare paid in the design year is assumed to be $1.0069 in 2005 dollars or 55 percent of the cash fare.

Table 9. Derivation of Average Fare Paid

		Model Assumption for Bus		for Rail
	Year $	2005	2030	2030
Fare Revenue	2005 $	$777,678	$2,921,240	$3,111,804
Boardings		754,834	2,294,139	3,090,522
Average Fare	2005 $	$ 1.0303	$ 1.2733	$ 1.0069
Cash Fare		$ 1.6667	$ 2.5446	$ 1.8448
Average Discount		61.8%	50.0%	55.0%
Average Fare	1995 $	$ 0.8098	$ 1.0000	$ 0.7975
Cash Fare		$ 1.3100	$ 2.0000	$ 1.4500

TTA plans to raise fares to the level assumed in the travel demand analysis by the opening year of the IOS. TTA raised its cash fare for bus from $1.50 to $2.00 in March 2005. This fare increase is reflected in the financial analysis model, with one-third of the annual fare revenue impact from the fare increase reflected in FY05, and two-thirds reflected in FY06. Thereafter, fares are assumed to increase every two years with inflation. In other words, after FY06, fares are assumed to remain unchanged in real terms.

Exhibit 10, below, summarizes the trend in average fare paid in YOE and base year dollars. Bus fares are higher than rail fares because of the longer average trip length on TTA regional bus services than on Regional Rail.

Exhibit 10. Average Fare Paid per Passenger by Market

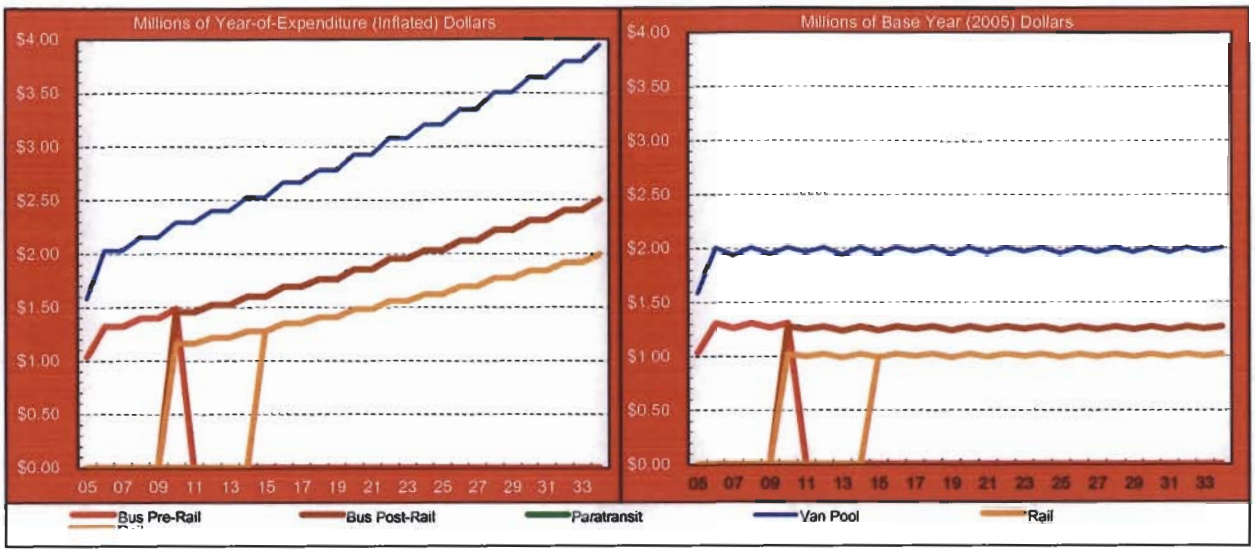
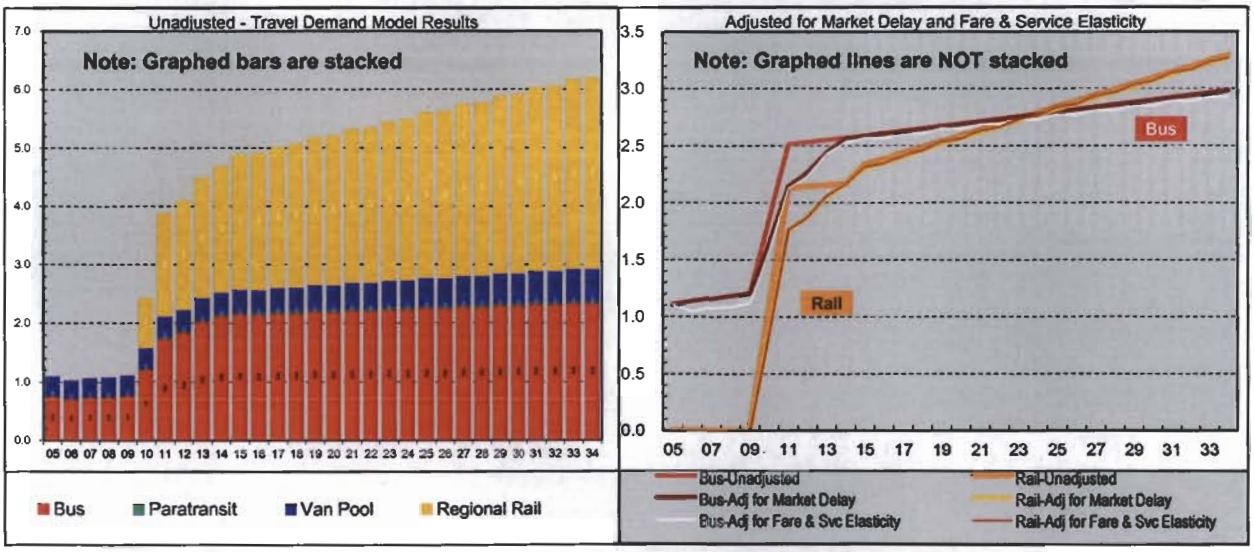


Exhibit 11, below, summarizes the annual TTA ridership projected in the travel demand annual and the adjustments made to account for fare increases and delayed market response.

Exhibit 11. Projected Ridership (Millions)

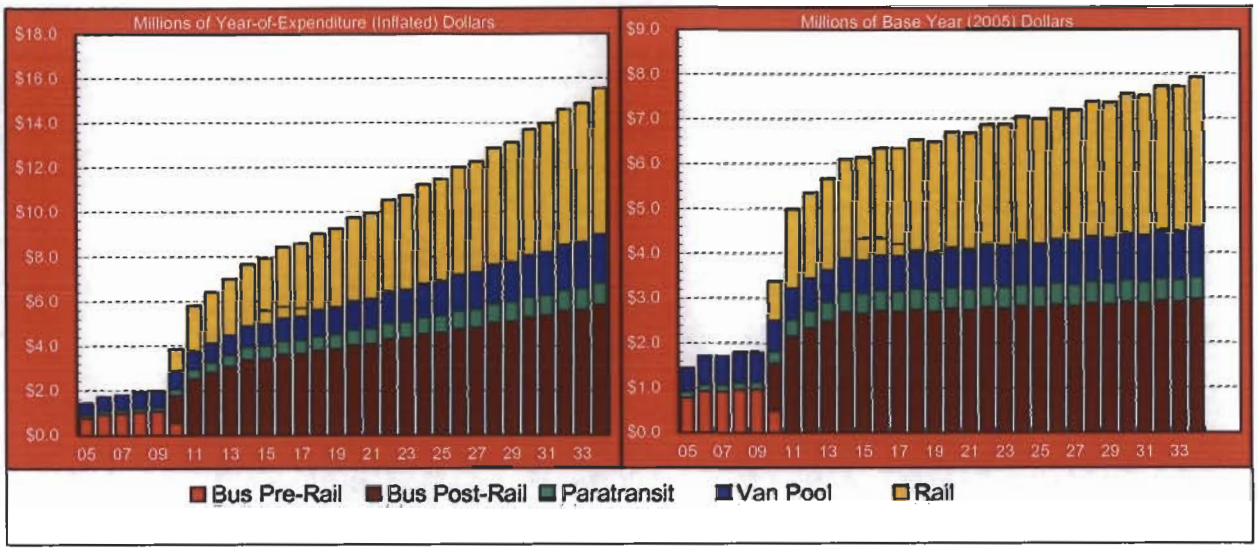


Beginning in the opening year, TTA ridership will substantially increase as a result of the introduction of Regional Rail service, the reorientation of many routes by the other local bus operators as feeders to Regional Rail, and the re-orientation and expansion of TTA express bus services. Growth in ridership from the opening year to the design year takes into consideration the following factors:

- **Demographic growth:** ridership is assumed to grow proportionate with regional population.
- **Fare increases:** Fares grow with inflation, adjusted every other year. In years that fares do not change, ridership increases marginally because fares are declining in real terms. The result is a "sawtooth" pattern in projected ridership and fare revenues.

Exhibit 12, below, summarizes the projected annual fare revenue for TTA bus and rail in year-of-expenditure dollars and base year dollars.

Exhibit 12. Fare Revenue



Fares are assumed to grow at the rate of inflation, with adjustments occurring every two years. Rail fares in the opening year are based on the travel demand model assumptions, adjusted for baseline inflation. Rail fares then grow at the baseline rate of inflation, adjusted every two years. In constant dollars, the average rail fare in 2030 matches the value derived from the travel demand analysis. The impacts of these fare increases on projected ridership were taken into account by assuming a fare elasticity of -0.3; that is, for each fare increase of one percent ridership would be expected to fall by 0.3 percent.

- Other Transit Related. These revenues include revenue from specialized services and other minor sources based on TTA's Fiscal Year 2005 budget values adjusted for inflation. Other transit revenues also includes advertising revenues. It is assumed that TTA would begin an advertising program in FY10, the year that the Regional Rail line begins operation. Revenues were based on the average advertising revenue per passenger experienced by similar transit agencies. Revenues are assumed to grow with the number of passengers and inflation. The representative transit systems considered are those that reported advertising revenue in the National Transit Database (as "Auxiliary Revenues" line 406 in Form 201) and operated new light rail, heavy rail, and commuter rail systems. Only bus and rail passengers were included in the determination of the average; vanpool and demand response passengers were not considered.

- Interest on prior year-end cash balance. Interest earnings are applied to capital or operating programs or a combination of both in a way most favorable to coverage. Beginning in FY17, 50 percent of interest from year-end cash balances is applied to the capital program, with the remainder applied to the operating program. Interest calculations are based on Economy.com projected rates for 3-month treasury bills.

3.5 Forms of Debt Financing

The financial analysis revealed that the projected revenue sources described in Section 3.3 would not be sufficient to cover project costs on a pay-as-you-go (cash) basis for the Regional Rail project. The financial analysis, therefore, considered conventional and innovative debt financing techniques recently and currently applied by U.S. transit agencies to advance major transit investments to implementation. In

addition, the analysis considered financing approaches under consideration by other transit agencies at a stage in the New Starts planning process similar to the Regional Rail project.

- Tax-Exempt Commercial Paper (TECP). The use of short-term debt in the form of TECP provides the opportunity to reduce near term financing costs, thereby improving debt service coverage ratios and thus increasing financial capacity. These advantages arise because debt instruments of shorter maturity have lower interest rates than longer-term debt. A portion of the borrowing requirement in each year was specified as TECP. The TECP was assumed to have an interest rate 1.3 percent below the 20-year Bond Buyer Index. At the end of four years, each annual issue of TECP was partially repaid with state and federal New Starts grant reimbursements, with the remainder refinanced into conventional bonds. Tax-exempt commercial paper was used by the Dallas Area Rapid Transit to help finance its light rail system, and is currently used by the Metropolitan Atlanta Rapid Transit Authority.

- Conventional Bonds. Dedicated revenue bonds were applied in the financial analysis to cover the difference between capital funding needs and resources. These are simple mortgage bonds with level combined principal and interest payments over a 30-year term. Interest payments were based on Economy.com projections of the 20-year Bond Buyer Index and the historic yield curve relationship of 20- and 30-year interest rates. The financial feasibility of debt financing was assured by maintaining the debt service coverage ratio above the acceptable floors defined in Section 2. Conventional long-term bonds are the most common technique used by transit agencies to leverage dedicated funding sources.

Table 10 summarizes the 30-year sources and uses of capital and operating funds. The 30-year analysis begins in FY 2005 and concludes in FY 2034. The expenditures for constructing the Regional Rail project, exclusive of interest costs, are assumed to occur between FY 2005 and FY 2010.

Table 10. TTA Sources & Uses of Capital and Operating Funds (2005-2034)

(Year of Expenditure Dollars in Millions) Fiscal Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CAPITAL SOURCES OF FUNDS										
Tax Applied First to Operations Surplus	$7.95	$9.02	$10.01	$8.80	$11.02	$7.27	$4.15	$4.70	$7.70	$10.60
Capital Only Sources	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Grants										
Sec 5307 Applied to Other Capital Projects	$2.15	$0.41	$0.56	$0.89	$0.42	$0.33	$1.33	$0.64	$0.64	$0.61
Sec 5307 Project-Specific	$0.00	$0.11	$0.09	$0.11	$0.11	$0.10	$0.10	$0.10	$0.10	$0.10
Sec 5307 Planning	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sec 5309 New Starts	$22.04	$22.90	$18.00	$45.00	$61.00	$55.00	$55.00	$55.00	$55.00	$55.00
Sec 5309 Bus Related	$0.00	$0.01	$2.57	$2.63	$2.71	$1.61	$1.63	$1.68	$0.01	$0.01
Sec 5309 Rail Modernization	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CMAQ/Bus	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CMAQ/New Start	$0.00	$1.97	$1.64	$5.96	$2.34	$0.08	$0.00	$0.00	$0.00	$0.00
State/Bus	$2.58	$0.24	$0.75	$1.07	$0.55	$0.32	$1.49	$0.72	$0.47	$0.48
State/New Start	$11.58	$9.81	$20.80	$44.26	$29.05	$20.62	$0.00	$0.00	$0.00	$0.00
Joint Development	$0.00	$0.00	$0.00	$10.00	$20.00	$20.00	$15.00	$0.00	$0.00	$0.00
Subtotal Grants	$38.35	$35.45	$44.40	$109.92	$116.19	$98.05	$74.55	$58.14	$56.22	$56.20
Interest on General Fund (Capital)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest on Prior Year TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Service Sinking Fund Transfer	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Real Estate Reserve	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Financing Program										
Construction Tax Exempt Commercial Paper	$0.00	$0.00	$24.44	$150.57	$112.30	$0.00	$0.00	$0.00	$0.00	$0.00
Conventional Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$25.25	$62.53	$0.00	$0.00
Subtotal Financing Program	$0.00	$0.00	$24.44	$150.57	$112.30	$0.00	$25.25	$62.53	$0.00	$0.00
TOTAL CAPITAL SOURCES OF FUNDS	$46.30	$44.47	$78.86	$269.30	$239.51	$105.32	$103.95	$125.36	$63.92	$66.80
CAPITAL USES OF FUNDS										
Regional Rail										
IOS ROW Acquisition/Real Estate	$12.15	$13.87	$14.80	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Durham North Parking Garage	$0.00	$1.76	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Demolition	$0.00	$0.49	$2.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Railcars	$0.00	$5.20	$12.83	$28.13	$6.75	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Construction Total	$0.12	$9.21	$38.91	$173.76	$191.47	$13.40	$0.00	$0.00	$0.00	$0.00
IOS ROMF	$0.00	$3.12	$11.01	$8.35	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Professional Services	$29.82	$16.76	$18.67	$25.71	$24.04	$14.60	$0.00	$0.00	$0.00	$0.00
Rail Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.81	$1.65	$1.69	$1.74	$1.77
Subtotal Regional Rail	$42.08	$50.42	$98.28	$235.96	$222.26	$28.81	$1.65	$1.69	$1.74	$1.77
Other Capital Programs										
Buses	$0.00	$0.00	$3.20	$3.28	$3.38	$1.99	$2.03	$2.08	$0.00	$0.00
Other CIP	$2.92	$0.51	$0.70	$1.12	$0.53	$0.42	$1.66	$0.80	$0.80	$0.76
Planning	$0.58	$0.59	$0.61	$0.62	$0.64	$0.66	$0.68	$0.69	$0.72	$0.73
Total Other Capital Programs	$3.50	$1.10	$4.51	$5.02	$4.55	$3.07	$4.36	$3.58	$1.51	$1.49
Financing Program										
Principal	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33	$1.10	$1.17	$1.24
Interest	$0.00	$0.00	$1.26	$7.27	$14.67	$13.95	$5.97	$5.37	$5.30	$5.23
Refinanced Principal from Constr/Rail Car TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$24.44	$150.57	$112.30	$0.00	$0.00
Refinanced (Defeased) Future Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Reissuance of Cumulative TECP	$0.00	$0.00	$0.00	$0.05	$0.34	$0.56	$0.56	$0.51	$0.22	$0.00
Surety	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.08	$0.19	$0.00	$0.00
Debt Issuance	$0.00	$0.00	$0.05	$0.29	$0.22	$0.00	$0.25	$0.63	$0.00	$0.00
Debt Service Reserve Fund	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Financing Program	$0.00	$0.00	$1.31	$7.62	$15.23	$38.95	$157.77	$120.10	$6.69	$6.47
TOTAL CAPITAL USES OF FUNDS	$45.58	$51.51	$104.10	$248.59	$242.05	$70.83	$163.78	$125.36	$9.95	$9.73
NET CAPITAL CASH FLOW	$0.72	($7.04)	($25.25)	$20.71	($2.54)	$34.49	($59.83)	$0.00	$53.97	$57.07
OPERATING SOURCES OF FUNDS										
Tax Applied First to Operations	$4.01	$3.38	$2.76	$4.33	$2.51	$6.69	$10.16	$10.01	$7.48	$4.95
Passenger Revenue	$1.45	$1.74	$1.80	$1.92	$1.99	$3.85	$5.81	$6.40	$7.00	$7.65
Other Transit Related	$0.88	$0.89	$0.92	$0.94	$0.97	$1.12	$1.21	$1.25	$1.31	$1.34
State Maintenance Assistance Program	$2.53	$1.80	$2.11	$2.29	$2.56	$2.68	$2.80	$3.77	$4.79	$5.03
FTA Sec 5307 Preventative Maintenance	$0.00	$1.36	$1.16	$0.88	$1.43	$1.59	$0.65	$2.17	$3.70	$3.84
Interest on Capital Reserve	$1.52	$1.55	$2.17	$0.74	$1.92	$1.85	$2.90	$0.47	$0.53	$2.38
TOTAL OPERATING SOURCES OF FUNDS	$10.39	$10.72	$10.92	$11.10	$11.38	$17.76	$23.53	$24.07	$24.82	$25.19
OPERATING USES OF FUNDS										
Bus	$9.08	$9.37	$9.51	$9.64	$9.85	$10.70	$10.84	$11.06	$11.35	$11.50
Paratransit	$0.45	$0.45	$0.47	$0.48	$0.49	$0.55	$0.56	$0.57	$0.59	$0.60
Van Pool	$0.86	$0.89	$0.94	$0.98	$1.04	$1.09	$1.14	$1.19	$1.25	$1.30
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$5.42	$10.99	$11.25	$11.62	$11.80
Fixed Costs Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other Operating Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OPERATING USES OF FUNDS	$10.39	$10.72	$10.92	$11.10	$11.38	$17.76	$23.53	$24.07	$24.82	$25.19
NET OPERATING CASH FLOW	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CASH BALANCES										
General Fund Balance										
Beginning Cash Balance	$48.74	$49.46	$42.42	$17.18	$37.88	$35.34	$69.83	$10.00	$10.00	$63.97
Additions (Deletions) to Cash	$0.72	($7.04)	($25.25)	$20.71	($2.54)	$34.49	($59.83)	$0.00	$53.97	$57.07
Ending Cash Balance	$49.46	$42.42	$17.18	$37.88	$35.34	$69.83	$10.00	$10.00	$63.97	$121.05
Debt Service Sinking Fund										
Opening Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Contributions:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Interest on Prior Year Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
- Excess Fund Amount	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
= Closing Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

(Year of Expenditure Dollars in Millions) Fiscal Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CAPITAL SOURCES OF FUNDS										
Tax Applied First to Operations Surplus	$11.54	$13.22	$12.42	$14.30	$14.44	$13.34	$13.69	$14.51	$12.15	$13.34
Capital Only Sources	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Grants										
Sec 5307 Applied to Other Capital Projects	$0.62	$0.67	$0.68	$0.00	$0.00	$0.00	$0.49	$0.00	$0.00	$0.00
Sec 5307 Project-Specific	$0.11	$0.11	$0.11	$0.12	$0.12	$0.12	$0.00	$0.00	$0.00	$0.00
Sec 5307 Planning	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sec 5309 New Starts	$21.58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sec 5309 Bus Related	$0.01	$0.01	$0.01	$0.01	$3.51	$3.58	$3.65	$2.14	$2.18	$2.22
Sec 5309 Rail Modernization	$0.00	$0.00	$1.88	$2.77	$2.79	$2.84	$3.60	$2.93	$3.03	$3.10
CMAQ/Bus	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CMAQ/New Start	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
State/Bus	$0.49	$0.50	$0.51	$0.59	$0.98	$1.00	$2.60	$1.04	$1.11	$1.15
State/New Start	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Joint Development	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Subtotal Grants	$22.81	$1.30	$3.20	$3.49	$7.39	$7.53	$10.35	$6.11	$6.31	$6.47
Interest on General Fund (Capital)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest on Prior Year TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Service Sinking Fund Transfer	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Real Estate Reserve	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Financing Program										
Construction Tax Exempt Commercial Paper	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Conventional Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Subtotal Financing Program	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL CAPITAL SOURCES OF FUNDS	$34.35	$14.52	$15.62	$17.79	$21.83	$20.87	$24.04	$20.62	$18.46	$19.81
CAPITAL USES OF FUNDS										
Regional Rail										
IOS ROW Acquisition/Real Estate	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Durham North Parking Garage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Demolition	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Railcars	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Construction Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS ROMF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IOS Professional Services	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Rail Rehabilitation & Replacement	$2.32	$2.38	$2.41	$3.46	$3.48	$3.55	$4.50	$3.67	$3.78	$3.87
Subtotal Regional Rail	$2.32	$2.38	$2.41	$3.46	$3.48	$3.55	$4.50	$3.67	$3.78	$3.87
Other Capital Programs										
Buses	$0.00	$0.00	$0.00	$0.00	$4.37	$4.46	$4.57	$2.67	$2.72	$2.78
Other CIP	$0.78	$0.84	$0.85	$0.00	$0.00	$0.00	$0.61	$0.00	$0.00	$0.00
Planning	$0.75	$0.77	$0.78	$0.80	$0.83	$0.84	$0.87	$0.89	$0.91	$0.93
Total Other Capital Programs	$1.53	$1.61	$1.64	$0.80	$5.20	$5.30	$6.04	$3.56	$3.63	$3.70
Financing Program										
Principal	$1.32	$1.40	$1.49	$1.58	$1.67	$1.78	$1.30	$0.00	$0.00	$0.00
Interest	$5.15	$5.07	$4.99	$4.89	$4.80	$4.70	$3.39	$0.00	$0.00	$0.00
Refinanced Principal from Constr/Rail Car TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Refinanced (Defeased) Future Debt	$0.00	$0.00	$0.00	$21.82	$0.00	$0.00	$14.87	$53.72	$0.00	$0.00
Reissuance of Cumulative TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Surety	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Issuance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Service Reserve Fund	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Financing Program	$6.47	$6.47	$6.47	$28.29	$6.47	$6.47	$19.56	$53.72	$0.00	$0.00
TOTAL CAPITAL USES OF FUNDS	$10.32	$10.46	$10.52	$32.56	$15.15	$15.32	$30.10	$60.95	$7.41	$7.57
NET CAPITAL CASH FLOW	$24.04	$4.05	$5.11	($14.77)	$6.68	$5.55	($6.07)	($40.33)	$11.05	$12.23
OPERATING SOURCES OF FUNDS										
Tax Applied First to Operations	$4.46	$3.27	$4.48	$3.05	$3.45	$5.01	$5.15	$4.89	$7.74	$7.06
Passenger Revenue	$7.93	$8.42	$8.59	$9.04	$9.25	$9.76	$9.96	$10.54	$10.74	$11.24
Other Transit Related	$1.39	$1.43	$1.47	$1.50	$1.56	$1.59	$1.63	$1.68	$1.72	$1.76
State Maintenance Assistance Program	$5.48	$5.77	$5.84	$6.05	$6.26	$6.39	$6.63	$6.82	$7.02	$7.19
FTA Sec 5307 Preventative Maintenance	$3.95	$4.01	$4.52	$5.33	$5.51	$5.69	$5.51	$6.19	$6.40	$6.60
Interest on Capital Reserve	$5.99	$7.05	$5.89	$6.89	$7.28	$6.04	$6.93	$7.22	$4.39	$4.83
TOTAL OPERATING SOURCES OF FUNDS	$29.20	$29.96	$30.78	$31.87	$33.30	$34.47	$35.82	$37.35	$38.01	$38.67
OPERATING USES OF FUNDS										
Bus	$11.77	$12.03	$12.59	$13.24	$14.03	$14.73	$15.51	$16.37	$16.63	$16.89
Paratransit	$0.62	$0.64	$0.67	$0.72	$0.77	$0.81	$0.86	$0.91	$0.93	$0.95
Van Pool	$1.36	$1.43	$1.49	$1.56	$1.64	$1.71	$1.79	$1.88	$1.96	$2.04
Regional Rail	$15.46	$15.87	$16.03	$16.35	$16.86	$17.22	$17.67	$18.19	$18.49	$18.80
Fixed Costs Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other Operating Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OPERATING USES OF FUNDS	$29.20	$29.96	$30.78	$31.87	$33.30	$34.47	$35.82	$37.35	$38.01	$38.67
NET OPERATING CASH FLOW	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CASH BALANCES										
General Fund Balance										
Beginning Cash Balance	$121.05	$145.08	$149.14	$154.24	$139.47	$146.15	$151.71	$145.64	$105.31	$116.36
Additions (Deletions) to Cash	$24.04	$4.05	$5.11	($14.77)	$6.68	$5.55	($6.07)	($40.33)	$11.05	$12.23
Ending Cash Balance	$145.08	$149.14	$154.24	$139.47	$146.15	$151.71	$145.64	$105.31	$116.36	$128.59
Debt Service Sinking Fund										
Opening Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Contributions:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Interest on Prior Year Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
- Excess Fund Amount	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
= Closing Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

(Year of Expenditure Dollars in Millions) Fiscal Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2005-2034
CAPITAL SOURCES OF FUNDS											
Tax Applied First to Operations Surplus	$15.13	$15.04	$17.02	$18.66	$19.83	$20.60	$23.37	$23.49	$25.74	$27.78	$420.84
Capital Only Sources	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Grants											
Sec 5307 Applied to Other Capital Projects	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$10.45
Sec 5307 Project-Specific	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.60
Sec 5307 Planning	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sec 5309 New Starts	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$465.52
Sec 5309 Bus Related	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4.55	$4.62	$5.78	$0.00	$45.13
Sec 5309 Rail Modernization	$3.11	$3.20	$3.28	$3.42	$3.47	$3.60	$5.08	$3.60	$3.72	$3.74	$59.15
CMAQ/Bus	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CMAQ/New Start	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$12.00
State/Bus	$0.81	$0.88	$0.89	$0.98	$0.99	$1.09	$3.24	$1.53	$1.91	$0.98	$31.95
State/New Start	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$136.11
Joint Development	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$65.00
Subtotal Grants	$3.92	$4.08	$4.17	$4.39	$4.47	$4.69	$12.87	$9.76	$11.41	$4.72	$426.92
Interest on General Fund (Capital)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest on Prior Year TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Debt Service Sinking Fund Transfer	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Real Estate Reserve	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Financing Program											
Construction Tax Exempt Commercial Paper	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$287.32
Conventional Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$87.78
Subtotal Financing Program	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$375.09
TOTAL CAPITAL SOURCES OF FUNDS	$19.05	$19.12	$21.19	$23.05	$24.29	$25.29	$36.25	$33.25	$37.16	$32.49	$1,622.85
CAPITAL USES OF FUNDS											
Regional Rail											
IOS ROW Acquisition/Real Estate	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$40.82
IOS Durham North Parking Garage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.76
IOS Demolition	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2.55
IOS Railcars	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$52.91
IOS Construction Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$426.88
IOS ROMF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$22.49
IOS Professional Services	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$129.60
Rail Rehabilitation & Replacement	$3.89	$4.01	$4.10	$4.27	$4.34	$4.50	$6.35	$4.50	$4.65	$4.67	$86.35
Subtotal Regional Rail	$3.89	$4.01	$4.10	$4.27	$4.34	$4.50	$6.35	$4.50	$4.65	$4.67	$763.36
Other Capital Programs											
Buses	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5.69	$5.78	$8.84	$0.00	$57.83
Other CIP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$13.28
Planning	$0.95	$0.97	$0.99	$1.01	$1.03	$1.05	$1.08	$1.10	$1.12	$1.14	$25.32
Total Other Capital Programs	$0.95	$0.97	$0.99	$1.01	$1.03	$1.05	$6.77	$6.88	$9.96	$1.14	$96.44
Financing Program											
Principal	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$14.38
Interest	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$92.01
Refinanced Principal from Constr/Rail Car TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$287.32
Refinanced (Defeased) Future Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$90.41
Reissuance of Cumulative TECP	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2.25
Surety	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.26
Debt Issuance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.44
Debt Service Reserve Fund	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Financing Program	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$488.08
TOTAL CAPITAL USES OF FUNDS	$4.84	$4.97	$5.09	$5.28	$5.38	$5.55	$13.11	$11.37	$14.61	$5.81	$1,347.88
NET CAPITAL CASH FLOW	$14.21	$14.15	$16.10	$17.77	$18.92	$19.73	$23.13	$21.88	$22.55	$26.68	$274.97
OPERATING SOURCES OF FUNDS											
Tax Applied First to Operations	$5.86	$6.47	$5.07	$4.06	$3.51	$3.32	$1.22	$1.72	$0.12	($1.21)	$134.95
Passenger Revenue	$11.48	$12.02	$12.25	$12.88	$13.13	$13.71	$13.98	$14.60	$14.86	$15.53	$269.51
Other Transit Related	$1.82	$1.85	$1.90	$1.94	$2.00	$2.03	$2.09	$2.13	$2.18	$2.22	$46.72
State Maintenance Assistance Program	$7.51	$7.71	$8.05	$8.31	$8.65	$8.92	$9.28	$9.52	$9.89	$10.18	$181.84
FTA Sec 5307 Preventative Maintenance	$6.76	$6.93	$7.10	$7.27	$7.45	$7.63	$7.82	$8.01	$8.20	$8.40	$146.07
Interest on Capital Reserve	$6.33	$5.47	$7.03	$7.94	$8.47	$8.33	$10.65	$9.85	$11.53	$12.65	$166.79
TOTAL OPERATING SOURCES OF FUNDS	$39.75	$40.44	$41.39	$42.42	$43.21	$43.93	$45.03	$45.82	$46.77	$47.78	$945.88
OPERATING USES OF FUNDS											
Bus	$17.31	$17.57	$17.94	$18.33	$18.65	$18.93	$19.35	$19.64	$20.00	$20.39	$434.80
Paratransit	$0.97	$0.99	$1.01	$1.04	$1.06	$1.08	$1.10	$1.12	$1.14	$1.17	$23.77
Van Pool	$2.13	$2.21	$2.30	$2.40	$2.50	$2.59	$2.70	$2.79	$2.89	$3.00	$53.06
Regional Rail	$19.33	$19.67	$20.14	$20.65	$21.00	$21.34	$21.88	$22.26	$22.73	$23.22	$434.25
Fixed Costs Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other Operating Adjustments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OPERATING USES OF FUNDS	$39.75	$40.44	$41.39	$42.42	$43.21	$43.93	$45.03	$45.82	$46.77	$47.78	$945.88
NET OPERATING CASH FLOW	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CASH BALANCES											
General Fund Balance											
Beginning Cash Balance	$128.59	$142.80	$156.95	$173.05	$190.83	$209.7	$229.5	$252.6	$274.5	$297.0	
Additions (Deletions) to Cash	$14.21	$14.15	$16.10	$17.77	$18.92	$19.73	$23.13	$21.88	$22.55	$26.68	$274.97
Ending Cash Balance	$142.80	$156.95	$173.05	$190.83	$209.74	$229.48	$252.61	$274.49	$297.04	$323.72	
Debt Service Sinking Fund											
Opening Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Contributions:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
+ Interest on Prior Year Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
- Excess Fund Amount	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
= Closing Reserve Fund Balance	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	

The financial analysis utilized capital financial indicators that are commonly applied in developing financial plans utilizing tax-exempt municipal securities to determine "success." The application of these methods was intended to structure the financial plan in a conservative way, addressing the typical concerns of credit analysts and investment bankers.

Debt service coverage is the most common test of financial feasibility applied in debt financing. Simply stated, it is the minimum value in each year across the 30-year analysis period of the ratio of projected tax revenue divided by projected debt service. The following two specific tests used to evaluate the financial feasibility of the Regional Rail project are:

- Gross Coverage Test. This is the ratio of current year dedicated revenues divided by current year debt service plus debt service for bonds to be issued in the current year. The values of this debt service coverage measure for the Regional Rail project is relatively high and therefore not an issue.

- Net Coverage Test. This is a variation of the gross coverage test in which the portion of the current year dedicated revenues applied to operations is subtracted from current dedicated revenues before dividing by current year debt service plus debt service for bonds to be issued in the current year.

Exhibit 13 summarizes the projected debt service coverage ratios for the Regional Rail project. The net debt service coverage ratio is sufficiently above the target minimum of 1.0, and the gross coverage ratio is sufficiently above its target minimum of 2.0, in each year of the analysis. The net coverage ratio falls sharply in FY16, a function of a final federal New Start grant payment that is less than $55 million, but remains higher than 2.0, more than twice the target minimum ratio.

Exhibit 13. Gross and Net Debt Service Coverage Ratios

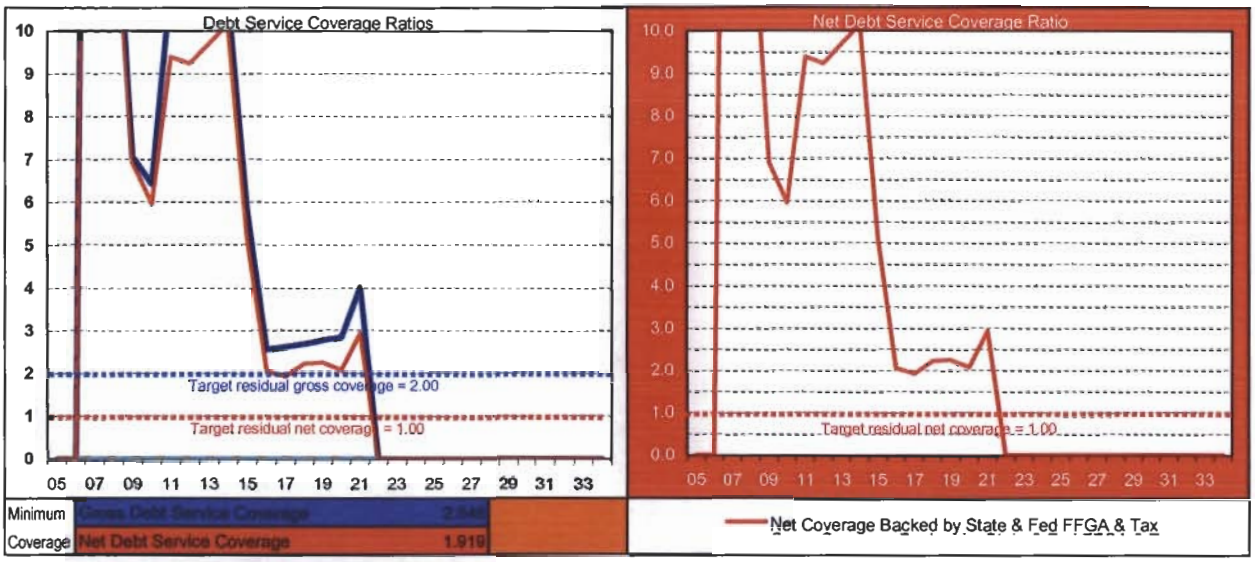


Exhibit 14, below, indicates TTA's annual fiscal year-end cash balance throughout the duration of this model, while Exhibit 15 illustrates principal outstanding in each fiscal year. Note that the financial analysis assumes that TTA defeases all bonded debt issued to pay for the Regional Rail project by 2021, ten years after issuance and following full receipt of federal New Starts grant monies.

Exhibit 14. Year-End Cash Balance and Required Working Capital

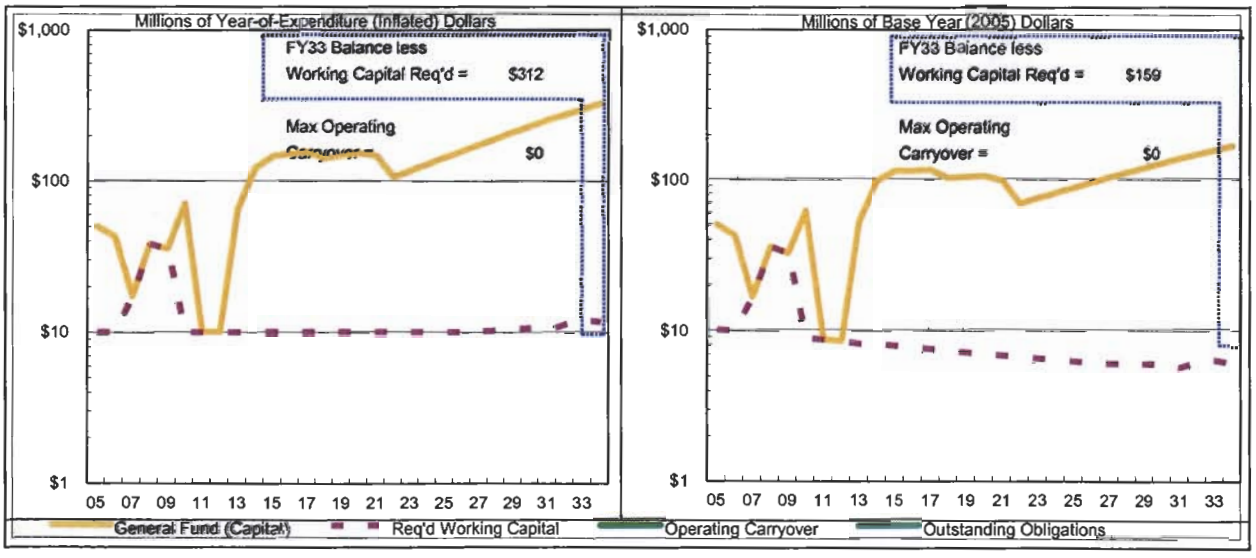
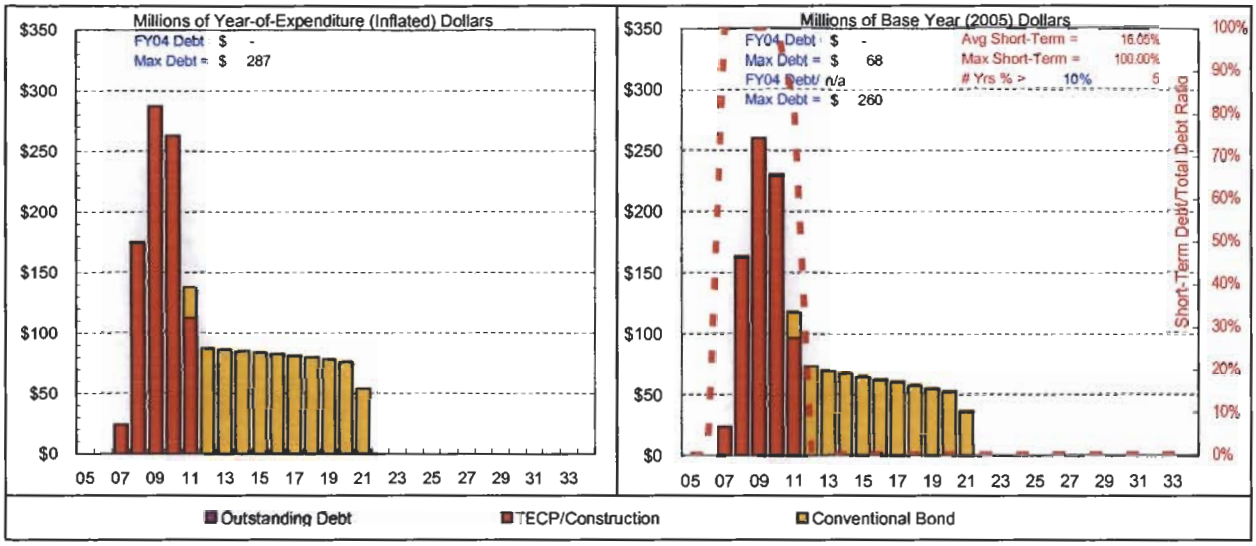


Exhibit 15. Principal Outstanding and Short Term Financing as a Percentage of Total Debt



4. Risks and Uncertainties

Introduction

Decision makers committing public resources to large-scale infrastructure investments must be informed as to the likely range of financial results that may occur. For this reason, a risk analysis is undertaken to explore the range of possible outcomes in the financial analysis. It must be recognized that the achievement of any financial projection may be affected by fluctuating economic conditions and depends on the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from point estimates and the variations could be material.

There are a number of uncertainty variables that cannot be directly controlled by management and governing bodies. These include inflation; interest rates; construction costs; rider-ship; and federal, state, and local grant funding levels. Undertaking a risk analysis reveals the combinations of management actions that result in financial outcomes that provide for the feasible implementation of the project, even in the more pessimistic of futures. Feasibility is measured by a set of politically and commercially acceptable strategies that result in favor-able values for specific measures such as a minimum debt service coverage.

Uni-dimensional "sensitivity tests" are often insufficient in their depth of analysis because they implicitly assume that only one uncertainty variable changes at a time. More sophisticated risk analyses are structured to permit the examination of the simultaneous varying of all uncertainty variables. One type of risk analysis that has been demonstrated to work well in the financial analysis of transportation investments is the "Monte Carlo" simulation. In 100 or more iterations of the financial analysis model, the risk variables are randomly varied based upon their pre-determined range of possible values. In contrast to traditional forecasts of worst case, expected case, and best case scenarios, the results of the risk analysis provides a continuum, or probability distribution of potential project financing out-comes that reflect all possible combinations of risk variable values.

The most significant advantage of more comprehensive risk analyses over simple point values of the most likely result is the opportunity to improve the understanding and "buy-in" by decision makers of the underlying assumptions as well as the results of the analysis.

The context of the results can be phrased as follows: "With this set of underlying assumptions, management actions result in an X percent likelihood that the financial plan will be feasible. If management actions are adjusted, the result improves to a Y percent likelihood of feasibility". Because the values of the un-certainty variables are randomly selected using an approximation of a normal distribution function, the results of the risk analysis are expressed in statistical terms. A convenient

measure is the range of outcomes within one standard deviation of the mean, that is, the lower and upper values of roughly 67 percent of the outcomes closest to the most likely value. Thus, roughly 33 percent of the outcomes fall outside this range; roughly 16 percent higher and 16 percent lower. Similarly, two standard deviations capture roughly 95 percent of the outcomes; roughly 2.5 percent falling above and 2.5 percent below this range.

Applying the example above, the Monte Carlo simulation can provide the following finding: "With this set of management actions(construction schedule, level of taxation, transit service growth), there is a 16 percent (1-in-6) probability that the minimum level of debt service coverage (e.g. 1.50) will not be achieved. If construction is delayed by x years or if the level of taxation is raised to y percent, there is a 2.5 percent (1-in-40) probability of not achieving a coverage of 1.50."

When the analysis is conducted with close interaction between analysts and decision makers, an acceptable set of underlying assumptions regarding uncertainty variables and management actions can be agreed upon. Risk analysis is therefore both an analytical technique and a process for reaching agreement leading to project implementation. The continuum of risk outcomes is structured to lead decision makers through a set of logical alter-native scenarios which examine alternative implementation schedules, levels of taxation, rates of service growth, and other management actions.

Risk analysis provides the context to obtain "buy-in" from stakeholders, including decision makers and the public, by providing the opportunity for the stakeholders to identify key uncertainty variables and to establish the "shape" of the uncertainty functions. The financial analysis is repeated until consensus is reached regarding the adequacy of the financial indicators and the probability of achieving desired results. Successful completion of the risk analysis results in a financially con-strained plan that meets local requirements and, particularly in the case of debt financing, meets the requirements of the capital markets.

Risk Variables

The following risk variables were identified in the financial analysis:

- **Economic forecasts:** The following national forecasts were prepared by Economy.com in August 2003:
    - **Consumer Price Index:** used to drive right-of-way and equipment capital costs, wages and salaries, fringes, parts, and other operating costs, fares, other operating revenues, to drive rental car tax income
    - **Petroleum Prices:** used to drive diesel fuel costs
    - **Construction Prices:** used to drive costs for maintenance yard, line, stations, trackwork (the average of the Engineering News-Record Building Cost Index and Construction Cost Index)
    - **Bond Buyer 20 Index:** basis for long-term interest rate for conventional bonds and short-term interest rate for tax-exempt commercial paper
    - **3-Month T-Bill Interest:** basis for interest income from cash balances

  For each of the above seven projections, the variance between the baseline and pessimistic forecast and the variance between the baseline and optimistic forecast was computed in each analysis year. In order to minimize the number of risk variables (which is important because the number of correlations tracked by the analysis is a function of the number of risk variables squared), the risk analysis considered the average baseline-to-pessimistic and baseline-to-optimistic variances in 6 multi-year intervals. In order to capture the near-term details of the Economy.com forecasts, the following intervals were applied in the analysis: FY05; FY06; FY07; FY08; FY09-FY19 average; and FY20-FY34 average.

  The Economy.com projections are summarized in the following exhibits.

Exhibit 16. Consumer Price Index Inflation Projections

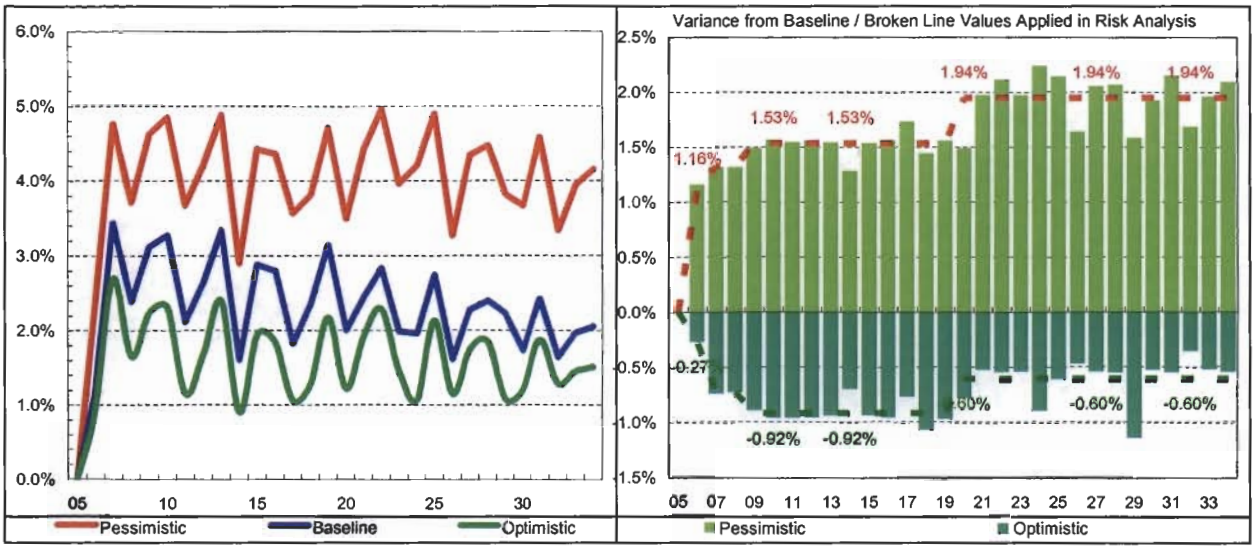


Exhibit 17. Petroleum Products (Diesel) Inflation Projections

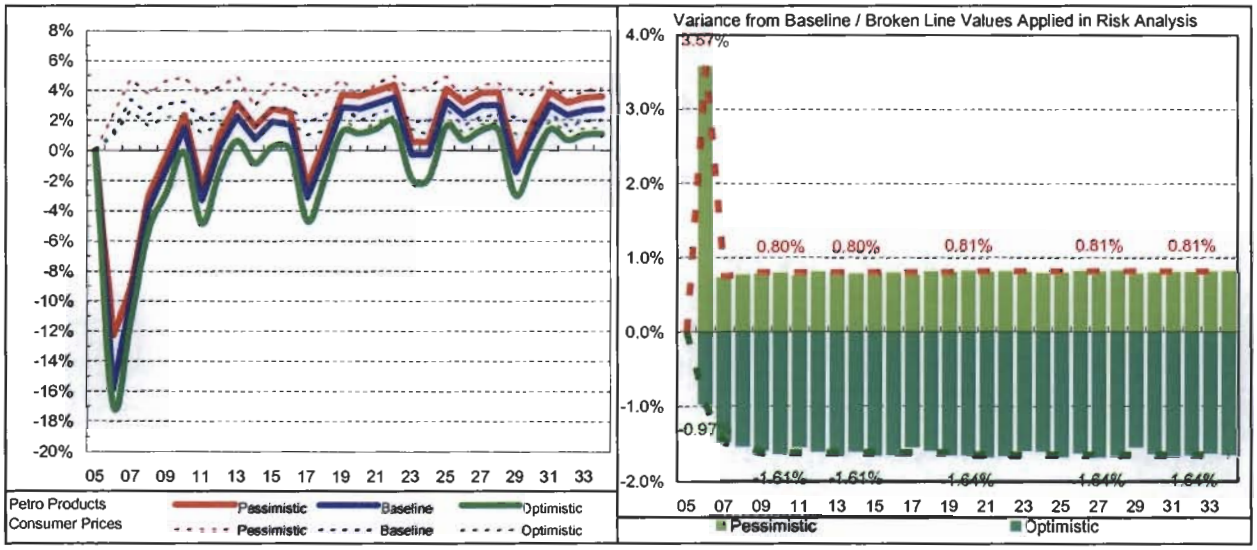


Exhibit 18. Bond Buyer 20 Index Interest Rate Projections

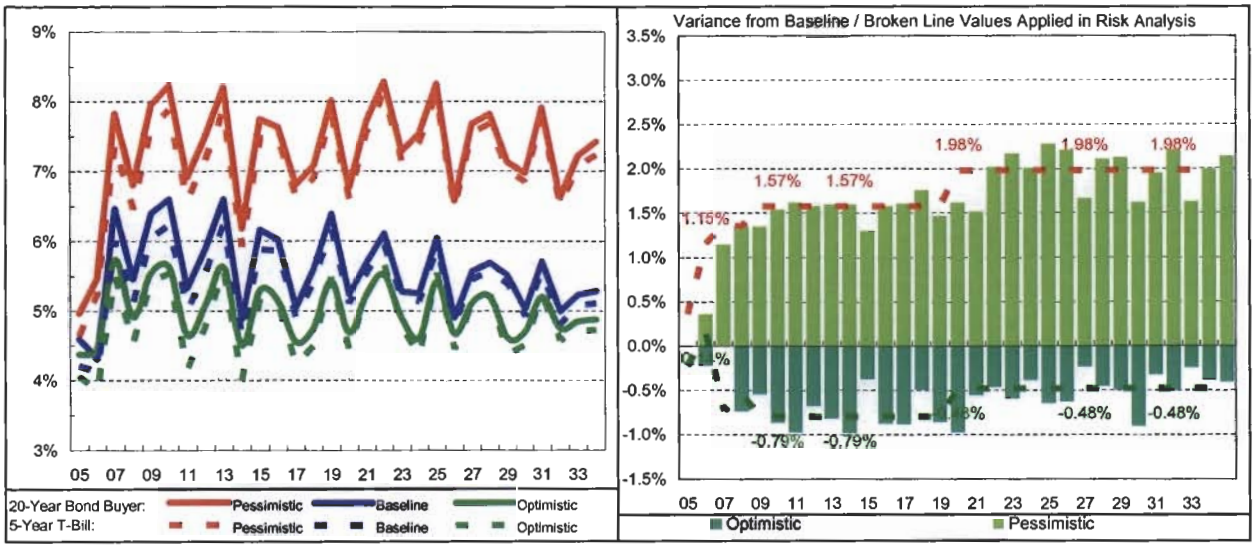
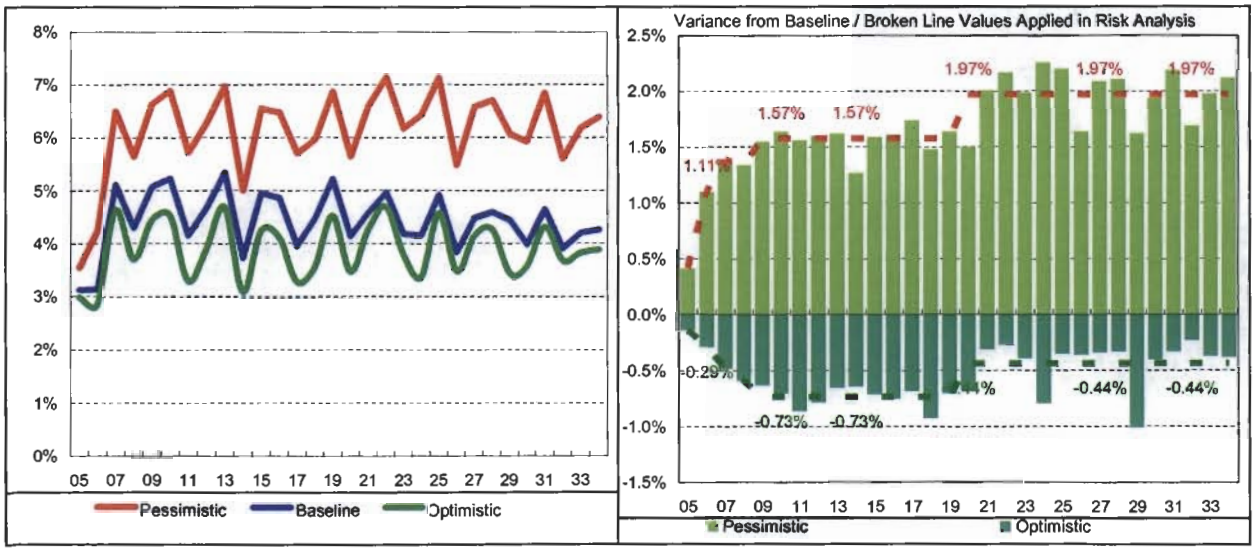


Exhibit 19. 3-Month U.S. Treasury Bill Interest Rate Projections



Other risk variables identified in the financial analysis include:

- **Fare Elasticity:** based on generalized industry experience
  - Bus
  - Regional Rail
- **Service Elasticity:** based on generalized industry experience
- **Ridership:** based on professional judgment
- **Design & Construction Contingency:** based on professional judgment
- **Joint Development Revenue:** based on professional judgment

- **Rental Car Tax Revenue:** based on historical low/average/high rates of growth
- **5309 New Starts Cap:** based on professional judgment
- **5307 Urban Area Formula Funds Grant Coefficient Growth and Base Expansion**: Based on historical low/average/high values
- **5309 Rail Modernization Grant Coefficient Growth and Base Expansion**: Based on historical low/average/high values

Table 11 summarizes the risk values applied in the analysis:

- **Expected value:** Three values are applied:
    - **Median value:** 50 percent of the outcomes will occur above this value and 50 percent will occur below this value
    - **Low (pessimistic) value:** A "reasonable" low value; the percent of outcomes occurring below this value is specified below.
    - **High (optimistic) value:** A "reasonable" high value; the percent of outcomes occurring above this value is specified below.
- **Percent of outcomes above/below the low/high values:**
    - **Economic forecasts by Economy.com:** The range of values captures 85 percent of the outcomes; 7.5 percent of the outcomes will occur above this value and 7.5 percent will occur below.
    - **Other forecasts:** Based on the judgments of practitioners in the fields of travel demand modeling and engineering, generally 10 percent above and 10 percent below the low/high values.
- **Resulting most likely value:** The mean value based on the shape of the probability density functions defined by the above parameters.
- **Stratum:** Describes the time period over which values are applied. Each stratum is five years in length.

Table 11a. Summary of Risk Variables Applied in Risk Analysis

			Expected Value					
			Low (Opt)	Most Likely	High (Pess)	% Low	% High	Raw Values
1	Baseline	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
2		FY06 / FY06	-0.27%	0.00%	1.16%	7.5	92.5	0.00%
3		FY07 / FY07	-0.74%	0.00%	1.32%	7.5	92.5	0.00%
4		FY08 / FY18	-0.73%	0.00%	1.32%	7.5	92.5	0.00%
5		FY09 / FY19	-0.92%	0.00%	1.53%	7.5	92.5	0.00%
6		FY20 / FY34	-0.60%	0.00%	1.94%	7.5	92.5	0.00%
7	Cons Expen	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
8		FY06 / FY06	-1.48%	0.00%	1.18%	7.5	92.5	0.00%
9		FY07 / FY07	-0.77%	0.00%	1.59%	7.5	92.5	0.00%
10		FY08 / FY18	-1.35%	0.00%	1.70%	7.5	92.5	0.00%
11		FY09 / FY19	-1.36%	0.00%	1.72%	7.5	92.5	0.00%
12		FY20 / FY34	-1.07%	0.00%	2.13%	7.5	92.5	0.00%
13	Natural Gas	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
14		FY06 / FY06	-3.01%	0.00%	8.33%	7.5	92.5	0.00%
15		FY07 / FY07	-2.25%	0.00%	2.00%	7.5	92.5	0.00%
16		FY08 / FY18	-2.18%	0.00%	1.88%	7.5	92.5	0.00%
17		FY09 / FY19	-2.12%	0.00%	1.93%	7.5	92.5	0.00%
18		FY20 / FY34	-2.09%	0.00%	1.88%	7.5	92.5	0.00%
19	Petroleum Prod	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
20		FY06 / FY06	-0.97%	0.00%	3.57%	7.5	92.5	0.00%
21		FY07 / FY07	-1.48%	0.00%	0.74%	7.5	92.5	0.00%
22		FY08 / FY18	-1.54%	0.00%	0.77%	7.5	92.5	0.00%
23		FY09 / FY19	-1.61%	0.00%	0.80%	7.5	92.5	0.00%
24		FY20 / FY34	-1.64%	0.00%	0.81%	7.5	92.5	0.00%
25	Electricity	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
26		FY06 / FY06	-0.80%	0.00%	2.13%	7.5	92.5	0.00%
27		FY07 / FY07	-0.80%	0.00%	2.13%	7.5	92.5	0.00%
28		FY08 / FY18	-0.79%	0.00%	2.12%	7.5	92.5	0.00%
29		FY09 / FY19	-0.79%	0.00%	2.11%	7.5	92.5	0.00%
30		FY20 / FY34	-0.68%	0.00%	2.32%	7.5	92.5	0.00%
31	Construction	FY05 / FY05	0.00%	0.00%	0.00%	7.5	92.5	0.00%
32		FY06 / FY06	-1.36%	0.00%	0.62%	7.5	92.5	0.00%
33		FY07 / FY07	-0.53%	0.00%	1.60%	7.5	92.5	0.00%
34		FY08 / FY18	-0.71%	0.00%	1.57%	7.5	92.5	0.00%
35		FY09 / FY19	-0.63%	0.00%	1.51%	7.5	92.5	0.00%
36		FY20 / FY34	-0.54%	0.00%	1.72%	7.5	92.5	0.00%
37	Bond Buyer Index	FY05 / FY05	-0.22%	0.00%	0.36%	7.5	92.5	0.00%
38		FY06 / FY06	0.00%	0.00%	1.15%	7.5	92.5	0.00%
39		FY07 / FY07	-0.73%	0.00%	1.36%	7.5	92.5	0.00%
40		FY08 / FY18	-0.54%	-0.11%	0.00%	7.5	92.5	-0.11%
41		FY09 / FY19	-0.79%	-0.33%	1.57%	7.5	92.5	-0.33%
42		FY20 / FY34	-0.48%	-0.44%	1.98%	7.5	92.5	-0.44%
43	3-Month T-Bill	FY05 / FY05	-0.14%	0.00%	0.41%	7.5	92.5	0.00%
44		FY06 / FY06	-0.29%	0.00%	1.10%	7.5	92.5	0.00%
45		FY07 / FY07	-0.48%	0.00%	1.38%	7.5	92.5	0.00%
46		FY08 / FY18	-0.59%	0.00%	1.34%	7.5	92.5	0.00%
47		FY09 / FY19	-0.73%	0.00%	1.57%	7.5	92.5	0.00%
48		FY20 / FY34	-0.44%	-0.22%	1.97%	7.5	92.5	-0.22%
49	5-Year T-Bill	FY05 / FY05	-0.14%	0.00%	0.42%	7.5	92.5	0.00%
50		FY06 / FY06	-0.29%	0.00%	1.11%	7.5	92.5	0.00%
51		FY07 / FY07	-0.49%	0.00%	1.38%	7.5	92.5	0.00%
52		FY08 / FY18	-0.59%	0.00%	1.34%	7.5	92.5	0.00%
53		FY09 / FY19	-0.73%	0.00%	1.57%	7.5	92.5	0.00%
54		FY20 / FY34	-0.44%	-0.22%	1.97%	7.5	92.5	-0.22%
55	30-Year T-Bill	FY05 / FY05	-0.14%	0.00%	0.42%	7.5	92.5	0.00%
56		FY06 / FY06	-0.28%	0.00%	1.11%	7.5	92.5	0.00%
57		FY07 / FY07	-0.48%	0.00%	1.38%	7.5	92.5	0.00%
58		FY08 / FY18	-0.59%	0.00%	1.34%	7.5	92.5	0.00%
59		FY09 / FY19	-0.73%	0.00%	1.57%	7.5	92.5	0.00%
60		FY20 / FY34	-0.43%	-0.22%	1.97%	7.5	92.5	-0.22%
61	Fare Elasticity	1/Bus Pre-Rail	-0.40	-0.30	-0.20	8	93	-30.00%
62		2/Paratransit	-0.40	-0.30	-0.20	8	93	-30.00%
63		3/Van Pool	-0.40	-0.30	-0.20	8	93	-30.00%
64		4/Rail	-0.40	-0.30	-0.20	8	93	-30.00%
65		5/Rail	-0.40	-0.30	-0.20	8	93	-30.00%
66		6/Bus Post-Rail	-0.40	-0.30	-0.20	8	93	-30.00%
67		7/Vacant	-0.40	-0.30	-0.20	8	93	-30.00%
68		8/Vacant	-0.40	-0.30	-0.20	8	93	-30.00%
69		9/Vacant	-0.40	-0.30	-0.20	8	93	-30.00%
70		10/Vacant	-0.40	-0.30	-0.20	8	93	-30.00%
71		11/Vacant	-0.40	-0.30	-0.20	8	93	-30.00%
72	Service Elasicity		0.30	0.40	0.50	8	93	40.00%
73	5309 Funding Cap	Bus	200%	300%	400%	8	93	300%
74		New Starts	100%	100%	100%	8	93	100%
75	Oth Cap Costs Infl		0%	0%	0%	10	90	0%
76	Rail Cars Infl		0%	0%	0%	10	90	0%
77	TECP Interest Earnings		-0.14%	0.00%	0.42%	10	90	0.00%
78	Tax Growth/Capita		-1.07%	-0.07%	0.93%	10	90	-0.07%
79	Ridership		75%	100%	105%	10	90	100%
80	Design & Construc Contin		-5%	0%	10%	10	90	0%
81	Joint Development Revenue		$30	$65	$65	10	90	$65
82	Rental Tax Revenue	FY05-FY07	90.0%	100.0%	110.0%	10	90	100%
83	Rental Tax Revenue	FY08-FY12	85.0%	100.0%	115.0%	10	90	100%
84	Rental Tax Revenue	FY12-End	95.0%	100.0%	105.0%	10	90	100%

Table 11b. Summary of Risk Variables Applied in Risk Analysis

				Expected Value					
				Low (Opt)	Most Likely	High (Pess)	% Low	% High	Raw Values
85	5307		Stratum A	3.98%	5.15%	5.87%	10	90	5.15%
86	Growth		Stratum B	3.98%	5.15%	5.87%	10	90	5.15%
87			Stratum C	3.98%	5.15%	5.87%	10	90	5.15%
88			Stratum D	3.98%	5.15%	5.87%	10	90	5.15%
89			Stratum E	3.98%	5.15%	5.87%	10	90	5.15%
90			Stratum F	3.98%	5.15%	5.87%	10	90	5.15%
91	5307	$/Population	Stratum A	-25.33%	-20.33%	-15.33%	10	90	-20.33%
92	Dilution		Stratum B	-25.33%	-20.33%	-15.33%	10	90	-20.33%
93			Stratum C	-25.33%	-20.33%	-15.33%	10	90	-20.33%
94			Stratum D	-25.33%	-20.33%	-15.33%	10	90	-20.33%
95			Stratum E	-25.33%	-20.33%	-15.33%	10	90	-20.33%
96			Stratum F	-25.33%	-20.33%	-15.33%	10	90	-20.33%
97	5307	$/Population x Density	Stratum A	-20.17%	-15.17%	-10.17%	10	90	-15.17%
98	Dilution		Stratum B	-20.17%	-15.17%	-10.17%	10	90	-15.17%
99			Stratum C	-20.17%	-15.17%	-10.17%	10	90	-15.17%
100			Stratum D	-20.17%	-15.17%	-10.17%	10	90	-15.17%
101			Stratum E	-20.17%	-15.17%	-10.17%	10	90	-15.17%
102			Stratum F	-20.17%	-15.17%	-10.17%	10	90	-15.17%
103	5307	$/Bus Vehicle Revenue Mile	Stratum A	-5.91%	-3.12%	0.00%	10	90	-3.12%
104	Dilution		Stratum B	-5.91%	-3.12%	0.00%	10	90	-3.12%
105			Stratum C	-5.91%	-3.12%	0.00%	10	90	-3.12%
106			Stratum D	-5.91%	-3.12%	0.00%	10	90	-3.12%
107			Stratum E	-5.91%	-3.12%	0.00%	10	90	-3.12%
108			Stratum F	-5.91%	-3.12%	0.00%	10	90	-3.12%
109	5307	$/Fixed GdwyVeh Rev-Mile	Stratum A	-4.66%	-2.27%	-0.26%	10	90	-2.27%
110	Dilution		Stratum B	-4.66%	-2.27%	-0.26%	10	90	-2.27%
111			Stratum C	-4.66%	-2.27%	-0.26%	10	90	-2.27%
112			Stratum D	-4.66%	-2.27%	-0.26%	10	90	-2.27%
113			Stratum E	-4.66%	-2.27%	-0.26%	10	90	-2.27%
114			Stratum F	-4.66%	-2.27%	-0.26%	10	90	-2.27%
115	5307	$/Fixed Gdwy Rte-Mi ($000)	Stratum A	-6.00%	-3.09%	-0.38%	10	90	-3.09%
116	Dilution		Stratum B	-6.00%	-3.09%	-0.38%	10	90	-3.09%
117			Stratum C	-6.00%	-3.09%	-0.38%	10	90	-3.09%
118			Stratum D	-6.00%	-3.09%	-0.38%	10	90	-3.09%
119			Stratum E	-6.00%	-3.09%	-0.38%	10	90	-3.09%
120			Stratum F	-6.00%	-3.09%	-0.38%	10	90	-3.09%
121	5307	$/Bus Pax-Mi^2/Op Cost	Stratum A	-6.00%	-3.09%	-0.38%	10	90	-3.09%
122	Dilution		Stratum B	-6.00%	-3.09%	-0.38%	10	90	-3.09%
123			Stratum C	-6.00%	-3.09%	-0.38%	10	90	-3.09%
124			Stratum D	-6.00%	-3.09%	-0.38%	10	90	-3.09%
125			Stratum E	-6.00%	-3.09%	-0.38%	10	90	-3.09%
126			Stratum F	-6.00%	-3.09%	-0.38%	10	90	-3.09%
127	5307	$/Rail Pax-Mi^2/Op Cost	Stratum A	-6.89%	-3.68%	-1.27%	10	90	-3.68%
128	Growth	Growth	Stratum B	-6.89%	-3.68%	-1.27%	10	90	-3.68%
129			Stratum C	-6.89%	-3.68%	-1.27%	10	90	-3.68%
130			Stratum D	-6.89%	-3.68%	-1.27%	10	90	-3.68%
131			Stratum E	-6.89%	-3.68%	-1.27%	10	90	-3.68%
132			Stratum F	-6.89%	-3.68%	-1.27%	10	90	-3.68%
133	5309 FG	$/Veh Rev-Mi	Stratum A	-9.95%	-8.54%	-5.82%	10	90	-8.54%
134	Growth	Growth	Stratum B	-9.95%	-8.54%	-5.82%	10	90	-8.54%
135			Stratum C	-9.95%	-8.54%	-5.82%	10	90	-8.54%
136			Stratum D	-9.95%	-8.54%	-5.82%	10	90	-8.54%
137			Stratum E	-9.95%	-8.54%	-5.82%	10	90	-8.54%
138			Stratum F	-9.95%	-8.54%	-5.82%	10	90	-8.54%
139	5309 FG	$/Route-Mi	Stratum A	-15.88%	-8.02%	-4.94%	10	90	-8.02%
140	Growth	Growth	Stratum B	-15.88%	-8.02%	-4.94%	10	90	-8.02%
141			Stratum C	-15.88%	-8.02%	-4.94%	10	90	-8.02%
142			Stratum D	-15.88%	-8.02%	-4.94%	10	90	-8.02%
143			Stratum E	-15.88%	-8.02%	-4.94%	10	90	-8.02%
144			Stratum F	-15.88%	-8.02%	-4.94%	10	90	-8.02%
145	5309 FG	Growth	Stratum A	5.26%	7.15%	7.93%	10	90	7.15%
146	Growth		Stratum B	5.26%	7.15%	7.93%	10	90	7.15%
147			Stratum C	5.26%	7.15%	7.93%	10	90	7.15%
148			Stratum D	5.26%	7.15%	7.93%	10	90	7.15%
149			Stratum E	5.26%	7.15%	7.93%	10	90	7.15%
150			Stratum F	5.26%	7.15%	7.93%	10	90	7.15%
151	5309 FG	$/Veh Rev-Mi	Stratum A	-4.66%	-2.27%	-0.26%	10	90	-2.27%
152	Dilution	Dilution	Stratum B	-4.66%	-2.27%	-0.26%	10	90	-2.27%
153			Stratum C	-4.66%	-2.27%	-0.26%	10	90	-2.27%
154			Stratum D	-4.66%	-2.27%	-0.26%	10	90	-2.27%
155			Stratum E	-4.66%	-2.27%	-0.26%	10	90	-2.27%
156			Stratum F	-4.66%	-2.27%	-0.26%	10	90	-2.27%
157	5309 FG	$/Route-Mi	Stratum A	-6.00%	-3.09%	-0.38%	10	90	-3.09%
158	Dilution	Dilution	Stratum B	-6.00%	-3.09%	-0.38%	10	90	-3.09%
159			Stratum C	-6.00%	-3.09%	-0.38%	10	90	-3.09%
160			Stratum D	-6.00%	-3.09%	-0.38%	10	90	-3.09%
161			Stratum E	-6.00%	-3.09%	-0.38%	10	90	-3.09%
162			Stratum F	-6.00%	-3.09%	-0.38%	10	90	-3.09%
163	TEA-21 Add'l GF Auth			-50%	0%	50%	10	90	0.00%

Correlation

A critical assumption in the risks analysis is the correlation among the risk variables. Some variables are highly correlated with each; in any particular outcome, high values of inflation will likely occur with high values of interest rates. Some variables have little or no correlation; uncertainty in inflation rates have little relationship to uncertainty in ridership or fare elasticity or construction costs in base year dollars. Applying highly correlated variables in the risk analysis will result in a narrower range in the resulting uncertainty of the selected performance variable, e.g., debt service coverage. Applying less correlated variables results in a broader range of uncertainty in the performance variable.

Table 13 summarizes the correlation among the risk variables:

Table 12. Correlation Among Risk Variables

	CPI Inflation	Petroleum Prices	Construction Prices	Bond Buyer Index	5-Year T-Bill Interest	Fare Elasticity	Service Elasticity	Ridership	FY04 $ Construction $ $	Joint Development Revenue	Rental Car Tax Revenue Growth	5309 New Starts Cap	5307 Growth and Base	5309 Growth and Base
CPI Inflation	High	High	High	High	High	None	None	None	None	None	None	None	None	None
Petroleum Prices		High	High	High	High	None	None	None	None	None	None	None	None	None
Construction Prices			High	High	High	None	None	None	None	None	None	None	None	None
Bond Buyer Index				High	High	None	None	None	None	None	None	None	None	None
5-Year T-Bill Interest					High	None	None	None	None	None	None	None	None	None
Fare Elasticity						High	None	None	None	None	None	None	None	None
Service Elasticity							High	None	None	None	None	None	None	None
Ridership								High	None	None	None	None	None	None
FY04 $ Cons-truction Cost									High	None	None	None	None	None
Joint Developmt. Revenue										High	None	None	None	None
Rental Car Tax Revenue Growth											High	None	None	None
5309 New Starts Cap												High	None	None
5307 Growth and Base													High	None
5309 Growth and Base														High

A risk analysis was conducted to assess potential impacts of the above risk factors on Regional Rail financial results. The findings of the risk analysis provide a degree of confidence that the TTA could commit itself to an initial program of rail construction, and could do so within its existing financial resources. Examples of actions to increase coverage ratios include:

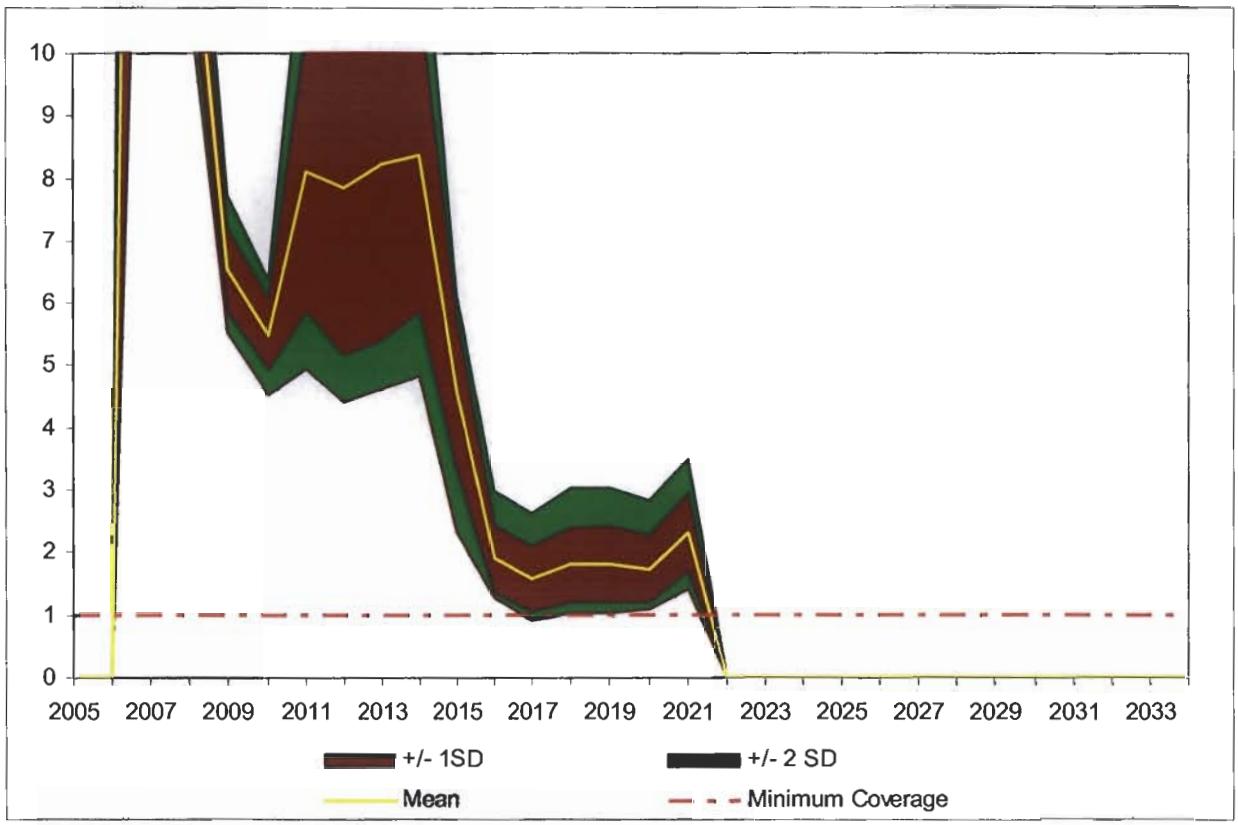
- Staging the construction of the project
- Controlling the growth of bus and rail service
- Raising fares
- Redefining the scope of the project
- Utilizing additional short-term financing strategies such as grant anticipation notes and revenue anticipation notes that can be used to close short-term gaps between needed and available revenues
- Issuing greater levels of long-term debt within the constraints of projected available revenue sources

This risk analysis is highly dependent on the formulation of the macroeconomic model being used and its underlying assumptions describing Gross Domestic Product growth, federal surplus/deficit, Federal Reserve policies, foreign exchange rates, and oil prices. As the TTA approaches the time to commit funds toward future projects, additional risk analyses would be undertaken with more current economic projections.

Results

Exhibit 20, below, summarizes the results of the risk analysis, applying the uncertainty variables defined above and the probability density functions as described above. The results of the risk analysis indicate that there is a less than one-in-forty chance that the financial plan will fail to achieve sufficient coverage. The years in which coverage is lowest are 2016 through 2021, when debt service is supported solely through TTA's dedicated revenue sources, as federal New Starts grant reimbursements are complete. Sufficient revenues exist to retire the debt early, with all bonded debt retired by 2021.

Exhibit 20. Baseline Risk Analysis



APPENDIX: Assumptions for TTA Financial Plan

EXPENSES

Capital

- **Construction:** Year-by-year cash flows for Initial Operating Segment, and increased train frequency from 15- to 10-minute service (10-minute service). Costs provided in YOE$.
- **Buses:** 12-year retirement schedule for existing and future bus sub-fleets. Annual purchases based on retirements of existing fleet and service growth. 20 percent spares assumed. Average unit cost per bus equals $300,000 (2005 $)
- **Balance of capital improvement program:** Based on FY03 CIP, with some project line-items continuing throughout the 30-year financial plan

Operating

Level of service:

Driving Variable	2005	2006	2007	2008	2009	2010*	2011	2012	2013	2014
Bus										
Peak vehicles	48	48	48	48	48	40	40	40	40	40
Vehicle revenue miles	1.808	1.808	1.808	1.808	1.808	1.947	1.947	1.947	1.947	1.947
Vehicle revenue hours	0.091	0.091	0.091	0.091	0.091	0.101	0.101	0.101	0.101	0.101
Paratransit										
Vehicle revenue hours	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Van Pool										
Vehicle revenue miles	1.074	1.098	1.122	1.146	1.170	1.193	1.216	1.239	1.262	1.285
Rail										
Route-miles	0.00	0.00	0.00	0.000	0.000	55	55	55	55	55
Stations	0	0	0	0	0	12	12	12	12	12
Peak rail cars	0	0	0	0	0	8	8	8	8	8
Fleet rail cars	0	0	0	0	0	14	14	14	14	14
Revenue car miles	0.00	0.00	0.00	0.00	0.00	1.080	1.080	1.080	1.080	1.080
Train hours	0.00	0.00	0.00	0.00	0.00	0.038	0.038	0.038	0.038	0.038

*Rail: Half-year of service in FY10.

Driving Variable	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Bus										
Peak vehicles	40	40	40	40	40	40	40	40	40	40
Vehicle revenue miles	1.947	1.947	2.033	2.118	2.204	2.289	2.375	2.460	2.460	2.460
Vehicle revenue hours	0.101	0.101	0.105	0.109	0.113	0.117	0.121	0.125	0.125	0.125
Paratransit										
Vehicle revenue hours	0.006	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007
Van Pool										
Vehicle revenue miles	1.308	1.340	1.371	1.403	1.434	1.465	1.497	1.528	1.560	1.591
Rail										
Route-miles	55	55	55	55	55	55	55	55	55	55
Stations	12	12	12	12	12	12	12	12	12	12
Peak rail cars	12	12	12	12	12	12	12	12	12	12
Fleet rail cars	14	14	14	14	14	14	14	14	14	14
Revenue car miles	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590
Train hours	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055

Driving Variable	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bus										
Peak vehicles	40	40	40	40	40	40	40	40	40	40
Vehicle revenue miles	2.460	2.460	2.460	2.460	2.460	2.460	2.460	2.460	2.460	2.460
Vehicle revenue hours	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
Paratransit										
Vehicle revenue hours	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
Van Pool										
Vehicle revenue miles	1.622	1.654	1.685	1.717	1.748	1.779	1.811	1.842	1.873	1.905
Rail										
Route-miles	55	55	55	55	55	55	55	55	55	55
Stations	12	12	12	12	12	12	12	12	12	12
Peak rail cars	12	12	12	12	12	12	12	12	12	12
Fleet rail cars	14	14	14	14	14	14	14	14	14	14
Revenue car miles	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590	1.590
Train hours	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055

Costs:

- **Bus:** unit costs per peak vehicle, vehicle revenue hour, and vehicle revenue mile based on cost allocation analysis from FY05 TTA financial actuals.

Bus Unit Operating Costs (2005 Dollars)

Driving Variable	Bus
Fixed costs	$1,878,863
Peak vehicles	$18,178
Vehicle revenue miles	$1.95
Vehicle revenue hours	$37.36

- **Paratransit:** unit cost per vehicle revenue hour from FY05 TTA financial actuals

Paratransit/Van Pool Unit Operating Costs (2005Dollars)

Driving Variable	2005 $
Paratransit: Vehicle revenue hours	$79.75
Van Pool: Vehicle revenue miles	$0.80

- **Rail:** unit costs from TTA Regional Rail O&M model:

Regional Rail Unit Operating Costs (2005 Dollars)

Driving Variable	15-MinuteHeadway	10-Minute Headway
Fixed Costs	$885,982	$987,084
Fleet Cars	$3,000	$3,000
Revenue Car-Miles	$2.31	$2.33
Revenue Train-Hours	$65.15	$65.02
Idle Train-Hours	$14.82	$14.82
Unlinked Passenger Trips	$0.05	$0.05
Track Miles	$34,193	$34,193
Total Stations	$93,095	$94,095
Maintenance Yards	$846,236	$845,405

REVENUES

Capital

- **TTA taxes:** Applied first to support operations, with the balance applied to capital:
  - **Rental car tax:** FY05 value, growing at rate derived from regression model calibrated based on enplanements (source: RDU Authority) and disposable personal income (source: Economy.com)
  - **Vehicle registration fee:** FY05 value, growing with CPI
- **Section 5309 New Starts grants:** 59.9 percent of total project cost (preliminary design, construction, and financing cost), capped at $55 million per year
- **Section 5309 Fixed Guideway Modernization grants:** FY05 unit grant amounts, growing as projected based on analysis of grant history and SAFETEA-LU projections and history of nationwide dilution, applied to projections of fixed guideway vehicle revenue miles and fixed guideway directional route-miles offset by 7 years
- **Section 5309 Bus and Bus-Related grants:** 80 percent of the cost of buses and bus-related assets, capped at $3 million per year in 2005$
- **Section 5307 Urbanized Area Formula grants:** FY05 unit grant amounts, growing as projected based on analysis of grant history and SAFETEA-LU projections and history of nationwide dilution, applied to projections of bus and fixed guideway vehicle revenue miles, fixed guideway directional route-miles, bus and fixed guideway passenger-miles x passenger-miles x operating cost, offset by 2 years. Limited to the portion of these funds applied to specific CIP projects (tools & equipment, 2005 technology capital project)
- **NC DOT grants matching 5309 New Starts:** $161.9 million of the construction cost of the New Starts project, with revenue accelerated in FY07 and FY08 and the balance appropriated proportionate to the Federal FFGA thereafter.
- **NC DOT grants matching 5309 Bus and Bus Related:** 10 percent of the cost of buses, tools & equipment.
- **Proceeds from tax exempt commercial paper (TECP):** Short-term (4-year) debt issued to support Regional Rail capital project, partially repaid with state and federal New Starts grant reimbursements with the remainder refinanced into long-term conventional bonds. Sized to maintain minimum $10 million cash balance and include financing costs. Interest-only instruments with very low rates (maximum 270 day maturity and typically overnight to one month maturity) requiring aggressive management.
- **Proceeds from long-term conventional bonds:** Refinanced principal from TECP. Computed as a simple mortgage, with level principal and interest payments over 30 years. Sized to maintain $10 million cash balance and include financing costs.

Operating

- **TTA taxes:** Applied first to support operations, with the balance applied to capital:
    - **Rental car tax:** Regression model calibrated based on enplanements (source: RDU Authority) and disposable personal income (source: Economy.com)
    - **Vehicle registration fee:** FY05 value, growing with CPI
- **Passenger fares:** Based on current ridership, fare revenue, and cash fare and travel demand analysis projections of ridership and fare revenue and model calibration-year cash fare.
    - **Pre-2010 bus fares:** Based on current ridership, factored by growth in population served and fare increases (based on fare elasticity) every two years.
    - **Post-2010 bus fares:** Based on projected opening year and design year bus ridership and average fare paid, factored by growth in population and bus service (based on service elasticity) and fare increases (based on fare elasticity). Service elasticity is assumed to be 0.4. Fare elasticity is assumed to be -0.3.
    - **Regional rail fares:** Based on projected opening year and design year rail ridership for the Initial Operating Segment and 10-minute service and average fare paid, factored by growth in population and fare increases (based on fare elasticity). Service and fare elasticity as above for bus service.
- **Interest on prior year-end balance**: Interest earnings are operating programs. Interest rate is 3-month Treasury bill rate.
- **Advertising Revenue:** Beginning when Regional Rail service begins. Average revenue per unlinked trip of transit agencies reporting such revenue to the National Transit Database in 2001, growing with unlinked trips and inflation. It is assumed that TTA and the other transit agencies in the region cooperatively negotiate a single contract with a national advertising firm and proportionately share the revenues.
- **Other Revenues:** FY05 value, growing with inflation
- **Section 5307 Urbanized Area Formula grants:** FY05 unit grant amounts, growing as projected based on analysis of grant history and SAFETEA-LU projections and history of nationwide dilution, applied to projections of bus and fixed guideway vehicle revenue miles, fixed guideway directional route-miles, bus and fixed guideway passenger-miles x passenger-miles x operating cost, offset by 2 years. Amount applied as preventative maintenance is derived as annual amount "earned" by TTA per the formula, less grant revenue applied to specific projects (e.g., tools and equipment), less grant revenue applied to debt service for certificates of participation (not applicable in the financing scenario submitted to FTA, but tested), less 80 percent of the cost of non-fixed guideway projects not otherwise funded by federal grants. It should be noted that the financial plan assumes that the annual 5307 grant is expended in each year and no grant revenues are carried over. This simplification has the effect of freeing TTA tax revenues that would otherwise be applied the operations, making such funds available to the capital program. This reduces the requirement for debt financing and increases the dedicated revenues available to service the debt. Both of this factors increase the debt service coverage ratio.
- **NCDOT State Maintenance Assistance Program:** FY05 value based on apportionment information provided by NCDOT. Post-FY05 projections based on assumed growth in the SMAP program and the following projected growth for each of the four components of the SMAP apportionment formula:
    - **Allocation for Unlinked Trips/Vehicle Revenue Hour:** growth in trips per bus vehicle revenue hour and train revenue vehicle hour

- **Allocation for Cost/Unlinked Trip:** growth in operating cost per bus vehicle revenue hour and train revenue vehicle hour
- **Allocation for Local Operating Revenue:** growth in TTA tax revenue applied to operations, fare revenue, other operating revenue, and interest income
- **Fixed Allocation:** limited to SMAP program growth

INFLATION AND INTEREST RATES

30-year projection prepared by Economy.com, a national economic consulting firm, in August 2005. Includes baseline, optimistic, and pessimistic projections of the following national forecasts:

- **Consumer Price Index:** The "baseline" inflation rate, applied to all costs and revenues, except as noted below. Applied as a component of the projection of rental car tax revenue. Baseline projection for each year over the 30-year life of the model is shown in the table below.

Index	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPI-U	---	1.21%	3.43%	2.39%	3.12%	3.27%	2.12%	2.64%	3.34%	1.60%
Index	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
CPI-U	2.88%	2.80%	1.82%	2.36%	3.14%	2.00%	2.44%	2.83%	1.99%	1.96%
Index	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**
CPI-U	2.74%	1.62%	2.28%	2.40%	2.23%	1.73%	2.42%	1.64%	1.97%	2.05%

- **Petroleum Product Price Index:** Applied to fuel expenses
- **Engineering News-Record Building Cost Index and Construction Cost Index:** Applied to Regional Rail project capital expenses
- **Bond Buyer 20 Index interest rate:** The annual interest rate of tax-exempt municipal securities secured by General Obligation debt. A 30 basis point (0.3 percent) higher rate was assumed for TTA tax-exempt revenue bonds.
- **U.S. Treasury 5-year T-bill interest rate:** Applied to compute interest income

FINANCING STRUCTURE

- **Tax-exempt commercial paper (TECP):** Issued beginning in FY07, as required to assure that year-end cash balances are the greater of $10 million or 3 months of operating expense plus 3 months of locally-funded capital. The proceeds of the debt issue include the net amount required to meet the cash balance requirement plus the first year principal and interest, debt service reserve, and issuance costs. This is an interest-only instrument; the principal amount is partially repaid with state and federal New Starts grant reimbursements with the remainder refinanced into long-term conventional bonds at the end of construction (assumed to be 4 years after TECP issue).
- **Long-term bonds:** 30-year simple mortgage (level principal and interest) bonds, resulting from the refinancing of TECP. Assumed to be fully defeased by TTA by FY21.

Cherokee Investment Partners, LLC

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October 10, 2005

Mr. John Claflin
General Manager
Triangle Transit Authority
PO Box 13787
Research Triangle Park, North Carolina 27709

Dear John:

On behalf of Cherokee Investment Partners ("Cherokee"), I am pleased that the Triangle Transit Authority ("TTA") has selected Cherokee as its preferred Master Developer for the joint economic development around the station sites for the 28-mile regional rail project. I understand how important this rail project is to the Triangle region of North Carolina, offering one of the nation's fastest growing areas a means to provide for greater future mobility, sustainable economic development and an enhanced quality of life.

Cherokee will bring to this partnership both the financial capacity to carry the development forward and the experience of working with other transit agencies on similar projects. Since 1990, Cherokee has acquired over 330 properties in the U.S. Canada and Western Europe. In early 2003, Cherokee closed its third fund comprised of $620 million of equity that, when combined with a dedicated debt facility, provides nearly $1 billion of discretionary capital to purchase real estate. Cherokee currently retains over $1 billion of assets under management and invests in properties throughout the United States, Canada and Western Europe. At the present time we are developing several transit oriented developments ("TOD") in New Jersey, one in Colorado and one in Montreal, with a total build out value in excess of $8 billion.

I believe that TTA's regional rail project is an opportunity to set an example that integrates sustainable development with multi-modal transit in a public private partnership structure. It has become evident that the rapidly growing population and subsequent demand on our highway system have brought us the dubious distinction of being the second fastest growing region of the country for traffic congestion. I believe that TTA's proposed system is needed now to help us adequately meet these challenges. Based upon my experience as a resident of the Triangle and our research into the market potential, I believe that there is a strong development opportunity for TOD around the

station sites planned by the TTA. By beginning the joint development work now, in conjunction with the construction of the rail line, we can take full advantage of these development opportunities while strengthening ridership for the rail system.

Cherokee's evaluation of TOD potential adjacent to the planned TTA system suggests that such development could reach a value in excess of $5 billion over the next 10 years. Cherokee has the capacity to invest $100 million of equity or more in this work. I am excited about proceeding in partnership with TTA, and the direct economic benefits to the Authority can be substantial. Based upon a $75 million equity investment by TTA into the partnership, I would expect a targeted return of $150 million to accrue to TTA over the first five years of the project. I understand TTA's need to fund approximately $65 million during the early years of the project and believe it is possible to create a financial structure that will provide this capital as a part of the Authority's overall financing plan.

In conclusion, let me reaffirm to you our excitement at the promise of our partnership for transit-sensitive development that supports the fundamental mission of the regional rail project while contributing to sustainable development and economic vitality of our region. I understand that our partnership with TTA represents the first time in the USA that a joint partnership for development of an entire transit line has come together in advance of the construction of the rail system. I look forward to working with you to fashion a strong, effective partnership that will serve as a model to the rest of our nation.

Sincerely,

Thomas F. Darden
Chief Executive Officer