

CATS NCCR TIGER Application

Summary of Cost-Benefit and Economic Impact Analysis

Expected Project Costs and Benefits

In support of this application, costs and benefits of the investment have been estimated over a 30 year lifecycle at present value using the required 7% discount rate. All benefits are estimated using unit values prescribed by USDOT or where specific guidance was not provided, standard industry practice. A summary of methods, data and assumptions have been posted online and is accessible on CATS website at www.charlotte.gov/City+Economic+Recovery/North+Corridor+TIGER+Grant.htm.

The present value of lifecycle costs has been estimated based on the capital construction cost and an annual operations and maintenance cost estimate. In real 2009 dollars, the 30 year present value cost of the improvement is estimated to be \$428 million. This figure includes \$357.5 million over three years in capital construction and \$10.4 million annually in operations and maintenance expenses, which are then discounted at the required 7 percent rate.

Benefits have been estimated for each primary evaluation criteria. Where appropriate, these are aggregated and compared to project costs. The Table below describes each benefit estimated for each criteria. Table X2, describes the primary outcomes of the evaluation and presents the benefit-cost analysis outcomes. As Table X2 indicates, discounted benefits exceed costs by 1.16 to 1 and generate net social welfare valued at \$68.6 million (in present value).

Table X: Benefits and Descriptions by Evaluation Criteria

Criteria	Benefit(s)	Description
State of Good Repair	Pavement Maintenance Savings	Reductions in pavement maintenance costs due to reductions in roadway usage
Economic Competitiveness	Short Term Employment	Value of new short-term jobs created
	Economic Development	Incremental property value appreciation due to commuter rail proximity, net of travel time savings
Livability	Vehicle Operating Cost Savings	Reductions in monetary costs to drivers switching to public transit
	Travel Time Savings	Door-to-door trip time savings to both commuter rail users and remaining roadway users
	Impacts to Low Income Population	Short-term employment opportunities benefiting low income workers
Sustainability	Emissions Reductions	Reductions in pollutants and green house gasses due to auto use reductions relative to the no-build condition
Safety	Accident Reduction	Reductions in property losses and injuries and deaths due to reductions in automobile use and removal or upgrade of existing at-grade crossings

Table X2: Summary of Cost-Benefit Analysis Results; 30 Year Lifecycle, 7% Discount Rate

Selection Criteria	Value
State of Good Repair	
Pavement Maintenance Savings (\$ millions)	\$0.4
Economic Competitiveness	
Additional Short-Term Employment (No. of New Jobs)	5,530
Direct Employment	2,077
Indirect Employment	1,216
Induced Employment	2,237
Benefits of Short-Term Employment (\$ millions)	\$193.3
Economic Development net of Travel Time Savings (\$ millions)	\$189.7
Livability	
Highway Users - VOC & Travel Time Savings (\$ millions)	\$47.5
Rail User from Auto - VOC & Travel Time Savings (\$ millions)	\$12.1
Rail Users from Bus- VOC & Travel Time Savings (\$ millions)	\$10.1
Sustainability	
Gallons of Gasoline Avoided	16,189,326
Reduced Emissions (tons)	1,438,171
VOC	162
CO	303,839
NOX	249
PM	84
SO2	11
CO2	1,133,827
Emissions Savings (\$ millions)	\$5.4
VOC	\$0.2
CO	\$1.2
NOX	\$0.3
PM	\$0.5
SO2	\$0.0
CO2	\$3.2
Safety	
Accident Cost Savings (\$ millions)	\$23.8
Benefit Cost Analysis Results	
Total Discounted Benefits (\$ millions)	\$496.5
Total Discounted Costs (\$ millions)	\$428.0
Benefit - Cost Ratio	1.16
Net Present Value (\$ millions)	\$68.6
Internal Rate of Return	11.1%

Economic Competitiveness Can Be Increased

The commuter rail is expected to attract new investment, as well as raise the value of existing properties in proximity to alignment. Empirical studies have indicated proximity premiums (additional property value due to transit proximity holding all other value-affecting attributes constant) of 2% to over 30%. Applying a conservative 4% premium we estimate that economic development to provide over \$189 million in (on a discounted basis) monetized benefits net of total travel time savings as illustrated in Table X3.

Table X3: Incremental Economic Development Benefits

Economic Development	2009 (Current \$2009)	2012 (Current \$2009)	Lifecycle (Current \$2009)
Total Economic Development Benefit	\$408,335	\$4,100,473	\$189,673,349

Creating Jobs and Stimulating the Economy

The construction of the NCCR project is estimated to create 5,530 short-term direct, indirect and induced jobs throughout the construction period with a value added to the economy estimated at \$433 million, of which \$294 are labor income (Table X4). The total estimated jobs created, 3,127 jobs (57 percent of the total) are projected to be in key industries that traditionally employ low income workers resulting in a total benefit of \$133 million in labor income during the construction period Table X5).

Table X4: Short Term Direct, Indirect and Induced Employment, Value Added and Labor Income by Year

	2010	2011	2012	TOTAL
Employment	653	3,872	1,005	5,530
Value Added	\$49.8	\$302.9	\$80.2	\$432.8
Labor Income	\$34.6	\$205.0	\$54.5	\$294.1

Table X5: Short Term Employment Key Industries

Key Industries Employing Low-Income People	Job Years	Labor Income (\$ Million)
Agriculture, forestry, fishing and hunting	56	\$1.2
Construction	1,793	\$94.3
Retail trade	405	\$12.4
Truck transportation	79	\$3.7
Administrative and support and waste management and remediation services	297	\$9.2
Nursing and residential care facilities, home health care services	182	\$5.6
Accommodation and food services	272	\$5.9
Personal and laundry services	43	\$1.0
TOTAL	3,127	\$133.4