



**LYNX Blue Line Extension  
(Northeast Corridor)**

**Light Rail Project**

**Contract #: 08-477**

**WBS #: 5.05**

# Operations and Maintenance Quantities and Costs

## Bus

**Prepared by:**

**STV/Ralph Whitehead Associates**

**1000 W. Morehead Street, Suite 200  
Charlotte, NC 28208**

**Prepared for:**

**City of Charlotte  
Charlotte Area Transit System**

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## 1.0 Introduction

This technical memorandum documents the operating and maintenance (O&M) cost estimates related to proposed 2016 (Opening Year) and 2035 bus service in the Build, No Build, and TSM (FTA Baseline) Alternatives for the Charlotte Area Transit System's LYNX Blue Line Extension-Northeast Corridor.

## 2.0 Methodology and Assumptions

The methodology developed and applied in the estimation of O&M costs is documented in the *Operations and Maintenance Cost Estimation Methodology– Bus Rev.00*, April 1, 2009, which describes the structure and basis of the Bus O&M cost model. Unit costs in the O&M model are based on the CATS FY 2008 Operating Budget for the Bus Operations Division. To bring the Bus O&M estimates in line with the FY 2010-based LRT O&M estimates, these bus costs would need to be adjusted to 2010 dollars.

The calculations in Table 1 show that CATS Bus costs, as reported by the agency to the National Transit Database (NTD), did not change greatly between 2008 and 2010. This supports the inclusion of no cost escalation between FY 2008 and FY 2010 costs. The final Bus O&M cost estimates are provided in 2010 dollars.

**TABLE 1  
CHANGE IN CATS BUS COSTS 2008-2010**

	FY 2008	FY 2010	% Change 2008-2010
Vehicle Revenue Miles (Bus)	11,725,493	10,768,012	
Vehicle Revenue Hours (Bus)	819,544	778,773	
CATS Bus Operating Expenses	\$83,084,773	\$75,732,475	
Op Exp / Veh Rev Mi	\$7.09	\$7.03	-0.7%
Op Exp / Veh Rev Hr	\$101.38	\$97.25	-4.1%

Source: Data reported by CATS to NTD in FY 2008 and 2010.

The operating statistics (annual revenue bus hours, annual revenue bus miles, and number of peak vehicles) applied in the O&M cost model are based on operating statistics data generated by the travel demand model for each scenario as follows (the sources files are identified on the O&M results tables for each scenario):

- Annual revenue bus hours are summed from the *ANN\_VEHRs* field on the *Operation\_Statistics* tab of the travel demand model output files.
- Annual revenue bus miles are summed from the *ANN\_VEMIL* field on the *Operation\_Statistics* tab of the travel demand model output files.
- Peak vehicles are summed from the *ADJ\_PMPK* field on the *Fleet\_Requirements* tab of the travel demand model output files.

Only CATS bus routes are included in the summation of operating quantities; Gaston, Cabarrus/Rowan bus routes as well as CATS LRT and streetcar operating statistics are excluded. The full cost of operating the CATS bus routes are reflected in these operating cost calculations, regardless of funding source.

The original model results for the analyzed scenarios showed that some bus routes would not have sufficient capacity to meet the projected peak hour demand. To address these capacity concerns, a bus optimization analysis was conducted, reducing peak headways in the final model runs to increase peak hour capacity on the constrained routes. In cases where demand still exceeded capacity, “trippers” or additional one-way peak trips were added to the route to support the projected demand. The annual vehicle mile, vehicle hour, and peak vehicle totals for these trippers were added to the operating quantity totals for each scenario.

### **3.0 Bus Operations and Maintenance Cost Estimates**

This section presents the results of the 2016 and 2035 Systemwide Bus O&M cost estimates for the No Build, Baseline and Build Alternatives.

Table 2 summarizes and compares the operating quantities and associated operating and maintenance costs of each alternative.

Tables 3 through 8 provide the detailed bus O&M cost model for each alternative and identify the travel demand model source files from which the quantities were generated.

**TABLE 2**  
**LYNX BLE BUS O&M QUANTITIES AND COSTS**

	2016		2035			
	No Build 7.5 min	Build 7.5 min	No Build 10 min	TSM / Baseline Premium 10 min	TSM / Baseline Non-Premium 10 min	Build 10 min
Peak Headway (Skip Stop Bus or LRT)						
<b>Quantities</b>						
Annual Revenue Bus Hours	798,113	778,273	860,552	970,660	960,605	833,313
Annual Revenue Bus Miles	10,914,230	10,707,963	11,006,705	12,560,025	12,526,106	10,754,922
Number of Peak Buses (CATS only)	260	251	302	336	329	289
<b>Costs</b>						
Vehicle Operations Costs	\$ 48,137,651.56	\$ 46,982,864.41	\$ 51,349,806.04	\$ 58,021,401.22	\$ 57,484,145.00	\$ 49,789,211.46
Vehicle Maintenance Costs	\$ 12,352,748.60	\$ 12,119,295.08	\$ 12,457,412.41	\$ 14,215,462.80	\$ 14,177,073.77	\$ 12,172,443.89
Administration Costs	\$ 1,732,246.10	\$ 1,672,283.74	\$ 2,012,070.47	\$ 2,238,594.96	\$ 2,191,957.57	\$ 1,925,458.17
<b>Total Systemwide CATS Bus O&amp;M Cost (2010\$)</b>	<b>\$ 62,222,646.26</b>	<b>\$ 60,774,443.23</b>	<b>\$ 65,819,288.91</b>	<b>\$ 74,475,458.98</b>	<b>\$ 73,853,176.33</b>	<b>\$ 63,887,113.51</b>

**TABLE 3  
2016 SYSTEMWIDE BUS O&M COST ESTIMATES  
FOR NO BUILD ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2016 No Build Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	798,113	Metrolina_2016_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	10,914,230	Metrolina_2016_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	260	Metrolina_2016_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	798,113 Revenue bus hours	L	\$44.08 /revenue bus hour	\$35,180,359
Materials and Supplies <sup>1</sup>	10,914,230 Revenue bus miles	M	\$0.95 /revenue bus mile	\$10,398,953
General Administration <sup>2</sup>	798,113 Revenue bus hours	-	\$0.62 /revenue bus hour	\$497,885
Casualty and Insurance <sup>3</sup>	260 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$2,060,455
<b>Subtotal</b>				<b>\$48,137,652</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	10,914,230 Revenue bus miles	L	\$0.89 /revenue bus mile	\$9,735,881
Materials and Supplies <sup>4</sup>	10,914,230 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,568,415
General Administration <sup>5</sup>	10,914,230 Revenue bus miles	-	\$0.004 /revenue bus mile	\$48,453
<b>Subtotal</b>				<b>\$12,352,749</b>
<b>Administration Department</b>				
Salary and Fringe	260 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$677,833
General Administration <sup>6</sup>	260 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,054,413
<b>Subtotal</b>				<b>\$1,732,246</b>
<b>Grand Total</b>				<b>\$62,222,646</b>

L = Labor M = Material U=Utilities

<sup>1</sup>- Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup>- Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2016 No Build Scenario Bus operating statistics were derived from 2016 No Build Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.

**TABLE 4  
2016 SYSTEMWIDE BUS O&M COST ESTIMATES  
FOR BUILD ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2016 Build Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	778,273	Metrolina_2016_Build_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	10,707,963	Metrolina_2016_Build_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	251	Metrolina_2016_Build_OPSTATS_FY12NS_052711.xlsx		
Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	778,273 Revenue bus hours	L	\$44.08 /revenue bus hour	\$34,305,801
Materials and Supplies <sup>1</sup>	10,707,963 Revenue bus miles	M	\$0.95 /revenue bus mile	\$10,202,424
General Administration <sup>2</sup>	778,273 Revenue bus hours	-	\$0.62 /revenue bus hour	\$485,508
Casualty and Insurance <sup>3</sup>	251 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$1,989,131
<b>Subtotal</b>				<b>\$46,982,864</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	10,707,963 Revenue bus miles	L	\$0.89 /revenue bus mile	\$9,551,883
Materials and Supplies <sup>4</sup>	10,707,963 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,519,874
General Administration <sup>5</sup>	10,707,963 Revenue bus miles	-	\$0.004 /revenue bus mile	\$47,537
<b>Subtotal</b>				<b>\$12,119,295</b>
<b>Administration Department</b>				
Salary and Fringe	251 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$654,370
General Administration <sup>6</sup>	251 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,017,914
<b>Subtotal</b>				<b>\$1,672,284</b>
<b>Grand Total</b>				<b>\$60,774,443</b>

L = Labor M = Material U=Utilities

<sup>1</sup> Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup> Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2035 Baseline Bus operating statistics were derived from 2035 Baseline Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.

**TABLE 5**  
**2035 SYSTEMWIDE BUS O&M COST ESTIMATES**  
**FOR NO BUILD ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2035 No Build Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	860,552	Metrolina_2035_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	11,006,705	Metrolina_2035_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	302	Metrolina_2035_NoBuild_OPSTATS_FY12NS_052711.xlsx		
Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	860,552 Revenue bus hours	L	\$44.08 /revenue bus hour	\$37,932,611
Materials and Supplies <sup>1</sup>	11,006,705 Revenue bus miles	M	\$0.95 /revenue bus mile	\$10,487,062
General Administration <sup>2</sup>	860,552 Revenue bus hours	-	\$0.62 /revenue bus hour	\$536,836
Casualty and Insurance <sup>3</sup>	302 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$2,393,297
<b>Subtotal</b>				<b>\$51,349,806</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	11,006,705 Revenue bus miles	L	\$0.89 /revenue bus mile	\$9,818,372
Materials and Supplies <sup>4</sup>	11,006,705 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,590,177
General Administration <sup>5</sup>	11,006,705 Revenue bus miles	-	\$0.004 /revenue bus mile	\$48,863
<b>Subtotal</b>				<b>\$12,457,412</b>
<b>Administration Department</b>				
Salary and Fringe	302 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$787,330
General Administration <sup>6</sup>	302 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,224,741
<b>Subtotal</b>				<b>\$2,012,070</b>
<b>Grand Total</b>				<b>\$65,819,289</b>

L = Labor M = Material U=Utilities

<sup>1</sup> - Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> - Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup> - Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> - Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> - Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> - Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2035 No Build Scenario Bus operating statistics were derived from 2035 No Build Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.



**TABLE 6  
2035 SYSTEMWIDE BUS O&M COST ESTIMATES  
FOR TSM (FTA BASELINE) PREMIUM ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2035 FTA Baseline Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	970,660	Metrolina_2035_TSM_Premium_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	12,560,025	Metrolina_2035_TSM_Premium_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	336	Metrolina_2035_TSM_Premium_OPSTATS_FY12NS_052711.xlsx		
Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	970,660 Revenue bus hours	L	\$44.08 /revenue bus hour	\$42,786,089
Materials and Supplies <sup>1</sup>	12,560,025 Revenue bus miles	M	\$0.95 /revenue bus mile	\$11,967,047
General Administration <sup>2</sup>	970,660 Revenue bus hours	-	\$0.62 /revenue bus hour	\$605,524
Casualty and Insurance <sup>3</sup>	336 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$2,662,741
<b>Subtotal</b>				<b>\$58,021,401</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	12,560,025 Revenue bus miles	L	\$0.89 /revenue bus mile	\$11,203,988
Materials and Supplies <sup>4</sup>	12,560,025 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,955,715
General Administration <sup>5</sup>	12,560,025 Revenue bus miles	-	\$0.004 /revenue bus mile	\$55,759
<b>Subtotal</b>				<b>\$14,215,463</b>
<b>Administration Department</b>				
Salary and Fringe	336 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$875,969
General Administration <sup>6</sup>	336 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,362,626
<b>Subtotal</b>				<b>\$2,238,595</b>
<b>Grand Total</b>				<b>\$74,475,459</b>

L = Labor M = Material U=Utilities

<sup>1</sup> Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup> Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2035 Baseline Premium Bus operating statistics were derived from 2035 Baseline Premium Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.

**TABLE 7  
2035 SYSTEMWIDE BUS O&M COST ESTIMATES  
FOR TSM (FTA BASELINE) NON-PREMIUM ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2035 FTA Baseline Non-Premium Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	960,605	Metrolina_2035_TSM_NonPrm_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	12,526,106	Metrolina_2035_TSM_NonPrm_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	329	Metrolina_2035_TSM_NonPrm_OPSTATS_FY12NS_052711.xlsx		
Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	960,605 Revenue bus hours	L	\$44.08 /revenue bus hour	\$42,342,896
Materials and Supplies <sup>1</sup>	12,526,106 Revenue bus miles	M	\$0.95 /revenue bus mile	\$11,934,730
General Administration <sup>2</sup>	960,605 Revenue bus hours	-	\$0.62 /revenue bus hour	\$599,252
Casualty and Insurance <sup>3</sup>	329 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$2,607,267
<b>Subtotal</b>				<b>\$57,484,145</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	12,526,106 Revenue bus miles	L	\$0.89 /revenue bus mile	\$11,173,732
Materials and Supplies <sup>4</sup>	12,526,106 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,947,733
General Administration <sup>5</sup>	12,526,106 Revenue bus miles	-	\$0.004 /revenue bus mile	\$55,609
<b>Subtotal</b>				<b>\$14,177,074</b>
<b>Administration Department</b>				
Salary and Fringe	329 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$857,720
General Administration <sup>6</sup>	329 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,334,238
<b>Subtotal</b>				<b>\$2,191,958</b>
<b>Grand Total</b>				<b>\$73,853,176</b>

L = Labor M = Material U=Utilities

<sup>1</sup> Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup> Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2035 Baseline Non-Premium Bus operating statistics were derived from 2035 Baseline Non-Premium Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.

**TABLE 8  
2035 SYSTEMWIDE BUS O&M COST ESTIMATES  
FOR BUILD ALTERNATIVE**

Systemwide Bus Operations and Maintenance Cost Estimate - 2035 Build Scenario (2010 Dollars)				
Inputs		Source:		
Annual Revenue Bus Hours	833,313	Metrolina_2035_Build_OPSTATS_FY12NS_052711.xlsx		
Annual Revenue Bus Miles	10,754,922	Metrolina_2035_Build_OPSTATS_FY12NS_052711.xlsx		
Number of Peak Buses	289	Metrolina_2035_Build_OPSTATS_FY12NS_052711.xlsx		

  

Cost Item	Unit Of Service (annual)	Type	Unit Cost	Annual Systemwide Bus O&M Cost (2008 Dollars)
<b>Vehicle Operations Department</b>				
Salary and Fringe	833,313 Revenue bus hours	L	\$44.08 /revenue bus hour	\$36,731,927
Materials and Supplies <sup>1</sup>	10,754,922 Revenue bus miles	M	\$0.95 /revenue bus mile	\$10,247,166
General Administration <sup>2</sup>	833,313 Revenue bus hours	-	\$0.62 /revenue bus hour	\$519,844
Casualty and Insurance <sup>3</sup>	289 Peak Vehicles	-	\$7,924.83 /peak vehicle	\$2,290,274
<b>Subtotal</b>				<b>\$49,789,211</b>
<b>Vehicle Maintenance Department</b>				
Salary and Fringe	10,754,922 Revenue bus miles	L	\$0.89 /revenue bus mile	\$9,593,773
Materials and Supplies <sup>4</sup>	10,754,922 Revenue bus miles	M	\$0.24 /revenue bus mile	\$2,530,925
General Administration <sup>5</sup>	10,754,922 Revenue bus miles	-	\$0.004 /revenue bus mile	\$47,746
<b>Subtotal</b>				<b>\$12,172,444</b>
<b>Administration Department</b>				
Salary and Fringe	289 Peak Vehicles	L	\$2,607.05 /peak vehicle	\$753,438
General Administration <sup>6</sup>	289 Peak Vehicles	-	\$4,055.43 /peak vehicle	\$1,172,020
<b>Subtotal</b>				<b>\$1,925,458</b>
<b>Grand Total</b>				<b>\$63,887,114</b>

L = Labor M = Material U=Utilities

<sup>1</sup>- Vehicle operations materials and supply costs include contract maintenance services, motor fuels & lubricants, tires and tubes, equipment, other materials/supplies, chemicals & lab supply, uniforms-protective clothing, and other specialty department supplies.

<sup>2</sup> Vehicle operations general administration costs include telecommunications, KBU Telecommunications, printing & publishing, technology supplies/services, rental of land & buildings, M&R-Auto/Equipment-Motorized, travel & meetings, employee reimbursable training, training conferences & meetings, professional fees - legal, adjusters fees, temporary help fees.

<sup>3</sup>- Casualty and insurance includes costs for insurance premiums, insurance administration, and worker's compensation.

<sup>4</sup> Vehicle maintenance materials and supplies include rental-uniform, wrecker service rental, M&R-equipment-non-self-propelled, M&R -auto/equipment motorized, M&R -buildings, M&R -communication equipment, contract maintenance services, maintenance & construction materials & supplies, tires and tubes, equipment, other materials/supplies, small tools & expnd equipment, uniforms-protective clothing, janitorial & cleaning supply and other specialty department supply.

<sup>5</sup> Vehicle maintenance general administration costs include KBU telecommunications, technology supplies/services, M&R-Buildings, travel & meetings, Employee Reimbursable Training Expenses, training conferences & meetings KBU M&R-communication equipment, temporary help fees, fees – other, and other miscellaneous contract services.

<sup>6</sup> Administration department costs include telecommunications, KBU telecommunications, postage, printing & publishing, technology supplies/services, advertising, advertising – media, rental of equipment, automobile & other Allowances, M&R-equipment-non-self-propelled, M&R-Auto/equipments - motorized, travel & meetings, employee reimbursable training expenses, training conferences & meetings, management fees, computer fees, temporary help fees, contract maintenance services, fees – other, dues, subscriptions, & professional licenses, subsistence, other miscellaneous contract services, other materials/supplies, office supplies, and small tools & expnd equipment.

**Assumptions:**

All costs are in 2010 Dollars.

2035 Build Scenario Bus operating statistics were derived from 2035 Build Ridership Model Runs. Unit costs were derived from CATS FY 2008 Operating Budget.

Operating statistics for bus routes operating outside of Mecklenburg County (i.e., Gaston, RFATS, Cabarrus/Rowan local routes) and CATS LRT have been excluded from the CATS operating statistics used as input into the CATS Systemwide Bus O&M cost model.