

**ATTACHMENT A**

**A RESOLUTION RECEIVING THE REPORT ON CHAPEL HILL TRANSIT FLEET  
RECOMMENDATIONS AND A PASSENGER AMENITIES PROGRAM  
Resolution No. 30/2006-07**

WHEREAS, the Transportation Director for Chapel Hill Transit has provide a report on the condition of the Chapel Hill Transit fleet and recommendations for future bus purchases, and a transit passenger amenities program..

NOW, THEREFORE, BE IT RESOLVED by the Carrboro Board of Aldermen that the Board receives the report.

## Discussion Paper

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### Chapel Hill Transit Fleet Analysis and Bus Purchase Recommendations

From: Steve Spade – Transportation Director

Date: June 18, 2006

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#### **Introduction**

Chapel Hill Transit provides the following document as a recommendation for the transit short term bus purchase and long term fleet modernization program.

#### **Background**

Chapel Hill Transit operates a fleet of 86 buses. The transit system has a peak hour requirement of 72 buses, however demand increases beyond 72 during certain times of the year. The fleet is challenged due to extremely high demand and its increasing age. Chapel Hill Transit is facing rising maintenance costs due to an aging fleet and demands for expanded service.

Chapel Hill Transit has \$7.7 million to purchase new buses. This funding will enable Chapel Hill Transit to replace nearly 25% of its active fleet. This is a significant opportunity that has short term benefits and long term implications. It is important to make decisions regarding the transit fleet now in order to insure that the fleet is consistent over the next 15 years.

#### **Discussion**

Chapel Hill Transit has evaluated the transit fleet, its age and operating cost and considered other issues (demands for more service and operating costs) facing the system to develop a series of recommendations regarding the modernization of the transit fleet and its ability to respond to community issues.

## Fleet Analysis

Chapel Hill Transit operates a fleet of 86 buses ranging in age from 4 – 19 years old. The following are facts about the fleet, its condition and usage.

Recommended national fleet standards:

- Maintain a fleet average age of 7.0 years
- Maintain a fleet spare ratio of 20%

The fleet:

- The Chapel Hill fleet currently has an average age of 7.55 years.
- In 2007 the average age will increase to 8.51 years.
- Chapel Hill Transit has a maximum peak hour pull out of 72 buses, leaving a 16% spare ratio
- Service improvements scheduled for the fall of 2006 will increase the peak requirement to 77 buses, leaving a 10% spare ratio.
- Based on a 77 bus peak the fleet should be a minimum size of 93 buses in order to maintain an adequate spare ratio.
- Future service needs of the funding partners suggest that the size of the fleet needs to increase over the next two years.
- Over the past 6 months the maintenance cost of the fleet has averaged \$.96 per mile.
- Vehicles ordered in 2006 will take 12 – 18 months to be delivered.

Bus Purchase recommendations:

- Purchase the maximum number of buses with the \$7.7 million – 19 diesel buses and 3 hybrid buses. This will increase Chapel Hill Transit's ability to respond to growing service needs, improve reliability and control maintenance costs.
- Expand the bus fleet from 86 to 99 buses by allocating a portion of the new buses to replacement and 13 buses to fleet expansion.
- Schedule ongoing procurement to maintain an average age of 7 years to best control cost and stay responsive to needs.

Staff has analyzed the fleet average age based on the recommended purchase of 16 diesel and 3 hybrid buses.

The receipt of 19 buses will only temporarily bring the fleet age within acceptable industry standards.

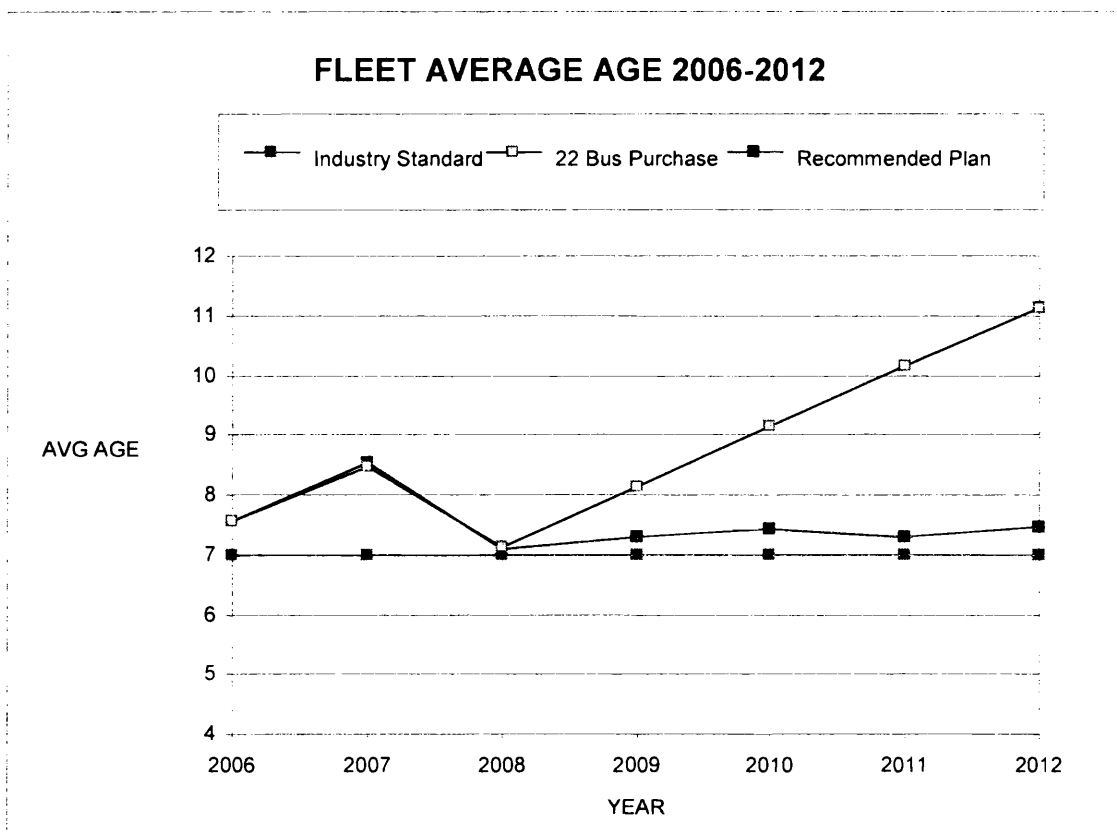
The purchase of 19 buses in 2008 and expansion of the fleet to 99 buses would reduce the fleet age to 7.14 years in 2008, 8.14 years in 2009, 9.14 years in 2010 and 10.14 in 2011.

In order to maintain a modern fleet and provide modest expansion, smaller bus purchases should be made annually in addition to the initial purchase of 19 buses. The suggested schedule for bus replacement will achieve and maintain an average fleet age at 7 years through 2012.

**Recommended vehicle purchase schedule**

2008	purchase 19 buses	9 replacement/ 10 expansion...expand fleet from 86 to 96
2009	purchase 6 buses	3 replacement / 3 expansion...expand fleet to 99 buses
2010	purchase 6 buses	replacement
2011	purchase 8 buses	replacement
2012	purchase <u>6</u> buses	replacement
	48 buses	

The chart below illustrates the effect of the recommended long term plan on fleet average age.



## Alternative Fuels

Chapel Hill Transit has a Congestion Mitigation / Air Quality grant that includes the purchase of 3 hybrid buses to be used on the Chatham park and ride route. This grant suggests that the long term plan for the transit fleet must be considered. The purchase of 3 hybrid vehicles will allow the town to consider the advantages and implications of a long term commitment to hybrid vehicles.

Industry data suggests that hybrid technology has great promise but has not been utilized in a transit setting long enough to determine long term reliability of hybrid engines. Purchasing 3 hybrid buses will allow Chapel Hill Transit to gain experience with hybrid engines. By 2010 the transit industry will have at least 10 years experience with hybrid buses in revenue service. This will be adequate time to prove long term reliability. The Town will be in a better position to make a long term decision regarding the future of hybrid buses in the Chapel Hill Transit fleet.

Chapel Hill Transit staff recommends the following regarding the acquisition of hybrid buses:

- Purchase 3 hybrid buses in 2006 as part of the Congestion Mitigation Air Quality grant.
- Ten per cent of the purchases from 2009 – 2012 should be hybrid buses as long as the vehicles meet performance expectations
- Additional large purchases should be made after the fleet has been brought to an acceptable level of size and condition.
- A determination should be made of what portion of the fleet will be hybrid.

Below are questions that must be answered as experience with hybrid vehicles is gained:

1. Is hybrid the best alternative fuel option?

Hybrid technology has gained much popularity in recent years. Numerous transit systems including Charlotte, Maryland DOT and New York City are experimenting with hybrid technology in buses. Many believe that it is one of two potential forms of alternative fuel vehicles that will be generally accepted in the future. (Bio-diesel being the other).

Hybrid technology still is in the early stages of development and there are still questions about the long term reliability of the technology in transit applications. Bio-diesel is currently the most often used alternative fuel.

2. Can the Chapel Hill Transit system support hybrid buses?

The high voltage of hybrid buses is dangerous if not properly controlled, but standards and training are in place to mitigate the dangers. The biggest challenge is to train mechanics in a new technology. Because it will take 18-24 months to receive new buses, existing staff can be trained and new staff acquired as necessary.

More significant is the concern that if Chapel Hill Transit purchases vehicles with new unproven technology, the overall fleet must be modern and well maintained enough to withstand the possibility of a portion of the fleet with major repair problems.

3. What is the level of commitment to rely on hybrid technology and are the funding partners able to support that commitment?

There is a high degree of interest among the transit partners in testing new technology and improving fleet performance to meet desirable environmental objectives. It is advisable to purchase a limited number of hybrid buses to gain experience with this technology. This will allow the partners to make a more ambitious commitment to the technology once it is proven.

## **Vehicle Characteristics**

### **Standard floor vs. low floor.**

Chapel Hill Transit recommends that all new buses be low floor. There are several advantages to low floor buses

1. The buses are less expensive because a lift is not required ( wheelchairs gain access via a ramp)
2. A ramp is less costly to maintain than a lift
3. Boarding for ambulatory and non-ambulatory passengers is faster and more efficient.
4. Almost 90% of the buses purchased today are low floor. Purchasing low floor assures a quicker delivery and a longer availability of parts as standard floor fleets are phased out.

The only disadvantage to low floor buses is the loss of seating. A 35 ft low floor bus can have 6 fewer seats than the same size standard floor bus.

## **Vehicle Size**

Chapel Hill Transit operates a fleet of 35-foot buses. The system is faced with 2 issues that give credibility to the idea that larger vehicles be considered as part of the long term fleet strategy. The issues of operating cost and over-crowding are inter-related. The funding partners are concerned with growing operating costs. Factors affecting cost are fuel prices, labor costs and overcrowding of buses. With the current fleet, overcrowding can only be resolved by adding additional buses. Utilizing larger buses can resolve over crowding by providing more capacity with no increase in labor.

Articulated buses have been used successfully in many university settings including the University of Illinois and East Carolina.

Chapel Hill Transit recommends that consideration be given to deployment of articulated buses on over-crowded peak hour routes. Most of the routes experiencing overcrowding are running from park and ride lots serving the University of North Carolina.

### **Other Technology**

The following equipment is recommended to be included in all bus purchases of Chapel Hill Transit vehicles.

#### Automated passenger counters

Automated passenger counters will record passenger boardings without reliance on operators. In the current fare free system the only source of rider information comes from drivers manually recording each passenger boarding using farebox counters. This is not always an accurate method of determining ridership. Automated passenger counters provide accurate detailed rider counting.

#### Automated vehicle locators

Chapel Hill Transit is installing real time passenger information system and automated vehicle locators. All future purchases should include the installation of automated vehicle locating equipment as part of the specifications. This is critical to maintain the effectiveness of the real time passenger information system.

#### Security cameras

Chapel Hill Transit staff recommends that all buses purchased have security cameras and that funds be committed to retrofit existing buses. Throughout the transit industry security cameras have proven to be critical to effective management of the system. Security cameras installed on buses can record all activity that occurs on the bus during the time the engine is running. Four camera locations record activities in the back of the bus, boarding, outside the windshield and passenger boarding.

Security cameras offer protection for both passengers and riders from unlawful or dangerous activities on the bus. They are particularly useful in protecting transit operators from false claims. The cameras can also mitigate exposure to the Town of Chapel Hill in accidents by providing accurate documentation account of an actual incident.

### **Project Cost and Financing**

The chart on the next page identifies the annual cost for recommended bus purchases over the 5 year period. Cost projections assume a 5% growth in FY 2007/08 and 3% growth each year thereafter.

The purchase recommendations include a mixture of 35 ft. and 40 ft. buses and the introduction of articulated buses. In addition, hybrid buses are purchased every other year.

The total cost to purchase 45 buses over the 5 year period is \$17,505,000. Assuming federal participation at 83%, federal cost will be \$14,529,200.

Chapel Hill Transit has funding available to purchase 19 buses programmed for FY 2006/07. After applying current federal funding of \$5,971,900, there is a 5 year federal funding deficit of \$8,557,300.

**5 Year Bus Purchase Cost Summary**

<u>Vehicle</u>	<u>#</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Federal Cost</u>	<u>State 8 %</u>	<u>Local 9 %</u>
<u>FY 2006/07</u>						
<u>Rec. 2008</u>						
35ft. bus	10	\$318,050	\$3,180,505	\$2,639,819	\$286,245	\$254,540
40ft. bus	2	\$341,205	\$ 682,410	\$ 566,400	\$ 61,417	\$ 54,593
60ft. bus	4	\$457,861	\$1,831,446	\$1,520,150	\$164,830	\$146,515
40ft. bus (Hybrid)	3	\$460,000	<u>\$1,380,000</u>	<u>\$1,145,400</u>	<u>\$91,632</u>	\$
Total			\$7,074,361	\$5,871,769	\$565,980	\$636,692
<u>FY 2007/08</u>						
<u>Rec. 2009</u>						
40ft. bus	6	\$ 360,000	<u>\$2,160,000</u>	<u>\$1,792,800</u>	<u>\$172,800</u>	<u>\$194,400</u>
Total			\$2,160,000	\$1,792,800	\$172,800	\$194,400
<u>FY2008/09</u>						
<u>Rec. 2010</u>						
35ft. bus	4	\$345,000	\$1,380,000	\$1,145,400	\$110,400	\$124,200
40ft. bus (Hybrid)	2	\$495,000	<u>\$ 990,000</u>	<u>\$ 821,700</u>	<u>\$ 29,200</u>	<u>\$ 89,100</u>
Total			\$2,370,000	\$1,967,100	\$189,600	\$213,300
<u>FY2009/10</u>						
<u>Rec. 2011</u>						
35ft. bus	6	\$355,000	\$2,130,000	\$1,767,900	\$120,400	\$191,700
60ft. bus (Articulated)	2	<u>\$510,000</u>	<u>\$1,020,000</u>	<u>\$ 846,600</u>	<u>\$ 81,600</u>	<u>\$ 91,800</u>
Total			\$3,150,000	\$2,614,500	\$252,000	\$283,500



FY2010/11  
Rec. 2012

40ft. buses	4	\$395,000	\$1,580,000	\$1,311,400	\$126,400	\$142,200
Hybrid	2	\$525,000	<u>\$1,050,000</u>	<u>\$ 871,500</u>	<u>\$ 84,000</u>	<u>\$ 94,500</u>
Total			\$2,630,000	\$2,182,900	\$210,400	\$236,700
<b>Total 5 Year Cost</b>			<b>\$17,384,361</b>	<b>\$14,429,069</b>	<b>\$1,390,750</b>	<b>\$1,564,592</b>
<b>Less FY 06/07 Committed</b>			<b><u>\$ 7,074,361</u></b>	<b><u>\$ 5,871,769</u></b>	<b><u>\$ 565,950</u></b>	<b><u>\$ 636,692</u></b>
<b>Unfunded</b>			<b>\$10,310,000</b>	<b>\$ 8,557,300</b>	<b>\$ 824,800</b>	<b>\$ 927,900</b>

By 2012 the fleet will consist of 99 buses in the following configuration:

Fleet configuration by size and fuel source

35 ft. Diesel Buses	72
40 ft. Diesel Buses	14
60 ft. Diesel Buses	6
40 ft. Hybrid Buses	7
Total	99

By 2012 45 buses will be less than 5 years old (45% of the fleet). More significantly about 30% of the fleet will be over 12 years old and eligible for replacement.

Possible Funding Sources

Federal Transit Administration 5307 Funds

Federal 5307 funds are allocated to transit systems annually based on a performance based distribution formula. This is the only source of federal transit funding that is guaranteed. Chapel Hill Transit will receive approximately \$2,750,000 in FY 2006/07. Those funds are expected to increase by about 20% during the life of the current transportation bill. These funds are eligible for either operating or capital activities. Currently 100% of these funds are programmed for operating purposes.

Surface Transportation Program Funds

Surface Transportation Program Funds are made available to local areas and distributed through the area Metropolitan Planning Organization. The funds can be used to fund any activities eligible under Federal Highway or Federal Transit programs. To secure these funds, Chapel Hill would make application through the metropolitan planning organization.

Congestion Mitigation / Air Quality Funds

Congestion Mitigation / Air Quality funds are available to fund highway and transit projects that will have a direct impact on improving air quality or reducing congestion. The funds are allocated to states and required to be spent in non-attainment areas. The funds are allocated on a competitive basis.

### Congressional Earmarks

All of the sources of federal funding described above will not fully fund the Chapel Hill Transit fleet replacement needs. We believe it will be necessary to seek congressional earmarks to fund long term vehicle replacement.

### Bus Leasing

If federal funds to purchase vehicles cannot be obtained it may be feasible to consider a bus lease option. Under the lease option the town would select a financial institution and a lease purchase agreement through a bidding process. The cost to purchase buses would then be spread over a twelve year period. Leasing has the following advantages;

1. A large number of buses can be procured with little cost up front.
2. Modernizing the fleet will avoid higher maintenance cost of an older fleet.
3. Services will be more dependable and better able to respond to service demands.

There are some disadvantages:

1. Interest rates will cause higher cost.
2. Ongoing payments can affect the ability to make other programmed purchases in the out years.

If the Town and its funding partners support the development of an ongoing fleet modernization program success will be dependent on securing funding. Since programmed federal funds will not adequately fund the recommended replacement program it will be necessary to look at congressional earmarks. If the Town is to pursue earmarks it is recommended that a funding strategy be developed and work begin with the congressional delegation in the fall of 2006 to plan for a multi-year earmark to secure the necessary funds.

## Chapel Hill Transit Passenger Amenities Program

Chapel Hill Transit has approximately \$290,000 in additional state allocation to support the improvement of passenger amenities.

Below is a summary of the activities planned.

**Emergency phones.** Chapel Hill Transit will install emergency phones at the following park and ride lots: Eubanks Road, NC 54, Southern Village and Jones Ferry Road. Over the past several months staff has worked with various suppliers to establish the proper number and location of phones to provide the maximum security for Chapel Hill Transit customers. Proposals have been received and staff is negotiating a project agreement with SFI – the most responsive proposal. Installation is expected to be completed by August 15.

Project cost                      \$90,000                                      Completion Date August 15, 2006

**Shelter repair and construction** The shelter program has two objectives:

1. To clean and repair existing shelters
2. Install new shelters throughout the community.

The following are being undertaken.

**Shelter cleaning and maintenance** Chapel Hill Transit will hire a permanent part time employee to clean and maintain shelters. The position will be filled in time to have all shelters cleaned before August. As a permanent employee this person will routinely clean and inspect all shelters, benches and bus stops.

**Shelter inventory** Chapel Hill Transit staff is conducting a shelter inventory that will evaluate the condition and the cost of repair or replacement of 80 shelters. The plan to be completed in June will establish budget and time table to complete the shelter repair over the next 12 months.

Project Cost                      \$75,000                                      Completion Date June 1, 2007

**New shelter locations** Once the shelter inventory is complete and a repair budget is established, Chapel Hill Transit will develop a process to select locations for new shelters. The plan will identify potential locations based on current ridership focusing on bus stops that have the highest number of boardings that do not have shelters as well as requests and petitions from the public.

Chapel Hill Transit has identified bus stop locations with the highest passenger boardings that do not currently have shelters.

Project Cost	\$50,000	Completion Date May 1, 2007
		5 Shelters

**Schedule information at bus stops** The Transportation Board has suggested that schedule information be provided at bus stops. Chapel Hill Transit recommends a program be started that provides schedule information at all timepoints in the system. It is estimated the there are 250 separate timepoints in the system. The cost to install schedule information could approach \$100 per stop.

Project Cost	\$25,000	Completion Date May 1, 2007
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