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TECHNICAL MEMORANDUM

Task Report ***Task 7 - New Process Improvements in Transit Asset Management***.

TxDOT Project 0-5542, Integrating Regional Multimodal and Public Transportation Planning

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TASK REPORT:

Guidelines for the disposition of transit vehicles vary because of differences in State and Federal rules. Due to capital funding availability and fleet/operational needs, some transit operators may be able to dispose of vehicles that have useful life remaining if purchased with federal funds. Other transit operators may have a need for such vehicles, as they could be more suitable for providing transit operations than their current fleet.

This task assesses current vehicle disposition practices and guidelines. Additionally, coordinating opportunities, tools, and resources that can be used in vehicle disposition are presented. The task was completed with cooperation from the North Central State Planning Region (4), and Services Program for Aging Needs (SPAN), the rural public transportation provider for Denton County.

Transit Vehicle Disposition

Vehicle disposition is regulated by both the Federal Transit Administration (FTA) and the Texas Department of Transportation (TxDOT) when either has contributed a portion of the cost of the vehicle. FTA Grant Management Guidelines C5010.1C contain the federal rules for determining whether a vehicle is eligible for disposition and how disposition should be handled. Texas Administrative Code (TAC) Title 43, Part 1, Chapter 31, Subchapter E, Rule 31.57 prescribes the disposition criteria and processes required by the state. Table 1 on page 3 of this technical memorandum compares FTA and TxDOT rules and regulations related to vehicle disposition.

Useful Life/ Eligible for Disposition

FTA sub-divides transit vehicles into five types, ranging from the large, heavy duty transit bus to light duty specialty vehicles. For each vehicle type, eligibility is defined based upon a minimum number years or miles of service life. These standards are contained in Table 1.

TxDOT's vehicle disposition eligibility is at the discretion of TxDOT staff. The TAC states that vehicles with a market value less than $5000 may be eligible for disposition. Thus, a vehicle may be eligible for disposition under FTA guidelines but not be approved for disposition by TxDOT.

End of Useful Life Disposition: Reimbursement

Upon their approval, both FTA and TxDOT require the vehicle owner to dispose of any vehicle in a competitive manner (unless they transfer the vehicle to another entity, as described below). Agencies typically conduct auctions to dispose of surplus and retired equipment. Traditionally, live auctions are the method used for vehicle disposition.. Many public agencies are now using web-based auction sites like www.publicsurplus.com to dispose of materials and equipment.

Even though FTA has recognized that a vehicle has reached the end of its useful life, FTA may still have a remaining financial interest in the proceeds from the sale of the vehicle. If a vehicle sells for less than $5000, then FTA requires no reimbursement. If the sale price exceeds $5000, then FTA requires reimbursement commensurate with the original federal share. Thus, if a vehicle sold for $4999, the FTA would require no reimbursement; if the vehicle sold for $5001 and if FTA provided 80% of the original cost, FTA would receive $4001 and the local transit agency would receive $1000. Note that the value of the vehicle is established by the sales price only.

If TxDOT approves disposition of a vehicle and considers the vehicle at the end of its useful life, then TxDOT requires no reimbursement of the state's percentage contribution of the original purchase price.

"Early" Transfer of Vehicle Assets

FTA permits the transfer of vehicles with remaining useful life to other public transportation operators that provide service to the public-at-large. FTA must approve the transfer and the FTA interest in the vehicles is retained, but is assigned to the new owner. FTA will also permit the transfer of vehicles to local government agencies for non-transit if:

- there is no identified public transportation use for the vehicles;
- the vehicles will remain in public use after the transfer for at least five years; and
- if the benefit of the transfer is greater than FTA's financial interest in the vehicle at the time of transfer.

Note that any service that is not available to the public-at-large, includes Medicaid transportation, university transportation, and charter services.

TxDOT matches the FTA conditions in cases where the vehicle is transferred to another public transportation provider. However, TxDOT does not permit transfer for non-public transportation purpose, even if FTA approves of such a transfer. TxDOT would require the current owner to sell the vehicle as an early disposition.

"Early" Disposition

An early disposition is the sale of a vehicle prior to it reaching its useful life. For example, if a provider reduces service, a portion of the service fleet may no longer be required. If there is no need to transfer the excess fleet to another public transportation provider, then TxDOT will require disposition of the vehicle (see above),

With an early disposition, FTA requires reimbursement of their share of the value of the vehicle, even if that value is less than $5000. FTA determines value by the sale price of the vehicle. However, if the remaining unamortized value on the vehicle is greater than the sale price, then the federal reimbursement would be based upon that unamortized value rather than the sale price.

TxDOT also requires reimbursement for the state's share of the value of the vehicle. However, TxDOT does not establish the vehicle's value based upon the sale price. Instead, for early disposition, TxDOT requires three valuations on the vehicle and bases the level of state reimbursement upon the average of the three.

Proceeds to Other Capital Projects

In place of remitting federal and/or state reimbursement, an agency may hold that money and apply it as part of the federal and/or state share on a future capital project. FTA requires the proceeds be placed in a restricted fund so that those monies can only be used on a future capital project.

TxDOT instead establishes a record of liability indicating that the agency owes TxDOT the state's computed portion share. That record is removed when the funds are applied. Thus, FTA and TxDOT have similar policies implemented in slightly different manners.

Table 1.
Federal and Texas Conditions for Disposition of Transit Vehicles with Federal/State Funding Participation

	FTA	TxDOT
Useful Life/ Eligible for Disposition	• Large size/heavy-duty (35+ ft): 12 yr/500k mi. • Medium/heavy duty (30'): 10yr/350k mi • Medium/medium duty(30'): 7 yr/200k mi • Medium/light duty(25'-35'): 5 yr/150k mi • Other light duty/special vans: 4 yr/100k mi	Requires TxDOT approval: if current per-unit value is less than $5000, under Administrative Code the vehicle "may" qualify for disposition
"Early" Transfer of Vehicle Assets	May transfer to local government authority for public use with no obligation to feds if: • Asset will remain in public use for 5 years after transfer • No public transportation use for the asset • Benefit of transfer outweighs financial benefit to Government	• No further financial obligation to state if state approves exception AND vehicle to continue to be used in transit (financial obligation assumed by transferee) • TxDOT does *not* permit transfer of vehicles for non-public transportation uses: becomes an early disposition
"Early" Disposition	Only after approval, must remit to FTA the Federal share of the sale price OR the unamortized value on the remaining service life, WHICHEVER IS GREATER (even if unamortized value is less than $5000)	Only after approval, must remit to TxDOT the state's share of the sales price
Proceeds to Other Capital Projects	Agency must put proceeds into a restricted fund for use in later capital projects; apply the funds to reduce the gross cost of the future project	Agency must establish a record of liability showing the funds as "owed" and then remove the record when funds are used on subsequent project
End of Useful Life Disposition: Reimbursement	• If unit has value of $5000 or less: no obligation to reimburse FTA • If unit has value above $5000: reimburse based upon federal share in unit (sales price if sold; market value if retained)	If TxDOT approves disposition, state has no further financial interest

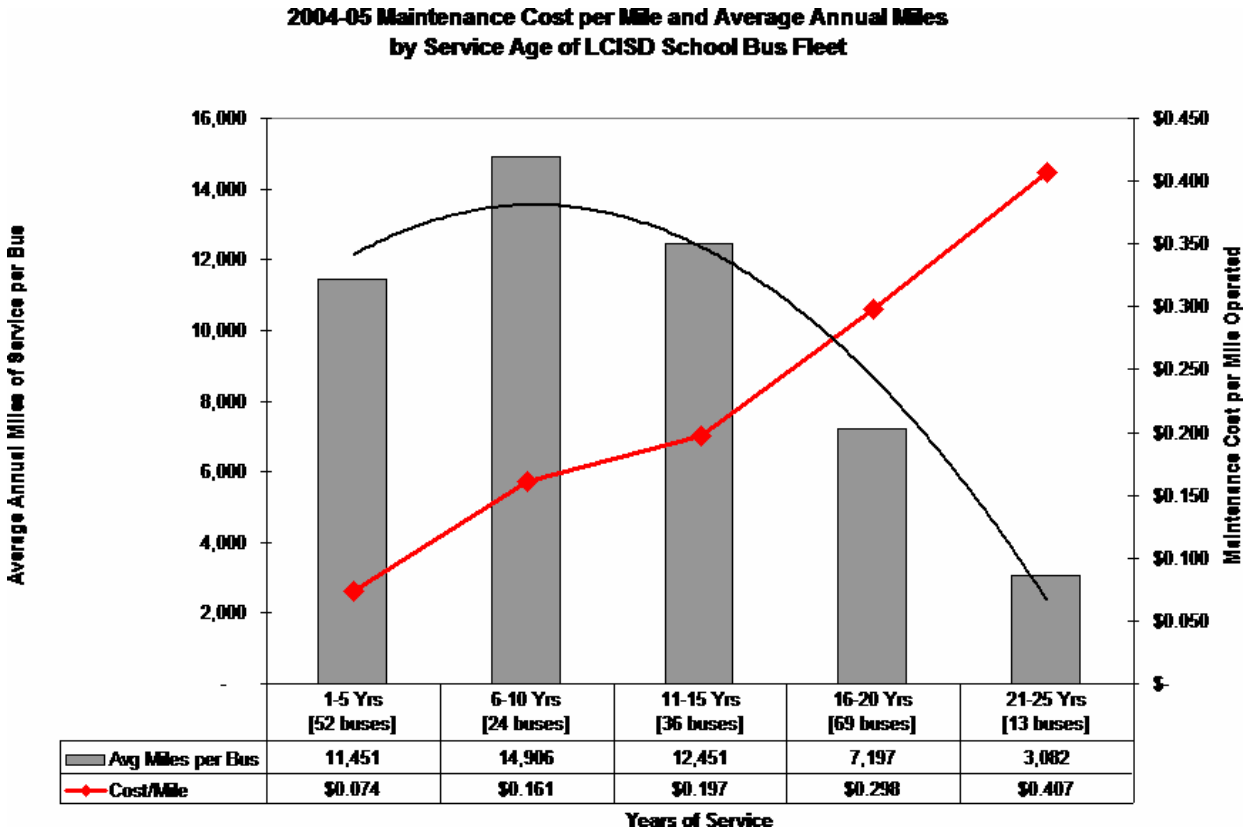
Operating Cost Considerations in Vehicle Fleet Replacement: SPAN (Services Program for Aging Needs) Example

SPAN is the designated provider of rural transportation services to the general public in Denton County. They also provide a variety of public services targeted at meeting the needs of seniors. They operate demand response service using 20 lift-equipped vehicles on weekdays between 7 a.m. and 6 p.m.

The fleet operated by SPAN is classified as "other light duty/special vans" per FTA definitions. FTA defines the useful life of a vehicle as four (4) years or 100,000 miles to this fleet type. As of January 2007, only five (5) vehicles in the SPAN fleet had accumulated less than 100,000 miles, and seven (7) vehicles had over 200,000 miles.

As any fleet ages, the cost per mile of operating that fleet will tend to escalate. To illustrate this point, Figure 1 displays actual data for a school transportation system. Data were accumulated by sub-fleets reflecting each five-year increment of vehicle service age.

Figure 1
Utilization and Maintenance Cost by Age Groupings of Vehicles



The vertical bar illustrates the average annual miles accumulated per bus in each sub-fleet. Vehicles in the "6 to 10 years" of service life ran the most average annual miles. Vehicles with a service life of 16 to 20 years are operated about half as many miles annually as the 6 to 10 year fleet; and vehicle older than 20 years are operated less than 25% of the miles of the 6 to 10 year fleet.

The line with diamond markers represents the average maintenance cost per mile of each sub-fleet. The slope of this line increases when the sub-fleet exceeds 15 years of service life, and the cost per mile is doubled when the fleet exceeds 20 years. Older vehicles have higher maintenance costs. These maintenance cost rates increase despite the lower mileage being accumulated on the older fleets.

Capital versus Operating Costs

One key benefit of capital investment is saving on operating costs. For example, automation of manufacturing processes leads to a reduction in the labor costs required to produce an item. In this example, a capital investment is justified if the annual depreciation on the investment plus the associated operating cost required to operate and maintain that investment results in a greater savings compared to the former non-automated process. Or, in the case of a vehicle fleet, capital investment in new vehicles may make economic sense if operating cost for older vehicles exceed the cost of capital investments.

In the case of vehicle replacement, a second factor influences this economic analysis. Rural transit agencies receive 5311 federal funding and state rural transportation funding to provide public transit. State funds are typically used to match federal funds. FTA permits the use of 80% federal dollars for capital expenditures and the use of 50% federal dollars for operating expenditures.

Since vehicle maintenance is considered an operating cost, the disparity in federal reimbursement rates for operating (maintenance) and capital (vehicle replacement) raised concern at the federal level that transit operators may defer care of vehicles and the related on-going expenses in favor of rapid replacement of the fleet. Therefore, maintenance costs are also reimbursed at the 80% rate to avoid deferral of maintenance. Other operating costs (i.e.fuel) may also vary with the age of a vehicle; those costs are reimbursed only at the 50% rate. These different rates of reimbursement may become factors in the economic analysis.

Economic Analysis

A sample analysis was conducted on the SPAN fleet. This analysis is based upon actual data provided by SPAN. However, the same process could be applied to any fleet using data from the fleet's system.

SPAN maintains records on parts and materials cost for each vehicle in its fleet. These vehicle costs for FY07 to-date were adjusted to reflect annualized parts/materials costs. The total maintenance cost was derived assuming that labor represent approximately 40% increase over

parts costs.[1] Maintenance costs reflect only typical preventive maintenance and standard repairs; major component rebuild/replacement and body repairs are not included for this comparison.

Based on the review of the SPAN inventory and maintenance records, Vehicle 40 appears to be a candidate for replacement. It has operated over 233,000 miles and has a projected annual maintenance cost of $17,530. Conversely, Vehicle 27 has among the lowest mileage recorded (30,000) and a similarly low annual maintenance cost of $4630. It is likely that a portion of these costs are recovered through warranty; to be conservative, no warranty recover is included in these calculations. Table 2 compares these two vehicles.

Table 2.
Comparison of Annual Costs

Annual cost	**Vehicle 40**	**Vehicle 27**
Est. Life Miles (1/1/07)	233,000	30,000
Depreciation	$0	$11,000
Maintenance	$17,530	$4630
TOTAL	$17,530	$15,630

For the SPAN fleet, a capital cost per vehicle of $60,000 and a residual value of $5000 at the end of its economic life is assumed. Therefore, over a five-year economic life, depreciation is an estimated $11,000 annually. Note that these assumptions are used in developing the depreciation expense; clearly, vehicles are not routinely retired at five years. Table 2 reflects an example economic analysis targeted at determining when a vehicle *should* be retired.

In Table 2, the total annual cost of operating Vehicle 40, despite the lack of depreciation cost, still exceeds the total annual cost of operating Vehicle 27. The comparison is conservative since there has been no consideration of possible warranty recovery for Vehicle 27, which would lower the annual maintenance cost to SPAN. Additionally, the disposal of Vehicle 40 would generate some additional income for the agency. Lastly, Vehicle 40 likely also has an incremental difference in operating cost, usually due to lower fuel efficiency in older vehicles. Since operating costs are reimbursed at only a 50% federal rate, these differences result in a greater impact to state and local transit dollars than maintenance cost differences.

Cash Flow Considerations

One factor that inhibits fleet replacement is cash flow. Using the example provided in Table 2, SPAN is expected to spend $2000 more this year maintaining Vehicle 40 compared to the annualized cost of operating a new vehicle. However, if SPAN buys a new vehicle, they must generate the entire non-Federal share at the time of procurement. Thus, SPAN would need to generate $12,000 in state and local money to buy a vehicle compared to the $2000 saved in maintenance costs.

However, with each passing year, SPAN will likely spend increasing amounts of money maintaining the older vehicle and responding to service interruptions. The investment in equipment would support improved service reliability, fuel economy and typically, reduced emissions.

[1] This labor adjustment reflects data obtained by reviewing details parts and labor documentation reviewed in the previous transportation analyses.

Ideally, a system would establish a vehicle replacement program so that monies can be reserved for regular replacement. In the long-term, the total system costs would be expected to decrease and service quality would improve.

Regional Opportunities

Conducting this economic analysis on a single fleet is limited and reflects any specific circumstances related to that agency's fleet mix, service mix and maintenance plan. An improved approach would be to gather information on a larger set of vehicles on a regional basis. A broader mix of providers and fleets could provide better information upon which to establish a regional vehicle replacement plan. Further, if an agency had vehicles that it no longer needed, sharing that information first with the region would permit other regional providers an early opportunity for transfer of a vehicle to their organization.

One simple mechanism for sharing of fleet information would be through the creation of a fleet management sub-committee as part of each regional service coordination group. This sub-committee could develop a regional fleet retirement/replacement schedule that would in turn foster the opportunity for joint vehicle procurement.

In order to ensure information flow, TxDOT could modify their fleet disposal process to include notification of all providers of an operator's intent to dispose of a vehicle. All providers wishing to dispose of a vehicle must obtain written concurrence from TxDOT prior doing so. If TxDOT concurs in this request, they could immediately notify all operators of the availability of a vehicle. Thus, TxDOT would still make sure that the intended disposal meets all federal and state requirements while giving Texas providers the first opportunity to obtain the vehicle. Vehicle availability could be made through website announcements.