AOT's Proposal to Purchase Colorado Railcar Equipment
Joint Fiscal Office Analysis
January 11, 2007

1. Summary
Key points:

> This is a fiscal analysis of the administration's proposal to purchase rail equipment for use on the Amtrak Vermonter service as a demonstration project. The analysis is based upon several key assumptions as to which the results are particularly sensitive. These include (1) federal funding of and policy governing Amtrak, (2) cost and revenue inflation rates, (3) ridership projections and (4) equipment maintenance costs.

> The annual cost of maintaining the state's two Amtrak services, the *Vermonter* and the *Ethan Allen*, is going to increase significantly absent Congressional action and the state's options are limited. Under current federal policy, Amtrak is requiring the state to absorb

all of the direct and indirect costs of the services. By FY13, when the phase-in of these costs is completed, the annual state cost of the existing services is projected to be $6.62 million. This compares to $2.65 million in FY06 and represents an average annual growth rate of 14% over the 7 year period. After FY13 the costs should grow in line with inflation.

> In an attempt to maintain the Amtrak services while mitigating the cost increase, the administration has proposed as a demonstration project that the state purchase new equipment from Colorado Railcar to be used on a reconfigured Vermonter service. The new equipment and reconfigured service would generate cost savings, but only relative to the costs as they are otherwise scheduled to increase.

If the existing Vermonter service is simply continued, the state cost in FY13 would be $4.37 million (66% of the $6.62 million for both services). Under the administration's proposal, as analyzed herein, the FY13 cost of the reconfigured Vermonter service (when all costs are phased in) is projected at $3.43 million, a cost differential of $938,000.

> The new equipment would cost $17.5 million and be financed via a special federal rail loan program. The state's exposure would be somewhat limited by a right to sell the equipment back to Colorado Railcar at the end of the 3 year demonstration program at a minimum guaranteed price equal to 90% of the original price. If the state exercised the option and the equipment sold at the 90% level, including interim interest payments on the loan, the total equipment-only related cost of the demonstration project would come to $5.1 million.

> Farmrail Corporation (in association with Industrial Rail Services Inc.) is the only other comparable equipment supplier in the market. While Colorado Railcar's equipment is new, Farmrail offers "remanufactured" used Budd Company rail equipment. The essential differences between the two alternatives are: (1) Colorado Railcar's equipment is totally new, engineered from scratch and (2) Farmrail's remanufactured Budd cars are based upon a used, decades old but retested, stainless steel structural frame. Other than the frame and truck castings (essentially the wheel assemblies, which have to be periodically replaced in any event), all other components of the Farmrail remanufactured equipment are new.

Farmrail has offered to sell the state 3 self-propelled remanufactured Budd cars ("RDCs") and 2 Budd car passenger coaches for a max-option price of $7.5 million. To optimize engine wear, however, Farmrail does not recommend using an RDC to pull an unpowered coach and as an alternative recommends a 5 RDC package to be used in two RDC-RDC train sets with one RDC as a spare. Farmrail's max-option price for 5 remanufactured RDCs is $8.0 million. This analysis considers the $8 million 5 RDC option.

The two equipment alternatives have different projected useful lives – 25 years for Farmrail, 40 years for Colorado Railcar. After adjusting for the difference in useful lives, the equipment cost of the Farmrail alternative is the range of $12.0 million, $5.5 million less than the Colorado Railcar alternative. This $5.5 million difference boils down to (1)

the putative risk associated with equipment having a decades old but retested stainless steel frame versus a new steel composite frame and (2) the putative additional revenue generating value of CRC's modern design.

In FY13 (when all costs are phased in), the cost differential between the Farmrail scenario and the existing Vermonter's costs as they are scheduled to increase is $1.2 million (versus $938,000 for the CRC scenario).

> The analysis assumes that Vermonter ridership will increase by 20,000 as projected by Amtrak. Since the proposal includes a change in schedule which adds 2 service runs between White River Junction and New Haven, some increase in ridershp is reasonable to expect. With the Colorado Railcar equipment, if ridership increases by only 10,530 (47% less than the projected increase), the cost savings through FY-13 relative to continuing the existing service would be eliminated although savings on a longer term basis would be generated. With the Farmrail equipment, the equivalent no-savings-relative-to-the-status-quo- ridership point is an increase of 7,860 (61% less than the projected increase).

If one assumes that with CRC equipment the ridership will increase 20,000 but with Farmrail equipment the increase will be less, the point at which the Farmrail equipment option produces the same cost savings as the CRC option through FY-13 relative to continuing the existing service is a ridership increase of 17,325, 13.4% less than the 20,000 as projected. This is the CRC versus Farmrail same-cost-savings point.

> All destinations and connections served by the existing Amtrak services are currently being served by bus services by Vermont Transit. Implementation of the administration's proposal would most likely have some adverse impact on Vermont Transit.

2. Background
The state of Vermont supports two Amtrak passenger rail services: the *Vermonter* and the *Ethan Allen.* In its present schedule the Vermonter runs two trains daily: (1) from St. Albans (departing 8:30 A.M.) to Washington, D.C. (arriving 10:05 P.M.) and (2) from Washington D.C. (departing 8.05 A.M.) to St. Albans (arriving (9:25 P.M.)[1]. The Ethan Allen also runs two trains daily: (1) from Rutland (departing 7:00 A.M.) to New York City (arriving 12:25 P.M.)[2] and (2) from New York City (departing 2:45 P.M.) to Rutland (arriving (8:10 P.M.)[3].

Both services operate at a deficit and require subsidies which for a number of years have been divided between Vermont and Amtrak. For the Vermonter the operating deficit so divided is limited to the cost of providing the service between St. Albans and Springfield, MA; and for the Ethan Allen the cost between Rutland and Albany, NY.

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[1] Mon-Fri schedule effective July 29-September 4, 2006.
[2] Tue-Fri schedule effective July 29-September 4, 2006.
[3] Sat-Thu schedule effective July 29-September 4, 2006.

For a number of years Amtrak has been under pressure to reduce its operating deficits. In pursuit of that goal, at least as early as 2002, Amtrak announced its intention to eliminate all Amtrak provided subsidies for state sponsored routes such as the Vermonter and Ethan Allen. Amtrak defines service costs as being "direct" (costs directly attributable to a particular route such as fuel, wages, and maintenance) and "indirect" (basically overhead costs such as management and reservation services). Amtrak's original position was that states must assume 100% of the direct allocated costs of state sponsored routes (the "allocated" direct costs being that portion of a service's direct costs attributable to the state sponsored segment of the route, e.g. for the Vermonter the portion of the St. Albans to Washington, D.C. costs attributable to the St. Albans to Springfield, MA segment). More recently, Amtrak has taken the position that over a period of years ending in 2012 states must also assume 100% of the indirect allocated costs of state sponsored routes.

Amtrak has been implementing its policy regarding the shifting of direct allocated costs through negotiations with states on a case by case basis over the past several years. In Vermont's case the direct cost shift phase-in has been gradual. In the FY06 Amtrak contract, for example, based on estimated costs and revenues at the time the contract was entered into, the contract contemplated a 2/3 state, 1/3 Amtrak split of the projected direct cost net operating deficit. Even with Amtrak covering 1/3 of the required subsidy, the cost to Vermont was $2.65 million, a 67% increase above the FY01 service contract amount of $1.59 million (a 10.8% annual growth rate in the contract amount over the 5 year period).

An historical analysis of the direct costs of the Vermonter and Ethan Allen services and the division of those costs between Vermont and Amtrak is complicated by several factors. First, a portion of the rising cost of the state's Amtrak contract is due, not to cost shifting, but to the decline in Vermonter ridership (down 27% from FY01 to FY06, Ethan Allen ridership has remained fairly stable). Declining ridership and thus ticket revenue even on a stable cost base translates into wider net operating deficits. Second, after announcing its policy of shifting all direct costs to sponsoring states, Amtrak and the affected states have gone through several rounds of resolving the exact scope and meaning of "direct" costs and how such costs are to be allocated between route segments. The state's annual contract negotiations with Amtrak have thus been based upon service cost projections that from year to year reflected an evolving methodology for accounting and classifying the costs involved. Without reconstructing and reconciling all historical costs on a common basis, a year over year comparison is of dubious value.

Going forward, of course, an objective and transparent methodology for classifying all costs is essential to any agreement to continue the Amtrak services. With respect to federal FY07, Amtrak projects that continuation of the existing Vermonter and Ethan Allan services will generate a direct allocated cost net operating deficit of $4 million (i.e. 100% of direct allocated costs for the services less 100% of the allocated ticket revenue) with fully allocated indirect costs of an additional $1.7 million. Absent a change in policy by Congress or cost saving changes in the services, this current total dollar cost figure of $5.7 million per year, with inflation, represents the best estimate of the future cost of

maintaining the existing services. As stated, this compares to $1.59 million in FY01, $2.65 million in FY06 and $3.3 million as budgeted for FY07.

The caveat regarding a change in policy by Congress is worth highlighting. Under current federal law, Amtrak classifies its routes as being either (1) long distance or (2) short distance corridors. The short distance corridor routes, in turn, are subdivided into (1) the New England Corridor and (2) state funded and legacy routes.[4] This current federal law route classification raises a basic issue of equity. The Vermonter and Ethan Allen routes are the functional equivalent of several of the legacy routes and of a number of inter-city segments of the long distance routes. The only real difference is that Vermont provides financial support for the Vermonter and Ethan Allen while the states which benefit from these functionally equivalent Amtrak services provide no financial support. This situation is mainly the result of political inertia – Amtrak has paid for the long distance and legacy routes since Amtrak was first formed in 1971 and the Congressional delegations of the beneficiary states have successfully resisted any change to the status quo. While the pressure on Amtrak to cut it deficits, and thus the pressure onVermont to cover a higher share of the Vermonter and Ethan Allen deficits, will likely continue, a restructuring of Amtrak which results in a more equitable basis for the determining the extent of federal support of inter-city passenger rail routes could well have positive fiscal implications for Vermont compared to the status quo.

A separate but related type of "free rider"problem is presented by states which benefit from but do not provide financial support to another state's funded route. For example, neither New Hampshire nor Massachusetts provide any support for the Vermonter. While the Amtrak system level type of free rider problem can be resolved by Congress, this second type of free rider problem can only be resolved through inter-state cooperation.

The table below summarizes the Vermont subsidy for the Vermonter and Ethan Allen services and ridership from FY01-FY06.[5]

Amtrak Subsidy and Ridership FY01-06					
FY	Vermonter	Ethan Allen	Total	VT subsidy	Subsidy per passenger
FY01	72,235	43,278	115,513	$1,587,658	$13.74
FY02	68,713	39,613	108,326	$2,020,000	$18.65
FY03	61,948	35,786	97,734	$2,670,000	$27.32
FY04	61,431	37,966	99,397	$2,300,000	$23.14
FY05	54,687	38,920	93,607	$2,500,000	$26.71
FY06	52,490	41,400	93,890	$2,650,000	$28.22

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[4] See GAO November 2006 report at http://www.gao.gov/new.items/d0715.pdf

[5] The subsidy is for both services on an aggregate basis. Ridership is counted per boarding. Thus a passenger making a round trip counts as two riders and on a round trip basis the subsidy is twice the per boarding figure. Throughout this analysis "subsidy per passenger" figures are derived by simply dividing the projected total service deficit by the projected number of total boardings. This means no distinction is made between passengers taking a long versus a short trip.

This table shows a definite declining trend over the 5 year period from FY01. Early figures for FY07, however, hint at a significant reversal. For FY07, from July through October 2006, year to date FY07 ridership is up 15.1% on the Vermonter compared to the same period in FY06 and is up 15.2% on the Ethan Allen.[6]

3. AOT proposal
AOT's proposal is summarized below:

New equipment
The state would purchase 3 self-propelled passenger rail vehicles (called "DMUs" short for "diesel multiple units") and 2 coaches to be manufactured by Colorado Railcar Manufacturing, LLC ("CRC"). The equipment would form two train sets each consisting of a DMU and a coach car with the third DMU as a back up. Price: $17.5 million. The new equipment would be delivered approximately 12-14 months after the order is placed.

Ownership
The state would own the equipment and contract with Amtrak to use it on a reconfigured Vermonter service. A contract for maintenance of the equipment would be put out to bid.[7] The Ethan Allen service would continue as is.

Vermonter service changes
As stated, the new equipment would be used on the Vermonter line. Instead of running from St. Albans to Washington, D.C. the new Vermonter would be limited between St. Albans and New Haven, Connecticut. At New Haven, a cross platform connection would enable southbound Vermonter passengers to continue on to New York and Washington and Vermont bound Amtrak passengers to proceed north on the Vermonter.

In the current service, the Vermonter must pull enough cars between St. Albans and New Haven to meet the significantly higher passenger demand that exists between New Haven and Washington, D.C. Through Vermont, however, those extra cars largely sit empty which raises the operating costs of the service both in terms of equipment utilization and fuel. A key advantage of the proposed reconfiguration is

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[6] Higher gas prices may be a key factor in explaining the year over year increase in ridership but the explanation would not be that gas prices were much higher in July-October 2006 than in July-October 2005. According to AAA data, the monthly average national price of regular gas first exceeded $2.00 a gallon in March 2005, hit a 2005 high of $2.75 in September, and averaged $2.63 between July-October 2005. Regular gas hit a to-date monthly average high of $2.97 in July 2006 but averaged $2.66 between July-October 2006. Thus the 15+% increase in ridership in July-October 2006 compared to July-October 2005 occurred in the context of very comparable gasoline prices during the two time periods. A possible explanation is that after 16 months of gas prices in excess of $2.00 a gallon (from March 2005-June 2006), consumers have started to adjust their travel decisions to the perception of permanently higher fuel prices. Absent a substantial decline in fuel prices, this would suggest the ridership increases may be sustained.

[7] CRC in its presentation stated that it would submit a bid to provide needed equipment maintenance. Whether any company other than CRC would be qualified to provide equipment maintenance is an issue to be resolved.

that it allows the passenger capacity of the Vermonter to be appropriately sized to the market demand between St. Albans and New Haven with consequent cost savings. In addition, the awkward switching maneuver required at Palmer, MA currently necessitates the use of an second locomotive so that that the train is bi-directional. This need for a second locomotive would be eliminated by the use of either CRC or Farmrail equipment.

The reconfigured Vermonter service would consist of two daily trains. One would run from St. Albans to White River Junction to New Haven and then from New Haven back to White River Junction where the train set would overnight. The second train would run from White River Junction to New Haven and then from New Haven to White River Junction to St. Albans where the train set would overnight. The two train sets would thus flip-flop their starting points each day and while each day there would be, as now, one train running from St. Albans to White River Junction and one train running from White River Junction to St. Albans, under the new schedule there would be two trains as opposed to one under the existing service running from White River Junction to New Haven and also two trains running from New Haven to White River Junction.

Financing
The entire purchase price would be financed via a loan from the Federal Railroad Administration's Railroad Rehabilitation and Improvement Financing ("RRIF") program. The term of the loan would be for 25 years and bear an interest rate equal to the federal government's cost of borrowing (i.e. the yield on 25 year Treasuries). Principal payments on the loan would be deferred while the equipment is being manufactured and for the 3 years of the Vermonter demonstration project and then repaid in equal annual payments (mortgage basis).

Amtrak grant
Amtrak would provide the state with a $2 million grant for transition and marketing costs on the new service including the cost of a new equipment maintenance facility which would be necessary (estimated cost of a new maintenance facility is $500,000). A portion of the grant ($675,000) is intended to cushion the impact of the state having to pay 100% of the direct allocated costs of the Vermonter using the existing equipment while the new equipment is being manufactured.

Equipment sell back option
At the end of the 3 year demonstration period, the state would have the option of unwinding the purchase. If exercised, CRC would endeavor on the state's behalf to resell the equipment for a price higher than 90% of the original sale price. If there are no buyers after one year, CRC would buy back the equipment for a price equal to 90% of the original sale price.

4. Cost Savings

As described, in terms of passenger capacity, the current Vermonter service is significantly oversized relative to what is needed between St. Albans and New Haven.[8] The propulsion system of the Vermonter train set is also significantly oversized. Because of the unique line switching problem in Palmer, MA and the fact that trains are prohibited from going in reverse for any significant distance, the Vermonter has to use two diesel engines, one at either end of the train set.

The new CRC equipment would generate operating cost savings in 3 distinct areas. First, and most importantly, the new equipment would be significantly more fuel efficient then the traditional heavy locomotives presently being used. According to CRC's fuel consumption analysis, a DMU-Coach train set running between St. Albans and New Haven would consume an average of 0.60 gallons of diesel fuel per mile (1.7 miles per gallon). This compares to 2.0 gallons per mile (0.5 miles per gallon) for the existing Vermonter two locomotive and multi-car 400 passenger capacity train set. Reduced idling time with the smaller DMU power plant, and just one DMU as opposed to two locomotives, would generate further fuel savings. The table below summarizes CRC's fuel analysis, using the diesel fuel per gallon price assumed in the cost projections.[9]

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[8] During holiday periods the Vermonter has at times been filled to capacity. However, the FY05 ridership of 52,490 breaks down to average of 72 passengers per train: 52,490 passengers / 365 days / 2 daily trains. This average represents just 18% of the current Vermonter's 400 seat capacity. While there are certainly periods when ridership significantly exceeds 72 passengers, mathematically that means there are other periods when ridership is significantly less than 72 passengers.

[9] The analysis is for the current Vermonter schedule limited between St. Albans and New Haven. Total annual train service miles between these points under the current schedule is 226,000. Under the reconfigured service, with 2 extra daily trips between White River Junction and New Haven, total annual train service miles would be 360,000.

CRC Fleet Fuel Consumption Analysis		
Current Vermonter schedule: St. Albans to New Haven		
Train Set	DMU-Coach	Amtrak
Miles ST.A-NH	309	309
x Days per year	365	365
x Runs per day	2	2
= Total annual miles	225,570	225,570
Annual miles rounded	226,000	226,000
x Gallons per mile	0.60	2.00
= Annual gallons	135,600	452,000
x diesel per gallon	$2.22	$2.22
= Annual fuel cost ex.idling	$301,032	$1,003,440
Miles per gallon	1.7	0.5
Idling hours per set per day	2	10
x gallons per idling hour	6	20
x days per year	365	365
x # idling engines	2	4
= Annual idling gallons	8,760	292,000
x diesel per gallon	$2.22	$2.22
= Annual fuel idling cost	$19,447	$648,240
Total fuel costs	$320,479	$1,651,680
Rounded	$320,000	$1,652,000

Second, the more appropriately sized train sets will generate cost savings in the form of lower equipment utilization, that is, depreciation costs. Besides fewer coach cars, the CRC equipment would eliminate the need for a second locomotive to deal with the Palmer switching problem. This is because a CRC DMU-Coach set has dual cab controls which allow the set to be operated from either end. Budd RDC cars also have dual cab controls so a two Budd RDC car train set is also bidirectional.

Third, a CRC DMU and coach train set or equivalent Budd RDC car train set would have a smaller crew than that required by the current Vermonter, generating savings in staffing costs.

5. Fiscal Analysis
(a) Summary
There are 3 attachments to this note. The first, entitled "Cost Projections of Existing Amtrak Services" is the status quo scenario. It details the cost projections of continuing the existing Vermonter and Ethan Allen services under Amtrak's requirement that the state eventually absorb 100% of the services' direct and indirect costs. The analysis shows the total net annual cost of the Amtrak services rising from $2.65 million in FY06 to $3.68 million in FY07 and then gradually increasing to $6.62 million in FY13 at which point all direct and indirect costs are fully phased in. Assuming that ridership remains

unchanged, the subsidy per passenger including both services rises from $28.22 in FY06 to $39.12 in FY07 and then to $70.46 in FY13.

The second attachment, entitled "Existing vs. Proposed Vermonter Service with Colorado Railcar Equipment", analyzes the administration's proposed reconfiguration of the Vermonter service using CRC DMUs and coaches. Since the Ethan Allen service is to remain unchanged during the Vermonter demonstration, the comparison is limited to the Vermonter. The analysis shows the net annual cost of the existing Vermonter service rising from $2.41 million in FY07 to $4.37 million in FY13 when all costs are phased in. For the reconfigured Vermonter service using CRC equipment, the net annual cost increases from $2.38 million in FY07 to $3.43 in FY13. Assuming Vermonter ridership increases by 20,000 per year as projected by Amtrak in the reconfigured service, the subsidy per passenger rises from $45.30 in FY07 to $47.28 in FY13.

For the 7 fiscal year period shown, the difference in total costs between the two scenarios amounts to $3.42 million, an average of $489,000 per year. This 7 year snapshot, however, does not fairly reflect the longer term benefits of the new equipment because (1) in FY07 and for half of FY08 the existing Vermonter equipment is used in both scenarios and (2) indirect costs, which are significantly higher for the existing Vermonter, are only phased in through FY13. In other words, the total 7 year cost differential includes 1.5 years in which the same equipment is used (though partially offset by the Amtrak transition grant) and throughout the 7 year period Amtrak is absorbing a portion of the indirect costs of each scenario which otherwise, because of the existing Vermonter's higher indirect costs, would translate into a higher total and annual average cost differential.

As of FY13 all costs are phased in resulting in a cost differential of $938,000. Thereafter, because of the existing Vermonter's higher cost base and assumed inflation to the cost base of 3.0% per annum, the cost differential widens over time. For the 10 year period FY13-22, the first 10 years after all costs have been phased in, the average cost differential is $1.21 million per year. For the first 15 years, from FY07-21, the average cost differential is $874,000.

The third attachment duplicates this analysis for the Farmrail equipment option discussed in Section 6.

Summary data for the CRC equipment scenario for fiscal years 2007 – 2013 is shown below:

Proposed Vermonter Service with Colorado Railcar Equipment					
Vermonter	Status quo		CRC Proposal		Cost
Fiscal Year	Net costs	Per rider	Net costs	Per rider	Difference
2007	$2,407,060	$45.85	$2,378,231	$45.30	$28,828
2008	$2,833,867	$53.98	$2,892,540	$49.13	-$58,672
2009	$3,152,044	$60.04	$2,826,513	$41.04	$325,531
2010	$3,483,127	$66.35	$2,886,491	$39.81	$596,636
2011	$3,827,637	$72.91	$3,098,547	$42.74	$729,090
2012	$4,186,113	$79.74	$3,322,737	$45.83	$863,376
2013	$4,365,866	$83.16	$3,427,665	$47.28	$938,201
Total FY07-13	$24,255,714		$20,832,724		$3,422,990

(b) Deferral of principal

For purposes of this cost analysis, one significant change is made to the administration's proposal concerning the period of time that principal payments on the loan are deferred. The administration's proposal assumes that principal payments on the loan will be deferred for 4 years (1 year while the equipment is being manufactured plus the 3 years of the demonstration period). The effect of this assumption, however, is to understate the annual costs of the equipment alternative during the 3 year demonstration period.

The effect of deferring payment of principal during the demonstration period is to shift the assessment of equipment acquisition costs to the future. Postponing these costs, however, comes at a price in the form of higher interest charges over the life of the loan. If principal is deferred for just 1 year instead of 4, total interest charges over first 7 years would be $902,000 higher but over the full 25 year term of the loan would be $872,000 lower. In other words, by deferring 4 years instead of 1, $902,000 of year 1-7 costs are shifted to years 8-25 but at the price of paying $872,000 in additional interest during years 8-25. The table below summarizes these figures:

Debt Service - Impact of Principal Deferal			
FY	Defer 4 Years	Defer 1 Year	Difference
2007	$241,172	$241,172	$0
2008	$884,297	$1,074,552	$190,255
2009	$918,750	$1,299,259	$380,509
2010	$918,750	$1,299,259	$380,509
2011	$1,156,937	$1,299,259	$142,322
2012	$1,395,125	$1,299,259	-$95,866
2013	$1,395,125	$1,299,259	-$95,866
Total FY07-13	$6,910,156	$7,812,020	$901,864
Total interest Payments 25 Years	$15,219,968	$14,348,318	-$871,649

The choice between deferring principal payments for 1 year or 4 years is purely discretionary (although subject to FRA approval). The fact that the state at the end of the demonstration period may decide to exercise the put option and sell the equipment has no

bearing on the issue. If principal is deferred for 4 years the principal balance on the loan at the end of the demonstration period is obviously $17.5 million. If the equipment sells for $15.75 million (90% of the original sale price), the state will have to come up with $1.75 million to pay off the loan. If principal is deferred for 1 year only, at the end of the demonstration period the principal balance on the loan would be $16,297,493, and if the put is exercised and the equipment is sold for $15.75 million, the state would have to come up with $547,493 to pay off the loan.

For these reasons, this analysis assumes that principal payments on the loan are deferred for one year only as the loan is being drawn down in stages. Thereafter, once the equipment is in service, the loan is amortized over the remaining 24 year term on a level payment mortgage basis. The Farmrail analysis uses the same assumptions.

(c) Out year costs after loan paydown / Net present value analysis

The analysis is on a current outlay basis. One problem with viewing just a few years of use of a very long lived asset is that cash flow items can significantly vary at different times of the asset's life. In this case, the annual costs of the CRC equipment alternative will significantly change once the loan is paid off. At that point in time, the level annual $1.3 million debt service charge disappears but the CRC equipment still has 15 years of remaining useful life. While inflation will probably have pushed other costs higher by that time, at least with respect to debt servicing costs the Vermonter's operating costs in years 26-40 will be significantly lower than in the years while the loan is being repaid.

The only way to capture this benefit of equity ownership, however, is to extend the cost analysis to cover the full 40 year useful life of the CRC equipment and then to discount the annual costs back to present value FY07 dollars. Projecting costs and ridership forward 40 years is obviously problematical, but it is the only methodology that assesses the appropriate time value to cash flow items widely spaced in time.

A summary of the 40 year projection is presented below. Because the analysis is sensitive to the discount rate assumed, 3 different scenarios are shown; one at the loan rate of 5.25% and the others at 4.25% and 6.25%. Using 5.25%, the total cost of continuing the existing Vermonter service through FY-2048 in present value terms, that is, in FY07 dollars, is $91.1 million. In theory what this means is that if the state set aside $91.1 million today in a bank account paying 5.25% interest, that corpus of funds could be drawn down to pay the Vermonter's costs through FY-2048. Alternatively, if the Vermonter service is reconfigured using CRC equipment as proposed, the total present value cost of running the reconfigured service through FY-2048 (after which the equipment would have to be scrapped) is $64.2 million. The 40 year present value cost differential between the status quo scenario and the CRC equipment scenario is thus $26.9 million (in FY07 dollars).

Present Value of Vermonter 40 Year Annual Costs			
Discount rate	4.25%	5.25%	6.25%
Existing Vermonter	$109,403,749	$91,066,299	$76,845,310
Vermonter with CRC equipment	$75,438,423	$64,159,493	$55,268,823
Cost difference	$33,965,325	$26,906,806	$21,576,487

(d) Cost of the put option

A key feature of the administration's proposal is the state's put option, the right of the state at the end of the 3 year Vermonter demonstration project to sell the equipment back to CRC at the guaranteed minimum price equal to 90% of the original purchase price. In some discussions, this put option has been described as limiting the state's exposure on the equipment to 10% of the equipment's $17.5 million purchase price = $1,750,000. This analysis, however, fails to take into account the state's interest liability on the underlying $17.5 million loan used to purchase the equipment.

The fiscal analysis assumes the $17.5 million loan is drawn down and paid to CRC in stages as the equipment is being manufactured. Interest thus only accrues on the full $17.5 million starting in the first year of the demonstration program.[10]   At 5.25%, the interest rate which as of the present date the FRA says would apply to the loan, the accrued interest on the loan through the demonstration period and thus to the point the put option would be exercised, would total $3.36 million.[11]

This interest liability is independent of the put option. The total cost to the state of testing out the CRC equipment during a 3 year demonstration period, that is, the cash that would be foregone in the event the state exercised the put option, thus amounts to $1.75 million + $3.36 million = $5.11 million. This cost is solely for the right to use the equipment. In addition, the state would be making annual payments to Amtrak to run the service and cover the operating deficit   This equipment "use" cost is a maximum, of course, because the equipment might resell for a price higher than the guaranteed minimum of 90% of the original price. Even if the equipment could be resold for 100% of the original price, however, the demonstration option would still cost the state $3.36 million.

(e) Vermonter ridership projections

Amtrak projects that with CRC equipment and the new schedule annual Vermonter boardings will increase 20,000 from 52,500 to 72,500, an increase of 38%. Considering that Vermonter ridership has declined for 5 straight years, these projections would seem to be aggressive. On the other hand, the projected increase would merely return ridership

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[10] Payments would be made to CRC as the manufacturing progresses. Whether the loan is structured to be drawn down in stages which match the CRC progress payments or the full $17.5 million is drawn down at once makes little difference. In the latter case, the state would deposit the loan proceeds in an interest bearing account and draw out sums as needed to make progress payments. While interest would be accruing on the full $17.5 million, the interest liability would be offset in part by the interest earned on the bank deposit.

[11] Deferring principal payments on the loan during the demonstration period would result in slightly higher interest costs ($61,000) during the 3 year demonstration program and thus a slightly higher exposure.

to its FY 2001 level on a schedule that includes two additional White River Junction – New Haven trips (and at a time when gasoline prices are and are expected to remain significantly higher).

Whether the projected increase in ridership is realistic or not is an issue beyond the competence of this analysis. Given Amtrak's projections, however, it is possible to analyze the sensitivity of the cost projections to deviations from the ridership projections. The table below summarizes the cost projections assuming the projected increase in ridership along with two scenarios in which ridership falls short of the projected increase.[12]

In scenario #1 Vermonter ridership increases by 18,000 = 90% of the projected increase of 20,000.[13] Total annual ridership is 70,500 = 97.2% of the 72,500 riders assumed in the base case. Over the 7 year period FY07-13, the cumulative service deficit increases by $723,000 from $20.8 million to $21.6 million, an average net cost increase of $103,000 per year. In the base case, the new service produces an annual average cost savings of $489,000 per year over the 7 year period relative to the status quo scenario of continuing the existing service with Amtrak equipment. In scenario #1, the average annual savings is reduced by the average annual $103,000 increase in the deficit to an average of $386,000 per year, a 21% reduction in the per year savings.

In scenario #2 Vermonter ridership increases by 10,000 = 50% of the projected increase of 20,000. Total annual ridership is 62,500 = 86.2% of the 72,500 riders assumed in the base case. Over the 7 year period FY07-13, the cumulative service deficit increases $3.6 million from $20.8 million to $24.4 million, an average net cost increase of $516,000 per year compared to the base case. Since the CRC base case scenario generates average savings through FY13 of $489,000 per year compared to continuing the existing service, this $516,000 per year swing in costs result in no cost savings in the 7 year period. The "exact" no-savings-relative-to-the-status-quo-ridership point is an increase of 10,530 (47% less than the projected 20,000 increase).

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[12] Presumably the projected increase in ridership is expected to be mainly, if not overwhelmingly, due to the two extra WRJ-NH runs and to the extent ridership fails to meet projections because of fewer passengers on these additional runs, the negative revenue impact is overstated. This is because revenues are adjusted by multiplying average revenue per passenger for the respective fiscal years by the scenario change in ridership. Since the average revenue per passenger represents a weighted average of the ticket prices of (1) WRJ-NH passengers and (2) all other passengers on longer trips, the average will be higher than WRJ-NH fare.

[13] As in the base case, the increase in ridership is phased in during the first 6 months after the new equipment goes into service with the full increase occurring in FFY09.

Vermonter with CRC Equipment - Ridership Scenarios			
	Projection	Scenario #1	Scenario #2
Current ridership	52,500	52,500	52,500
Increase with new equipment/schedule	20,000	18,000	10,000
Increase as pct. of projected increase		90%	50%
Annual ridership	72,500	70,500	62,500
Total as pct. of projected total		97.2%	86.2%
FY07-13 Total service deficit	$20,832,724	$21,555,457	$24,446,391
Scenario 7 year change		$722,733	$3,613,666
Average scenario change per year		$103,248	$516,238
FY07-13 Average annual savings vs status quo	$488,999	$385,751	-$27,240
Scenario 7 year change		-$103,248	-$516,238
Scenario pct. change		-21%	-106%

This analysis highlights the sensitivity of the fiscal analysis to the projected increase in ridership. A 10% change in ridership produces a 21% swing in the annual cost savings. Because the proposal assumes a 38% increase in ridership, this analysis has focused on scenarios where ridership falls short of the projections. The leverage, however, does work both ways except that to generate net cost savings beyond those projected, ridership would have to obviously increase by more than 20,000 per year.

(f) Fiscal analysis details

Base line assumptions: Both the administration's and the Joint Fiscal Office's analysis is founded upon 3 base line cost projections provided by Amtrak. These cost projections, in turn, are all based on the assumption that Amtrak's current policy of shifting 100% of all direct and indirect costs of state sponsored routes to sponsoring states will be fully implemented.

The first is that the fully allocated net direct costs of the existing Vermonter and Ethan Allen services in FFY07 (federal fiscal year) amount to $3,975,448. The current Amtrak contract expired on June 30, 2006 and the new contract will be shifted from the state fiscal year (July-June) to the federal fiscal year (October-September). For the three month period July-September 2006, a quarterly rate equal to the FY06 contract rate + 5% is to apply with the FFY-07 fully allocated net direct cost rate applying thereafter. Thus the net direct cost shown in the analysis for *state* FY07 represents a combination of the two rates. Based on Amtrak projections, in subsequent years this federal fiscal year base line net cost is assumed to grow at a rate of 3.0% per annum with the *state* fiscal year total always being a combination of 1/4 of the prior FFY rate and 3/4 of the then current FFY rate.

The second base line cost assumption is that the fully allocated net direct cost of the reconfigured Vermonter service using the new CRC equipment would be $1.28 million in FFY09 (this compares to $2.76 million for the status quo Vermonter service in FFY09). The analysis assumes the reconfigured Vermonter will go into service in Jan 2008 and thus be in service for 3/4 of FFY08 and 2/4 of SFY08. To calculate these costs the base

line FFY09 figures are deflated by 3.0%. For FFY10 and thereafter, the net direct cost of the reconfigured Vermonter service is assumed, based on Amtrak projections, to increase at the rate of 3.0% per annum. Again, the *state* fiscal year calculations represent a combination of the 1/4 of the prior FFY rate and 3/4 of the then current FFY rate.

Amtrak's FFY09 projection of the net direct costs of the reconfigured Vermonter service using the new CRC equipment includes the assumptions that (1) Vermonter ridership will increase by 20,000 to the annual level of 72,500 and (2) ticket prices and thus revenue will grow 3.0% per year just like costs. To the extent that annual ridership falls short of (or exceeds) 72,500, annual costs will be higher (lower). A mismatch between cost inflation and ticket price inflation would likewise impact net annual costs.

The third base line cost assumption is that Amtrak's *indirect* costs associated with each of the services is a function of (1) overhead costs which are proportional to direct costs and (2) equipment depreciation. In the status quo scenario, these indirect costs are phased in and absorbed by the state over the 4 fiscal year period starting in FFY08 and ending in FFY12. In the alternative proposal, these indirect costs are phased over the 3 fiscal year period starting in FFY09 and ending in FFY12.

6. Farmrail Budd RDC Car Equipment Alternative

The precursor of CRC's DMU is the Rail Diesel Car, RDC or "Budd car", manufactured by the Budd Company of Philadelphia between 1949 and 1962. The RDC was the first self propelled "train in one car".[14] The Budd Company manufactured 398 RDCs which over the years have collectively logged millions of miles of reliable, efficient performance, many of which remain in operation today.

When AOT and Amtrak started exploring equipment alternatives for the Vermonter and Ethan Allen lines, Farmrail Corporation of Clinton, Oklahoma and Industrial Rail Services Inc. of Moncton, New Brunswick (herein jointly referred to as "Farmrail") proposed to AOT that the state purchase "remanufactured" RDCs.

Farmrail describes its remanufacturing process as follows. A used RDC is stripped to its stainless steel structural frame. The frame and truck castings (wheel assemblies) are then analyzed by metallurgical techniques for signs of stress or fatigue which are addressed. The car is then rebuilt with all new components: engine, transmission, brakes, wheels, electrical, ventilation, flooring, seats, etc. Farmrail projects a remanufactured RDC would have a useful life of 25 years (this compares to a CRC DMU estimated useful life of 40 years).

In its proposal Farmrail matched the CRC equipment package requested by AOT consisting of 3 self-propelled vehicles and 2 passenger coaches. For a "fully loaded" remanufactured RDC, Farmrail's proposal quotes a not-to-exceed price (depending upon the options) of $1.6 million per unit; and for a remanufactured passenger coach on the

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[14] See http://www.budd-rdc.org/introduction.html for a short history of the Budd RDC.

same basis of $1.35 million per unit. The total cost for the 3 RDC – 2 coach package is thus $7.5 million.[15]

The Budd Company RDC, however, is truly a "train in one car" and while it was designed to be modular so that capacity needs could be met by running multiple RDC train sets, the RDC was not designed to pull an unpowered coach in a single RDC-coach set.[16] While a single RDC can pull a coach and transit agencies have run such sets in the past, the stress on the engines does not make it cost effective. Farmrail thus recommends a different package; namely 5 RDCs at a maximum price of $8 million.[17] The two Vermonter train sets would each consist of 2 RDCs with the 5th RDC as a backup. This analysis is limited to the 5 RDC package and RDC-RDC train sets.

(a) Equipment comparability
Farmrail claims the performance characteristics of its remanufactured RDC are comparable to the performance characteristics claimed for the CRC DMU. Since all of the working components of the remanufactured RDC would be brand new, Farmrail's claim is certainly conceivable. Whether the quality, reliability and maintenance requirements of the different components are comparable, however, could only be determined through a detailed component by component comparison which is beyond the scope and competence of this fiscal note (the maintenance requirements of the systems as a whole presents a different issue discussed below). Professional assessments on this issue would certainly be critical to any decision, but other key issues would remain even if Farmrail's remanufactured RDCs and CRC DMUs are determined to be basically equivalent in their performance characteristics. This analysis assumes equipment comparability and moves on to these other issues.

(b) Fuel efficiency
As of the date of this report there is still some uncertainty regarding the fuel efficiency of the Farmrail train sets that would be used on the Vermonter line. The equipment manager of Dallas Trinity Rail, which uses several Farmrail rebuilt RDCs, estimates that between St. Albans and New Haven, a remanufactured RDC would have a fuel efficiency of approximately 2.5 miles per gallon.[18] The Dallas Trinity Railway Express RDCs on which this estimate is based, however, have older rebuilt engines. The Farmrail remanufactured RDCs would have new engines which the manufacturer says woud be 20% more fuel efficient. Consistent with this position, according to Farmrail, VIA ran on a test basis in actual service a prototype of Farmrail's remanufactured RDC in the fall of 2006 and achieved an average fuel efficienty of 3.0 miles per gallon.[19]

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[15] Farmrail equipment proposal to AOT dated June 2006.
[16] While the RDC was not designed to be cost effective in a single RDC-Coach set, it was designed to be cost effective in a RDC-RDC-Coach set thus enhancing its flexibility.
[17] Neil Schickner meeting with George Betke, Farmrail CEO, September 22, 2006.
[18] Email from Joshus Coran, Chief Mechanical Office of Dallas Trinity Railway Express to Charlie Miller of AOT dated November 2, 2006.
[19] Email from George Betke, Farmrail CEO to Neil Schickner dated January 8, 2007.

Both figures are significantly higher than the estimate for CRC equipment but the comparison is apples to oranges because the Farmrail figure is for a single RDC while the CRC estimate is for a DMU-Coach train set. What is still unclear at this point is what the fuel efficiency of an RDC-RDC train set would be. While an RDC is underpowerd to pull itself and an unpowered coach, it does not logically follow that in an RDC-RDC set each would have to operate at 100% of power to move the set.

Using CRC's model for the reconfigured Vermonter route and assuming (1) that one RDC would run at 100% of power and (2) the second RDC would run at 75% of power while in route, an RDC-RDC train set would have a slightly higher fuel efficiency that an CRC-Coach train set. When fuel usage consumed during idling is taken into account, however, the fuel effciency of the two systems is virtually the same. This is because the RDC-RDC set would be idling 4 engines (2 in each RDC and obviously at the same idling rate) versus 2 engines in the DMU-Coach set.

There is no engineering basis for the assumption that in a RDC-RDC train set, the first RDC would operate at 100% of power while the second RDC would operate at 75% of power. These assumptions are simply the break even point at which the fuel efficiency of the two equipment alternatives is the same. If the power ratio of the second RDC while in route were 65%, the RDC-RDC set, including idling, would be 4% more fuel efficient than the DMU-Coach set while if the ratio were 85%, the DMU-Coach set would 6% more fuel efficient than the RDC-RDC set.

(c) Farmrail RDC Cost Analysis - Assumptions

Attached, in the same format as that used for the CRC equipment option, is a cost analysis of the Farmrail RDC equipment alternative. With 5 exceptions, the assumptions underlying the projections are identical to the CRC analysis. First, capital financing costs are obviously lower. Instead of borrowing $17.5 million, the state borrows $8.0 million. The phasing of the loan drawdown, the term of the loan, the time period for manufacturing of the equipment, start-up costs for the reconfigured Vermonter service and the start date of the reconfigured service are assumed to be the same.[20]

Second, the Farmrail RDC option assumes there would be no Amtrak transition cost grant. This assumption is based on information from AOT and presumably reflects Amtrak's interest in encouraging the development of a new generation of rail technology. Considering the significant, up front impact of the Amtrak grant on the cost projections, determining whether the Farmrail RDC equipment option would be eligible for some level of Amtrak cash grant assistance is an important outstanding issue to be resolved.

Third, the Amtrak grant also includes $225,000 which is budgeted for marketing. On the assumption that no Amtrak grant would be available under the Farmrail option, the analysis assumes that the state itself would fund these marketing efforts and these are added as costs to the Farmrail scenario. The analysis thus assumes that an equal

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[20] For purposes of comparability a 25 year loan term is assumed although it would not be in the state's interest to amortize an $8 million debt over such a long time.

marketing effort would be made to promote the new Vermonter service regardless of which equipment is used although the marketing costs are covered by different sources.

Fourth, the assumption of a 5 RDC package using RDC-RDC train sets requires some upward adjustment to annual equipment maintenance costs. This is because each RDC has 2 engines and thus there are 4 engines running in an RDC-RDC train set. This compares to 2 engines in a DMU-Coach train set. Obviously running 4 engines per day per run (and 8 engines for both daily runs) is going to require more maintenance than running 2 engines per day per run (and 4 engines for both daily runs).

CRC in its proposal estimated the annual equipment maintenance costs on the reconfigured Vermonter schedule assuming a 3 DMU-2 Coach package using DMU-Coach train sets (each with 2 engines) and a 5 DMU package using DMU-DMU train sets (each with 4 engines). In this CRC analysis, the annual equipment maintenance cost of the DMU-DMU trains sets were 22% higher than for the DMU-Coach train sets. Amtrak's projection of fully allocated direct costs for the reconfigured Vermonter schedule using CRC equipment includes a number of other items besides equipment maintenance costs. The analysis assumes, however, that if one subtracts from Amtrak's direct costs CRC's equipment maintenance costs for a 3 DMU-2 Coach package using DMU-Coach train sets and then adds back in CRC's equipment maintenance costs for a 5 DMU package using DMU-DMU train sets, the resulting direct cost figures would reflect the maintenance costs of a 5 DMU package.

The remaining issue is the maintenance cost relationship between a 5 DMU package and a 5 RDC package. Specifically, since the maintenance costs of a 5 DMU package are 22% higher than a 3 DMU-2 Coach package, is it reasonable to assume that the maintenance costs of a 5 RDC package would likewise be 22% higher than a 3 DMU-2 Coach package? Considering the different power to weight relationships of the two equipment sets, Farmrail contends that increasing the base line maintenance costs for the CRC DMU-Coach train sets by 22% to account for the additional maintenance costs of RDC-RDC train sets is excessive.

Regarding power, each Farmrail remanufactured RDC has two engines each rated at 400 horsepower. A single RDC thus has 800 horsepower and an RDC-RDC train set has 1,600 horsepower. The CRC DMU has two engines each rated at 600 horsepower. A DMU-Coach train set thus has 1,200 horsepower total. An RDC-RDC train set thus has 33% more horsepower than a DMU-Coach train set.

Regarding weight, each Farmrail remanufactured RDC has an unloaded weight of 120,000 lbs and an unloaded RDC-RDC train set thus weighs 240,000 lbs.[21] A single level DMU-Coach train set has a total unloaded weight of 308,000 lbs. The DMU-Coach train set thus weights 28% more than an RDC-RDC train set.[22]

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[21] Farmrail horsepower and weight data is from Farmrail's equipment proposal to AOT dated June 2006.
[22] CRC horsepower data is from CRC's equipment proposal to AOT dated October 2005. Weight data is from the Transportation Research Board's fact sheet on self-powered rail cars dated January 27, 2006.

In terms of the power to weight relationship, a DMU-Coach train set is pulling 28% more weight with 33% less horsepower than a RDC-RDC train set. This is the basis for Farmrail's position that any additional maintenance costs required for a 5 RDC package running RDC-RDC trains sets would be modest compared to the maintenance costs of a 3 DMU-2 Coach package running DMU-Coach train sets.

Given the information available at this time, this analysis has no basis on which to clarify this key issue. On the one hand, with a 5 RDC package, certainly additional engine monitoring and presumably some additional engine maintenance would be required compared to a 3 DMU-2 coach package. On the other hand, considering the significantly different power to weight relationships of the two equipment sets, it is also reasonable to infer that the maintenance costs of the 5 RDC package would not be 22% higher than that for the 3 DMU-2 Coach package. The base line case in this analysis assumes that the annual maintenance costs of the 5 RDC package running RDC-RDC train sets would be 15% higher the annual maintenance costs of the base line 3 DMU-2 Coach package running DMU-Coach train sets.

Fifth, to compare the equipment alternatives on an equivalent basis, adjustments must be made to account for the equipments' different estimated useful lives: 40 years for the CRC equipment versus 25 years for Farmrail's. The objective is the determine the annual cost of running the Amtrak service with the different equipment over the same span of time, namely the 40 year estimated useful life of the CRC equipment. To run the Amtrak services for 40 years with Farmrail equipment, the state would have to purchase replacement equipment in year 25 which, in turn, at the end of 40 years would have a remaining useful life of 10 years and thus have a residual market value.

To account for this scenario, the Farmrail projection includes two additional line items. To spread the cost of having to purchase replacement equipment in year 25, an "equipment reserve" charge is added to the annual costs. Assuming a Farmrail equivalent equipment inflation rate of 3.0% per annum and a long term interest rate of 5.25%, the annual charge comes to $339,036. Held in reserve and invested, this stream of cash flows with accumulated interest in year 25 yields the amount required to purchase the replacement equipment at its year 25 price. The fact that the state would probably choose not to create such a fund is irrelevant; the annual charge serves to spread the one time out-year equipment replacement cost among the preceding 25 years on a time value basis.

The second new line item is a "residual equipment value" credit which functions to spread, on an equivalent time value basis, the projected residual market value of the replacement equipment in year 40. Under the same inflation rate and interest rate assumptions, and assuming that 15 year old Farmrail equivalent equipment in year 40 would have a used market value equal to 25% of the year 40 price of new Farmrail equivalent equipment[23], the annual residual equipment value credit amounts to $50,782.

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[23] In comparison, the 2006 price of a Farmrail remanufactured RDC with new components and a structural frame with a 25 year useful life is equal to 41% of the 2006 price of the CRC DMU. In year 40, after 15 years of service, Farmrail equivalent equipment would have some 15 year old components (many components such as wheels have a shorter useful life and have to be periodically replaced) and a structural

This stream of annual credits has a future value in year 40 equal to the projected residual value of the replacement equipment. Combining the two items, the $339,036 equipment reserve charge offset by the $50,782 residual value credit amounts to a net annual charge to service costs of $288,253 during the first 25 years to account for the need to replace equipment in year 26 and thereafter a net annual $50,782 reduction in service costs to account for the equipment's residual value in year 40.

(d) Farmrail RDC Cost Analysis - Results

With these adjustments, the analysis of the Farmrail RDC equipment option shows the total net annual cost of the Vermonter service rising from $2.51 million in FY07 to $3.18 million in FY13. Assuming that Vermonter ridership increases by 20,000 per year as projected by Amtrak (although with new CRC equipment), the subsidy per passenger declines from $47.95 in FY07 to $43.87 in FY13 (in the CRC scenario the passenger subsidy rises because the deficits in FY07 and FY08 are held down by the benefit of the Amtrak grant. In the Farmrail scenario, no grant is assumed and marketing costs are paid by the state so the net deficits in FY07 and FY08 are correspondingly higher and the per passenger subsidy then declines).

For the 7 year period shown, the difference in total costs between the existing Vermonter and the reconfigured Vermonter using Farmrail equipment amounts to $4.4 million, an average of $627,000 per year. For the 10 year period from FY13-FY22, the first 10 years after all costs have been phased in, the annual average cost differential is $1.44 million. For the first 15 years, from FY07-21, the averager cost differential is $1.06 million.

Summary data for fiscal years 2007 – 2013, at which point Amtrak indirect costs are fully phased in, are shown below:

Vermonter Fiscal Year	Status quo		Farmrail Equipment		Cost Difference
	Net costs	Per rider	Net costs	Per rider	
2007	$2,407,060	$45.85	$2,517,310	$47.95	-$110,250
2008	$2,833,867	$53.98	$2,949,928	$50.10	-$116,060
2009	$3,152,044	$60.04	$2,681,729	$38.94	$470,315
2010	$3,483,127	$66.35	$2,624,826	$36.20	$858,301
2011	$3,827,637	$72.91	$2,841,543	$39.19	$986,094
2012	$4,186,113	$79.74	$3,070,535	$42.35	$1,115,578
2013	$4,365,866	$83.16	$3,180,409	$43.87	$1,185,457
Total FY07-13	$24,255,714		$19,866,278		$4,389,436

Table title: **Vermonter Service with Farmrail Equipment**

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frame with 10 years remaining of useful life. Some used-market-price-as-a-percentage-of-current-price less than 41% is appropriate but the impact of the level assumed does not dramatically alter the results. For example, assuming a 15% resale percentage reduces the 40 year present value cost differential between Farmrail and CRC from $4.88 to $4.56 million, a change of $320,000.

The table below compares the two equipment options:

Equipment Alternatives Relative to the Status Quo			
Vermonter service	CRC	Farmrail	Difference
Savings FY07-13	$3,422,990	$4,389,436	$966,446
Per year	$488,999	$627,062	$138,064
Savings FY07-21	$13,107,194	$15,854,873	$2,747,678
Per year	$873,813	$1,056,992	$183,179
Savings FY13-22	$12,126,008	$14,350,002	$2,223,994
Per year	$1,212,601	$1,435,000	$222,399

The 40 year present value cost analysis for the Vermonter service using the Farmrail equipment is summarized below:

Present Value of Vermonter 40 Year Annual Costs			
Discount rate	4.25%	5.25%	6.25%
Existing Vermonter	$109,403,749	$91,066,299	$76,845,310
Vermonter with Farmrail equipment	$75,603,353	$63,675,406	$54,388,597
Cost difference	$33,800,396	$27,390,893	$22,456,713

A comparison of the 40 year present value costs of the two equipment alternatives is summarized below. Using the middle case of a 5.25% discount rate, operating the Vermonter on the proposed reconfigured route for the next 40 years using CRC equipment would cost the state a total of $64.2 million in current FY07 dollars as compared to $63.7 million if the Farmrail equipment were used. The cost differential is $484,000. What this means is that if all of the assumptions in the analysis are correct and if cost inflation, ticket pricing and ridership all play out exactly as assumed over the course of the next 40 years, then the cost of the two equipment alternatives in present values terms is very comparable. Considering how all the different variables may deviate from their assumed course over a 40 year period, little weight should be attached to this conclusion.

CRC vs Farmrail - Comparison of Vermonter 40 Present Value Costs			
Discount rate	4.25%	5.25%	6.25%
CRC equipment	$75,438,420	$64,159,491	$55,268,820
Farmrail equipment	$75,603,353	$63,675,406	$54,388,597
Cost difference	-$164,933	$484,085	$880,224

(e) Vermonter ridership projections
Below is the same table produced in the CRC analysis which analyzes the sensitivity of the Farmrail cost projections to different ridership scenarios. All of the dollar values of the "scenario changes" are the same since a given decline in ridership produces exactly the same dollar decline in revenue which translates into the same dollar increase in net costs (and thus the same dollar decline in annual savings versus the status quo).

The difference lies in the impact of these ridership scenario dollar changes on CRC's cost base versus Farmrail's cost base relative to the status quo. With a higher cost base, the CRC alternative as projected compared to the status quo produces average annual savings of $489,000 over the 7 year period from FY07-13. If the increase in ridership is 10% less than projected (+18,000 as opposed to +20,000), average annual savings over the 7 year period is reduced by $103,000 to $386,000 per year. In other words, a 10% change in ridership produces a 21% swing in CRC's average annual savings. If the increase in ridership is 50% less than projected (+10,000 as opposed to +20,000), average annual savings over the 7 year period is reduced by $516,000 to -$27,000 per year, a 106% swing from an annual savings to a net increase in cost.

With its lower cost base, the Farmrail alternative compared to the status quo produces an average annual savings of $627,000 over the 7 years. In the same 10% ridership scenario, the average annual savings are reduced by $103,000 to $524,000 per year, a 16% swing. In the same 50% ridership scenario, the average annual savings are reduced by $516,000 to $111,000 per year, a 82% swing. With the Farmrail equipment, for the 7 year period FY07-13, the no-savings-relative-to-the-status-quo- ridership point is an increase of 7,860 (61% less than the projected increase). The equivalent point with the CRC equipment is an increase of 10,530 (47% less than the projected increase).

Vermonter with Farmrail Equipment - Ridership Scenarios			
	Projection	Scenario #1	Scenario #2
Current ridership	52,500	52,500	52,500
Increase with new equipment/schedule	20,000	18,000	10,000
Increase as pct. of projected increase		90%	50%
Annual ridership	72,500	70,500	62,500
Total as pct. of projected total		97.2%	86.2%
FY07-13 Total service deficit	$19,866,278	$20,589,011	$23,479,945
Scenario 7 year change		$722,733	$3,613,666
Average scenario change per year		$103,248	$516,238
FY07-13 Average annual savings vs status quo	$627,062	$523,815	$110,824
Scenario 7 year change		-$103,248	-$516,238
Scenario pct. change		-16%	-82%

The above analysis assumes the two equipment options draw the same number of passengers. Another variable to assess, however, is the putative market drawing power of CRC's more modern design. The contrast here is not between new and old equipment since both equipment options will certainly look "new". Rather the contrast is between CRC's sleeker, more modern configuration of its new components compared to the Farmrail RDC's 1950's constrained configuration of its new components.

It is difficult to assign a value to CRC's modern design, and no such attempt is made here. Amtrak projects that with the CRC equipment and the new schedule the Vermonter

will attract 20,000 additional passengers per year over the FY06 base of 52,500. Assuming that Vermonter ridership, on the current schedule and with Amtrak equipment, has ended its post 9-11 decline and stabilized at the annual level of 52,500, logically, the same service with Farmrail RDCs should be able to attract the same annual traffic because, if anything, the Farmrail RDCs should be perceived as an upgrade over the Amtrak equipment. Building on this assumption, since the new proposed schedule adds two new trips between White River Junction and New Haven, a Vermonter service using Farmrail equipment on the new schedule should be able to increase ridership over the 52,500 annual base.

The table below summarizes the cost projections assuming the reconfigured Vermonter schedule increases annual ridership by 20,000 whether CRC or Farmrail equipment is used along with two scenarios in which the service with Farmrail equipment attracts fewer passengers. In Farmrail Scenario #1, the new schedule with Farmrail equipment increases ridership by 18,000, 10% less than the 20,000 increase which is assumed to occur with CRC equipment. The effect is to reduce Farmrail's FY07-13 average annual savings compared to the status quo by $103,000 per year, from $627,000 to $524,000. CRC's FY07-13 average annual savings is $489,00 so the gap between the equipment options narrows from $138,000 to $35,000 per year for the 7 year period.   Farmrail Scenario #2 calculates the ridership shortfall that would have to occur in order to eliminate the FY07-13 cost savings gap between the equipment alternatives. If the new service with Farmrail equipment increases ridership by 17,325, 13.4% less than the 20,000 increase assumed for the CRC equipment, the FY07-13 average annual savings (relative to continuing the existing service) of the two equipment alternatives is the same.

Ridership Scenarios Assuming CRC's Design Attracts More Passengers			
Vermonter FY07-13	Base Line	Farmrail Scenario #1	Farmrail Scenario #2
Existing base annual ridership	52,500	52,500	52,500
Increase in annual ridership	20,000	18,000	17,325
Scenario change in increase		-10.0%	-13.4%
Total annual ridership	72,500	70,500	69,825
Farmrail FY07-13 average annual savings	$627,062	$523,815	$488,969
CRC FY07-13 average annual savings	$488,999	$488,999	$488,999
Difference	$138,064	$34,816	-$30
Scenario change		-$103,248	-$138,094

How should this analysis be interpreted? If one assumes that Amtrak's projections are correct and that a new Vermonter schedule with CRC equipment would increase annual ridership by 20,000, the critical question is how reasonable is it to expect that 13.4% of the new passengers would choose a different mode if the service were run with Farmrail equipment. To the extent this "modern design preference ratio" is on target, the net costs of the two equipment options would be the same during the 7 year period FY07-13 with the CRC option having an advantage beyond FY13 to the extent the preference ratio

continues to influence travelers decisions. To the extent the preference ratio is lower, Farmrail's net costs over the 7 year period will be lower, producing a higher average annual savings than the CRC option relative to the status quo.

(f) Maintenance facility issue
The administration's CRC proposal includes the requirement of a new maintenance facility for the equipment. If the facility must be built from scratch, AOT estimates the cost at $500,000. If an existing industrial facility can be converted, the cost could be significantly lower. In any event, under the CRC scenario, this cost is covered as part of the $2 million Amtrak grant (only $675,000 of this grant is earmarked for offsetting the increased operating costs for the services) and does not appear in this analysis as a cost.

Farmrail contends that a new maintenance facility would not be needed for its equipment but that position has not been confirmed as of this date. Since the Farmrail scenario assumes no Amtrak grant, if a new facility is required, costs would be incurred which this analysis does not include. If a new facility is required, since the costs are up front, the scenario's FY07-13 and FY13-22 total costs would increase by approximately the cost of the facility.

(g) Put option
The Farmrail proposal did not include a put option at the end of the demonstration period. The value of the put option, however, is in direct proportion to the equipment purchase price, meaning the put option is quite valuable in terms of CRC's $17.5 million price but is of much smaller value in terms of Farmrail's $8.0 million price (5 RDC package). As described above, with CRC's 90% put option, if the put option is exercised the state's worst case scenario, including loan interest, is a non-recoverable equipment related cash outlay of $5.1 million. Given the difference in the equipment prices and the difference in debt servicing costs through the demonstration period, with the Farmrail equipment and no put option, the state at the end of the demonstration period would incur an exposure greater than $5.1 million only if the used equipment sold for less than 55% of its original price. This is shown in the table below along with the state's exposure if the equipment is sold at 75% or 65% of its original price. Farmrail has indicated it is open to discussing a put option, particularly if a put option is determined to be a key variable affecting how the debt is recorded on the state's balance sheet. [24]

Year 3 Sell back	CRC	Farmrail scenarios		
Equipment cost	$17,500,000	$8,000,000	$8,000,000	$8,000,000
Yr 3 Sale price % of original	90%	75%	65%	55%
Yr 3 Sale proceeds	$15,750,000	$6,000,000	$5,200,000	$4,400,000
State exposure on price	$1,750,000	$2,000,000	$2,800,000	$3,600,000
+ Loan Interest	$3,361,365	$1,536,624	$1,536,624	$1,536,624
= Total state exposure	$5,111,365	$3,536,624	$4,336,624	$5,136,624

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[24] September 22, 2006 meeting and email correspondence between Neil Schickner, JFO, and George Betke, Farmrail CEO.

(h) Structural frame issue – Round 1

The most significant difference between the two equipment alternatives is that the Farmrail RDCs are built with a decades old stainless steel structural frame whereas the CRC cars have a brand new composite steel structural frame. Since all the other components of both cars are new, this difference in the frame accounts for the 15 year longer estimated useful life of the CRC DMU and coaches.[25] Although the Budd RDCs have proven their reliability over decades of service and Farmrail says the used frame would be tested and analyzed in detail and reinforced wherever necessary, it would seem to a non-engineer that a used frame that has already been under daily stress for decades, is not likely to last as long as a new frame.

The difference in the *projected* useful lives of the frames, however, can be accounted for in the pricing and cost analysis of the equipment. What is more difficult to account for is the risk of a material stress failure in the frame prior to the end of the car's expected useful life. All risk has two components: (1) the chance of a particular event occurring and (2) the consequences which follow when it does occur. Perhaps a metallurgical specialist could assess these variables in order to quantify the risk differential of the two equipment options. No such attempt is made here. From a fiscal perspective, however, a few general observations can be made.

The table below analyzes the Farmrail equipment acquisition cost assuming Farmrail and Farmrail equivalent equipment is used over a 40 year period matching the expected useful life of the CRC equipment. The CRC equipment package has a present value cost of $17.5 million which the state would use for 40 years and then sell for scrap. For the first 25 years (the projected useful life of the equipment), the present value of the Farmrail RDC equipment cost is $8.0 million. Under various real interest rate, equipment inflation rate and used equipment resale value assumptions which are intended to represent lower and upper boundaries to the calculated values (the higher the inflation rate and the lower the year 40 resale percentage, both in the right hand column, the higher the total present value of equipment costs), the model calculates the present value of the equipment costs for the years 26-40. Under the different assumptions, these costs are $3.8 and $4.2 million. The total present value of Farmrail RDC 40 year equipment acquisition costs is equal to the $8.0 million in year 1-25 costs plus the year 26-40 costs. These total present value costs thus range between $11.8 and $12.2 million (line 12).

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[25] The estimated 40 year useful life of the CRC DMU structural frame and the estimated 25 year useful life of the Farmrail remanufactured RDC structural frame are both conservative informed guesstimates. The industry has substantial practical experience measuring the useful lives of engines, transmissions and other components but structural frames are in a unique class. The unexpected longevity of the famous Douglas DC-3 airframe is one example of the difficulty in estimating structural frame useful lives. The durability and longevity of the Budd car RDCs is another. Both CRC and Farmrail expect their frames to remain safe and serviceable considerably longer than the stated estimates.

Farm Rail Equipment	Row	Useful Life Reconciliation	
Buy 5 DMU now	1	$8,000,000	$8,000,000
Useful life years	2	25	25
Real rate	3	2.25%	2.25%
Inflation rate	4	0.00%	3.00%
Price of new equivalent RDCs in year 25	5	$8,000,000	$16,750,223
Present value cost of year 25 equivalent RDCs	6	$4,586,771	$4,660,881
Price of new equivalent RDCs in year 40	7	$8,000,000	$26,096,302
Used value in year 40 as pct of year 40 price	8	25%	15%
Used equipment sale proceeeds in year 40	9	$2,000,000	$3,914,445
Present value of year 40 sale proceeds	10	$821,292	$505,576
Net present value of years 25-40 use (6 -10)	11	$3,765,480	$4,155,305
Present value of equipment costs years 1-40 (1+11)	12	$11,765,480	$12,155,305
Present value of CRC equipment costs years 1-40	13	$17,500,000	$17,500,000
Difference	14	$5,734,520	$5,344,695

On a comparable basis, therefore, the present value equipment acquisition cost difference between the two equipment alternatives ranges between $5.7 and $5.4 million, or $5.5 million as a midpoint. This compares to the nominal price difference of $17.5 - $8.0 = $9.5 million. This $5.5 million cost difference can be viewed as a kind of "reserve" to cover the supposed risks associated with the two essential differences between the equipment alternatives: (1) Farmrail's old versus CRC's new structural frame and (2) because of the design constraints created by the RDC frame, CRC's sleeker, more modern appearance relative to Farmrail's remanufactured Budd RDCs.

Is this $5.5 million "reserve" sufficient to cover these risks? The difficulty of assigning a value to CRC's modern design has already been discussed. With respect to the structural frame, to answer the question, one would need to know (1) the relative probabilities of structural frame failures occurring in the Farmrail RDCs compared to the CRC DMUs, (2) the relative costs of fixing the failures that may occur in each of the equipment alternatives and (3) the impact of any service disruptions on revenue. Little is known about these variables but some broader context can be provided.

First, considering that the Farmrail 5 RDC package costs $8.0 million, one would think that $5.5 million should go a long way towards fixing any frame problems that may arise in 1 or more of the cars. Second, for service to be disrupted, problems would need to arise in more than one RDC contemporaneously. If one RDC is down, the backup RDC could be used to maintain full service. Even if two RDCs were down simultaneously, full service could be maintained with the 3 remaining RDCs although with lower capacity as one train could run with a RDC-RDC set and the other with just a single RDC. A 10% decline in the projected Vermonter ridership translates into a revenue loss of $434,500 (in FY07$) at an annual rate and $16,712 at a weekly rate. Presumably any service disruption due to a frame problem could be corrected and service restored within a matter of weeks as opposed to months. Suppose a service disruption occurs which results in an immediate 30% decline in ridership. Further suppose it takes a month to restore full service and

another two months to regain the lost ridership. The total revenue loss would be in the range of $125,00.

(i) Structural frame issue – Round 2

Farmrail presents an alternative explanation of the price difference between the two equipment options. The heart of the argument is that Farmrail acquired its stock of used RDCs at a time when virtually everyone in the market assumed the equipment's only value lay in the salvage value of its components. A rail equipment company weighing a bid for the VIARail Canada used RDCs acquired by Farmrail had to assess two issues: (1) Could the RDCs be rebuilt into a serviceable passenger rail product? and (2) If they could, were there any buyers to sell them to?[26] A pessimistic assessment of the opportunities for resale would have made the first issue irrelevant, and at the time there were plenty of reasons to be pessimistic. After all, VIA was not replacing the RDCs with new equipment but was permanently decommissioning the equipment as being surplus in the context of a significant downsizing of its fleet. Even if a company believed the used RDCs retained great utility and value as passenger rail vehicles, the company would substantially discount its bid to account for the apparent resale market risk. So, Farmrail argues, it was able to obtain a structural frame of a proven design, composed of high quality original materials, for little more than its value as scrap.

This argument makes a valid point. In a well established market, the track record of products among users feeds back into the market's pricing so that price differences between products end up as reliable indicators of real product differences. In this case, however, no such market exists and the price differential between CRC's DMU and Farmrail's RDC tells us more about what is unknown as opposed to what is known about the reliability, durability and useful lives of the products. This is particularly true with respect to the relative "pricing" of Farmrail's remanufactured Budd RDC stainless steel structural frame compared to CRC's new composite structural frame.

On one side, Farmrail contends that its remanufactured frame will be as durable and reliable as, and in some respects due to the proven qualities of stainless steel relative to carbon steel composites, superior to CRC's structural frame, and thus the cost difference is pure savings to the Farmrail customer. On the other side, AOT points out that remanufacturing a well used and decades old structural frame is uncharted territory involving many uncertainties. Taking the state of the market into account, one cannot say that the $5.5 million cost difference between the equipment alternatives represents a well established product and market tested assessment of the supposed premium value of CRC's new frame relative to Farmrail's remanufactured frame and of CRC's modern design. Subject to that caveat, however, the analysis of the previous section still applies. As a practical matter, if the state buys the Farmrail equipment it, in effect, would have a $5.5 million "reserve" to offset the advantage of CRC's modern design and to cover possible structural frame problems. The caveat is that the market provides no basis for determining whether this "reserve" is a fair and sufficient tradeoff or not.

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[26] VIA Rail Canada is the Canadian equivalent of Amtrak.

(j) FRA safety regulations

In 1999 the FRA adopted stringent crash worthiness structural safety specifications for all new train passenger cars operating on dual use rail lines (lines also carrying freight trains).[27] It is because of these regulations that the supplier market of new passenger rail equipment is so thin in the U.S. The regulations require a "heavy" DMU on dual use rail lines whereas a "light" DMU can be operated on a dedicated passenger only rail line. Since nearly all European and Asian passenger rail services run on dedicated passenger only rail lines, and considering the relatively small size of the U.S. market, most rail equipment manufacturers have been reluctant to launch the process of re-engineering their established light DMU product lines to meet the FRA's heavy DMU requirements.

The CRC DMU, in fact, is the only product in the market which has been certified by the FRA as being in compliance with the new regulations. Thus the CRC equipment alternative involves no regulatory approval risk.

Farmrail's position is that the FRA's 1999 crash worthiness specifications apply differently to new as opposed to pre-existing equipment. According to Farmrail, the two key regulations concern a "buff strength" standard which applies to all equipment and a "corner post" standard which only applies to new equipment. Farmrail contends its RDCs are in full complaince with the buff strength requirement; and that in the remanufacturing process the structural frame could be strengthened to meet the corner post standard although compliance is not legally required. This position appears to be supported by the FRA. Responding to an inquiry from Farmrail, Dan Alpert of the FRA's Office of Chief Counsel wrote:

> "…having consulted with FRA engineering staff, it is FRA's understanding that the Budd cars comply with FRA's 800,000-pound buff strength requirement in 49 C.F.R. 238.203. That requirement applies to both new and existing passenger equipment. Because of their age, these cars are not subject to FRA's other crashworthiness requirements.
>
> In short, FRA is not aware of any compliance problem for your cars with regard to the issues you have raised.
>
> Of course, there are other FRA requirements which apply to existing passenger equipment, such as those for window glazing and fire safety. However, I understand that your company would make any necessary modifications to the cars to be in compliance."[28]

Based on this information, it appears that securing whatever FRA regulatory approvals may be required for the Farmrail remanufactured RDCs should not be a serious problem.

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[27] See 49 C.F.R. Part 238
[28] Correspondence between Farmrail and Dan Alpert, Office of Chief Counsel, Federal Railroad Administration dated August 22, 2006.

(k) Track record

As stated, no Farmrail remanufactured "heavy" RDC compliant with the new FRA safety regulations is currently in operation. On the other hand, the basic Budd car has a proven track record over many decades. In addition, prior to introducing its remanufactured prototype RDC, Farmrail and Industrial Rail Services Inc refurbished and rebuilt five RDCs which are being used on Canadian lines by VIA, the Canadian equivalent of Amtrak. If the Farmrail equipment alternative is deemed to merit serious consideration, the performance record of these "Farmrail" as opposed to Budd Company cars should be examined.

The CRC heavy, FRA compliant DMU also has a nonexistent track record. CRC, however, is a proven, reliable rail equipment manufacturer. CRC, for example, is the supplier of many of the double-deck, sky view passenger coaches used in excursion lines. Of more direct relevance, there have been reports that at least two U.S. inter-city passenger rail agencies have decided to purchase CRC DMUs. The contractual status of these "decisions" is unknown, however, and follow up confirmation has not been received as of this date. If accurate, the decision-making processes of these agencies would be of great interest.

8. Bus Alternative

Strictly in terms of the basic transportation function of moving people from point A to point B, daily fixed route bus service is an obvious alternative to Amtrak. A key point often overlooked in discussions of Amtrak is that a private sector bus alternative already exists. For years, Vermont Transit Co, Inc. has offered daily fixed route bus services from the same Vermont locales served by Amtrak to essentially the same Boston, New York and interim connection destinations. These bus routes are in direct competition with Amtrak, which, in turn, means the relative success of one impacts on the prospects of the other.

According to Vermont Transit, in fiscal year 2006 the bus service had 103,913 passengers between Burlington and White River Junction (a substantial portion of which boarded or deboarded at Montreal) and 69,567 passengers between White River Junction and Springfield, MA.[29]

The competitive relationship between Amtrak and Vermont Transit highlights the point that any proposal affecting Amtrak has implications for the broader transportation system beyond the narrow area of passenger rail travel. The broader system which is impacted includes not just the public transportation system for interstate travel but also the freight rail system. This perspective raises several factors which, while certainly relevant to and deserving of consideration in, a cost-benefit analysis of the administration's proposal, are difficult to quantify. Four such factors are discussed below.

First, implementation of the administration's proposal would most probably have an adverse impact upon Vermont Transit. A key feature of the administration's proposal is

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[29] Email from Chris Andreasson, CEO of Vermont Transit, Inc., October 12, 2006.

the inclusion of two additional daily runs between White River Junction and New Haven. According to Amtrak, the additional runs are projected to increase annual ridership by 20,000 which, in turn, would generate revenue that would lower the operating deficit of the Vermonter route as a whole. While a number of the additional passengers are likely to be new to the market (i.e. people attracted to the train who otherwise would drive as well as people induced to travel by the availability of the train), a certain number, plausibly the greater proportion, are likely to be travelers who otherwise would take the bus. Based on available information, it is not possible to project the financial impact of any lost ridership on Vermont Transit and how Vermont Transit may respond in terms of adjusting the frequency or quality of its services. Some adverse impact, however, is likely which, in assessing the impact of the administration's proposal on the system as a whole, must be accounted for on the cost side of the equation.

Second, cancellation of the Amtrak services would not leave Amtrak patrons in a situation of having no other public transportation option available. While some, perhaps most, Amtrak patrons may find bus travel to be unattractive, in terms of assessing the costs and benefits of a proposal, there is a significant difference between a proposal which creates a transportation option which otherwise would not exist and a proposal which creates an alternative to an existing transportation option.

Third, cutting the other way, while cancellation of the Amtrak services would not leave rail patrons with no other transportation option, it would eliminate the redundancy feature of the existing system. For various reasons, rail and bus services will invariably be interrupted and the co-existence of the two modes certainly contributes to the smooth functioning of the system as a whole.

Fourth, also cutting the other way, a significant portion of the cost of Amtrak (approximately $900,000 of the FY06 Amtrak contract payment of $2,650,000) ends up as track access and other service fee payments to Vermont's railroad companies, providing them with revenue which supports their freight services. The more freight that is carried within Vermont by rail instead of by truck, in turn, redounds to the benefit of the state by lowering road maintenance costs. Thus, while extremely difficult to quantify, some portion of the per passenger Amtrak subsidy paid by the state has a double benefit, providing Vermonters with a rail travel option as well as reducing freight truck wear and tear on the state's highways.

Because of the additional service runs proposed by the administration between White River Junction and Hartford, the track access fees paid to NECR will probably be marginally higher under the proposal than in prior years. Thus, under the administration's proposal and the flow of cash whereby the state pays Amtrak and Amtrak pays the railroads, Vermont's railroads would continue to receive a portion of the Amtrak payment amounting to $900,000+ per year. It should be noted, however, that under any alternative that continues Amtrak services the Amtrak cost that redounds to the benefit of the state via this feedback loop, as a proportion of the total subsidy cost, is going to be much lower than in previous years. This is because the significantly higher Amtrak subsidy is going to cover Amtrak costs previously absorbed by Amtrak. Any

increase in the track access fee *rate* increases Amtrak's costs which are fully allocated and passed on to the state.

9. Additional Information Needs
The following information, presently unavailable, would aid the decision-making process:

> Data on Amtrak's historical cost growth rate. This analysis, based on Amtrak projections, assumes that Amtrak's operating costs grow at an average of 3.0% a year. A 1% change in the growth rate translates into roughly a $300,000 a year change in the annual costs of both Amtrak services.

> Data on the accounting of equipment maintenance costs within Amtrak's operating cost projections. The analysis assumes that equipment maintenance costs are included within Amtrak's projection of direct operating costs; but the CRC package requires a new maintenance facility and the accounting for the staffing and other associated costs of the facility are not clear. Whether the Farmrail equipment would also require a new maintenance facility is also not known.

> Data on potential differences in the equipment maintenance costs of the different equipment alternatives. Since all the working components of the CRC and Farmrail equipment are brand new, maintenance costs are assumed to be comparable; but the assumption has not been confirmed. Even if maintenance costs are comparable, the available market for service contracts to maintain the different equipment may vary.

> Longer term, if the demonstration project is judged to be successful in restraining the operating costs of the Vermonter to an affordable level, would the same model be applied to the Ethan Allen line? If so, what would the capital costs be and the aggregate impact on the state's borrowing capacity?