

The Economic Impact of Improved Network Efficiency and Operations and Maintenance Spending Due to the New Mexico Rail Runner Express

Summary

This report documents an analysis performed by The Mid-Region Council of Governments (MRCOG) regarding the economic impact of the Rail Runner to the region it serves. MRCOG operates TranSight, a model developed by Regional Economic Models, Inc. (REMI) that measures the economic impact of regional transportation projects and proposals. REMI was founded in 1980 for the purpose of developing regional forecasting and policy analysis models to inform public policy decisions. MRCOG has been running their PI+ Model since 1999, and purchased TranSight in 2010 to assist with regional transportation planning.

For the purpose of this project, a five-region REMI model was developed that included Bernalillo, Sandoval, Valencia and Santa Fe Counties and the rest of New Mexico. This allowed for analysis of inter-county commuting along the Rail Runner line.

This report summarizes some key aspects of commuter rail service; specifically, the economic impact of improved network efficiency and operations and maintenance expenditures on the region. In addition, some off-model statistics were developed that relate to incidents, emissions, and travel time savings.

Network Efficiency

Santa Fe County is not included in the standard MRCOG travel model. Therefore, data from a model built in 2005 specifically to project impacts on travel between Albuquerque and Santa Fe was used to determine impacts on network efficiency attributable to Rail Runner service. The summary statistics from this model are presented in table 1.

Year 2025	Vehicle Miles Traveled	Vehicle Hours Traveled	Average System Speed
No Build Scenario	1,088,415	47,451	22.9
Build Scenario	1,063,413	45,601	23.3
Savings with Build	25,002	1,850	1.67%
<i>* These numbers reflect all trips in the AM peak period traveling from Albuquerque to Santa Fe.</i>			

The increase in system speed modeled in the 2025 build was applied throughout our analysis years, 2010 to 2025. Therefore, an increase in network efficiency of 1.67%, was entered into TranSight for trips between Bernalillo and Santa Fe County as both savings due to accessibility and transportation cost savings. Because speeds are improved slightly in the build, households have access to more diverse goods and services (accessibility cost savings), and in addition there is a cost savings realized in transporting goods and services due to network efficiency (transportation cost savings).

This 1.67% savings was also applied to trips between Sandoval and Santa Fe County given that I-25 is the primary corridor for these trips and therefore the savings from the Rail Runner would apply. It was also assumed that this savings could be applied to trips between Valencia County and Bernalillo County. While this leg was not modeled as part of the alternatives analysis, given that present congestion levels between these counties is even greater than the region's northern leg of I-25 to Santa Fe, and that over half of Valencia County's commuters work in Bernalillo County, a savings of 1.67% is a conservative estimate of the increase in network efficiency between Valencia and Bernalillo County due to Rail Runner.

Finally, a savings for internal trips to Bernalillo County was also estimated by applying the 1.67% savings only to trips on I-25, with the assumption that Rail Runner passengers would likely be in vehicles on I-25 if they were not on the train. The resulting county-wide impact when applied to all trips within Bernalillo County was 0.11%.

Operations and Maintenance

Rail Runner's operations and maintenance costs were entered into TranSight as new industry sales and production, each item was entered into the appropriate economic sector. Salaries were entered as an adjustment to wages. Table 2 shows the figures entered for Fiscal Year 2009.

Table 2: Operation & Maintenance Expenditures, FY 2009

	Year End Final 7/01/09 - 6/30/10 Expenses
MRCOG:	
SALARIES/BENEFITS	\$1,159,924.00
UTILITIES	\$141,680.00
TELEPHONE/COMM	\$167,807.00
PRINTING/SUPPLIES	\$48,684.00
MARKETING/ADVERTISING	\$58,680.00
NON PROFESSIONAL SVC	\$69,740.00
INDIRECT LEASE/UTILITIES	\$335,407.00
TRAVEL	\$6,658.00
PROFESSIONAL SERVICES	\$19,536.00
VEHICLE GAS/REPAIR/MAINTENANCE	\$12,308.00
SUBTOTAL	\$2,020,424.00
HERZOG:	
MAINTENANCE	\$5,712,675.00
WEEKDAY SERVICE	\$8,503,269.00
WEEKEND/SPECIAL SERVICE**	\$1,756,251.00
FUEL**	\$2,495,724.00
MANAGEMENT FEE	\$569,224.00
OTHER OPERATING EXPENSES	\$949,870.00
SUBTOTAL	\$19,987,013.00

Revenues were not modeled to avoid the issue of double counting benefits. The money spent on the service creates the network efficiency and the resulting benefits reported in the study. In addition, the impact of the transportation tax or the comparative real costs of driving versus riding the train including fares and gas prices, were not modeled as part of this study.

Modeled Results

	2010	2015	2020	2025
IMPACT ON POPULATION AND JOBS				
Total Employment	845	903	837	819
<i>Employment Sectors with largest impact</i>				
Transportation and Warehousing	154	121	96	77
Repair & Maintenance Services	77	64	52	43
Health Care and Social Assistance	59	68	76	90
Retail Trade	56	68	67	69
Construction	50	84	57	42
Population	192	932	1349	1584
INCREASE IN SPENDING POTENTIAL				
Gross Regional Product	\$60,160,000	\$74,240,000	\$78,080,000	\$84,480,000
Personal Consumption Expenditures	\$33,075,640	\$49,613,460	\$58,518,440	\$69,967,700
Real Disposable Personal Income	\$29,259,220	\$41,980,620	\$47,069,180	\$52,157,740
<i>* Monetary figures are expressed in 2010 dollars.</i>				
<i>* Population and Employment are expressed as a total impact and can not be summed. Monetary figures are annual and can be summed from year to year.</i>				

It is estimated that a more efficient network and operations and maintenance spending has created 845 jobs in the region. These include about 130 direct jobs related to the Rail Runner and several hundred indirect jobs. Increases in the health care, retail trade and construction industries are related to the population growth attributed to the Rail Runner. Employment growth is projected to decline over time due to increases in efficiency of service. Job growth and improved attractiveness of the region gives rise to population growth that gains momentum over time.

The combination of increased network efficiency, Rail Runner expenditures, and new jobs in the region impact the overall GRP by \$60 million, personal consumption by \$33 million, and real disposable personal income by \$29 million in 2010. These annual benefits from the Rail Runner continue to rise over time, conservatively assuming continuation of service at current levels. Cumulatively, an overall growth in GRP of \$1.2 billion related to the Rail Runner is projected over the next 15 years.

Savings per Passenger

Currently, it is faster to travel by auto than Rail Runner between Albuquerque and Santa Fe, and the Los Lunas to Albuquerque trip is about the same in a car than on the train. This won't be the case for long, as congestion is projected to grow significantly as population grows. By 2015 the trip to Santa Fe will be faster by train, and by 2025 Rail Runner passengers will get to where they're going an average of 41 minutes faster according to the Alternatives Analysis. On the southern leg, the travel time savings between Los Lunas and Albuquerque will begin in 2011, and by 2025 this commute will be about 18 minutes longer by car than by train, according to the MRCOG travel demand model.

The savings expected per passenger can be quantified by placing a value on time. The idea being that time saved might either be utilized being productive at work, or of greater value to the

individual if spent leisurely. While the value of time is different depending on the trip purpose and the possible alternative uses of time, as well as the conditions of travel, there is general guidance released by the U.S. Department of Transportation on quantifying the value of time at 50 percent of the average wage. According to the Bureau of Labor Statistics wage data for 4th quarter 2009, for the Albuquerque area the average wage is \$21.25, and at 50 percent this is 10.36 per hour. It should be noted that this is a conservative approach given that the majority of Rail Runner trips are work commutes, and work related trips are valued higher than personal trips.

Table 4: Estimated Savings Per Passenger based on Travel Time Savings

	Albuquerque - Santa Fe	Albuquerque - Los Lunas
Current travel time by car (min)	75	41
Projected travel time by car in 2025 (min)	135	59
Rail Runner travel time (min)	94	41
Annual Savings per Passenger in 2015	\$ 90	\$ 476
Annual Savings per Passenger in 2025	\$ 3,690	\$ 1,620
* The value of time is calculated as 50% of the area's average hourly wage per guidance from the US Department of Transportation, Office of the Secretary of Transportation, 1997.		

Annual savings per passenger is projected at \$3,690 for commuters between Albuquerque and Santa Fe and \$1,620 for commuters between Albuquerque and Los Lunas in 2025 based on an average weekday round trip commute during peak hours.

Accident Savings

A reduction in the number of incidents (including fatalities, injuries, and property damage) as well as the monetary savings related to incident reduction is calculated using a few reasonable assumptions. The reduction in incidents on the roads is assumed to be directly related to the reduction of miles traveled on the roadway. That is, a reduction in cars on the road will result in fewer incidents. In addition, all incidents can be assigned a dollar value, and the more serious the incident the higher the cost.

A reduction in vehicle miles traveled (VMT) is calculated to be the equivalent of the passenger miles traveled (PMT) on the Rail Runner per ridership statistics collected at MRCOG. For Fiscal Year 2010 this was approximately 45 million. This number is extrapolated to 2025 using the modeled VMT reduction rates in the Alternatives Analysis, assuming that ridership will increase proportionately to the VMT reduction in the build scenario. Accident rates are based on US Department of Transportation data (Bureau of Transportation Statistics, *National Transportation Statistics 2001*). Accident cost figures incorporate wage and productivity losses, medical and administrative expenses, motor vehicle damage, and a willingness to pay to reduce safety risks (National Safety Council, *Estimating the Cost of Unintentional Injuries*).

Table 5: Savings in Incidents

	2010	Next 15 Years
Reduction in Fatalities & Injuries	37	769
Reduction in Property Damage	115	2,400
Annual Savings	\$5,238,589	\$ 106,113,444

Emissions Savings

The calculation of emissions savings is similar to the process for incidents. Savings are directly associated with the reduction of VMT due to the increase in ridership on the Rail Runner. The reduction rates are based on the EPA's models PART5 (for Sox and PM) and Mobile6b (for CO, NOx, and VOCs). Costs associated with these reductions are available in TranSight's advanced parameters.

	2010	Next 15 Years
VOC Reduction (tons)	53.30	1,074.81
NOX Reduction (tons)	46.27	959.19
CO Reduction (tons)	582.75	12,058.48
SOX Reduction (tons)	5.49	111.15
PM 10 Reduction (tons)	5.61	113.56
Annual Savings	\$187,378	\$ 3,834,185

Conclusion

The Rail Runner service is responsible for an increase in network efficiency associated with lowering transportation costs and providing better accessibility to goods and services. Spending on operations and maintenance is responsible for the job creation and infuses valuable resources and investment into the regional economy. In 2010, these factors together served to increase our GRP by \$60 million, personal consumption by \$33 million, and real disposable income by \$29 million. These figures will only increase as Rail Runner continues to serve New Mexicans.

In addition, because the Rail Runner is responsible for taking automobile trips off the road, it is also responsible for a reduction in accidents on our roadways and vehicle emissions into our environment. It is estimated that there are 45 million fewer miles traveled on our roadway in 2010 due to Rail Runner service and that will increase to over 70 million by 2025.

Commuters who choose to ride the train rather than sit in traffic will be amply rewarded in the future as auto times increase due to congestion. It is estimated that the average annual savings per passenger due to shorter commutes will be about \$1,000 in 2018 and \$3,000 in 2025. This does not consider savings due to fuel costs, wear and tear on the automobile, or potentially not having to own an automobile at all.

It should be noted that this report identifies and analyzes some key aspects of Rail Runner service. It does not attempt to quantify some other economic impacts that may be associated with the Rail Runner such as tourism spending, impacts to land values, impacts of a regional transit tax, new development associated with the Rail Runner corridor, etc. These factors could easily be the subject of future research.

SUMMARY OF ECONOMIC IMPACTS ANALYZED				
RELATED TO RAIL RUNNER SERVICE IN CENTRAL NEW MEXICO				
Performed with the TranSight Model from Regional Economic Models Inc.				
Dec-10				
	2010	2015	2020	2025
REGIONAL IMPACT				
Total Employment	845	903	837	819
<i>Employment Sectors with largest impact</i>				
Transportation and Warehousing	154	121	96	77
Repair & Maintenance Services	77	64	52	43
Health Care and Social Assistance	59	68	76	90
Retail Trade	56	68	67	69
Construction	50	84	57	42
Population	192	932	1349	1584
Gross Domestic Product	\$60,160,000	\$74,240,000	\$78,080,000	\$84,480,000
Reduction in Vehicle Miles Traveled	45,726,846	53,835,141	61,943,436	70,071,268
INCREASE IN SPENDING POTENTIAL				
Personal Consumption Expenditures	\$33,075,640	\$49,613,460	\$58,518,440	\$69,967,700
Real Disposable Personal Income	\$29,259,220	\$41,980,620	\$47,069,180	\$52,157,740
Annual Savings per Passenger (as a function of travel time savings)	-\$1,217	\$201	\$1,637	\$3,093
SAVINGS IN INCIDENTS				
Reduction in Fatalities & Injuries	37	44	50	57
Reduction in Property Damage	115	136	156	177
Annual Savings	\$5,238,589	\$6,167,496	\$7,096,404	\$8,027,550
SAVINGS IN EMISSIONS				
VOC (tons)	53.3	62.5	71.8	81.1
NOX (tons)	46.3	55.5	64.4	73.7
CO (tons)	582.7	697.5	809.5	925.6
SOX (tons)	5.5	6.5	7.4	8.4
PM 10 (tons)	5.6	6.6	7.6	8.6
Annual Savings	\$187,378	\$222,344	\$256,886	\$292,073
Notes:				
Monetary figures are all expressed in 2010 dollars.				
Population and Jobs are inclusive of the prior year and cannot be summed cumulatively. All other figures are unique to each year and can be summed.				