



# Countywide EcoPass Feasibility Study

Final Report  
January, 2014





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In association with:



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# EXECUTIVE SUMMARY

## Purpose

A Community-wide EcoPass Feasibility Study was conducted for Boulder County and the City of Boulder in coordination with the Regional Transportation District (RTD). The main purpose of this study was to:

- Formulate strategic objectives for a community-wide EcoPass
- Develop demographic and geographic implementation scenarios
- Estimate induced demand and program costs under each scenario
- Analyze program benefits
- Address implementation challenges

## Strategic Objectives

Five core strategic objectives for a community-wide EcoPass program in Boulder County were developed as a part of this feasibility study:

1. Reduce vehicle miles of travel
2. Reduce greenhouse gases emitted by mobile sources
3. Increase transit mode share
4. Improve access to transit
5. Provide a financially feasible transit pass program

## Scenarios Evaluated

Three types of pass programs were evaluated in Boulder County and within the City of Boulder:

1. All residents, employees and university students
2. Residents only
3. Employees only

## Induced Demand

Induced demand from a community-wide EcoPass in Boulder County was estimated based on national and international research on fare elasticity, using examples of transit systems that have converted from cash-fare to fare-free systems. To account for variance, three elasticity measures were used in the analysis: a lower bound, an upper bound and a medium elasticity (see Appendix B for an explanation of elasticity used and how induced demand was calculated). The estimated induced annual ridership from the program using the medium elasticity is shown in Table ES-1. Total annual boardings on all RTD routes that pass through Boulder County in 2011 was 8.45 million (7.85 million for routes that pass through the City of Boulder).

**Table ES-1 Forecast Induced Annual Ridership**

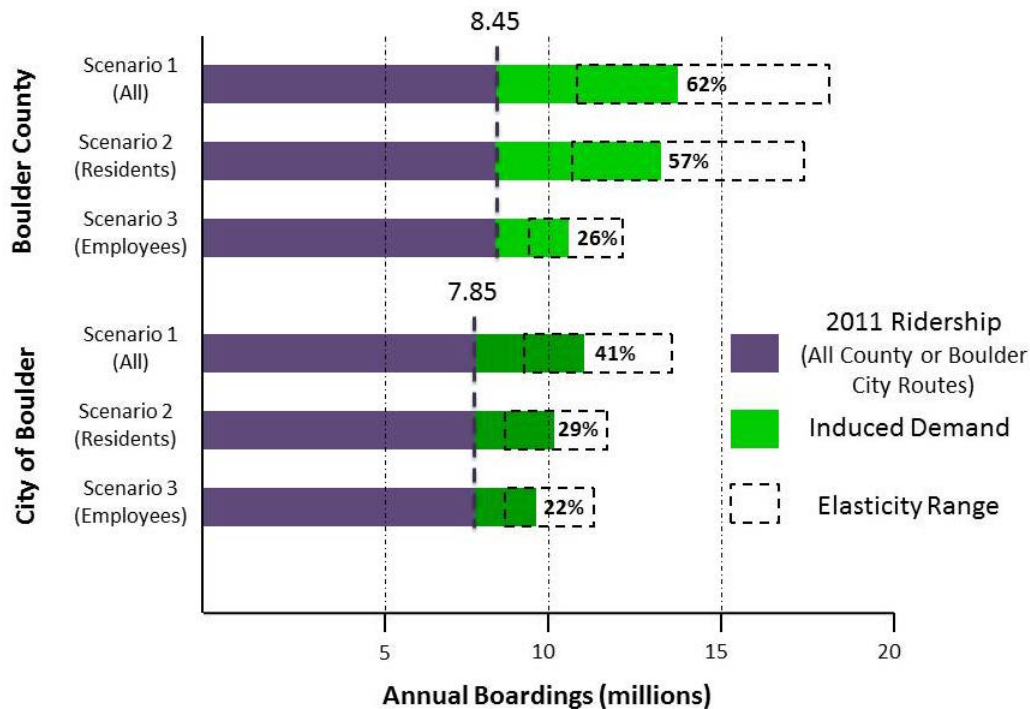
Scenario	2011 Ridership*	Boulder County			City of Boulder		
		Lower Bound	Medium Elasticity	Upper Bound	Lower Bound	Medium Elasticity	Upper Bound
1 (All)	8,454,157	2,433,619	<b>5,241,642</b>	9,734,477	1,480,374	<b>3,188,498</b>	5,921,495
2 (Residents)	8,454,157	2,231,870	<b>4,807,105</b>	8,927,480	1,072,691	<b>2,310,411</b>	4,290,764
3 (Employees)	8,454,157	1,006,395	<b>2,167,619</b>	4,025,578	814,372	<b>1,754,032</b>	3,257,488

\*Transit routes in Boulder County. Note: see Appendix B for methodology including elasticity used.



Induced demand from a communitywide EcoPass in Boulder County would result in a 26%-62% ridership increase on bus routes in Boulder County depending on the Scenario (see Figure ES-1). A citywide EcoPass in Boulder would increase ridership on bus routes that pass through the City of Boulder by 22%-41% depending on the Scenario (see Figure ES-1).

**Figure ES-1 Forecast Ridership Increase on County and Boulder City Bus Routes**



### Program Cost

Year 1 program costs were estimated by adding the cost of replacing existing revenue generated by each scenario group with the fully allocated cost of providing additional transit service in order to prevent overcrowding on transit buses resulting from the induced demand created by a Countywide EcoPass program. Fully allocated costs include capital and other costs in addition to basic operations and maintenance (O&M) costs. RTD requested that fully allocated costs be used to estimate the cost of providing additional service (O&M costs would be about 40-50% less than fully allocated costs). This cost methodology would protect RTD from unfunded service cost increases during the first year of implementation. The estimated total program costs for each scenario using this methodology are summarized in Table ES-2.

Table ES-2 Estimated Year 1 Program Cost

		Induced Demand Cost			
Scenario	2011 RTD Revenue	Lower Bound	Medium Elasticity	Upper Bound	Total Program Cost
Boulder County					
Scenario 1 (All)	\$18,217,059	\$727,650	\$3,265,178	\$11,344,395	\$21,482,237
Scenario 2 (Residents)	\$15,131,422	\$642,002	\$2,525,129	\$10,175,338	\$17,656,551
Scenarios 3 (Employees)	\$6,500,889	\$372,663	\$573,580	\$1,876,764	\$7,074,468
City of Boulder					
Scenario 1 (All)	\$14,185,543	\$433,663	\$956,246	\$3,414,830	\$15,141,789
Scenario 2 (Residents)	\$8,447,519	\$375,709	\$727,536	\$2,058,233	\$9,175,055
Scenarios 3 (Employees)	\$5,388,194	\$340,299	\$476,758	\$943,103	\$5,864,952

Note: Year 1 program cost was calculated by adding existing revenue with induced demand cost

The program cost for years 2+ (after implementation) could be determined using actual (instead of estimated) ridership through the use of smart cards. Smart cards have an embedded electronic chip that can be read by small onboard scanners each time a passenger boards a bus. RTD introduced smart cards to their existing EcoPass programs in January 2013 in part to more accurately price the EcoPass programs using the more robust ridership data. RTD currently prices their existing EcoPass programs with the intent of providing a 40% discount off the equivalent cash fare (45% for the CU Boulder CollegePass program). Additionally, larger EcoPass contracts receive a deeper discount per employee than smaller contracts. Estimating program costs using smart card data could be determined using this same approach: by multiplying the total boardings with an appropriate discount per boarding off the equivalent cash fare.

### Program Benefits

A community-wide EcoPass program could achieve many of the program's Strategic Objectives. Quantitative analysis revealed that this program could increase transit ridership, reduce VMT, reduce GHG emissions, increase the transit mode share and increase the number of people with access to an EcoPass in Boulder County (see Table ES-3 and ES-4). Additionally, a qualitative analysis found that the provision of a free transit pass would improve access to jobs in Boulder County and help reduce the housing plus transportation (H+T) costs for many households in Boulder County. The cost savings from the program would be most beneficial to young adults, seniors and low-income households.



Table ES-3 Benefit Analysis: Boulder County

Scenario	Additional Annual Boardings	Annual VMT Saved	Annual GHG Emissions Saved (kg)	Transit Mode Share Change* (per scenario)	# New Transit Pass-Holders
Existing	8.45 million <sup>1</sup>	2,240 million <sup>2</sup>	--	2% All Trips <sup>3</sup> 5.2% Work Trips <sup>4</sup>	1. 81,000 <sup>5</sup> 2. 68,000 <sup>5</sup> 3. 36,000 <sup>5</sup>
<b>1 All</b>	<b>5.2 million</b> (↑ 62%)	<b>40 million</b> (↓1.8%)	<b>15 million</b> --	<b>1.0%</b> (↑ 50%)	<b>270,000</b> (↑ 340%)
<b>2 Residents</b>	<b>4.8 million</b> (↑ 57%)	<b>35 million</b> (↓1.6%)	<b>13 million</b> --	<b>1.1%</b> (↑ 55%)	<b>230,000</b> (↑ 340%)
<b>3 Employees</b>	<b>2.2 million</b> (↑ 26%)	<b>13 million</b> (↓0.6%)	<b>5 million</b> --	<b>2.6%</b> (↑ 50%)	<b>130,000</b> (↑ 360%)

\*Note: The mode share change in Scenario 1 & 2 is relative to all trips, while the mode share change in Scenario 3 is relative to work trips. Source: see Appendix G. <sup>1</sup>Ridership on routes that pass through Boulder County (RTD, 2011). <sup>2</sup>DRCOG 2010 model, cycle 2. <sup>3</sup>Estimate based on the ratio of transit mode share of all trips to work trips from the 2009 NHTS. <sup>4</sup>2012 ACS. <sup>5</sup>Estimate of existing EcoPass holders by scenarios (see Appendix A for calculations)

Table ES-4 Benefit Analysis: City of Boulder

Scenario	Additional Annual Boardings	Annual VMT Saved	Annual GHG Emissions Saved (kg)	Transit Mode Share Change* (per scenario)	# New Transit Pass-Holders
Existing	7.85 million <sup>1</sup>	865 million <sup>2</sup>	--	4.9% All Trips <sup>3</sup> 7.8% Work Trips <sup>4</sup>	1. 71,000 <sup>5</sup> 2. 48,000 <sup>5</sup> 3. 33,000 <sup>5</sup>
<b>1 All</b>	<b>3.2 million</b> (↑ 41%)	<b>17 million</b> (↓2.0 %)	<b>6 million</b> --	<b>1.2%</b> (↑ 25%)	<b>90,000</b> (↑ 120%)
<b>2 Residents</b>	<b>2.3 million</b> (↑ 29%)	<b>11 million</b> (↓1.3%)	<b>4 million</b> --	<b>1.5%</b> (↑ 30%)	<b>50,000</b> (↑ 110%)
<b>3 Employees</b>	<b>1.8 million</b> (↑ 22%)	<b>8 million</b> (↓0.9%)	<b>3 million</b> --	<b>3.8%</b> (↑ 50%)	<b>60,000</b> (↑ 180%)

\*Note: The mode share change in Scenario 1 & 2 is relative to all trips, while the mode share change in Scenario 3 is relative to work trips. Source: see Appendix G. <sup>1</sup>Ridership on routes that pass through the City of Boulder (RTD, 2011). <sup>2</sup>Annual VMT in Boulder Valley in 2012; from the City of Boulder Transportation Department. <sup>3</sup>Modal Shift in Boulder Valley 1990-2012, January 2013. <sup>4</sup>2011 Boulder Valley Employee Survey for Transportation Report of Results, June 2012. <sup>5</sup>Estimate of existing of EcoPass holders by scenarios (see Appendix A for calculations)





## Implementation Challenges

Several implementation challenges, along with potential strategies for addressing these challenges, were identified as part of the feasibility study.

- **Integration with Existing Eco Pass Programs** – A community-wide EcoPass program that includes the City of Boulder should include a strategy for integrating the existing EcoPass programs. Potential integration strategies vary depending on the scenario, but would aim to preserve the integrity of as many of the existing EcoPass programs as feasible and maintain as much of the existing revenue to offset the program's cost.
- **Funding** – Several potential funding sources were identified, including a sales tax, property tax, business head tax, parking fees, and student fees. Each of these funding mechanisms would incur different challenges. Additionally, some could be applied at the County-wide, City-wide or district level depending on the context.
- **Administration** – Primary administrative tasks would include the distribution of passes, the management of cash flow, enforcement to prevent program abuse, and marketing and education. Potential administrators that would manage part of (or the entire) program include the County, cities or towns within the County, existing transportation management organizations (TMO's), or a new TMO that could be created specifically to manage a community-wide EcoPass program. Administrative costs would need to be included in the program's budget.
- **Geographic Equity** – In order to reflect the variation in transit service frequency and coverage across different parts of the County an equitable pricing structure is recommended by varying tax rates or fees to fund the program based on location and transit level of service.
- **Risk Identification and Management** – Five potential risk types to the County, RTD and public as part of implementing a community-wide EcoPass were identified. These include:
  1. Ridership higher than forecast
  2. Ridership lower than forecast
  3. Future program discontinuance
  4. Economic disruption
  5. Pass program impact on region

Potential strategies for managing these risks include phased implementation, establishing a reserve account for unexpected cost increases, performance monitoring, negotiating a multi-year commitment, and establishing provisions for periodically renegotiating contract and terms.

## Next Steps

The feasibility study will be incorporated into the City of Boulder's Transportation Master Plan update as staff identifies future transit scenarios and investment strategies. As city staff and consultants analyze different future transit scenarios, options in which a community-wide Eco Pass program can be implemented will be explored.





## CHAPTER 1 ■ INTRODUCTION

### Purpose & Background

A core goal of the Boulder County Transportation Master Plan (2012) is to increase accessibility of the County's transportation system. This includes increasing "housing-based or community-wide EcoPasses to enable more transit use." The purpose of this study is to examine the feasibility of initiating a community-wide EcoPass program in Boulder County.

This feasibility study uses a scenario-based analysis to assess how a community transit pass program might be implemented. For each scenario a detailed cost analysis was performed. In addition, this study also identified potential revenue sources, addressed implementation challenges and identified potential program risks, including tools for managing such risks.

Given the numerous ways that a community-wide transit pass program could be implemented, this study is not intended to definitively determine whether or not a specific program is feasible. Instead, the intent of this study is to provide County staff, City staff, RTD, elected officials, and other interested parties with the information and tools necessary to decide if, when, and how to move forward with a community transit pass program.

### EcoPass Background

EcoPass is a bulk-rate, deep-discount transit pass that can be purchased from the Regional Transportation District (RTD) only through employers, universities or neighborhoods. The EcoPass program began in 1990 as an employer-provided pass and has since expanded to include colleges and universities (through the CollegePass Program), and neighborhoods (through the Neighborhood EcoPass or NECOPass Program). Two community-wide EcoPass pilot programs were recently started in Lyons (in 2010) and Nederland (in 2011), and while this study was being written a third community-wide transit pass was in the process of being implemented for local routes in Longmont.

The EcoPass program is based on "an insurance model", which means EcoPasses must be purchased for every employee (or college student or resident of a neighborhood) regardless of use. Since not every employee will use the pass (and some will use it infrequently), RTD can offer EcoPass at a substantially reduced price per person compared to a typical monthly transit pass. Additional benefits of the EcoPass program include:

- Increased transit patronage;
- Reliable revenue source for RTD, paid in advance;
- Improved operational efficiency of transit system because of a faster boarding process;
- Reduced parking demand for employers and colleges/universities that participate in the program; and
- The Guaranteed-Ride-Home Program (for employer EcoPass)



## Process

This project was managed by the Boulder County Transportation Department in conjunction with the City of Boulder. In addition, the project team worked with RTD in order to reveal concerns and keep staff informed during all major steps of this project. These agencies, as well as staff from other municipalities in Boulder County helped define the objectives, potential challenges and other parameters to be addressed within this feasibility study.

## Uniqueness of a Proposed Boulder County Community-wide Transit Pass

At least three aspects of a potential community-wide EcoPass in Boulder County would be unique among existing examples of fare-free transit systems:

- **The program could potentially be one of the larger fare-free transit programs in the country** - There are few, if any, examples of a community implementing a community-wide transit pass of the scale and type proposed in Boulder County. There are numerous fare-free transit systems within the U.S and other parts of the world. Most of those in the U.S. are in small communities (typically resort or college towns) with fewer than 2 million boardings per year. In 2012 Chapel Hill, NC, had one of the largest fare-free transit systems in the Country, with about 7 million boardings. Total ridership on transit routes serving Boulder County in 2011 was around 8.5 million.
- **The program would not be fare-free in the traditional sense** - Although it would be essentially free to those who have an EcoPass, riders would still be required to have a transit pass or pay cash fare. This has the added benefit of reducing the likelihood of passengers abusing the bus, which can occur in traditional fare-free systems.
- **Transit in Boulder County would still be part of a larger transit network** - Most fare-free transit communities offer free service system-wide or on particular routes or portions of routes (such as in a downtown). However, transit in Boulder County is part of the larger transit network in the Denver Region, and there are numerous well patronized local and regional routes that operate both in and out of the County. A community-wide EcoPass could potentially provide users with access to entire RTD transit system.

The lack of other similar examples presents numerous challenges to the technical analysis, including predicting induced ridership, estimating program costs, dividing operating costs within a regional transit system, predicting administrative challenges, and integrating the program within the existing pass programs and funding structure of the larger transit network.

## Study Contents

This feasibility study is divided into six chapters:

1. Introduction
2. Strategic Objectives
3. Scenario Development
4. Cost Analysis
5. Program Benefits
6. Implementation: Potential Challenges & Strategies



## CHAPTER 2 ■ STRATEGIC OBJECTIVES

Five core strategic objectives were developed as part this feasibility study. These strategic objectives are intended to provide a framework for what a community-wide transit pass program in Boulder County should aim to achieve (see Table 2-1). These objectives are closely aligned with several core objectives of the Transportation Element of the Boulder County Comprehensive Plan (2009) and the Boulder County Transportation Master Plan (2012).

**Table 2-1 Strategic Objectives**

<b>Strategic Objectives</b>	<b>Performance Measure</b>
1. <b>Reduce vehicle miles of travel Boulder County</b>	Change in Annual VMT
2. <b>Reduce greenhouse gases emitted by mobile sources in Boulder County</b>	Change in total GHG emissions from mobile sources
3. <b>Increase the transit mode share in Boulder County (to/from &amp; within)</b>	Change in transit mode share
4. <b>Improve access to transit in Boulder County</b>	Number of individuals eligible for a free transit pass
5. <b>Provide a financially feasible transit pass program</b>	To Be Determined

Performance measures were identified for four of the five objectives. These performance measures provide a basis for estimating the benefits of a potential community-wide EcoPass program (see benefits analysis in Chapter 5). These measures would also be used to periodically monitor the program's performance if a community pass program were to be implemented.

The performance measure for Strategic Objective 5 (to provide a financially feasible transit pass program) was intentionally left undefined in this study in part because of the subjective nature of this objective. It is hoped that the outcomes of this feasibility study along with the next steps that the County takes in pursuing a community-wide EcoPass will be used to better define what a financially feasible transit pass program means to the community, elected officials and RTD, and how it's performance might be measured.



## CHAPTER 3 ■ SCENARIO DEVELOPMENT

Given the variety of ways a community-wide EcoPass program could be priced, funded, managed and integrated into the existing transit pass programs, three feasible implementation scenarios were developed as part of this study. The scenarios provide a basis from which to analyze costs, evaluate potential revenue sources, measure benefits and address potential implementation challenges. Organizing this study by scenarios also provides a decision framework for staff and elected officials within the County and various Boulder County municipalities.

### Scenario Descriptions

Each of the three scenarios includes a different population group within the County that would be eligible to receive a community transit pass. There may be additional scenarios that the County would consider implementing.

#### Scenario 1. All Boulder County residents, employees and university students

Under this scenario a community transit pass would be distributed to three groups:

- All Boulder County residents;
- Employees who work in Boulder County, but live outside Boulder County; and
- College students enrolled at a university in Boulder County (University of Colorado Boulder and Naropa University), but who live outside Boulder County.

About 69% of Boulder County employees are also residents of the County and about 88% of college students attending a university in Boulder County are also residents of the County. Under this scenario about 354,000 people would be eligible to receive a community transit pass (see Table 3-1).

#### Scenario 2. Boulder County residents only

Under this scenario a community transit pass would be distributed *only* to residents of Boulder County. This would make about 299,000 people eligible to receive a community transit pass (see Table 3-1). It should be noted that children under 6 already ride free.

#### Scenario 3. Boulder County employees only

Under this scenario a community transit pass would be distributed *only* to employees who work in Boulder County. This would make about 163,000 people eligible to receive a community transit pass (see Table 3-1).<sup>1</sup>

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<sup>1</sup> Note: the employee data used in this analysis comes from the Bureau of Labor Statistics and does not factor in employees that work more than one job and does not include self-employed workers, most agricultural workers on small farms, all members of the Armed Forces, elected officials, most employees of railroads, some domestic workers, most student workers at schools, and employees of certain small nonprofit organizations.



### Geographic Areas Analyzed

The scenario analysis was performed to assess the impacts and costs of a community-wide EcoPass for two geographic areas: County-wide and just in the City of Boulder. Within the context of transit and travel patterns, Boulder is unique within the County. Most of Boulder County's transit routes pass through the City of Boulder, over half of all employees in Boulder County work within the City of Boulder, both universities in the County that distribute EcoPasses (CU Boulder and Naropa) are located in the City of Boulder, and about 93% of all EcoPasses (employer-paid, neighborhood, and student) in Boulder County are distributed from neighborhoods, employers or universities located within the City of Boulder.

### Eligible Pass-Holders

The following tables show the number of people that would be eligible to receive a transit pass under each scenario for both a countywide program and a City of Boulder program.

**Table 3-1 Boulder County Eligible Pass-Holders by Scenario**

Scenario	Residents working in Boulder County	Residents not working or working outside Boulder County	Employees living outside Boulder County	Students living outside Boulder County	Total Eligible Pass-Holders
1. All (residents, employees, students)	112,380	186,998	50,923	3,776	<b>354,077</b>
2. Residents only	112,380	186,998	N/A	N/A	<b>299,378</b>
3. Employees only	112,380	N/A	50,923	N/A	<b>163,303</b>

Source: see Appendix A

**Table 3-2 City of Boulder Eligible Pass-Holders by Scenario**

Scenario (City of Boulder)	Residents working in the City of Boulder	Residents not working or working outside the City of Boulder	Employees living outside the City of Boulder	Students living outside the City of Boulder	Total Eligible Pass-Holders
1. All (residents, employees, students)	36,153	62,736	54,677	6,293	<b>159,859</b>
2. Residents only	36,153	62,736	N/A	N/A	<b>98,889</b>
3. Employees only	36,153	N/A	54,677	N/A	<b>90,830</b>

Source: see Appendix A

**Table 3-3 Population Data (Boulder County and City of Boulder)**

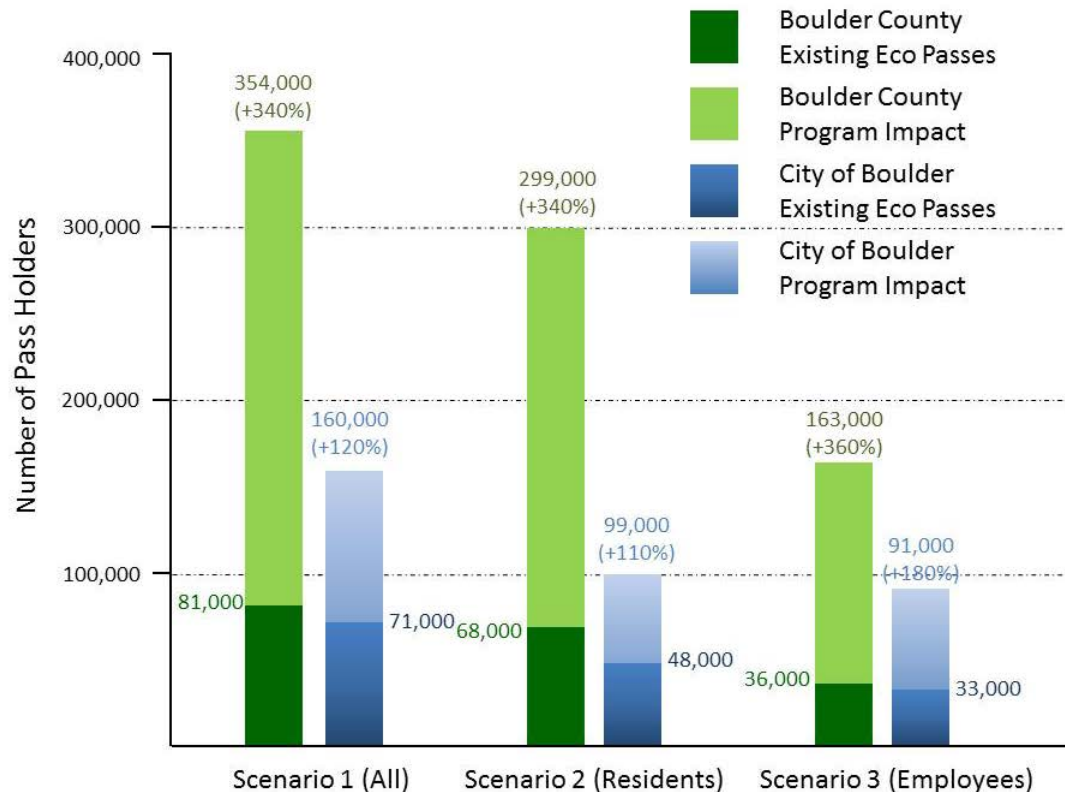
	Boulder County	City of Boulder
Resident Population (2011)	299,378	98,889
Number of Employees (2012)	163,303	90,830
Enrollment at CU Boulder and Naropa Universities (2012-13)	31,466	31,466
% Employees that live outside each jurisdiction	31%	60%
% University Students that live outside each jurisdiction	12%	20%

Source: see Appendix A



Figure 3-1 illustrates the impact each scenario would have on the number of EcoPasses in both the County and City of Boulder. Under all three scenarios the number of people within the County that would have access to an EcoPass would more than quadruple. Within the City of Boulder the number of EcoPass-holders would more than double for all three scenarios. The remaining chapters in this report discuss the implications of the program impact (illustrated here), including associated costs, benefits and implementation challenges given each scenario.

**Figure 3-1 Program Impact**



Note: These percentages account for the small number of people that are, or would be, eligible to receive more than one EcoPass, such as through a resident and employee pass program.

Source: see Appendix A



## CHAPTER 4 ■ COST ANALYSIS

This chapter provides an overview of the cost analysis performed as part of this feasibility study. The program costs presented in this chapter are general estimates that provide a starting point from which Boulder County and jurisdictions within the County can determine whether or not to pursue a broader EcoPass program. Before a final price could be determined, Boulder County and/or other jurisdictions within the County would need to negotiate a final pass price with RTD, which would require further analysis.

This chapter is divided into three sections:

- The first section covers the methodology used for estimating the Year 1 program's cost;
- The second section presents the findings of the analysis (including both the induced demand results and Year 1 cost estimates); and
- The third part covers Year 2+ pass pricing.

### METHODOLOGY

#### Year 1 Cost Estimation Formula

The project team worked with RTD to develop a cost estimation formula for a community-wide EcoPass Program in Boulder County. Coordination included two formal meetings with RTD in addition to numerous phone calls and e-mail exchanges. During these meetings RTD provided insight into concerns with a potential community-wide EcoPass and guidance on the costs they would expect a pass program of this nature to cover.

RTD's major concern regarding a community-wide EcoPass program in Boulder County is that the program cost would exceed program revenue. Specific issues include:

- The operational cost of providing additional service to meet increased demand generated by the program;
- The capital cost of purchasing additional buses and/or expanding the Boulder bus storage facility to meet increased demand generated by the program; and
- The loss of revenues from cash fares and existing EcoPass programs that would be replaced by a community-wide EcoPass.

RTD also expressed additional concerns related to pass pricing which are addressed in the "Year 2+ Program Costs" section at the end of this Chapter. Concerns related to program implementation are addressed in Chapter 6.

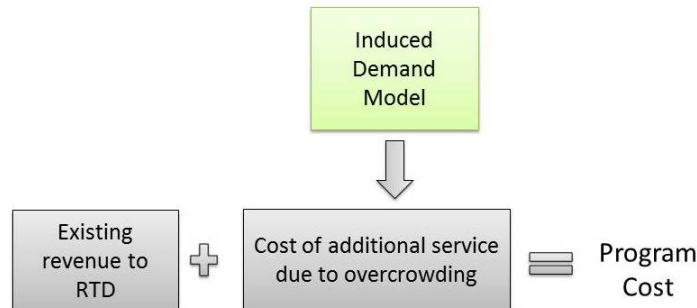
Based on RTD's concerns, a cost formula (shown in Figure 4-1) was developed that would protect RTD from unfunded service cost increases during the program's first year. The Year 1 cost formula includes two components:

1. Replacement of the existing cash fare and pass revenue currently generated by those who would become eligible to participate in the community-wide pass program; and



2. The fully allocated operating cost (capital and operations) of providing additional service to prevent overcrowding triggered by induced demand.

**Figure 4-1 Year 1 Cost Estimation Formula**



While RTD staff generally accept the methodology used in this study to estimate program costs, they expressed concern over the accuracy of some of the available baseline data used to forecast induced ridership. Several strategies were used to address this concern. First, this study used a range of potential elasticity in the induced demand model to account for uncertainty (see below). Second, a risk management plan was recommended as part of the program's implementation strategy (see Chapter 6). Finally, through the use of smart cards it would be possible to track ridership from the program once the program begins. This would allow the program's cost in successive years (years 2+ of implementation) to be determined based on actual ridership (addressed further at the end of this chapter).

### Estimating Induced Demand

Part of the cost formula (used to estimate program costs) requires estimating induced demand. To do this an induced demand model was developed based on national and international research on fare elasticity primarily using examples of transit systems that have converted from cash-fare to fare-free systems. The number of these cases is limited and the ridership response in these limited cases has varied widely. In general, transit agencies that have converted to fare-free systems have experienced a ridership increase of somewhere between 25%-200%, with most resulting in between a 50% and 100% increase in the first year.

To account for the unpredictability of estimating induced ridership three elasticity measures were used in the induced demand model (see Appendix B for specific elasticity quantities used and how they were applied):

- A lower bound - representing a low range of the estimated ridership increase;
- A medium elasticity - representing the most likely ridership increase; and
- An upper bound - representing a high range of ridership increase that could occur.

The induced demand model accounts for existing ridership by residents and employees at the route level as well as the existing EcoPass penetration rates among residents along each route. For a more detailed description of the methodology and sources used to estimate induced demand see Appendix B. The results of the cost analysis, benefits analysis, and funding sources discussed later in this report all assumed a ridership increase associated with the medium elasticity.

## SUMMARY OF FINDINGS

### Induced Demand Model Results

The results of the induced demand model, i.e. the estimated additional annual ridership that would be induced in each scenario, are shown in Table 4-1. The ridership forecast were analyzed by route and then aggregated (see Appendix C for forecast ridership by route).

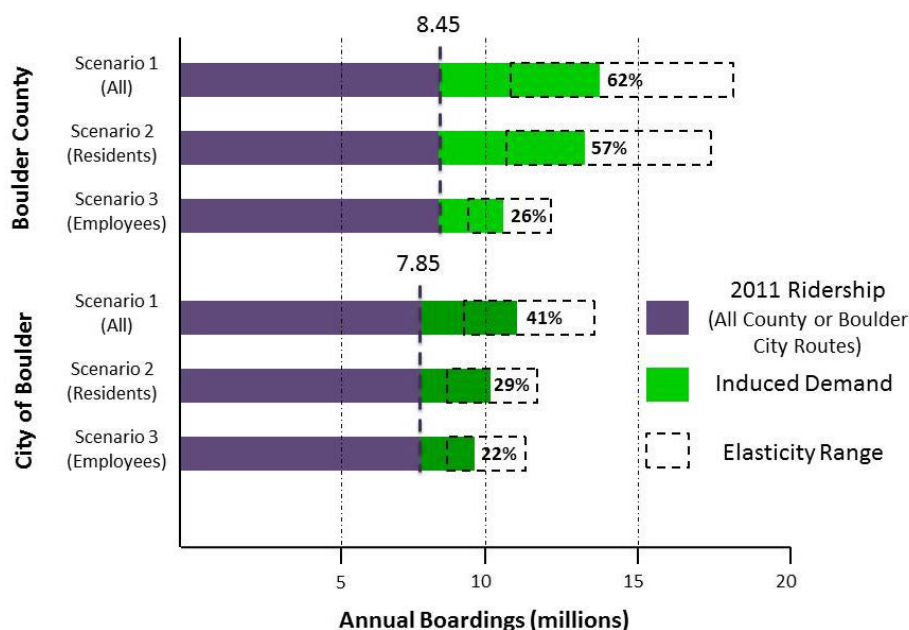
**Table 4-1 Estimated Induced Annual Transit Boardings**

Scenario	2011 Ridership*	Lower Bound	Medium Elasticity	Upper Bound
<b>Boulder County</b>				
<b>Scenario 1 (All)</b>	8,454,157	2,433,619	<b>5,241,642</b>	9,734,477
<b>Scenario 2 (Residents)</b>	8,454,157	2,231,870	<b>4,807,105</b>	8,927,480
<b>Scenarios 3 (Employees)</b>	8,454,157	1,006,395	<b>2,167,619</b>	4,025,578
<b>City of Boulder</b>				
<b>Scenario 1 (All)</b>	7,853,361	1,480,374	<b>3,188,498</b>	5,921,495
<b>Scenario 2 (Residents)</b>	7,853,361	1,072,691	<b>2,310,411</b>	4,290,764
<b>Scenarios 3 (Employees)</b>	7,853,361	814,372	<b>1,754,032</b>	3,257,488

\*Ridership on transit routes in Boulder County (8,454,157) and in the City of Boulder (7,853,361)

Figure 4-2 shows the percent ridership increase that would occur from a County-wide or City of Boulder program (assuming the medium elasticity) relative to the 2011 annual ridership on all RTD routes that pass through Boulder County (8.45 million) or the City of Boulder (7.85 million). Because some of the routes in Boulder County also operate outside the County, the 8.45 million ridership figure includes some riders that never enter Boulder County. Similarly the 7.85 million ridership number includes riders that never the City of Boulder. The range of forecast induced ridership (between the lower bound and the upper bound elasticity) is shown in dashed lines.

**Figure 4-2 Forecast Ridership Increase**





### Year 1 Cost Analysis Results

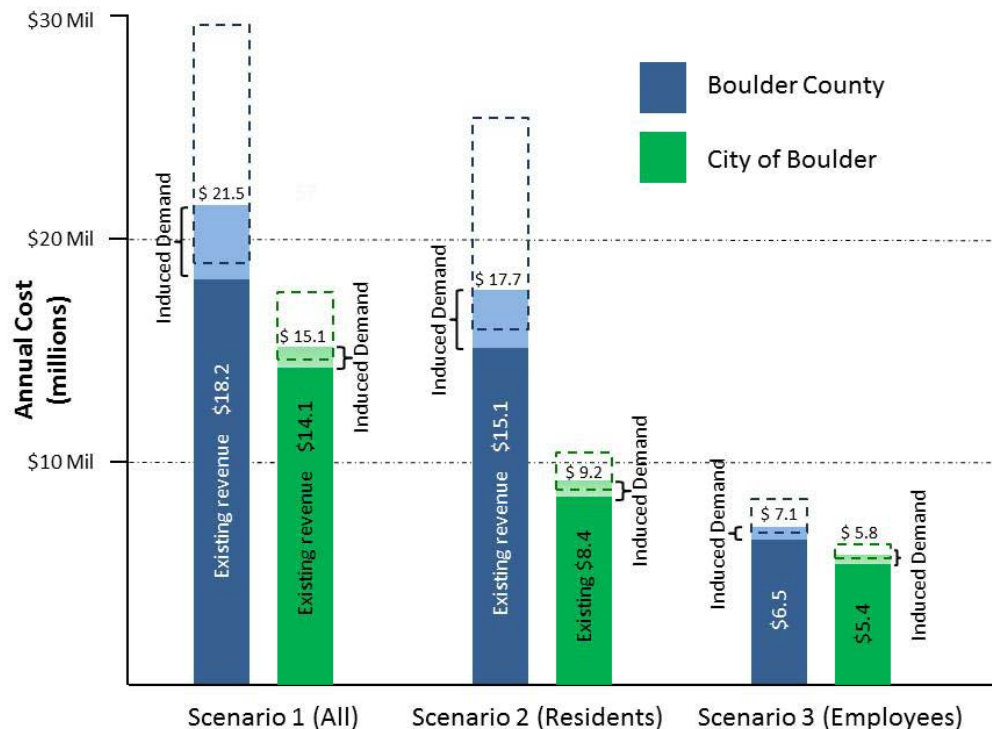
The estimated Year 1 costs for each scenario in both Boulder County and the City of Boulder are shown in Table 4-2 and Figure 4-3. These cost estimates are based on the two components described in Figure 4-1. This includes the estimated annual revenue generated in 2011 by those that would become eligible to receive a community-wide EcoPass given each scenario and the fully allocated annual costs (administration, capital and operations and maintenance) that RTD requested would be needed to pay for service increases in each scenario to meet the induced demand. Operations and maintenance costs typically account for about 50%-60% of fully allocated costs. Total estimated program costs are based on the medium elasticity.

**Table 4-2 Estimated Year 1 Program Cost**

		Induced Demand Cost			
Scenario	2011 RTD Revenue	Lower Bound	Medium Elasticity	Upper Bound	Total Program Cost
Boulder County					
Scenario 1 (All)	\$18,217,059	\$727,650	\$3,265,178	\$11,344,395	\$21,482,237
Scenario 2 (Residents)	\$15,131,422	\$642,002	\$2,525,129	\$10,175,338	\$17,656,551
Scenarios 3 (Employees)	\$6,500,889	\$372,663	\$573,580	\$1,876,764	\$7,074,468
City of Boulder					
Scenario 1 (All)	\$14,185,543	\$433,663	\$956,246	\$3,414,830	\$15,141,789
Scenario 2 (Residents)	\$8,447,519	\$375,709	\$727,536	\$2,058,233	\$9,175,055
Scenarios 3 (Employees)	\$5,388,194	\$340,299	\$476,758	\$943,103	\$5,864,952

Source: Existing revenue – Appendix E; Induced demand cost – Appendix D

**Figure 4-3 Estimated Year 1 Program Costs**



Based on the induced demand model a community-wide EcoPass program is expected increase ridership in Boulder County. However, this does not necessarily mean there will be a need for additional transit service on all routes or at all times of the day. Many buses do not run full and the transit system has some amount of additional capacity that could accommodate increased ridership without overcrowding. In fact, one effect of a community-wide EcoPass program would be to more efficiently utilize the existing capacity of the transit system by filling empty seats. However, there are routes in Boulder County (such as the B, Dash and Skip among others) that are currently at or near capacity for part of the day. For these routes, additional bus trips would be necessary to prevent overcrowding. The induced demand costs (shown in Figure 4-4 and 4-5) would be the cost of providing additional bus trips to prevent overcrowding and are based on the estimated induced demand and existing transit capacity. These costs were derived using a trip-by-trip cost analysis for each route. See Appendix D for more detailed tables on induced demand costs.

## YEAR 2+ PROGRAM COSTS (USING SMART CARD DATA)

The program costs presented thus far are estimates that would protect RTD from unfunded service cost increases during the first year of implementation. However, given that actual ridership may vary from these estimates, and given that ridership would likely change from year to year once the program is implemented, it will be important to establish a more sustainable long-term cost formula that would be connected to actual ridership. Ridership could be tracked as part of the program's implementation through the use of smart cards. Smart cards have an embedded electronic chip that can be read by small onboard scanners each time a passenger boards a bus, thus allowing for the collection of more robust ridership data, including ridership data linked to each organization's EcoPass account.

RTD began distributing smart cards to participants of their existing EcoPass programs in January 2013 in part to collect ridership data to more accurately price their EcoPass programs. There would be several advantages to using this same approach to price a community-wide EcoPass in Boulder County for years 2+. It would ensure that the cost of the program would be directly tied to its use, thus providing RTD and Boulder County with a mutually agreeable and predictable way to determine an annual program cost. That way, if ridership from the community-wide EcoPass were to increase during successive years of the program, RTD would have a revenue source to pay for additional service increases as needed. Alternatively, if ridership from the program were to decrease at any time, the program's cost to Boulder County would reflect that decrease. This cost formula would also ensure that any ridership increase across RTD's system not attributable to the program (such as from decreased unemployment, increased gas prices etc.) would not be reflected in the EcoPass program cost to Boulder County.

**Figure 4-4 Years 2+ Cost Estimation Formula**

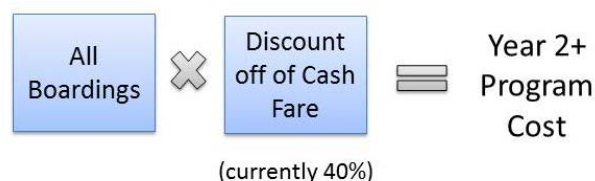


Figure 4-4 shows how Boulder County and RTD could use ridership data from smart cards to price the program for years 2+ (this is the same formula RTD plans to use to price all its existing EcoPass programs). The cost of providing additional service to meet induced demand is built into this cost formula. Specifically, the “discount off the cash fare” would be set at a rate that would cover the costs to RTD of any service increases that would be needed as a result of this program. There are several ways to set the discount off cash fare. Some possibilities include: using the equivalent cash fare, using the existing discounted rate per cash fare that RTD uses for most EcoPass programs (40%), achieving a certain system-wide operating ratio, or setting the discount per boarding at a rate that would protect RTD from unfunded service increases. The level of discount per boarding could have a significant impact on the overall price.

RTD currently prices most of their EcoPass programs with the intent of providing a 40% discount per boarding off the equivalent cash fare (45% for CU Boulder CollegePass). However, with the exception of the CU Boulder CollegePass, RTD has had no accurate way of tracking EcoPass use, and therefore no way of knowing whether some companies or neighborhoods are actually getting more than or less than a 40% discount. The introduction of smart cards in 2013 will allow RTD to track EcoPass use, which should lead to more equitable pricing. In meetings with RTD staff as part of this study, RTD expressed a desire that the price per boarding be similar to the targeted discount rate of the existing EcoPass programs (about 40%). Appendix F contains a cost analysis using the Year 2+ cost formula.



## CHAPTER 5 ■ PROGRAM BENEFITS

This feasibility study includes an assessment of the potential benefits of implementing a community-wide EcoPass in Boulder County and the City of Boulder. Several of the potential benefits of this program were quantitatively estimated using the performance measures identified in Chapter 2. Table 5-1 and 5-2 show each scenario's forecast impact (in Boulder County and the City of Boulder respectively) using the following indicators:

- Change in transit ridership
- Change in VMT
- Change in GHG emissions
- Change in transit mode share
- Change in the number of persons with access to an EcoPass

**Table 5-1 Benefits Analysis: Boulder County**

Scenario	Additional Annual Boardings	Annual VMT Saved	Annual GHG Emissions Saved (kg)	Transit Mode Share Change* (per scenario)	# New Transit Pass-Holders
Existing	8.45 million <sup>1</sup>	2,240 million <sup>2</sup>	--	2% All Trips <sup>3</sup> 5.2% Work Trips <sup>4</sup>	1. 81,000 <sup>5</sup> 2. 68,000 <sup>5</sup> 3. 36,000 <sup>5</sup>
<b>1 All</b>	<b>5.2 million</b> (↑ 62%)	<b>40 million</b> (↓1.8%)	<b>15 million</b> --	<b>1.0%</b> (↑ 50%)	<b>270,000</b> (↑ 340%)
<b>2 Residents</b>	<b>4.8 million</b> (↑ 57%)	<b>35 million</b> (↓1.6%)	<b>13 million</b> --	<b>1.1%</b> (↑ 55%)	<b>230,000</b> (↑ 340%)
<b>3 Employees</b>	<b>2.2 million</b> (↑ 26%)	<b>13 million</b> (↓0.6%)	<b>5 million</b> --	<b>2.6%</b> (↑ 50%)	<b>130,000</b> (↑ 360%)

Source: see Appendix G.

\*Note: The mode share change in Scenario 1 & 2 is relative to all trips, while the mode share change in Scenario 3 is relative to work trips.

<sup>1</sup>Ridership on routes that pass through Boulder County (RTD, 2011)

<sup>2</sup>DRCOG 2010 model, cycle 2 (calculated by multiplying reported daily VMT by 365 days)

<sup>3</sup>Estimate based on the ratio of transit mode share of all trips to work trips from the 2009 NHTS.

<sup>4</sup>2012 ACS

<sup>5</sup>Estimate of existing EcoPass holders by scenarios (see Appendix A for calculations)



Table 5-2 Benefits Analysis: City of Boulder

Scenario	Additional Annual Boardings	Annual VMT Saved	Annual GHG Emissions Saved (kg)	Transit Mode Share Change* (per scenario)	# New Transit Pass-Holders
Existing	7.85 million <sup>1</sup>	865 million <sup>2</sup>	--	4.9% All Trips <sup>3</sup> 7.8% Work Trips <sup>4</sup>	1. 71,000 <sup>5</sup> 2. 48,000 <sup>5</sup> 3. 33,000 <sup>5</sup>
<b>1 All</b>	<b>3.2 million</b> (↑ 41%)	<b>17 million</b> (↓2.0 %)	<b>6 million</b> --	<b>1.2%</b> (↑ 25%)	<b>90,000</b> (↑ 120%)
<b>2 Residents</b>	<b>2.3 million</b> (↑ 29%)	<b>11 million</b> (↓1.3%)	<b>4 million</b> --	<b>1.5%</b> (↑ 30%)	<b>50,000</b> (↑ 110%)
<b>3 Employees</b>	<b>1.8 million</b> (↑ 22%)	<b>8 million</b> (↓0.9%)	<b>3 million</b> --	<b>3.8%</b> (↑ 50%)	<b>60,000</b> (↑ 180%)

Source: see Appendix G.

\*Note: The mode share change in Scenario 1 & 2 is relative to all trips, while the mode share change in Scenario 3 is relative to work trips.

<sup>1</sup>Ridership on routes that pass through the City of Boulder (RTD, 2011)

<sup>2</sup>Annual VMT in Boulder Valley in 2012; from the City of Boulder Transportation Department (calculated by multiplying reported daily VMT by 365 days)

<sup>3</sup>Modal Shift in Boulder Valley 1990-2012, January 2013

<sup>4</sup>2011 Boulder Valley Employee Survey for Transportation Report of Results, June 2012

<sup>5</sup>Estimate of existing of EcoPass holders by scenarios (see Appendix A for calculations)

### Summary of Quantitative Benefits Analysis

- **Increased Transit Ridership** – A core benefit of implementing a community-wide EcoPass would be an increase in transit ridership. Depending on the scenario, a County-wide program would result in an annual ridership increase of between 2.2 million and 5.2 million. For comparison, in 2011 annual transit ridership on all Boulder County bus routes was 8.45 million. This means a County-wide program would result in about a 26-62% increase in transit ridership on these routes depending on the scenario. A community-wide program just in the City of Boulder would increase transit ridership on buses that pass through the City of Boulder by about 22-41% depending on the scenario.
- **Reduced VMT** – The increase in transit ridership would mean fewer trips by automobile in Boulder County. Depending on the scenario, this would equate to a reduction of Vehicle Miles Traveled (VMT) between 13 million and 40 million per year under a County-wide program. This equates to about a 1-2% decrease in annual VMT across the County. A similar decrease in the percent of VMT would occur in Boulder Valley under a City of Boulder program.
- **Reduced GHG Emissions** – The reduced VMT would also mean a reduction of GHG emissions. Depending on the scenario, the approximate reduction in GHG emissions from a County-wide EcoPass would be between 5 million and 15 million kilograms per year, and 3-6 million kg per year under a City of Boulder only program.





- **Increased Transit Mode Share** – The predicted increase in transit ridership from a community-wide EcoPass program would also be reflected as an increase the transit mode share. Transit mode share is the percent of all person trips that are transit trips. The change in transit mode share (shown in Table 5-1 and 5-2) would be the change in the percent of transit trips taken by the population of the scenario. Under Scenario 1 and 2, the mode share change is shown among all trips taken by the respective population of that group. Under Scenario 3, the mode share change is shown relative to work trips taken by employees. Based on the estimated existing transit mode share of 2% for all trips and 5.2% for work trips in Boulder County (see Table 5-1), the transit mode share for all trips and work trips would increase by about 50% under countywide program. Under a City of Boulder program, the transit mode share in the Boulder Valley would increase by about 25-30% for all trips under Scenario 1 and 2, and by about 50% for work trips under Scenario 3.
- **Increased Transit Accessibility** – A community-wide EcoPass program in Boulder County would increase the number of people eligible for an EcoPass by between 130,000 and 270,000 depending on the scenario, which would equate to about a 340-360% increase. In the City of Boulder the number of new transit pass-holders would increase by 50,000-90,000 depending on the scenario, which would be a 110-180% increase. The cost of the bus fare can be a significant barrier to using transit for many people. For others, finding exact change or not knowing the fare can be a barrier to accessing transit. Additionally, each EcoPass is individualized with a photo ID, which gives users a sense of ownership and investment in the transit system. Because this program would provide so many additional people with an EcoPass, it would increase transit accessibility for much of the population that travels in the County.

### Additional Program Benefits

There would be several additional benefits from a community-wide EcoPass program that are not quantified in the benefits analysis. Two notable benefits to the County are described here:

- **Increased Access to Jobs** – A community-wide EcoPass would improve access to jobs by reducing the cost of commuting. The cost of commuting can be a barrier to low-wage earners. For those who can use transit to get to work, the cost of commuting would essentially become free. Accessibility to transit varies throughout the County and the benefit of an EcoPass to each individual's commute will largely depend on the level of transit service to their home and work locations. Additionally, a community-wide EcoPass could further increase access to jobs because employers would have an incentive to locate their businesses close to transit centers and high frequency transit routes. Because Scenario 1 and Scenario 3 would provide all employees working in Boulder County with an EcoPass, these scenarios would have the greatest benefit to job access.
- **Reduction in the H+T Index** – The average cost of housing plus transportation (H+T) per household consumes about 47% of the median household income in the Boulder County. The average household in Boulder County spends about \$13,800 annually on transportation (\$12,600 in the City of Boulder).<sup>2</sup> A community-wide EcoPass program could significantly reduce these household transportation costs. For example, the

<sup>2</sup> Center for Neighborhood Technology (CNT) H+T Index. <http://htaindex.cnt.org/>.



annual cost per person of a monthly transit pass is \$948 for a local pass and \$2,112 for a regional pass. By reducing the cost of transportation, this program would, in effect, increase the affordability of housing in the County because households would have more money to spend toward housing. Those who would see the most impactful reduction in H+T costs from a community-wide EcoPass program would be young adults, seniors, and low-income households. For these population groups, the marginal costs of transportation relative to income are significant and can be a barrier to accessing jobs, schools, doctors, services, and recreational opportunities.



## CHAPTER 6 ■ IMPLEMENTATION

The purpose of this chapter is to review several options, including identifying preferred strategies for how Boulder County could implement a community-wide EcoPass program. Several fundamental and interrelated programmatic level challenges for implementing each of the three scenarios will be addressed. These include:

- **Integration** – One of the biggest challenges to implementing a community transit pass program in Boulder County would be integrating it with existing EcoPass programs. Would existing EcoPass programs within the County continue? How would the overlap between existing EcoPass programs and a potential community-wide EcoPass program be managed?
- **Funding** – How would a community-wide EcoPass be funded? What are some feasible options given the program's cost? Could some of the existing EcoPass funding sources be used? The funding strategy would be closely interrelated with how the existing EcoPass programs are integrated into a community pass program.
- **Administration** - How would the administration of a community-wide EcoPass program be managed? Would the County, Cities or other entities be responsible for handling payments, distribution, enforcement and other administrative duties?
- **Geographic Equity & Phasing** – The current level of transit service (frequency and route coverage) varies significantly throughout the County. Given this, should different parts of the County pay different EcoPass prices? How would this work? Can a community transit pass be implemented differently or phased in different parts of the County?
- **Risk Identification & Management** – Potential risks include higher or lower than forecast ridership, future program discontinuance making it difficult to reinstate existing EcoPass programs, and economic disruption. A Boulder County community-wide EcoPass would significantly transform the way transit is funded in Boulder County. This not only comes with risks to the County but could impact the remaining EcoPass programs, transit service and transit funding structure in the rest of the Denver region.

### INTEGRATION WITH EXISTING ECOPASS PROGRAMS

#### Summary of Existing EcoPass Programs in Boulder County

There are currently seven different EcoPass programs in Boulder County (summarized in Table 6-1). In 2013 these programs provided about 75,000 passes to residents, employees and students in Boulder County and collectively generated about \$8.5 million dollars in revenue for RTD. Each program serves one of three different populations that travel in the County:

- Employees (CAGID and Employer Paid Program)
- Residents (NECOPass, Lyon Community Pass, and Nederland Community Pass); and
- College Students (CU Boulder CollegePass and Naropa University CollegePass)



Each program is paid for through specific funding sources and RTD uses a different methodology for determining each program's pass price. As part of implementing a community-wide EcoPass the County would need to determine how to integrate each of these existing EcoPass programs. Options for integration could include absorption into the community pass program, continuation in conjunction with a new community pass, or a hybrid combination. A brief description of each existing EcoPass program, including the costs, funding sources and administrative logistics can be found in Appendix H.

**Table 6-1 Existing EcoPass Programs in Boulder County (2013)**

	# of Passes	Revenue	Price per EcoPass	Percent Total
<b>Employer Paid<sup>1</sup></b>	23,159	\$ 2,385,377	\$ 103	28%
<b>CAGID</b>	6,362	\$ 795,000	\$ 125	9%
<b>NECO Pass<sup>2</sup></b>	11,298	\$ 835,773	\$ 74	10%
<b>Lyons EcoPass</b>	2,067	\$ 30,512	\$ 15	0%
<b>Nederland EcoPass</b>	1,470	\$ 85,279	\$ 58	1%
<b>CU Boulder Students<sup>3</sup></b>	30,417	\$ 4,297,761	\$ 141	50%
<b>Naropa Students<sup>3</sup></b>	1,049	\$ 99,246	\$ 95	1%
<b>Total</b>	<b>75,822</b>	<b>\$ 8,528,948</b>	<b>\$ 113</b>	<b>100%</b>

<sup>1</sup> Estimate, <sup>2</sup> Data is from 2012, <sup>3</sup> Data is from 2012-13 Academic Year

Note: The City of Boulder subsidizes the NECO Pass by about 25-30% annually

Source: RTD and Boulder County Transportation Department

### Strategies for Integrating a Community-wide EcoPass Program by Scenario

Three scenarios have been identified for who would be included in a community-wide transit EcoPass program (see Chapter 3):

- **Scenario 1:** All Boulder County (or City of Boulder) residents, college students and employees
- **Scenario 2:** Boulder County (or City of Boulder) residents only
- **Scenario 3:** Only employees working in Boulder County (or City of Boulder)

There are several feasible options for integrating each of the existing EcoPass programs (a complete summary of all of these options can be found in Appendix I). The recommended options for each scenario, based on feasibility, maximizing existing revenue sources, and maintaining existing EcoPass programs, are summarized below. In some cases it could be possible to continue the existing funding mechanisms, particularly from CAGID and the university programs, but a new funding mechanism will likely be required to cover the cost of other existing programs. Options on how to pay for each of these implementation scenarios are discussed in the "Funding Options" section of the Chapter.

- **Scenario 1 Integration Strategy (All residents, students, and employees)**

In Scenario 1 all seven of the existing EcoPass programs in Boulder County would be replaced by a County-wide EcoPass. Currently these programs pay RTD about \$8.5 million a year, which the County would have to make up. It could be possible for the County to maintain some of the existing funding mechanisms (through CAGID and



student fees from the University programs), but much of this revenue would have to be generated using new sources.

- **Scenario 2 Integration Strategy (Residents Only)**

In Scenario 2 all residents of Boulder County would be eligible to receive a free transit pass. This means 100% of the existing Neighborhood EcoPass holders, Lyons pass holders, and Nederland pass holders would be covered. About 70% of existing employer-paid pass holders in Boulder County, 75% of CAGID employees, and 88% of existing CU Boulder and NAROPA students are also residents of the County and would be eligible to receive a resident pass. This poses the question of how to continue the employer EcoPass and CollegePass programs when a significant percentage of these existing pass-holders would be eligible to receive a free resident transit pass through the County.

One option to encourage employers to continue to participate in the existing EcoPass program would be for the County to reimburse employers for each employee that is a resident of the County. The estimated cost to cover resident-employees would be about \$2,300,000. However, this strategy would maintain about \$900,000 in payments from existing participating businesses for 8,500 employee EcoPasses that otherwise could disappear with a resident pass program.

In order to maintain the existing CollegePass program in conjunction with a resident pass, the County (or City of Boulder) should involve the universities early the program's planning process. The intent would be to preserve the CollegePass funding mechanism and maintain the integrity of the program for the 12% of students that currently receive a CollegePass, but are not residents of the County. One option to maintain the program would be to establish a rebate system so that students in the County could be reimbursed for any tax that would be used to fund the resident pass program.

- **Scenario 3 (Employees Only)**

In Scenario 3 all employees working in Boulder County would be eligible to receive a transit pass. This means 100% of existing employer-paid EcoPass-holders in Boulder County, and 100% of CAGID employees would be eligible for a pass. About 40-42% of existing Neighborhood EcoPass-holders, Lyons pass-holders, and Nederland pass-holders also work in Boulder County and would therefore be eligible for a pass. This poses a potential issue for how to continue these existing programs when part of the population would be eligible to receive a free transit pass.

The recommended option to maintain the integrity of the resident EcoPass programs in conjunction with an employee pass program would be for the County to work with RTD to reduce the cost of the NECOPass program by about 40%. The County would by default pay for this portion of the resident population through the County-wide employee pass program. Finally, it is assumed that a very small (and therefore negligible) percentage of existing CU Boulder and Naropa students would be eligible to receive an employee pass. Therefore these programs would continue unchanged. The total estimated cost of covering the existing EcoPass programs that would be replaced under this scenario would be about \$3.5 million.





Two additional things should be considered as part of developing an integration strategy for implementing any one of the three scenarios:

- If Boulder County or the City of Boulder decides to implement one of the three scenarios, it would be important to involve CU Boulder early in the program planning process given the significant presence of their existing CollegePass and EcoPass programs. Between the CollegePass program and employee EcoPass program, CU Boulder funds about 37,000 EcoPasses in Boulder and pays RTD about \$5 million annually. This represents about half of all the EcoPasses distributed in Boulder County and more than half of EcoPasses distributed within the City of Boulder. Getting the university involved early would be essential to designing the program's structure, facilitating a smooth transition and would help to maintain as much of the existing funding mechanisms as possible.
- Additionally, the need for integration strategies suggested here are more important if this program were implemented County-wide or in the City of Boulder. About 93% of the EcoPasses in Boulder County are distributed by businesses, neighborhood organizations, or universities in the City of Boulder (see Table 6-2). Therefore, there would be less need to integrate with existing EcoPass programs if a community-wide EcoPass were implemented just within one of the other cities or towns in Boulder County or outside the City of Boulder (this is the case with the existing Lyons and Nederland community-wide EcoPass programs).

**Table 6-2 Existing EcoPass Programs in the City of Boulder Relative to Boulder County**

Existing EcoPass Program	Boulder County	City of Boulder	City of Boulder (% of County)
<b>Employer Paid*</b>	23,159	21,736	94%
<b>CAGID</b>	6,362	6,362	100%
<b>NECOPass</b>	11,298	11,227	99%
<b>Lyons EcoPass</b>	2,067	0	0%
<b>Nederland EcoPass</b>	1,470	0	0%
<b>CU Boulder Students</b>	30,417	30,417	100%
<b>Naropa Students</b>	1,049	1,049	100%
<b>Total</b>	<b>75,822</b>	<b>70,791</b>	<b>93%</b>

\*Estimate

Source: RTD and Boulder County

## FUNDING A COMMUNITY TRANSIT PASS PROGRAM

### Funding Options

Five potential revenue sources to fund a community transit pass are summarized below. Under each of these options revenue would be collected from different populations in Boulder County. In order to ensure that the program is paid for by those who would benefit from the program, certain options will be more appropriate than others depending on which scenario is implemented.



**Property Tax** – A one mil property tax in Boulder County generates about \$5.6 million per year (see Table 6-3) and cost an owner of a \$400,000 house about \$32 per year. It would make the most sense to use this type of tax to fund a resident pass. However increasing property taxes can be politically challenging to implement without a high level of support from residents.

**Sales Tax** - A tenth of a cent (0.1%) sales tax in Boulder County generates about \$4.1 million per year (see Table 6-3). This method of taxation tends to be more popular with residents because some of the sales tax is generated by non-County residents. However, raising the sales tax may be difficult in some parts of the County. The State of Colorado imposes a sales tax ceiling of 8.85% and some parts of the County, especially places with improvement districts, already have sales tax rates approaching the maximum. For example, the current sales tax rate in the City of Boulder is 8.21% and in Nederland the rate is 8.55%. Some other parts of the County have much lower sales tax rates. Another consideration of using sales tax to generate revenues is that the amount of money generated is closely tied to the economy and can fluctuate year-to-year. Relying entirely on sales tax to fund a community transit pass program would incur the risk of revenue fluctuation.

**Business Head Tax** – A business head tax would assess businesses in Boulder County based on the number of employed persons at the business. As an example, a head tax of \$10 per employee per year in Boulder County would generate around \$1.6 million per year. This type of tax currently does not exist anywhere in Boulder County. However numerous cities throughout the Country use variations of a business head tax to generate revenue, including Chicago and Denver. The Denver tax is called the Occupational Privilege Tax (OPT). The Denver OPT funds planning, design, maintenance and improvement of City facilities and the provision of municipal services to Denver citizens and businesses. Under Denver’s OPT all employers that do business in the City of Denver are charged \$4 per employee per month regardless of how much they work plus an additional \$5.75 a month for each employee that makes over \$500 a month. The latter amount is deducted from the employee’s salary. It would make the most sense to use this type of tax to fund a community EcoPass program serving employees. There are two drawbacks to implementing a business head tax. First, it can be politically unpopular because of the fear that it would discourage businesses from locating in the community. Second, it is unclear whether the County would have the legal authority to implement a business head tax. Instead, it might only be possible for individual cities and towns in the County to administer such a tax.

**Student Fees** – Student fees at CU Boulder and Naropa University are currently used to fund the CollegePass program. Students at CU Boulder currently pay \$71 a semester in student fees, which generated about \$4.3 million in the 2012-2013 academic year for the CollegePass program.

**Parking Fees** – The EcoPass provided to employees in CAGID is currently funded by parking fees downtown. This type of funding mechanism could continue for CAGID employees and could potentially be used in other areas of the County where parking is in high demand.



Table 6-3 Annual Tax Yield in Boulder County

Area	FY 2012 0.1% Sales Tax <sup>1</sup>	2012 1 Mil Property Tax <sup>2</sup>	\$1 Monthly Employee Head Tax <sup>3</sup>
<b>County</b>	<b>\$4,100,000</b>	<b>\$5,600,000</b>	<b>\$2,000,000</b>
Boulder	\$2,070,000	\$2,500,000	\$1,090,000
Longmont	\$950,000	\$1,000,000	\$420,000
Louisville	\$360,000	\$440,000	\$140,000
Lafayette	\$210,000	\$360,000	\$60,000
Superior	\$170,000	\$160,000	\$20,000
Erie	\$20,000	\$100,000	\$10,000
Lyons	\$15,000	\$30,000	\$7,000
Nederland	\$20,000	\$20,000	\$8,000

1 Colorado Department of Revenue FY 2012

2 Colorado Department of Local Affairs, Certification of Levies and Revenues, Boulder County, State of Colorado 2012 Annual Report

3 DRCOG Workforce Commuting Patterns (2000) adjusted using County data from Colorado Department of Labor and Employment, 4th Qtr

### Potential Funding Strategies (by scenario)

In each of the three implementation scenarios a community-wide transit pass would be made available to different segments of the population (residents, employees, students, or some combination). Therefore, the funding strategy for each scenario must be tailored to the population being served. The following funding strategies are based on the recommended integration strategy for each scenario (see “Integration” above).

#### Scenario 1 (All residents, students, and employees)

Based on the Year 1 cost estimates presented in Chapter 4, a transit pass for all residents, students and employees in Boulder County would cost about \$21.5 million per year. Because this type of pass would incorporate several different populations, funding should include several different revenue sources.

Three of the existing EcoPass programs in Boulder County could potentially continue to be funded the same way they are today: the CU Boulder Student CollegePass, the Naropa University Student CollegePass, and the CAGID employee EcoPass. Combined these programs generated about \$5.2 million in revenue for RTD in 2013. CAGID employers would be exempt from any tax used to fund the community-wide EcoPass program. Details on how to maintain the existing CollegePass program and funding mechanism would need to be resolved with the universities’ participation.

A new revenue source would be needed to fund the estimated \$16.3 million cost during Year 1 of the community pass program to cover the two remaining groups of people. These include about 157,000 employees who work in Boulder County outside of CAGID and about 159,000 residents of Boulder County who do not work in Boulder County and are not students of CU Boulder or Naropa University.



Revenue to fund employee passes could be generated using a Business Head Tax (BHT). The estimated cost of providing an EcoPass to every employee in Boulder County outside of CAGID would be about \$6.3 million per year. To generate this much revenue, the County would need to charge employers an average of \$3.35 per employee per month (\$40 per year). Given the uncertainty of the County's legal authority to initiate a BHT, each town and city may need to establish its own BHT. To more equitably distribute the costs, the BHT rate would be higher in places like the City of Boulder where transit service is better, and the rate would be lower in more rural parts of the County where fewer transit options are available.

An annual transit pass for the remaining residents would cost about \$10 million and could be generated using either a property tax or sales tax. A property tax of 1.8 mils or a sales tax of 0.245% would cover the remaining cost for residents. A 1.8 mil property tax would increase the taxes on a \$400,000 home about \$57 per year. It should be noted that if a rebate program is used to reimburse university students for property or sales taxes they incur, these costs should be accounted for in setting the sales or property tax rates.

**Table 6-4 Summary of Scenario 1 Potential Funding Sources**

Population	Number of Passes	Funding Source	Tax Rate	Estimated Revenue
CU Boulder students	30,000	Student Fees	Existing Rate	\$4,300,000*
Naropa U. students	1,000	Student Fees	Existing Rate	\$100,000*
CAGID employees	6,400	Downtown Parking Revenue	N/A	\$800,000
All other employees	157,000	Business Head Tax	\$3.35/month	\$6,300,000
Remaining residents	159,000	Opt 1: Property Tax	1.8 mils	\$10,000,000
		Opt 2: Sales Tax	0.245%	
<b>Total</b>	<b>353,000</b>			<b>\$21,500,000</b>

\*Dependent on the continuation of the CollegePass funding source

#### **Scenario 2 (Residents Only)**

Based on the integration strategy recommended for Scenario 2 (see above), students at The University of Boulder and Naropa University would continue to pay for a transit pass through student fees. Using the Year 1 cost estimates presented in Chapter 4, the cost of providing an annual transit pass to all other residents of Boulder County (about 275,000 people) would be about \$13,300,000. Two potential options for generating revenue to fund a resident pass would be to establish an EcoPass Property Tax (through a mil levy) or an EcoPass sales tax.

**Property Tax** – In order to generate the estimated \$13.3 million that it would cost for a Boulder County resident EcoPass, the County would need to enact a mil levy on property of approximately 2.4 mils. This would increase property taxes on a \$400,000 house by about \$76 a year. To more equitably distribute the costs, the mill levy could be set higher in places like the City of Boulder that are well served by transit and lower in places like Erie, Lyons and rural unincorporated Boulder County that are not as well served by transit.



Sales Tax – A countywide sales tax rate of about 0.325 % would generate enough revenue to fund the estimated Year 1 cost (\$13.3 million a year). This level of sales tax could be difficult to implement in some parts of the County because the State imposes a sales tax ceiling of 8.85%. Similar to the mill levy, it may be appropriate to use different tax rates in different parts of the County to reflect the level of transit service in that area.

**Table 6-5 Scenario 2 Potential Funding Sources**

Population	Number of Passes	Funding Source	Tax Rate	Estimated Revenue
CU Boulder students	30,000	Student Fees	Existing Rate	\$4,300,000*
Naropa U. students	1,000	Student Fees	Existing Rate	\$100,000*
Residents (excluding students)	275,000	Opt 1: Property Tax	2.4 mills	\$13,300,000
		Opt 2: Sales Tax	0.325%	
<b>Total</b>	<b>299,000</b>			<b>\$17,700,000</b>

\* Dependent on the continuation of the CollegePass funding source

### Scenario 3 (Employees Only)

A community-wide EcoPass for every employee in Boulder County would cost about \$7.1 million per year (based on the Year 1 estimated program cost from Chapter 4). The most user-based means to fund this pass program would be to initiate a Business Head Tax (BHT) similar to Denver's Occupational Privilege Tax (OPT). In order to keep costs low, the 6,400 EcoPasses provided to employees through CAGID could continue to be funded by parking revenues and those employers in CAGID would be exempt from a BHT. CAGID pays about \$800,000 per year for employee EcoPasses. Therefore the County would need to generate an additional \$6.3 million to pay for EcoPasses for the remaining 157,000 employees in Boulder County. Using a BHT the County would need to charge employers an average of \$3.35 per employee per month (\$40 per year). Given the uncertainty of the County's legal authority to initiate a BHT, each town and city may need to establish its own BHT. To more equitably distribute the costs, the BHT rate would be higher in places like the City of Boulder where transit service is better, and the rate would be lower in more rural parts of the County where fewer transit options are available.

**Table 6-6 Scenario 3 Potential Funding Sources**

Population	Number of Passes	Funding Source	Tax Rate	Estimated Revenue
CAGID employees	6,400	Downtown Parking Revenue	N/A	\$800,000
All other employees	157,000	Business Head Tax	\$3.35/month	\$6,300,000
<b>Total</b>	<b>163,000</b>			<b>\$7,100,000</b>





Table 6-7 Summary of Potential Funding Strategy

Population	Scenario 1	Scenario 2	Scenario 3
Residents	Property Tax at 1.8 mills or Sales Tax at 0.245%	Property Tax at 2.4 mills or Sales Tax at 0.325%	Not Covered
Employees	Business Head Tax at \$3.35 per month (CAGID funded through parking revenue)	Not Covered	Business Head Tax at \$3.35 per month (CAGID funded through parking revenue)
University Students	Student Fees	Student Fees	Not Covered
Estimated Revenue	\$21,500,000	\$17,700,000	\$7,100,000

## ADMINISTRATION

There are several administrative challenges to address prior to implementing a community-wide EcoPass program of this scale. These include:

- **Administration Cost** - The cost of administration, including the cost of dedicating staff, should be built into the program's budget and funding mechanism. A conservative estimate would be to budget between 3% and 6% of the total cost of the program for this (administrative costs to the County were not included in the program cost estimates provided in Chapter 4).
- **Distribution of passes** – Distribution of 160,000 to 350,000 passes would likely be one of the most substantial administrative tasks of initiating a community-wide EcoPass program. One way to make this administrative task more manageable (both for the program administrators and the public) would be to stagger the distribution and renewal process throughout the year. There are several ways to do this. Assuming passes would be renewed annually, the time of year when passes are to be distributed could vary by population groups (such as employees, residents, etc.) or geographic locations within the County. Alternatively passes could be distributed throughout the year with renewal tied to the date the pass is originally distributed instead of every pass expiring on December 31<sup>st</sup>. The use of smart cards should also make pass distribution more manageable. After the initial set of smart cards is distributed, renewal can be completed electronically upon proof of residency, employment or enrollment at a university depending on the implementation scenario.
- **Cash flow** – This will involve the collection and distribution of money to cover the cost of the program. Some of the challenges to managing cash flow include the scale of the program's cost, timing of the receipt of tax revenue during the course of a year, temporary reduction in tax revenue from economic disruptions, and changes in ridership (which would impact the program's cost). Potential ways to address these challenges include establishing monthly, instead of annual payments, and staggering the initial tax collection with the program's start-up to build up a reserve fund in case revenues temporarily decrease or ridership suddenly increases.



- **Enforcement** – Enforcement would be needed to prevent program abuse, such as pass sharing and unintended persons acquiring passes. Passes that contain ID's (like the current EcoPass) would help prevent pass-sharing. It will be important to develop a simple, yet effective means for program participants to acquire a pass (such as standardizing the means by which participants provide a proof of address, work location, etc.) to enforce proper use of the program without discouraging use. Data monitoring/reporting could also be useful in preventing people from abusing the program.
- **Marketing and Education** – Marketing and education would be critical to the success of a community-wide EcoPass program. Marketing would help build support and maximize program participation. Given the potential size and complexity of the program, education would be particularly valuable in alleviating confusion in how the program works and ensuring that the program is an accessible amenity to the community.
- **Designating a Program Administrator** – While this may be a County- or City-initiated program, there are several options for who would be responsible for carrying out the administrative tasks involved in a Boulder County community transit pass program. Possible administrators include:
  - The County;
  - Cities or towns within the County;
  - One or more of the County's existing Transportation Management Organizations (such as Boulder Transportation Connections or 36 Commuting Solutions); or
  - A new TMO that would be dedicated specifically to administering a County-wide EcoPass program.

There are different advantages to each potential program administrator. The County could provide a centralized administrative body that would have more resources than some of the smaller towns. The towns and cities would be more locally accessible to the public, particularly when it comes to pass distribution. TMO's would put less strain on the local government. Existing TMO's are already well set-up for the marketing and education component, while a new TMO could be designed specifically to meet the administrative needs of a community transit pass program. Alternatively, it may also be preferable to involve several agencies to manage different parts of the program's administration. For example, the County could be responsible for cash flow, performance monitoring and negotiations with RTD; the cities and town could be responsible for distributing passes, enforcement and tax collection; and the TMO's could be responsible for marketing and education.



## GEOGRAPHICAL EQUITY

An important consideration of funding a community transit pass program will be balancing the costs and the benefits geographically across the County. It would be politically unpopular and unfair for all parts of the County to be taxed at the same rates for a community EcoPass when the level of transit service, transit use and cost of providing a transit pass will vary so much by location. The most balanced approach to generating revenue to fund a community pass program would be to divide the County into different geographical areas based on transit service levels (similar to the existing business EcoPass cost structure). Each geographic area would be taxed at a different rate based on estimated (or actual) ridership and the cost of providing transit to those areas.

There are many ways the County could be geographically divided. However, the simplest and most politically feasible way would be to use the existing jurisdictional boundaries. Each city and town in Boulder County would establish its own taxing district at a rate that adequately reflects the cost of providing a free transit pass to that particular area. Unincorporated Boulder County could be taxed as one district, or divided it into several taxing districts. There are several benefits to using this funding approach:

- It would ensure that the costs to different parts of the County match the benefits;
- It would support a phased implementation approach so different parts of the County could implement the community pass program at different times (this has already started with the Lyons Pass, Nederland Pass, and potentially the Longmont Local Pass); and
- The program could be structured so jurisdictions within of the County can decide whether or not they want to opt into a community pass program

This approach also would introduce some challenges that would have to be sorted out, namely determining a fair pass price for providing a community EcoPass to each City and Town. This could be particularly complicated if each jurisdiction chose to implement different types of passes (i.e. different scenarios).

## RISK IDENTIFICATION AND MANAGEMENT

As part of discussions between RTD, Boulder County and the City of Boulder, and based on research and analysis performed as part of this feasibility study, several potential risks were identified as part of implementing a community-wide EcoPass in Boulder County. These were organized into five risk types. For each risk type, the source of the risk, impact of the risk, and potential strategies for managing the risk were identified.



Five risk types:

**1. Ridership higher than forecast**

- Source: Unpredictability in forecasting program demand.
- Impacts: Overcrowded buses, insufficient RTD equipment and staffing availability, underfunded contract, cost burden to RTD, and insufficient local revenue sources.
- Management: Establishing a reserve account could offset unanticipated costs associated with this risk type. One way to build up a reserve account would be to stagger the revenue collection start date with program implementation and pass distribution. Another technique would be to “oversize” the local revenue source from anticipated costs for the first year or two. Phased-implementation, such as initiating a smaller-scale program at first could help the County better predict induced demand prior to implementing a County-wide program. Periodic performance monitoring (quarterly or annually) could also be used to monitor demand and plan for costs and service needs (more discussed below). Finally to prevent drastic changes in the program’s cost from year-to-year, Boulder County and RTD could agree to establish a maximum amount that the cost of the program is allowed to fluctuate from year-to-year. For example, the City of Boulder currently has an agreement that prevents the cost of their EcoPass program from increasing or decreasing by more than 10% every year.

**2. Ridership lower than forecast**

- Source: Unpredictability in forecasting program demand.
- Impacts: Overestimated RTD equipment and staffing needs, fewer program benefits, contract amount set too high, and local revenue taxes set too high.
- Management: Performance monitoring (see section below) and phased implementation would help to track demand early in the implementation process, which would help to better define the program’s cost in subsequent years. Using smart cards and linking actual ridership generated by the program with the program’s cost would help protect Boulder County from overpaying if ridership were to be lower than anticipated.

**3. Future program discontinuance**

- Source: Loss of public support for local tax source or a turnover in elected leadership (local or RTD).
- Impacts: Sudden loss of the community-wide EcoPass program, sudden decrease in ridership, difficulty of re-instating existing EcoPass programs.
- Management: This risk is not as great with smaller community-wide EcoPass programs, such as the pilot programs established in Lyons and Nederland. However, the risk increases with a larger-scale program that would require integration with the existing EcoPass programs in Boulder County. A program of this scale should not just be implemented as a pilot program. Instead, establishing a multi-year commitment and long-term funding plan would help manage this risk. A reserve fund could also be used as a buffer if there were a need to restructure the program at some point in the future.



#### 4. Economic disruption

- Source: Lower than anticipated tax revenues (from a recession), higher than anticipated transit costs (e.g. petroleum pricing), or both.
- Impacts: Insufficient revenue to cover planned service levels or service levels become insufficient to meet demand.
- Management: A reserve account (as described in Risk Type 1) could act as a temporary buffer to offset unanticipated cost increases until a longer-term strategy is established (if that becomes necessary). Using a diversity of local revenue sources could lessen the impact of an economic disruption. Lastly, linking the program cost with ridership through the use of smart cards could help ensure RTD would have funding if and when service increases become necessary.

#### 5. Pass program “slippery slope”

- Source: Data inaccuracies in the induced demand model; other jurisdictions may want a similar pass program; or unworkable provisions in the Boulder County contract could become precedents for other local governments.
- Impacts: Could affect the viability/stability of RTD financial systems and it could trigger regional controversy over the equity of transit funding.
- Management: A program that is designed to address the previous four major risk types would help manage this risk. Another potential strategy would be to include a provision for re-negotiation of the contract (costs, program structure, etc.) at a future date.

### Performance Monitoring

As part of implementing a community-wide Eco Pass in Boulder County it would be important to periodically monitor and evaluate how the program is performing. This could be done quarterly or annually. Performance monitoring would help the County effectively manage the program to better achieve the Strategic Objectives (see Chapter 2) and support the program’s long-term success. Data collected as part of this process can be used to adjust pass pricing in different locations, to estimate future program costs, better target marketing and education efforts, and provide transparency and accountability of the program to the general public.

Smart cards would provide a significant source of data for evaluating the performance of the program. Key variables that the County could monitor include (but are not limited to): total ridership, ridership by route, ridership by time of day, ridership by geographic location, average ridership per program participant, and the percent of eligible pass-holders using the program. Performance monitoring should also include periodic evaluation of the program’s benefits using the performance measures identified in Chapter 2.

### Next Steps

The feasibility study will be incorporated into the City of Boulder’s Transportation Master Plan update as staff identifies future transit scenarios and investment strategies. As city staff and consultants analyze different future transit scenarios, options in which a community-wide Eco Pass program can be implemented will be explored.

