PARKING PRICING TECHNICAL ASSESSMENT

Prepared for:
Regional Transportation District
Denver, Colorado

JULY 2016

WALKER
PARKING CONSULTANTS

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July 2016
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Mr. Brian Welch
Senior Manager, Planning Technical Services
Regional Transportation District
1560 Broadway, Suite 700
Denver, Colorado 80202

Re: Parking Pricing Technical Assessment
Regional Transportation District

Dear Mr. Welch:

Walker Parking Consultants ("Walker"), along with our sub-consultants CH2M and Fehr & Peers, are pleased to submit the following report containing our *Parking Pricing Technical Assessment* for the Regional Transportation District (RTD) parking system.

This report presents a summary of our study methodology and findings. We hope that our analysis assists you in assessing the feasibility and potential impacts of an expanded paid parking program at RTD's Park-and-Ride facilities.

We appreciate the opportunity to be of service to you on this important project. If you have any questions or comments, please do not hesitate to call.

Sincerely,
WALKER PARKING CONSULTANTS

Jeremiah J. Simpson
Parking Consultant

Enclosure

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**Cover Photos: Central Park Park-and-Ride (left) and Jefferson County Government Center Station (right); provided by RTD*

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EXECUTIVE SUMMARY

As of the end of 2015, Denver's Regional Transportation District (RTD) operated a parking system of approximately 30,000 parking spaces, located throughout the RTD system in roughly 78 different lots and garages. With the opening of four new rail lines in 2016 and the N Line opening in 2018, the parking system is anticipated to grow to over 40,000 parking spaces and 101 locations. Long-term projections indicate a future capacity of over 50,000 parking spaces by 2040.

These parking facilities are essential points of access for a number of RTD services including bus rapid transit (BRT) stations along US-36, Park-and-Ride bus locations throughout the metro area, and light rail stations along the west, central, southeast, and southwest transit corridors. As the system expands to include the new University of Colorado A-Line (commuter rail), plus the northwest line (B), gold line (G), I-225 line (R) in 2016, and the N line in 2018, additional parking facilities are expected to follow suit. Though many patrons do access RTD services by modes other than a personal vehicle, the parking lots and garages still provide a very important point of modal transition and access for a substantial portion of riders.

Under the current parking program, RTD collects parking revenues at 39 of its 78 locations for certain user groups including out-of-district patrons, overnight parkers, and patrons who opt to pre-reserve a parking space, which is available at selected facilities. These charges currently impact about 15% of all RTD parking patrons. Meanwhile, daily parking for in-district users is free of charge, as pay parking was previously prohibited by state statute.

Legislative changes enacted in 2015 have enabled RTD to consider third party concession or management agreements to offer paid parking for all user groups at most of the locations throughout the District system. While RTD cannot receive any direct revenues from these arrangements, the District has the ability to benefit from an on-going lease, upfront "monetization" payment, or other type of financial arrangement with third party operators in exchange for parking operation rights.

To study the potential impacts of expanded pay parking, RTD has engaged the Walker team, which includes Walker, CH2M, and Fehr & Peers, to conduct the following *Parking Pricing Technical Assessment*. The purpose of this study is to analyze the feasibility, cost, income potential, and impact on ridership of implementing a universal or expanded pay parking program in the District's Park-n-Ride lots and garages. Our analysis is meant to provide a basis from which to determine whether and how paid parking will function within the District's parameters. This report includes the following key takeaways:

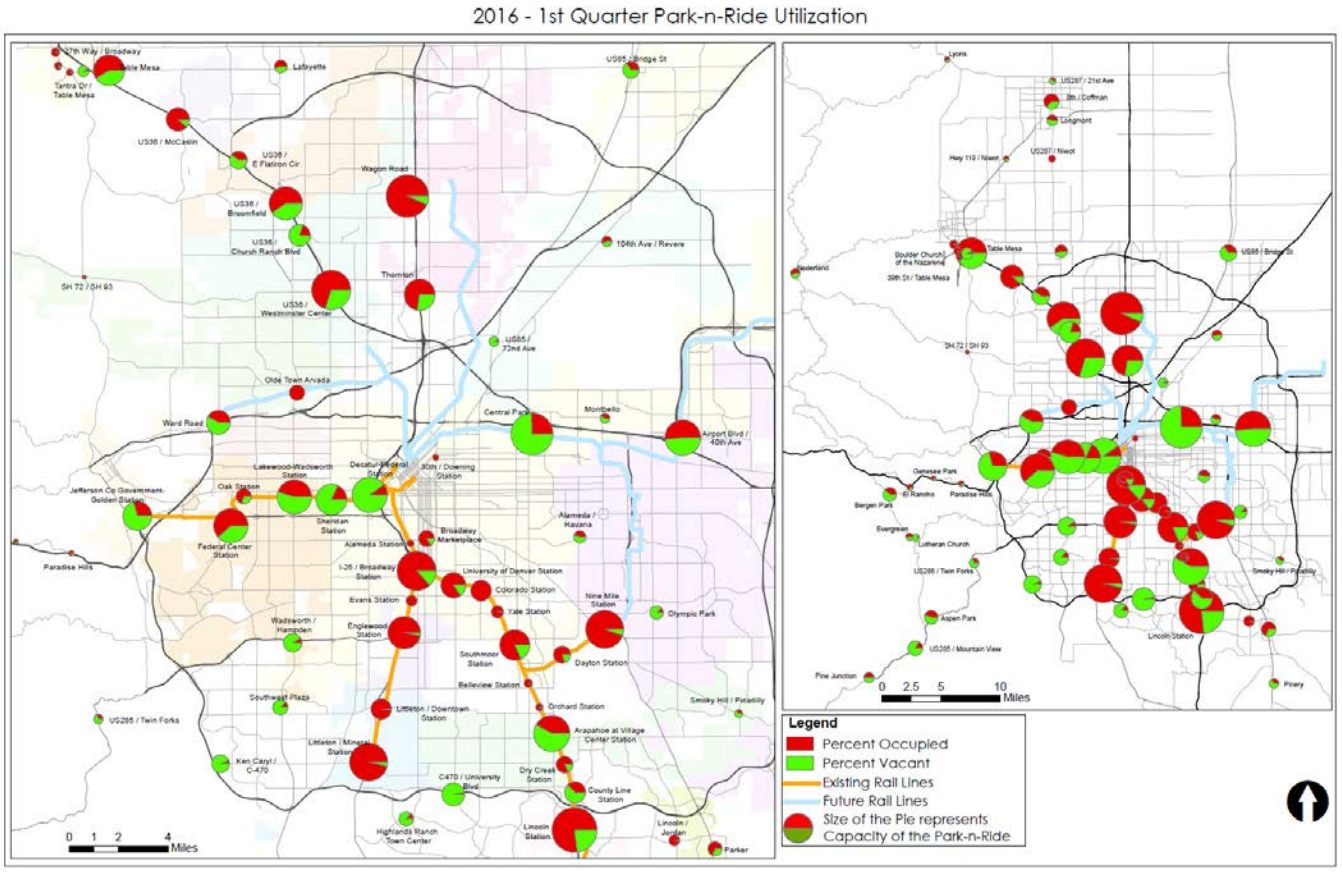
- Parking Pricing Scenario ANOI: To calculate Adjusted Net Operating Income, annual net operating income (NOI) for the paid parking system was calculated over a ten-year period for each parking pricing scenario. Projected fare loss was then deducted from the annual NOI; different levels of fare loss were estimated based on low, average, or high sensitivity assumptions. All three pricing scenarios were determined to be revenue positive, with the exception of Scenario C which has the potential to be revenue negative under the higher sensitivity (low performance) models.
- Operational Recommendations: The study team has determined that a paid parking system would be feasible for RTD to implement. This determination assumes that the operation and management structure at existing Park-n-Ride facilities would not change significantly; rather, it would be scaled for a larger operation including a larger number of paying parkers. The system would remain ungated, and would utilize the same collection and enforcement strategies.
- Future Study and Analysis: Presently, as RTD cannot benefit from direct parking revenues from a paid parking system, it is assumed that any revenues received will come from an agreement with a third party operator. For the purposes of this analysis, projected fare loss and projected parking

revenues were combined to calculate annual Adjusted Net Operating Income. However, a future study should endeavor to separate direct impacts on the RTD budget (such as fare loss) from parking revenues and costs, so as to more accurately estimate the value of a paid parking system under a concession or management agreement. Such a study should incorporate any financial elements of an agreement with a third-party operator, including profit margin, type and frequency of payments to RTD, etc.

Results from our ANOI analysis are presented in this report beginning on page 37. Findings related to rate sensitivity, ridership elasticity, feasibility of implementing expanded pay parking, and potential risks and challenges are presented in other sections this report.

We encourage all interested parties to read this document in full to understand the approach to this analysis and the multiple variables that were considered for each scenario.

Figure 1: RTD System Map and 2016 1st Quarter Utilization



The RTD system is extensive and provides bus, rail, shuttle, and BRT services throughout the metro area and as far away as communities such as Lyons, Piney, and Pine Junction. The figures above provide an overview of the RTD system and 1st Quarter Park-n-Ride Utilization.

Source: Provided by RTD

INTRODUCTION

Denver's Regional Transportation District (RTD) engaged Walker Parking Consultants to assess the feasibility and potential ridership and parking demand impacts of a universal or expanded paid parking program at RTD Park-and-Ride locations. In completing the RTD *Parking Pricing Technical Assessment*, the following major tasks were mutually agreed to by the Regional Transportation District (RTD) and Walker Parking Consultants. Fehr & Peers and CH2M have been engaged as sub-consultants responsible for various elements of the project:

- **Phase 1:** Summarization of the Existing RTD Parking System
- **Phase 2:** Peer Agency Review/ Determination of Elasticity
- **Phase 3:** Estimation of Costs and Feasibility
- **Phase 4:** Demand Variables/ Spillover Analysis
- **Phase 5:** Contract and Risk Assessment/ Items for Additional Study
- **Phase 6:** Calculations of Adjusted Net Operating Incomes and Final Reports

PROJECT APPROACH

In its approach to this project, the Walker team determined that the main objective was to evaluate the cost and feasibility of implementing an expanded paid parking system at various RTD-operated Park-and-Ride locations, and to assess any potential impacts on ridership and parking demand. Excluded from this analysis was a subjective evaluation of the pros and cons of paid parking, potential allocation of generated revenues, public relations challenges and strategy, a specific implementation plan, and an evaluation of any potential impact on future transit fares.

Current legislation regulates RTD's ability to charge for parking at the District's bus and rail Park-and-Ride facilities. RTD cannot, by law, charge in-District users for daily parking at RTD-owned or operated Park-and-Ride lots. Parking charges within the District are limited to out-of-District patrons, special time-based reserved parking spaces, and extended parking for multiple days. The District can, however, enter into parking concession arrangements that result in charging in-District patrons for daily parking so long as (1) RTD does not receive revenue from this arrangement, *and* (2) RTD does not specify the terms and use of the parking facility.

While no such arrangements are currently in place, the District *may* wish to explore the feasibility of such programs under appropriate circumstances. Parking charges could, for example, potentially provide the following benefits:

- A revenue source to offset ongoing maintenance and operating costs.
- A method to manage demand at heavily-utilized parking facilities.
- A revenue source available for other transit-related purposes.

Any decision regarding parking charges at RTD facilities would be preceded by an extensive, transparent, and inclusive process involving RTD and all of its stakeholders. In that light, this report should not be construed as a tool to determine the merits of parking charges, but rather as an early investigation of technical issues, opportunities, and constraints. More simply, this report is not intended to answer the question "should an entity charge $x or $y for parking," but rather, "what are the likely technical issues and ramifications if an entity were to charge $x and $y for parking."

The information contained in this report was derived from essential background data provided by RTD pertaining to district operations, ridership and mode-of-access data, and station area planning.

It is likely that additional technical studies may be need if RTD opts to proceed forward with an expanded paid parking program. Possible areas for additional study are addressed under Phase 5 of this report.

REPORT ORGANIZATION

The organization of this report is based on the project phases, as listed above. **Phase 1** provides a general basis for our findings, summarizing existing conditions within the RTD system. **Phase 2** describes our methodology for determining demand elasticity, including an overview of best practices from comparable transit agencies nationwide, and presents results for three different paid parking pricing scenarios. Phase 2 has been divided into two sections- Peer Agency Review (2.1) and Determination of Elasticity (2.2)- for further clarity. **Phases 3 through 5** evaluate implementation feasibility and potential logistical obstacles, estimated costs, and potential ridership and parking demand impacts. **Phase 6** summarizes findings and presents the calculated adjusted net operating incomes for each scenario over a ten-year period.

DEFINITION OF TERMS (FOR REFERENCE)

Several terms are used in this report which may have specific meanings when applied to parking planning, demand analysis, and/or parking management for the RTD system. For this report the following definitions are assumed:

Adjusted Gross Revenue: Adjusted Gross Revenue (AGR) is defined as the projected parking revenues for a given period less the projected fare revenue loss due to ridership demand elasticity.

Adjusted Net Operating Income: Adjusted Net Operating Income (ANOI) is defined as the Adjusted Gross Revenue (AGR) less the estimated Operations and Management (O&M) costs.

Elasticity: The percentage change in demand, for either parking usage or ridership, in response to a change in price. Note that that the term "elasticity" in economics is usually only applicable where the starting price is greater than $0. Therefore, this report uses the term elasticity more broadly than its formal definition. Occasionally, the term "rate sensitivity" may also be used.

High Utilization Parking Facility: Defined in this study as any Park-and-Ride lot or garage with a typical daily utilization of over 90%

Kiss and Rides: In a number of transit systems, Kiss and Rides are designated areas in which drivers can gather to drop off or wait for transit patrons, rather than using long-term facilities.

Managed / Unmanaged Parking Facility: Managed facilities are defined as the roughly 39 Park-and-Ride locations that are already equipped with parking kiosks to collect parking fees from out-of-district, overnight, and reserved parking patrons. Remaining locations are defined as un-managed as they are either too small or too remote to justify installing parking controls and expanding enforcement. A list of current and future managed and unmanaged facilities can be found in Appendix A.

Park-and-Ride: Used in this report to refer to any RTD owned or operated parking facility that provides access to RTD rail, bus, and/or bus rapid transit services. Note that CDOT-operated Park-and-Ride locations near the exit 259 off of I-70 (Highway 93 / Morrison) are excluded. Other RTD facilities where paid parking is specifically prohibited by agreement are included in the system inventory but not included in the financial models.

Rail Zone A: The RTD rail system is divided into four zones: Zone A, B, C, and Airport. The number of zones included in a particular trip dictates the trip fare. Rail Zone A is the central zone, encompassing

Downtown Denver and bounded by Pecos Junction station to the north, 40th and Colorado station to the east, I-25 and Broadway station to the south, and Sheridan station to the east.

Spillover: The tendency of drivers at some Park-and-Ride locations to utilize non-RTD parking facilities intended for another use and/or adjacent unrestricted street parking. This may be because the facility is at or above effective capacity, or to avoid paying for parking, or if the alternative parking is judged to be more convenient.

PHASE 1: SUMMARY OF EXISTING RTD PARKING SYSTEM

Based on background documents and data provided by RTD, the project team has prepared a summary of all Park-and-Ride parking facilities within the District's existing system. A total of 101 facilities (78 existing and 23 new) were identified and evaluated based on the following information in both graphical and tabular formats:

- The name, capacity, location, and characteristics of all parking facilities currently owned or operated by RTD
- Existing and projected build-out impacting the size, type, and number of spaces available at each location
- Identification of parking lot ingress/egress points for vehicles
- Pedestrian path of travel
- Preliminary identification of pay parking kiosks or other access and revenue controls that would be added should expanded pay parking be implemented

Note that transit and rail stations without parking facilities were excluded from the analysis. CDOT-operated parking lots along I-70 and I-25 were also excluded.

A summary of the existing and projected system data is provided in Appendix A of this report. A separate PDF document that includes the graphical data described below was provided to RTD in electronic format (due to size) as a report addendum.

DATA SOURCES

Graphical Data

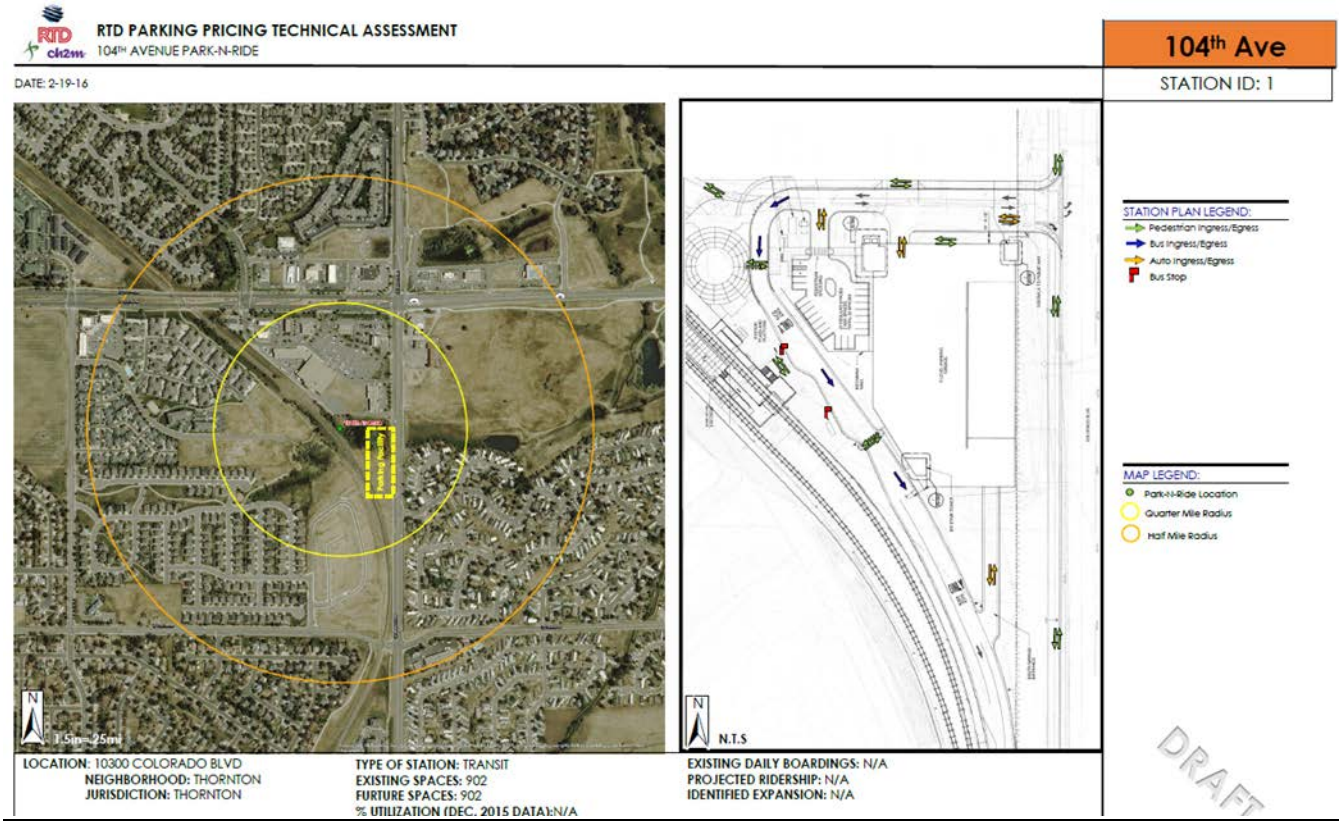
Graphic data was developed for each of the 101 identified stations. The data included the following elements:

- Aerial photo of the existing station area identifying the quarter-mile and half-mile radius from the station
- Station diagram using existing RTD plan drawings from the Trailblazer, showing basic layout of the bus movements/stops, parking, and ingress/egress points
- Data showing the name of the station, jurisdiction, neighborhood, number of parking stalls, ridership (if available) and % utilization based on the RTD 2015 Parking Utilization Report-January 25, 2016

The figure below shows an example of the data included in the report addendum.

The quarter-mile and half-mile walking distance analysis was used to inform our assessment of potential spillover from each station. The information related to capacity and historical usage data is incorporated into the model of potential future parking revenues, after adjusting for rate sensitivity and demand elasticities.

Figure 2: Example of Park-and-Ride Graphical Data



Source: Prepared by CH2M, 2016

Tabular Data

A tabular spreadsheet was developed for the 101 identified stations based on information provided to the team as part of the DRCOG 2040 Plan. The data is categorized in Transit Stations and Park-and-Ride lots, and includes the following elements:

- Station Name
- Transit Corridor (where applicable)
- Jurisdiction
- Station Status (Existing or New)
- Number of Parking Spaces
    - Existing
    - Opening Day (new lines only)
    - 2040 Projections
- Surface or Structure
- 2015 Average Utilization Rate (if available)
- Average Daily Boardings and Alightings (if available)
- Document Sources:
    - DRCOG 2040 RTD-Appendix 2
    - RTD 2015 Parking Utilization Report-January 25, 2016
    - RTD Park-and-Rides by Ownership/Type/Shared Responsibilities-February 2013
    - RTD Trail Blazer

INITIAL BACKGROUND DATA FINDINGS

We have identified a number of initial findings based on our analysis of the data compiled:

- Existing and projected system-wide parking quantities include the following:
  - Existing Spaces: 29,326
  - New Opening Day Spaces: 11,346
  - Total Parking Spaces (Existing and Opening Day): 44,772
  - Total Future 2040 Spaces: 50,298
- Three stations were identified where pay parking is either not allowed or will be managed by other entities, including:
  - Englewood Station (paid parking not allowed by covenants agreement)
  - 61st and Peña Station (parking managed through developer in conjunction with DIA)
  - Iliff Station (parking managed through City of Aurora)
- One bus Park-and-Ride will be closed before the adjacent rail lines open in 2017, including:
  - Ward Road (replaced by Wheat Ridge-Ward Road Rail Station).

In a few future and proposed locations, such as the new garage at Olde Town Arvada, the RTD parking spaces might be included as part of shared facility. Here, we assume the RTD spaces would remain exclusively allocated for RTD usage at peak times. Therefore, projected revenues and expenses for these spaces are treated the same as any other Park-and-Ride location.

STATION ACCESS AND WALKABILITY ANALYSIS

A Station Access and Walkability Analysis was prepared for all stations where the 2015 average utilization rate calculated for available parking facilities was over 90% (Refer to Appendix A for the complete analysis). The purpose of this analysis was to identify whether any other means of access to the stations exist that could replace the need to drive to and park at the station if an additional fee for parking was enforced. Based on our analysis, there are a total of 21 stations that offer such access. Each of these stations was ranked “High”, “Medium” or “Low” based on Bus Access/Route Coverage, Station Area Walkability, and Available Parking at Adjacent Stations. These factors were defined as follows:

- Bus Access/Route Coverage: The quality and scope of bus service provided at the station. If the bus coverage had multiple routes servicing many areas, the station received a high score. If bus routes were minimal or had limited coverage, the station was scored low.
- Station Area Walkability: Pedestrian and cyclist accessibility based on the street grid and connections to the station. If the station had many streets and ways for pedestrians and bicyclists to access the station, the station scored high. If the station had few connection points or required crossing busy streets, the station was scored low.
- Available Parking at Adjacent Stations: Available parking at alternative up-stream or down-stream RTD stations. If there was available parking at an underutilized station nearby, the station was scored high. If there were limited choices for parking due to availability or size of parking lot, the station was scored low.

Note that future stations were not included in the Station Access and Walkability Analysis, as the purpose of the analysis was to determine the impact of accessibility and alternative parking options on demand elasticity at existing stations.

PHASE 2.1: PEER AGENCY REVIEW

This section provides an overview of the study team's examination of comparable parking pricing implementations at other transit agencies nationwide. The results of the analysis conducted include agency implementation guidance, as well as an applicable range of price elasticities for parking demand and ridership. The following sections document five different types of paid parking system implementations incorporated by the analyzed peer agencies, including:

- On Hold: Paid parking explored, but not yet pursued.
- Metered Parking: Metered parking installed for a subset of spaces at select Park and Ride locations.
- Partial Pricing: Paid parking instituted at selected Park and Ride locations.
- Flat Fee-All Lots: A flat fee instituted at all Park and Ride locations system-wide.
- Variable Fee-All Lots: A variable fee instituted at all Park and Ride locations system-wide.

ON HOLD

Metro Transit – Minneapolis, Minnesota

- Underutilized Lots: Metro Transit tried a service cut off for later transit trips at full lots and moved the service hours to underutilized lots, but wasn't able to attract users. The most successful Park and Ride lots are transfer points, offering service to multiple routes.
- Leased Lots: Metro Transit's practices have demonstrated that leased parking can be made cheaper and mutually beneficial by offering use of agency-owned Park and Ride lots to neighboring churches, retail, and other surrounding uses when transit usage is low, such as on weekends and holidays.
- "Smart" Park and Rides: Metro installed freeway signs near Park-and-Rides that show the estimated travel times to downtown for vehicles in general traffic lanes compared to buses traveling in transit-advantage lanes. Other signs show how many parking spaces are available at the upcoming Park & Ride lot. Vehicle counters at each Park-and-Ride count how many people drive into the lots.

METERED PARKING

Trimet – Portland, Oregon

- Park and Ride Locations: Park and Rides are located only at stations at least 5 miles from the urban core.
- Short-Term Parking: 5-hour maximum use reserved parking is available at two locations: Sunset Transit Center (roughly 6 miles from Downtown Portland) and Gateway Transit Center (roughly 8 miles from Downtown Portland). Metered parking is also offered at a rate of $0.50/hour for patrons arriving after the morning peak; metered spaces are located close to the platform and are often used by students.

PARTIAL PRICING

DART (Pilot Program) – Dallas, Texas

- Pricing: Pricing was successful at managing demand where it was implemented, but it shifted demand to free lots. Implementing pricing at a higher number of Park and Ride lots would have mitigated this impact.
- Ride Share: DART's effort to integrate transit with Uber is still in progress, but has promise. The idea involves defining "Uber Areas" at some short distance (3-6 miles) around transit stations where DART would subsidize the Uber trip at some level to achieve the first-mile/last-mile connection. An agreement is still pending. Efforts would be focused on areas outside of the DART service area with a substantial demand for transit service.
- Kiss-and-Rides: DART's kiss-and-rides are heavily used, successful, and have eliminated some need for additional parking. These Kiss-and-Rides incorporate a design standard that places them close to transit and provides a certain number of spaces. DART is also experimenting with using some Kiss-and-Ride space for Zipcars/car-share; this effort has proved popular thus far.
- Restriping: The DART system has benefited from restriping. Working alongside municipal governments to reduce the green/landscaping requirement for Park and Ride lots is another measure that can yield additional parking spaces.
- Shuttle Service: DART is subsidizing up to 50% of shuttle service to major employers outside of walking distance from stations, and this program has been hugely successful. In one instance, a city is paying 100% of the cost of shuttle service to avoid having a large amount of parking built around their station.

UTA (Pilot Program) – Wasatch Front, Utah

- Pricing: UTA initiated a $1/day fee at two newly opened stations as a way to pay for investment, including:
    - Jordan Valley Light Rail
        - Fee collection began December 2011 and ended June 2013.
        - Since discontinuing the charge, utilization has increased from 6% to 15%.
    - Draper Commuter Rail
        - Fee collection began March 2013 and ended June 2013.
        - Since discontinuing the charge, utilization has increased from 10% to 35%.

RT – Sacramento, California

- Pricing: RT initiated a $1/day fee in 2010, affecting three stations in January 2010 and three additional stations in October 2010. While the system experienced overall decline in ridership during that time, relative elasticities of -0.52 to -1.01 were noted.
- Payment: Users can use cash, credit cards, or debit card at kiosks on the boarding platform while entering their parking stall number. Monthly pass holders need only display their monthly pass in their vehicle. Failure to pay for parking results in a $29.50 citation. Failure to pay citation will prevent vehicle registration.

FLAT FEE- ALL LOTS

Caltrain – Bay Area, California

- Pricing: The Caltrain system obtained commuter rail parking lots in 1992 from the California Department of Transportation (Caltrans). At that time, a flat fee of $0.50/day was charged. The system raised the pricing over the next 17 years in the following increments: $0.50/day to $1.50/day in 2002; $1.50/day to $2.00/day in 2006; $2.00 to $3.00 in 2009.
- Elasticity: Elasticity was evaluated at the Caltrain system's "high utilization" station lots, each with a utilization rate of 85% or higher; this analysis is further discussed in the Determination of Elasticity section on pg. 14.

VARIABLE FEE- ALL LOTS

WMATA – Washington, D.C.

- Paid Parking Pricing**:** WMATA instituted system-wide paid parking at all Park-and-Ride facilities, with fees ranging from $4-6 daily and $45-65 monthly reserved, depending on the lot.
- Enforcement: WMATA police and local jurisdiction police check hang tags to enforce monthly permits. Each hang tag applies to a particular station, month, parking space, and account number to discourage forgery. Jurisdictions are incentivized to enforce permits as they are able to collect revenue from citations.
- Carpools: The WMATA chose to discontinue carpool parking after management proved too difficult. For carpool parking to be successful, enforcement challenges and costs need to be considered.
- Bike Parking: Secure bike parking works very well for WMATA where demand and theft are high. Secure bike parking implementation was accompanied by a mandate to increase bike mode share to Park and Rides.
- Car Share**:** WMATA's car share program has been very well used and generates revenue for the agency.
- Shuttles: Independent shuttle activity has generated the highest amount of growth in Park and Ride usage for the WMATA. These shuttles are fully funded by private companies, apartments, HOAs, and large government complexes, and are not charged for access to the Park and Ride lots.
- Underutilized Lots: The WMATA has unsuccessfully attempted to encourage the use of underutilized lots by lowering prices, or by maintaining existing prices and advertising certain lots.
- Expanded Capacity: In the WMATA system, local jurisdictions have paid for their own expansions at Park and Ride lots within their boundaries.

BART – San Francisco Bay Area, California

- Pricing Phasing: BART implemented paid parking at Park and Ride lots in 2001 with monthly permit options at lots with the highest utilization rates; at these lots, 25% of spaces were set aside for permit parking. Later, BART adopted a two-type system, including monthly spaces reserved until 10 am, and single-day spaces available on a first-come, first-served basis. Fees range from $1.50 to $8 daily and $30 to $115.50 monthly reserved, depending on the lot.
- Pricing Flexibility: BART officials stressed that flexibility is important in any pricing program, as it enables a rise and fall in price with demand.

- Pricing Enforcement: BART is currently testing license plate enforcement, which has been very successful thus far. When vehicles drive through reservable parking areas, a machine automatically checks for the proper permit and issues citations. BART officials stressed that it's very important to link any permit system to license plate numbers so they can be checked automatically.
- Spillover/On-street Parking: Where spillover has been an issue, a number of jurisdictions within the BART system have used this as an opportunity and meter on-street parking, in many cases charging more than BART does for parking in the off-street lot. One city has allocated on-street parking revenue to pay for access and station improvements for the nearby Park and Ride.
- Parking information: BART offers estimated parking fill times on their website for each of their lots.
- Parking Revenue: BART allocates some of its parking revenue for certain station access and Park and Ride improvements, including feeder service, real-time signage, and lighting.
- BART Bike Stations: BART currently has six bike station locations that include some or all of the following features: valet parking, secure and controlled-access parking, bike rentals, bike repairs, classes, and events.
- Shared Mobility Options: BART is supporting efforts to monetize parking spaces in neighborhoods with an app.
- Shuttles: Various types of shuttles transport a lot of people in the Bay Area. BART is working with them to facilitate or discourage their use, depending on the situation. BART is allowing non-BART shuttles closer access to transit stations, but discouraging use of Park-and-Rides for people who take private employer shuttles instead of transit and use of transit stops by private shuttles.

HOW THE PEER AGENCY DATA IS USED

Based on our review of peer agencies the consultant team was able to narrow down our parking pricing models to three scenarios that we determined to be most effective for the RTD system based on the following criteria:

- Ease of implementing the proposed rate scenario
- Effectiveness at meeting the stated objectives (described in the next section)
- Scalability as the system expands
- Reduced risk of unforeseen consequences

For example, it would be feasible for RTD to implement pay parking charges at just some of the higher utilization stations or on a specific corridor, such as the southwest rail line. However, based on the experience with several peer agencies and charging at only a limited number of locations, the potential for unforeseen impacts was deemed too unpredictable to recommend for RTD as a baseline scenario.

In addition, the consultant team made the determination (based on peer agency review) that universal pay parking charges for every RTD location may not be effective, due to the potential for spill-over at smaller and more remote bus locations. Therefore, all three pay parking scenarios recommend an expansion of pay parking at rail Park-and-Ride new locations and at locations that are currently "managed", leaving unmanaged locations unchanged.

Finally, peer agency review data was used in our elasticity models to validate findings as they relate to potential changes in parking demand and also the potential for ridership loss at different price points. Additional discussion on elasticity research is provided in the next section.

PHASE 2.2: DETERMINATION OF ELASTICITY

As part of this project, the study team has completed a demand analysis for three parking pricing scenarios. The scenarios can be described as follows:

Scenario A- Low Rate

- Key Objectives: Introduce pay parking with the possibility of future rate changes; incentivize alternative methods of access; produce a potential funding mechanism.
- Fee Structure: Flat fee at all RTD stations currently classified as "managed", including new parking developed along the G, B, N, A, and R lines. Parking facilities owned by another entity, or facilities where parking charges are specifically prohibited by agreement, were excluded from the analysis.
- Parking Charges:

Base Parking Charge		High Utilization/Rail Zone A	
In-District	**Out-of-District**	**In-District**	**Out-of-District**
$2	$4	same	same

Scenario B- Variable Rate

- Key Objectives: Manage parking demand through a fee-based tool.
- Fee Structure: Premium rate for all for all Park-and-Ride facilities with a utilization rate of 90% or greater (High Utilization) and for all facilities located within fare zone A.
- Parking Charges:

Base Parking Charge		High Utilization/Rail Zone A	
In-District	**Out-of-District**	**In-District**	**Out-of-District**
$2	$4	$4	$6

Scenario C- High Rate

- Key Objectives: Increase funding streams for capital investment; attract possible Public Private Partnership (P3) opportunities; produce higher value for system monetization; generate greater shift to alternative modes for station access
- Fee Structure: Flat fee for all managed and new stations, designed to (potentially) maximize parking income based on the highest rate possible before ridership and parking demand become more highly elastic.
- Parking Charges:

Base Parking Charge		High Utilization/Zone A	
In-District	**Out-of-District**	**In-District**	**Out-of-District**
$5	$7	$5	$7

The following section first describes the basis, assumptions, and methodology used in completing the demand analysis; secondly, this section presents results for each of the three scenarios analyzed.

PARKING PRICING ELASTICITY METHODOLOGY

The topic of parking pricing elasticities has yet to be thoroughly explored as relatively few transit agencies have implemented such programs. Furthermore, parking pricing implementations are seldom well-conditioned with a true control group, and other confounding factors always impact the accuracy of parking pricing elasticity analyses. Quantitative analysis of this topic was performed on the Caltrain "High Utilization" stations; results are shown in the table below (Table 1):

Table 1: Caltrain "High Utilization" Station Parking Elasticities with Respect to Total Trip Cost

Time Period	Parking Fee Change	Average Change in Parking Utilization at "High Utilization" Stations	Range of Parking Utilization Elasticities with Respect to Total Trip Cost	Change in Caltrain System-Wide Ridership
2001-2003	$0.50 → $1.50	-4%	Inelastic	-19%
2005-2007	$1.50 → $2.00	8%	Inelastic	10%
Sep 2006- Oct 2006	$1.50 → $2.00	-2%	Inelastic	-4%
Apr 2009- Oct 2009[1]	$2.00 → $3.00	-6%	-0.6 to 0.4	-2%

Source: Caltrain Parking Utilization and Ridership

It should be noted that the long-term effect on parking demand of a particular fee increase may influence later periods included in the study. The study noted that transit ridership at these stations declined half as much as parking demand, indicating that some riders would find other means for accessing the station.

Habib et al. 2013 used a stated preference survey and an econometric model at Vancouver's TransLink system to analyze the effects of parking charges on mode choice. The researchers presented participants with various parking cost and availability scenarios. For each scenario, the researchers asked participants to choose between 4 modes, including:

- Park and ride
- Transit all-way
- Private car all-way
- Abandon the trip

As a result of this study, it was determined that different users have different sensitivities to a parking fee depending on a variety of factors related to their ability to choose whether or not to utilize a certain station or parking facility, and whether they have the option to use an alternative mode of transportation.

Two other studies, Rodier and Shaheen 2010 and Shirgaokar and Deakin 2005, analyzed the BART system's implementation of pricing and smart parking management, but did not include elasticity information. A third, Syed et al. 2009, concluded that assuming that the transit trip cost was still well below the same automobile trip cost, the parking fee implemented did not cause significant changes in access mode choice and that arrival times shifted later in the morning.

RTD PARKING AND RIDERSHIP ELASTICITIES

The following baseline elasticities, defined for each use group (Free Parking, Paid Parking for Out-of-Pocket users, and Paid Parking for EcoPass users), are used in our analysis (Table 2 on pg. 15). These elasticities are based primarily on information reviewed from peer agencies and the research performed to date. Baseline elasticities were generally applied to stations with a utilization rate under 90%; elasticities

[1] Source: Fehr & Peers October 2009 Field Survey

were modified for each scenario analyzed, taking into account a number of factors including utilization rate and station accessibility. High utilization stations were further analyzed to assess the impact of station accessibility on elasticity. The gap between the elasticities represents the share of users who will find another way to access transit. This could be through another mode of transit, or via free parking facilities offered at another transit station located upstream or downstream. It should be noted that the elasticity for EcoPass users is theoretically infinite as their base price is $0. However, to ensure that the EcoPass users' rider elasticity was not underestimated, the analysis utilizes an equal elasticity for Ecopass riders and Out-of-Pocket riders.

Additional elasticity tables for the various pricing scenarios are shown in Appendix B.

Table 2: Parking and Ridership Elasticities by User Group (High Performance Scenario)

	Free Parking at Destination	Paid Parking at Destination: Out-of-Pocket	Paid Parking at Destination: EcoPass
Ridership Elasticity	-0.30	-0.17	-0.17
Parking Elasticity	-1.00	-0.34	-0.34

Each scenario was analyzed under two sets of assumptions for the high performance scenario and low performance scenario:

- High Performance Scenario: No latent demand is assumed, meaning that parking patrons who abandon the Park-and-Ride are not replaced by new patrons. However, some parking patrons do find other means to access the station. Therefore, the ridership elasticity is less than the parking elasticity.
- Low Performance Scenario: No latent demand is also assumed in this scenario. In addition, for this scenario, we assume that riders who abandon a Park-and-Ride due to parking pricing do not find another method to access transit.

A Medium scenario was also developed for each set of pricing models, though this scenario is simply the mid-point of the high end and low end calculations.

The RTD FARES Model was reviewed as part of this study, but its assumptions and results were not directly incorporated into our analysis. The FARES Model, developed for a 2015 RTD Fare Study, utilized projected 2016 ridership and revenue levels to model the impact of expected changes on the total cost of transit.

DEMAND AND GROSS REVENUE CALCULATIONS

Opening Day Conditions: To include new stations opening in 2016 that will dramatically expand the RTD system, the year 2017 was set as the base year for each parking pricing scenario analysis. A typology was determined based on the average of different subsets of managed lots currently in operation in order to estimate the near-term stations' projected parking demand, utilization, and percentage of out-of-district users. The table below (Table 3) depicts the typology segmented by position on the rail line and regional or local ridership to downtown.

Table 3: New Station Typologies for Utilization and Percentage of Out-of-District Users

Typology	Utilization	Percent Out-of-District
End of Line	Regional: 73%	Regional: 14%
	Local: 97%	Local: 0%
Non End of Line	Regional: 73%	Regional: 5%
	Local: 67%	Local: 7%

Source: 2015 RTD Park-and-Ride Data (provided by RTD)

After baseline characteristics of each lot were collected, calculations were made to determine the ridership and parking demand effect, as well as the associated revenue impacts. Below are the calculation factors for each lot:

- Parking fee and percent price change
  - In-District
  - Out-of-District
- Number of users
  - In-District - Paid Parking at Destination – Eco Pass User
  - In-District - Paid Parking at Destination – Out-of-Pocket User
  - In-District - Non-Paid Parking at Destination – Out-of-Pocket User
  - Out-of-District - Paid Parking at Destination – Eco Pass User
  - Out-of-District- Paid Parking at Destination – Out-of-Pocket User
- Ridership and parking elasticities by user group
  - Parking elasticity doubled for >70% utilization lots in pricing Scenario C
  - Ridership elasticity for >90% utilization lots based upon accessibility to the station
- Ridership and Parking Demand Change
- Latent Demand at >90% utilization lots set equal to parking lot (see the following section for further information on latent demand assumptions)
- New Parking Demand, Ridership, Parking Revenue, and Ridership Revenue
  - Revenue was based on the results of the peak demand analysis multiplied by 1.2 uses per peak hour occupied stalls to obtain the daily parking and ridership revenue. Note that the RTD 2015 Park-and-Ride Trip Generation Study estimated 1.96 uses per hour; however, this assumption was adjusted to reflect observed conditions at similar Park-and-Ride systems (such as that in Washington State) where paid parking has been implemented. The 1.2 uses per peak hour utilized for this analysis is a conservative estimate based on the assumption that uses per hour will be reduced if paid parking is implemented and the number of non-commuters currently taking advantage of the free parking available at RTD Park-and-Rides will diminish.

LATENT DEMAND

Latent demand is expected to occur at high utilization lots, as it is assumed that additional transit patrons would be utilizing the lot if greater consistent access to open parking spaces was provided. Furthermore, we assume that at the $2 price point, all parking demand will fill back in at the high utilization stations due to latent demand. As higher fees are levied, the reductions in parking demand increase further while the latent demand is capped at the $2 level. This assumption is meant to prevent an unrealistic latent demand expectation when higher parking fees are levied. Furthermore, a typology was applied to adjust the rider elasticity based on how easy it is for riders to access the high utilization stations by alternative means[2].

FUTURE CONDITIONS

To calculate future demand for each station, growth rates were obtained from existing lines based on their maturity. If a station's utilization was below 60%, a 3.8% annual growth rate was applied based on growth obtained from the Southeast rail corridor between 2010 and 2015. If a station's utilization was above 75%, a 0.2% annual growth rate was applied based on growth obtained from the Southwest rail corridor between 2010 and 2015. If a station's utilization fell between those benchmark values, the average 2.0% annual growth rate was used. These growth rates were applied to the "before pricing" base year utilization to obtain a "before pricing" future year utilization that was then inputted into the analysis

[2] See Appendix A for an evaluation of access and walkability for each existing RTD station.

process outlined in the "Demand and Revenue Calculations" section of this report. While the growth rates assumed for this analysis are considerably lower than the annual growth rate observed for light rail boardings over the last 15 years, these lower rates more accurately reflect the constrained capacity present in RTD Park-and-Ride lots.

ANALYSIS RESULTS

The following narrative and graphic discussion provides an overview of three topics related to the projected outcomes of paid parking implementation: projected ridership loss, projected ridership fare revenue loss, and adjusted gross revenue (including parking revenue). While many factors may impact ridership and associated revenues, this analysis isolates parking pricing as the only variable factor; therefore, no other factors, such as potential future fare price increases, are taken into account.

The figures below (Figures 3-5) demonstrate the projected ridership over a 10-year period for each Scenario. Ridership was further analyzed based on elasticity levels yielding a "high performance" and a "low performance". In each figure, the blue line represents the projected ridership if no paid parking option is implemented. The difference between high and low performance is intended as a range in which ridership numbers could fall, dependent upon the level of elasticity yielded from riders' reactions to parking pricing. As shown, Scenario A and Scenario B result in relatively similar ridership growth for the high and low performances; conversely, Scenario C results in much wider gap between high and low performance.

Figure 3: Projected Annual Ridership- Scenario A

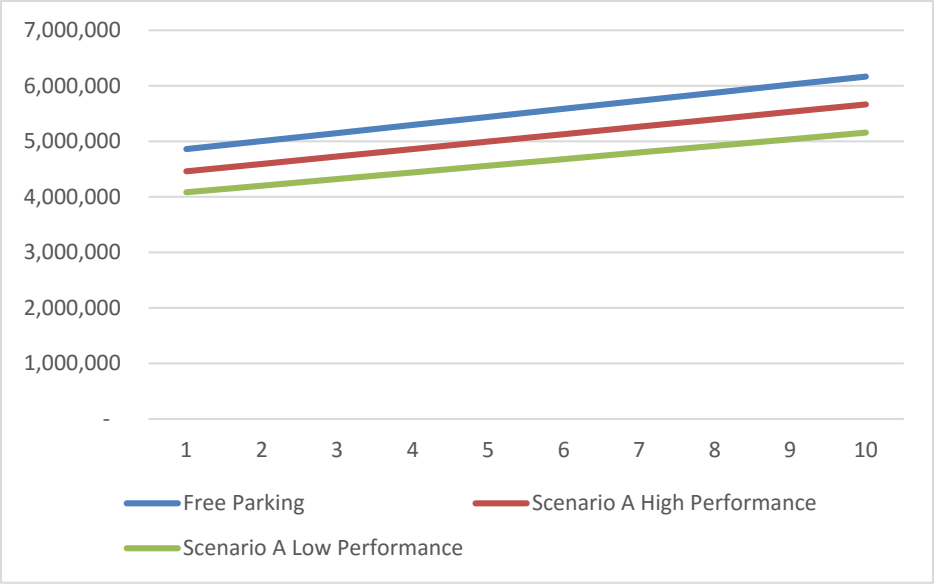


Figure 4: Projected Annual Ridership- Scenario B

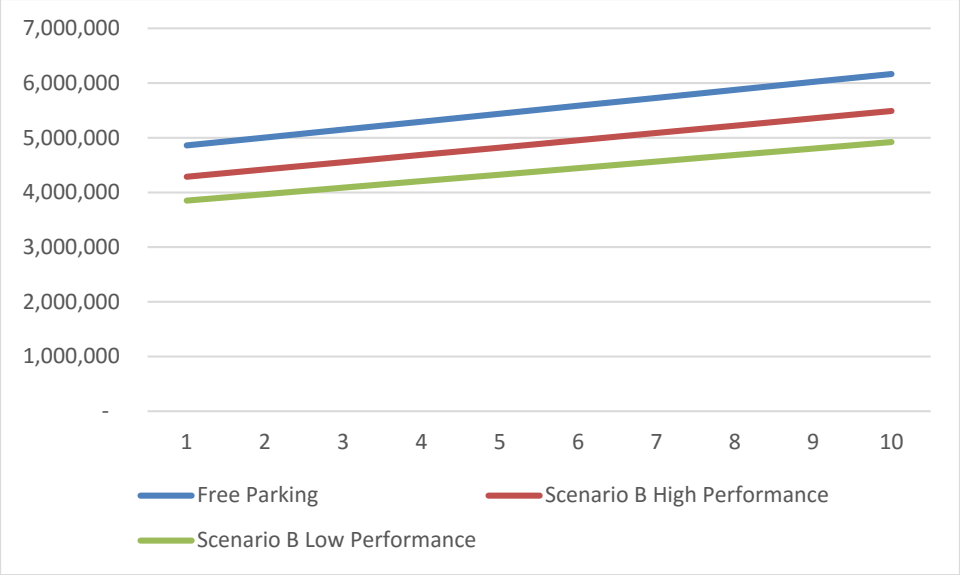
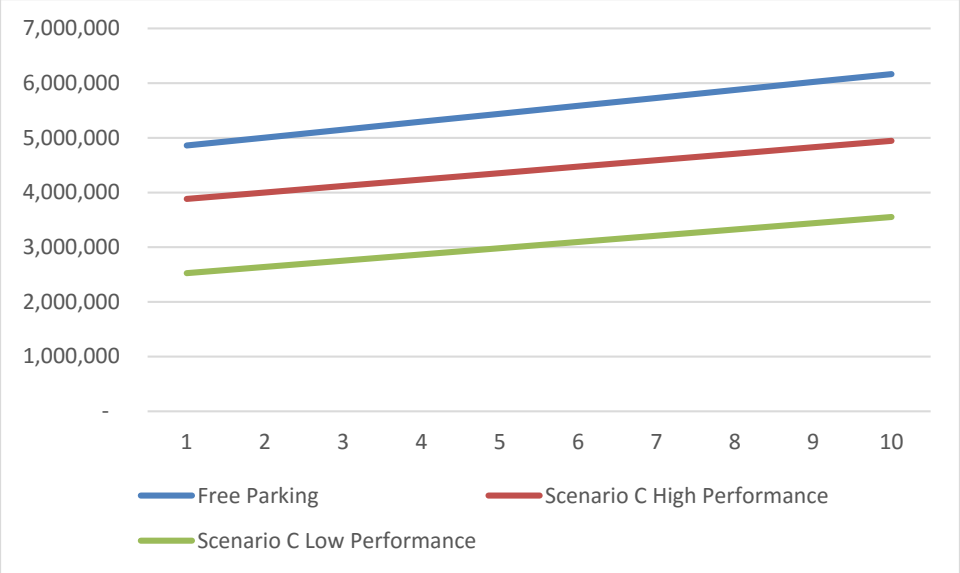


Figure 5: Projected Annual Ridership- Scenario C



Figures 6-8 (below) show the projected average annual fare revenue loss for each Scenario, based on a high performance and a low performance. As stated above, no fare increases or adjustments were assumed over the ten-year period in order to isolate paid parking as the only variable factor in ridership and revenue levels. Projected revenue trends track projected losses in ridership growth as shown in the figures above; therefore, Scenario C demonstrates the most volatile results, with the widest gap between high performance and low performance.

Figure 6: Projected Average Annual Fare Loss- Scenario A

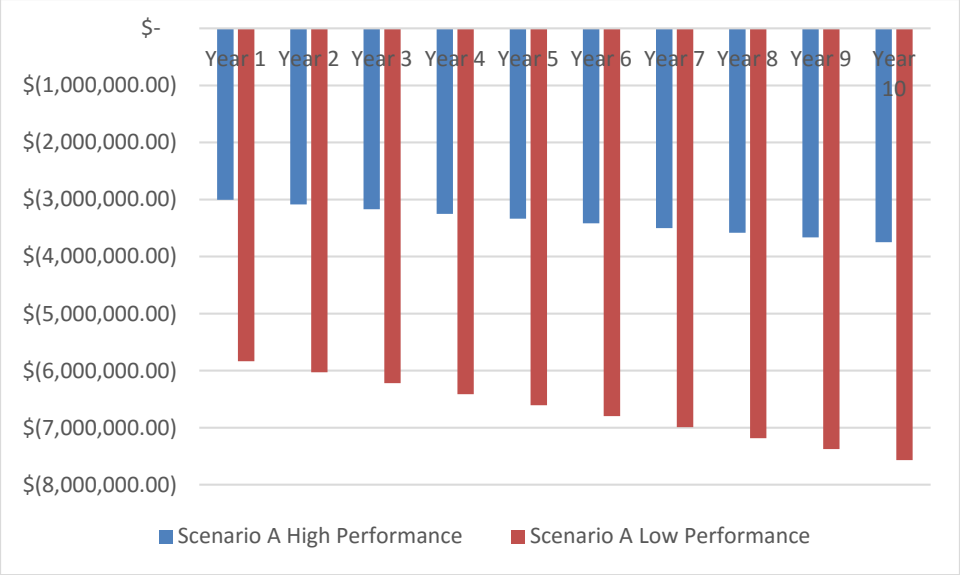


Figure 7: Projected Average Annual Fare Loss- Scenario B

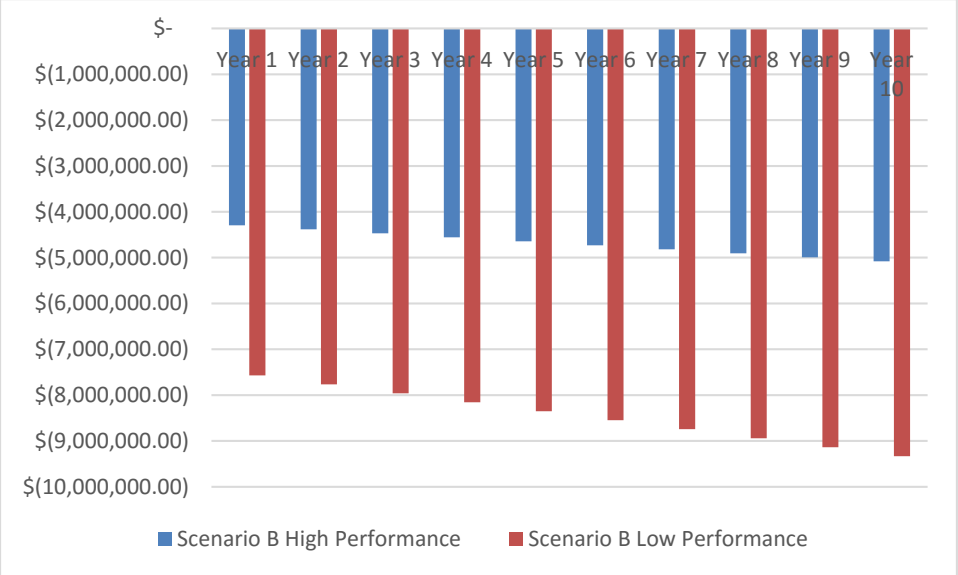
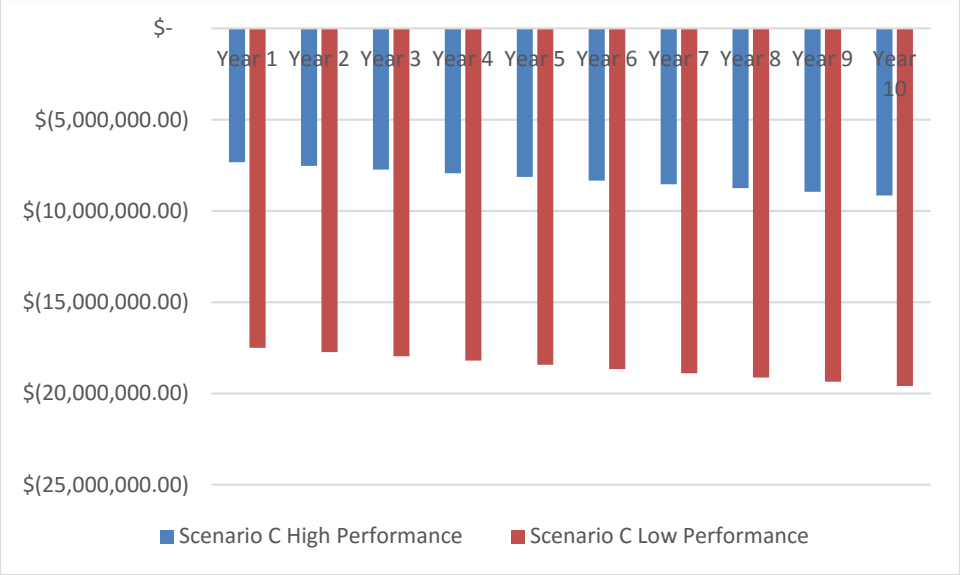


Figure 8: Projected Average Annual Fare Loss- Scenario C

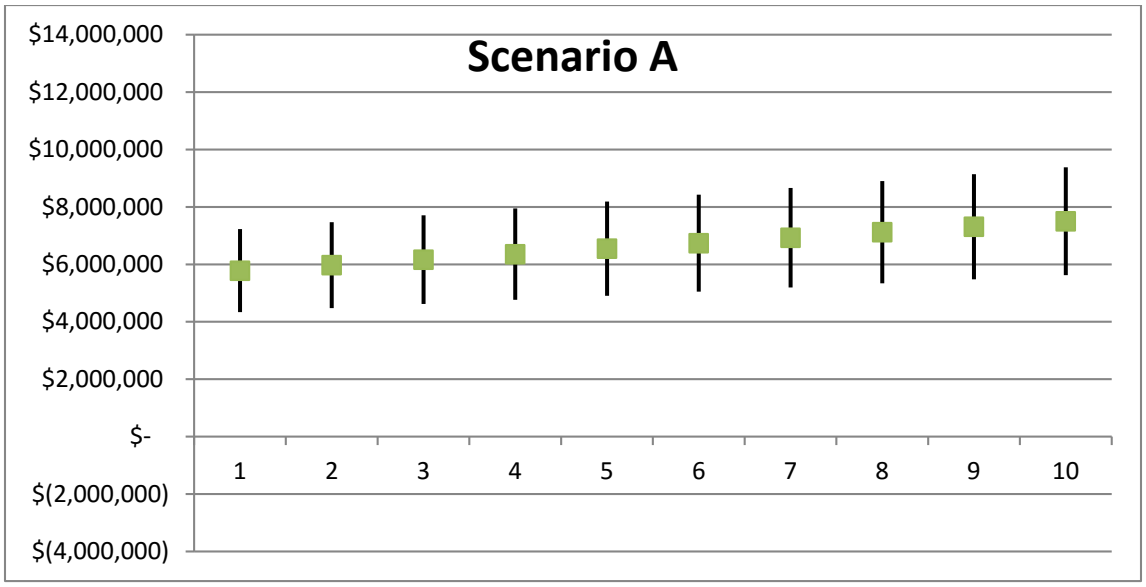


Figures 9-11 (below) present the three parking pricing scenarios' annual Adjusted Gross Revenue projections for 10 years after opening day implementation (2017). The estimated annual Adjusted Gross Revenue projections do not take into account O&M costs; nor do they take into account the potential difference between projected parking revenues and the associated monies received by RTD from the third party operator managing the paid parking system. For each year, the annual Adjusted Gross Revenue was evaluated based on elasticity levels yielding low performance, average performance, and high performance. Scenarios A and B result in very similar projections, while Scenario C yields a wide range between the high performing and low performing results that is, on average, lower than Scenario A and B. The similarity between the Scenario A and Scenario B results is due to the following factors:

1. For Scenario B, high utilization stations are assumed to have variable rider elasticity depending on their level of accessibility.
2. Scenario B's increase in pricing is only applied at high utilization stations (28% of opening year demand).
3. As prices rise, an inflexion point is reached where increasing parking prices equally reduces ridership revenue.

For Scenario C, the low performance range yields a negative annual Adjusted Gross Revenue between years 1 and 5, as lost ridership revenue exceeds projected parking revenues. Even when averaged over a period of ten years, the low performance Adjusted Gross Revenue for Scenario C is still negative. This large discrepancy when compared to Scenario A and Scenario B is due to the much higher parking price charged in Scenario C and the doubled parking elasticity for lots with less than 70% utilization. This latter assumption was made to reflect the higher price sensitivity of Park-and-Ride users at stations with lower utilization rates. As a further sensitivity test, if this assumption is lifted, the average low performance Adjusted Gross Revenue for Scenario C becomes positive and Scenario C becomes competitive with Scenario A and Scenario B.

Figure 9: Scenario A - Adjusted Gross Revenue



*All three Figures show the possible ranges at years 1 through 10 based on the "Low", "Medium," and "High" latent demand assumptions as discussed earlier.

Figure 10: Scenario B - Adjusted Gross Revenue

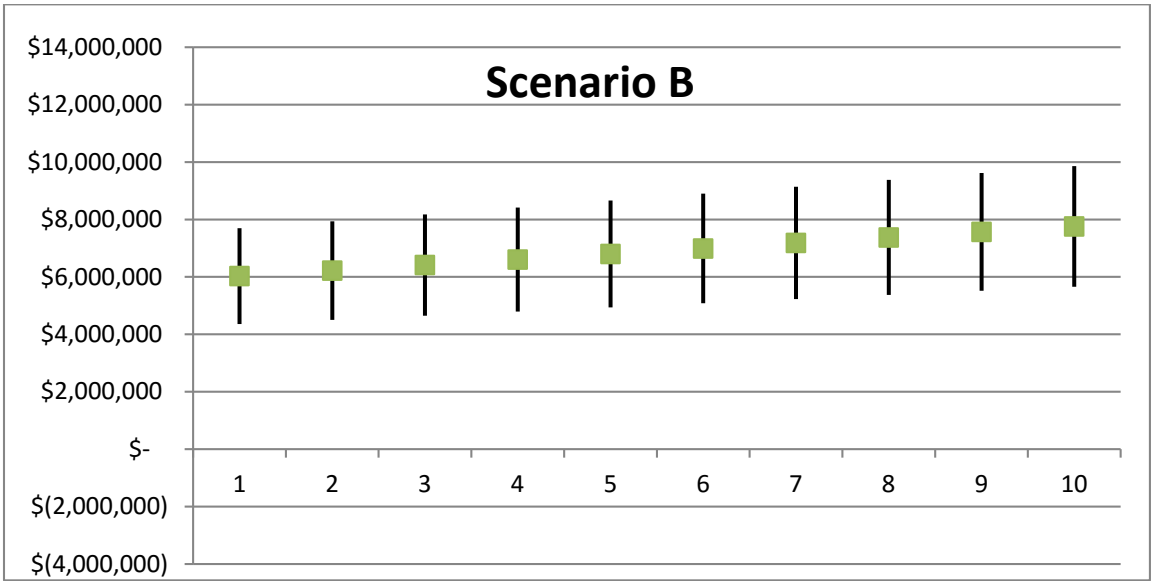
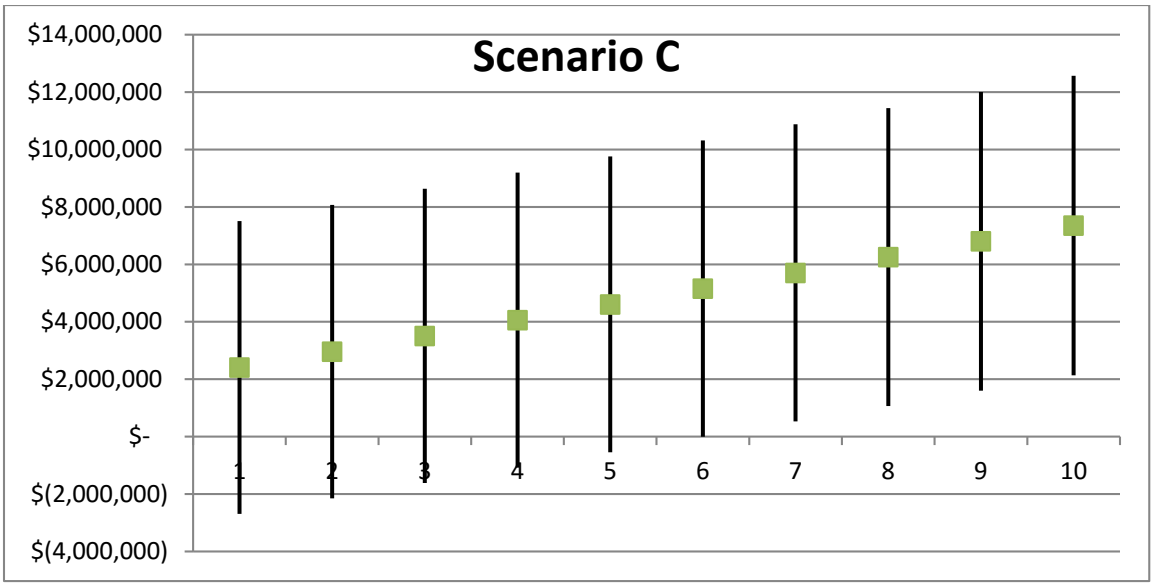


Figure 11: Scenario C - Adjusted Gross Revenue



The table on the following page (Table 4) shows the estimated annual Adjusted Gross Revenues projected over a ten-year period; note that the opening year (year 1) is set as 2017. Growth for each performance level was calculated using the estimated annual growth rates discussed on pg. 16. It is important to note that while a certain level of growth is anticipated from year to year, progression may not necessarily be linear, as changes in elasticity due to ridership demand volatility, changes in station accessibility, and other factors may impact performance. As such, the figures included in this table should be utilized as a range of performance levels and associated estimated AGR for each year.

Table 4: Estimated Annual Adjusted Gross Revenues

Scenario A			
Year	**Low Performance**	**Average Performance**	**High Performance**
1	$4,279,400	$5,693,500	$7,107,700
2	$4,436,800	$5,905,200	$7,373,700
3	$4,594,200	$6,117,000	$7,639,700
4	$4,751,600	$6,328,700	$7,905,700
5	$4,909,000	$6,540,400	$8,171,800
6	$5,066,400	$6,752,000	$8,437,800
7	$5,223,700	$6,963,800	$8,703,800
8	$5,381,100	$7,175,500	$8,969,900
9	$5,538,500	$7,387,200	$9,235,900
10	$5,695,900	$7,598,900	$9,501,900
Scenario B			
Year	**Low Performance**	**Average Performance**	**High Performance**
1	$4,304,900	$5,940,900	$7,576,800
2	$4,463,500	$6,153,700	$7,844,000
3	$4,622,000	$6,366,600	$8,111,200
4	$4,780,500	$6,579,400	$8,378,300
5	$4,939,100	$6,792,300	$8,645,500
6	$5,097,600	$7,005,200	$8,912,700
7	$5,256,100	$7,218,000	$9,179,900
8	$5,414,700	$7,430,900	$9,447,000
9	$5,573,200	$7,643,700	$9,714,200
10	$5,731,800	$7,856,600	$9,981,400
Scenario C			
Year	**Low Performance**	**Average Performance**	**High Performance**
1	($2,961,100)	$2,133,500	$7,228,000
2	($2,364,700)	$2,743,800	$7,852,400
3	($1,768,400)	$3,354,100	$8,476,700
4	($1,172,100)	$3,964,500	$9,101,100
5	($575,800)	$4,574,800	$9,725,400
6	$20,500	$5,185,100	$10,349,800
7	$616,800	$5,795,500	$10,974,100
8	$1,213,100	$6,405,800	$11,598,500
9	$1,809,400	$7,016,100	$12,222,800
10	$2,405,700	$7,626,400	$12,847,100

PHASE 3: ESTIMATION OF COSTS AND FEASIBILITY

Prudent operations and enforcement are essential elements in maximizing revenue capture in paid parking systems. The following section includes a discussion of existing revenue collection, operations, and enforcement measures at the existing "managed" RTD Park-and-Ride facilities requiring parking payment for certain users. Additionally, this section provides an overview of various technologies and practices for managing paid parking facilities, and offers recommendations for potentially expanding the paid parking system for RTD that reflects the district's logistical opportunities and constraints. Finally, this section projects annual Operations and Management costs over a ten-year period based on the study team's recommendations and assumptions.

EXISTING CONDITIONS

While parking is currently free and uncontrolled at many of the smaller and more remote RTD facilities, primarily serving bus routes, parking payments are required at 39 Park-and-Ride facilities under the following circumstances:

- Vehicles that are registered 'in-district' are provided up to 24 hours of free parking but are charged $2.00 for each additional 24-hour period
- Vehicles that are registered 'out-of-district' are charged $4.00 for each 24-hour period
- Certain facilities also offer the option to pre- reserve parking within a designated area of the lot

Parking is physically uncontrolled - there are no gates barring entry or exit. Signs advise motorists of the parking fees, and motorists are afforded a number of pay options, including a pay-by-plate multi-space meter (MSM), a pay-by-cell phone (PbC) option, and an automated option.

Motorists are able to pay by walking up to a pay-by-plate multi-space meter (aka kiosk) near the bus stop or the train platform. The vehicle's license plate number is required in order to identify the vehicle as paid. The meters accept cash or credit cards, but do not make change. To accommodate this option, RTD has purchased 45 VenTek brand pay-by-plate multi-space meters for $10,300 per unit. The meters have been reliable thus far with minimal service issues.

Motorists can by-pass the meters by registering for 'pay-by-cell phone' (PbC) parking:

1. Motorists register their cellphones and provide credit card payment information for the pay-by-cell vendor (Parkmobile). Credit card information is encrypted, and PCI-DSS compliant.
2. Upon parking, the motorist calls the pay-by-cell vendor's payment line or clicks on the mobile application (app).
3. The motorist enters the appropriate location code and enters the vehicle's license plate number. The license plate can be pre-registered rather than typing it in each time a registered user parks.
4. The motorist enters the desired parking time.
5. Parkmobile processes the credit card on file, and charges a $0.35 convenience fee to the motorist.
6. The pay-by-cell vendor deposits the parking fees into RTD's established bank account, keeping the convenience fees.

Motorists can also set up an automated pre-paid debit account with RTD, and are rewarded with a 15% discount. This is the most common form of payment. Following is a breakdown of payment modes by percentage, based on RTD payment data from February 2015:

- Automated Pre-paid: 46%
- Credit Card at the Meter: 33%

- Pay-by-Cell: 14%
- Cash at the Meter: 6%

Reserved monthly parking is also available for motorists arriving between the hours of 5 am and 10 am (Monday through Friday) for $42 per month (priced at $2 per day for 21 days). RTD currently has 528 reserved parkers.

RTD ENFORCEMENT

RTD utilizes three mobile License Plate Recognition (LPR) vehicles made by PIPS Technology for daily vehicle inventory, reserved parking and extended stay enforcement; however, the PIPS LPR system has limited functionality, and can't enforce out-of-district plates concurrently with other infractions. A fourth mobile LPR vehicle is used to detect out-of-district license plates, covering different facilities on different days. Walker understands that plans are underway to upgrade to a new LPR system that will provide all of these features in each vehicle. Enforcement staff use Clancy Systems handheld enforcement units.

RTD uses the following fine schedule for nonpayment of applicable parking fees:

- First violation: Warning
- Second Violation: $20
- Third Violation: $50
- Fourth Violation: $100
- Fifth and Subsequent Violation: $100, Boot or Tow

GATED VS. UNGATED PARKING

Walker was asked to offer an analysis of the most advantageous type of parking access and revenue control system for RTD. We considered a gated system to collect parking fees, as gated systems are far more common for off-street parking; however, we believe an ungated system is the best fit. Following are the comparative advantages, disadvantages and differences between gated and ungated parking systems:

1. The most significant (and obvious) difference is that gated systems provide a physical barrier, resulting in a higher percentage of paid parking transactions, as vehicles need to physically drive through a gate to exit without paying. By contrast, ungated systems rely on the honor system and/or enforcement. Good and honest people that wouldn't steal from a store (or drive through a parking gate) are often willing to 'steal' parking by not paying a parking meter. Vigilant enforcement is required to ensure payment. Furthermore, a collection process (aka citation management) is required to collect parking fees from those who fail to pay.
2. Enforcement of ungated scenarios rarely captures 100% of all parkers – gates typically do.
3. Citations, fines, booting and/or towing are the only recourse for repeated parking scofflaws. All are perceived as punitive, alienating customers, and they still don't guarantee payment or compliance.
4. Gated systems are typically more expensive to purchase, install, maintain and operate than gateless systems. There is more equipment required for a gated system, as all entry and exit lanes need to be controlled. There are more moving parts, requiring more maintenance and repair than gateless systems.
5. Gated systems require space for equipment, equipment islands and the queuing of vehicles, which can reduce the overall capacity of the facility.

6. Throughput at entry and exit lanes is faster in a gateless scenario, as vehicles are not required to stop at the gates. Various technologies require more or less time than others; however, in the event of a mass entrance or exit, gates can cause back-ups, reducing customer service levels.
7. Gated systems are typically post-pay, allowing for an easy validated parking process. Gateless systems are typically pre-pay, making the validation process more challenging. The motorist needs to receive the validation in advance.
8. Gated systems typically provide change for cash transactions (gateless typically do not).

Walker believes that items 5 and 6 are the most significant for this project. The majority of RTD Park-and-Ride facilities were not designed for gates and equipment islands. Parking spaces would need to be sacrificed to accommodate the equipment and the queuing of vehicles. Furthermore, transit schedules create mass entrances and exits, as groups of cars are all arriving and leaving at the same times (to catch or leave a train). A gated scenario would cause back-ups as vehicles stopped at the gate to receive a ticket or to pay for parking.

MULTI-SPACE METERS

Walker recommends expanding RTD's current pay-by-plate multi-space meter system, pay-by-cell phone option and mobile LPR enforcement system. Technological advances have made MSMs (and their supporting technologies) far superior to conventional parking meters and foot-patrol enforcement.

Credit card acceptance was a major game changer, and perhaps the most significant parking meter improvement. Furthermore, computer software programs enable multi-space and smart single-space meters to utilize complex rate structures and to provide advanced audit control. Computer software tracks and reports every payment being made. The software tracks the date and time of all payments, how much time was purchased, and how it was paid for (coin denominations, credit card types, etc.). If any money goes missing, the auditors will know. Multi-space and smart single-space meters also have self-diagnostic software that enables them to 'report' maintenance issues via wireless communication, enabling staff to respond immediately.

A typical installation is networked, allowing transaction and revenue data to be consolidated to a central server and viewed remotely. This allows management to remotely generate reports and other useful data necessary to manage the parking assets, including changing the rates and monitoring revenue.

MULTI-SPACE METER PAYMENT MODES

Multi-space meters (MSMs) can be configured for use in one of three modes of operation: pay and display, pay-by-space, or pay-by-license plate. Most MSM manufacturers make one meter capable of being programmed for all three payment modes by changing the user interface (face plate) and the system software (rather than replacing the meter).

Pay-and-Display

In pay-and-display mode, patrons park the vehicle, walk to the parking meter, pay for a certain amount of time and receive a receipt. The patron then has to return to their vehicle to place the receipt on the dashboard as proof of payment. The receipt indicates the duration and end time for which the vehicle has paid for parking. The receipts are visually inspected during enforcement sessions.

Pay-by-Space

In pay-by-space mode, the patron is not required to return to the vehicle with a receipt. Each parking space is numbered. After parking, the patron approaches the parking meter, enters the parking space number in which the vehicle is parked and selects the amount of time desired. No receipt is needed for enforcement, but there can be a receipt for proof of transaction. Enforcement is done by viewing a web-based report of paid and/or unpaid spaces on a hand-held enforcement device or from any web-enabled computer, tablet, or smart phone.

Pay-by-Plate

In pay-by-license plate mode, the patron is not required to remember the parking space or return to the vehicle with a receipt; however, the patron needs to enter the vehicle's license plate number to identify the vehicle as paid. Enforcement is conducted with a vehicle mounted, mobile license plate recognition (LPR) system that scans the license plates of all parked cars and compares them to a database of paid license plates.

Enforcement can also be conducted with a hand held unit, either scanning or manually entering the license plate number; however, RTD has already implemented mobile LPR, and mobile LPR is the primary reason Walker recommends pay-by-plate.

MOBILE LICENSE PLATE RECOGNITION

Mobile LPR utilizes vehicle-mounted cameras that read and record license plates as an enforcement vehicle is driven on roadways, surface lots, garages, etc. A processor is installed in the vehicle's trunk or in the floor, and a laptop is installed on the dashboard, between the front seats. The LPR cameras use a series of algorithms to convert the photographic images of license plates into text data. System software then compares the plate numbers with previous enforcement session(s) and/or databases of paid or permitted license plates, to determine if the vehicle has overstayed the time limit, if it has paid, or otherwise has a right to park in that particular location at that particular time.

The LPR software integrates with meter, pay-by-cell, reserved, pre-paid and other databases such as law enforcement agencies, to not only identify paid and unpaid parkers, but also identify stolen or otherwise significant license plates. If the LPR camera reads a plate that has overstayed the time limit, is not listed as paid or permitted, or has been otherwise identified as searchable, an audible 'ping' is generated, to alert the driver. The driver can then view the image of the license plate (or plates) to confirm accuracy and take the appropriate action.

Mobile LPR can collect parking occupancy and frequency of visit data, as well as limited duration of stay data – while enforcing paid parking. Each time the mobile LPR vehicle drives past a parked vehicle, it

time-stamps the image and the location, using GPS technology to identify the locations of the parking spaces. The vehicle is capable of sorting the data by parking facility, by street, or by customized zones. Note that the system won't know the exact time that the vehicle parked or exited – it only knows that the vehicle was parked in a specific location at the time of enforcement. Throughout multiple tours, the system software calculates the total time that the vehicle was observed as parked, up until it is observed to have moved.

LPR ACCURACY: CAPTURE RATE VS. READ RATE

LPR is not perfect. Some license plates will be missed, some will be misread and some will be reported incorrectly; however, the efficiency in coverage while driving, rather than walking, usually makes up for the errors and imperfections. It's important to realize that foot patrols typically capture less than 100% of parked vehicles, and that humans accidentally misread or misrepresent license plates on occasion.

In order to quantify the accuracy of an LPR system, we must consider two different factors: the capture rate and the read rate. The percentage of license plates that are recognized by the system is called the capture rate. The cameras may fail to recognize some plates, depending on the camera angle, distance, lighting, weather conditions, etc.

LPR cameras are similar to the human eye. If the license plate is not visible to the human eye, it is not visible to the camera. The following scenarios can prevent the camera from capturing and/or identifying the license plate:

- Snow, sand, soot or dirt covering the plate.
- Trailer hitches, bicycle racks or bicycles covering the plate.
- Poor camera angle.

In these scenarios, manual intervention will be required, or the vehicle will not be properly enforced. In addition, the cameras may not be able to identify all of the characters in the following scenarios:

- Temporary cardboard plates (the character reflection is different from aluminum plates).
- Plates with stacked characters.
- Out of state plates that use different styles, shapes or colors.

The percentage of license plates that are read accurately is referred to as the "read rate". System software needs to convert the camera images into usable data, which is also challenging. Every state has different license plate types, colors, fonts and plate designs, making it more challenging for the software to identify some numbers and letters. The software will sometimes confuse similar numbers and letters, such as O and Q, or S and 5, or B and 8, etc. The software will be calibrated by the manufacturer for Colorado's characteristics and will 'learn' from previous enforcement sessions to identify unusual characters; however, the read rate will always be less than 100%.

The study team conducted a comparative analysis of three LPR installations and found an average read rate of 91.5% for all captured images; however, note that 6 of 7 digits (N-1) were read accurately 97.1% of the time, 5 of 7 digits (N-2) were read accurately 98.6% of the time and 4 of 7 digits (N-3) were read accurately 99.1% of the time. These partial reads will still enable the system to identify the vehicle with staff providing visual confirmation of a partial plate read.

Furthermore, the enforcement software can be programmed to give the motorist the benefit of the doubt. For example, if enforcing paid parking, the software can be programmed to accept a partial read of 5 or 6 digits if it matches 5 or 6 digits of a paid license plate. If an unpaid vehicle has the same 5 digits as a paid vehicle, the owner may 'get away' without paying for parking; however, the odds are fairly slim

that this will occur, and in most cases, it is preferable to risk this than to cite a paid vehicle due to a misread.

Note that stationary cameras can be installed at vehicle entrances and exits to perform the same function; however, lanes need to be carefully delineated, and vehicles need to stop in order to achieve the highest capture rate. The study team understands that RTD investigated stationary cameras and determined that lane delineation would be problematic.

PAY-BY-PLATE AND MOBILE LPR IMPLEMENTATION

While this technology has not yet been widely deployed, many municipalities, universities and transit agencies are considering it, and some have implemented it. Walker is aware of twelve municipalities and twelve universities that have implemented pay-by-plate multi-space meter systems with LPR enforcement. The study team is not aware of other transit agencies using pay-by-plate meters with LPR enforcement; however, Walker is currently working with the MBTA and Metro to implement LPR-related programs:

- MBTA- Boston, Massachusetts: The MBTA controls approximately 100 gateless parking facilities with paid parking. Payments are made via pay-by-cell phone and monthly contracts. The MBTA elected to go 100% pay-by-cell, rather than utilize meters, using LPR for enforcement. Enforcement is currently conducted on foot, utilizing handheld units; however, the MBTA is planning to implement mobile LPR enforcement. The owners of unpaid vehicles receive invoices via the U.S. mail. If unpaid, the invoices become citations.
- LA Metro- Los Angeles, California: LA Metro is considering implementing paid parking at 50 transit parking facilities that are currently 'free' and is ultimately planning for a gateless program. Metro is hoping to integrate their Transit Access Pass (TAP) Card with pay-by-cell and pay-by-plate meters, and mobile and/or stationary LPR for enforcement.

RTD SYSTEM EXPANSION

The RTD is considering implementing paid parking for all parkers at 59 RTD-managed Park-and-Ride facilities as part of the expansion projects scheduled to open between 2016 and 2019. The study team was asked to provide recommendations as to the number of meters required at each facility and the number of mobile LPR vehicles required to enforce paid parking at these facilities. We were also asked to provide operating and maintenance projections for the first ten years of operations.

MSM Quantities and Assumptions

The table on the following page (Table 5) provides baseline MSM quantities recommended for parking facilities of various sizes:

Table 5: Space to Meter Ratios

No. Utilized Spaces	No. Multi-Space Meters
25	2
50	3
100	4
150	5
200	6
300	7
400	8
500	9
600	10
700	11
800	12
900	13
1000	14

Source: Walker Parking Consultants, 2016

Note that facilities with fewer than 25 spaces would only require one meter; however, redundancy is recommended for optimal customer service.

The study team used RTD's existing payment data to determine the percentage of parkers projected to conduct parking transactions at the meters. Approximately 40% of all paid transactions occurred at the meter. Approximately 46% percent of paid parkers utilized RTD's automated prepaid program (bypassing the meter), and 14% use RTD's PbC option (also bypassing the meter). It is interesting to note that prepaid programs typically have lower utilization rates, while PbC use has been steadily increasing industry-wide. RTD discounts automated prepaid transactions by 15%, while PbC customers pay a $0.35 convenience fee; therefore, we expect these percentages to continue.

We estimate that a total of 268 multi-space meters will be required for the 59 Park-and-Ride facilities (with a total of 21,800 utilized spaces). This includes 24 "stock" meters to be installed after opening, where needed, based on actual demand and individual facility logistics. The total space to meter ratio is 110 spaces per meter. The projected 40% multi-space meter utilization assumes 8,800 utilized spaces, for a space to meter ratio of 33 spaces per meter.

We have budgeted $8,000 per meter for a pay-by-plate, AC-mains, cash & credit card accepting multi-space meter, installed. Note that this unit price assumes a bulk purchase of 268 meters. Full replacement is budgeted in year seven, as wear-and-tear will have fully depreciated the value of the meters at that point.

Operations and Management Calculations and Assumptions

Annual O&M costs were projected over a ten-year period; the opening year or "year 1" is set at 2017. A breakdown of O&M costs for each scenario is provided in Appendix C.

Meter-related budgetary costs include:

- Spare Parts: Budgeted at $50,000. Even under warranty, spare parts need to be kept on hand. Meter parts are modular. RTD staff will be able to replace most parts without a service call; however, the part needs to be on hand or the meter could be out of service for days waiting for the part.

- Receipt Paper: We estimate 574 rolls per year at $40 per roll, or $23,000 per year, based on 1.4 turns per current space utilization, with 75% of users requesting receipts.
- Batteries: Batteries are rated for a minimum of three years; however, they are considered a consumable and typically not under warranty. We have budgeted for a third of the batteries to be replaced each year, at $140 per battery, or $12,500 per year, commencing year two.
- Extended Parts Warranty: We have budgeted $350 per meter year one, increasing 10% per year due to wear and tear. This is an optional expense. RTD could seek pricing, then elect to wait and see what the value of actual replacement parts are in years one and two before purchasing the extended warranty.
- Service Contract: We have budgeted $400 per meter year one, increasing 10% per year due to wear and tear. This is an optional expense. RTD could seek pricing, then elect to wait and see what the value of actual service calls are in years one and two before purchasing the service contract.
- Management and Communication Fees: These are monthly management and communication fees due to the manufacturer. RTD currently pays $90 per meter, per month; however, for a competitive bulk purchase, we have budgeted $60 per meter, per month, or $161,000 per year for six years (to be stipulated in procurement contract), increasing by 18% when new meters are procured in year seven.

Enforcement budgetary costs include:

- LPR Equipment: Ten mobile LPR enforcement kits @$45,000 per, or $450,000. RTD currently enforces 15,500 occupied spaces in 38 facilities once per day, utilizing three vehicles. Projected expansion totals 22,000 occupied spaces (a 42% increase). We assume 1.4 turns per utilized space; therefore, we recommend two enforcement tours per day. Mathematical calculations would require eight vehicles; however; with all vehicles paying for parking, enforcement will take longer, as they will require more frequent stops for issuing citations.
- LPR Replacement: Full replacement is budgeted in year six, as wear and tear will have fully depreciated the value of the LPR kits.
- LPR Warranties: LPR Extended warranties are budgeted at $5,300 per year. This is an optional expense. RTD could seek pricing, then elect to wait and see what the value of actual replacement parts are in years one and two before purchasing the extended warranty.
- Equipment Support and Maintenance: LPR remote support and two preventative maintenance trips per year are budgeted at $1,800 per unit or $18,000 per year.
- Handheld ticketing devices: $5,000 per unit or $50,000 for 10 units budgeted.
- Communications: Handheld communication fees are budgeted at $100 per month or $12,000 per year for ten units.
- Handheld Warranties: Handheld extended warranties are budgeted at $400 per year or $4,000 for ten units.
- LPR Vehicle Lease: RTD currently leases enforcement vehicles for $2,103 per month. We assume this will continue. For ten vehicles, this totals $252,000 per year.
- Vehicle Maintenance: RTD currently spends $125 per month per vehicle, or $15,000 per year for ten vehicles.
- Vehicle Insurance: RTD currently spends $943 per month per vehicle, or $113,000 per year for ten vehicles.
- Gasoline: RTD currently spends $600 per month per vehicle, or $72,000 per year for ten vehicles.

Staffing budgetary costs include:

- Mobile LPR Staffing: RTD hourly wages average $21.70 fully loaded. We assume ten full-time staff (for ten vehicles) at $431,000 per year.
- Maintenance and Collections Staffing: RTD hourly wages average $21.70 fully loaded. We assume three full-time staff to maintain and collect the 268 meters at $129,000 per year.

Credit card processing fees are based on transaction revenue, which was projected with three scenarios, by Fehr & Peers, plus citation revenue. Citation revenue is difficult to project, as RTD has a limited track record, and comparable transit agencies have different rate schedules, fee schedules and levels of enforcement. Citation rates and collection rates vary widely. Walker has budgeted a 'placeholder' number equal to 2% of paid parking revenue.

For credit card processing fees, we have assumed 90% of transaction revenue and 50% of citation revenue paid via credit card, at RTD's current rate of 9% of revenue; however, it is possible that RTD could receive reduced rates based on the transaction volumes projected.

PHASE 4: DEMAND VARIABLES AND SPILLOVER ANALYSIS

As part of this project, the study team has analyzed the potential for spillover at 101 stations within the RTD system. The following section includes a discussion of the study team's methodology for determining the potential for spillover, an overview of the most vulnerable stations, and a discussion of demand management opportunities that may assist in curbing the potential for excessive spillover.

PARKING SPILLOVER METHODOLOGY

The study team took the following steps to determine each station's vulnerability to spillover:

- Inventory surrounding land uses within 1500' of the subject station.
- Evaluate the station neighborhood using aerial photographs to identify potential spillover parking impacts.
- Evaluate each station based on risk factors, including: location along the transit line, population density of surrounding area, utilization rate, adjacent uncontrolled parking or dedicated commercial parking facilities.
- Rate each station's spillover potential "low", "medium", or "high" based on location, capacity, current utilization, and adjacent uses.

Based on this evaluation, 23 stations (22.7%) were identified as having a high potential for spillover. The majority of these stations are located in Denver suburbs, where ample on-street parking and uncontrolled retail and commercial parking facilities are more prevalent. A breakdown of each station's spillover rating can be found in Appendix A, with additional detail available in the report Addendum which contains the graphical data for each station.

DEMAND MANAGEMENT STRATEGIES

The study team has identified a number of demand management strategies to curb the potential for spillover into adjacent parking facilities, particularly at the most vulnerable stations. These strategies could be implemented by adjacent parking facility managers, such as the municipal government for on-street spaces or property owners for retail parking lots, in conjunction with RTD. These strategies include:

- Time-Limited Parking: Enables enforcement for vehicles that exceed a designated time limit, acting as a disincentive for transit users.
- Metered Parking: Eliminates the free options outside of the Park-and-Ride, encouraging drivers to use RTD facilities.
- Signage: Designates certain areas for particular uses only (such as retail customers), discouraging external users (such as RTD customers) and potentially enabling enforcement.
- Residential Parking Permits: Discourages long-term use of on-street parking in residential areas by offering unlimited parking to registered, permitted residents only.
- Commercial Parking Permits: Discourages long-term use of parking facilities intended for commercial purposes by offering unlimited parking to registered, permitted users only (such as office employees).

The potential for spill over is one area that RTD might have to address during a subsequent public outreach phase, should RTD opt to move forward with one of the pay parking scenarios. RTD might also be able to address some of the potential for spill over impacts by working directly with Denver-area municipalities to set up programs and code language related to the above possible solutions, before pay parking is implemented.

PHASE 5: CONTRACT RISK ASSESSMENT AND ITEMS FOR ADDITIONAL STUDY

As mentioned in the introduction, current Colorado state statutes puts certain limitations on the ability of RTD to charge for parking and collect revenues directly from in-district parking patrons. The applicable language can be found in the following section:

> *Colorado Revised Statutes 2015- Excerpt*
> *32-9-119.9. Limited authority to charge fees for parking - reserved parking spaces penalties- definitions*

In summary, the CRS Section referenced above results in the following:

- This statute provides the parameters by which a district can charge for, prohibit, and enforce parking.
- Districts can only charge directly for parking when users are out-of-district, have reserved spaces, or have left their vehicles at the facility for over 24 hours.
- Districts can take measures to prohibit users who are not using the transit system from using the parking facility.
- No more than 15% of any given parking facility can be reserved.
- Certain fines may be charged for offenses ($20 1st, $50 2nd, $100 3rd)
- A public or private entity can lease, own, or operate parking facilities at or near RTD stations, enabling the district to enter into agreements with these entities. If revenues are shared directly with RTD, the facility is seen as a "district parking facility" and therefore subject to the restrictions above.
- The district must consult with impacted municipalities prior to entering contracts/agreements pertaining to mass transit parking facilities.

THIRD PARTY MANAGEMENT RISKS

Based on the above, we understand that RTD can still implement universal or expanded paid parking charges at Park-n-Ride locations, but must do so by entering into a lease agreement, IGA agreement (with lease payments), or a monetization agreement- an agreement allowing a third party to operate and collect revenue from Park-and-Ride facilities in exchange for a monetary amount paid to RTD for the asset. Under any of these forms certain contracting benefits and risks might apply.

Pros:

- Ability to tap into third party source of financing and execute a capital project that otherwise may not be possible; this would be most applicable under a long-term lease with an up-front payment or a monetization agreement
- Acquisition of expertise, i.e., parking operations knowledge, technology applications, etc. not available in-house
- Shift of business risk to private sector
- Upside potential to be gained through revenue enhancements, operational efficiencies, and improved customer experience
- Offloading of a responsibility for an ancillary service (parking) which may allow RTD to focus on a higher priority

- If a municipal entity (e.g. City of Denver), increased authority, responsibility, and ability to manage and mitigate spillover

Cons:

- Loss of owner control
- Limited authority, responsibility, or ability to manage or mitigate spillover (third-party operators can agree to indirectly enforcing spillover through coordination with the responsible municipal or other public entity)
- Potentially higher cost of capital (under a PPP or similar)
- Risk of public criticism
- Political risk
- Substantial time and resource commitment to close on a suitable 3rd party agreement
- Creation of "one-off" paid parking scenarios and inconsistent parking operations which may frustrate and confuse RTD patrons.

In general terms, entering into a 3rd party management agreement with a private entity might provide valuable benefits, such as upfront capital and expertise, but could also carry more risk than self-operation. For example, private partners will require a reasonable rate of return for their investment. To achieve these objectives, private partners may require the RTD system to generate a reasonable cash flow, often by implementing policies aimed to increase parking revenues and citation revenues over time. This issue illustrates a more fundamental concern: the public sector's perceived loss of control in a PPP or similar agreement. This concern may be compounded in a monetization agreement is being considered due to the dominance of foreign investment funds and large national or multinational contracting firms in recent PPPs.

If entering into an IGA with another government, RTD may encounter other risks and complications, such as jurisdiction issues of having one municipality operating parking within another city's boundaries. As with a private entity, there may also be fundamental differences in the standards and procedures that RTD would like to see implemented and the standards and procedures used by the other entity. In this case, the loss of control over policy and practices is still a potential risk to consider.

ITEMS FOR ADDITIONAL STUDY

If RTD opts to implement an expanded pay parking model, there are several areas that we would recommend for additional study and analysis:

Valuation Study and Revised Pro Forma: What sort of valuation or lease payments should RTD be seeking for the parking assets under a concession agreement or long-term management contract? How would the terms and limitations of this agreement potentially impact the valuation? What would be the financial implications of transferring parking management to another entity in terms of RTD's bottom line (i.e., ridership loss)? Who would be responsible for covering long term capital costs for the system?

Parking Facility Asset Management Plan: Which entity will be responsible for long-term capital repairs for the RTD lots and garages? What is the magnitude of these costs? What is the recommended schedule for preventative maintenance to extend the life of these parking assets?

Request for Proposals Documents: How does RTD plan to procure and evaluate bids to manage the parking system? What sort of performance-based tools are available to ensure that operators are providing a high level of service for RTD patrons? Should RTD produce performance based specifications prior to awarding a contract for any additional parking revenue collection equipment? Does the

functionality of the current equipment allow the system to evolve as the parking technology landscape changes?

Transportation Demand Management Studies: Are there any alternative service models that need to be considered that might help to incentivize non-driving alternates for each RTD Park-and-Ride? Are there ways to better promote alternative modes of arrival including walking, biking, car share, carpool, and bus service?

TOD Policy Review: What are RTD's policies regarding transit-oriented developed on RTD surface lot properties? Should there be a policy in place to govern parking space replacement criteria if future developments are considered? Are there other ways to partner with the private sector to encourage additional public-private developments and create additional density near RTD stations? How would this density potentially help to promote ridership and what impact will it have on demand characteristics at each station?

Public Outreach and Implementation Plan: What is the timetable and steps needed if RTD opts to move forward with an expanded pay parking model?

ADDITIONAL RECOMMENDATION FOR FURTHER STUDY

Parking Guidance System (Recommended Technology): Transit customers find nothing more frustrating than driving to their chosen station only to find that the parking lot is full. Parking guidance systems and wayfinding applications can provide real-time space availability at all of RTD's parking facilities, enabling motorists to login to RTD's website or to RTD's mobile parking application (app) to see space availability at each of its parking facilities.

Count modules, (loops, magnetic sensors, or ultrasonic sensors) can monitor the number of vehicles that enter and exit the facility to maintain an overall count of vehicles in the facility. The count modules track the number of vehicles traveling in and out of the facility and communicate the facility status to a zone controller, communication points, a gateway and a server. For example, if a facility has 1,000 stalls, when the facility is empty the counter is set at 1,000. Each time a car enters the facility the count is reduced by one and each time a car exits the facility the count is increased by one, thereby keeping a count of the number available stalls. This information can be displayed, in real time, on RTD's website or mobile parking app.

The app can bring motorists to the app vendor's site or the app vendor can set up a 'private label' for RTD (for development fees). In this case, RTD would own the app, even if RTD decides to contract with another app vendor in the future. The app also allows for mobile payments, similar to RTD's current PbC system.

Dynamic signage (typically LED) can also display the number of available spaces and/or color-coded messages such as "Full" in red, or "Open" in green. Signage can be installed on roadways or highways so that motorists can determine where they will park on their way to the facility. If multiple facilities are involved, signage can advise and direct motorists to the facility or facilities with the most available spaces.

PHASE 6: CALCULATION OF ADJUSTED NET OPERATING INCOMES AND FINAL REPORTS

CONCLUSIONS

The following charts and tables provide a consolidated summary of the Adjusted Net Operating Income calculations found in Appendix C.

Figure 12: Scenario A - 10-Year ANOI

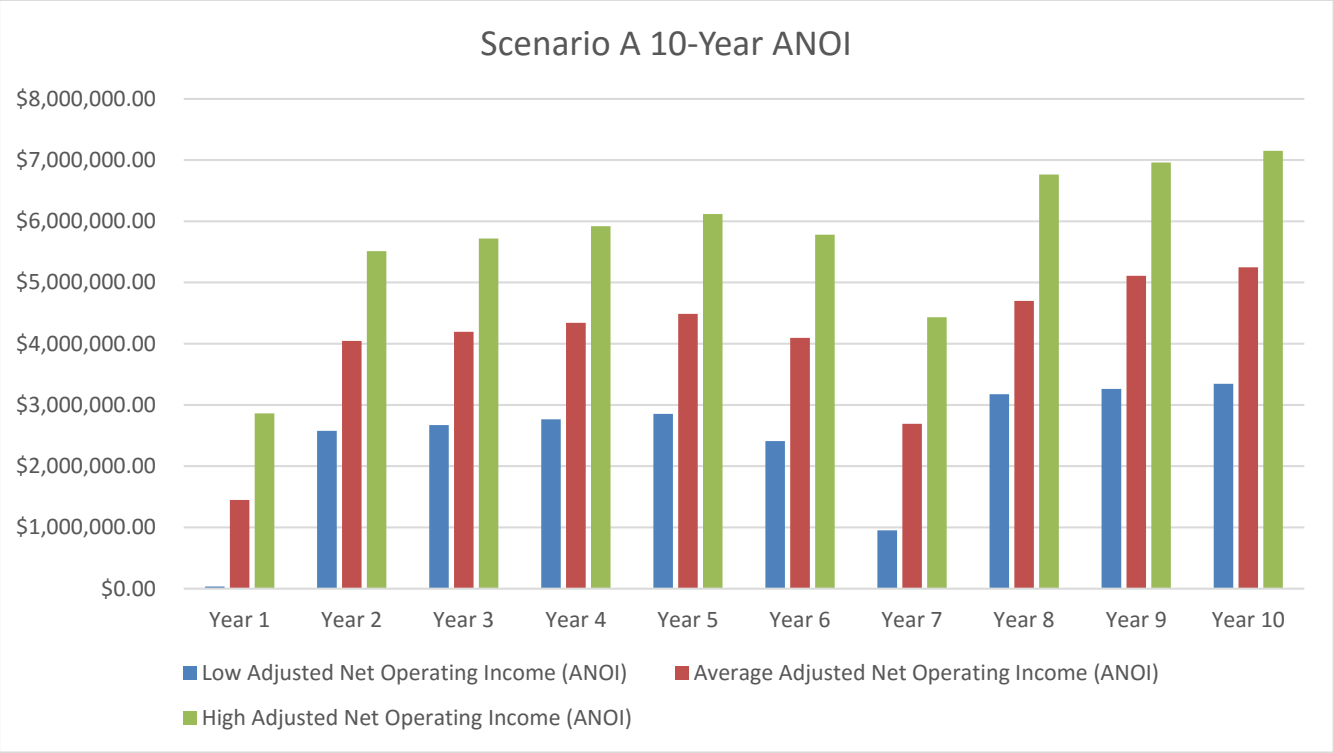


Figure 13: Scenario B - 10-Year ANOI

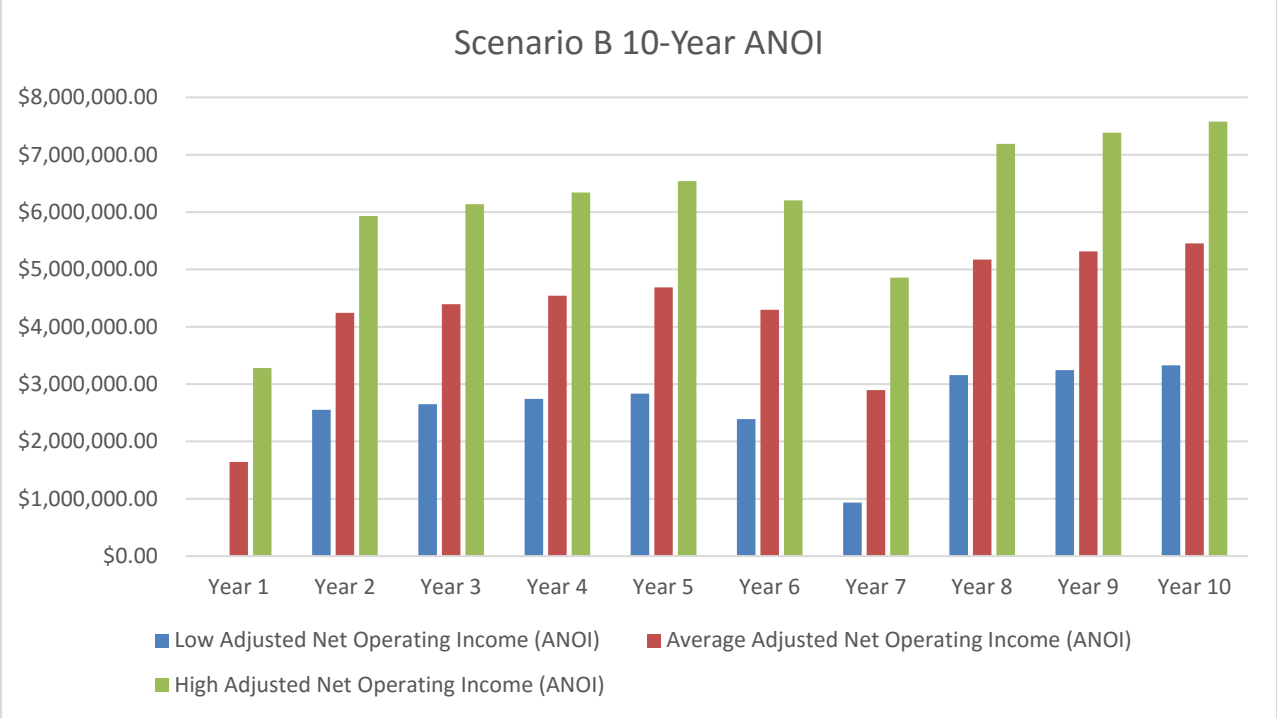
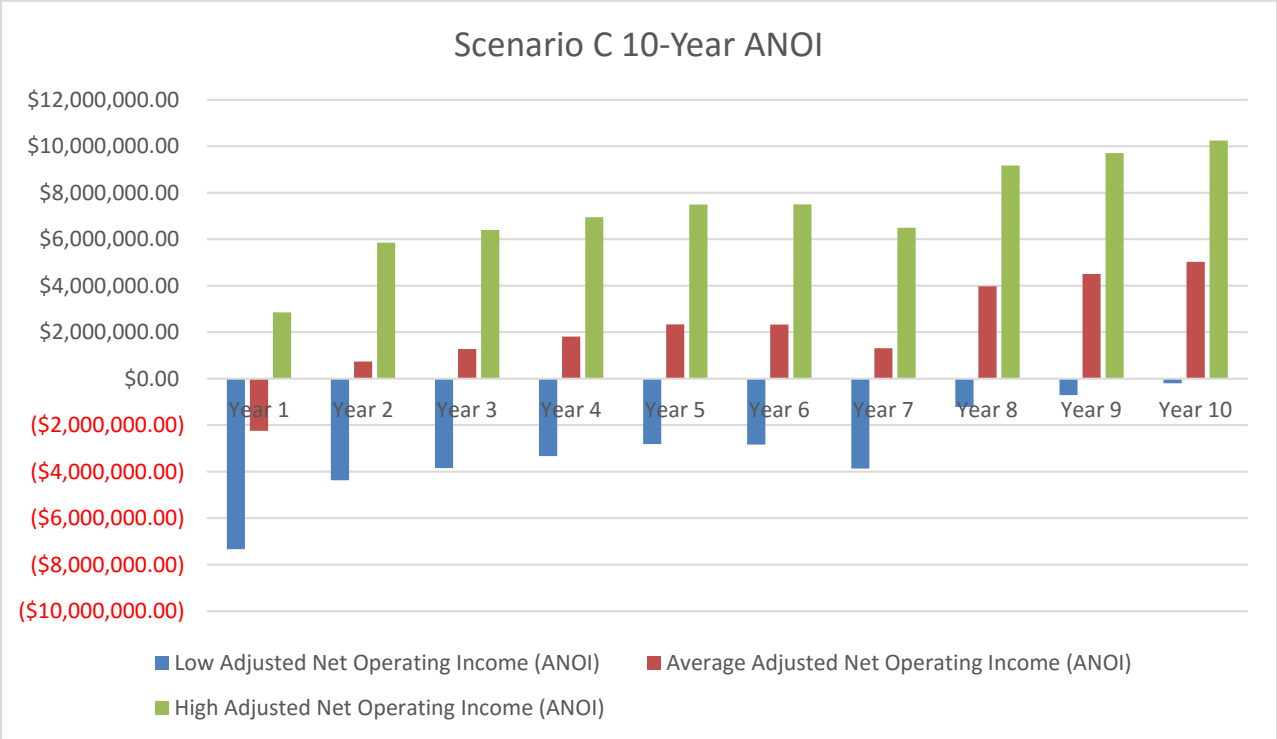


Figure 14: Scenario C - 10-Year ANOI



Once operating expenses are taken into account, the differences between Scenarios A and B and Scenario C become even more stark. Note that while Scenario C has the highest revenue potential, with an average annual ANOI of $7,264,912.92 assuming high performance, this scenario also yields the highest level of volatility among low, average, and high performance. In fact, a low performing Scenario C would yield an average annual loss of $3,050,334.88 due to significant ridership loss. Scenarios A and B yield similar ANOI, with Scenario B demonstrating slightly higher volatility due to an increased difference in projected ridership loss for low, average, and high performance. The following table (Table 6) depicts the range of average annual ANOI yielded from each scenario for each performance level.

Table 6: Average Annual ANOI Range

Scenario	Average Annual ANOI Range
A	$2,404,405.99 - $5,721,540.59
B	$2,383,938.18 - $6,144,695.18
C	$(3,050,334.88) - $7,264,912.92

APPENDIX A: EXISTING AND PROJECTED SYSTEM DATA

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Appendix A: Existing and Projected PnR System Data

Existing and 2040 PnR Summary

Transit Stations												
					Parking Spaces							
Station ID Numbe	Facility Name	Transit Corridor	Station Location/ Jurisdiction	Status	Existing 2015	Opening Day	Total 2040	Surface or Structure	% Utilization- 2015 Average	Average Daily Boardings and Alightings	Currently Managed Lot	Comments
	Rapid Transit Stations with Parking											
1	Thornton Crossroads at 104th	North Metro	Thornton	New		1,002	1,460	Surface/ Structure	NA			
2	Northglenn- 112th	North Metro	Northglenn	New		311	1,200	Surface	NA			
3	2nd/ Ave/Abilene	I-225	Aurora	New		242	200	Surface	NA			
4	13th Ave	I-225	Aurora	New		253	690	Surface	NA			
5	30th/Downing	Central	Denver	Existing	27		27	Surface	**97%**	2,351	Yes	
6	38th/Blake	East Corridor	Denver	New		200	500	Surface	NA			
7	41st/Fox	Gold Line (may be shared with	Denver	New		500	770	Surface	NA			
8	60th/Sheridan-Arvada Gold Strike	Gold Line	Arvada	New		330	330	Surface	NA			
9	Peña Blvd	East Corridor	Denver	New		1,079	800	Surface	NA			
10	Commerce City- 72nd	North Metro	Commerce City	New		333	330	Surface	NA			
11	Original Thorton at 88th	North Metro	Thornton	New		586	1,500	Surface	NA			
12	Alameda	Central Corridor	Denver	Existing	40		40	Surface	88%	4,060	Yes	302 spaces identified in 2040 numbers
12	Broadway Marketplace	Central Corridor	Denver	Existing	200			Surface	74%			Station not identified in DRCOG 2040 numbers
13	Arapahoe at Village Center	Southeast Corridor	Greenwood Village	Existing	1,115		1,115	Surface/ Structure	43%	3,040	Yes	Surface parking is leased from developer
14	Arvada Ridge	Gold Line	Arvada	New		200	280	Surface	NA			
15	Belleview	Southeast	Denver	Existing	59		59	Surface	**97%**	1,797	Yes	
16	Central Park	East Corridor	Denver	New	1,500	1,500	1,500	Surface	NA		Yes	
17	Aurora Metro Center	I-225	Aurora	New		145	200	Surface	NA			
18	Clear Creek/Federal	Gold Line	Denver	New		283	370	Surface	NA			
19	Colorado	Southeast	Denver	Existing	363		363	Surface	**94%**	4,944	Yes	
20	40th/Colorado	East Corridor	Denver	New		200	1,800	Surface	NA			
21	County Line	Southeast	Lone Tree	Existing	388		388	Surface	29%	1,684	Yes	
22	Dayton	Southeast	Denver	Existing	250		250	Surface	65%	812	Yes	
23	Downtown Longmont	Northwest Rail	Longmont	New			439	Surface	NA			
24	Dry Creek	Southeast	Centennial	Existing	235		235	Structure	87%	2,000	Yes	
25	Eastlake at 124th	North Metro		New		413	960	Surface	NA			

26	Englewood	Southwest Corridor	Englewood	Expansion	910		1,350	Surface/ Structure	**90%**	5,129		Covenants restrict charging for parking at this station.
27	Evans	Southwest	Denver	Existing	99		99	Surface	**97%**	1,758	Yes	
28	Federal Center	West Corridor	Denver	Existing	1,000		1,000	Surface	60%	2,220	Yes	
29	Decatur-Federal	West Corridor	Denver	Existing	1,069		1,069	Surface	9%	1,988	Yes	1900 spaces identified in 2040 numbers
30	I-25 / Broadway	Central Corridor	Denver	Existing	1,308		1,308	Surface	83%	12,811	Yes	1248 spaces identified in 2040 numbers. 200 spaces leased from developer to south.
31	Iliff	I-225	Aurora	New		600	600	Surface	NA			RFP for parking management-structure to be managed by City of Aurora
32	Jeffco/Golden	West Corridor	Golden	Existing	705		705	Surface	31%	1,863	Yes	
33	Lakewood/Wadsworth	West Corridor	Lakewood	Existing	1,000		1,000	Surface	40%	2,451	Yes	
34	Lincoln	Southeast	Lone Tree	Existing	1,734		1,734	Structure	68%	3,973	Yes	
35	Littleton Downtown	Southwest	Littleton	Existing	361		361	Surface	**98%**	3,625	Yes	
36	Littleton Mineral Station	Southwest	Littleton	Existing	1,227		1,227	Surface	**96%**	4,502	Yes	
37	48th and Brighton at National Western Center	North Metro	Denver	New		40	40	Surface	NA			
38	Nine Mile	Southeast Corridor	Aurora	Existing	1,225		1,225	Structure (1,225)	**96%**	6,238	Yes	
39	Oak	West Corridor	Lakewood	Existing	200		200	Surface	71%	1,281	Yes	
40	Orchard	Southeast	Greenwood Village	Existing	48		48	Surface	**94%**	1,361	Yes	
41	Pecos Junction	Gold Line (may be shared with	Denver	New		300	300	Surface	NA			
42	Peoria	I-225 / East	Aurora	New		550	1,900	Surface	NA			
43	RidgeGate Parkway	Southeast Corridor	Lone Tree	New		1,312	2,100	Surface/ Structure (1260)	NA			
44	Sheridan	West Corridor	Denver	Existing	800		800	Surface	19%	1,458	Yes	
45	Southmoor	Southeast	Denver	Existing	788		788	Surface	70%	5,759	Yes	
46	University of Denver Station	Southeast Corridor	Denver	Existing	540		540	Structure (540)	80%	3,370	Yes	
47	Westminster -71st and Lowell	Northwest Rail	Westminster	New		350	1,000	Surface/ Structure	NA			Non RTD Ownership
48	Yale	Southeast	Denver	Existing	129		129	Surface	**97%**	1,531	Yes	
				Subtotal	**17,320**	**10,729**	**35,329**					

Park-n-Ride Lots and Transit Stations

Transit Stations

Station ID Numbe	Facility Name	Tier 1 Rapid Transit Corridor	Station Location/ Jurisdiction	Status	Parking Spaces			Surface or Structure	% Utilization-2015 Average	Average Daily Boardings and Alightings	Currently Managed Lot	Comments
					Existing 2015	Opening Day	Total 2040					
	Existing PnRs (Future Rapid Transit Stations) with Parking											
49	40th Ave & Airport Blvd - [illegible]	East Corridor	Denver	Expansion	1,079		2,200	Surface	54%		Yes	
50	Broomfield	US-36 BRT	Broomfield	Existing	940		1,810	Structure	56%		Yes	
51	US-36/Flatirons	US-36 BRT	Boulder	Existing	264		264	Surface	39%		Yes	
52	Olde Town Arvada	Gold Line	Arvada	Expansion	200	330	400	Surface	**109%**			Station could be managed by future development and City of Arvada
53	US-36/Table Mesa	US-36 BRT	Boulder	Existing	824		824	Structure	57%		Yes	
54	US-36 / Church Ranch	US-36 BRT	Westminster	Existing	396		396	Surface	20%		Yes	
55	US-36 / McCaslin	US-36 BRT	Broomfield	Existing	466		466	Surface	87%		Yes	
56	Wheat Ridge/Ward Rd-I-70		Wheat Ridge	Existing	-491			Surface	40%			Station to be closed when Gold Line opens
56A	Wheat Ridge/Ward Rd	Gold Line	Wheat Ridge	New		287	440					
57	US-36/ Sheridan	US-36 BRT	Westminster	Existing	1,310		1,310	Surface/ Structure	70%		Yes	
				Subtotal	**4,988**	**617**	**8,110**					

Park-n-Ride Lots

Station ID Numbe	Facility Name	Station Location/ Jurisdiction	Status	Parking Spaces			Surface or Structure	% Utilization-2015 Average	Average Daily Boardings and Alightings	Currently Managed Lot	Comments
				Existing 2015	Opening Day	Total 2040					
	RTD park-n-Ride Lots										
58	104th Ave & Revere	Commerce City	Existing	89		89	Surface	71%			
59	39th/Table Mesa Dr	Boulder	Existing	40		40	Surface	81%		Yes	
60	70th/Broadway	Boulder	Existing	308	-308		Surface	13%		Yes	Station to be closed when Gold Line opens
61	Aspen Park	Jefferson County	Existing	162		162	Surface	41%			
62	Bergen Park	Jefferson County	Existing	160		160	Surface	41%			
63	Boulder Junction at Depot Square Station	Boulder	Existing	100		100	Surface				RTD part of condominium ownership
64	Broadway / 27th Way	Boulder	Existing	59		59	Surface	**91%**		Yes	
65	Broadway Marketplace	Denver	Existing	221		221	Surface	74%			
66	Boulder Church of the Nazarene	Boulder	Existing	49		49	Surface	68%		Yes	
67	C-470 / University	Highlands Ranch/ [illegible]	Existing	440		440	Surface	5%			
68	El Rancho	Jefferson County	Existing	36		36	Surface	58%			
69	Evergreen	Evergreen	Existing	45		45	Surface	47%			
70	Genesee Park	Jefferson County	Existing	21		21	Surface	67%			
71	Alameda/Havana	Aurora	Existing	128		128	Surface	43%			
72	Highlands Ranch Town Center	Highlands Ranch/ [illegible]	Existing	177		177	Surface	15%			
73	Ken Caryl / C-470	Jefferson County	Existing	268		268	Surface	7%			
74	Lafayette	Lafayette	Existing	136		136	Surface	49%			
75	Lincoln/Jordan	Parker	Existing	102		102	Surface	**99%**			

Park-n-Ride Lots

Station ID Numbe	Facility Name	Station Location/ Jurisdiction	Status	Parking Spaces			Surface or Structure	% Utilization-2015 Average	Average Daily Boardings and Alightings	Currently Managed Lot	Comments
				Existing 2015	Opening Day	Total 2040					
76	Longmont (replaced by Downtown Longmont	Longmont	Existing	101		0	Surface	40%			
77	Lutheran Church of the Cross	Evergreen	Existing	41		41	Surface	15%			
78	Lyons	Lyons	Existing	27		27	Surface	57%			
79	Montbello	Montbello	Existing	-84		-84	Surface	46%			Station to be closed when A Line Opens
80	Nederland	Nederland	Existing	75		75	Surface	52%			
81	Olympic	Aurora	Existing	152		152	Surface	11%			
82	Paradise Hills	Jefferson County	Existing	26		26	Surface	79%			
83	Parker	Parker	Existing	173		173	Surface	71%			
84	Pine Junction	Jefferson County	Existing	90		90	Surface	43%			92 spaces identified in 2040 numbers
85	Pinery	Douglas County	Existing	79		79	Surface	31%			
86	SH-72/SH-93	Arvada	Existing	14		14	Surface	73%			
87	8th and Coffman	Longmont	Existing	97		197	Surface	54%			
88	SH-119 / Niwot	Boulder County/Longmont	Existing	28		28	Surface	57%			
89	Smoky Hill/Picadilly	Parker	Existing	55		55	Surface	30%			
90	Southwest Plaza	Jefferson County	Existing	200		200	Surface	8%			
	Stapleton (replaced by Central Park Station)	Denver	Existing				Surface				Station replaced by Central Park in September 2015. Totals removed from overall count.
91	Tantra Dr/Table Mesa	Boulder	Existing	105		105	Surface	23%		Yes	
92	Thornton	Thornton	Existing	817		817	Surface	70%		Yes	
93	US-285 / Mountain View	Jefferson County	Existing	183		183	Surface	15%			
94	US-285 / Twin Forks	Jefferson County	Existing	77		77	Surface	31%			
95	US-287/Ute Rd (Hwy 66)	Longmont	New	0		150	Surface	NA			
96	US-287/Niwot Rd	Boulder County/Longmont	Existing	40		40	Surface	**108%**			
	US-85 / 72nd Ave (replaced by 71st and Lowell Station)	Westminster	Existing				Surface				Station replaced by Westminster 71st and Lowell Station. Totals removed from
97	US-85 / Bridge St	Brighton	Existing	234		234	Surface	40%			
98	Wadsworth / Hampden	Denver	Existing	284		284	Surface	7%			
99	Wagon Road	Westminster	Existing	1,540		1,540	Surface	**97%**		Yes	
100	US-287 and 21st Avenue	Longmont	Existing	40		40	Surface	**102%**			Station not identified in DRCOG
101	US-85 and 72nd Avenue	Commerce City	Existing	83		83	Surface	17%			Station not identified in DRCOG
			Subtotal	**7,018**		**6,859**					
	Total Existing Parking Spaces			**29,326**							
	Total New Opening Day Parking Spaces				**11,346**						
	Total Existing and New Opening Day Parking Spaces				**40,672**						
	Total 2040 Parking Spaces					**50,298**					

Sources: DR COG 2040 RTD Appendix 2

RTD 2015 Parking Utilization Report- Janury 25, 2016

RTD Park n Rides by Ownership/Type/Shared Responsibilities- February 21, 2013

RTD Trailblazer August 2015

Appendix A: Existing and Projected PnR System Data
Station Access and Walkability Summary

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Transit Stations

	Facility Name	Bus Routes Serving Station*	Route Coverage (H,M,L)	Station Area Pedestrian Connectivity (H,M,L)	Parking Availability at Nearby Stations	Overall Accessibility Score
	Rapid Transit Stations with Parking					
5	**30th/Downing**	**12** Nb/Sb, **28** Eb/Wb, **38** Eb/Wb, **43** Eb	**H**	**H**	**L**	**M**
12	**Alameda**	**3** Eb/Wb,**4** Wb,**33** Nwb,**52** Nwb	**M**	**M**	**L**	**M**
15	**Belleview**	**46** Nb, **73** Nb/Sb, CnR	**L**	**M**	**L**	**L**
19	**Colorado**	**21** Eb/Wb, **40** Nb/Sb, **46** Nb/Sb	**H**	**H**	**L**	**M**
24	**Dry Creek**	Dry Creek CnR, North Inverness CnR	**L**	**M**	**M**	**M**
26	**Englewood**	**0** Nb/Sb, **12** Nb, **27** Eb/Wb, **35** Eb, **51** Nb, Art Shuttle	**H**	**H**	**L**	**M**
27	**Evans**	**21** Eb/Wb, 0 Nb/Sb	**M**	**H**	**M**	**M**
30	**I-25 and Broadway**	**0** Nb/Sb, **0ltd** Nb/Sb, **11** Eb/Wb, **14**Wb	**H**	**H**	**L**	**H**
35	**Littleton Downtown**	**29** Nb, **36** Nb, **36Ltd** Nb, **59** Wb, **66** Eb, **67** Eb	**M**	**H**	**L**	**M**
36	**Littleton Mineral Station**	**77** Wb, **85** Wb, **401** Sb, **402Ltd** Eb, **403** Eb, S.Jeffco **CnR**, Lockhead **CnR**	**H**	**L**	**L**	**M**
38	**Nine Mile**	**35** Wb, **79Ltd** NWb, **83Ltd** NWb, **121** Nb, **130** Nb, **131** Eb, **133** Nb, **135** Eb, **139** Eb, **AT** Nb/Sb, Special Event Rides	**H**	**L**	**H**	**H**
40	**Orchard**	**72** Nb, Orchard **CnR**	**L**	**M**	**M**	**M**
46	**University of Denver**	**24** Nb/Sb,**DU SHUTTLE**	**L**	**M**	**L**	**L**
48	**Yale**	**27** Wb	**L**	**L**	**M**	**L**

Park-n-Ride Lots and Transit Stations

Transit Stations

	Facility Name	Bus Routes Serving Station*	Route Coverage (H,M,L)	Station Area Pedestrian Connectivity (H,M,L)	Parking Availability at Nearby Stations	Overall Accessibility Score
	Existing PnRs (Future Rapid Transit Stations) with Parking					
52	**Olde Town Arvada**	**50** Sb, **52** Wb/Eb, **55X** SEb, **72** Wb/Eb, **76** Nb/Sb	**H**	**M**	**M**	**M**

Park-n-Ride Lots

	Facility Name	Bus Routes Serving Station*	Route Coverage (H,M,L)	Station Area Pedestrian Connectivity (H,M,L)	Parking Availability at Nearby Stations	Overall Accessibility Score
	RTD park-n-Ride Lots					
59	**39th/Table Mesa Dr**	**204** NWb,**206** NEb,**AB, BV** Sb ,**BMX** Sb, **BX** Sb, **DM** SEb, **DASH** Eb, **SKIP** Nb, **GS** Nb, **J** Sb	**H**	**H**	**L**	**H**
64	**Broadway / 27th Way**	**BOUND** Nb, **DASH** SEb, **SKIP** Nb/Sb, **BV** Sb, **BMX** SEb, **DM** Sb, **GS** Sb, **J** Nb, **AB** SEb	**H**	**H**	**L**	**M**
75	**Lincoln/Jordan**	**410** Wb/Sb, **P** NWb/Sb	**M**	**H**	**L**	**M**
96	**US-287/Niwot Rd**	**L, LX, LSX**	**L**	**L**	**L**	**L**
99	**Wagon Road**	**8** Sb, **12** Sb, **120** Eb/Wb, **120X** Sb, **122X** Sb, **128** Wb, **AA** Eb, Rockies/Broncos, Thornton **CnR**	**M**	**H**	**H**	**H**
100	**US-287 and 21st Avenue**	**323** NEb/SWb, **326** Sb, **327** Sb, **J** SWb, **L** Sb, **BOLT** SWb, Longmont **CnR**	**H**	**M**	**L**	**M**

*Source: RTD Trailblazer-August 2015 Edition

Appendix A: Existing and Projected PnR System Data

Spillover Parking Analysis

Transit Stations							
Station ID Number	Facility Name	Transit Corridor	Station Location/ Jurisdiction	Total 2040	% Utilization- 2015 Average	Parking Spill Over Potential	Comments
	Rapid Transit Stations with Parking						
1	Thornton Crossroads at	North Metro	Thornton	1,460	NA	Medium	Potential for spillover at uncontrolled retail center to
2	Northglenn- 112th	North Metro	Northglenn	1,200	NA	Low	Limited uses adjacent to station.
3	2nd/ Ave/Abilene	I-225	Aurora	200	NA	Medium	Potential for spillover at adjacent multi family and office
4	13th Ave	I-225	Aurora	690	NA	Low	Limited spillover potential at office to north. Some
5	30th/Downing	Central Corridor	Denver	27	97%	High	End of line. Potential spillover at adjacent commercial
6	38th/Blake	East Corridor	Denver	500	NA	High	Potential spillover on public streets.
7	41st/Fox	Gold Line (may be shared with	Denver	770	NA	High	Potential for on-street spillover and spillover at adjacent comercial uses.
8	60th/Sheridan-Arvada Gold Strike	Gold Line	Arvada	330	NA	Medium	Potential for spillover at adjacent industrial/commercial uses. Spillover on adjacent streets.
9	Peña Blvd	East Corridor	Denver	800	NA		Parking managed by developer in conjunction with DIA
10	Commerce City- 72nd	North Metro	Commerce City	330	NA	Low	Low spillover potential until adjacent land is developed.
11	Original Thornton at 88th	North Metro	Thornton	1,500	NA	Low	Limited access to station from adjacent uses.
12	Alameda	Central Corridor	Denver	40	88%	Medium	1 sided station. Potential for spillover at retail/commercial. Local street spillover at Cherokee, W. Alaska and W. Dakota
12	Broadway Marketplace	Central Corridor	Denver		74%	High	Spillover potential at adjacent uncontrolled retail uses
13	Arapahoe at Village Center	Southeast Corridor	Greenwood Village	1,115	43%	Low	Potential for office/commercial spillover. Potential local street spillover at Fiddlers Green Circle (west side)
14	Arvada Ridge	Gold Line	Arvada	280	NA	Medium	Potential spillover at commercial areas south of new
15	Belleview	Southeast	Denver	59	97%	High	Currently spillover on public street
16	Central Park	East Corridor	Denver	1,500	NA	Low	Potential spillover at future development
17	Aurora Metro Center	I-225	Aurora	200	NA	High	Spillover potential at adjacent uncontrolled retail uses
18	Clear Creek/Federal	Gold Line	Denver	370	NA	Low	Limited access to station from adjacent uses.
19	Colorado	Southeast Corridor	Denver	363	94%	Medium	Potential for commercial/office spillover. Potential for public street spillover south of Evans
20	40th/Colorado	East Corridor	Denver	1,800	NA	High	Potential for spillover iat adjacent commercila nd industrial uses and on neighborhood streets.
21	County Line	Southeast Corridor	Lone Tree	388	29%		Potential for commercial/retail spillover (Park Meadows) and office spillover on east side of I-25.

22	Dayton	Southeast Corridor	Denver	250	65%	Low	1 sided station. Potential for spillover at adjacent multi-family residential.
23	Downtown Longmont	Northwest Rail	Longmont	439	NA		Station not constructed at this time.
24	Dry Creek	Southeast Corridor	Centennial	235	87%	Low	Potential for office spillover in surface lots at each side of I-25 (pedestrian bridge). Existing parking structure is controlled.
25	Eastlake at 124th	North Metro		960	NA	Low	Potential for spillover in neighborhood to west of station.
26	Englewood	Southwest Corridor	Englewood	1,350	90%	High	1 sided station. Potential for commercial spillover at shopping center.
27	Evans	Southwest	Denver	99	97%	High	1 sided station. Potential for public street spillover north
28	Federal Center	West Corridor	Denver	1,000	60%	Medium	Potential for spillover at adjacent office/commercial
29	Decatur-Federal	West Corridor	Denver	1,069	9%	Low	Potential for spillover at adjacent multi-family
30	I-25 / Broadway	Central Corridor	Denver	1,308	83%	Medium	Potential for spillover at adjacent and new development north and south of station.
31	Iliff	I-225	Aurora	600	NA		
32	Jeffco/Golden	West Corridor	Golden	705	31%	Medium	Potential spillover at Jefferson County Government Center
33	Lakewood/Wadsworth	West Corridor	Lakewood	1,000	40%	Medium	Elevated Station. Potential for commercial and residential spillover each side of 13th Avenue and Wadsworth Blvd.
34	Lincoln	Southeast Corridor	Lone Tree	1,734	68%	Low	Existing end of line station. Potential for spillover at adjacent office/commercial
35	Littleton Downtown	Southwest Corridor	Littleton	361	98%	High	1 sided station. Potential for spillover at adjacent public streets-time limited parking and Arapahoe Community College.
36	Littleton Mineral Station	Southwest Corridor	Littleton	1,227	96%	High	1 sided station. End of line station. Potential for spillover at adjacent retail (Aspen Grove).
37	48th and Brighton at National Western Center	North Metro	Denver	40	NA	Medium	Potential for spillover into neighborhood to east.
38	Nine Mile	Southeast Corridor	Aurora	1,225	96%	Medium	1 sided station. Potential for spillover at commercial/retail property north of Parker Road
39	Oak	West Corridor	Lakewood	200	71%	Medium	Potential for commerial spillover.
40	Orchard	Southeast	Greenwood	48	94%	Medium	Potential for office spillover at each side of I-25.
41	Pecos Junction	Gold Line (may be shared with	Denver	300	NA	Low	Limited uses around station.
42	Peoria	I-225 / East	Aurora	1,900	NA	Medium	1 sided station.
43	RidgeGate Parkway	Southeast Corridor	Lone Tree	2,100	NA	Medium	New end of line station. Poential for spillover to future office and development adjacent to station and south of RidgeGate Parkway.
44	Sheridan	West Corridor	Denver	800	19%	Low	Potential for spillover to adjacent public streets.
45	Southmoor	Southeast	Denver	788	70%	Medium	1 sided station. Potential for spillover to adjacent

46	University of Denver Station	Southeast Corridor	Denver	540	80%	Low	1 sided station. Potential for spillover to adjacent public streets/residential.
47	Westminster/71st and Lowell	Northwest Rail	Westminster	925	NA	Medium	Potential for spillover at adjacent residential and commercial uses.
48	Yale	Southeast Corridor	Denver	129	97%	High	1 sided station. Potential for spillover at adjacent commercial and residential north and south of Yale.

Park-n-Ride Lots and Transit Stations

Transit Stations							
Station ID Number	**Facility Name**	**Tier 1 Rapid Transit Corridor**	**Station Location/ Jurisdiction**	**Total 2040**	**% Utilization- 2015 Average**	**Parking Spill Over Potential**	**Comments**
	Existing PnRs (Future Rapid Transit Stations) with Parking						
49	40th Ave & Airport Blvd - Gateway Park	East Corridor	Denver	2,200	54%	Medium	Potential for spillover at adjacent commercial/office.
50	Broomfield	US-36 BRT	Broomfield	1,810	56%	Medium	Potential for spillover to adjacent commercial and multi-
51	US-36/Flatirons	US-36 BRT	Boulder	264	39%	Medium	Potential for spillover at Flatiron Crossing Mall.
52	Olde Town Arvada	Gold Line	Arvada	400	109%	High	Potential for public street parking in Olde Town Arvada and new development south of tracks.
53	US-36/Table Mesa	US-36 BRT	Boulder	824	57%	Low	Low due to station surrounded by major roadways-
54	US-36 / Church Ranch	US-36 BRT	Westminster	396	20%	Medium	Potential for spillover at adjacent commercial/retail
55	US-36 / McCaslin	US-36 BRT	Broomfield	466	87%	Medium	Potential spillover at adjacent commercial/retail uses (each side of US 36).
56	Wheat Ridge/Ward Rd	Gold Line	Wheat Ridge	440	40%	Low	Low due to limited uses directly around staiton.
57	US-36/ Sheridan	US-36 BRT	Westminster	1,310	70%	Low	Potential for spillover at adjacent office uses.

Park-n-Ride Lots						
Station ID Number	**Facility Name**	**Station Location/ Jurisdiction**	**Total 2040**	**% Utilization- 2015 Average**	**Parking Spill Over Potential**	**Comments**
	RTD park-n-Ride Lots					
58	104th Ave & Revere	Commerce City	89	71%	Low	Potential parking spillover at future development.
59	39th/Table Mesa Dr	Boulder	40	81%	Medium	Potential spillover at residential north and south of Table Mesa and commercial south of station.
60	70th/Broadway	Boulder	308	13%	Low	Potential spillover at adjacent commercial/industrial.
61	Aspen Park	Jefferson County	162	41%	Low	Potential spillover at adjacent commercial.
62	Bergen Park	Jefferson County	160	41%	Low	Potential spillover at adjacent commercial.
63	Boulder Junction at Depot Square Station	Boulder	100		Medium	Potential spillover at adjacent commercial.
64	Broadway / 27th Way	Boulder	59	91%	High	Potential spillover at adjacent commercial and at residential east and west of station.
65	Broadway Marketplace	Denver	221	74%	Medium	1 sided station. Potential for spillover at retail/commercial. Local street spillover at Cherokee, W. Alaska and W. Dakota
66	Boulder Church of the Nazarene	Boulder	49	68%	High	Potential spillover at adjacent residential east and west
67	C-470 / University	Highlands	440	5%	Low	Potential spillover at adjacent private school.

Park-n-Ride Lots						
Station ID Number	Facility Name	Station Location/ Jurisdiction	Total 2040	% Utilization- 2015 Average	Parking Spill Over Potential	Comments
68	El Rancho	Jefferson County	36	58%	Low	Potential spillover at uncontrolled adjacent
69	Evergreen	Evergreen	45	47%	Low	Potention spillover at adjacent church.
70	Genesee Park	Jefferson County	21	67%	Low	Potential for spillover at adjacent public roads.
71	Alameda/Havana	Aurora	128	43%	Medium	Potential for spillover at Walgreens south of station. Vacant RTD parcel to north.
72	Highlands Ranch Town Center	Highlands Ranch/Douglas	177	15%	High	Potential spillover at uncontrolled adjacent commercial.
73	Ken Caryl / C-470	Jefferson County	268	7%	High	Potential spillover at uncontrolled adjacent commercial and multi family (east).
74	Lafayette	Lafayette	136	49%	High	Potential spillover at uncontrolled adjacent commercial.
75	Lincoln/Jordan	Parker	102	99%	Medium	Potential spillover at adjacent commercial.
76	Longmont (replaced by Downtown Longmont	Longmont	0	40%	Medium	Potential spillover at adjacent commercial.
77	Lutheran Church of the Cross	Evergreen	41	15%	Low	Low density residential
78	Lyons	Lyons	27	57%	Medium	Potential spillover along public streets and at adjacent
79	Montbello	Montbello	84	46%	Medium	Potential spillover at multi family residential (north) and commercial (south)
80	Nederland	Nederland	75	52%	Medium	Potential for spillover at adjacent commercial.
81	Olympic Park	Aurora	152	11%	Low	Potential spillover at adjacent residential streets.
82	Paradise Hills	Jefferson County	26	79%	Low	Limited adjacent uses.
83	Parker	Parker	173	71%	Low	Limited adjacent uses.
84	Pine Junction	Jefferson County	90	43%	Low	Potential spillover at adjacent commercial uses.
85	Pinery	Douglas County	79	31%	Low	Potential spillover at adjacent private school (north).
86	SH-72/SH-93	Arvada	14	73%	Low	Limited adjacent uses.
87	8th and Coffman	Longmont	197	54%	High	Potential spillover at adjacent park, residential and Main Street commercial.
88	SH-119 / Niwot	Boulder	28	57%	Low	Low density area.
89	Smoky Hill/Picadilly	Parker	55	30%	Low	Potential for spillover at adjacent uses.
90	Southwest Plaza	Jefferson County	200	8%	High	Potential for spillover at adjacent uncontrolled
91	Tantra Dr/Table Mesa	Boulder	105	23%	Medium	Potential for spillover at adjacent commercial uses.
92	Thornton	Thornton	817	70%	Low	Limited adjacent uses.
93	US-285 / Mountain View	Jefferson County	183	15%	Low	Limited adjacent uses.
94	US-285 / Twin Forks	Jefferson County	77	31%	Low	Limited adjacent uses.
95	US-287/Ute Rd (Hwy 66)	Longmont	150	NA		
96	US-287/Niwot Rd	Boulder	40	108%	Low	Limited adjacent uses.
97	US-85 / Bridge St	Brighton	234	40%	Medium	Potential spillover at adjacent uncontrolled commercial uses.
98	Wadsworth / Hampden	Denver	284	7%	Low	Potential spillover at adjacent commercial and multi family uses.
99	Wagon Road	Westminster	1,540	97%	High	Potential spillover at adjacent comercial and residential uses.
100	US-287/21st Avenue	Longmont	40	102%	High	Potential spillover at adjacent commercial/retail and residential uses.
101	US-85/72nd Avenue	Commerce City	83	17%	High	Potential spillover at adjacent uncontrolled commercial uses.

APPENDIX B: PARKING DEMAND AND RIDERSHIP ELASTICITY SUMMARY

WALKER
PARKING CONSULTANTS

Appendix B: Parking Demand and Ridership Elasticity Summaries

Parking and Ridership Elasticities

		Free Parking at Destination	Paid Parking: Out-of-Pocket	Paid Parking: EcoPass
A, High	**Ridership**	-0.3	-0.17	-0.17
	Parking	-1	-0.34	-0.34
A, Low	**Ridership**	-1	-0.34	-0.34
	Parking	-1	-0.34	-0.34
B, High	**Ridership**	-0.3	-0.17	-0.17
	Parking	-1	-0.34	-0.34
B, Low	**Ridership**	-1	-0.34	-0.34
	Parking	-1	-0.34	-0.34
C, High	**Ridership**	-0.3	-0.17	-0.17
	Parking	-1	-0.68	-0.68
C, Low	**Ridership**	-1	-0.68	-0.68
	Parking	-1	-0.68	-0.68

*Note that elasticity for high utilization stations (utilization rate > 90%) differs by level of accessibility

Appendix B: Parking Demand and Ridership Elasticity Summaries
Opening Year Summary

FEHR PEERS

	Scenario	2015 Demand	Capacity	Base Utilization	Parking Demand Change	Ridership Change	New Utilization	Parking Revenue	Ridership Revenue Loss	Net Revenue	Average Yearly Parking	Average Yearly Fare Loss	Average Yearly Revenue
Scenario A	High Performance	18691	28319	66%	-2970	-1493	56%	$38,892	-$11,555	$27,337	$10,111,920	-$3,004,264	$7,107,656
	Low Performance	18691	28319	66%	-2973	-2973	56%	$38,837	-$22,442	$16,395	$10,097,568	-$5,834,878	$4,262,690
Scenario B	**Scenario**	**2015 Demand**	**Capacity**	**Base Utilization**	**Parking Demand Change**	**Ridership Change**	**New Utilization**	**Parking Revenue**	**Ridership Revenue Loss**	**Net Revenue**	**Average Yearly Parking**	**Average Yearly Fare Loss**	**Average Yearly Revenue**
	High Performance	18691	28319	66%	-3713	-2046	53%	$45,660	-$16,518	$29,142	$11,871,600	-$4,294,779	$7,576,821
	Low Performance	18691	28319	66%	-3716	-3716	53%	$45,605	-$29,112	$16,493	$11,857,248	-$7,569,016	$4,288,232
Scenario C	**Scenario**	**2015 Demand**	**Capacity**	**Base Utilization**	**Parking Demand Change**	**Ridership Change**	**New Utilization**	**Parking Revenue**	**Ridership Revenue Loss**	**Net Revenue**	**Average Yearly Parking**	**Average Yearly Fare Loss**	**Average Yearly Revenue**
	High Performance	18691	28319	66%	-9047	-3659	34%	$55,981	-$28,181	$27,800	$14,555,112	-$7,327,076	$7,228,036
	Low Performance	18691	28319	66%	-9051	-9051	34%	$55,940	-$67,313	-$11,373	$14,544,504	-$17,501,484	-$2,956,980

Notes

Average Performance is calculated as a midpoint between High Performance and Low Performance.

Complete models are substantially large and can be provided in a separate package if requested.

Appendix B: Parking Demand and Ridership Elasticity Summaries
Future Year Summary

FEHR PEERS

	Scenario	Future Demand	Capacity	Base Utilization	Parking Demand Change	Ridership Change	New Utilization	Parking Revenue	Ridership Revenue Loss	Net Revenue	Average Yearly Parking	Average Yearly Fare Loss	Average Yearly Revenue
Scenario A	High Performance	23715	28319	84%	-3864	-1888	70%	$51,017	-$14,471	$36,546	$13,264,368	-$3,762,434	$9,501,934
	Low Performance	23715	28319	84%	-3864	-3864	70%	$51,017	-$29,109	$21,907	$13,264,368	-$7,568,449	$5,695,919
Scenario B	Scenario	Future Demand	Capacity	Base Utilization	Parking Demand Change	Ridership Change	New Utilization	Parking Revenue	Ridership Revenue Loss	Net Revenue	Average Yearly Parking	Average Yearly Fare Loss	Average Yearly Revenue
	High Performance	23715	28319	84%	-4619	-2453	67%	$57,936	-$19,546	$38,390	$15,063,360	-$5,081,970	$9,981,390
	Low Performance	23715	28319	84%	-4619	-4619	67%	$57,936	-$35,891	$22,045	$15,063,360	-$9,331,608	$5,731,752
Scenario C	Scenario	Future Demand	Capacity	Base Utilization	Parking Demand Change	Ridership Change	New Utilization	Parking Revenue	Ridership Revenue Loss	Net Revenue	Average Yearly Parking	Average Yearly Fare Loss	Average Yearly Revenue
	High Performance	23715	28319	84%	-10051	-4605	48%	$84,610	-$35,198	$49,412	$21,998,496	-$9,151,350	$12,847,146
	Low Performance	23715	28319	84%	-10051	-10051	48%	$84,610	-$75,357	$9,253	$21,998,496	-$19,592,747	$2,405,749

Notes

"Average Performance" is calculated as a midpoint between High Performance and Low Performance.

Complete models are substantially large and can be provided in a separate package if requested.

Appendix B: Parking Demand and Ridership Elasticity Summaries
Scenario Performance Summary

FEHR PEERS

Scenario A				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 11,352,109.56	$ 2,247,220.17	$ (6,700,483.40)	**$ 2,404,405.99**
Average Performance	$ 11,352,109.56	$ 2,247,220.17	$ (5,041,916.10)	**$ 4,062,973.29**
High Performance	$ 11,352,109.56	$ 2,247,220.17	$ (3,383,348.80)	**$ 5,721,540.59**

Scenario B				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 13,080,289.95	$ 2,247,220.17	$ (8,449,131.60)	**$ 2,383,938.18**
Average Performance	$ 13,080,289.95	$ 2,247,220.17	$ (6,568,753.10)	**$ 4,264,316.68**
High Performance	$ 13,080,289.95	$ 2,247,220.17	$ (4,688,374.60)	**$ 6,144,695.18**

Scenario C				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 17,751,345.89	$ 2,247,220.17	$ (18,554,460.60)	**$ (3,050,334.88)**
Average Performance	$ 17,751,345.89	$ 2,247,220.17	$ (13,396,836.70)	**$ 2,107,289.02**
High Performance	$ 17,751,345.89	$ 2,247,220.17	$ (8,239,212.80)	**$ 7,264,912.92**

Notes & Assumptions

Total Revenue includes gross parking revenue and expected citation revenue less credit card processing fees.

Expenses are the same for each scenario and each performance level.

APPENDIX C: PROJECTED COSTS AND ANOI ANALYSIS

WALKER
PARKING CONSULTANTS

WALKER PARKING CONSULTANTS

MULTI-SPACE METER QUANTITY ANALYSIS

Station ID Number	Station	Status	Total Spaces Opening Day	2015 Average Utilization	New Lot 75% Utilization	Spaces Utilized	60% Automated and PbC Payments	40% MSM Payments	# of MSMS
1	Thornton Crossroads at 104th	New	1,002	N/A	75%	752	451	301	7
2	Northglenn- 112th	New	311	N/A	75%	233	140	93	4
3	2nd/ Ave/Abilene	New	242	N/A	75%	182	109	73	3
4	13th Ave	New	253	N/A	75%	190	114	76	3
5	30th/Downing	Existing	27	97%	N/A	26	16	10	2
6	38th/Blake	New	200	N/A	75%	150	90	60	3
7	41st/Fox	New	500	N/A	75%	375	225	150	5
8	60th/Sheridan-Arvada Gold Strike	New	330	N/A	75%	248	149	99	4
9	Peña Blvd	New	1,079	N/A	75%	809	486	324	7
10	Commerce City- 72nd	New	333	N/A	75%	250	150	100	4
11	Original Thorton at 88th	New	586	N/A	75%	440	264	176	5
12	Alameda	Existing	40	88%	N/A	35	21	14	2
12	Broadway Marketplace	Existing	200	74%	N/A	148	89	59	3
13	Arapahoe at Village Center	Existing	1,115	43%	N/A	479	288	192	5
14	Arvada Ridge	New	200	N/A	75%	150	90	60	3
15	Belleview	Existing	59	97%	N/A	57	34	23	2
16	Central Park	New	1,500	N/A	75%	1125	675	450	8
17	Aurora Metro Center	New	145	N/A	75%	109	65	44	2
18	Clear Creek/Federal	New	283	N/A	75%	212	127	85	3
19	Colorado	Existing	363	94%	N/A	341	205	136	4
20	40th/Colorado	New	200	N/A	75%	150	90	60	3
21	County Line	Existing	388	29%	N/A	113	68	45	2
22	Dayton	Existing	250	65%	N/A	163	98	65	3
23	Downtown Longmont	New	439		N/A	0	0	0	
24	Dry Creek	Existing	235	87%	N/A	204	123	82	3
25	Eastlake at 124th	New	413	N/A	75%	310	186	124	4
26	Englewood	Expansion	910	90%	N/A	819	491	328	N/A
27	Evans	Existing	99	97%	N/A	96	58	38	2

28	Federal Center	Existing	1,000	60%	N/A	600	360	240	6
29	Decatur-Federal	Existing	1,069	9%	N/A	96	58	38	2
30	I-25 / Broadway	Existing	1,308	83%	N/A	1086	651	434	8
31	Iliff	New	600	N/A	75%	450	270	180	N/A
32	Jeffco/Golden	Existing	705	31%	N/A	219	131	87	3
33	Lakewood/Wadsworth	Existing	1,000	40%	N/A	400	240	160	5
34	Lincoln	Existing	1,734	68%	N/A	1179	707	472	8
35	Littleton Downtown	Existing	361	98%	N/A	354	212	142	4
36	Littleton Mineral Station	Existing	1,227	96%	N/A	1178	707	471	8
37	48th and Brighton at National Western Center	New	40	N/A	75%	30	18	12	2
38	Nine Mile	Existing	1,225	96%	N/A	1176	706	470	8
39	Oak	Existing	200	71%	N/A	142	85	57	3
40	Orchard	Existing	48	94%	N/A	45	27	18	2
41	Pecos Junction	New	300	N/A	75%	225	135	90	3
42	Peoria	New	550	N/A	75%	413	248	165	5
43	RidgeGate Parkway	New	1,312	N/A	75%	984	590	394	8
44	Sheridan	Existing	800	19%	N/A	152	91	61	3
45	Southmoor	Existing	788	70%	N/A	552	331	221	6
46	University of Denver Station	Existing	540	80%	N/A	432	259	173	5
47	Westminster -71st and Lowell	New	350	N/A	75%	263	158	105	N/A
48	Yale	Existing	129	97%	N/A	125	75	50	3
49	40th Ave & Airport Blvd - Gateway Park	Existing	1,079	54%	N/A	583	350	233	6
50	Broomfield	Existing	940	56%	N/A	526	316	211	6
51	US-36/Flatirons	Existing	264	39%	N/A	103	62	41	2
52	Olde Town Arvada	Expansion	330	109%	N/A	330	198	132	4
53	US-36/Table Mesa	Existing	824	57%	N/A	470	282	188	5
54	US-36 / Church Ranch	Existing	396	20%	N/A	79	48	32	2
55	US-36 / McCaslin	Existing	466	87%	N/A	405	243	162	5
56	Wheat Ridge/Ward Rd-I-70	Existing	-491	N/A	N/A	N/A	N/A	N/A	N/A
56A	Wheat Ridge/Ward Rd	New	287	40%	N/A	115	34	80	3
57	US-36/ Sheridan	Existing	1,310	70%	N/A	917	550	367	7
Station Totals			**32,393**			**21,792**	**13,041**	**8,751**	**244**
								Add 18% "stock" inventory	**24**
								Total	**268**

Notes:

MSM quantities are planned for peak-hour volume (7 am - 8 am), based on 2015 utilization for existing stations and 75% for new stations.

Existing RTD data shows 60% automated and PbC utilization.

Ten stations with fewer than 25 spaces require only one MSM; however, redundancy is recommended for optimal customer service.

10% "stock" inventory to be utilized as needed, based on actual demand and individual facility logistics.

MSM quantities per station were calculated using the following formula:

Utilized Spaces	MSMs
25	2
50	3
100	4
150	5
200	6
300	7
400	8
500	9
600	10
700	11
800	12
900	13
1000	14

Receipt paper calculations assumes 8,751 utilized spaces, turning over 1.4 times, or 12,251 transactions x 250 days per year = 3,062,850 transactions per year.
We assume 75% receipt requests and 4,000 tickets per roll, for 574 paper rolls per year.

Appendix C: Projected Costs and ANOI Analysis

WALKER PARKING CONSULTANTS

Scenario Performance Summary

Scenario A				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 11,352,109.56	$ 2,247,220.17	$ (6,700,483.40)	**$ 2,404,405.99**
Average Performance	$ 11,352,109.56	$ 2,247,220.17	$ (5,041,916.10)	**$ 4,062,973.29**
High Performance	$ 11,352,109.56	$ 2,247,220.17	$ (3,383,348.80)	**$ 5,721,540.59**

Scenario B				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 13,080,289.95	$ 2,247,220.17	$ (8,449,131.60)	**$ 2,383,938.18**
Average Performance	$ 13,080,289.95	$ 2,247,220.17	$ (6,568,753.10)	**$ 4,264,316.68**
High Performance	$ 13,080,289.95	$ 2,247,220.17	$ (4,688,374.60)	**$ 6,144,695.18**

Scenario C				
	Average Annual Total Revenue	Average Annual Expenses	Average Annual Ridership Loss	Average Annual ANOI
Low Performance	$ 17,751,345.89	$ 2,247,220.17	$ (18,554,460.60)	**$ (3,050,334.88)**
Average Performance	$ 17,751,345.89	$ 2,247,220.17	$ (13,396,836.70)	**$ 2,107,289.02**
High Performance	$ 17,751,345.89	$ 2,247,220.17	$ (8,239,212.80)	**$ 7,264,912.92**

Notes & Assumptions

Total Revenue includes gross parking revenue and expected citation revenue less credit card processing fees.

Expenses are the same for each scenario and each performance level.

Appendix C: Projected Costs and ANOI Analysis

WALKER PARKING CONSULTANTS

Denver RTD PbP/Mobile LPR Operating and Maintenance Budget - Scenario A

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Parking Revenue	$ 10,111,920.00	$ 10,462,192.00	$ 10,812,464.00	$ 11,162,736.00	$ 11,513,008.00	$ 11,863,280.00	$ 12,213,552.00	$ 12,563,824.00	$ 12,914,096.00	$ 13,264,368.00
Citation Revenue	$ 505,596.00	$ 523,109.60	$ 540,623.20	$ 558,136.80	$ 575,650.40	$ 593,164.00	$ 610,677.60	$ 628,191.20	$ 645,704.80	$ 663,218.40
Credit Card Processing Fees	$ (796,313.70)	$ (823,897.62)	$ (851,481.54)	$ (879,065.46)	$ (906,649.38)	$ (934,233.30)	$ (961,817.22)	$ (989,401.14)	$ (1,016,985.06)	$ (1,044,568.98)
TotalRevenue	**$ 9,821,202.30**	**$ 10,161,403.98**	**$ 10,501,605.66**	**$ 10,841,807.34**	**$ 11,182,009.02**	**$ 11,522,210.70**	**$ 11,862,412.38**	**$ 12,202,614.06**	**$ 12,542,815.74**	**$ 12,883,017.42**
Meter Expenses										
Meter Procurement (268)	$ 2,147,200.00	$ -	$ -	$ -	$ -	$ -	$ 2,303,360.00		$ -	$ -
Spare Parts	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ 59,000.00	$ -	$ -	$ -
Receipt Paper	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00
Batteries	$ -	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 14,389.73	$ -	$ 14,389.73	$ 14,389.73	$ 14,389.73
Extended Parts Warranty	$ -	$ 93,940.00	$ 103,334.00	$ 113,667.40	$ 125,034.14	$ 137,537.55	$ -	$ 108,031.00	$ 118,834.10	$ 130,717.51
Service Contract	$ -	$ 107,360.00	$ 118,096.00	$ 129,905.60	$ 142,896.16	$ 157,185.78	$ -	$ 123,464.00	$ 135,810.40	$ 149,391.44
MSM Mgmt. & Comm. Fees	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 228,032.64	$ 228,032.64	$ 228,032.64	$ 228,032.64
Enforcement Expenses										
Mobile LPR Procurement (10)	$ 450,000.00	$ -	$ -	$ -	$ -	$ 517,500.00	$ -	$ -	$ -	$ -
LPR Extended Warranty	$ -	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ -	$ 60,950.00	$ 60,950.00	$ 60,950.00	$ 60,950.00
Remote Support & PM Contract	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00
Handheld Ticketing Device (10)	$ 50,000.00	$ -	$ -	$ -	$ -	$ 57,500.00	$ -	$ -	$ -	$ -
Handheld Communication Fees	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Handheld Extended Warranty	$ -	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ -	$ 4,600.00	$ 4,600.00	$ 4,600.00
LPR Vehicle Lease (10)	$ 252,360.00	$ 259,930.80	$ 267,728.72	$ 275,760.59	$ 284,033.40	$ 292,554.41	$ 301,331.04	$ 310,370.97	$ 319,682.10	$ 329,272.56
Vehicle Maintenance	$ 15,000.00	$ 15,450.00	$ 15,913.50	$ 16,390.91	$ 16,882.63	$ 17,389.11	$ 17,910.78	$ 18,448.11	$ 19,001.55	$ 19,571.60
Vehicle Insurance	$ 113,160.00	$ 116,554.80	$ 120,051.44	$ 123,652.99	$ 127,362.58	$ 131,183.45	$ 135,118.96	$ 139,172.53	$ 143,347.70	$ 147,648.13
Gasoline	$ 72,000.00	$ 74,160.00	$ 76,384.80	$ 78,676.34	$ 81,036.63	$ 83,467.73	$ 85,971.77	$ 88,550.92	$ 91,207.45	$ 93,943.67
Payroll Expenses										
Mobile LPR Staffing	$ 430,560.00	$ 443,476.80	$ 456,781.10	$ 470,484.54	$ 484,599.07	$ 499,137.05	$ 514,111.16	$ 529,534.49	$ 545,420.53	$ 561,783.14
Maintenance and Collections	$ 129,168.00	$ 133,043.04	$ 137,034.33	$ 141,145.36	$ 145,379.72	$ 149,741.11	$ 154,233.35	$ 158,860.35	$ 163,626.16	$ 168,534.94
Total Expenses	**$ 3,955,656.00**	**$ 1,559,636.25**	**$ 1,611,044.71**	**$ 1,665,404.53**	**$ 1,722,945.15**	**$ 2,315,737.92**	**$ 3,920,923.69**	**$ 1,845,308.73**	**$ 1,905,806.35**	**$ 1,969,739.36**
Unadjusted Net Operating Income	**$ 5,865,546.30**	**$ 8,601,767.73**	**$ 8,890,560.95**	**$ 9,176,402.81**	**$ 9,459,063.87**	**$ 9,206,472.78**	**$ 7,941,488.69**	**$ 10,357,305.33**	**$ 10,637,009.39**	**$ 10,913,278.06**
LOW PERFORMANCE										
Ridership Revenue Loss	$ (5,832,517.60)	$ (6,025,398.89)	$ (6,218,280.18)	$ (6,411,161.47)	$ (6,604,042.76)	$ (6,796,924.04)	$ (6,989,805.33)	$ (7,182,686.62)	$ (7,375,567.91)	$ (7,568,449.20)
Adjusted Net Operating Income (ANOI)	**$ 33,028.70**	**$ 2,576,368.84**	**$ 2,672,280.77**	**$ 2,765,241.35**	**$ 2,855,021.11**	**$ 2,409,548.73**	**$ 951,683.36**	**$ 3,174,618.71**	**$ 3,261,441.48**	**$ 3,344,828.86**
AVERAGE PERFORMANCE										
Ridership Revenue Loss	$ (4,418,390.60)	$ (4,556,951.82)	$ (4,695,513.04)	$ (4,834,074.27)	$ (4,972,635.49)	$ (5,111,196.71)	$ (5,249,757.93)	$ (5,388,319.16)	$ (5,526,880.38)	$ (5,665,441.60)
Adjusted Net Operating Income (ANOI)	**$ 1,447,155.70**	**$ 4,044,815.91**	**$ 4,195,047.90**	**$ 4,342,328.55**	**$ 4,486,428.38**	**$ 4,095,276.07**	**$ 2,691,730.76**	**$ 4,968,986.17**	**$ 5,110,129.01**	**$ 5,247,836.46**
HIGH PERFORMANCE										
Ridership Revenue Loss	$ (3,004,263.60)	$ (3,088,504.76)	$ (3,172,745.91)	$ (3,256,987.07)	$ (3,341,228.22)	$ (3,425,469.38)	$ (3,509,710.53)	$ (3,593,951.69)	$ (3,678,192.84)	$ (3,762,434.00)
Adjusted Net Operating Income (ANOI)	**$ 2,861,282.70**	**$ 5,513,262.98**	**$ 5,717,815.04**	**$ 5,919,415.75**	**$ 6,117,835.65**	**$ 5,781,003.40**	**$ 4,431,778.16**	**$ 6,763,353.64**	**$ 6,958,816.55**	**$ 7,150,844.06**

Notes & Assumptions

CC processing fees estimated at 90% of revenue, using current 9% cost to RTD. 9% cost should be lower based on new volume.
See "MSM Quantity Chart" for meter calculations.
Meter expenses and related costs based on industry averages and historical data, and vary greatly based on competitive climate and quantities.
Meter battery replacement budgeted every 3 years.
Full meter replacement budgeted for year 7 (18% price increase).
Enforcement expenses assume 10 leased enforcement vehicles, each outfitted with Genetec AutoView mobile LPR system.
Full LPR system replacement budgeted for year 6 (15% increase).
Enforcement vehicle expenses based on current RTD lease/maintenance/gasoline costs.
Staffing assumed to be 10 FT enforcement staff and 3 FT maintenance/collection staff.
Payroll expenses assume all staff on 8 hour shifts Monday- Friday, based on current blended $15/hour plus 38% taxes, benefits, etc.

All expenses increase 3% annually, except:

Meter, meter mgmt,/comm fees and spare parts replacement w/18% increase in year 7.
Paper and batteries increase 15% after year 5 (assumes 5 year contract).
Extended meter warranty and service contracts increase 10% annually.
Mobile LPR & handheld related expenses increase 15% after year 5 (assumes 5 year contracts).

Unit Pricing:

MSM	$8,000	(PbP, AC mains, cash & CC, installed).
Spare Parts	$50,000	
MSM Receipt Paper	$40	(See MSM quantities tab for paper calculations).
MSM Battery	$140	
MSM Extended Warranty	$350	
MSM Service Contract	$400	
MSM Mgmt. & Comm. Fees	$60	
Mobile LPR System	$45,000	
LPR Extended Warranty	$5,300	
Remote Support & PM Contract	$1,800	per year, includes 2 onsite PMs/year.
Handheld Ticketing Device	$5,000	
Handheld Communication Fees	$100	per month.
Handheld Extended Warranty	$400	
LPR Vehicle Lease	$2,103	per month.

WALKER PARKING CONSULTANTS

Denver RTD PbP/Mobile LPR Operating and Maintenance Budget - Scenario B

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Parking Revenue	$ 11,871,600.00	$ 12,226,240.00	$ 12,580,880.00	$ 12,935,520.00	$ 13,290,160.00	$ 13,644,800.00	$ 13,999,440.00	$ 14,354,080.00	$ 14,708,720.00	$ 15,063,360.00
Citation Revenue	$ 593,580.00	$ 611,312.00	$ 629,044.00	$ 646,776.00	$ 664,508.00	$ 682,240.00	$ 699,972.00	$ 717,704.00	$ 735,436.00	$ 753,168.00
Credit Card Processing Fees	$ (934,888.50)	$ (962,816.40)	$ (990,744.30)	$ (1,018,672.20)	$ (1,046,600.10)	$ (1,074,528.00)	$ (1,102,455.90)	$ (1,130,383.80)	$ (1,158,311.70)	$ (1,186,239.60)
Total Revenue	**$ 11,530,291.50**	**$ 11,874,735.60**	**$ 12,219,179.70**	**$ 12,563,623.80**	**$ 12,908,067.90**	**$ 13,252,512.00**	**$ 13,596,956.10**	**$ 13,941,400.20**	**$ 14,285,844.30**	**$ 14,630,288.40**
Meter Expenses										
Meter Procurement (268)	$ 2,147,200.00	$ -	$ -	$ -	$ -	$ -	$ 2,303,360.00	$ -	$ -	$ -
Spare Parts	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ 59,000.00	$ -	$ -	$ -
Receipt Paper	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00
Batteries	$ -	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 14,389.73	$ -	$ 14,389.73	$ 14,389.73	$ 14,389.73
Extended Parts Warranty	$ -	$ 93,940.00	$ 103,334.00	$ 113,667.40	$ 125,034.14	$ 137,537.55	$ -	$ 108,031.00	$ 118,834.10	$ 130,717.51
Service Contract	$ -	$ 107,360.00	$ 118,096.00	$ 129,905.60	$ 142,896.16	$ 157,185.78	$ -	$ 123,464.00	$ 135,810.40	$ 149,391.44
MSM Mgmt. & Comm. Fees	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 228,032.64	$ 228,032.64	$ 228,032.64	$ 228,032.64
Enforcement Expenses										
Mobile LPR Procurement (10)	$ 450,000.00	$ -	$ -	$ -	$ -	$ 517,500.00	$ -	$ -	$ -	$ -
LPR Extended Warranty	$ -	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ -	$ 60,950.00	$ 60,950.00	$ 60,950.00	$ 60,950.00
Remote Support & PM Contract	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00
Handheld Ticketing Device (10)	$ 50,000.00	$ -	$ -	$ -	$ -	$ 57,500.00	$ -	$ -	$ -	$ -
Handheld Communication Fees	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Handheld Extended Warranty	$ -	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ -	$ 4,600.00	$ 4,600.00	$ 4,600.00
LPR Vehicle Lease (10)	$ 252,360.00	$ 259,930.80	$ 267,728.72	$ 275,760.59	$ 284,033.40	$ 292,554.41	$ 301,331.04	$ 310,370.97	$ 319,682.10	$ 329,272.56
Vehicle Maintenance	$ 15,000.00	$ 15,450.00	$ 15,913.50	$ 16,390.91	$ 16,882.63	$ 17,389.11	$ 17,910.78	$ 18,448.11	$ 19,001.55	$ 19,571.60
Vehicle Insurance	$ 113,160.00	$ 116,554.80	$ 120,051.44	$ 123,652.99	$ 127,362.58	$ 131,183.45	$ 135,118.96	$ 139,172.53	$ 143,347.70	$ 147,648.13
Gasoline	$ 72,000.00	$ 74,160.00	$ 76,384.80	$ 78,676.34	$ 81,036.63	$ 83,467.73	$ 85,971.77	$ 88,550.92	$ 91,207.45	$ 93,943.67
Payroll Expenses										
Mobile LPR Staffing	$ 430,560.00	$ 443,476.80	$ 456,781.10	$ 470,484.54	$ 484,599.07	$ 499,137.05	$ 514,111.16	$ 529,534.49	$ 545,420.53	$ 561,783.14
Maintenance and Collections	$ 129,168.00	$ 133,043.04	$ 137,034.33	$ 141,145.36	$ 145,379.72	$ 149,741.11	$ 154,233.35	$ 158,860.35	$ 163,626.16	$ 168,534.94
Total Expenses	**$ 3,955,656.00**	**$ 1,559,636.25**	**$ 1,611,044.71**	**$ 1,665,404.53**	**$ 1,722,945.15**	**$ 2,315,737.92**	**$ 3,920,923.69**	**$ 1,845,308.73**	**$ 1,905,806.35**	**$ 1,969,739.36**
Unadjusted Net Operating Income	**$ 7,574,635.50**	**$ 10,315,099.35**	**$ 10,608,134.99**	**$ 10,898,219.27**	**$ 11,185,122.75**	**$ 10,936,774.08**	**$ 9,676,032.41**	**$ 12,096,091.47**	**$ 12,380,037.95**	**$ 12,660,549.04**
LOW PERFORMANCE										
Ridership Revenue Loss	$ (7,566,655.20)	$ (7,762,761.07)	$ (7,958,866.93)	$ (8,154,972.80)	$ (8,351,078.67)	$ (8,547,184.53)	$ (8,743,290.40)	$ (8,939,396.27)	$ (9,135,502.13)	$ (9,331,608.00)
Adjusted Net Operating Income (ANOI)	**$ 7,980.30**	**$ 2,552,338.29**	**$ 2,649,268.06**	**$ 2,743,246.47**	**$ 2,834,044.08**	**$ 2,389,589.54**	**$ 932,742.01**	**$ 3,156,695.20**	**$ 3,244,535.82**	**$ 3,328,941.04**
AVERAGE PERFORMANCE										
Ridership Revenue Loss	$ (5,930,717.00)	$ (6,072,502.80)	$ (6,214,288.60)	$ (6,356,074.40)	$ (6,497,860.20)	$ (6,639,646.00)	$ (6,781,431.80)	$ (6,923,217.60)	$ (7,065,003.40)	$ (7,206,789.20)
Adjusted Net Operating Income (ANOI)	**$ 1,643,918.50**	**$ 4,242,596.55**	**$ 4,393,846.39**	**$ 4,542,144.87**	**$ 4,687,262.55**	**$ 4,297,128.08**	**$ 2,894,600.61**	**$ 5,172,873.87**	**$ 5,315,034.55**	**$ 5,453,759.84**
HIGH PERFORMANCE										
Ridership Revenue Loss	$ (4,294,778.80)	$ (4,382,244.53)	$ (4,469,710.27)	$ (4,557,176.00)	$ (4,644,641.73)	$ (4,732,107.47)	$ (4,819,573.20)	$ (4,907,038.93)	$ (4,994,504.67)	$ (5,081,970.40)
Adjusted Net Operating Income (ANOI)	**$ 3,279,856.70**	**$ 5,932,854.82**	**$ 6,138,424.72**	**$ 6,341,043.27**	**$ 6,540,481.02**	**$ 6,204,666.61**	**$ 4,856,459.21**	**$ 7,189,052.54**	**$ 7,385,533.28**	**$ 7,578,578.64**

Notes & Assumptions

CC processing fees estimated at 90% of revenue, using current 9% cost to RTD. 9% cost should be lower based on new volume.

See "MSM Quantity Chart" for meter calculations.

Meter expenses and related costs based on industry averages and historical data, and vary greatly based on competitive climate and quantities.

Meter battery replacement budgeted every 3 years.

Full meter replacement budgeted for year 7 (18% price increase).
Enforcement expenses assume 10 leased enforcement vehicles, each outfitted with Genetec AutoView mobile LPR system.
Full LPR system replacement budgeted for year 6 (15% increase).
Enforcement vehicle expenses based on current RTD lease/maintenance/gasoline costs.
Staffing assumed to be 10 FT enforcement staff and 3 FT maintenance/collection staff.
Payroll expenses assume all staff on 8 hour shifts Monday- Friday, based on current blended $15/hour plus 38% taxes, benefits, etc.
All expenses increase 3% annually, except:

Meter, meter mgmt,/comm fees and spare parts replacement w/18% increase in year 7.
Paper and batteries increase 15% after year 5 (assumes 5 year contract).
Extended meter warranty and service contracts increase 10% annually.
Mobile LPR & handheld related expenses increase 15% after year 5 (assumes 5 year contracts).

Unit Pricing:

MSM	$8,000	(PbP, AC mains, cash & CC, installed).
Spare Parts	$50,000	
MSM Receipt Paper	$40	(See MSM quantities tab for paper calculations).
MSM Battery	$140	
MSM Extended Warranty	$350	
MSM Service Contract	$400	
MSM Mgmt. & Comm. Fees	$60	
Mobile LPR System	$45,000	
LPR Extended Warranty	$5,300	
Remote Support & PM Contract	$1,800	per year, includes 2 onsite PMs/year.
Handheld Ticketing Device	$5,000	
Handheld Communication Fees	$100	per month.
Handheld Extended Warranty	$400	
LPR Vehicle Lease	$2,103	per month.

WALKER PARKING CONSULTANTS

Denver RTD PbP/Mobile LPR Operating and Maintenance Budget - Scenario C

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Parking Revenue	$ 14,555,112.00	$ 15,382,154.67	$ 16,209,197.33	$ 17,036,240.00	$ 17,863,282.67	$ 18,690,325.33	$ 19,517,368.00	$ 20,344,410.67	$ 21,171,453.33	$ 21,998,496.00
Citation Revenue	$ 727,755.60	$ 769,107.73	$ 810,459.87	$ 851,812.00	$ 893,164.13	$ 934,516.27	$ 975,868.40	$ 1,017,220.53	$ 1,058,572.67	$ 1,099,924.80
Credit Card Processing Fees	$ (1,146,215.07)	$ (1,211,344.68)	$ (1,276,474.29)	$ (1,341,603.90)	$ (1,406,733.51)	$ (1,471,863.12)	$ (1,536,992.73)	$ (1,602,122.34)	$ (1,667,251.95)	$ (1,732,381.56)
Total Revenue	**$ 14,136,652.53**	**$ 14,939,917.72**	**$ 15,743,182.91**	**$ 16,546,448.10**	**$ 17,349,713.29**	**$ 18,152,978.48**	**$ 18,956,243.67**	**$ 19,759,508.86**	**$ 20,562,774.05**	**$ 21,366,039.24**
Meter Expenses										
Meter Procurement (268)	$ 2,147,200.00	$ -	$ -	$ -	$ -	$ -	$ 2,303,360.00	$ -	$ -	$ -
Spare Parts	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ 59,000.00	$ -	$ -	$ -
Receipt Paper	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 22,960.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00	$ 26,404.00
Batteries	$ -	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 12,512.81	$ 14,389.73	$ -	$ 14,389.73	$ 14,389.73	$ 14,389.73
Extended Parts Warranty	$ -	$ 93,940.00	$ 103,334.00	$ 113,667.40	$ 125,034.14	$ 137,537.55	$ -	$ 108,031.00	$ 118,834.10	$ 130,717.51
Service Contract	$ -	$ 107,360.00	$ 118,096.00	$ 129,905.60	$ 142,896.16	$ 157,185.78	$ -	$ 123,464.00	$ 135,810.40	$ 149,391.44
MSM Mgmt. & Comm. Fees	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 193,248.00	$ 228,032.64	$ 228,032.64	$ 228,032.64	$ 228,032.64
Enforcement Expenses										
Mobile LPR Procurement (10)	$ 450,000.00	$ -	$ -	$ -	$ -	$ 517,500.00	$ -	$ -	$ -	$ -
LPR Extended Warranty	$ -	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ 53,000.00	$ -	$ 60,950.00	$ 60,950.00	$ 60,950.00	$ 60,950.00
Remote Support & PM Contract	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00	$ 20,700.00
Handheld Ticketing Device (10)	$ 50,000.00	$ -	$ -	$ -	$ -	$ 57,500.00	$ -	$ -	$ -	$ -
Handheld Communication Fees	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00	$ 13,800.00
Handheld Extended Warranty	$ -	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ -	$ 4,600.00	$ 4,600.00	$ 4,600.00
LPR Vehicle Lease (10)	$ 252,360.00	$ 259,930.80	$ 267,728.72	$ 275,760.59	$ 284,033.40	$ 292,554.41	$ 301,331.04	$ 310,370.97	$ 319,682.10	$ 329,272.56
Vehicle Maintenance	$ 15,000.00	$ 15,450.00	$ 15,913.50	$ 16,390.91	$ 16,882.63	$ 17,389.11	$ 17,910.78	$ 18,448.11	$ 19,001.55	$ 19,571.60
Vehicle Insurance	$ 113,160.00	$ 116,554.80	$ 120,051.44	$ 123,652.99	$ 127,362.58	$ 131,183.45	$ 135,118.96	$ 139,172.53	$ 143,347.70	$ 147,648.13
Gasoline	$ 72,000.00	$ 74,160.00	$ 76,384.80	$ 78,676.34	$ 81,036.63	$ 83,467.73	$ 85,971.77	$ 88,550.92	$ 91,207.45	$ 93,943.67
Payroll Expenses										
Mobile LPR Staffing	$ 430,560.00	$ 443,476.80	$ 456,781.10	$ 470,484.54	$ 484,599.07	$ 499,137.05	$ 514,111.16	$ 529,534.49	$ 545,420.53	$ 561,783.14
Maintenance and Collections	$ 129,168.00	$ 133,043.04	$ 137,034.33	$ 141,145.36	$ 145,379.72	$ 149,741.11	$ 154,233.35	$ 158,860.35	$ 163,626.16	$ 168,534.94
Total Expenses	**$ 3,955,656.00**	**$ 1,559,636.25**	**$ 1,611,044.71**	**$ 1,665,404.53**	**$ 1,722,945.15**	**$ 2,315,737.92**	**$ 3,920,923.69**	**$ 1,845,308.73**	**$ 1,905,806.35**	**$ 1,969,739.36**
Unadjusted Net Operating Income	**$ 10,180,996.53**	**$ 13,380,281.47**	**$ 14,132,138.20**	**$ 14,881,043.57**	**$ 15,626,768.14**	**$ 15,837,240.56**	**$ 15,035,319.98**	**$ 17,914,200.13**	**$ 18,656,967.70**	**$ 19,396,299.88**
LOW PERFORMANCE										
Ridership Revenue Loss	$ (17,516,174.00)	$ (17,746,904.36)	$ (17,977,634.71)	$ (18,208,365.07)	$ (18,439,095.42)	$ (18,669,825.78)	$ (18,900,556.13)	$ (19,131,286.49)	$ (19,362,016.84)	$ (19,592,747.20)
Adjusted Net Operating Income (ANOI)	**$ (7,335,177.47)**	**$ (4,366,622.88)**	**$ (3,845,496.51)**	**$ (3,327,321.49)**	**$ (2,812,327.28)**	**$ (2,832,585.22)**	**$ (3,865,236.15)**	**$ (1,217,086.36)**	**$ (705,049.14)**	**$ (196,447.32)**
AVERAGE PERFORMANCE										
Ridership Revenue Loss	$ (12,421,624.80)	$ (12,638,338.56)	$ (12,855,052.31)	$ (13,071,766.07)	$ (13,288,479.82)	$ (13,505,193.58)	$ (13,721,907.33)	$ (13,938,621.09)	$ (14,155,334.84)	$ (14,372,048.60)
Adjusted Net Operating Income (ANOI)	**$ (2,240,628.27)**	**$ 741,942.92**	**$ 1,277,085.89**	**$ 1,809,277.51**	**$ 2,338,288.32**	**$ 2,332,046.98**	**$ 1,313,412.65**	**$ 3,975,579.04**	**$ 4,501,632.86**	**$ 5,024,251.28**
HIGH PERFORMANCE										
Ridership Revenue Loss	$ (7,327,075.60)	$ (7,529,772.76)	$ (7,732,469.91)	$ (7,935,167.07)	$ (8,137,864.22)	$ (8,340,561.38)	$ (8,543,258.53)	$ (8,745,955.69)	$ (8,948,652.84)	$ (9,151,350.00)
Adjusted Net Operating Income (ANOI)	**$ 2,853,920.93**	**$ 5,850,508.72**	**$ 6,399,668.29**	**$ 6,945,876.51**	**$ 7,488,903.92**	**$ 7,496,679.18**	**$ 6,492,061.45**	**$ 9,168,244.44**	**$ 9,708,314.86**	**$ 10,244,949.88**

Notes & Assumptions

CC processing fees estimated at 90% of revenue, using current 9% cost to RTD. 9% cost should be lower based on new volume.
See "MSM Quantity Chart" for meter calculations.
Meter expenses and related costs based on industry averages and historical data, and vary greatly based on competitive climate and quantities.
Meter battery replacement budgeted every 3 years.
Full meter replacement budgeted for year 7 (18% price increase).
Enforcement expenses assume 10 leased enforcement vehicles, each outfitted with Genetec AutoView mobile LPR system.

Full LPR system replacement budgeted for year 6 (15% increase).
Enforcement vehicle expenses based on current RTD lease/maintenance/gasoline costs.
Staffing assumed to be 10 FT enforcement staff and 3 FT maintenance/collection staff.
Payroll expenses assume all staff on 8 hour shifts Monday- Friday, based on current blended $15/hour plus 38% taxes, benefits, etc.
All expenses increase 3% annually, except:

Meter, meter mgmt,/comm fees and spare parts replacement w/18% increase in year 7.
Paper and batteries increase 15% after year 5 (assumes 5 year contract).
Extended meter warranty and service contracts increase 10% annually.
Mobile LPR & handheld related expenses increase 15% after year 5 (assumes 5 year contracts).

Unit Pricing:

MSM	$8,000	(PbP, AC mains, cash & CC, installed).
Spare Parts	$50,000	
MSM Receipt Paper	$40	(See MSM quantities tab for paper calculations).
MSM Battery	$140	
MSM Extended Warranty	$350	
MSM Service Contract	$400	
MSM Mgmt. & Comm. Fees	$60	
Mobile LPR System	$45,000	
LPR Extended Warranty	$5,300	
Remote Support & PM Contract	$1,800	per year, includes 2 onsite PMs/year.
Handheld Ticketing Device	$5,000	
Handheld Communication Fees	$100	per month.
Handheld Extended Warranty	$400	
LPR Vehicle Lease	$2,103	per month.

WALKER
PARKING CONSULTANTS