

CASTLE ROCK TRANSIT FEASIBILITY STUDY

OCTOBER 2020



TABLE OF CONTENTS

INTRODUCTION

EXISTING CONDITIONS

STAKEHOLDER & COMMUNITY ENGAGEMENT

IDENTIFIED NEEDS AND OPPORTUNITIES

SERVICE MODEL EVALUATION

PREFERRED SERVICE MODEL ANALYSIS

RECOMMENDATIONS & IMPLEMENTATION PLAN

FUNDING CONSIDERATIONS

NEXT STEPS

LIST OF APPENDICES

APPENDIX A -

EXISTING CONDITIONS TECHNICAL MEMORANDUM

APPENDIX B -

STAKEHOLDER & COMMUNITY ENGAGEMENT SUMMARY REPORT

APPENDIX C -

SERVICE MODEL EVALUATION MATRIX

APPENDIX D -

SERVICE MODEL ANALYSIS TECHNICAL MEMORANDUM

PAGE

3

4

8

12

13

14

20

22

23

INTRODUCTION

The Town of Castle Rock is a standalone full-service community in the south Denver Metro Area and as of 2020 home to approximately 70,000 residents. At full buildout, the Town's population is projected to reach approximately 140,000 residents, with commercial and retail development expected to continue in areas such as Downtown, Promenade, and Millers Landing. In preparation for this anticipated growth, and in response to community interest in transit services, the Town embarked on a Transit Feasibility Study in fall 2019. This Study seeks to determine how transit could support the Town's multimodal transportation goals, identify community needs and opportunities, define what transit service models best meet those needs, and whether transit service provides good value based on a reasonable level of investment. The recommendations in this Study provide a framework for informed decision making by elected officials, staff, and community members. Currently, transit improvements are unfunded and there is no timeline for implementation. Additionally, the Town has many competing interests for transportation investment and will have to determine how to best allocate finite resources across community wants and needs. Although transit services can be supported through farebox and advertising revenue, transit does not typically pay for itself and requires a subsidy. As such, identifying sustainable funding sources will be critical if the Town moves forward with the implementation of public transit service.

TRANSIT FEASIBILITY STUDY HIGHLIGHTS

Key elements of the Transit Feasibility Study are highlighted in this report. Additional detail and findings from public outreach, data collection, and transit service model evaluation and analysis can be found in the appendices.

» Stakeholder and Public Engagement

Comprehensive stakeholder and public engagement efforts were the cornerstone of development of the Transit Feasibility Study. Public input was solicited from community members through online engagement tools, social media, public meetings, and a community survey. Town staff and project team members met with key stakeholder groups throughout the project and a "Focus Group," made up of stakeholders and elected and appointed officials served as thought leaders and advisors throughout the Study.

» Existing Conditions and Travel Patterns

A key element of the Study process was documenting existing local, regional, and interregional service providers to understand existing services and to inform gaps and needs. The existing conditions assessment also includes a summary of key destinations and local activity centers, key demographic indicators, and information about commuter travel patterns.

» Service Model Evaluation

Given that the Town of Castle Rock currently does not operate public transit service and is not a part of the Regional Transportation District (RTD), the Transit Feasibility Study provides an opportunity to look comprehensively at traditional transit service models and newer services to determine what services best meet the needs of Castle Rock. The service model evaluation provides a summary of potential transit service delivery models, how the services meet the community identified needs and opportunities, planning level cost estimates, and an overall assessment of feasibility. The evaluation screening resulted in three service models emerging as most feasible to move forward for further analysis and evaluation.

» Preferred Service Model Analysis

A comprehensive analysis of each of the three preferred service models that emerged from the evaluation was completed to determine service characteristics, potential ridership, order-of-magnitude costs, potential implementation phasing, and overall feasibility. The following service models were analyzed:

- Point-to-Point On-Demand Service
- Local Microtransit
- Commuter Service to/from RidgeGate Station

This report includes a summary of the preferred operating models for each of the three analyzed service types. All evaluated service models are feasible independently; however, it is important to note the ultimate implementation plan includes a combination of service models to best meet the needs of Castle Rock residents, employees, and visitors.

» Recommendations and Implementation Plan

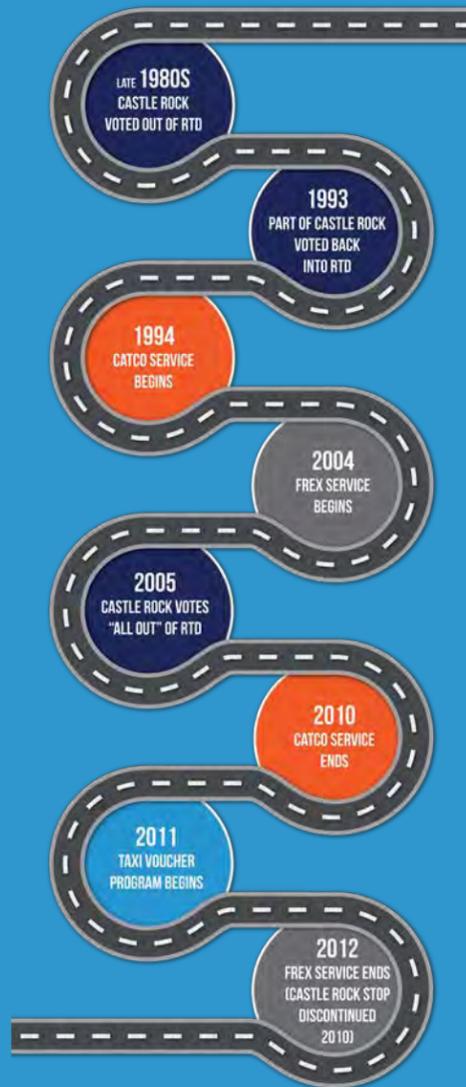
The culmination of the Transit Feasibility Study is an implementation plan that provides the Town with a path forward and options for how service could be phased in over time. The implementation plan includes a phased approach of all service models that grows incrementally over time with the final phase providing general public transit service throughout the Town and commuter service into the RTD network. Ultimately, Town Council, with input from the public and Town staff, will be responsible for determining policies, actions, timelines, and funding for the potential growth and implementation of public transit in Castle Rock. An exact timeframe for service implementation is to be determined.

Photo Credit: Town of Castle Rock

EXISTING CONDITIONS

HISTORY OF PUBLIC TRANSIT IN CASTLE ROCK

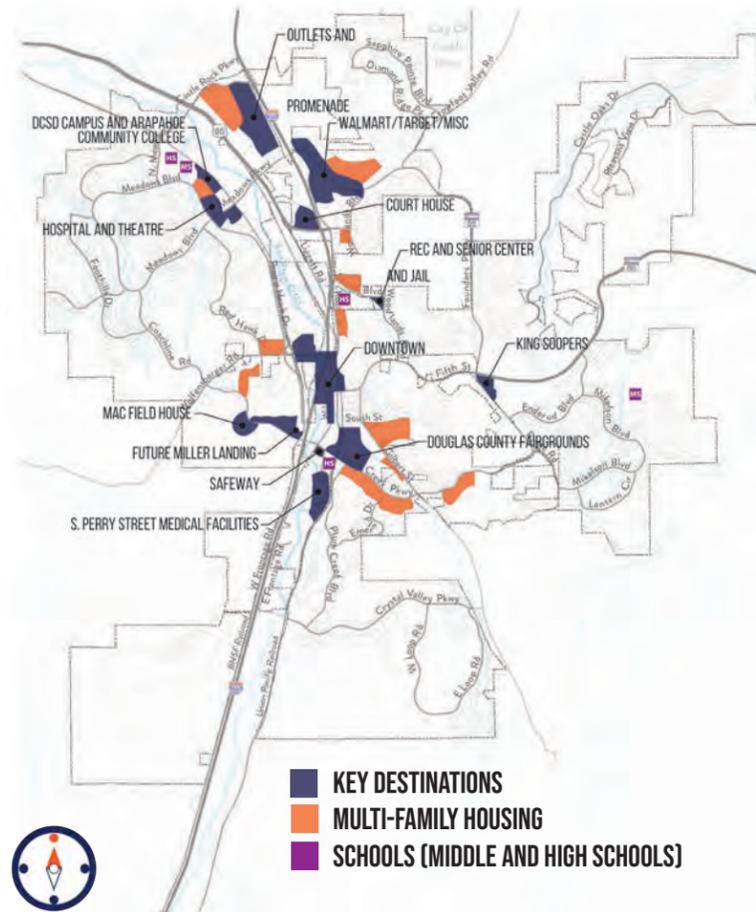
Transit in the Town of Castle Rock has a long history that has varied from the provision of local transit service (CATCO), serving as a stop for regional transit service (FREX), and the Town being both in and out of the RTD. Today, the Town funds and manages the Taxi Voucher Program and financially supports the Castle Rock Senior Activity Center's "Senior Shuttle," which both have ridership eligibility limitations. General public transit service is currently not available in Castle Rock.



The Town of Castle Rock is currently home to approximately 70,000 residents and at full build-out is projected to reach a population of approximately 140,000. With continued growth and development of residential, commercial, and retail uses across the Town, transit service must consider both existing destinations and planned areas of expansion to ensure potential transit service is effective and efficient.

The map below presents an overview of existing key activity centers and destinations within the Town to be considered in assessing the feasibility of transit in Castle Rock. A more in-depth summary of existing conditions in Castle Rock can be found in [Appendix A](#).

EXISTING KEY ACTIVITY CENTERS AND DESTINATIONS IN THE TOWN OF CASTLE ROCK



KEY DEMOGRAPHICS

When considering Castle Rock's mobility future and potential transit service, reviewing and analyzing available data uncovers potential gaps and needs in the transportation network. Populations that need special consideration and often have a higher than average need for transit and/or have limited access to transportation services and facilities include older adults, people with disabilities, minorities, low-income residents, people with limited English proficiency, households without a car, veterans, and youth. Castle Rock has a significant youth population, a high propensity of older adults and minorities, and other vulnerable populations to consider when planning for transit.

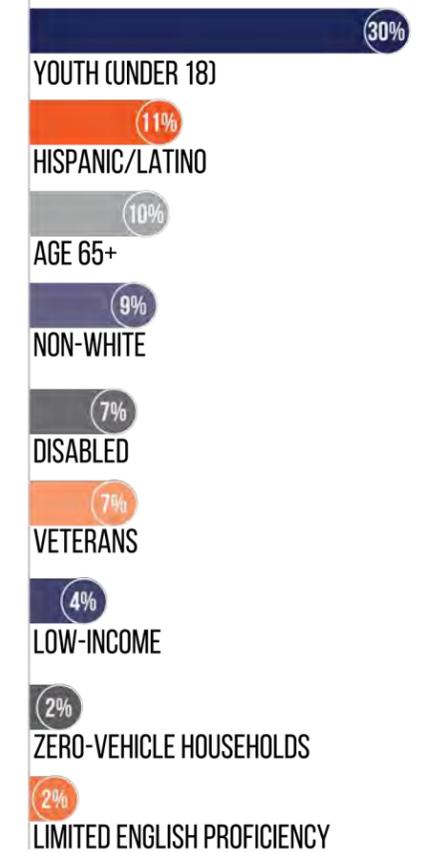


KEY COMMUTER INDICATORS

Commute patterns, both in and out of the Town of Castle Rock, provide vital insight into where people are traveling and informs potential demand for transit services. According to the U.S. Census Bureau's 2017 Longitudinal Employer Household Dynamics data, commuter inflow-outflow patterns for the Town indicate that approximately 23,500 Castle Rock residents commute out of Town for work, over 18,000 people commute to Castle Rock for work, and about 5,300 people both live and work in Town.

Most commuters travel north toward the Denver Metro Area, with the top destinations being Highlands Ranch, Denver, and Parker. The data indicates that a significant portion of the people who commute to Castle Rock for work come from the north with the highest percentage of commuters coming from Denver, Centennial, and Aurora.

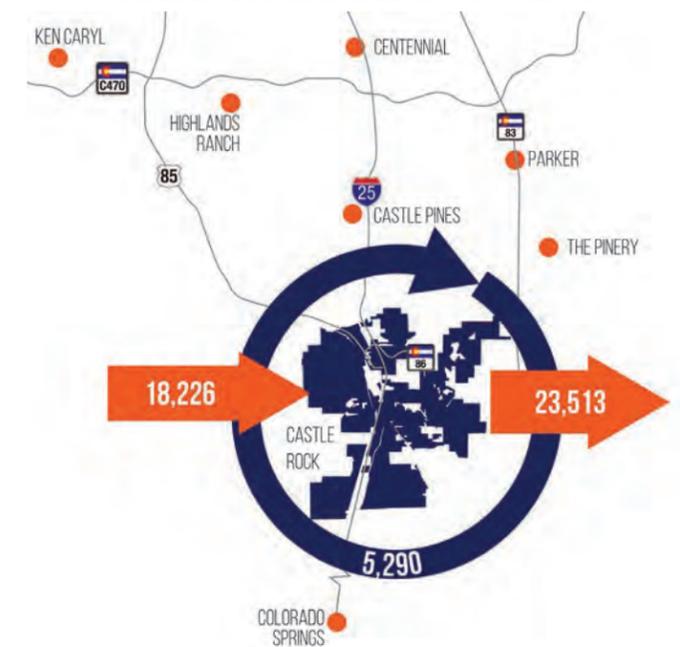
VULNERABLE POPULATIONS IN CASTLE ROCK



Source: U.S. Census Bureau American Community Survey 2018 1-Year Estimates.

Note: Residents may fall in one or more of the categories listed

CASTLE ROCK COMMUTER INFLOW/OUTFLOW WEEKDAY PATTERNS



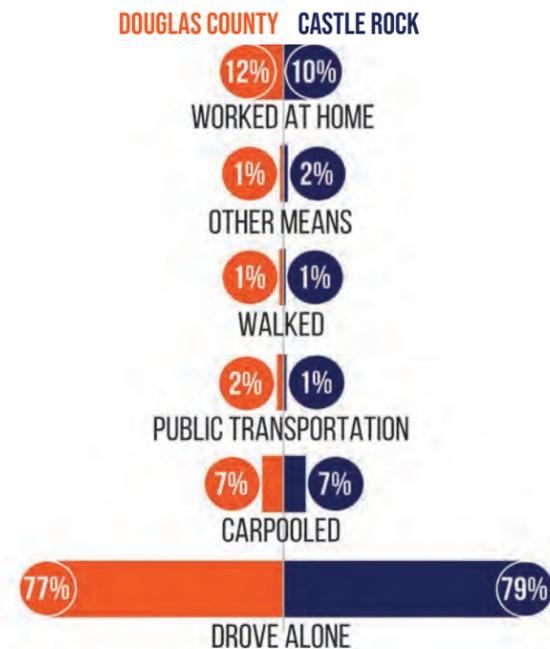
Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics, On the Map, 2017 (based on "All Jobs").

EXISTING CONDITIONS

Photo Credit: Town of Castle Rock

The 2018 United States Census American Community Survey data provides a snapshot of how commuters travel to work, also known as “commuter mode split.” Data indicates that nearly 80 percent of Castle Rock residents drive alone to work and 10 percent work from home, which is largely consistent with Douglas County’s means of transportation to work data. Given the lack of public transportation options in Castle Rock, it is not surprising that less than 1 percent of commuters report using public transportation to get to work. Approximately half of Castle Rock residents who commute to work travel between 10 to 24 miles each way.

CASTLE ROCK MEANS OF TRANSPORTATION TO WORK



Source: U.S. Census Bureau American Community Survey 2018 1-Year Estimates.

DISTANCE RESIDENTS TRAVEL TO WORK



Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics, On the Map, 2017 (based on “All Jobs”).

LOCAL TRANSIT SERVICE PROVIDERS

Currently, local public transportation options for people who live, work, and visit Castle Rock are limited. The Town provides the Taxi Voucher Program and financially contributes to the Senior Activity Center’s Senior Shuttle program, but both programs have user eligibility requirements and limited service hours. A few additional human services providers, as well as rideshare services such as Uber and Lyft, also operate in town.

» Town of Castle Rock Taxi Voucher Program

The Town of Castle Rock initiated the Taxi Voucher Program in 2011 to support the mobility needs of vulnerable populations in Castle Rock. The Taxi Voucher Program is currently limited to Castle Rock residents who cannot drive, who have a disability that prevents them from driving, and who do not have access to a vehicle. Additional eligibility requirements include being a resident of the Town of Castle Rock and being at least 18 years old (16 to 17 year olds can use the service for work trips with parental consent). Community members who meet the eligibility requirements can use the service for work, medical/dental, grocery, and pharmacy related trips only.

The service operates Monday through Friday from 7:00 AM to 4:30 PM. Each passenger pays a \$2 base fare, and the Town contributes up to \$8 per trip. If the cost of the trip exceeds \$10, the passenger must pay the difference. In 2019, the Taxi Voucher Program provided over 1,500 one-way trips. The Town contributes \$25,000 to the program annually as approved by Town Council, which is subject to change and currently contracts with Metro Taxi to operate the service. The Town releases a Request for Proposal annually to allow competitive bidding from interested service providers.

» Castle Rock Senior Activity Center

The Castle Rock Senior Activity Center’s transportation program serves seniors (age 50+) and people with disabilities in Castle Rock, Castle Pines, Larkspur, Sedalia, Perry Park, Louviers, and Franktown. The Senior Shuttle provides local trips (e.g., grocery shopping, dentist) and individual “special” rides for medical appointments at facilities in the Denver Metro Area. Service operates from 9:00 AM to 3:00 PM, Monday through Friday. In 2019, the Senior Activity Center provided 8,500 one-way trips. Currently, the program is funded through grants, contracts from service entities, voluntary contributions, and local agency support. The Town of Castle Rock provides \$60,000 to support the program, the appropriated amount must be approved by Town Council on an annual basis.

REGIONAL TRANSIT SERVICE PROVIDER

Currently, there is no general public regional transit service available for Castle Rock residents. There are several human services transportation providers, but many of these services have eligibility restrictions and limitations on the types of trips it can serve.

» Regional Transportation District

The Denver Metro Area’s regional transit provider is the RTD. Castle Rock residents voted “all out” of RTD in 2005; therefore, regional service from the Denver area does not provide a direct connection to the Town of Castle Rock. Other parts of Douglas County, including Lone Tree, Highlands Ranch, and Parker, are within RTD’s service area and have varying levels of local, regional, and Flex Ride bus service. The Southeast Light Rail line terminates at the RidgeGate Station, which is the closest location for Castle Rock residents to access the regional transit network. Castle Rock residents may use the RidgeGate Station Park-n-Ride but are considered “out of district” users and must pay \$4 per day to park, in addition to the transit fares.

» Human Services Transportation Providers

Two primary human services transportation providers serve Castle Rock residents: 1) Aging Resources of Douglas County, which provides regional transit service for adults with disabilities and people over age 60 for medical appointments, local errands, visiting loved ones, adult day programs, and other social activities within the County, and 2) Continuum of Colorado, which provides services for people with a wide range of abilities to access day programs, work, and other activities. Continuum of Colorado serves a large portion of the Denver Metro Area, including Castle Rock.

INTERREGIONAL TRANSIT SERVICE PROVIDERS

» Bustang, Colorado Department of Transportation’s (CDOT) Interregional Service

Bustang launched in 2015 with routes serving I-25 from Fort Collins to Colorado Springs and I-70 from Denver to Grand Junction. The “Bustang South Line” travels through Castle Rock on I-25 but currently does not stop in the Town. CDOT is currently working to improve multimodal connectivity along Bustang routes and has identified Castle Rock as a location for a future stop and buildout of a mobility hub. CDOT is still in the planning phase and coordinating with local partners on mobility hub siting, funding strategies, and service operations.

Colorado’s Southwest Chief and Front Range Passenger Rail Commission is currently studying the potential of Front Range Passenger Rail to connect the front range of Colorado from New Mexico to Wyoming. The completion of the study is slated for 2021 and will include an implementation strategy. One of CDOT’s key strategies in the near term is to locate and build any new mobility hubs to be able to seamlessly transition from bus to rail service in the future.

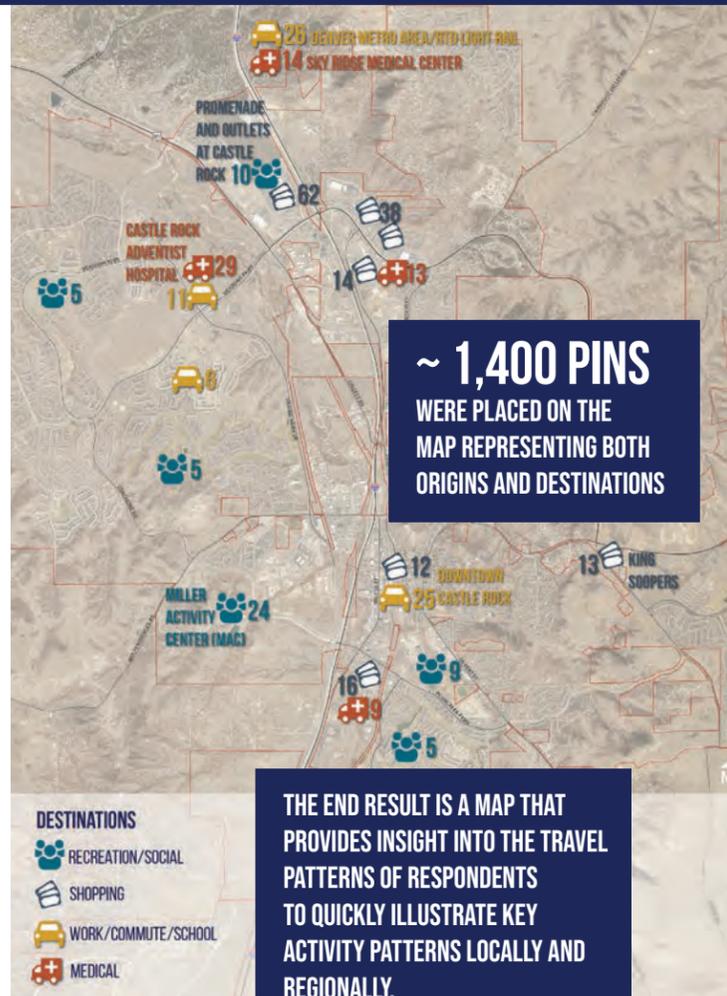
STAKEHOLDER AND COMMUNITY ENGAGEMENT

To understand gaps, needs, and alternatives for potential transit service in the Town of Castle Rock, several public engagement efforts were conducted. To ensure accessible and varied ways to provide feedback, an online commenting map, idea wall, questionnaire, stakeholder interviews, and public open-house meetings and pop-up events were organized as a part of the public engagement process. This engagement effort gathered input from elected officials, stakeholders, and community members. The results helped to inform how to plan transit to meet the needs of Castle Rock residents and take advantage of the opportunities offered through a connected and accessible transit system. The full Community and Stakeholder Engagement Summary Report can be found in **Appendix B**.

KEY DESTINATIONS BY TRIP TYPE

The key destinations by trip type map demonstrates that questionnaire respondents travel to **regional destinations** like the Denver Metro Area and **local shopping and medical facilities** within the Town of Castle Rock.

AN ONLINE COMMENTING MAP, HOSTED BY SOCIAL PINPOINT, ALLOWED STAKEHOLDERS AND COMMUNITY MEMBERS TO IDENTIFY THEIR LOCAL AND REGIONAL TRAVEL PATTERNS



IDEA WALL

The Transit Feasibility Study project webpage hosted an idea wall that encouraged residents to provide their thoughts and suggestions on how to improve mobility around Castle Rock.

315 IDEA WALL COMMENTS RECEIVED

Participants engaged with one another by liking and disliking each other's comments.

278 LIKES
275 DISLIKES

KEY THEMES

THE IDEA WALL REVEALED THAT RESPONDENTS WERE INTERESTED IN **REGIONAL CONNECTIVITY AND SUPPORTING OLDER ADULTS, PEOPLE WITH DISABILITIES, AND LOW-INCOME POPULATIONS**. INNOVATION AND TECHNOLOGY WERE ALSO MENTIONED AS IMPORTANT COMPONENTS OF FUTURE MOBILITY OPTIONS.

THERE WERE NUMEROUS RESPONDENTS WHO SAID THEY WERE NOT INTERESTED IN THE DEVELOPMENT OF PUBLIC TRANSIT IN CASTLE ROCK.

PUBLIC AND STAKEHOLDER INPUT COMMON THEMES



A series of stakeholder interviews and public open-house and pop-up events were conducted to seek input about the community's interest, need, and vision for public transit. The goal was to understand realistic options considering the Town's finite revenue resources and if implemented, what the most important characteristics of a transit service would be.

When you think of the **future of transit** in Castle Rock, what does it look like?

- » Transit should be a **mixture of options and solutions** to **meet community needs**.
- » Transit options need to be **affordable, reliable, easy to use, and safe**.
- » Transit options need to help **reduce congestion and overall emissions**.
- » **Collaborate with other programs** to build on their success, for example, Windcrest senior housing Uber/Lyft voucher program.
- » Transit travel times need to be **competitive with vehicle drive times**.

Where should **service be provided** or what other services should be connected?

- » It is important to service **local high density areas** (both residential and commercial).
- » It is important to provide **connections to Downtown**; it could serve as a "transit hub."
- » Bustang is needed and can help serve **regional connections**.
- » **Regional options** need to connect with the RidgeGate Light Rail Station.

What are the **highest priority populations** we should be serving with transit?

- » Transit should **serve all people** within the Town.
- » Castle Rock should **focus services on no-vehicle households, youth, and vulnerable populations**.
- » It is challenging to get **entry-level and retail workers** into Town and people to fill retail jobs.
- » Options need to be **ADA accessible**.
- » **Extended hours of operation**—into the evening—are needed to serve those who work non-traditional hours.

PUBLIC OUTREACH & STAKEHOLDER ENGAGEMENT MEETINGS & ACTIVITIES

| 2019 | 2020 |
|--|---|
| NOVEMBER | JANUARY |
| <ul style="list-style-type: none"> • FOCUS GROUP MEETING #1 • TOWN-WIDE POSTCARD MAILING • PUBLIC OPEN HOUSE • DOWNTOWN DEVELOPMENT AUTHORITY • STARLIGHTING | <ul style="list-style-type: none"> • PUBLIC WORKS COMMISSION • RTD • MILLERS LANDING AND BUSTANG • DOUGLAS COUNTY TRANSIT SOLUTIONS |
| DECEMBER | FEBRUARY |
| <ul style="list-style-type: none"> • CASTLE ROCK PLANNING COMMISSION • CITY OF LONE TREE • VIA TRANSPORTATION SERVICES • METRO TAXI OF DENVER • CASTLE ROCK MOBILITY HUB, BUSTANG AND CDOT • METRO TAXI • SENIOR CENTER | <ul style="list-style-type: none"> • TOWN COUNCIL OPEN HOUSES • OUTLETS AT CASTLE ROCK • OAKWOOD SENIOR CENTER • FOCUS GROUP MEETING #2 |
| ONLINE MAP, IDEA WALL, AND QUESTIONNAIRE OPEN TO THE PUBLIC | MARCH |
| | <ul style="list-style-type: none"> • FOCUS GROUP MEETING #3 |
| | JULY |
| | <ul style="list-style-type: none"> • FOCUS GROUP MEETING #4 |
| | AUGUST |
| | <ul style="list-style-type: none"> • CHAMBER OF COMMERCE • CASTLE ROCK PLANNING COMMISSION |
| | SEPTEMBER |
| | <ul style="list-style-type: none"> • ADDITIONAL STAKEHOLDER MEETINGS (TBD) • PUBLIC WORKS COMMISSION • PUBLIC REVIEW/COMMENT OF DRAFT STUDY |
| | OCTOBER |
| | <ul style="list-style-type: none"> • FEASIBILITY STUDY ADOPTION BY TOWN COUNCIL |

QUESTIONNAIRE SUMMARY

The Transit Feasibility Study questionnaire included questions related to the community's potential support for a future transit system, how they would use it, the groups that should be served by transit, and key destinations in and around Castle Rock.

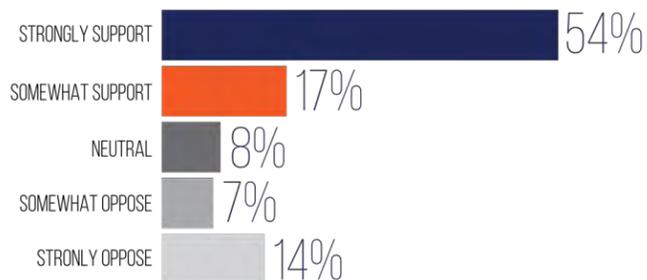
More than 400 individual questionnaire responses were received. The results reinforced themes found in the online commenting map, idea wall, and public and stakeholder meetings. There is general support for transit, and respondents are most concerned with developing a transit system that is well-equipped to serve vulnerable populations.

Most respondents said it would be beneficial to establish regional connectivity to major destinations and offer local access along key town corridors.

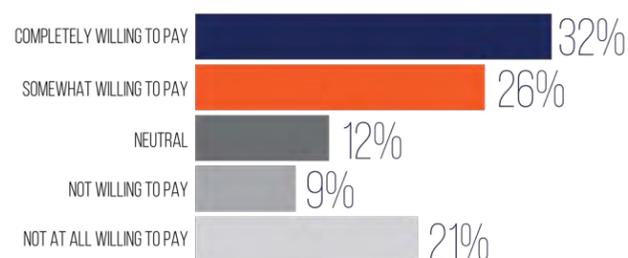
While the questionnaire was not conducted in a statistically valid manner, the results do provide valuable insight into community perspectives on the potential development of transit in Castle Rock.

It is important to note that the questionnaire was conducted prior to the COVID-19 pandemic. Responses do not reflect changes in travel patterns that have occurred in 2020.

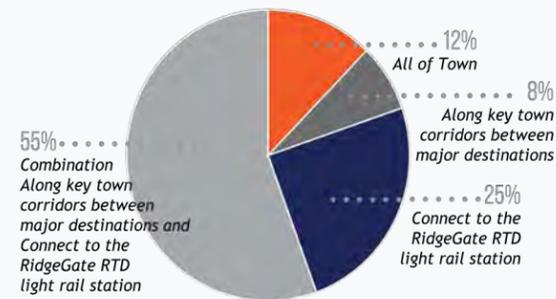
Would you support or oppose the Town investing in public transportation services within the Town limits of Castle Rock?



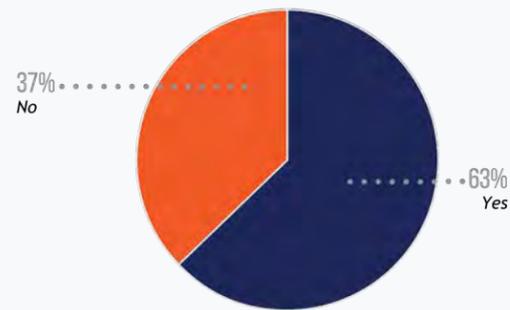
Would you be willing to pay an additional tax so that the Town can develop a public transportation system within the Town of Castle Rock?



If transit was provided, where would transit be most beneficial?

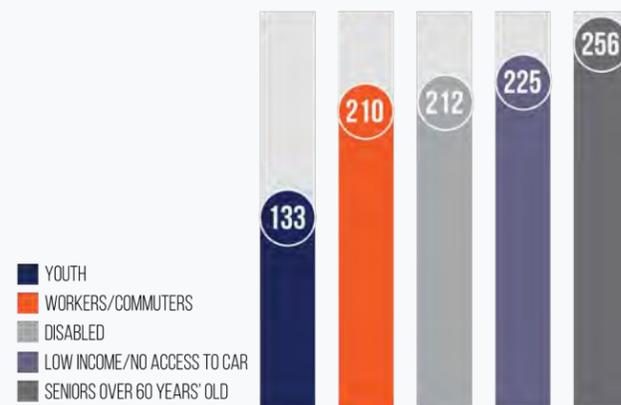


Do you commute outside Town for work/school?



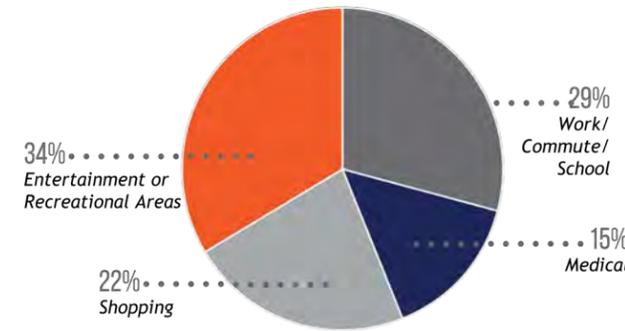
THE MAJORITY (63%) OF RESPONDENTS COMMUTE OUTSIDE OF THE TOWN FOR WORK AND/OR SCHOOL. OF THOSE WHO COMMUTE, 64% LEAVE THEIR HOME BEFORE 8:00 AM TO GET TO WORK/SCHOOL AND 70% LEAVE WORK BETWEEN 4:00 TO 6:00 PM.

What population groups are the most important for transit to serve?



VULNERABLE COMMUNITIES ARE DEFINED AS OLDER ADULTS, LOW-INCOME, MINORITIES, PEOPLE WITH DISABILITIES, YOUTH (AGES 6-17), THOSE WITH LIMITED ENGLISH PROFICIENCY, AND ZERO VEHICLE HOUSEHOLDS.

Which types of trips would you use transit for?



WHEN RESPONDENTS WERE ASKED ABOUT THE TYPES OF TRIPS THEY WOULD USE TRANSIT FOR, THE RESULTS WERE EVENLY DISTRIBUTED DEMONSTRATING BOTH NEED AND INTEREST TO USE TRANSIT FOR A VARIETY OF PURPOSES.

21% of respondents said the lack of transit prevents them from traveling more often.

Of the people who strongly or somewhat support investing in transit, respondents said they would use these service to get to:

177

Entertainment/Recreation

157

Commute to School/Work

129

Shopping

85

Medical

Of the people who strongly or somewhat support investing in transit, the most important service characteristics included:

232

Stop Locations

218

Service Hours

149

Cost to the Rider

GETTING TO KNOW THOSE WHO WOULD SUPPORT A FUTURE TRANSIT SYSTEM

Of the almost 300 people who strongly or somewhat support investing in future public transit services, 81 percent would be willing to pay up to \$4.00 for one-way service, and 170 of those respondents commute outside of town. Relatedly, respondents identified stop locations and service hours as the most important service characteristics of a potential transit service.

STAKEHOLDER AND COMMUNITY ENGAGEMENT RESULTS

The various public engagement opportunities revealed consistent interests and concerns for how transit should be developed, who it needs to serve, and the areas it should connect.

All public input showed strong interest in **providing regional connectivity** for residents and people who work in Castle Rock. Similarly, public input demonstrated strong support, even among those who said they are not interested in developing transit, for providing more mobility options to **serve vulnerable populations**.

Respondents also want transit service to be considerate of different hours and shifts of people who work in town, as well as the need for safer and more accessible mobility options. Additionally, providing reliable and connected service can potentially lead to expansion of higher-wage jobs and **support population growth** in the Town.

As seen in the public and stakeholder input and the Study questionnaire results, many respondents are interested in having mobility options to access local commercial areas and busy Downtown events, demonstrating support for linking the development of transit to **enhancing economic sustainability**. The full Community and Stakeholder Engagement Summary Report can be found in **Appendix B**.

IDENTIFIED NEEDS AND OPPORTUNITIES

Review and analysis of the input from key stakeholders and community members, along with available data, informed how transit could support needs across the community as well as help shape future growth and development. The identified needs and opportunities served as a tool throughout the study process to evaluate potential transit service for Castle Rock.

IDENTIFIED NEEDS & OPPORTUNITIES



ACCESS TO/FROM:

- Regional transit connections/hubs
- Regional medical facilities
- Jobs in Castle Rock and surrounding communities



ACCESS TO/FROM:

- Jobs within Castle Rock and regionally
- Douglas County Justice Center
- Local and regional medical facilities (e.g., SkyRidge, Kaiser)
- Necessities within town (e.g., food, medical, clothing, haircuts, etc.)
- Social and community services and events to support quality of life
- School/college



ACCESS TO/FROM:

- Regional transit service to bring workers into town from surrounding communities
- Local service to support access to local jobs and social activities/events



ACCESS TO:

- Jobs within Castle Rock and regionally
- Downtown, recreational facilities, and major activity centers
- Regional connections to bring workers into town from surrounding communities
- More mobility options thereby minimizing congestion and providing an opportunity to manage parking demand

SERVICE MODEL EVALUATION

The Service Model Evaluation looked at nine potential transit service types for the Town of Castle Rock, including everything from light rail transit to shuttles to vanpools. The intent of the Service Model Evaluation was to use community and stakeholder input, along with key data, to determine which models would best suit the identified mobility needs and opportunities for Castle Rock and which service types should move forward for additional analysis. A snapshot of the Service Model Evaluation is below; the full evaluation can be found in [Appendix C](#).

Feasibility Considerations:

Does the service:

- Support community identified needs and opportunities
- Provide good value to the Town based on the level of investment (cost/rider)
- Provide flexibility given the Town's unique built environment
- Allow for growth over time to support demand

| SERVICE MODEL | NEEDS/OPPORTUNITIES | COST | FEASIBILITY |
|--|---------------------|----------|-------------|
| LIGHT RAIL TRANSIT | 👁️👁️👁️👁️ | \$\$\$\$ | 👁️ |
| FIXED-ROUTE REGIONAL BUSES | 👁️👁️👁️👁️ | \$\$\$ | 👁️ |
| FIXED-ROUTE LOCAL BUSES | 👁️👁️👁️ | \$\$\$ | 👁️ |
| CIRCULATOR | 👁️👁️👁️ | \$\$ | 👁️ |
| POINT-TO-POINT ON-DEMAND SERVICE | 👁️👁️👁️ | \$ | 👁️ |
| COMMUTER SERVICE TO/FROM RIDGEGATE STATION | 👁️👁️👁️👁️ | \$\$ | 👁️ |
| MICROTRANSIT (LOCAL) | 👁️👁️👁️ | \$\$ | 👁️ |
| VANPOOL | 👁️👁️ | \$ | N/A** |
| CARPPOOL | 👁️👁️ | \$ | N/A** |

KEY COST PER REVENUE HOUR*: \$ LESS THAN \$75 \$\$ \$75-\$125 \$\$\$ \$125-\$225 \$\$\$\$ MORE THAN \$225
 FEASIBILITY: 👁️ LOW 👁️ MEDIUM 👁️ HIGH

*Average operating costs per revenue service hour: the average cost for one vehicle to supply transportation services for one hour.

**Denver Regional Council of Governments (DRCOG) serves as the regional ridematching provider; service by the Town would be duplicative.

Through discussions with Focus Group members and stakeholders, the list of transit services was successfully narrowed down to three service models that were deemed feasible and effective in being able to meet current and future mobility needs.

All service model options were reviewed in isolation of one another to ensure each service was able to operate independently and provide sustainable transit service. However, as the evaluation process was refined, there were opportunities to also pair service models and refine services to better meet community needs. This is further explored in the recommendations and implementation summary later in this report.

Many residents indicated interest in extending light rail to Castle Rock. At this time, this is not feasible because:

1. Castle Rock is not a member of RTD
2. It is cost prohibitive (\$1B to build 10-mile extension).

THREE SERVICE MODELS EMERGED FROM THE EVALUATION FOR FURTHER ANALYSIS

- POINT-TO-POINT ON-DEMAND SERVICE
- LOCAL MICROTRANSIT SERVICE
- COMMUTER SERVICE TO/FROM THE RTD RIDGEGATE LIGHT RAIL STATION

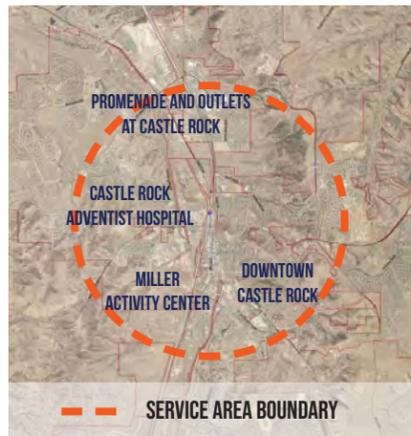
PREFERRED SERVICE MODEL ANALYSIS

1. POINT-TO-POINT ON-DEMAND SERVICE

This service model modifies the Town's current service and focuses on local trips within Castle Rock where any rider would request a ride and be picked up and dropped off at their destination within town limits, similar to a taxi service. Two point-to-point on-demand models were evaluated as part of the analysis, both assuming the Town would contract directly with a provider. The two models analyzed were:

- 1) Town Contracts with a Ridehailing Company** (e.g., Uber or Lyft) to provide service that is open to the general public for local trips within town limits using a technology-based platform.
- 2) Town Expands the Existing Taxi Voucher Program** to be open to the general public and operates similar to how it works today.

POTENTIAL POINT-TO-POINT ON-DEMAND SERVICE MAP



HOW DOES THIS MODEL MEET THE NEEDS AND OPPORTUNITIES?



- Would maintain current taxi voucher boundaries (Town of Castle Rock)
- 15-30 minute wait time
- Could provide weekday service and potential 6-day service depending on funding
- Service hours would be structured to ensure reliable evening service; providing more transit service availability throughout the day
- Provides local access to/from work within Town limits
- Service model can be scaled up as population increases
- Trip types and eligibility can be expanded in phases
- Potential to expand booking structure to on-demand platform to make the service more attractive and user friendly

The Castle Rock Senior Activity Center's Senior Shuttle program would continue to operate under all scenarios; the Point-to-Point On-Demand Service would augment existing service and expand operating hours.

PREFERRED OPTION

Based on the evaluation and analysis, Option 1 – Town Contracts with a Ridehailing Company (e.g., Uber or Lyft) is the preferred option for several reasons, including: lower cost per rider, more flexibility in service, national service model recognition and marketing strategies, and technology-based booking to make service easier to use and more attractive to riders. This report includes information about how this service type meets the identified needs and opportunities and details about operating characteristics. The detailed analysis of the Point-to-Point On-Demand Service can be found in [Appendix D](#).

POTENTIAL IMPLEMENTATION PHASING

Two options for potential implementation phasing are outlined on the next page. Option 1 uses the existing pricing structure for the Taxi Voucher Program in the Town, with a \$2 base fare and the Town paying up to \$8 of the fee, with the rider paying anything over \$10. Under this option, it is estimated 8 to 12 vehicles will be needed for fully operational service to cover the entire Town of Castle Rock. Option 2 would have a \$2.50 shared ride fare and a \$5.00 regular fare, and 10 to 15 vehicles would be needed to provide reliable service to meet demand.

POTENTIAL IMPLEMENTATION PHASING

| FARE STRUCTURE | COST RANGE (LOW-HIGH) | DAYS OF SERVICE (7AM-10PM) | RIDERSHIP FORECAST | COST TO TOWN (YEARS 2+) | VEHICLES IN SERVICE | GEOGRAPHIC COVERAGE |
|--|-----------------------|----------------------------|--------------------|-------------------------|---------------------|---------------------|
| OPTION 1 \$2 base fare, Town pays up to \$8 | ● | Mon-Fri | 60,000 | \$380,000 | 8 | Town of Castle Rock |
| | ● | Mon-Fri | 90,000 | \$685,000 | 12 | |
| | ● | Mon-Sat | 80,000 | \$510,000 | 8 | |
| | ● | Mon-Sat | 120,000 | \$915,000 | 12 | |
| OPTION 2 \$2.50 shared ride fare, \$5 regular fare | ● | Mon-Fri | 80,000 | \$455,000 | 10 | |
| | ● | Mon-Fri | 110,000 | \$835,000 | 15 | |
| | ● | Mon-Sat | 100,000 | \$585,000 | 10 | |
| | ● | Mon-Sat | 150,000 | \$1,120,000 | 15 | |

The cost to implement the preferred Point-to-Point On-Demand Service is exponentially higher than what the Town is providing for the Taxi Voucher Program today. With that in mind, an incremental approach to implementing Point-to-Point On-Demand Service would likely be needed to phase the service in over time. Conceptual phasing options are summarized below.

| PHASE 1: | PHASE 2: | PHASE 3: | PHASE 4: | PHASE 5: |
|--|---|---|--|--|
| CONTINUE CURRENT TAXI VOUCHER PROGRAM - ALLOW ALL TRIP TYPES & EXTEND SERVICE HOURS TO 10 PM | CONTINUE TAXI VOUCHER PROGRAM AND EXPAND ELIGIBILITY TO SENIORS | CONVERT PROGRAM TO ON-DEMAND WITH RIDE HAILING PROVIDER | OPEN ELIGIBILITY TO THE GENERAL PUBLIC | EXPAND DAYS OF SERVICE TO INCLUDE SATURDAY |
| \$35K - \$50K/Year | \$60K - \$90K/Year | \$150K - \$250K/Year | \$380K - \$915K/Year | \$455K - \$1.1M/Year |

Note: Cost estimates for each Phase are cumulative

Phased Implementation Service Assumptions

- Hours/Days of Service: 7 AM -10 PM, Monday-Friday
- Phase 1 includes the current allocation to the Taxi Voucher Program
- Maintain Taxi Voucher Program fare structure until Phase 3; then convert to \$2.50 for a shared ride and \$5 for regular one-way fare

Point-to-Point On-Demand Service Considerations

- Town would need to coordinate with current Taxi Voucher Program provider to determine agency capacity to expand service hours and accommodate an increase in demand in each phase
- Town would need to coordinate with ridehailing agencies to determine if the travel market in Castle Rock is sufficient to attract a national partner for the provision of service
- Implementation of robust marketing campaigns are critical to the success of program expansion and growth of new riders
- Important to operate new service levels for at least one-year to assess service performance and to determine opportunities for scaling of service
- Important to assess and monitor service using preset performance measures to track how the service is meeting Town identified goals over time

2. LOCAL MICROTRANSIT SERVICE

Microtransit is a form of demand response transit that leverages smartphone technology using a smartphone app to match trip requests in real-time to dynamic/flexible routes in a defined service area. Trip requests are typically filled within 15 minutes and riders are picked up and dropped off within a short distance of their origin and destination points at “virtual” bus stops (typically one to two blocks or less).

Two general public microtransit service models for the Town of Castle Rock were analyzed:

1) Turnkey Contract, where the Town contracts directly with an experienced vendor to manage all service aspects, including provision of vehicles and drivers, the technology platform, and all reporting and program administration. Several microtransit service providers operate in the US today, including RideCo, Via, Spare, and TransLoc. This service is often referred to as Mobility as a Service (Maas).

2) Agency Operated, where the Town would operate and manage the service directly with agency-owned vehicles and agency-employed drivers, but the technology platform to enable real-time ride-matching would be purchased on a subscription basis per vehicle operated. This service is often referred to as Software as a Service (Saas).

The Castle Rock Senior Activity Center’s Senior Shuttle program would continue to operate under all scenarios; the Local Microtransit Service would augment existing service and expand operating hours.

PREFERRED OPTION

Based on the evaluation and analysis, implementation of microtransit as a Turnkey – or Mobility as a Service – model is preferred. Turnkey service offers the following advantages:

- Offers a faster and simpler implementation; the Town currently does not operate transit service in-house
- Eliminates the need for the Town to purchase and maintain vehicles and other equipment
- Leverages vendor’s expertise, technology, and ability to scale operations based on real-time demand
- Transfers compliance and reporting requirements to the vendor and minimizes risk to the Town
- Provides a high-quality mobility option that is flexible, responsive, and easy-to-use
- Allows accommodations for ADA passengers by providing curb-to-curb service as needed, smartphone and telephone booking options, and both electronic and cash fare collection

Additional detail about the preferred Local Microtransit Service model can be found in [Appendix D](#).

HOW DOES THIS MODEL MEET THE NEEDS AND OPPORTUNITIES?



- Fare structure balances convenience and affordability
- Trip wait times would be on average close to 15 minutes
- Microtransit fleet would ensure ADA-accessible vehicles and curb pickups as needed
- Call-in booking option would be available to users without access to a smartphone



- Service model requires key destinations within service area, such as shopping/retail, employment centers, and/or transit hubs, be served
- Connecting high activity centers in town can aid businesses by increasing access to locations in a convenient and efficient manner
- Provides local access to/from work within Town limits



- Microtransit service is a flexible option that can be used to provide transit in areas without existing service or supplement regional transit service at a future date
- Service is easy to use and could provide an additional mobility option for those who live, work, and visit Castle Rock
- Potential to have phased service expansion, allowing transit service to grow alongside the Town

POTENTIAL IMPLEMENTATION PHASING

| IMPLEMENTATION PHASE | FARE STRUCTURE | COST RANGE (LOW HIGH) | DAYS OF SERVICE (7AM-10PM) | RIDERSHIP FORECAST | COST TO TOWN (YEARS 2+)* | VEHICLES IN SERVICE | SERVICE AREA BOUNDARY |
|----------------------|----------------|-----------------------|----------------------------|--------------------|--------------------------|---------------------|--|
| PHASE 1 | \$2/Trip | ● LOW ● HIGH | Mon-Fri | 23,000 - 27,000 | \$290K - \$390K | 1-2 | Phase 1 Service Area Boundary (20 Sq. Miles) |
| | | | Mon-Sat | 31,000 - 38,000 | \$440K - \$580K | 1-2 | |
| PHASE 2 | \$2/Trip | ● LOW ● HIGH | Mon-Fri | 36,000 - 48,000 | \$455K - \$835K | 3-5 | Phase 2 Service Area Boundary (20-35 Sq. Miles) |
| | | | Mon-Sat | 44,000 - 60,000 | \$585K - \$1.1M | 3-5 | |
| PHASE 3 | \$2/Trip | ● LOW ● HIGH | Mon-Fri | 45,000 - 64,000 | \$1.2M - \$1.5M | 5-7 | Phase 3 Service Area Boundary (Full Town Limits) |
| | | | Mon-Sat | 56,000 - 82,000 | \$1.6M - \$2.1M | 5-7 | |

* Does not include fare revenue

The cost to implement the preferred Turnkey Local Microtransit Service is much higher than what the Town is providing for the Taxi Voucher Program today. An incremental approach to implementing Local Microtransit Service would likely be needed. It is estimated that one to two years would be required for each phase of service expansion to reach complete stability and determine viability of service. Conceptual phasing options and costs are summarized below.

PHASE 1:

IMPLEMENT INITIAL SERVICE ZONE (20 SQ. MILES)

\$290K - \$580K/Year

PHASE 2:

EXPAND SERVICE ZONE (25-35 SQ. MILES)

\$455K - \$1.1M/Year

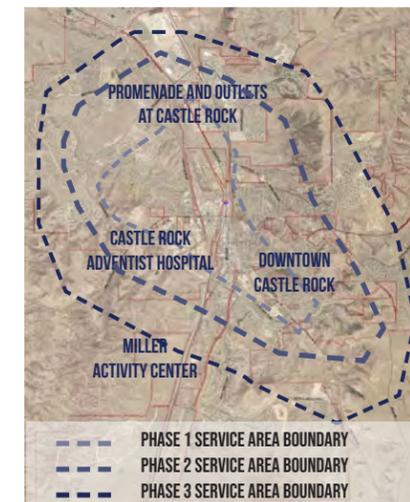
PHASE 3:

EXPAND SERVICE ZONE TO COVER TOWN LIMITS

\$1.2M - 2.1M/Year

Note: Cost estimates for each Phase are cumulative

POTENTIAL LOCAL MICROTRANSIT SERVICE MAP



This concept map is for illustrative purposes only and does not represent where final service areas will be defined

A separate ADA service will need to be provided until local microtransit expands to cover the full Town limits.

Phased Implementation Service Assumptions

- Hours/Days of Service: 7 AM -10 PM, Monday-Friday
- Cost estimates represent gross costs (e.g., does not include potential fare or advertising revenue)
- Trips would be fulfilled within 15 minutes or less
- Passengers walk one to two blocks to virtual bus stops to access service
- ADA service (curb-to-curb) service available on request
- Flat fare of \$2 per one-way trip

Local Microtransit Service Considerations

- Town would need to coordinate with private microtransit providers to gauge interest and obtain service simulations and market drive cost estimates
- Turnkey service can be deployed quickly when compared to implementation of Town operated service
- Under a turnkey model, the Town would lose some control over service quality, customer experience, and operational procedures
- Implementation of robust marketing campaigns is critical to the success of program expansion and growth of new riders
- Important to maintain new service levels for at least one to two years to assess service performance and to determine opportunities for scaling of service
- Important to assess and monitor service using preset performance measures to track how the service is meeting Town identified goals

3. COMMUTER SERVICE TO/FROM RIDGEGATE STATION

This service model focuses on the provision of regional transit service to connect Castle Rock residents to the Denver Metro Area’s regional transit network and key activity centers and to provide mobility options for people coming to Castle Rock for work. Three Commuter Service Models were evaluated as part of the analysis, all assuming the Town would contract directly with a service provider. The models analyzed were:

1) Traditional Commuter Fixed-Route Service that would operate on a specific route with defined stops and pick-up times.

2) Microtransit Flex Route Service that would provide a microtransit service zone along I-25 between Downtown and Castle Rock Parkway. For residents located outside of the microtransit service zone, riders would need to drive to the park-n-ride to connect to the commuter service. Direct commuter service would be provided to the RidgeGate Station from the park-n-ride location in Castle Rock at the north end of the microtransit zone at fixed timepoints.

3) Hybrid Service combines aspects of the traditional fixed route commuter service and the microtransit flex route service. This model provides a fixed-route with scheduled timepoints combined with a deviated fixed-route microtransit zone in a small area around the route. Riders could go to one of the scheduled stops for pickup or request a microtransit pickup. The remainder of the route operates as fixed-route to the RidgeGate Station.

PREFERRED OPTION

The Castle Rock Senior Activity Center’s Senior Shuttle program would continue to operate under all scenarios; the Commuter Service would augment existing service and expand operating hours.

Based on the evaluation and analysis, the Hybrid Service is the preferred model for the provision of commuter service to the RidgeGate Station. This model assumes a turnkey contract with a private provider and use of their microtransit technology to provide real-time service in the microtransit zone in conjunction with the fixed-route elements of the service. This model allows riders to choose whether to go to a stop or request a real-time trip at or near their home, provides additional geographic coverage, and minimizes the need for people to get in their cars. The Hybrid Service can operate independently as a regional fixed-route service and/or in conjunction with either the Point-to-Point On-Demand Service or Local Microtransit Service if implemented by the Town. The detailed analysis of the Commuter Service model evaluation can be found in [Appendix D](#).

HOW DOES THIS MODEL MEET THE NEEDS AND OPPORTUNITIES?

- PROVIDE REGIONAL CONNECTIVITY**
 - Service provides connections to the Denver Metro Area transit network
 - Opportunity to phase in service over time as ridership and demand for service increase
- SERVE VULNERABLE POPULATIONS**
 - Service flexibility for scheduled stops and microtransit options to meet needs of all users
 - Microtransit hybrid service would offer pickup/drop-off within a block or two of a rider’s home
 - All vehicles would be ADA accessible and call-in trip booking options would be available for those without a smartphone
- ENHANCE ECONOMIC SUSTAINABILITY**
 - Increased local and regional connectivity would allow greater access to Castle Rock and could lead to greater economic activity in commercial and retail areas
 - Greater connectivity between the Town and other parts of the Denver Metro Area may attract more employers to Castle Rock and expand the labor pool
 - Provides regional and local access to/from work within the Town
- SUPPORT POPULATION GROWTH**
 - The Hybrid Service model allows more residents to access the fixed-route service without getting in their cars
 - Service provides real-time, dynamic routing, which is attractive to choice riders

POTENTIAL IMPLEMENTATION PHASING

The implementation of Hybrid Service could be phased in over time based on the number of roundtrips provided each day. The implementation of a new commuter service will require extensive marketing and outreach efforts to make residents and employees aware of the service and will likely take at least one to two years to fully mature. Ultimately, ridership and service demand will inform the need to increase the number of roundtrips per day.

| IMPLEMENTATION PHASE | FARE STRUCTURE | ROUNDTrips/DAY | DAYS OF SERVICE | COST RANGE (LOW HIGH) | RIDERSHIP FORECAST | COST TO TOWN * | VEHICLES IN SERVICE | GEOGRAPHIC COVERAGE |
|----------------------|-----------------------------------|----------------|-----------------|-----------------------|--------------------|----------------|---------------------|-----------------------------------|
| PHASE 1 | \$2/trip-fixed-route stop pickup | 8 | Mon-Fri | (● LOW ● HIGH) | 23,000 | \$200K | 1 | Castle Rock to Ridge-Gate Station |
| | \$3/trip-microtransit zone pickup | | | 27,000 | \$270K | | | |
| PHASE 2 | \$2/trip-fixed-route stop pickup | 12 | Mon-Fri | (● LOW ● HIGH) | 36,000 | \$310K | 1 | Castle Rock to Ridge-Gate Station |
| | \$3/trip-microtransit zone pickup | | | 48,000 | \$400K | | | |
| PHASE 3 | \$2/trip-fixed-route stop pickup | 16 | Mon-Fri | (● LOW ● HIGH) | 45,000 | \$410K | 1 | Castle Rock to Ridge-Gate Station |
| | \$3/trip-microtransit zone pickup | | | 64,000 | \$540K | | | |

* Does not include fare revenue



Note: Cost estimates for each Phase are cumulative

POTENTIAL COMMUTER SERVICE TO RIDGEGATE STATION MAP



The concept map is for illustrative purposes only and does not represent where final service areas will be defined

Phased Implementation Service Assumptions

To maximize ridership growth, ease of use, community adoption, and convenience, it is recommended that the Hybrid Service model:

- Operate Monday through Friday with a minimum of four roundtrips in the AM and four roundtrips in the PM
- Operate with a small shuttle type vehicle that accommodates between 18 to 24 passengers
- Provide ADA accessible vehicles for all trips and call-in options for microtransit service
- Allow cash and online prepay fare collection
- Consider that commuter transportation choices are determined by choice and convenience; given that parking at the RidgeGate Station is \$4 per day, a fare of \$2 per one-way trip for fixed-route service and \$3 per one-way trip if a user elects to use the microtransit service would provide competitive service

RECOMMENDATIONS AND IMPLEMENTATION PLAN

The three transit service models, Point-to-Point On-Demand, Local Microtransit, and Commuter Service, are all feasible options for the Town of Castle Rock. While each service model could be implemented independently and would support some of the needs and opportunities of the Town, an implementation plan that provides elements of each provides a strategic approach to growing transit service over time based on user demand and availability of funding.

SERVICE IMPLEMENTATION RECOMMENDATIONS

- 1 Early stages of service expansion and implementation should focus on providing mobility for vulnerable populations and access to jobs.
- 2 After initial service expansion for vulnerable populations, expand service to the general public to support population growth and provide commuter connections to/from the regional transit network.
- 3 Ensure adequate investment in marketing of new and expanded services to create a successful, sustainable program (see **Appendix D** for a high-level Strategic Marketing Plan).
- 4 Establish performance metrics and goals prior to implementing new services and/or expanding service to be able to monitor progress over time.
- 5 Allow service to establish itself for at least one year, and even up to 18 months to two years, prior to determining overall viability of service and need to increase or decrease service levels.
- 6 Gather input from the public and key stakeholders regularly to identify opportunities for improvement and ways to pivot to make the service more successful.

WHAT ABOUT BUSTANG?

As CDOT moves forward with the planning and implementation of Bustang service expansion along I-25 and a potential Mobility Hub in Castle Rock, the Town will need to coordinate closely to ensure that any local and/or commuter services are designed to complement or supplement one another in terms of stop locations and service schedules to maximize ridership.



Photo Credit: RideBustang

POTENTIAL IMPLEMENTATION PHASING

Developing a conceptual phasing plan allows the Town to consider how to implement transit service over time and be responsive to policy actions, funding opportunities, community needs, and existing and future service demand. The following phased implementation approach builds on existing service such as the Taxi Voucher Program, adds technology-based service models like Point-to-Point On-Demand Service and/or Microtransit Service, and ultimately provides general public transit to the entire Town and connections to/from the regional transit network. It is important to note that phasing recommendations are fiscally unconstrained and new funding for transit would need to be assessed against all unfunded transportation services and infrastructure wants and needs.

PHASE 1: EXPAND TAXI VOUCHER SERVICE HOURS AND ALLOW ALL TRIP TYPES

- 7AM - 10PM; Monday - Friday
- Maintain current eligibility
- Continue advance booking requirements
- Maintain current fare structure

PHASE 1 COST ESTIMATE: \$35,000-\$50,000/YEAR

Phase 1 includes the Town's current \$25,000 year-to-year allocation to the Taxi Voucher Program. All costs in subsequent phases are cumulative.

PHASE 2: CONVERT TAXI VOUCHER PROGRAM TO ON-DEMAND SERVICE AND EXTEND ELIGIBILITY

- 7AM - 10PM; Monday - Friday
- Same eligibility as Phase 1, add seniors
- On-demand booking
- Maintain current fare structure

PHASE 2 COST ESTIMATE: \$150,000-\$250,00/YEAR

In the implementation phasing approach, Phase 3 indicates transitioning the Taxi Voucher Program to "On-Demand Service." This implementation plan does not explicitly define if this should be Point-to-Point On-Demand Service or Microtransit Service. The ultimate on-demand service model will be selected based on partnership options, what service best meets community needs, and which service best aligns with budgetary considerations.

PHASE 3: TRANSITION TAXI VOUCHER PROGRAM TO GENERAL PUBLIC ON-DEMAND SERVICE

- 7AM - 10PM; Monday - Friday
- Implement on-demand service to cover one zone
- Open service to the general public
- Taxi voucher program continues to operate outside of on-demand zone
- Fare structure: \$2/one way trip

PHASE 3 COST ESTIMATE: \$300,000/\$600,000/YEAR

PHASE 4: IMPLEMENT HYBRID COMMUTER SERVICE AND EXPAND ON-DEMAND SERVICE

- Add 8 commuter service roundtrips/day
- On-demand service to cover town limits; discontinue taxi voucher program
- Fare structure: \$2/one-way on-demand trip; \$2-3 per one-way commuter trip

PHASE 4 COST ESTIMATE: \$1.2M-\$2.4M/YEAR

The phased implementation plan includes components of each of the three preferred service models analyzed during this Study. Therefore the planning level cost estimates do not directly mirror the service costs identified in the Preferred Service Model Analysis section of this report.

PHASE 5: TRANSIT SYSTEM ESTABLISHED; ASSESS AND MONITOR SERVICE FOR GROWTH/EXPANSION

FUNDING CONSIDERATIONS

Funding has not been identified in the Town's budget or Capital Improvement Program to expand transit service in Town. With an understanding of feasible operating models and planning level cost estimates, Town staff, elected officials, and the community are equipped to make informed decisions and determine if and how to expand mobility options in Castle Rock.

Transit funding comes in many forms, and there is no one-size-fits all solution. If the Town decides to move forward with its vision for public transit, creativity and resourcefulness will be imperative for success. While there are number of funding opportunities at the state and federal levels, the availability of funds is extremely limited and highly competitive. The following summarizes funding options for consideration at the federal, state, and local levels. Additional details about funding sources can be found in **Appendix D**.

General public transit service is a community service provided to meet the needs, values, and priorities of a community. Funding of transit is of critical importance as all transit services are subsidized and cannot subsist on farebox and advertising revenue alone. Identifying and securing funding for public transit service is the lynch pin in moving transit forward for the Town of Castle Rock.

FEDERAL FUNDING

Federal transit grants are managed and awarded by the Federal Transit Administration (FTA) and are split into two categories: formula grants and discretionary grants. Formula grants are awarded based on a formula, usually allocated according to population, ridership, and/or system extent, and are not competitive. Additionally, capital infrastructure funds are available at the federal level for projects ranging from major busway and rail systems to stop and station improvements. The adjacent list of federal programs focuses on operating funds as all recommendations in this Study include turnkey operations with a private contractor.

- FTA Section 5307 – Formula Grants for Urbanized Areas (RTD is the designated recipient for the Denver-Aurora Urbanized Area)
- FTA Section 5310 - Enhanced Mobility of Seniors and Individuals with Disabilities (Denver Regional Council of Governments is the designated recipient for the Denver-Aurora Urbanized Area)
- FTA Integrated Mobility Innovation
- FTA Mobility On-Demand Sandbox Program
- Surface Transportation Block Grants
- Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants

STATE FUNDING

State funding for transit projects is allocated through CDOT's Division of Transit and Rail. Annual funding availability can vary, and traditionally, state funds have been used to support the development of the interregional bus network and transit capital projects. State funding is highly competitive and typically local match is required. It is recommended the Town coordinate with CDOT, especially in light of COVID-19 impacts, to determine potential funding to support new transit service operations in Castle Rock.

- Funding Advancements for Surface Transportation (FASTER)
- Senate Bill 09-228
- Senate Bill 17-267

LOCAL FUNDING

Many transit services are supported by community-based funding initiatives such as sales/property tax, newly formed transit taxing districts, and public private partnerships. Additionally, many communities allocate funds from their general fund and/or program dollars from the Capital Improvement Program to support mobility services. The Town will need to evaluate competing transportation needs and priorities - including transit - in its budgeting process each year.

- Sales, property, payroll, and/or lodging tax
- Transportation utility fees
- Public-private-nonprofit partnerships
- Transit district with taxing authority
- General fund
- Capital Improvement Program
- Farebox and advertising revenues

NEXT STEPS

The Transit Feasibility Study indicates that most stakeholders and residents who provided input support the expansion of public transit in Castle Rock and there are three service models that independently, or in combination, support the community identified transit needs and opportunities. However, given that there is currently no funding in place to implement transit, several next steps are needed to move transit forward.

- Conduct additional research on federal and state grant opportunities to determine which have the most potential; submit grant applications as appropriate.
- Meet with CDOT, DRCOG, and RTD to determine if any formula or discretionary grants are available to support transit service in Castle Rock.
- Meet with Douglas County, other agencies, and surrounding communities regarding potential partnerships and/or shared services.
- Meet with community partners (e.g., developers, shopping/retail centers, hospitals, etc.) to determine viability of public/private partnerships to fund transit service (e.g., cost sharing agreements, advertising, etc.).
- Collaborate with Town leadership and elected officials to identify any policy changes and/or actions needed to financially support, and ultimately implement, new and/or expanded transit service.
- Assess this plan as part of the annual budgeting process to evaluate and determine funding priorities across all transportation needs and desires.
- Coordinate with CDOT to plan for the expansion of the Bustang South Line, infrastructure improvements, and integration of local/regional services.
- Meet with private sector taxi, rideshare, and microtransit providers to further vet each service model and determine which providers are interested in serving the Town of Castle Rock and which is most viable to meet community needs.
- Conduct stakeholder and public outreach for all phases of service implementation to gather feedback on proposed service delivery, operational characteristics, service area, fares, etc.
- Develop comprehensive financial, operational, and marketing plans for the implementation of each phase of service and/or service type.
- Prior to implementation of any new and/or expanded service, develop performance measures so that the Town can quantitatively track progress toward meeting identified goals.

The availability of mobility options for both transit dependent and choice transit riders gives people freedom on how, when, and where they choose to travel. This Study confirms that several transit service models are viable for the Town of Castle Rock that independently or in combination help meet the identified needs and opportunities of serving vulnerable populations, enhancing economic sustainability, supporting population growth, and providing regional connectivity.

Photo Credit: LiveCrystalValley



LET'S TALK TRANSIT

CRGOV.COM/TRANSITSTUDY



APPENDIX A

EXISTING CONDITIONS TECHNICAL MEMORANDUM

OCTOBER 2020



TRANSIT FEASIBILITY STUDY



TRANSIT FEASIBILITY STUDY

TO: Tom Reiff
FROM: Cady Dawson & Rocio Ramirez
DATE: October 2020
RE: Castle Rock Transit Feasibility Study Existing Conditions Summary Report

1. History of Transit in the Town of Castle Rock

The Town of Castle Rock is not currently served by the Regional Transportation District (RTD). The Town voted out of the district in 1975. In 1993, new state legislation was passed to allow all town annexations to be included in RTD. However, in 2005, the Town voted “all out” of the District, and as such, no service connecting into the regional network is provided.

The Clean Air Transit Company’s (CATCO) local circulator transit service began operating in the Town in 1994. The service primarily offered transportation for visitors at the Outlets at Castle Rock shopping center. In 1999, management of the service shifted to the Town, along with proposed service expansion to more communities in Castle Rock. Increasing ridership, community support, and population growth were all contributing factors to the resulting increase of CATCO transit service throughout the Town. For years CATCO’s transit service continued to have broad public support and healthy ridership numbers. In August 2010, the Town of Castle Rock was not able to continue funding the operation of the transit service, and CATCO provided their last service in December 2010.

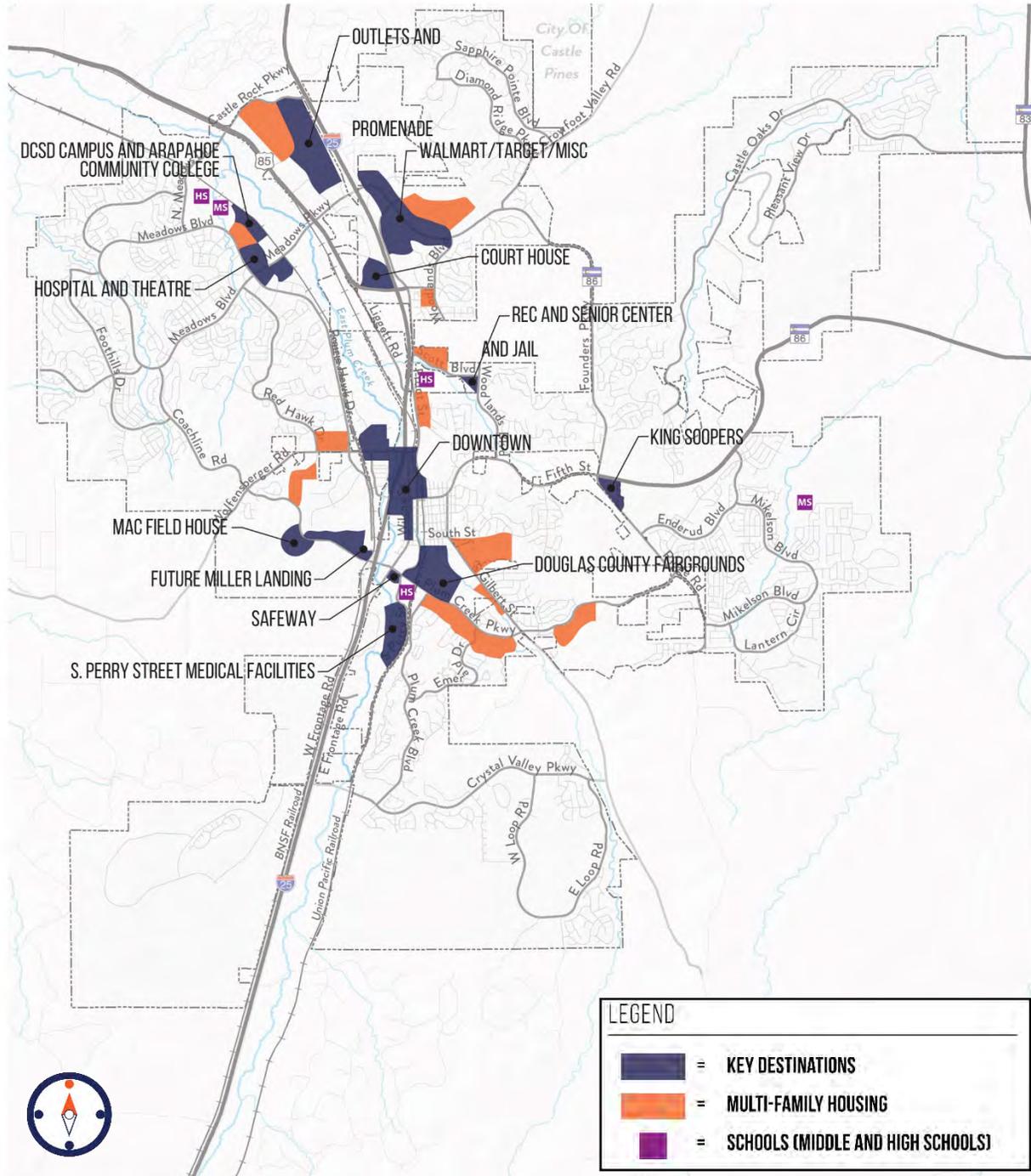
From 2002 through 2003, the Colorado Department of Transportation (CDOT) conducted a Front Range Commuter Bus Study to identify the feasibility of a transit service connecting Denver and Colorado Springs. The study found there was sufficient interest and ridership that would use an express commuter transit service. Front Range Express (FREX), operated by Mountain Metro Transit, began service in 2004. FREX provided weekday service during peak-hour commute times along the I-25 corridor, making stops in Monument, Castle Rock, and the Denver Tech Center. In 2009, the Town of Castle Rock opted out of the service. Due to consistent funding challenges, FREX was unable to continue operation and stopped services in 2012.

In 2011, the Town of Castle Rock implemented the Town funded Taxi Voucher Program to support the mobility needs of those who cannot drive, are unable to drive due to a disability, or do not have access to a vehicle. This service is still in operation and provided over 1,500 rides to Castle Rock residents in 2019. More about this service is provided in the Local, Regional and Interregional Service summaries later in this memo.

2. Existing Conditions

The Town of Castle Rock continues to grow, and any development of transit service should consider both existing destinations and potential areas of expansion to ensure an effective and sustainable service model. **Figure 1** presents a conceptual map of possible trip origins and destinations to aid in identifying the areas that possible transit routes may serve.

FIGURE I: KEY ACTIVITY CENTERS AND DESTINATIONS



Source: Castle Rock Transportation Master Plan, 2017

A. Local Transit Service

Taxi Voucher Program

In response to discontinued transit services, like FREX and CATCO, and the transit need of older adults, a taxi voucher program was initiated. Currently, Metro Taxi is the service operator. Every year the program conducts a Request for Proposals and the contract is later approved by the Town. The service operates from Monday through Friday, from 7:00 AM to 4:30 PM. Passenger fares are a total of \$10. The Town pays up to \$8 of the total fare; if the trip total is more than \$10, the passenger must cover the remaining difference in addition to the required \$2 fee.

To use the taxi voucher service, all trips must begin and end in the Town. Passengers must also be a resident of Castle Rock, 18 years or older, and not have access to a vehicle or have a disability. Young adults, ages 16 to 17, may also use the taxi voucher program for work trips. The service can be used only for work, medical/dental, grocery, and pharmacy trips. In 2019, the taxi voucher program provided a little over 1,500 trips. The Town of Castle Rock contributes \$25,000 to fund the service annually.

Castle Rock Senior Center

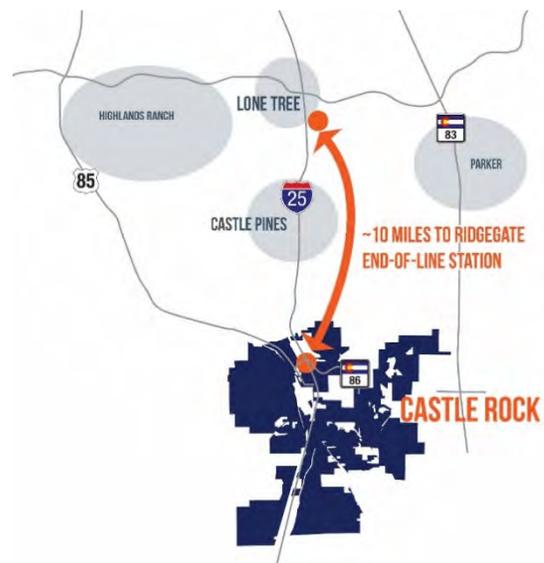
The Castle Rock Senior Center’s transportation program, the Senior Shuttle, serves seniors (age 50+) and people with disabilities in Castle Rock, Castle Pines, Larkspur, Sedalia, Perry Park, Louviers, and Franktown. The Senior Shuttle provides local trips (e.g., grocery shopping, dentist) and individual “special” rides for medical appointments at facilities in the Denver metro area. Service operates from 9:00 AM to 3:00 PM, Monday through Friday. Local trips must be booked one day in advance, and “special” rides must be booked one week in advance. The service operates Monday through Friday, from 9:00 AM until 3:00 PM, and all medical trips are prioritized over other trips.

This past year, the Center provided approximately 8,500 total trips for people with disabilities or those over the age of 50 who needed transportation services. Fares for the transportation service are provided on a voluntary basis. The program provides a voluntary contribution fare information sheet in their welcome letter. Roundtrip service within the Town of Castle Rock has a voluntary fare of \$4.00, while longer trips to the Denver metro area have a suggested roundtrip fee of \$40.00. The program is funded through grants, contracts from service entities, voluntary contributions, and the Town. The Town of Castle Rock provides \$60,000 to fund this much needed service.

B. Regional Transit Service

Regional Transportation District

The Denver metro area’s regional transit provider is the RTD. Castle Rock residents voted “all out” of RTD in 2005; therefore, regional service from the Denver area does not provide a direct connection to the Town of Castle Rock. Other parts of Douglas County, including Lone Tree, Highlands Ranch, and Parker, are within RTD’s service area and have varying levels of local, regional, and Flex Ride bus service. The Southeast Light Rail line terminates at the RidgeGate Station, which is 10 miles north and the closest point for Castle Rock residents to access the regional transit network. Castle Rock residents may use the Park-n-Ride but are considered “out of district” users and must pay \$4 per day to park, in addition to the transit fares.



Aging Resources of Douglas County

Another important transit service in the area is offered by Aging Resources of Douglas County. Aging Resources of Douglas County provides regional transit service throughout the county. Service is dependent on the availability of volunteer drivers and staff at Aging Resources. People who need transit service are asked to schedule trips at least five days in advance.

The service is primarily used for medical appointments, local errands, visiting loved ones, adult day programs, and other social activities. Adults with disabilities or people over the age of 60 are eligible to use the service. Using this service comes at no cost to passengers who are Neighbor Network members. Volunteer donations are encouraged to aid in funding for vehicle maintenance cost, insurance, and other administrative efforts operated by Aging Resources of Douglas County.

Continuum of Colorado

Continuum of Colorado is a nonprofit agency that provides services for people with a wide range of abilities. Transportation services are offered to individuals' homes, day programs, work, and other activities. Continuum of Colorado serves a large portion of the Denver metro area, including Aurora, Castle Rock, Centennial, Denver, Englewood, Highlands Ranch, Littleton, and Parker.

To the Rescue

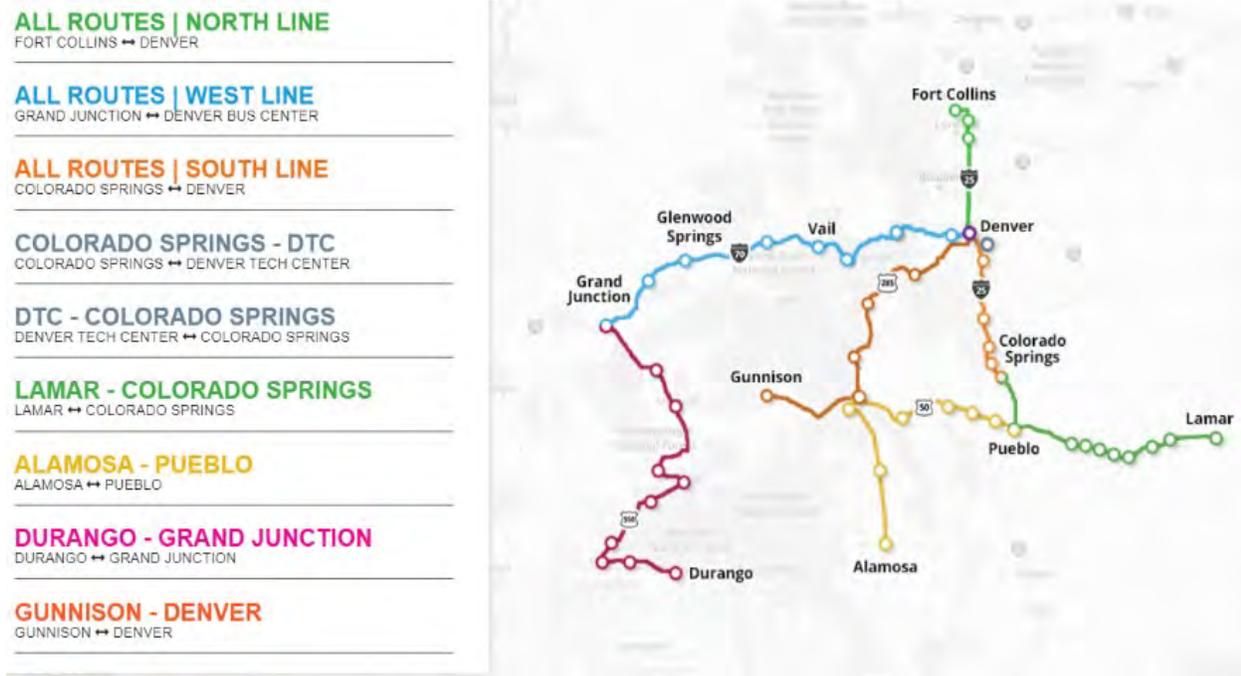
To the Rescue is a Comprehensive Life Services company that currently serves communities in Iowa and Colorado. To the Rescue offers door-to-door transportation services for people in Parker and surrounding communities.

C. Interregional Service Providers

Bustang

CDOT's interregional bus service, Bustang, currently does not serve the Town of Castle Rock. The Bustang South Line, depicted on **Figure 2**, goes through the Town, using the I-25 corridor to reach Colorado Springs. Current planning efforts are underway to establish multimodal connectivity along the I-25 and I-70 corridors through the development of mobility hubs. Proposed transit stations and mobility hubs are planned to be built out within 10 miles of each other to facilitate increased Bustang service frequency and later to allow a more seamless transition to Front Range Passenger Rail service. At this time, there are efforts to develop a mobility hub in the Town of Castle Rock. Mobility hub location, design, and construction date are all still under consideration.

FIGURE 2: BUSTANG & BUSTANG OUTRIDER SERVICE MAP



Source: RideBustang.com.

Potential Front Range Passenger Rail

Front Range Passenger Rail is in the early stages of conceptualization. Progress is being made to understand opinions and interest in developing a passenger rail system that would connect the Front Range. The Southwest Chief, Front Range Passenger Rail Commission, and CDOT’s Office of Innovative Mobility produced a preliminary survey to gather feedback on future passenger rail service.

The survey data collection period started in July and ended in late September 2019. In total, almost 7,000 survey responses were gathered, indicating that 95 percent of respondents believe that passenger rail service could help address transportation needs along the Front Range. Most survey respondents, 93 percent, also supported the establishment of a passenger rail line between Fort Collins and Pueblo. Survey respondents stated they would like to use passenger rail service for tourism/recreation and personal/shopping trips. Respondents were asked to drop pins for areas or cities they would want as potential origins or destinations. The Town of Castle Rock was one of the cities that received a large number of pin drops.

D. Demographic Summary

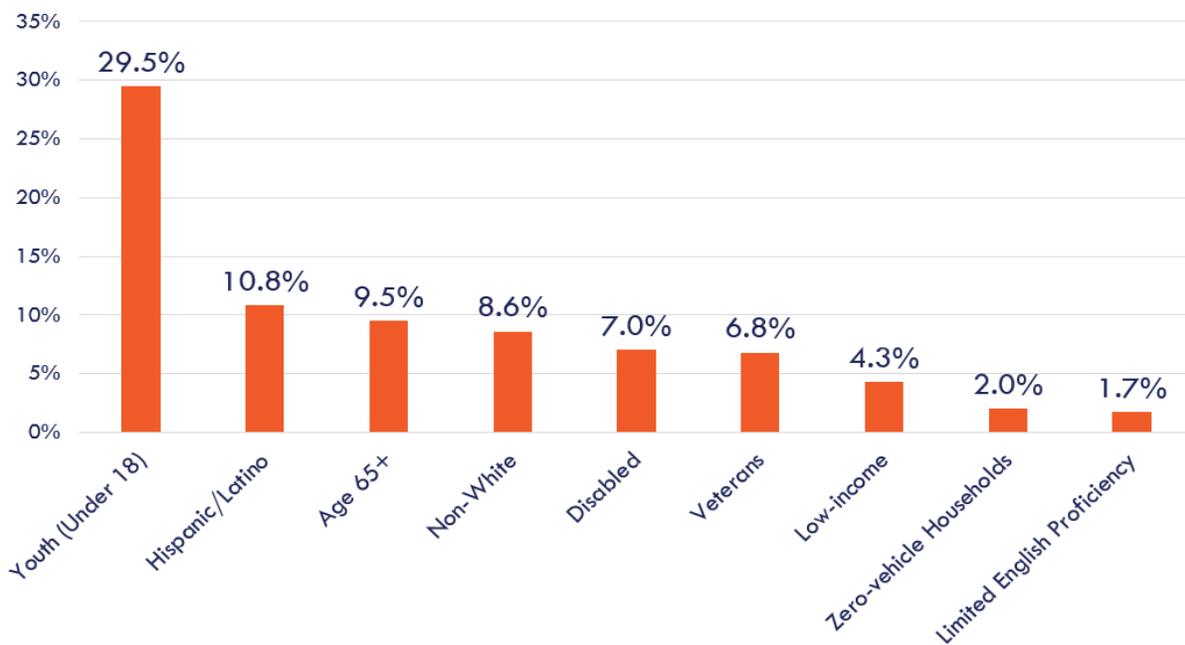
Understanding demographic characteristics in the Town of Castle Rock is critical to developing a transit service that is responsive to the needs of vulnerable populations, modeled after community values, and adaptable for future transportation demands. The 2018 American Survey Data for the Town of Castle Rock is based on a total population of a little over 59,000 people and approximately 20,000 households.

Several vulnerable population groups were considered in developing inclusive transit service models. **Figure 3** shows vulnerable population group numbers compared to the total population of Castle Rock. The youth population (under 18) makes up almost 30 percent of the population in the Town. People who identify as Hispanic/Latino represent over 10 percent of the total Town population. People over the age of 65 are close to 10 percent of the population total. Non-white population groups in Castle Rock are nearly

9 percent of the population. People with disabilities represent 7 percent of the Town population. A little over 4 percent of the total population is considered low-income. Zero-vehicle households and people with Limited English Proficiency each account for approximately 2 percent of the population total in the Town of Castle Rock.

Examining vulnerable population numbers in the Town illustrates that there are important considerations to be made for the high percentage of young people who may be able to use public transit now or in the coming years. Moreover, there is also a significant percentage of older adults who already use many of the transportation programs made available to them through the Town. Importantly, people with disabilities, people without access to a vehicle, or others who may need some type of transportation alternative could benefit from expanded mobility options offered by the Town.

FIGURE 3: VULNERABLE POPULATION DATA

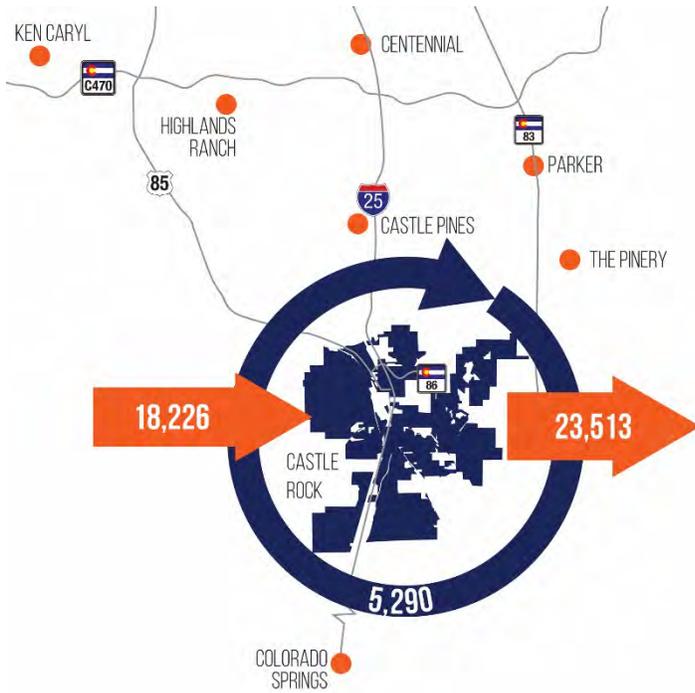


Source: U.S. Census Bureau American Community Survey 2018 1-Year Estimates.

E. Commuter Patterns

Commuter patterns in the Town of Castle Rock provide vital insight into how corridors in and out of the Town are being used, who is using them, and potential opportunities to provide transit to communities. Commuter inflow-outflow patterns for the Town, depicted on **Figure 4**, show that approximately 23,500 Castle Rock residents commute out of town for work, while over 18,000 people commute to the Town for work.

FIGURE 4: CASTLE ROCK COMMUTER INFLOW-OUTFLOW PATTERNS

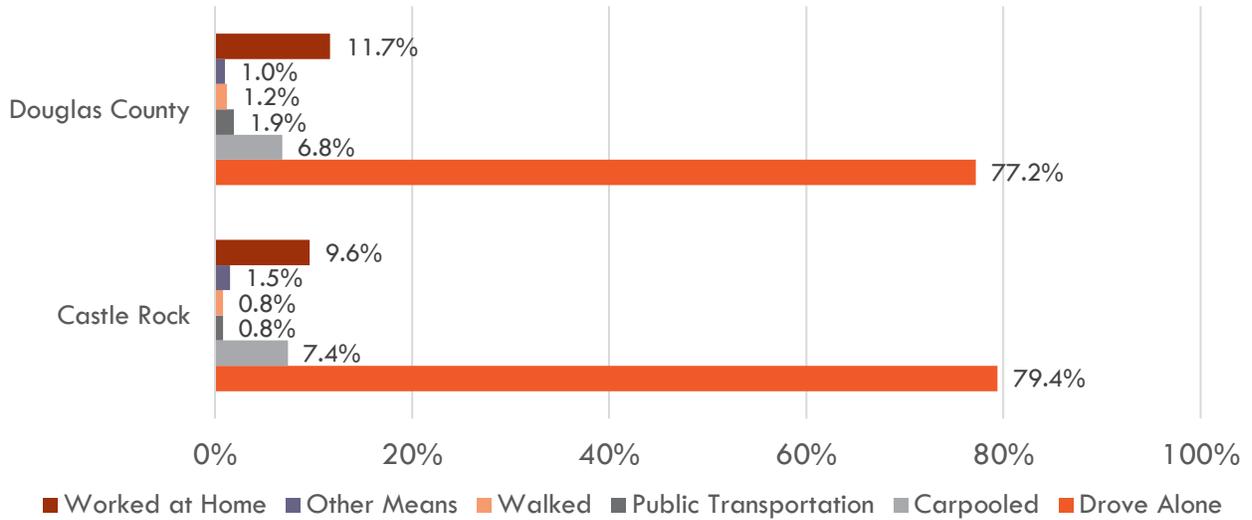


Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics, On the Map, 2017 (based on “All Jobs”).

Almost 5,300 people who live in Castle Rock also work in Town. The commuter mode split, shown on **Figure 5**, for the Town indicates that close to 80 percent of residents drive alone to work. This number is also slightly higher than what is reported in Douglas County. Nearly 10 percent of people in Castle Rock work from home, while a little over 7 percent carpool. Less than 1 percent of people report using public transportation to get to work, which is slightly lower than what is reported for the County

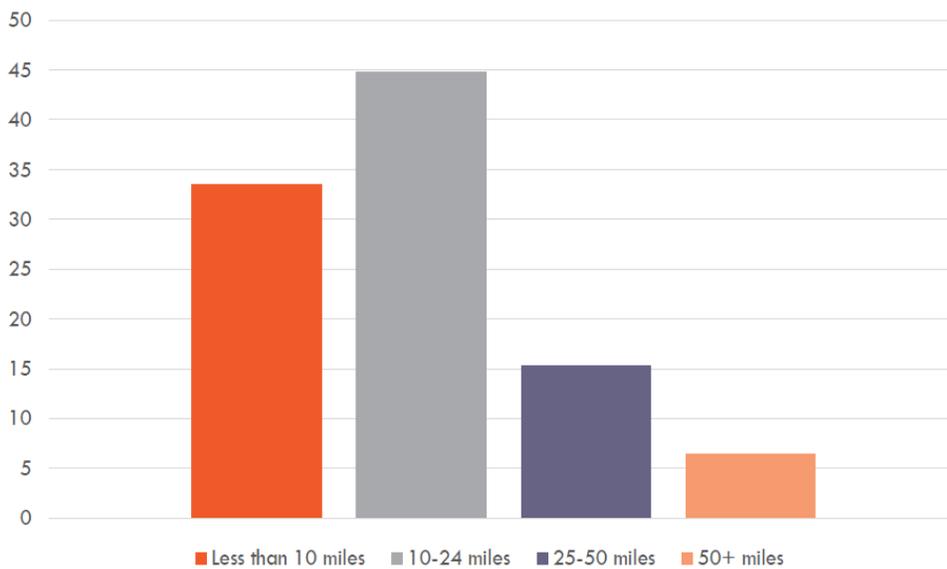
Approximately half of Castle Rock residents who commute to work travel between 10 to 24 miles (**Figure 6**). Close to 35 percent travel less than 10 miles and over 20 percent travel more than 25 miles. Most commuters travel to nearby cities like Highlands Ranch (9.5 percent), Denver (6.5 percent), and Parker (6.4 percent). The numbers show that a significant portion of the people who commute to Castle Rock for work come from cities north of the Town. Cities with the highest percentage of commuters to Castle Rock include Denver (17.5 percent), Centennial (7 percent), and Aurora (6.4 percent) as shown on **Figure 7** and **Figure 8**.

FIGURE 5: MEANS OF TRANSPORTATION TO WORK (COMMUTER WORK SPLIT)



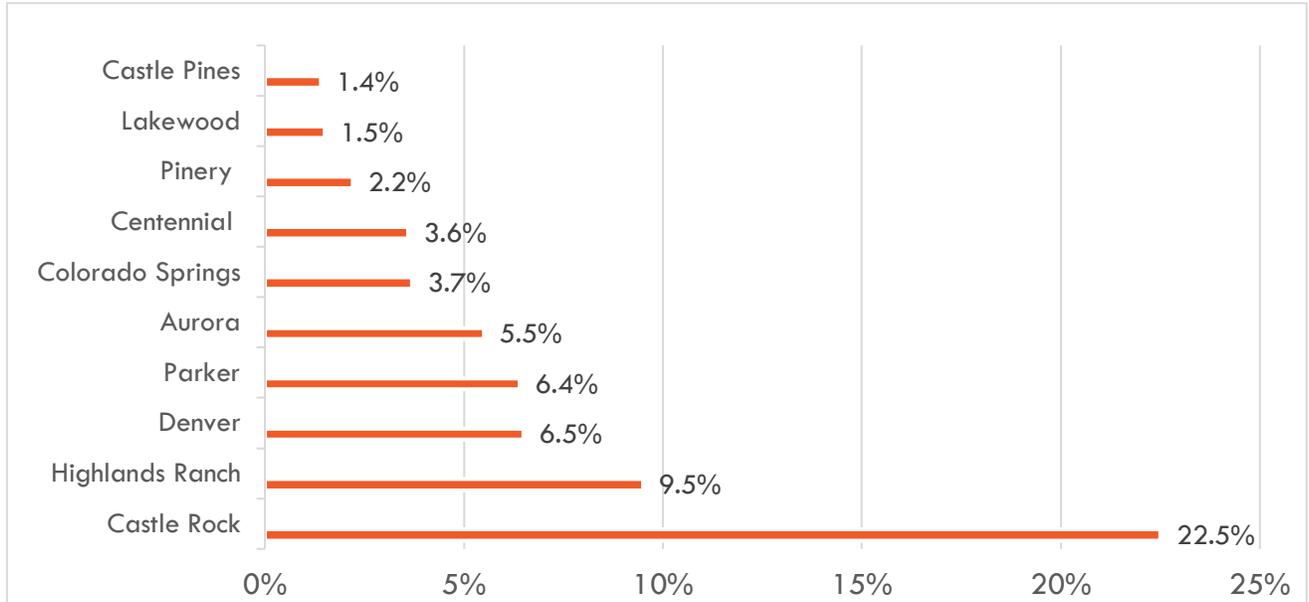
Source: American Community Survey, 2018 1-Year Estimates.

FIGURE 6: DISTANCE RESIDENTS TRAVEL TO WORK



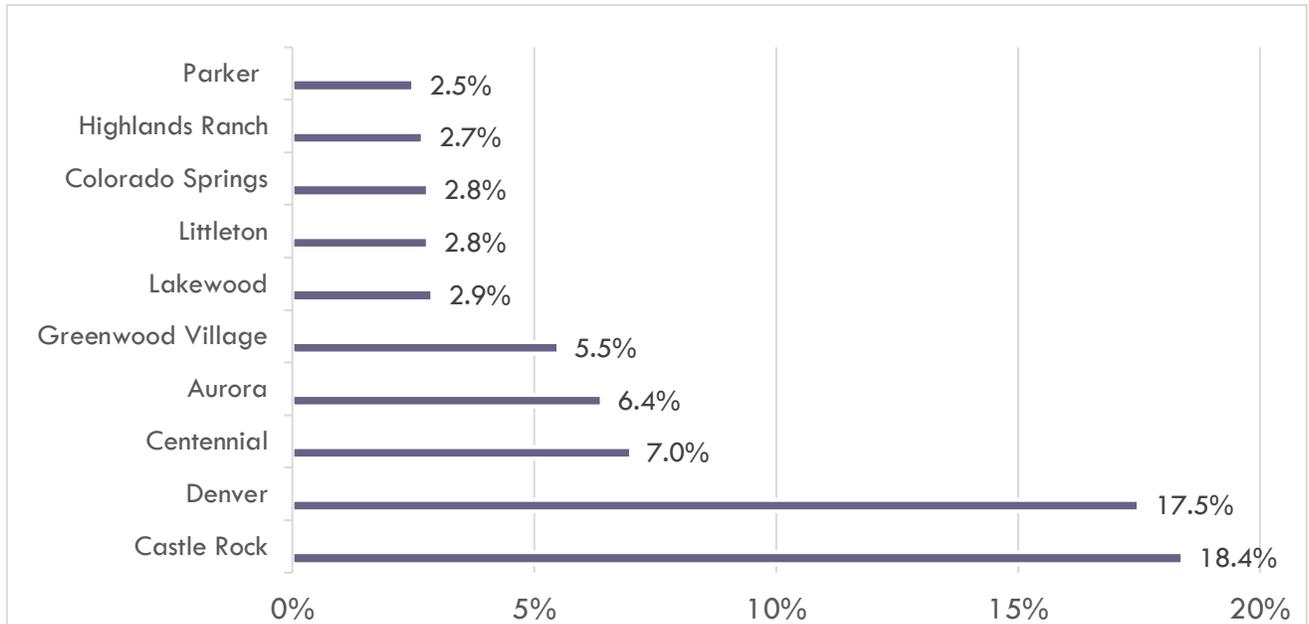
Source: American Community Survey, 2018 1-Year Estimates.

FIGURE 7: TOP 10 PLACES WHERE CASTLE ROCK RESIDENTS WORK



Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics, On the Map, 2017 (based on “All Jobs”).

FIGURE 8: TOP 10 PLACES WHERE CASTLE ROCK EMPLOYEES LIVE



Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics, On the Map, 2017 (based on “All Jobs”).

Other important demographic information was captured in the U.S. Census Bureau's Longitudinal-Employer Household Dynamics data, (**Figure 9**). Information gathered showed that of the almost 5,300 people who live and work in Castle Rock, almost 40 percent earn more than \$3,333 a month. While close to 1,600 people earn between \$1,251 and \$3,333, and almost the same amount earns less than \$1,251 a month. Many of these Castle Rock residents are in service jobs, while a little over 600 are employed in trade, transportation, or utilities fields. Approximately 300 residents work in goods producing jobs.

More than 5,000 Denver residents commute to Castle Rock for work. The employee analysis showed that, like Castle Rock residents, a majority earn more than \$3,333 a month, followed by people who earn between \$1,251 and \$3,333, and then close to 700 commuters who earn less than \$1,251 monthly. Another similarity that emerged between the Castle Rock and Denver data is the job sector split of commuters. Most Denver commuters held service jobs in Castle Rock, followed by those employed in trade, transportation, and utilities, and less than 10 percent who worked in goods producing jobs.

The number of Centennial commuters to Castle Rock is half of what is recorded for Denver, totaling close to 2,000 people. Similarly, Aurora and Greenwood Village data confirms the same trend of more higher income earners (\$3,333 or more/month) commuting to Castle Rock for work, followed by those who make between \$1,251 and \$3,333, and then by people who earn less than \$1,251. People commuting from Centennial, Aurora, and Greenwood Village also demonstrated the same pattern of employment in different job sectors. A majority of these commuters work in service jobs, followed by trade, transportation, and utilities, and goods production.

The cities of Lakewood, Littleton, Colorado Springs, Highlands Ranch, Parker, and Lone Tree all have between approximately 600 to 800 people commuting to work. The same income pattern is evident as was seen with cities that have more than 1,000 people who commute to Castle Rock for work. Both Castle Pines and Monument have fewer than 130 residents commuting to Castle Rock and notably are the only two cities that do not follow the same income pattern described previously. Castle Pines has almost three times more commuters who fall under the \$1,251 to \$3,333 income bracket. Commuters from Monument have a fairly even earning distribution with an average of a little over 20 people commuting to Castle Rock in each income category.

FIGURE 9: TOWN OF CASTLE ROCK EMPLOYEE ANALYSIS

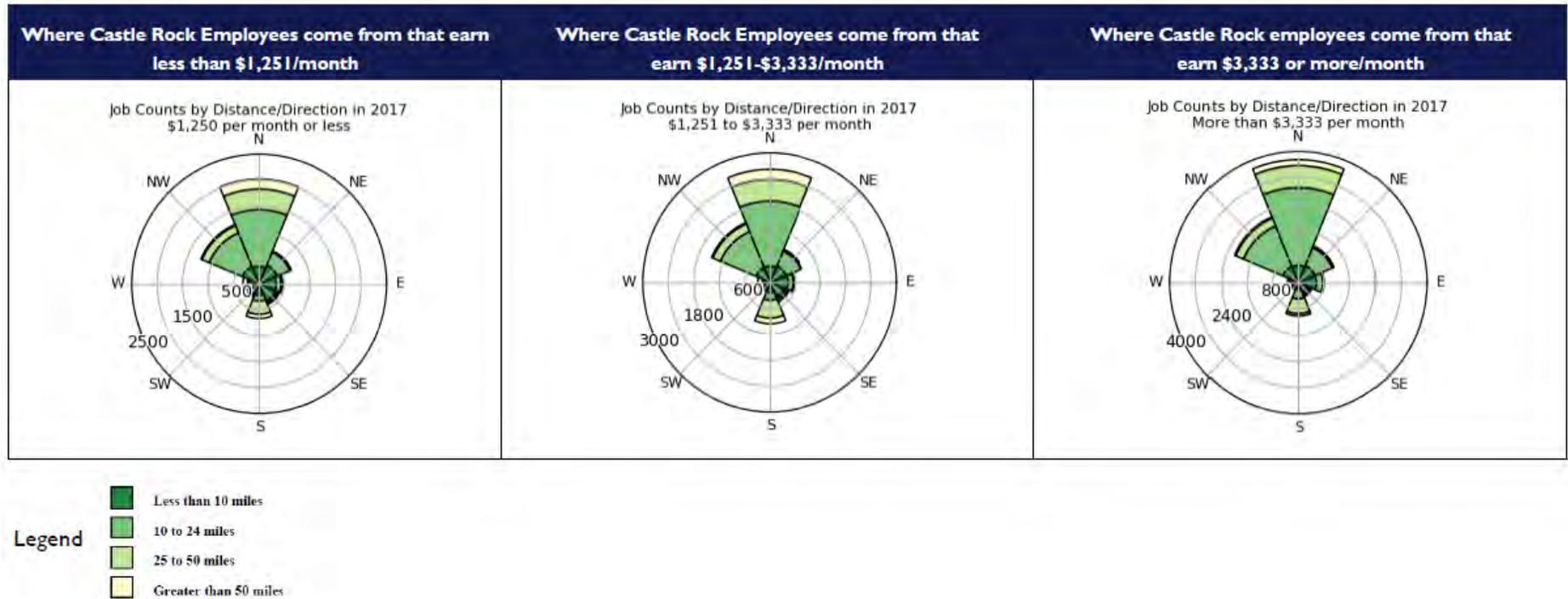
| Castle Rock Employee Home Location | Number of Castle Rock Employees | Earning \$1,250 or Less/Month | Earning \$1250-\$3,333/Month | Earning \$3,333 or More/Month | Goods Producing Jobs | Trade, Transportation, Utilities Jobs | All Other Service Jobs |
|------------------------------------|---------------------------------|-------------------------------|------------------------------|-------------------------------|--|---------------------------------------|------------------------|
| Castle Rock | 5,290 | 1,594 | 1,630 | 2,066 | 322 | 616 | 4,352 |
| Denver | 5,047 | 724 | 1,082 | 3,241 | 445 | 1,098 | 3,504 |
| Centennial | 2,025 | 216 | 338 | 1,471 | 196 | 336 | 1,493 |
| Aurora | 1,840 | 371 | 464 | 1,005 | 107 | 501 | 1,232 |
| Greenwood Village | 1,589 | 131 | 250 | 1,208 | 96 | 100 | 1,393 |
| Lakewood | 830 | 159 | 234 | 437 | job sector data only stratified for locations with greater than 1,000 Castle Rock employees. | | |
| Littleton | 818 | 114 | 150 | 554 | | | |
| Colorado Springs | 804 | 169 | 171 | 464 | | | |
| Highlands Ranch | 780 | 165 | 207 | 408 | | | |
| Parker | 711 | 204 | 208 | 299 | | | |
| Lone Tree | 622 | 197 | 176 | 249 | | | |
| Castle Pines | 128 | 35 | 86 | 33 | | | |
| Monument | 66 | 25 | 20 | 21 | | | |

Source: Longitudinal-Employer Household Dynamics, U.S. Census Bureau, 2017

Figure 10 shows further visualization of how job counts organized by income break down geographically. Commuters whose monthly earnings are less than \$1,251 are primarily traveling south between 10 to 24 miles. An almost identical trend is seen for commuters who earn in the middle of \$1,251 and \$3,333 monthly. The only large distinction in the data between the two is the slightly higher number of commuters who are traveling more than 50 miles from cities south of Castle Rock.

When looking at higher income earners who commute to the Town for work, some differences emerge in traveling patterns. There are almost double the number of people who commute up to 24 miles from cities north of Castle Rock compared to the other income brackets. There also appears to be a smaller number of people who travel greater than 50 miles from cities north and south of Castle Rock.

FIGURE 10: CASTLE ROCK EMPLOYEE COUNT BY DISTANCE AND DIRECTION



Source: Longitudinal-Employer Household Dynamics, U.S. Census Bureau, 2017

APPENDIX B

STAKEHOLDER & COMMUNITY ENGAGEMENT SUMMARY REPORT

OCTOBER 2020



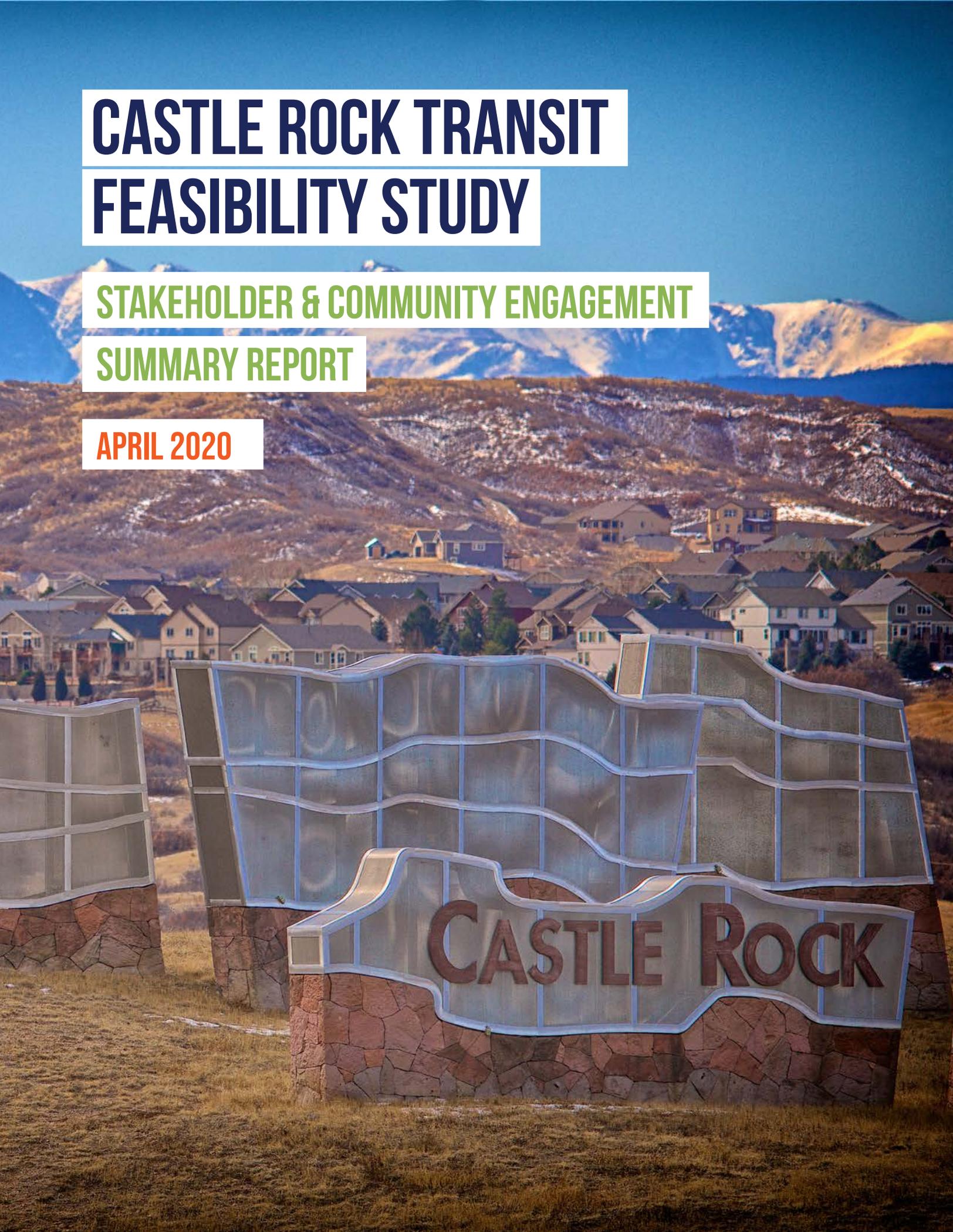
TRANSIT FEASIBILITY STUDY

CASTLE ROCK TRANSIT FEASIBILITY STUDY

STAKEHOLDER & COMMUNITY ENGAGEMENT

SUMMARY REPORT

APRIL 2020



LET'S TALK TRANSIT

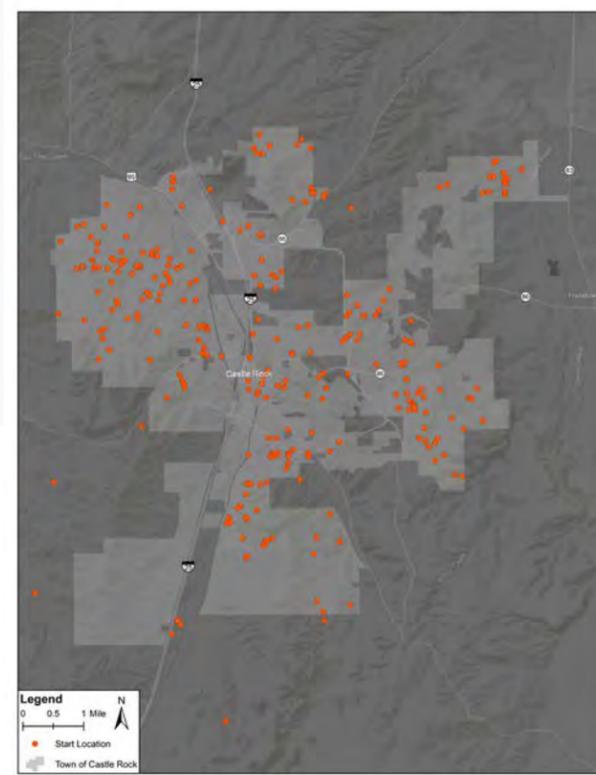
Recent findings from the 2017 Transportation Master Plan (TMP) indicate a renewed interest by the residents of the Town of Castle Rock in expanding mobility options within the Town. Based on this community interest, the Town conducted a comprehensive engagement process, as part of a Transit Feasibility Study, to further understand gaps, needs, potential alternatives, and future funding strategies. This engagement effort, which started in November 2019 and concluded in January 2020, included three key steps to gather input from elected officials, stakeholders, and community members. Many of the input opportunities were hosted on the project website, however in-person input opportunities were also provided.



TRAVEL PATTERNS & KEY DESTINATIONS

An online commenting map, hosted by Social Pinpoint, was created that allowed stakeholders and community members to identify their travel patterns. Respondents were asked to identify their start location and their destination(s); each destination was categorized as recreation/social, shopping, work/commute/school, or medical. Approximately 1,400 pins were placed on the map; this number represents both origin and destination pins and cannot be interpreted as 1,400 unique individuals providing feedback. The end result is a map that provides insights into the origins and destinations of Castle Rock residents and informs overall travel patterns within the Town.

Online Map Comment Origins/Home Locations

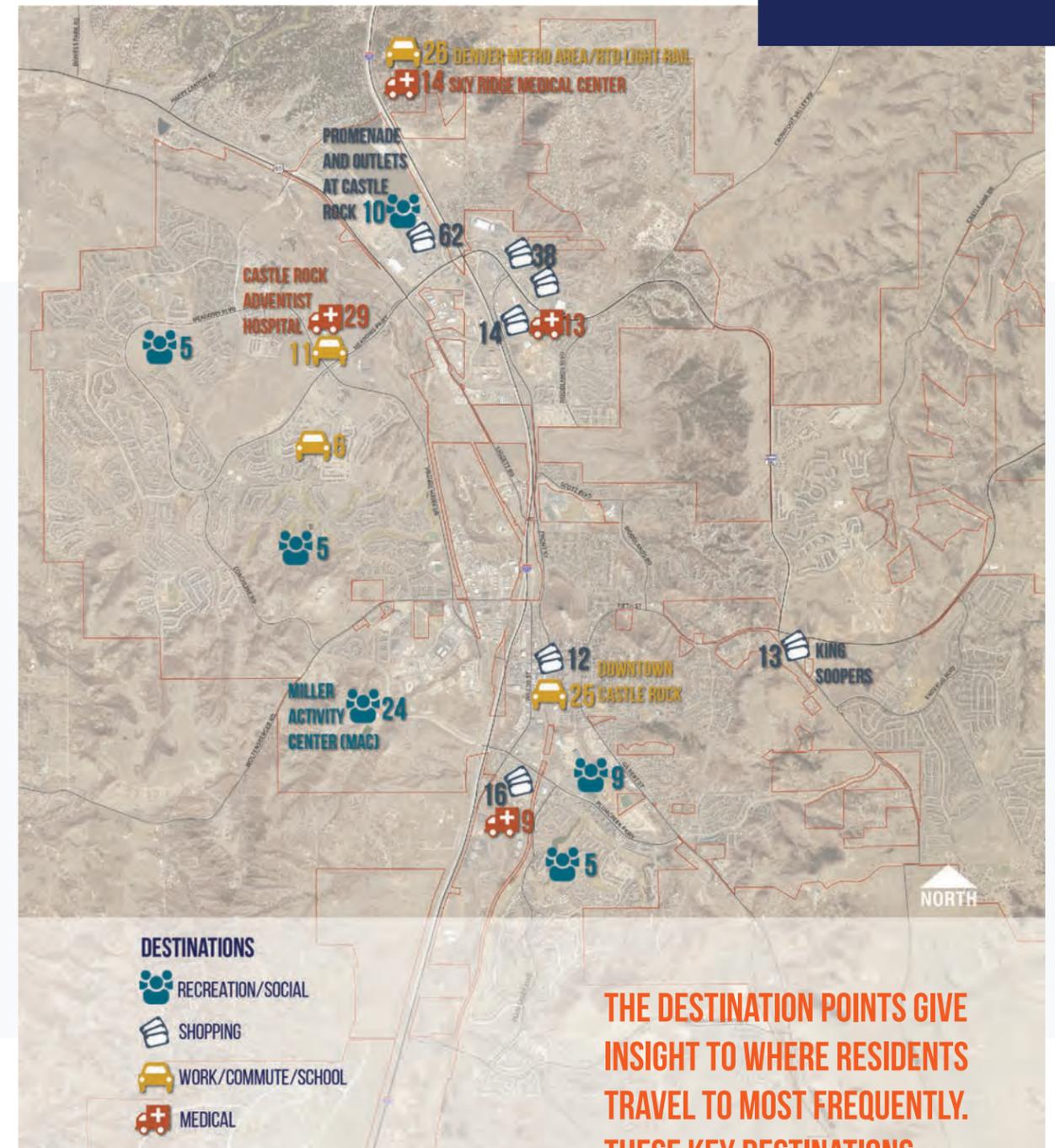


ALTHOUGH NO PATTERN EMERGES FROM THE ORIGINS MAP, IT DOES APPEAR COMMENTS WERE PROVIDED BY RESIDENTS FROM A WIDE RANGE OF COMMUNITIES WITHIN THE TOWN.

200+

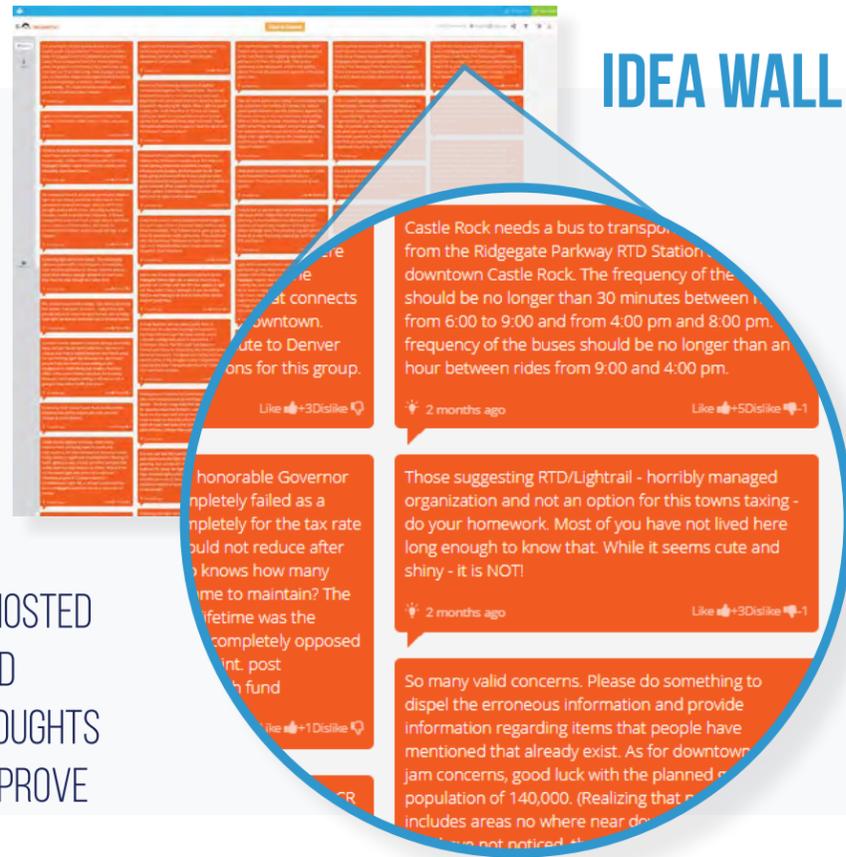
MAP PINS WERE PLACED NORTH OF CASTLE ROCK IN THE DENVER METRO AREA

KEY DESTINATIONS BY TRIP TYPE



THE DESTINATION POINTS GIVE INSIGHT TO WHERE RESIDENTS TRAVEL TO MOST FREQUENTLY. THESE KEY DESTINATIONS RECEIVED THE HIGHEST CONCENTRATION OF PINS.

STEP 2: SHARE YOUR THOUGHTS



IDEA WALL

THE SOCIAL PINPOINT WEBPAGE HOSTED AN IDEA WALL THAT ENCOURAGED RESIDENTS TO PROVIDE THEIR THOUGHTS AND SUGGESTIONS ON HOW TO IMPROVE MOBILITY AROUND CASTLE ROCK. COMMENTS WERE VISIBLE TO ALL WHO VIEWED THE PAGE AND PEOPLE COULD SHOW THEIR SUPPORT OR DISLIKE OF A POST BY "VOTING."

315 IDEA WALL
COMMENTS
RECEIVED

Participants engaged with one another by liking and disliking each other's comments.

278 LIKES
275 DISLIKES

KEY THEMES



PUBLIC AND STAKEHOLDER INPUT COMMON THEMES

The Transit Feasibility Study team held a series of stakeholder interviews and a public open-house meeting to seek input about the community's interest, need, and vision for public transit. The goal was to understand realistic options considering the Town's finite revenue resources and if implemented, what the most important characteristics of a transit service would be. Although feedback from each meeting was unique, each conversation asked the three same questions. Below are the themes that emerged for the stakeholder and public engagement efforts.

When you think of the **future of transit** in Castle Rock, what does it look like?

- » The future of transit should be light rail.
- » Transit should be a mixture of options and solutions to meet the community's needs; this should include micro transit options.
- » Transit options need to be affordable, reliable, easy to use, and safe.
- » Transit options need to help reduce congestion and overall emissions.
- » Collaborate with other programs to build on their success. For example, Windcrest senior housing Uber/Lyft voucher program.
- » Transit travel times need to be competitive with vehicle drive times.
- » There need to be different solutions for peak vs. non-peak hours.

Where should service **be** provided or what other services should be connected?

- » It is important to service local, high density areas (both residential and commercial).
- » It is important to provide connections to Downtown; it could serve as a "transit hub."
- » Bustang is needed and can help serve regional connections.
- » Regional options need to connect with the RidgeGate light rail station.

What are the **highest priority populations** we should be serving with transit?

- » Transit should serve all people within the Town.
- » Castle Rock should focus services for no-vehicle households, youth and vulnerable populations.
- » It is challenging to get entry-level workers into town.
- » Options need to be ADA accessible.
- » Extended hours of operation—into the evening—is needed to serve workers who work non-traditional hours.

PUBLIC OUTREACH & STAKEHOLDER ENGAGEMENT ACTIVITIES



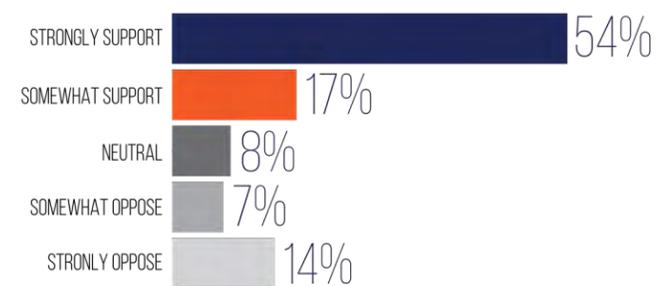
- ONLINE MAP, IDEA WALL, AND QUESTIONNAIRE OPEN TO THE PUBLIC
- 2019**
 - NOVEMBER**
 - FOCUS GROUP MEETING #1
 - TOWN-WIDE POSTCARD MAILING
 - PUBLIC OPEN HOUSE
 - DOWNTOWN DEVELOPMENT AUTHORITY
 - STARLIGHTING
 - DECEMBER**
 - CASTLE ROCK PLANNING COMMISSION
 - CITY OF LONE TREE
 - VIA TRANSPORTATION SERVICES
 - METRO TAXI OF DENVER
 - CASTLE ROCK MOBILITY HUB, BUSTANG AND CDOT
 - METRO TAXI
 - SENIOR CENTER
 - 2020**
 - JANUARY**
 - PUBLIC WORKS COMMISSION
 - RTD
 - MILLERS LANDING AND BUSTANG
 - DOUGLAS COUNTY TRANSIT SOLUTIONS
 - FEBRUARY**
 - TOWN COUNCIL OPEN HOUSES
 - OUTLETS AT CASTLE ROCK
 - OAKWOOD SENIOR CENTER
 - FOCUS GROUP MEETING #2



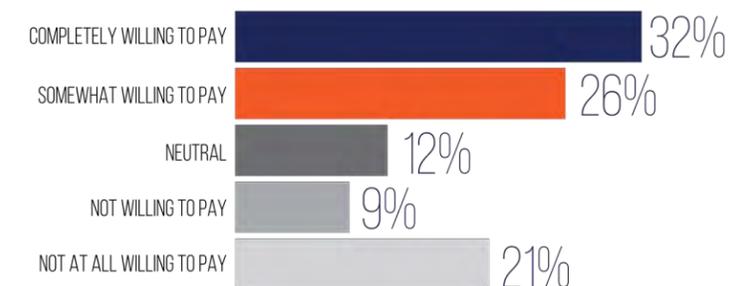
WHAT WE HEARD

THE TRANSIT FEASIBILITY STUDY QUESTIONNAIRE WAS HOSTED ON THE SOCIAL PINPOINT WEBSITE FOR THREE MONTHS AND INCLUDED QUESTIONS RELATED TO THE COMMUNITY'S POTENTIAL SUPPORT FOR A FUTURE TRANSIT SYSTEM, UNDER WHAT CIRCUMSTANCES THEY WOULD USE THE SYSTEM, AND THEIR CURRENT TRAVEL PATTERNS. THE FOLLOWING INSIGHTS WERE PROVIDED BY THE COMMUNITY AND REFLECT APPROXIMATELY 400 RESPONSES.

Would you support or oppose the Town investing in public transportation services within the Town limits of Castle Rock?



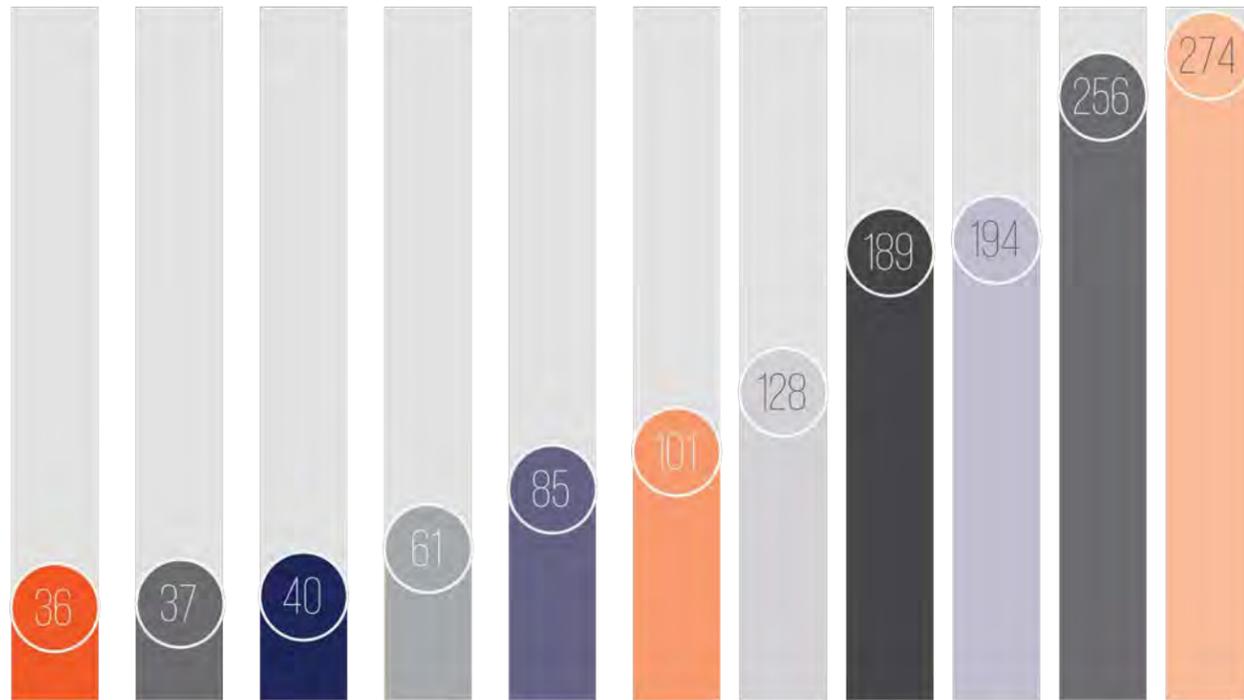
Would you be willing to pay an additional tax so that the Town can develop a public transportation system within the Town of Castle Rock?



While the questionnaire was not statistically valid, the responses provide insight into resident perceptions and feelings about transit. Residents were asked if they would support or oppose the Town investing in public transit services within the Town limits of Castle Rock. Approximately 71% of respondents would strongly or somewhat **support** a future transit investment and 21% of respondents would strongly or somewhat **oppose** the future investment.

Of the respondents who would **support** a future transit investment, 81% would be completely or be somewhat willing to pay an additional tax so that the Town could develop a public transportation system within the town of Castle Rock.

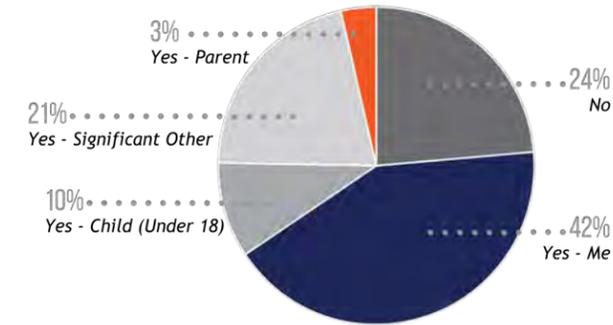
If transit was available what would be most important when deciding to use the service?



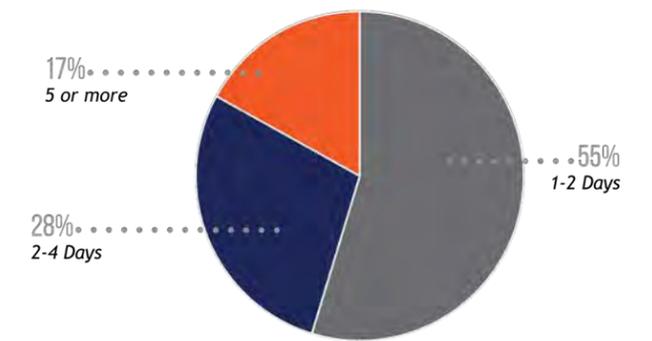
- I WOULD NOT USE TRANSIT BECAUSE I NEED MY CAR DURING THE WORK/SCHOOL DAY FOR MEETINGS OR OTHER TRAVEL
- I WOULD NOT USE TRANSIT BECAUSE I HAVE TO MAKE OTHER STOPS ON MY WAY TO/FROM WORK/SCHOOL (E.G. DROP OFF/PICK UP CHILD)
- FREE WI-FI
- DOOR TO DOOR SERVICE
- ABILITY TO SCHEDULE A RIDE ON MY SCHEDULE (E.G. SEVERAL HOURS AHEAD OF TIME)
- ABILITY TO ORDER A RIDE FROM CELL PHONE OR COMPUTER
- APPEARANCE AND CLEANLINESS OF VEHICLE
- COST
- KNOWING EXACT TIME WHEN MY RIDE IS TO ARRIVE
- SERVICE HOURS (E.G. EVENINGS AND WEEKENDS)
- STOP LOCATIONS (E.G. WITHIN 3 BLOCKS OF MY DESTINATION)

“ADDING A FREE SHUTTLE SYSTEM TO THE RTD RIDGEGATE STATION WOULD BE VERY BENEFICIAL. BECAUSE MOST OF CASTLE ROCK IS NOT WITHIN THE RTD BOUNDARIES, WE HAVE TO PAY \$4/DAY TO PARK AT THE RTD RIDGEGATE STATION.” - QUESTIONNAIRE RESPONDENT

Would you or a member of your household use transit?



How many days a week would you use transit?



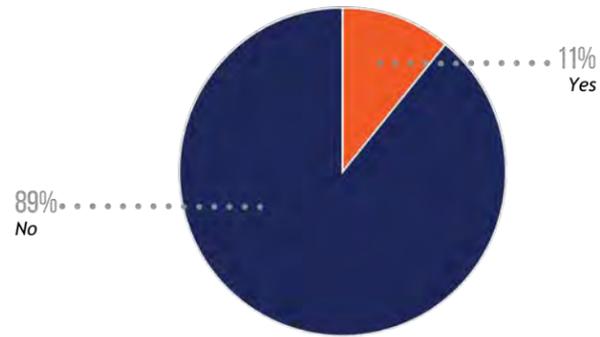
How much would you be willing to pay for a one-way trip?



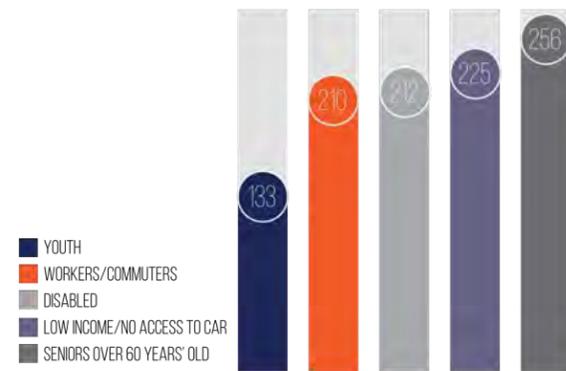
Of the approximately 400 individual questionnaire responses, 24% said they would not use transit. However, 76% of respondents identified that either they or someone in their family would use transit. Fifty-five percent said they would use transit 1-2 days per week and 55% would be willing to pay up to \$3.00 for a one-way trip.

"I CURRENTLY DRIVE BUT I AM 84 AND KNOW THAT THE TIME WILL SOON COME WHEN THAT WILL NO LONGER BE AN OPTION. ADDITIONALLY, I SEE MANY FOLKS WALKING LONG DISTANCES TO BUY GROCERIES...I TRULY BELIEVE PUBLIC TRANSPORTATION WOULD BENEFIT US ALL AND THEREFORE I AM MORE THAN WILLING TO PAY EXTRA TAXES". - QUESTIONNAIRE RESPONDENT

Does anyone in your household have a physical, sensory, or cognitive impairment that affects their mobility or ability to drive?



What population groups are the most important for transit to serve?

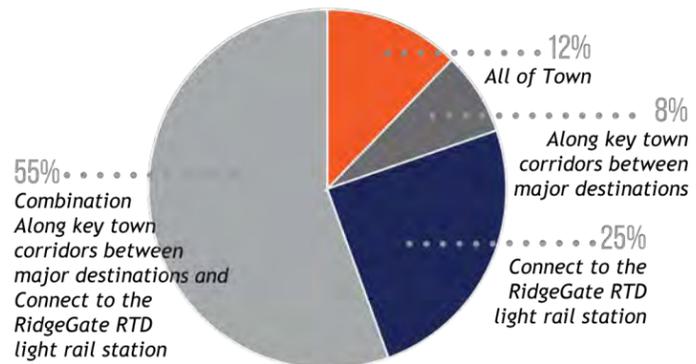


Seventy-six percent of respondents said transit would not be their primary way to get around Town and 95% of respondents said that a car is usually available to them for commuting or other travel needs. However, if transit was provided, it would be most important that it **serve major destinations along key town corridors and connect to the RidgeGate RTD light rail station.**

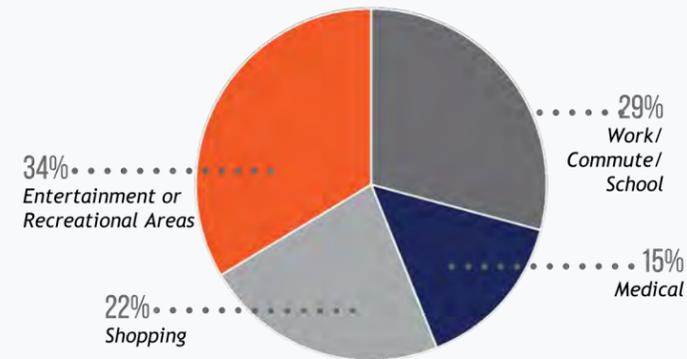
» In open-ended questions, respondents identified the Denver Tech Center, RidgeGate light rail station, and Denver International Airport as the top regional destinations.

164 respondents said that they only use their personal motor vehicle to get where they need to go. However, many respondents currently use other forms of transportation and for 21% of respondents, the lack of a transit system prevents them from traveling more often.

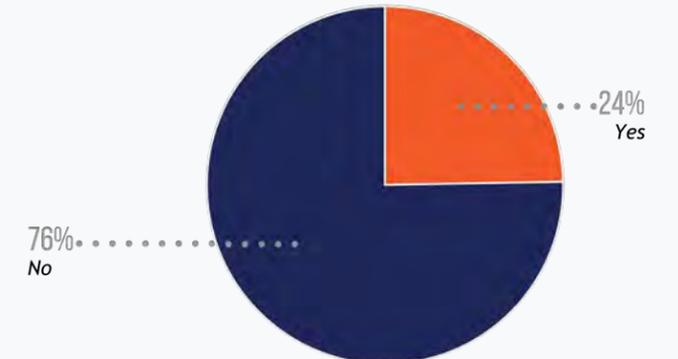
If transit was provided, where would transit be most beneficial?



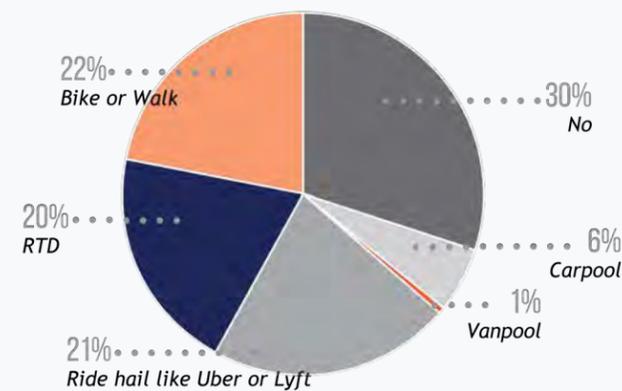
Which types of trips would you use transit for?



If transit was available, would transit be your primary way to get around Town?



Do you currently use other forms of transportation, other than a personal motor vehicle? If yes, what form(s)?

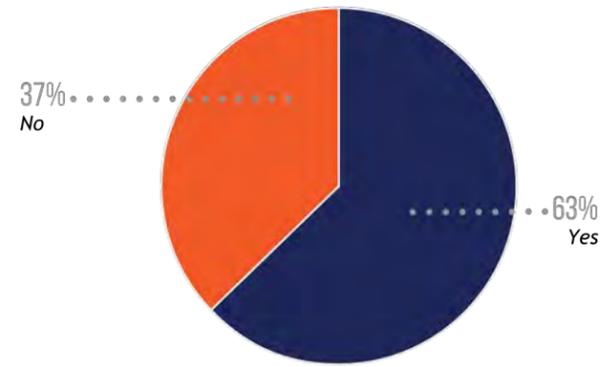


If transit was available when would you use it?

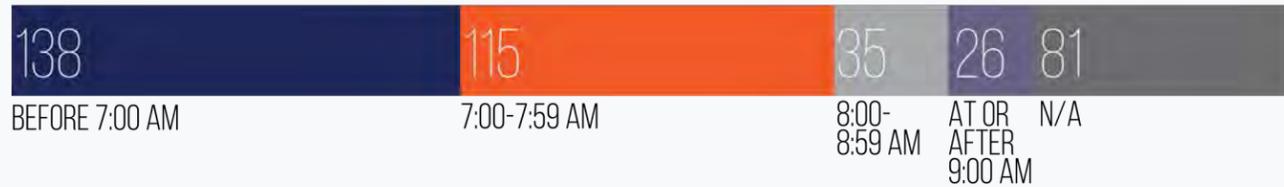


THE MAJORITY (63%) OF RESPONDENTS COMMUTE OUTSIDE OF THE TOWN FOR WORK AND/OR SCHOOL. 64% OF THOSE WHO COMMUTE LEAVE THEIR HOME BEFORE 8:00 A.M. TO GET TO WORK/SCHOOL AND 70% LEAVE WORK BETWEEN 4:00 TO 6:00 P.M.

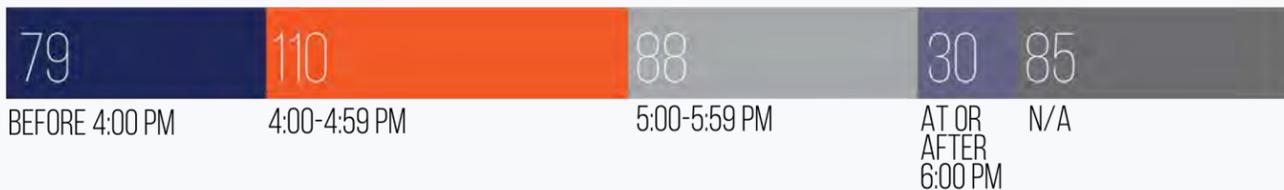
Do you commute outside Town for work/school?



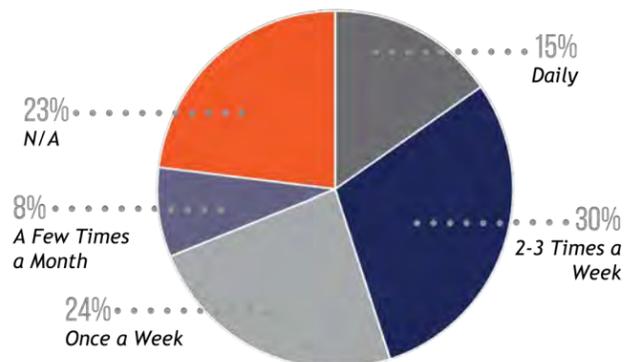
When do you typically have to leave home to get to work/school?



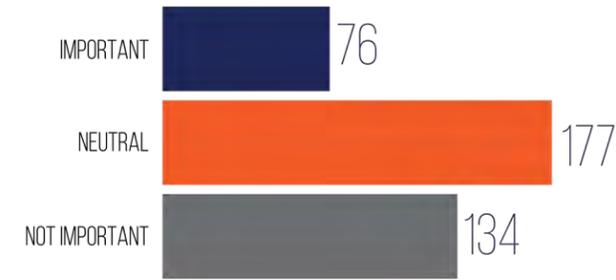
When do you typically leave work/school?



How often do you make stops on your way to or from work/school? (e.g. drop off/pick up child or run errands)



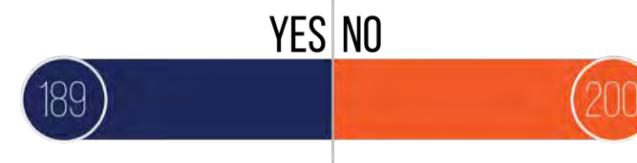
How important is it that the transit service have a call center to schedule rides?



If you had to schedule a ride the day before, how likely would you use transit service?



If the Bustang regional bus service had a stop in Town would you use it to commute to Denver or Colorado Springs?



If you chose to use the Bustang service in the future, how would you get to the Bustang Stop/Park-n-Ride?



If Bustang regional bus service had a stop in Town, respondents were split on if they would use it to commute to Denver or Colorado Springs. However, for those who would use the service, most would choose to drive alone to a park-n-ride instead of finding alternative ways to get to the station. Of note, many respondents identified the cost of parking at a park-n-ride lot as a concern and one of the reasons they chose to not use RTD transit services.



“CASTLE ROCK DESPERATELY NEEDS PUBLIC TRANSPORTATION. STUDENTS AND ADULTS COULD USE TRANSPORTATION THEY CAN COUNT ON FOR MEDICAL CARE, WORK, AND SOCIAL ACTIVITIES.” - QUESTIONNAIRE RESPONDENT

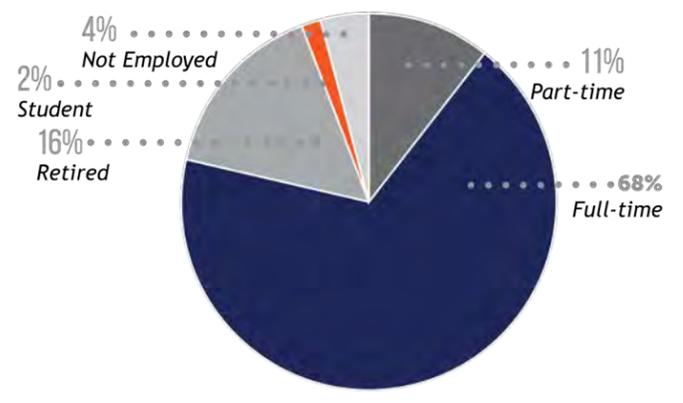
In general, is a car usually available to you for commuting or other travel needs?



Does the lack of transit prevent you from traveling more often?

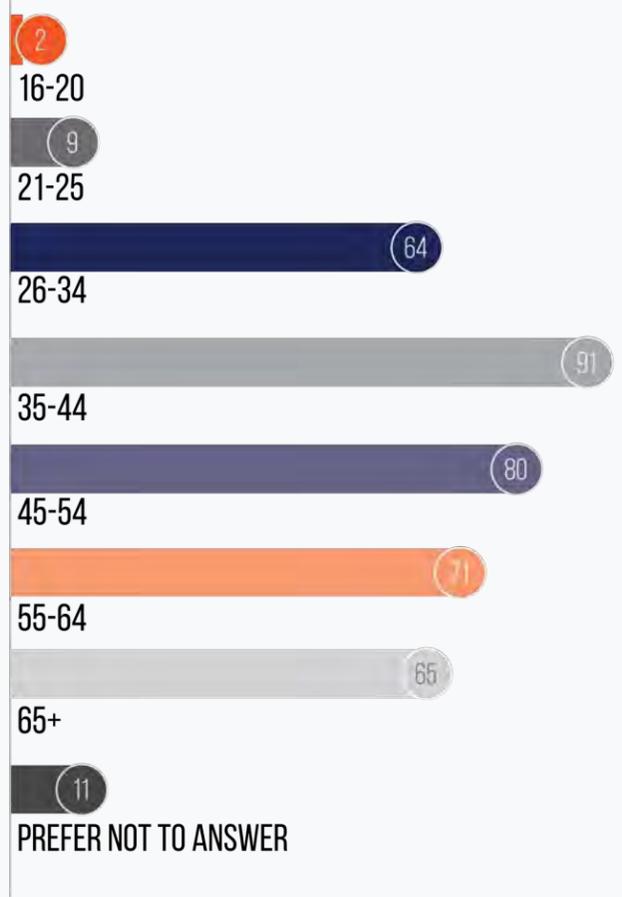


What is your work status?

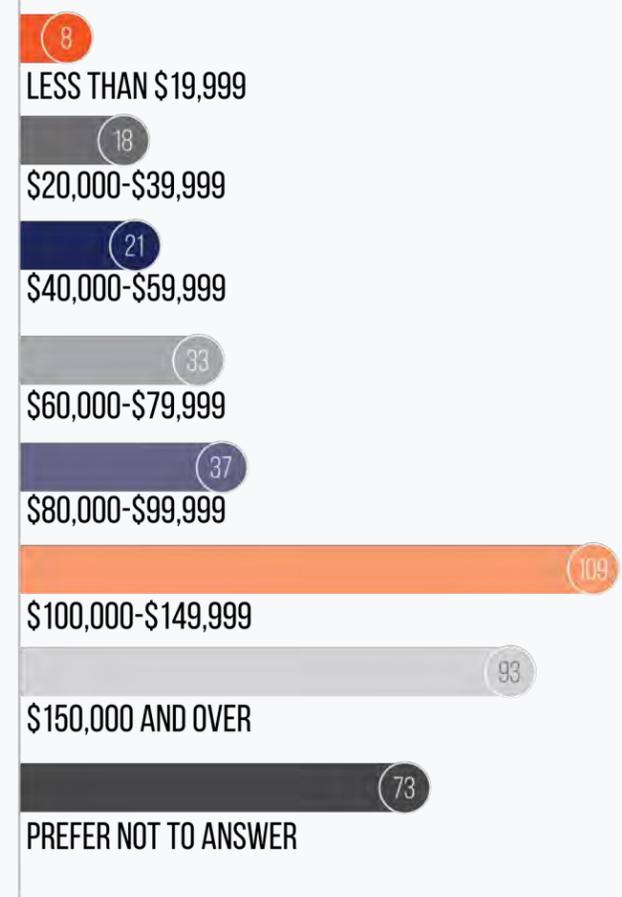


DEMOGRAPHICS OF RESPONDENTS

What category best describes your age?



What is your average household income before taxes?



GETTING TO KNOW THOSE WHO WOULD SUPPORT A FUTURE TRANSIT SYSTEM

Of the almost 300 people who strongly or somewhat support investing in a future public transit services, 81% would be willing to pay up to \$4.00 for one-way service and 170 of those respondents commute outside of town.

Supporters would use transit to get to

School/Work

157

Medical

85

Shopping

129

Entertainment/Recreation

177

They would most use transit services during daytime hours both during the week and on weekends

Daytime Weekday

218

Nighttime Weekday

93

Daytime Saturday

132

Nighttime Saturday

119

Daytime Sunday

104

Nighttime Sunday

52

The most important service characteristics include

Stop Locations

232

Service Hours

218

Knowing the exact time when my ride is to arrive

164

Cost

149

Appearance and cleanliness of vehicle

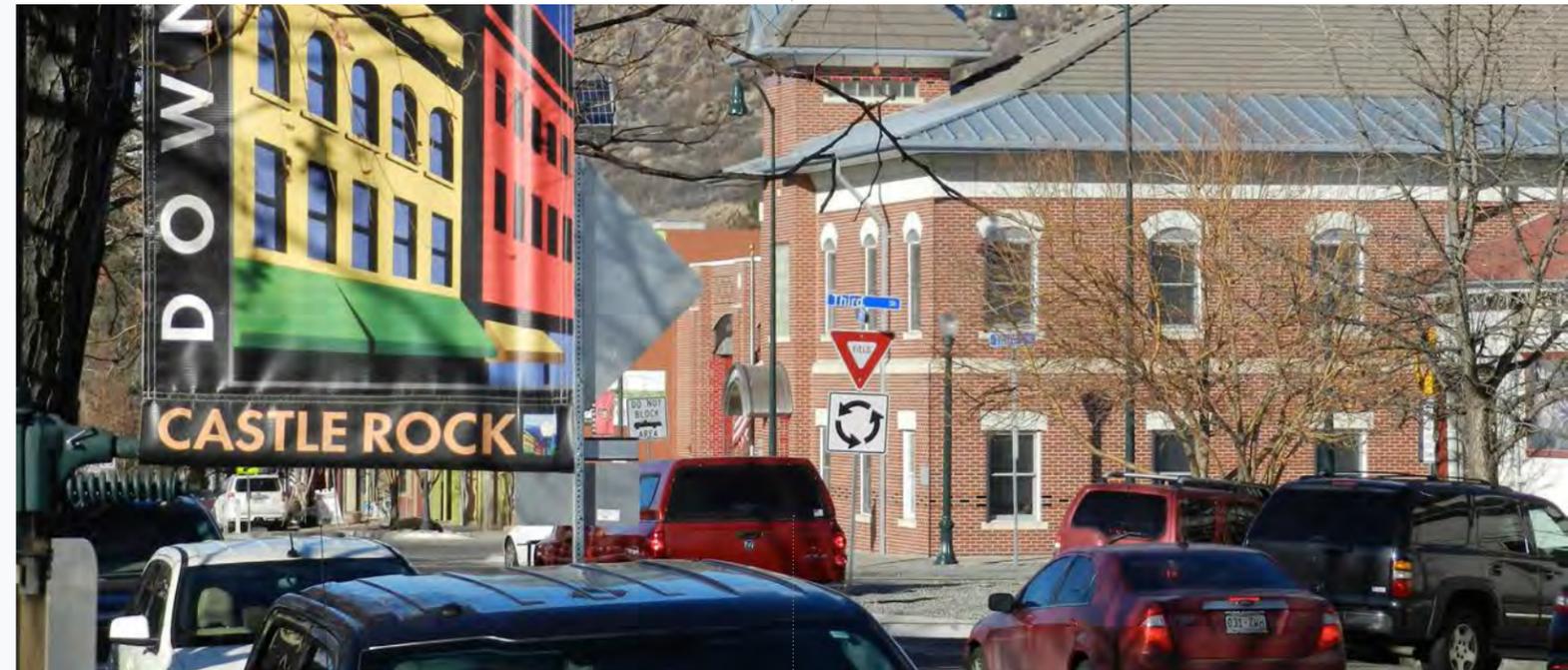
104

All other options*

241

*Question 19 of questionnaire

“WORK AT A SCHOOL IN DENVER AND COMMUTE UP TO 5 DAYS A WEEK. I CATCH A RIDE TO RIDGEGATE WITH A FRIEND, BUT THAT SOMETIMES MAKES ME LATE. RELIABLE TRANSIT WOULD MAKE ME HAPPIER BECAUSE I'D BE MORE ON TIME MORE OFTEN. IT'S ALSO MORE CONVENIENT TO BE ABLE TO GET TO THE STORE WITHOUT HAVING TO BOTHER MY FRIEND FOR A RIDE OR HAVING TO WAIT UNTIL SHE'S ABLE TO TAKE ME.” - QUESTIONNAIRE RESPONDENT



“TRANSIT IS REALLY IMPORTANT AND A MUST FOR SMART GROWTH. WITH ALL OF THE NEW GROWTH IN CASTLE ROCK (CR) WE HAVE CONSIDERED MOVING AWAY AND GETTING CLOSER TO THE RTD LINE. PLEASE GIVE CR RESIDENTS TRANSIT OPTIONS. IT MAKES SENSE.” - QUESTIONNAIRE RESPONDENT

GETTING TO KNOW THOSE WHO WOULD NOT SUPPORT A FUTURE TRANSIT SYSTEM

Although these residents do not support the development of a future transit system, they do feel it is important to provide transit options to certain population groups.

Age 60+ population

50%

Disabled

44%

Low income/no access to a car

28%

Youth

12%

Workers/Commuters

21%

Of the 82 people who strongly or somewhat oppose investing in a future public transit services, 37% identified that they need their car during the day and 29% said they make stops on their way to and from work/school 2-3 times per week.

Of the respondents that do not support a future transit system, 40% are not willing or not at all willing to pay new taxes to support the development of a public transportation system within the Town of Castle Rock.



“AROUND TOWN, I CAN'T SEE MY FAMILY USING PUBLIC TRANSPORTATION. LIGHT RAIL IS TOO EXPENSIVE AND NOT DEPENDABLE IN THIS AREA, THEREFORE I WOULDN'T USE IT EVEN IF CASTLE ROCK HAD TRANSIT GOING TO THE STATION.” - QUESTIONNAIRE RESPONDENT

“IF I WANTED PUBLIC TRANSPORTATION, I WOULD HAVE MOVED TO A DIFFERENT COMMUNITY WHERE MY TAXES WOULD ALREADY SUPPORT SERVICES LIKE RTD. MY TAXES ARE ALREADY TOO HIGH.” - QUESTIONNAIRE RESPONDENT

“DO NOT WANT LIGHT RAIL AS IT WILL BRING IN CRIME EASILY INTO THE AREA. NOR DO WE THINK IT'S A GOOD IDEA TO HAVE BUS STOPS COMING INTO NEIGHBORHOODS. MOST PEOPLE IN THIS AREA ARE ABLE TO TRANSPORT THEMSELVES AROUND!” - QUESTIONNAIRE RESPONDENT



LET'S TALK TRANSIT

CRGOV.COM/TRANSITSTUDY



APPENDIX C

SERVICE MODEL EVALUATION MATRIX

OCTOBER 2020



TRANSIT FEASIBILITY STUDY



TRANSIT FEASIBILITY STUDY

Service Model Evaluation

April 2, 2020 FINAL

Service Types Considered, Cost Estimates, & Feasibility

| Service Model | Service Description | Needs/Opportunities Addressed | Pros | Cons | Other Considerations | Cost | Feasibility |
|----------------------------------|---|--|--|--|--|-------------|-------------|
| Light Rail Transit | Train service that runs on a regular schedule and connects to the regional transit network | <ul style="list-style-type: none"> Provides Regional Connections Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Connects to regional transit system Provides modal choice for commuters Provides an option for entry level workers to get to Castle Rock | <ul style="list-style-type: none"> Very high cost to build (\$100M/mile) Very high cost to operate (\$300+/revenue hour) Limited geographic coverage Not a short-term solution as Castle Rock is not currently a part of RTD | <ul style="list-style-type: none"> Potential for Castle Rock to be served by Front Range Rail Future Bustang stop will help support regional connectivity | \$ \$ \$ \$ | ● |
| Fixed-Route Regional Buses | Buses that travel on a regular route at scheduled times, and provides access to destinations on a regional scale | <ul style="list-style-type: none"> Provides Regional Connections Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Connects to regional transit system Provides modal choice for commuters Provides an option for entry level workers to get to Castle Rock | <ul style="list-style-type: none"> High cost to operate (\$200+/revenue hour) Standard diesel 40' bus - \$450,000 each, electric 40' bus - \$900,000 each Limited geographic coverage High cost limits frequency and span of service | <ul style="list-style-type: none"> Potential for Castle Rock to be served by Front Range Rail Future Bustang stop will help support regional connectivity | \$ \$ \$ | ● |
| Fixed-Route Local Buses | Buses that travel on a regular route at scheduled times, and provide access to destinations on a local scale | <ul style="list-style-type: none"> Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Provides access to local jobs/destinations Provides modal choice for residents Potential to connect major activity centers; support downtown events | <ul style="list-style-type: none"> Cost to operate ~\$125+/revenue hour Standard diesel 40' bus - \$450,000 each, electric 40' bus - \$900,000 each Cost limits span of service Limited geographic coverage Requires two-way operations to make travel times feasible | <ul style="list-style-type: none"> Potential to provide regional connections when Bustang begins serving Castle Rock Fixed route service limits flexibility to serve more of Castle Rock | \$ \$ \$ | ● |
| Circulator | Runs on a fixed route between key destinations; can be a public-private partnership funded partially by large employers or retail destinations or publicly funded | <ul style="list-style-type: none"> Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Provides access to local jobs/destinations Provides modal choice for residents Potential to connect major activity centers; support downtown events Lower capital costs; standard body-on-chassis vehicle (similar to CATCO) ~\$80,000 each | <ul style="list-style-type: none"> Cost to operate ~\$75-\$125/revenue hour Limited geographic coverage Requires two-way operations to make travel times feasible | <ul style="list-style-type: none"> Potential to provide regional connections when Bustang begins serving Castle Rock Fixed route service limits flexibility to serve more of Castle Rock | \$ \$ | ● |
| Point-to-Point On-Demand Service | On-demand transportation that connects riders between any two points within a defined service and/or geofenced area | <ul style="list-style-type: none"> Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> On-demand service model in place through existing Taxi Voucher program and Senior Center Shuttle No or limited capital investment cost Opportunity to look at partnerships with existing ride hailing services (e.g., Uber and Lyft) | <ul style="list-style-type: none"> Current Taxi Voucher program and Senior Center Shuttle limited to certain populations Would need to consider viability of providing service to general public | <ul style="list-style-type: none"> Operational model in place (Taxi Voucher program and Senior Center Shuttle) Scalable based on funding, demand, and driver availability Potential to provide regional connections when Bustang begins serving Castle Rock | \$ | ● |

| Service Model | Service Description | Needs/Opportunities Addressed | Pros | Cons | Other Considerations | Cost | Feasibility |
|---|---|---|---|--|--|-------|-------------|
| | | | <ul style="list-style-type: none"> Provides lifeline/quality of life support to vulnerable populations Service could be expanded to provide trips to general public Scalable based on funding availability | | | | |
| Regional Commuter Service to/from RidgeGate Station | On-demand/flex or fixed-route transportation where one end of the trip must be a transit stop/station | <ul style="list-style-type: none"> Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Private sector models/partnerships available Scalable based on demand If deploying service in partnership with private sector, no capital investment required Provides connections to regional transit system Provides modal choice for commuters Provides an option for entry level workers to get to Castle Rock Potential to provide more frequent service | <ul style="list-style-type: none"> Private sector service models still being proven | <ul style="list-style-type: none"> Town staff in conversation with Via to learn more about microtransit operations and deployment Opportunity for a regional microtransit service option in partnership with other public agencies Potential to parter with other public agencies | \$ \$ | ● |
| Microtransit (Local) | Transit service that offers flexible routing and scheduling but generally shared and not fully door to door (requires users to walk short distances to virtual bus stops); generally mid-size vehicles; hybrid between fixed route and on-demand transportation | <ul style="list-style-type: none"> Serves Vulnerable Populations Enhances Economic Sustainability Supports Population Growth | <ul style="list-style-type: none"> Private sector models/partnerships available Scalable based on demand If deploying service in partnership with private sector, no capital investment required Provides modal choice for residents Provides access to local jobs Opportunity to augment existing Taxi Voucher program to support travel needs of vulnerable populations Potential to provide more geogrpahic coveragen and service frequency | <ul style="list-style-type: none"> Private sector service models still being proven | <ul style="list-style-type: none"> Town staff in conversation with Via to learn more about microtransit operations and deployment Potential to provide regional connections for vulnerable populations when Bustang begins serving Castle Rock Potential to parter with other public agencies | \$ \$ | ● |
| Vanpool | A formal carpool arrangement (coordinated by an employer or regional program) that pairs 4 to 15 riders with similar origins and destinations; Organizational structure varies- publicly operated, private non-profit, or public-private partnerships | <ul style="list-style-type: none"> Provides Regional Connectivity, Supports Population Growth | N/A - See "Other Considerations" | N/A - See "Other Considerations" | <ul style="list-style-type: none"> Vanpool program in place through DRCOG's Way to Go program Opportunity to market existing program to Castle Rock residents and/or utilize future Park-n-Rides to support vanpools Opportunity for partnerships with private sector to get employees to Castle Rock | \$ | ● |
| Carpool | The informal or formal pairing of riders with similar origins/destinations | <ul style="list-style-type: none"> Provides Regional Connections, Supports Population Growth | N/A - See "Other Considerations" | N/A - See "Other Considerations" | <ul style="list-style-type: none"> Capitalize on DRCOG's existing program No need for further evaluation | \$ | ● |

Legend

| | | | | | | | |
|-------------------------------------|----------------------------------|--------------------------------------|---|-------------------|----------------------|--------------------|--|
| \$ Less than \$75 per revenue hour* | \$ \$ \$75-125 per revenue hour* | \$ \$ \$ \$125-225 per revenue hour* | \$ \$ \$ \$ More than \$225 per revenue hour* | ● Low Feasibility | ● Medium Feasibility | ● High Feasibility | Service models recommended for further evaluation and analysis |
|-------------------------------------|----------------------------------|--------------------------------------|---|-------------------|----------------------|--------------------|--|

*Average operating costs per revenue service hour: the average cost for one vehicle to supply transportation services for one hour.



TRANSIT FEASIBILITY STUDY

Next Steps

Based on the evaluation of potential transit operational models for Castle Rock, the project team recommends that three of the service types that ranked with high or medium feasibility move forward for further evaluation. By conducting further analysis and evaluation of multiple service models, the Town will have a menu of options to inform preferred service alternatives and how they align with community values. A single preferred alternative may not be appropriate for Castle Rock; the Town may consider a phased implementation strategy comprised of multiple operational models to meet community needs over time.

Recommended Operational Models for Further Analysis

1. Point-to-Point On-Demand Service
 - a. Enhanced Taxi Voucher program, ridehail service provider partnerships, partnerships with local specialized service providers
2. Microtransit
 - a. General public on-demand transportation with flexible routing and scheduling
 - b. Local service in the Town of Castle Rock
3. First/Last Mile Service
 - a. Commuter shuttle and/or microtransit service to RidgeGate

APPENDIX D

SERVICE MODEL ANALYSIS TECHNICAL MEMORANDUM

OCTOBER 2020



TRANSIT FEASIBILITY STUDY

Memorandum

Date: July 14, 2020
To: Cady Dawson, FHU
Thomas Reiff, Town of Castle Rock
From: Patrick Picard, Jason Miller and Carly Sieff, Fehr & Peers
Subject: **Analysis of Public Transportation Operational Models for Town of Castle Rock**

DN19-0633

Introduction

This memo describes the analysis of three potential operational models for public transportation services within the Town of Castle Rock, including:

- Point-to-Point On-Demand Service
- Microtransit Service
- Commuter Service to the RTD RidgeGate Light Rail Station

These three models were identified by the public and stakeholders as the most feasible as part of an initial screening process. Options within each operational model are explored, preferred options and models identified, including service characteristics, and initial service planning is presented.

It should be noted that these models assume the existing Castle Rock Senior Activity Center Driver Program would continue to operate. Demand for this program may shift with implementation of these models as some users opt for these public transportation options, but given the specialized nature of the Senior Center Volunteer Driver Program and the clientele



serviced, it is anticipated that this service will still be needed in addition to the public transit models.

Lastly this memo covers strategies and recommendations for marketing and implementation of future transit service, including suggestions for phasing.

Point-to-Point On-Demand Service

Under this model riders would request a ride and be picked up at their origin within Castle Rock and dropped off at their destination within Castle Rock, similar to a taxi service.

Provider Models

Two different point-to-point on-demand models were evaluated as part of this analysis, both assuming the Town would contract with a private provider:

- **Ride Hailing** – Under this model, the Town would contract with a ride hailing company (such as Lyft or Uber) to provide service. Ridehailing companies match riders with drivers who use their personal vehicle through an online-enabled web application. Payment is exchanged entirely through the application. Ridehailing companies also typically offer a less expensive shared-ride option that will match riders going the same direction (such as Lyft Line and UberPool - note: this service was temporarily halted during the COVID-19 pandemic).
- **Expanded Taxi Voucher Program** – The Town of Castle Rock currently offers a taxi voucher program to a limited pool of eligible candidates. Under the current program to be eligible one must be a resident of Castle Rock, at least 18 years old (can be 16 years old if using for works trips), and not have access to a personal vehicle or have a disability that prevents that person from driving. This service is also limited to work, medical/dental, grocery and pharmacy related trips. Rides must also be requested no later than the morning before the intended trip. Under an expanded taxi voucher program anyone would be eligible to use the service and requests could be made up to 15 minutes before the service is needed.



Other Models Considered

Other point-to-point on-demand transportation models were considered, including scooter/bike share and car share. These models were not analyzed further primarily because they would only serve a limited population and would not meet one of the Town's goals of serving the most vulnerable population. Bike and scooter share would serve abled bodied adults in good weather, while car share would only serve those with a driver's license. These types of services are more appropriate as complimentary services to existing transit systems, often as first and final mile connections. There certainly can be benefit to communities in providing bike/scooter or car share programs in the right context and the Town may consider these services in the future to fill an additional transportation niche within the community, but they were not explored any further as part of this analysis.

Operational Characteristics

The following sections describe the operational characteristics of on-demand point-to-point service types:

- Ride hailing (*note: companies that provide ridehailing service, such as Uber and Lyft, are often referred to as Transportation Network Companies or TNCs*)
- Expansion of the existing Taxi Voucher Program
- Role of the Existing Castle Rock Senior Activity Center Volunteer Driver Program

The operational characteristics in the following sections are described in the scenario under which either the proposed ride hailing or Taxi Voucher expanded program would exist, but not both services concurrently. The section on the preferred scenario identifies recommendations as to how these various services can be implemented together.

It should be noted that while annual cost and ridership under each model were estimated, the number of comparable programs around the country is limited and this service type is still evolving. Therefore, ridership and cost forecasts have a fairly wide range and are intended to be rough estimates. Where the actual cost and number of riders falls within the forecast range will be heavily dependent on the following factors:

- Level of marketing
- Availability of drivers to meet demand, and
- Other difficult to predict factors, such origin-destination pairs and demand.



Lastly, these forecasts assume a fully mature system, which may take one or more years, with fine tuning along the way, to achieve.

Ride hailing

Eligibility

The current transportation services in Castle Rock are only available for specific user groups. Community, stakeholder, and staff feedback through this transit feasibility study revealed the need for a local transit service that serves all users. The proposed ride hailing service should be eligible to any user traveling within the service area.

Booking

The current Taxi Voucher program requires reservations to be made at least one business day in advance of a trip. The reservation center is open only between 8:00 AM -11:30 AM Monday thru Friday. This restricted reservation system provides a barrier to recruiting and retaining riders. A ride hailing system would provide an on-demand booking mechanism that can utilize smart phone applications. The service should have an average wait time between booking a ride and being picked up of 15 minutes.

There are two types of rides that can be taken through a ride hailing service:

- Shared ride- this ride opens up a ride request to other users who are requesting a ride with a similar route at a similar time, allowing a vehicle to carry multiple passengers. The cost of the ride is reduced.
- Regular, unshared ride- this is the traditional ride, that carries one user at a time.

The Town of Castle Rock can determine if this service will be shared, traditional or both. It is recommended to implement a service where the user can determine if a ride is shared or traditional. This will not limit users who do not feel comfortable sharing a ride but will allow for the environmental and cost benefits of pairing trips. A user fee for a traditional ride should be higher.

Pricing structure

There are three primary pricing structures for a public private partnership with an on-demand service:

- Fully subsidized fare - While a free point-to-point service would likely result in higher ridership, it would also have a large financial impact on Castle Rock. Free service could



cause high enough demand that it could exceed the ability of the program to meet minimum wait times, resulting in customer frustration.

- Subsidy as a percentage of cost - Another option for the Town of Castle Rock is to subsidize a percentage of each ride up to a certain cap. This form of pricing structure limits the potential financial burden on the Town, but it can be more complicated to calculate and leaves riders unsure of what they may have to pay for each ride. If this on-demand program aims to keep user costs comparable to current transit service while serving under-served populations then controlling the rider's share of the price is important.
- Flat fee subsidy - The third option is for the Town of Castle Rock to charge riders a flat cost for each ride. A fixed subsidy is a simpler calculation, while also discouraging riders from abusing the service as could be the case with a free service. Riders know how much they will need to pay for their trip while the agency can still cap their financial contribution per ride, lowering their financial risk.

A flat fee subsidy pricing structure is recommended for a ride hailing service in the Town of Castle Rock so that the cost per on-demand trip is kept consistent and comparable to fixed-route service, but Castle Rock can also minimize their financial burden.

The analysis was performed under two cost scenarios, which are recommended for consideration:

- The user pays the first \$2, Town of Castle Rock pays the next \$8, and the user pays anything beyond the total \$10. This is consistent with the current Taxi Voucher program.
- The user pays one flat fee (\$2.50 for shared rides and \$5 for regular rides). The Town of Castle Rock pays anything beyond that, without a cap. This pricing scheme is modeled after GoMonrovia which developed a highly successful partnership with Lyft and offers a similar service as is proposed in Castle Rock under the point-to-point on-demand model (see case study on next page).



CASE STUDY: GOMONROVIA

In 2018, the City of Monrovia, CA (located in Los Angeles County with a population of 37,000) scrapped their dial-a-ride transit program and instead established a partnership with Lyft. The City initially charged passengers \$1 for shared rides, \$3 for solo rides, and \$0.50 for rides to/from the City's light rail station and downtown. The program has been highly successful. In the few months after launch, ridership increase from about 3,000 riders per month on the old dial-a-ride program to 70,000 per month through the partnership with Lyft. During the same time, the subsidy per passenger decreased from \$20 per passenger to about \$4 per passenger. The original budget for the program was \$1 million per year, but was so successful, it was at risk of far exceeding that.

The City has since made adjustments, reducing the service area from 19 to 13 square miles (now entirely within the City limits). Fares were also adjusted to \$2.50 for shared rides, \$5 for solo rides, and \$0.50 for rides to/from the City's light rail station and downtown. This brought the overall cost down, and under the new structure the City is aiming to get ridership down to about 350,000 per year (from about 800,000 at its peak) to match the program budget.



The robust marketing effort significantly contributed to the program's early success, including branding, signage and wayfinding downtown and at the rail station, and through the Lyft mobile application. Additionally, about 90% of the ride requests are shared, and about 50% of those end up actually shared. About 30% of rides are to/from downtown or the light rail station, and about 50% of rides are to one of seven locations in the City. The average trip length is 1.9 miles. Lastly, the City provides a separate dial-a-ride on-demand service for passengers in need of an ADA accessible vehicle. Overall, this program is one of the most successful examples of a ride-hailing partnership in the United States.



Service area

It is recommended that the ride hailing program maintains the Taxi Voucher's current service area of the Town of Castle Rock boundaries.

The Town boundary service area was determined based on an effective distance that would provide a transportation option to a number of users while still being cost effective and a quick turnaround of vehicles accommodating a 15 to 30 minute wait time. In order to have a cost-effective service that maintains a low wait time and on-demand reservation system, the service area needs to be contained enough to guarantee that drivers can quickly reach a rider, drop them off at their destination, and then go to the next rider, even when there are multiple simultaneous requests. Considering the decrease in land use density beyond Town boundaries, extending this service area would exponentially increase costs, and potentially decrease level of service.

Narrowing the service area to a smaller zone within Castle Rock would also be another option and could help keep costs lower. However, the primary drawback to this option has to do with equity. A smaller boundary than the Town would allow some residents and employees in Castle Rock to access the program, while excluding others that fall outside the service boundary, and thus is not recommended.

Service hours

In order to effectively serve the existing and latent demand for transportation services and increase the reliability of mobility options in Castle Rock, evening service needs to be available. Based on the existing ridership and demand for the taxi voucher program, it is recommended to run a point-to-point on-demand service from 7 AM to 10 PM. Throughout first year pilot, ridership during evening hours should be assessed to determine if evening service hours should be refined in the long-term. Even if ridership declines during these hours, it is important to maintain service in order to offer mobility options that are reliable and consistent enough to encourage behavior change and support those who do not own a vehicle. The number of vehicles can decrease due to an expected decline of demand during evening hours.

Expected ridership

Ridership was forecasted based on the assumption that this service can accommodate an average of 2.5 riders per hour per vehicle. Based on the size and density of Castle Rock and an understanding of peer programs and best practices, it was assumed that when fully mature somewhere between 8 and 15 vehicles would be needed for the \$8 Town contribution cap pricing structure, and 12-20 vehicles for the \$2.50 ride share and \$5 regular ride base fare. See **Table 1** for



the range of ridership estimates based on the number of service hours per day, days per year and a low and high ridership estimate based on the low and high ends of vehicles in service. The shorter time frame assumes service would be offered 12 hours per day Monday through Friday, while the expanded option assumes the service would be offered 15 hours per day Monday through Saturday.

Table 1: Ride hailing ridership forecasts

| Cost structure | Range | # of hours per day | # of days per year | Vehicles in service | Ridership |
|--|------------|--------------------|--------------------|---------------------|-----------|
| TNC - capped at \$8/trip (\$2 base fare) | Low range | 12 | 252 | 8 | 60,000 |
| | High range | | | 12 | 90,000 |
| | Low range | 15 | 304 | 8 | 80,000 |
| | High range | | | 12 | 120,000 |
| TNC - no cap, (\$2.50 shared, \$5 regular fare) | Low range | 12 | 252 | 10 | 80,000 |
| | High range | | | 15 | 110,000 |
| | Low range | 15 | 304 | 10 | 100,000 |
| | High range | | | 15 | 150,000 |

Cost estimate

The variable cost per rider is based on the Uber/Lyft formula for trips using an estimated average trip distance and time based on identified origins and destinations collected through outreach. The average trip fare from Uber/Lyft was used. Cost is based on ridership, but because TNCs are not currently prevalent in the area, a one-time baseline cost will be incurred to ensure a basic level of service. This means that there will likely be a minimum cost of about 30% of the high ridership cost to provide a guaranteed wage to TNC drivers during the first year, regardless of ridership. This cost may not be necessary if driver supply and rider demand is sufficient but should be assumed as a conservative estimate.

The Uber/Lyft formulas for calculating cost were applied.

$$\text{Base Fare} + (\text{Cost per minute} * \text{time in ride}) + (\text{Cost per mile} * \text{ride distance}) + \text{Booking Fee} = \text{Total trip cost}$$

Note: Uber does not use a base fare in their formula.

Total Cost (Town of Castle Rock + User)

Low Range: Average trip distance 4 miles, trip time 10 minutes



$$\text{Uber: } (\$0.42 * 10) + (\$1.60 * 4) + \$2.20 = \$12.80$$

$$\text{Lyft: } \$0.81 + (\$0.28 * 10) + (\$0.83 * 4) + \$3.45 = \$10.38$$

High Range: Average trip distance 5 miles, trip time 12 minutes

$$\text{Uber: } (\$0.42 * 12) + (\$1.60 * 5) + \$2.20 = \$15.24$$

$$\text{Lyft: } \$0.81 + (\$0.28 * 12) + (\$0.83 * 5) + \$3.45 = \$11.77$$

It should be noted that under this scenario it is assumed that the Town would continue to provide an ADA accessible option. This would include either procuring ADA vehicles or maintaining the existing taxi partnership. The service can be linked into the ride hailing app. For example, under Go Centennial, ADA trip requests were booked the same way as a standard Lyft trip, but a different provider with an ADA accessible vehicle would arrive. Alternatively, Castle Rock could use the GoMonrovia model where trips requiring ADA accessible vehicles are booked through a separate process. One thing to keep in mind is that if Federal Transit Administration (FTA) funding is used, the ADA options will need to provide an “equivalent level of service” per the FTA Guidelines (<https://www.transit.dot.gov/regulations-and-guidance/civil-rights-ada/part-37-transportation-services-individuals-disabilities>).

Cost to Town of Castle Rock

Table 2 shows the total annual cost to the Town of Castle Rock for a ride hailing service. These costs take into consideration rider contribution, marketing costs, and one time start-up costs (30%) to recruit enough drivers to guarantee a level of service. Depending on the fare structure, success of the system, and service hours, the annual cost for a mature system is estimated to range from about \$380,000 to \$1,120,000 starting in year two. Year one includes one-time start up costs to guarantee drivers and thus range from \$490,000 to \$1,450,000. In reality, the cost for the first year is likely to be lower than what’s shown here as demand will likely not be as high in the first year as successive years. The wide range in estimated cost estimate is based in large part on the wide range of ridership forecasts and average trip lengths, as there are not many comparable programs around the country from which to base ridership forecasts. The level of marketing will also determine how successful the program is and impact cost.



Table 2: Ride hailing, total annual cost to the Town of Castle Rock

| Models | Service Hours | Range | Service Cost | Marketing costs (1.5%) | Annual cost to Town of Castle Rock (Year 2+) | One time (30%) start-up costs for driver recruitment |
|--|--------------------|-------|--------------|------------------------|--|--|
| TNC - capped at \$8/trip (\$2 base fare) | 7 AM- 7 PM, M-F | Low | \$375,000 | \$6,000 | \$380,000 | \$110,000 |
| | | High | \$675,000 | \$10,000 | \$685,000 | \$200,000 |
| | 7 AM – 10 PM, M-Sa | Low | \$500,000 | \$8,000 | \$510,000 | \$150,000 |
| | | High | \$900,000 | \$14,000 | \$915,000 | \$270,000 |
| TNC - no cap, (\$2.50 shared, \$5 regular fare) | 7 AM - 7 PM, M-F | Low | \$450,000 | \$7,000 | \$455,000 | \$140,000 |
| | | High | \$825,000 | \$12,000 | \$835,000 | \$250,000 |
| | 7 AM– 10 PM, M-Sa | Low | \$575,000 | \$9,000 | \$585,000 | \$170,000 |
| | | High | \$1,100,000 | \$17,000 | \$1,120,000 | \$330,000 |

Taxi Voucher

Eligibility

Currently, to be eligible for the Taxi Voucher program, riders must:

- Be residents of the Town of Castle Rock
- Be at least 18 years old (16 and 17-year-olds may apply for work trips only)
- Not have access to a personal vehicle or have a disability that prevents them from driving
- Limited to work, medical/dental, grocery and pharmacy related trips.

Given that 98% of the Castle Rock population owns a vehicle, this serves a limited number of Castle Rock residents and does not serve Castle Rock employees or visitors who are not residents. Both public and stakeholder outreach through this effort showed a latent demand for a transportation service that serves all travelers in Castle Rock.

It is recommended to expand eligibility of the Taxi Voucher program to all users traveling within the defined service area. Based on the budget and demand for the service, the Town of Castle Rock can consider capping the number of daily, weekly or monthly uses per person. This assessment should be made after a year pilot of the expanded service. The Town is interested in gradually expanding service to the level recommended. The phases of this expansion are described in more detail in the Phasing & Implementation section below.



Booking

The current Taxi Voucher program requires reservations are made at least one business day in advance of a trip. The reservation center is open only between 8:00 AM -11:30 AM Monday thru Friday. This restricted reservation system provides a barrier to recruiting and retaining riders. It is recommended to shift the Taxi Voucher program to on-demand booking mechanism that can either utilize smart phone applications or a dispatcher through a call service. The service should have an average wait time between booking a ride and being picked up of 15 minutes. It should be noted that riders will still have the option of booking rides several days in advance to guarantee a ride.

Pricing structure

It is recommended to consider the two fare options discussed in the ride hailing section.

The analysis was performed under two cost scenarios, which are recommended for consideration:

- The user pays the first \$2, Town of castle Rock pays the next \$8, and the user pays anything beyond the total \$10. This is consistent with the current Taxi Voucher program.
- The user pays one flat fee (\$2.50 for shared rides and \$5 for regular rides). The Town of Castle Rock pays anything beyond that, without a cap.

Service area

The Taxi Voucher program currently serves trips within the Town of Castle Rock boundaries. It is recommended to maintain this existing service area, for the same reasons discussed in the ride hailing section.

Service hours

It is recommended to run the expanded Taxi Voucher program from 7 AM to 10 PM, as described in the ride hailing section.

Expected ridership

Ridership was forecasted based on the assumption that this service can accommodate an average of 2.5 riders per hour per vehicle. Based on the size and density of Castle Rock and an understanding of peer programs and best practices, it was assumed that when fully mature somewhere between 5 and 10 vehicles would be needed. This estimate is a little lower than the ride hailing estimate given it is less convenient to book and pay, which creates a barrier to some users, and there would not be an option for shared rides under a taxi program, which means costs



on average will be higher for the user. See **Table 3** for the range of ridership estimates based on the number of service hours per day, days per year and a low and high ridership estimate based on the low and high ends of vehicles in service.

Table 3: Taxi Voucher ridership forecasts

| Cost structure | Range | # of hours per day | # of days per year | Vehicles in service | Ridership |
|---|------------|--------------------|--------------------|---------------------|-----------|
| Taxi - capped at \$8/trip (\$2 base fare) | Low range | 12 | 252 | 5 | 40,000 |
| | High range | | | 10 | 80,000 |
| | Low range | 15 | 304 | 5 | 50,000 |
| | High range | | | 10 | 100,000 |
| Taxi - no cap, (\$2.50 shared, \$5 regular fare) | Low range | 12 | 252 | 5 | 40,000 |
| | High range | | | 10 | 80,000 |
| | Low range | 15 | 304 | 5 | 50,000 |
| | High range | | | 10 | 100,000 |

Cost estimate

The variable cost per rider is based on the formula in the existing contract with the current taxi provider. This formula assumes a base fare \$2.50 and cost of \$2.50 per mile. The average trip distance is based on identified origins and destinations collected through outreach.

The existing taxi formula for calculating cost were applied.

$$\text{Base Fare } [\$2.50] + (\text{Cost per mile } [\$2.50] * \text{ride distance}) = \text{Total trip cost}$$

Total Cost (Town of Castle Rock + User)

Low Range: Average trip distance 4 miles

$$\text{Taxi fare: } \$2.50 + (\$2.50 * 4) = \$12.50$$

High Range: Average trip distance 5 miles

$$\text{Taxi fare: } \$2.50 + (\$2.50 * 5) = \$15.00$$

Cost to Town of Castle Rock

Table 4 shows the total cost of an expanded Taxi Voucher program to the Town of Castle Rock. These costs take into consideration rider contribution, and marketing costs. Depending on the fare structure, number of vehicles in operation, and service hours, the annual cost ranges from



\$255,000 to \$1,015,000. . The wide range in estimated cost estimate is based in large part on the wide range of ridership forecasts and average trip lengths, as there are not many comparable programs around the country from which to base ridership forecasts. The level of marketing will also determine how successful the program is and impact cost.

Table 4: Taxi Voucher, total annual cost to the Town of Castle Rock

| Cost Structure | Service Hours | Range | Cost to Castle Rock | Marketing costs (1.5%) | Total cost for Town of Castle Rock |
|--|--------------------|-------|---------------------|------------------------|------------------------------------|
| TNC - capped at \$8/trip (\$2 base fare) | 7 AM- 7 PM, M-F | Low | \$250,000 | \$4,000 | \$255,000 |
| | | High | \$600,000 | \$9,000 | \$610,000 |
| | 7 AM – 10 PM, M-Sa | Low | \$325,000 | \$5,000 | \$330,000 |
| | | High | \$750,000 | \$11,000 | \$760,000 |
| TNC - no cap, (\$2.50 shared, \$5 regular fare) | 7 AM - 7 PM, M-F | Low | \$300,000 | \$5,000 | \$305,000 |
| | | High | \$800,000 | \$12,000 | \$810,000 |
| | 7 AM– 10 PM, M-Sa | Low | \$375,000 | \$6,000 | \$380,000 |
| | | High | \$1,000,00 | \$15,000 | \$1,015,000 |

Senior Center Volunteer Driver Program

The Castle Rock Senior Activity Center runs a transportation program that is eligible to seniors (age 50+) and persons with a disability in Castle Rock, Castle Pines, Franktown, Sedalia, Larkspur, Perry Park and Louviers. This service currently operates between 9 AM and 3 PM Monday thru Friday. The Town of Castle Rock currently contributes \$60,000 per year to support this program. This is an important program that provides regional transportation to two user groups with higher than average transportation needs. Additionally, the program is at capacity and struggles to meet existing demand. It is assumed this program would be maintained in its current form to serve this specialized population and the Town would continue to provide contributions to support this service.

Some current users of the Senior Activity Center Volunteer Driver Program may shift to one of the on-demand services described in this memo if offered, which would help reduce demand for the program that exceeds capacity today. However, it is anticipated that the Senior Activity Center Volunteer Driver Program will continue to be used and will provide valuable transportation asset to the community. To further support and expand the program, the Town could reach out to the County or some of the surrounding communities the program currently serves to inquire about additional funding. However, it should be noted that the Senior Activity Center is a nonprofit 501(c)3 organization, and they will ultimately be in charge of managing their resources, fundraising, and will determine how additional funds can be best used.



Pros and Cons of Ride Hailing Model & Taxi Voucher Model

Advantages of Ride Hailing Model

- Contracting with a ride hailing provider can transfer the financial risk and staff resource requirement from the Town onto the provider.
- Ride hailing providers have the benefits that come with economies of scale in the development and application of technologies, pool of drivers, and marketing that taxi companies generally don't offer.
- The cost to provide the services through a ride hailing provider is estimated to be lower per rider than a taxi voucher program, meaning the service is more cost effective.
- If ride hailing providers provide the service, they can also save the Town money by providing some of the marketing due to their national recognition and ability to send notifications through their app to users in the area.
- Ride hailing providers are generally subsidized by investors, meaning that the Town and users might not face the full cost of providing the service.
- The driver supply may be less flexible when run through the Town of Castle Rock, the Senior Center, or Douglas County because they are subject to the existing bargaining agreement for unionized employees that require them to work a certain number of hours. The Senior Center also uses volunteer drivers that are available only in limited capacities.
- The technology of the existing taxi voucher program may not be able to support a significant increase in ridership, coordinating trip requests, optimizing ride sharing and route selection as a ride hailing provider would offer.

Advantages of Expanding Existing Taxi Voucher Program

- There is less risk under the existing taxi voucher program. Because ride hailing providers are still highly subsidized by investors, the cost per ride might change into the future as the financial models and market for ride hailing providers evolves in the region and around the country. Additionally, there could be up front and ongoing costs to get Uber/Lyft to enter the Castle Rock market and maintain adequate service levels. This can be addressed by setting a contract with the provider that provides a fixed fee or at least addresses the unpredictability of a potential increase in prices in the long term and surge pricing in the short term.
- Traditional taxis hire drivers and are better able to guarantee service levels. Due to the service model of a ride hailing company they cannot guarantee enough drivers to operate within defined level of service thresholds.



- It may not be feasible to get a contract with a ride hailing company. Nationally, ride hailing providers are reluctant to create public private partnerships in less dense, outlying communities. The Town will need to further explore whether ride hailing is an option.
- Collecting and distributing data is much easier and guaranteed when the Town of Castle Rock or a local partner is the operator. Other agencies have faced challenges in receiving data in a timely and detailed manner when working with Transportation network companies such as Uber or Lyft.
- The existing program already has name recognition, ridership, and a client base in the Castle Rock region. Continuing to build on that may increase the intuitiveness for users and decrease marketing costs.
- The contract with Metro Taxi Denver is already in place. Developing a contract with a new provider may require going out to bid, and additional resources and time.

Recommendation & Next Steps

Based on the analysis presented in this memo, either utilizing a taxi voucher program or contracting with a ride hailing agency to provide point-to-point on-demand service would be effective in achieving the outcomes the Town is seeking in expanding transit and would result in a similar product. However, the feasibility of landing a contract with a ride hailing company or scaling up the existing taxi voucher program are yet to be determined. Some of the unknown variables include:

- Would enough drivers associated with a ride hailing company be reliably available to meet demand?
- Is the travel market in Castle Rock sufficient to get a ride hailing provider to partner?
- Would Metro Taxi (or another taxi vendor) have the resources (drivers, vehicles, booking platforms, dispatchers, etc.) to provide the type of on-demand service desired?

Given these unknowns, it is recommended as the next step that the Town initiate conversations with potential providers (both ride hailing and taxi vendors) to determine whether the service assumptions discussed in this memo would be feasible and whether any tradeoffs would need to be made.

Recommended Model

Assuming both models are feasible, the recommendation from this analysis would be to pursue a contract with a ride hailing agency. Because ride hailing agencies offer both individual and shared rides, generally have a lower pricing model, and a fully established online booking and payment



platform, contracting with a ride hailing agency is forecast to result in higher overall ridership at a lower cost per ride as compared to an expanded taxi voucher program. Ride hailing agencies also have already established platforms that can more easily be leveraged for marketing the program. However, as noted previously there are some risks to teaming with a ride hailing agency. Risks include reliability of drivers to meet demand and unknowns regarding the long term sustainability of their model. Assuming a fully mature system, contracting with a ride hailing agency is anticipated to result in higher overall ridership than using a taxi vendor, and despite a lower average cost per rider, may result in a higher total cost to Castle Rock.

Phasing & Implementation

The Town is interested in incrementally phasing implementation of a point-to-point on-demand service by gradually growing the existing taxi voucher program. Four phases for expanding the existing program were identified and are described below, including high-level cost estimates for each phase of expansion.

Phase 1: Allow all trip purposes and extend hours to 10 PM.

Under the first phase of expansion of the taxi voucher program the Town would maintain the existing eligibility requirements, but allow trips for all purposes (not just to those that are work-related, for grocery, and medical/pharmacy trips as the program does today) and would extend the hours of service to 10 PM (instead of 4:30 PM). Parties of more than one would be allowed to use the service between the same origin and destination. This would allow use of the program for recreational trips or other needs as well as by those commuting and traveling in the evening.

Under the existing taxi voucher program, Metro Taxi has not agreed to extend the hours of service beyond 4:30 PM because the demand for the service under the current structure is not high enough to meet the taxi company's bottom line. Allowing all trip purposes will increase demand, particularly in the evening, but the increase in demand under this phase is forecast to be marginal given that trips will be limited to the same pool of applicants and still must be made at least 24 hours in advance. Therefore, the limiting factor to cost may be the need to pay the taxi company a baseline guaranteed price to operate in the evening. Assuming this arrangement, it is estimated that this will increase the cost of the program by about 50% to 100%. The variability in cost estimates will depend on the terms outlined by the taxi company and the number of additional trip requests during the day which may trigger the need to provide a second vehicle. Therefore annual cost under this phase is estimated at \$35,000 to \$50,000.



Phase 2: Expand eligibility to seniors.

Under second phase of expansion of the taxi voucher program the Town would expand eligibility to allow seniors to utilize the program. Assuming the same age thresholds as the existing Senior Activity Center Volunteer Driver Program, which is age 50 and above, this would increase the pool of eligible riders from about 5-8% of the Castle Rock population to about 30%. While this will inevitably increase demand for the taxi voucher program, seniors that have access to a vehicle and do not have a disability, are not as likely to use the program to the extent of the existing pool of applicants. Therefore, it is assumed under this phase, demand for the service would likely double and therefore the cost of the program is expected to increase by another 50% to 100%. The reason cost may not double even if ridership does is due to the fact that there's likely to be some efficiencies gained through economies of scale, particularly in the evening, and the increased demand may cover more of the guaranteed price for the taxi company to operate in the evening. Under this phase of expansion it's estimated that annual cost of the program to be between \$60,000 and \$90,000.

Phase 3: Convert to on-demand.

Under the third phase of expansion of the taxi voucher program the Town would convert to an on-demand model, allowing trips to be booked in as little as 15 minutes prior to a trip. The same eligibility requirements of Phase 2 would be maintained. Under this scenario, one would not have to book a trip 24 hours in advance (although they still could), but one could request a trip shortly before they are ready to depart. Because of the flexibility and convenience this provides as compared to the existing program, its expected that many more people would use the service under this phase of expansion. In addition, for this model to be successful, the taxi program would need to scale up service so as not to risk turning away customers. Lastly, the taxi program would need to establish a dispatch system in order to respond to requests for trips on-demand. As this point in the expansion, the Town of Castle Rock could consider contracting with a ride-hailing company or a traditional taxi provider.

This phase of expansion is essentially the same as the point-to-point models described earlier in the memo, with the exception that eligibility would be limited to about 30% of the Town's population. This portion of the population (seniors, people with a disability, and people without access to a vehicle) would use the service more than the general population, and thus cost is estimated to be a little higher than 30% of the estimated cost of an expanded Taxi Voucher Program described in **Table 4**. Therefore, this phase of expansion is estimated to cost about



\$150,000 to \$250,000 annually depending on the success of the program and contract negotiations with the taxi provider or ride hailing company.

Phase 4: Remove eligibility requirements.

Phase 4 expansion would be the same as the point-to-point models described earlier whereby the Town would contract with a ride hailing or taxi company. Under this model, anyone traveling within the Town boundaries could use the service and there would be no eligibility requirements.

Under the final expansion, it is recommended that the Town initiate a pilot program in order to test the program's effectiveness and improve the model. Once a contract is established it should run for at least a year to allow time for greater adoption of the program and more accurate evaluation of the results. As learned from other similar pilots, a six month pilot does not give adequate time to see a significant shift in travel behavior. As part of the pilot program the Town may want to consider offering a lower price point to users initially in order to attract riders who may be tentative and establish and to initial base.

Second, it is also recommended that the program be heavily marketed, especially in the first year. One of the primary lessons learned from other communities that have piloted such service is that the level of ridership and success of these types of programs are heavily dependent on the level of marketing. More detail and specific marketing strategies are discussed in the Marketing section later in this memo.

Lastly, it's recommended the Town closely track ridership, cost and other factors during the initial pilot run and hold off making drastic changes until the pilot has run its course. Following the initial pilot, it may be necessary to make adjustments to the system to achieve the desired outcomes or meet budgets in the following years. Potential tweaks may include:

- Adjusting the pricing structure
- Adjusting the service area or hours
- Capping the number of rides per user per week to manage costs (for example, if there are a limited number of users who disproportionately use the program)
- Providing incentives for certain users or types of trips
- Track and act on equity measures (such as increasing affordability to certain user groups)
- More strategic marketing



Microtransit

General public on-demand transportation

This section details microtransit and its applicability, considerations, and initial service planning as an on-demand public transportation solution for the Town of Castle Rock.

Microtransit – What is it?

Microtransit is a form of demand response transit that leverages smartphone technology using a smartphone app to match trip requests in real-time to dynamic/flexible routes in a defined service area. For users, it is similar to using ride-hailing services such as Uber or Lyft with ability to request a trip within a short timeframe (typically 15 minutes or less) and be picked up and dropped off within a short distance of their origin and destination points (typically 1-2 blocks or less). Microtransit typically operates with smaller vehicles, such as cars, vans, or shuttle buses.

Success Factors

In the past five years, microtransit has matured as a public transportation service option. As a result, many lessons have been learned about what success factors contribute to a successful microtransit program:

- Service area size of two to five square miles per vehicle, depending on density.
- Key destinations within service area, such as shopping/retail, employment centers, transit hubs or high frequency transit, medical services, and social services.
- Mix of population densities within service area, often matching low to medium density housing with higher density commercial areas.
- Ability to group trips to/from key destination at similar times.
- Fare structure that balances convenience, affordability, and ridership goals.
- Robust marketing and public education.
- ADA accessible vehicles and call-in option for those without smartphones.

Performance

Setting reasonable financial and ridership performances is necessary prior to establishing microtransit service. When comparing typical applications and results, microtransit does not perform as well as most fixed route bus routes in terms of riders per vehicle service hour or cost



per rider, but microtransit performs better in terms of cost per vehicle service hour. It also performs better than most paratransit or demand response systems, in terms of ridership per hour and cost per passenger.

A recent national study¹ of microtransit services and associated performance was conducted and yielded performance results shown in **Table 5** (note the numbers shown are self-reported figures from agencies that responded).

Table 5: Comparison of microtransit performance

| Service | Contract or In-House | Cost/Vehicle Service Hour | Passengers/Vehicle Service Hour | Cost per Passenger Trip |
|----------------|---|---|---|-------------------------|
| AC Transit | In house | \$214.00 (fully allocated) | 3 | \$71.00 |
| Cherriots | In house | \$65.00 | 3.5 | \$18.57 |
| DART (Dallas) | Contracted. Dart provides vehicles and facilities but not fuel. | \$46.00 | 2.5 for original DRT service, 3.5 for new GoLink service. | \$18.40 \$13.14 |
| Denver RTD | Contracted | \$83.00 | 3.8 | \$21.84 |
| HART | Contracted | HART pays contractor by trip and not by hour. | 3.5 | \$10.00 |
| Houston METRO | In house | \$75.00 | 2.4 | \$31.25 |
| Kitsap Transit | In house | \$130.72 | 3.66 | \$35.68 |
| LYNX | Contracted | \$41.17 | 3.3 | \$12.60 |
| MST | Contracted | \$54.18 | 4.03 | \$13.44 |
| NVTA | Contracted | \$44.48 | 2.6 | \$17.00 |
| NCTD | Contracted | \$97.00 | 2.7 | \$36.00 |
| TDU | Contracted and in house | \$34.69 | 4.7 | \$7.34 |

Source: Transit Cooperative Research Program (TCRP) Synthesis 141

¹ Transit Cooperative Research Program (TCRP) Synthesis 141, *Microtransit or General Public Demand-Response Transit Services: State of the Practice*



Vendors

Microtransit requires a technology platform and expertise that is beyond typical public transportation services. Over the past five to ten years, a variety of private sector vendors have grown to provide a variety of microtransit services. Solutions vary by vendor but generally include simulation tools, ridematching software, dispatching platforms, and full turn-key operations. Examples of vendors include Transloc, Downtowner, Spare Labs, RideCo, and Via.



Applications

There are many different applications for microtransit but the most common include:

- As a first/final mile solution to connect high frequency bus routes or rail lines to lower density areas.
- As an incremental improvement to existing dial-a-ride or paratransit services.
- As a replacement for low-performing suburban or rural fixed route services.
- As a new public transportation solution for areas without existing fixed route service and not easily served by fixed route service.

In general, the application of microtransit with smaller vehicles provides more flexibility in serving more distributed areas, and residential neighborhoods may find that microtransit is less impactful than fixed route bus service due to reduced noise and vehicle pollution.

Service Delivery Models

Microtransit has two primary models for delivery of service:

- **Turn-key Contract**
 - Under this model, a municipality or public transit agency would contract with an experienced vendor who provides and manages all aspects of the microtransit service including provision of vehicles and drivers, technology platform, reporting, and program administration.
 - Often called Transportation as a Service (TaaS) or Mobility as a Service (MaaS) model.
- **Agency Operated**



- Under this model, a municipality or public transit agency would operate and manage the service directly with agency-owned vehicles and agency-employed drivers, but the technology platform to enable real-time ride-matching would be purchased on a subscription basis per vehicle operated.
- Often called Software as a Service (SaaS) model.

Turn-key Microtransit

Turn-key microtransit provides for a quick and easy implementation and ongoing operational path for the Town of Castle Rock, but it comes with a higher cost and less control.

Considerations

Turn-key microtransit provides the following advantages and disadvantages to a community or agency considering microtransit implementation:

- **Advantages**
 - Can be deployed quickly
 - Does not require public transportation knowledge or expertise
 - Does not require hiring or management of drivers, mechanics, or administration staff
 - Contractor accountability for service quality
 - No (or low) vehicle capital costs
 - Leverage of vendor's scale of operations
 - Puts most compliance requirements onto vendor
- **Disadvantages**
 - Less overall control of service quality, customer experience, and operational procedures
 - Higher ongoing operating cost
 - Flexibility, responsiveness, and adaptability of service constrained to terms of contract
 - Requires oversight by Town



Town-Operated Microtransit

Town-operated microtransit is less expensive and provides for more control and oversight of the service, but it comes with higher capital equipment costs and requires Town organizational infrastructure.

Considerations

Town-operated microtransit provides the following advantages and disadvantages to a community or agency considering microtransit implementation:

- **Advantages**
 - Lower ongoing operational costs
 - More control of service quality, customer experience, and operational procedures
 - Allows Town to adapt or change service quickly without contractual limitations
 - Simpler procurement and contracting process for ridematching software
- **Disadvantages**
 - High upfront and replacement vehicle capital costs
 - Requires hiring and management of drivers, mechanics, and support staff
 - Puts more compliance requirements onto Town
 - Takes longer to plan and implement new service
 - Requires Town to learn operational aspects of microtransit and build institutional knowledge

Delivery Model Comparisons

As shown in **Table 6**, a comparison of ease and cost is presented for the two service models. For the three ease categories a “high” rating is desirable, and for the two cost categories a “low” rating is desirable.



Table 6: Comparison of microtransit delivery models

| Model | Ease of passenger use | Ease of implementation | Ease of ongoing operations | Operating Cost | Capital Cost |
|----------------------|-----------------------|------------------------|----------------------------|----------------|--------------|
| Turn-key | High | High | High | High | Low |
| Town-operated | High | Low | Mid | Mid | High |

The turn-key model is easy to implement and operate long-term, given that the Town doesn't have to operate or manage day-to-day operations, but turn-key is higher to operate per hour of service. The capital cost is generally included in the cost of turn-key operations, so the capital costs are low.

For Town-operated service, the ease of implementation is lower, but cost of operations is lower per hour, given use of Town staff. Capital cost is high due to the need to purchase, maintain, and replace vehicles long-term.

Preferred Model

Of the two provider models, the preferred model is turn-key microtransit for the following primary reasons:

- The Town of Castle Rock does not currently operate transit services – building the necessary organizational capacity and knowledge would take significant effort and cost.
- Leveraging the experience and knowledge of a microtransit vendor will ensure quality and ease of implementation, as well as ongoing operations.
- The path to implementation is quicker and simpler.

Service Characteristics

To maximize ridership growth, ease of use, community adoption, and convenience, it is recommended that microtransit in Castle Rock have easy to understand service characteristics:

1. *Hours of service*
 - a. Cover 10 to 12 hours of all weekdays as a Phase 1 minimum starting point.
2. *Trip parameters*
 - a. Exact origin and destination pickup and drop-off (curb to curb) or cross street locations that require one to two blocks of walking for passenger access.
3. *Trip fulfillment*



- a. 15 minutes or less response time from trip request to pick up.
- 4. *Vehicle type*
 - a. Could be a minivan, passenger van, or small shuttle bus.
- 5. *Accessibility*
 - a. At least half of the microtransit vehicles should be ADA-accessible vehicles.
 - b. Call-in option for those without smartphones.
 - c. Cash or prepay payment option for those without credit cards or access to banking.

Service Area

One of the important success factors for microtransit is appropriately sizing the service area to ensure highly responsive service that is convenient for users. Given that this will be a new service for the Town of Castle Rock with new budget expenses, a phased approach to service area development is preferred. The following concept maps are preliminary and likely not where the final service areas will be defined, but they are meant to be a starting point to show how microtransit could start and develop within Castle Rock.

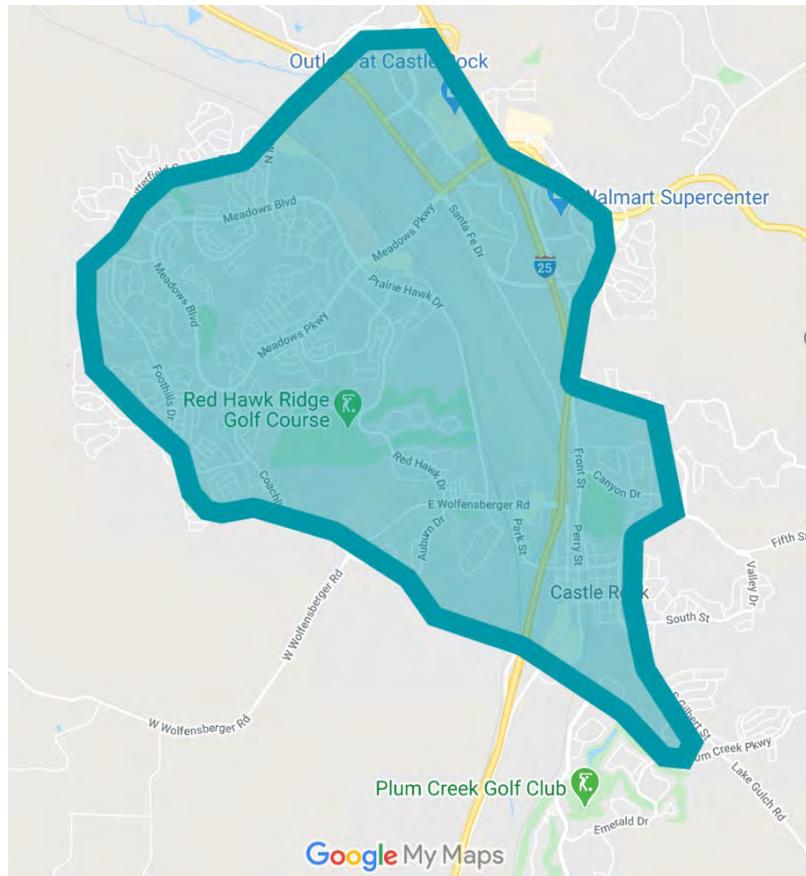
Since service area size and hours of service are the key factors that drive operational cost, the example phased approach is built around starting small and building over time, as resources, demand, and community support grow. For estimation purposes, we have used general guidelines of one microtransit vehicle for each four to five square mile area, given Castle Rock's relatively low overall density and large geographic Town area, and of fulfilling trips within 15 minutes or less.

Phase 1

As shown in **Figure 1**, this example Phase 1 service area is just under eight square miles, which would require two active microtransit vehicles for most weekday service hours.



Figure 1: Microtransit Phase 1 Example

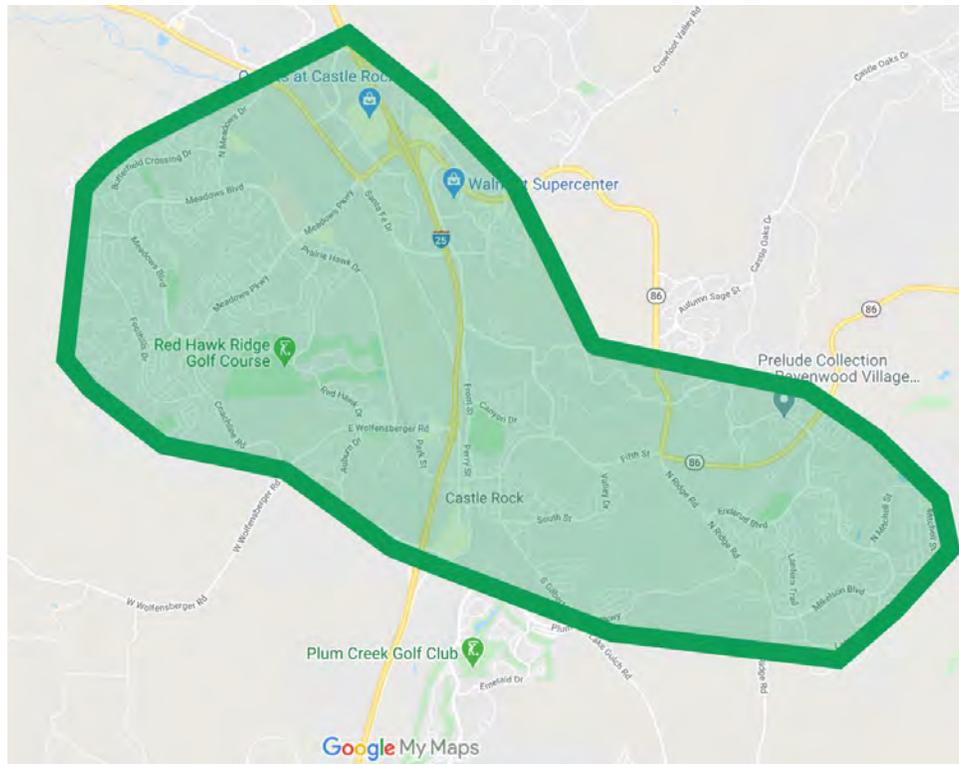


Phase 2

As shown in **Figure 2**, this example Phase 2 service area is just under 20 square miles, which would require four to five active microtransit vehicles for most weekday service hours.



Figure 2: Microtransit Phase 2 Example

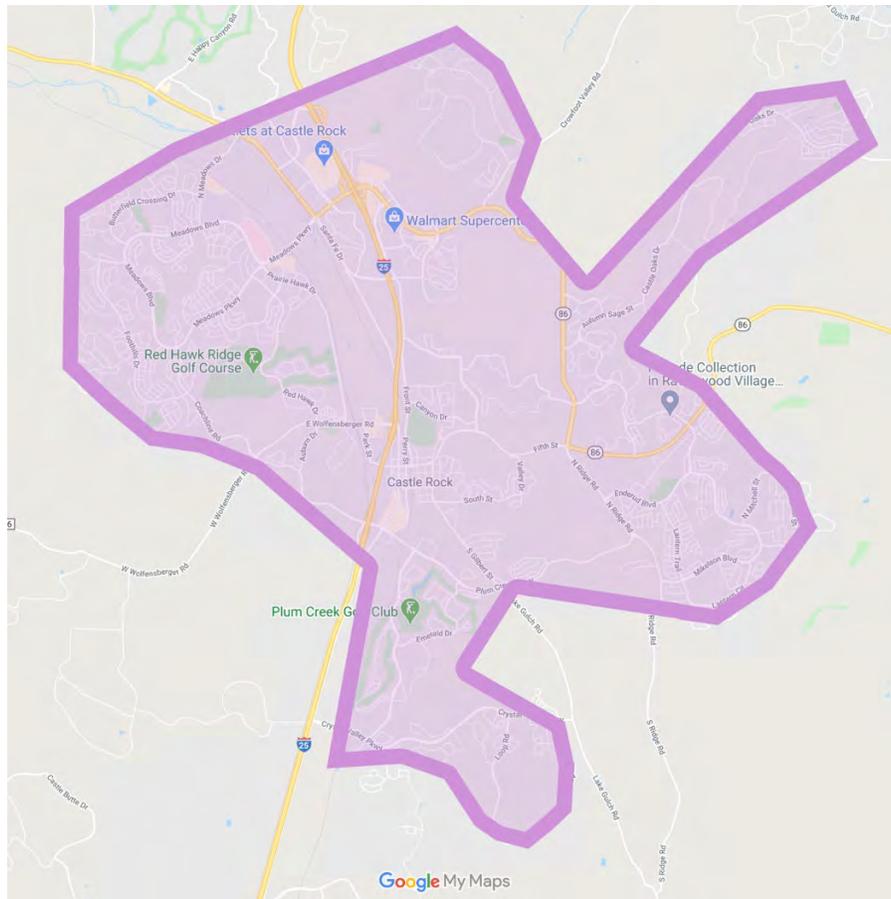


Phase 3

This example Phase 3 service area is just under 30 square miles, as shown in **Figure 3**, which would require five to seven active microtransit vehicles for most weekday service hours. It encompasses the entire Town of Castle Rock boundary.



Figure 3: Microtransit Phase 3 Example



Cost and Performance Estimates

The ridership, cost, and performance estimates are shown in **Table 7**. Microtransit service is shown as starting with the Phase 1 zone and a base level of weekday hours from 7:00 AM until 7:00 PM. Extended hours of 7:00 AM until 10:00 PM Monday through Saturday are also shown. Phase 2 and Phase 3 are the larger footprint microtransit zones and are shown with both base and extended hours of service. As hours of service, days of service, and service area grow, ridership per hour (service productivity) decreases based on serving lower demand times/days (later evenings and Saturdays), and a larger service area with lower overall density. Note: all cost estimates are shown as gross cost and do not account for revenues.

This is anticipated to be a starting point with growth in terms of service hours and service area over time – it may take five to 10 years to grow the system to Phase 3 – Monday through Saturday. It should also be noted that ridership estimate ranges will not be achieved in first



months of launching a new service (or expanding hours or zone size) and may take six to 12 months before growing into the estimated ranges.

Table 7: Microtransit Cost and Performance Estimates

| Microtransit Service* | Vehicles in service | Hours of service | Cost estimate range** | | Ridership estimation basis | Ridership estimate range | | Cost per passenger range | |
|-----------------------|---------------------|--------------------|-----------------------|-------------|--|--------------------------|--------|--------------------------|---------|
| Phase 1, M-F | 1-2 | 7:00 AM - 7:00 PM | \$ 290,000 | \$ 390,000 | 5-6 passengers per vehicle service hour for 10 sq. mile or less zone, M-F | 23,000 | 27,000 | \$11.00 | \$17.00 |
| Phase 1, M-Sa | 1-2 | 7:00 AM - 10:00 PM | \$ 440,000 | \$ 580,000 | 4.5-5.5 passengers per vehicle service hour for 10 sq. mile or less zone, M-Sa | 31,000 | 38,000 | \$12.00 | \$19.00 |
| Phase 2, M-F | 3-5 | 7:00 AM - 7:00 PM | \$ 790,000 | \$1,030,000 | 3-4 passengers per vehicle service hour for 10-20 sq. mile zone, M-F | 36,000 | 48,000 | \$16.00 | \$29.00 |
| Phase 2, M-Sa | 3-5 | 7:00 AM - 10:00 PM | \$1,040,000 | \$1,360,000 | 2.75-3.75 passengers per vehicle service hour for 10-20 sq. mile zone, M-Sa | 44,000 | 60,000 | \$17.00 | \$31.00 |
| Phase 3, M-F | 5-7 | 7:00 AM - 7:00 PM | \$1,180,000 | \$1,540,000 | 2.5-3.5 passengers per vehicle service hour for 20 sq. mile or more zone, M-F | 45,000 | 64,000 | \$18.00 | \$34.00 |
| Phase 3, M-Sa | 5-7 | 7:00 AM - 10:00 PM | \$1,630,000 | \$2,130,000 | 2.25-3.25 passengers per vehicle service hour for 20 sq. mile or more zone, M-Sa | 56,000 | 82,000 | \$20.00 | \$38.00 |

*Note: * Each phase has both Monday - Friday 7A-7P and Monday - Saturday 7A-10P estimates.
 ** Cost estimates based on \$65 - \$85 per vehicle service hour for turn-key microtransit service.
 Source: Fehr & Peers, 2020*

Fare Structure

Defining fare structure is a policy decision with significant ridership implications. As a new service that needs to attract new riders, it is important to create a fare that incentivizes use and creates ridership growth. As the service develops and service demand changes, the fare may need to be adjusted over time. Fares and ridership have an inverse elasticity in that as fares increase, ridership decreases, but not necessarily equally.

As with any other public transportation service, microtransit has widely varied fares from one agency to another. Examples of microtransit fares include:

- The Lone Tree Link on Demand is free
- The Aspen Downtowner is free
- Arlington Via On-demand (TX) is \$3.00 per trip
- Ride KC Microtransit (KS) is \$1.50 per trip
- West Sacramento On-demand (CA) is \$3.50 per trip
- San Antonio LINK (TX) is \$1.30 per trip



For a new service in Castle Rock, it is likely that a free or low fare, such as \$2 flat fee per trips with any origination or destination point within the defined microtransit zone, would be most appropriate to attract new riders.

Phasing and Implementation

Phasing and implementation of microtransit would follow the phased approach to microtransit zone size, hours of service, and days of service per week, previously described in this section. Microtransit is recommended to start with Phase 1 service size area, 7:00 AM – 7:00 PM daily hours, and Monday through Friday days of service. As ridership grows and performance benchmarks are achieved, the hours of service would be expanded until 10:00 PM and Saturday would be added. The size of the microtransit area would then be expanded to the Phase 2 and Phase 3 microtransit zone areas. It is likely that it would take one to two years for each expansion in service to mature before another expansion in either microtransit service hours or service area would be considered.

Commuter Service

Castle Rock to RidgeGate/Lone Tree RTD rail station

This section details options for establishment of a new commuter service connecting Castle Rock to the RTD RidgeGate Parkway Station, which is the southernmost RTD rail station and accessed by a portion of commuters from Castle Rock. The service options are presented along with considerations and initial service planning on a preferred commuter option.

It should be noted that these commuter options assume that Bustang service connecting RidgeGate and Castle Rock may not begin for many years – the commuter service options described in this section may need to adjusted if/when Bustang were to connect RidgeGate and Castle Rock. Even if Bustang were to make this connection, it is likely that there would still be the need for a dedicated commuter connection between RidgeGate and Castle Rock at certain times of the day that Bustang wouldn't operate or wouldn't provide enough connectivity.

Service Options

We have identified the three viable options for the commuter service between Castle Rock and RidgeGate:



- **Commuter Fixed Route**
 - This option is for a traditional commuter fixed route service with fixed stops and timetable.
- **Microtransit Flex Route**
 - This option would operate as microtransit zone within Castle Rock and then a direct route to Lone Tree.
- **Hybrid Route**
 - This could combine aspects of the first two options, creating a deviated fixed route that would service a microtransit zone in between established stops.

Commuter Fixed Route

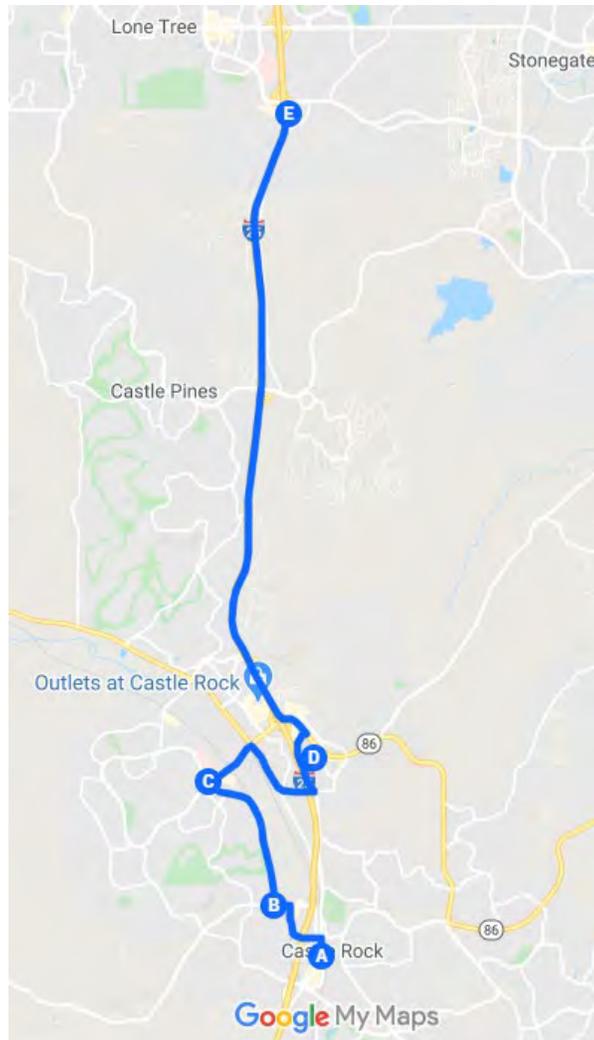
A commuter fixed route would operate on a set route with four to five stops within Castle Rock before connecting directly to RidgeGate Parkway Station, as shown in **Figure 4**. It would have an established schedule and the stop locations would likely be located with park and ride parking available, perhaps through an agreement with a local business or through a shared parking agreement.

The stops labeled A, B, C, and D in Figure 4 are for illustration only and not exact stop locations. It is possible that the route may have more or less stops within Castle Rock. More public outreach would be needed to understand where commuters live and how far they might be willing to walk or drive to access a stop. However, having less or more stops both have trade-offs and considerations. More stops make the route accessible to more people who can walk to a bus stop without using a car, while only one central stop requires most riders to get in their car to drive to the bus stop/park and ride location, which may mean that many people would opt to just drive to RidgeGate versus getting in their car, parking, waiting for the bus, and then traveling by bus to RidgeGate. Given the travel time to RidgeGate from Castle Rock, most people, once in their car, will continue to drive to their final destination.

This commuter fixed route would likely be run with vans or small shuttle buses and through a turn-key contract with a private provider.



Figure 4: Commuter Fixed Route Map Example



Considerations

A commuter fixed route has the following identified advantages and disadvantages for passengers and for the Town:

- **Advantages**
 - Simple for riders to understand with a fixed schedule and stops
 - No special technology requirements
 - Direct route that would be time efficient for riders (and comparable to drive time)
 - No variable operational costs



- **Disadvantages**

- Constrains riders to specific stops, which may be perceived as less convenient
- Requires riders to get in their car before getting on the bus, which could limit ridership (once a person is in their car, they are more likely to continue driving to their destination)
- For riders without access to vehicles, route is only useful if they live within walking distance of the limited stops

Microtransit Flex Route

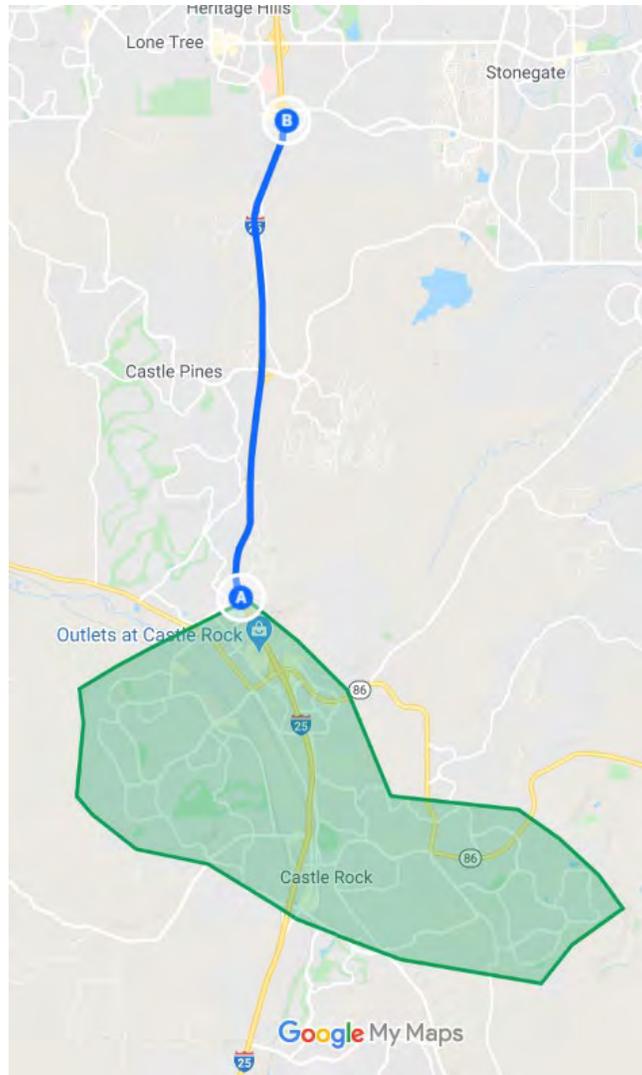
As shown in **Figure 5**, a microtransit flex route would operate as microtransit within Castle Rock, picking up and dropping off riders anywhere within a pre-determined zone, combined with an express route segment (between points labeled A and B in **Figure 5**). The express route segment would operate on a specific schedule but the Castle Rock pick up and drop off times would vary within a pre-determined time range to allow for time for the bus to react in real time to trip requests. For example, for a 7:00 AM northbound departure from Castle Rock the rider requirement would be that trip requests would need to be submitted before 6:30 AM and would be fulfilled between 6:30 AM and 6:55 AM, depending on pick up location. This would give riders the assurance that the trip will leave Castle Rock no later than 7:00 AM. Pick up and drop off locations would be within one block of the rider's address.

It is also possible that the express segment of the route could start and end at a central park and ride location in Castle Rock, perhaps at Wolfensberger Road and I-25. The route could serve the park and ride before making microtransit drop-offs and after making pick-ups.

This microtransit flex route would likely be run with vans or small shuttle buses and through a turn-key contract with a private provider capable of operating a bus route and providing the necessary microtransit technology.



Figure 5: Microtransit Flex Route Example



Considerations

A microtransit flex route has the following identified advantages and disadvantages for passengers and for the Town:

- **Advantages**
 - Allows for pickup and drop-off at (or within a block of) a rider's home
 - Real-time, dynamic routing to meet exact ridership demand
 - Easy to use for riders without access to a car and who live within the defined microtransit zone



- Provides larger geographic route coverage and higher service flexibility
- Could be combined with local microtransit service
- **Disadvantages**
 - Requires microtransit ridematching technology and associated costs
 - Variable operational costs, in terms of vehicle service hours and miles
 - Could be perceived as confusing or inconvenient to use for riders, given that pick-up requests need to be made in the app
 - The time for a rider to get to and from home is variable and may take significantly longer than comparable drive time (with other riders getting on or off and bus making deviations)
 - If a potential rider lives outside of the defined microtransit zone, driving, walking, or ridesharing would be required to access the service

Hybrid Service

As shown in **Figure 6**, a hybrid commuter service would combine the aspects of fixed route service and microtransit flex route service, previously described. There would be a fixed route with scheduled timepoints combined with a microtransit real-time, on-demand zone within a predetermined area around the route within Castle Rock. Riders could choose to go to one of the scheduled stops or riders could request a microtransit pickup, subject to certain time parameters, in real-time via a smartphone app. The fixed stops and schedules would be timed in such a way to allow the bus time between stops to deviate within the microtransit zone to pickup riders at or near their home. This option is similar to what is known as a deviated fixed route model but combined with a ridematching technology platform.

This hybrid service would likely be run with vans or small shuttle buses and through a turn-key contract with a private provider capable of operating a bus route and providing the necessary microtransit technology.



- Allows riders to choose whether to go to a stop at a set time or request a trip in real-time at or near their home
- While less time efficient than a fixed route, more time efficient than microtransit flex route
- Allows for pickup and drop-off at, or within less than one block walk, a rider's home, if within microtransit zone
- Real-time, dynamic routing to meet exact ridership demand
- Easy to use for riders without access to a car and who live within the defined microtransit zone
- Provides additional geographic route coverage and service flexibility
- One vehicle can provide both the microtransit pickups and the scheduled fixed route pickups while traveling along the route
- **Disadvantages**
 - Requires microtransit ridematching technology and associated costs
 - Somewhat variable operational costs, in terms of vehicle service hours and miles
 - The time for a rider to get to and from home is variable and may take somewhat longer than comparable drive time (with other riders getting on or off and bus making deviations)
 - If a potential rider lives outside of the defined microtransit zone, driving, walking, or ridesharing would be required to access the service
 - Microtransit zone would need to be relatively small to allow the bus to make scheduled stops

Preferred Model

Of the three provider models, the preferred model is a hybrid route for the following reasons:

- It allows riders to choose between going to a fixed stop at a fixed time or requesting an on-demand trip at or near their origination or destination point.
- It is more time efficient than the microtransit flex route.
- More of Castle Rock's population would be able to access the hybrid route service without driving or walking to a park and ride than a commuter fixed route.



- It can be operated independently of other point-to-point or microtransit services within Castle Rock or could be integrated into other solutions.
- It allows a single vehicle to serve the fixed route stops and microtransit zone.

Service Characteristics

To maximize ridership growth, ease of use, community adoption, and convenience, it is recommended that the hybrid route in Castle Rock have the following service characteristics (as previously discussed in this section, service characteristics may change if/when Bustang made stops at RidgeGate and Castle Rock):

1. *Amount of service*
 - a. Four roundtrips AM and PM, Monday-Friday, as a Phase 1 starting point with one vehicle.
2. *Schedule*
 - a. Example of four AM Departures from last fixed timepoint in Castle Rock: 6:00 AM, 7:00 AM, 8:00 AM, 9:00 AM, with microtransit zone pickups and fixed route stop pickups occurring within 10 to 15 minutes prior to these times. These times would likely be adjusted as service is finalized and times are refined to best meet work needs.
 - b. Example of PM Departures from RTD RidgeGate Station: 4:00 PM, 5:00 PM, 6:00 PM, 7:00 PM. These times would likely be adjusted as service is finalized and times are refined to best meet work needs.
 - c. Reverse commute riders coming into Castle Rock to work would be able to get AM departures from RidgeGate going back to Castle Rock and PM departures from Castle Rock to RidgeGate.
3. *Trip parameters*
 - a. Ability to wait for bus at a pre-determined stop at a pre-determined time without having to preschedule.
 - b. Ability to schedule a microtransit on-demand trip for curb-to-curb pickup or drop-off within the defined microtransit zone via a smartphone app or call-in number.
 - c. 30-minute runtime allowance for each trip leg to allow for microtransit zone pickups and recovery.
4. *Vehicle Type*
 - a. Would likely be a small bus with capacity between 18 and 24 passengers.



5. Accessibility

- a. ADA-accessible vehicles on all trips.
- b. Call-in option for those without smartphones.
- c. Cash or prepay payment option for those without credit cards or access to banking.

Cost and Performance Estimates

The ridership, cost, and performance estimates are shown in **Table 8**. Commuter service is shown as starting with eight roundtrips per weekday in Phase 1 and growing to 16 roundtrips per weekday by Phase 3, as demand grows. Cost estimates are based on a range of \$95 to \$125 per vehicle service hour for turn-key commuter service with a contracted operator. This is more expensive than microtransit because of the likely larger vehicle size and associated commercial driver's license requirement, as well as higher mileage of a commuter route and associated operational costs. It should also be noted that ridership estimate ranges will not be achieved in the early months of starting or growing the commuter service. It may take six to 12 months or longer before growing into the estimated ranges. Note: all cost estimates are shown as gross costs and do not account for revenues.

Table 8: Commuter Hybrid Route Cost and Performance Estimates

| Commuter service* | Peak vehicles in service | Cost basis | Cost estimate range* | | Ridership estimation basis | Ridership estimate range | | Cost per passenger range | |
|---------------------------------------|--------------------------|--|----------------------|-----------|---|--------------------------|--------|--------------------------|---------|
| | | | | | | | | | |
| Phase 1: 8 roundtrips per weekday | 1 | \$95-\$125 per hour for turn-key service | \$200,000 | \$270,000 | 75-85% passenger load on traditional commute trips; 15-25% of reverse commute trips | 36,000 | 45,000 | \$4.40 | \$ 7.50 |
| Phase 2: 12 roundtrips per weekday | 2 | \$95-\$125 per hour for turn-key service | \$310,000 | \$400,000 | 65-75% passenger load on traditional commute trips; 10-20% of reverse commute trips | 45,000 | 55,000 | \$5.60 | \$ 8.90 |
| Phase 3: 16 roundtrips per weekday | 3 | \$95-\$125 per hour for turn-key service | \$410,000 | \$540,000 | 60-70% passenger load on traditional commute trips; 5-15% of reverse commute trips | 50,000 | 70,000 | \$5.90 | \$10.80 |

Note: * Cost estimates based on \$95 - \$125 per vehicle service hour for turn-key service
 Source: Fehr & Peers, 2020.

Fare Structure

Fares for commuter service vary greatly between communities and depending on exact service characteristics. A hybrid route such as this would likely have a different fare for the two aspects of



the service – if a rider uses as an established bus stop at an established time, the fare would be lower than if a rider chooses to use microtransit.

Commuter transportation choices are largely determined by price and convenience. Given that parking at RTD’s RidgeGate station is \$4 per day for out of district users, it is recommended that the hybrid route be priced at: \$4 per roundtrip for pickup/drop-off at fixed stops; \$6 per roundtrip for pickup/drop-off within the microtransit zone.

Phasing and Implementation

Phasing and implementation of the hybrid commuter route would follow the phased approach to number of roundtrips per weekday, previously described in this section. It is likely that it would take one to two years for each expansion in number of roundtrips per weekday to mature before another expansion in commuter trips would be considered.

Marketing for all service types

This section on marketing serves as a strategic plan for the marketing and branding of Town of Castle Rock’s adoption of point-to-point on-demand service, microtransit, and/or commuter services. It aims to ensure the success of these services in coordination with the operational recommendations. Of the lessons learned through case studies of on-demand services around the country, it is crucial that potential customers know about an on-demand transit service and their expanded set of transportation options.

Marketing Goals and Objectives

The primary goal of implementing marketing efforts is the successful launch and implementation of future on-demand service in Castle Rock, along with sufficient and cost-effective ridership that creates a sustainable program. The objectives of this marketing plan are to:

- Build awareness of the new service and a positive image
- Educate the community about the benefits of this new service and how to use it in conjunction with existing transit services like Bustang and RTD light rail
- Promote ridership of the on-demand service among current light rail users and new users
- Conduct targeted marketing efforts for key rider populations
- Build support for the new service and address rider concerns



- Develop a strong customer relationship and high level of satisfaction with the new service
- Show seamless integration with existing RTD and CDOT transit services
- Improve the ease of understanding, eligibility and use of on-demand services

Target markets

This plan identifies key users based on public and stakeholder outreach as a part of the transit feasibility analysis in Castle Rock and information assembled from peer transit agencies and public private partnerships. Most of the marketing strategies in this plan are efforts to address all or many of these target groups.

Low-Income Families

Based on U.S. Census Bureau American Community Survey 2018 1-Year Estimates, about 4.3% of the Castle Rock population (around 3,000 people) are below the poverty line. A low cost, reliable on-demand service that connects low-income families and individuals with jobs and regional services is an important mobility option for these riders.

Transit Dependent Households with Limited Access to a Vehicle

A substantial percent of Castle Rock's population is under 18 (30%), over 65 (9.5%), disabled (7%), does not own a car (2%). Transportation for these populations is often challenging, due to the limitations in driving a personal automobile. By expanding transit service areas and operating hours, the Town of Castle Rock offers mobility options to those who would otherwise have a difficult time accessing the places that they need to go.

Commuters

The geospatial data collected as a part of the outreach effort showed that over one quarter of trips were commute to work or school trips. These trips to school or work are essential to meeting the basic needs of these individuals and are a priority trip-type.

Elderly Residents and Visitors

People age 65 and over make up almost 10% of the Castle Rock population. Additionally, those aged 50 and over are eligible for the current Castle Rock Senior Center service (about 27% of the Town population). If the proposed services will replace or augment the Castle Rock Senior Center volunteer driver service, serving this group is important. These groups may also be slower to change their travel behavior and require a greater amount of education and guidance on new service types.



Downtown/Outlet Mall Shoppers and Diners

Recreational and shopping trips (46%) are the most frequent trip type reported by the outreach effort as a part of this study. Additionally, if the taxi voucher, ride-hailing, or microtransit model adopts extended evening hours, this trip share may increase as residents use it for dining and shopping after work.

Arapahoe Community College- Sturm Campus (RCC) Students and Employees

With the recent opening of the Sturm Campus, almost 4,000 students, faculty and staff are commuting to campus throughout the semester from across the region. Additional first/last mile and point-to-point service would expand the reach for those coming to campus and increase mobility throughout the school day.

Young Users

There are over 4,000 Castle Rock residents age 15 to 19 years old. These riders may not have a driver's license or access to a vehicle and may be a market for increased ridership. Castle View High School has approximately 2,200 students currently enrolled in grades 9 through 12 and Douglas County High School has nearly 2,000 students currently enrolled. Young users may be more open to app-based on-demand services than other user groups.

Limited Mobility Users

The taxi voucher program, senior center volunteer service and Douglas County Area on Aging transportation service currently offers rides to those with limited mobility. Those residents that don't meet eligibility requirements for these services or who do not need the specialized vehicle accommodation could potentially use the new on-demand service instead.

Potential Ride Hailing Drivers

If a ride hailing service is pursued, there needs to be enough drivers to service the demand. Town of Castle Rock could potentially offer incentives for residents to sign up as drivers and target drivers for specific marketing campaigns.

New Transit Users

Many residents that don't currently use transit may find the new on-demand service appealing if it is easy to understand and use. The market for evening point-to-point travel is likely to be most attractive to people who do not take transit now.



Marketing strategies

Branding

Branding the new on-demand services will increase visibility, awareness, and recognition. It will apply a uniform color scheme and logo to all marketing efforts for the service, including the service name, logo, and associated graphics. First/last mile service should also consider and build off RTD and Bustang current branding to illustrate the integration of the services. Uniform branding can increase ease of use for residents and visitors and promote instant recognition of the connection to existing regional services that provide access to or near Castle Rock.

Signage

Signage at Bustang and RidgeGate stops, on and in transit vehicles, and at high activity pick up/drop off locations will increase awareness of the new service among current and potential riders. Signs should all include branding elements and speak to a variety of key market groups. Signage content and design can vary be targeted depending on the location. For example, in areas with dining and shopping, it can emphasize the advantage of evening service, while signage at ACC can appeal to students. Setting designated pick up and drop off locations for microtransit can help reduce confusion for new riders who are not sure where to go. These are prime spots for signage that explain the service, has wayfinding to/from microtransit stops and key destinations, and is highly visible to increase recognition and reinforce the brand for residents passing by.

Media Advertisements and Information

There are a range of media outlets that can be used to increase awareness and understanding of the proposed on-demand services. Newspaper, radio, and TV are all standard locations for advertisements with a range of costs. Printed flyers, mailers, and utility bill inserts in multiple languages can be used to share information on the service area, eligibility requirements, connection to current transit routes, and fare information. In addition, some riders with use a concierge service telephone line or Douglas County First Call to get information about transportation options, so it important to ensure that the operators are well-informed about the proposed on-demand services as well.

Social media and the community website are also a way to reach other audiences, especially those that are to use the app-based on-demand service. Target websites include the town's site, RTD and Bustang websites, and RCC website. These websites can share the same information as printed media: how to use the service, who is eligible, fare information, and how to use the app



technology (and concierge service for non-smartphone users). Email lists and newsletters from these sites can also disseminate information. Social media platforms like Facebook and Twitter are free options that can provide real-time information to the public as well. One lesson learned from the Go Dublin pilot of on-demand service in Dublin, California was to eliminate in-app marketing through Uber/Lyft for ride hailing services as this likely results in the subsidy of on-demand trips that were going to take place anyway.

Outreach

On-going outreach to current and potential riders, employers, 'gatekeepers', and members of the public will further the goals of this marketing plan. 'Gatekeepers' are organizations and their employees that often help their clients to identify transportation options. These can include:

- Social service agencies and human service organizations
- Employment programs
- Senior centers and complexes
- Schools and colleges
- Youth programs
- Support organizations for persons with disabilities
- Medical clinics and facilities
- Outlets
- Large employers

In-person training and informational events can be held with gatekeepers, large employers in the town, business and economic groups, ACC staff, and civic organizations. Public workshops and booths at community events will create more recognition and allow the interested public to ask questions and give comments on the service. Low income, senior, and transit dependent households may be better accessed through community organizations such as churches, schools, and libraries.

Budget and Staffing

A general rule of thumb is that a small transit system should spend about 1-2% of its annual operating budget on marketing. With a proposed contribution of between \$430,000 to \$1.4 M to local services, this would mean a marketing budget of between \$6,000 and \$20,000 annually. The Town of Castle Rock would need to examine both internal and external funding sources to determine if it can spend the amount needed to successfully market the new program(s). Spending closer to 5% of the annual budget, a total of \$20,000-70,000 a year, on this program



would ensure a greater level of success on launch if the funding can be secured. Marketing dollars could likely decrease after the first year if the program is successful, assuming that the branding, ridership and reputation have been established and the service performance remains strong. As learned in many of the pilot programs around the country, insufficient marketing of new on-demand services can lead to slow uptake and lower ridership than needed to keep the program cost-effective and operating. This slow start, combined with a short pilot period can deal a fatal blow to a new on-demand service. It is recommended that Castle Rock hire a professional marketing firm to implement the planning, branding, and implementation of marketing efforts to better reach the key market segments outlined in this plan.

Implementation

Implementation of any or all the services discussed and reviewed in this memo is dependent on funding. This section considers the recommended model and possible funding sources.

Recommended Model

Low budget

Under a low budget model of less than \$150,000 in total funding available, there would be limited opportunities for Castle Rock to start new general public services. The recommendation under a low budget model would be to make modest improvements to existing services including:

- Expansion of hours and/or eligibility of existing Taxi Voucher program
- Planning for implementation of ride hailing and/or microtransit (if budget increases are anticipated in the future)

Medium Budget

Under a medium budget model of \$150,000 to \$400,000, opportunities to start new service would be created. The recommendation under a medium budget scenario would be to:

- Start a general public ride hailing service OR microtransit service
 - Since operating characteristics are similar and service would be duplicative, it is recommended to pick one of these services, based on budget available and where service is desired most (microtransit is more expensive relative to area served)



- Transition existing taxi voucher users, and associated funding, to support microtransit or ride hailing
- Retain existing investment in senior transportation

High Budget

Under a high budget model of \$400,000 or more in total available funding, opportunities to start the commuter service and expand a ride hailing or microtransit service would be created. The recommendation under a high budget scenario would be to:

- Grow microtransit or ride hailing service area and/or hours
- Start commuter service with eight roundtrips per weekday or more
- Additional investment in senior transportation

Funding

There are a variety of funding measures that the Town of Castle Rock can pursue to support the on-demand program implementation and operations.

Federal Grants

There are a variety of grants that could be used to fund on-demand services. Grants are split into two categories – formula grants and discretionary grants. Formula grants are awarded based on a formula, usually allocated according to population, ridership and/or system extent, and are not competitive. Discretionary grants are awarded through a competitive application process which funds specific projects for a specific period. Discretionary grants have a downside in that they are time-limited and competitive. There is no guarantee that the Town will receive replacement federal funding once the grant expires. Thus, discretionary grants are best for one-time costs like service planning or purchasing new vehicles rather than ongoing operating expenses.

- **5310 Enhanced Mobility of Seniors and Individuals with Disabilities**

This formula fund supports public transportation for seniors and individuals with disabilities by funding eligible capital, purchased service, and preventive maintenance projects for transportation providers. Eligible projects include vehicle purchases, passenger shelters, purchased services, preventive maintenance, travel training, marketing programs, development of centralized call centers, and other equipment that supports transportation to meet the special needs of seniors and individuals with disabilities.



DRCOG administers 5310 funding for the Denver-Aurora Urbanized Area, which includes Castle Rock.

- **5307 Formula Grants for Urbanized Areas**

These grants support transit in urbanized areas with populations over 50,000 by financing operations, capital, project administration, and preventive maintenance projects. Federal share may not exceed 80% of eligible capital costs, 90% of vehicle related equipment in compliance with ADA and Clean Air Act, 50% of operating assistance. RTD is the designated recipient of 5307 funding for the Denver-Aurora Urbanized Area, which includes Castle Rock.

- **FTA Mobility On-Demand Sandbox Program**

The MOD program envisions a multimodal, integrated, automated, accessible, and connected transportation system in which personalized mobility is a key feature. The Sandbox Demonstration Program seeks to fund project teams to innovate, explore partnerships, develop new business models, integrate transit and MOD solutions, and investigate new, enabling technical capabilities such as integrated payment systems, decision support, and incentives for traveler choices. \$8 million was allocated in 2016.

- **US DOT's Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants (formerly TIGER grants)**

This formula grant program funds investments in transportation infrastructure, including transit. Projects are evaluated based on merit criteria that include safety, economic competitiveness, quality of life, environmental protection, state of good repair, innovation, partnership, and additional non-Federal revenue for future transportation infrastructure investments. \$1.5 billion in funding is available through September 2020. While technically eligible for this grant program, our team has not seen a successful BUILD grant application for a first-last mile or point-to-point transit project.

- **Surface Transportation Block Grant**

A formula grant distributed to states who then distribute it through discretionary grants. Primarily funds capital improvements.

- **Public Transportation Innovation Program**

The program is a competitive grant process that provides funding to develop innovative products and services assisting transit agencies in better meeting the needs of their



customers. It funds research, development, demonstration and deployment projects, and evaluation of technology of national significance to public transportation.

State Funding

Historically there have been a limited number of State funds allocated to transit projects through the Colorado Department of Transportation (CDOT) Division of Transit and Rail (DTR). The amount of funds can vary year to year and historically funds have been allocated mostly to transit capital projects. It is recommended that Castle Rock contact the DTR to find out how to be added to their pool of potential recipients and be informed of future available funding streams. Current state transit funding streams include:

- **Funding Advancements for Surface Transportation (FASTER)**

FASTER supports transit projects with \$15 million every year based on a statutory set aside from the road safety surcharge revenue. FASTER transit dollars help maintain existing local transit systems, support regional bus transit service (Bustang) and rural bus service (Outrider), and determine the feasibility of a high-speed rail system. FASTER transit funds are split between local transit grants (\$5 million per year) and statewide projects (\$10 million per year).

- **Senate Bill 09-228**

Senate Bill 228 allocates funding specifically for transit projects for the five year period following and increase in personal income of 5% or greater. This was first achieved in the 2015-16 budget cycle. In the 2019-20 funding year about \$2 million was allocated to local transit agencies through this funding stream.

- **Senate Bill 17-267**

In 2017, the State legislature approved SB-267, which allocates \$500 million in general funds for each of four years to address transportation needs in Colorado. SB-267 mandates that at least 10 percent, or \$50 million, is allocated to transit capital projects annually. Twenty-five percent of the SB-267 transit funds are allocated to CDOT projects, including Bustang; approximately 50 percent of funds are to be allocated to CDOT and partner agency projects; and 25 percent of funds are allocated to local agency transit improvement projects. SB-267 is only a four-year program; for the funding to continue, the State legislature would have to approve such legislation. Impacts of COVID-19 on SB-267 transit funds are still being determined.



Local Funding

While local funding is more limited, it is also feasible to supplement State and Federal funding options.

- **Farebox Revenue and Advertisements**

These are direct revenues from fares for on-demand service or advertisements through transit. Raising on-demand fares would increase income from this source but may lead to decreased ridership and reduced mobility options for underserved populations. Increasing advertisement options could increase revenue from local sources.

- **Local Sales Tax**

Sales tax is a common way communities, especially in Colorado, fund transit programs. This is because funding is generated by both residents and visitors, which is often popular with the community. Given that the Castle Rock Outlets is a regional draw and high generator of sales, this could be a popular option here as well. However, relying on sales tax to fund transit does come with risks. First, this would require voter approval. A well-crafted transit tax that identifies specific projects and services and how the community will benefit typically stands a better chance at passing a public vote. Second, sales tax revenue are not as reliable and funding levels can vary year-to-year. There's no better illustration of this risk than that drastic reduction in sales tax that has occurred over the last several months during the COVID-19 pandemic, which has forced many agencies that rely on sales tax to slash budgets (and thus service). Maintaining a reserve fund that is more heavily funded during high sales tax years can help mitigate this risk.

- **Transportation Utility Fee**

A utility similar to those established fees for gas and electricity could be implemented to fund transit or transportation. Existing fees on the electric utility could also be increased. Utility fees can be established without a public vote, and can generate significant revenues, but at a higher cost burden per household than sales tax, which also generates revenue from non-residents. A major benefit of utility fees is stability. Sales tax can vary considerably due to economic cycles and even seasonal weather patterns. Utility fees tend to be very stable.

- **Local Property Taxes**



Cities/towns and counties may levy property taxes to support transit. These can either be permanent or a local option tax that is subject to voter approval.

- **Community Partners**

Transit service could seek funding from Arapahoe Community College and/or human services agencies. It is possible that other large employers in Castle Rock or interested community partners could contribute to the on-demand program as it serves their users and provides better access to their services, including Business Improvement District (BID) for Millers Landing or the Urban Renewal Authority. These local partners may gift funds to the program or they could help to subsidize trips for their employees or students. Other similar entities that fund transit in other areas include chambers of commerce or business improvement districts. The Lone Tree Link is a Strong example of on-demand transit funded in part by local partners.

- **Local Payroll Tax**

It is an option to assess a local payroll tax on employers or employees. This can raise funds but can also burden low-income workers and may not have public support.

Other funding options that could be considered with further analysis are formulation of a transit district with taxing authority, parking fees, transportation impact fees, and special assessments.

Phasing Operations

If at least a medium funding model can be identified and secured with the possibility of additional long-term funding growth, the phasing of operations and growth in services will take many years and will require pre-planning to achieve success. Service growth will not only be dependent on funding but will be dependent on ridership growth over time – establishing a new service that meets ridership expectation takes at least a year (18 months to two years is often required). Having funding stability, community buy-in, and long-term commitment of the Town are all necessary to achieve long-term success as services are phased over time. The Town and community partners will also need to be flexible and adaptable so that service adjustments can be made over time to adjust to demand and needs.

An example of how operations may be phased over time is shown in **Figure 7**.



Figure 7: Phased Implementation and Major Activities

