

Meeting Agenda

City Council

Tuesday, June 13, 2017	6:30 PM	Community Room

Study Session

1. Ordinance Review for following regular meeting

a) <u>ID# 17-184</u> Ordinance Review: Consideration of an ordinance on first reading amending Ordinance No. 21 Series of 2016 known as the Annual Appropriation Bill for all municipal purposes for the fiscal year beginning January 1, 2017 and ending December 31, 2017.

Attachments: Ordinance No. 17-2017

2. Study Session Topics

a)	<u>ID# 17-166</u>	Presentation of the draft housing study by BBC Research and Consulting
	<u>Attachments:</u>	Littleton Housing Study Draft Report
b)	<u>ID# 17-189</u>	Discussion of issues related to the proposal for Fire Unification
	Attachments:	Attachment 1 - May 31, 2017 Fire Partner Letter
		Attachment 2 - fire partners list of questions
		Attachment 3 - proposed questions for consideration
c)	<u>ID# 17-175</u>	Smart Cities / Littleton's Digital Strategy / IS update
	<u>Attachments:</u>	Littletons Smart City Roadmap
		Trends in Smart City Development

The public is invited to attend all regular meetings or study sessions of the City Council or any City Board or Commission. Please call 303-795-3780 at least forty-eight (48) hours prior to the meeting if you believe you will need special assistance or any reasonable accommodation in order to be in attendance at or participate in any such meeting. For any additional information concerning City meetings, please call the above referenced number.



Staff Communication

File #: ID# 17-184, Version: 1

Agenda Date: 06/13/2017

Subject:

Ordinance Review: Consideration of an ordinance on first reading amending Ordinance No. 21 Series of 2016 known as the Annual Appropriation Bill for all municipal purposes for the fiscal year beginning January 1, 2017 and ending December 31, 2017.

Presented By: Tiffany Hooten, Finance Director

POLICY QUESTION:

Does city council support an amendment to the 2017 annual appropriation for the City of Littleton?

BACKGROUND:

Staff typically prepares a request to increase the annual appropriation at the end of each year. In an effort to provide updated information to city council throughout the year, staff will be preparing and presenting budget increase requests periodically. This will be in addition to the annual appropriation at the end of the year. Staff has identified a need to increase the annual appropriation for the 2017 budget for projects or service needs at this time.

These funds are recommended to be increased.

<u>General Fund - \$346,200</u>

The General Fund increase is comprised of the following.

- Contract city attorney services and personnel recruitment \$134,200. Stephen Kemp will be joining the city as the Littleton City Attorney in July. It is anticipated to take up to nine months to attain the required credentials to practice in Colorado. Meanwhile, it will be necessary for the city to continue to contract for attorney services until this process is complete. This is the additional amount needed above the 2017 attorney office personnel budget to continue contracting for attorney services through the end of the year, maintaining a full time assistant city attorney through December 2017, and includes \$4,340 in recruitment costs. Contracted attorney services average \$22,000 per month. The city conservatively estimates that this amount will decrease to \$15,000 per month through the end of the year.
- Roof inspection contract \$49,000. The Community Development Department issues approximately 3,000 building permits each year. Of the total permits issued, at least 500 permits are issued for roof replacements in an average year, and the city has also issued over 1,000 roof permits in years following severe weather events. For each roof permit issued, there are two required inspections: a pre-roof inspection and a final roof inspection. The pre-roof inspection is to verify the decking is in good condition and underlayment is properly installed prior to finish materials (i.e. shingles) being installed. The final roof inspection is conducted once the finish materials have been installed.

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While all construction activity is time-sensitive, the time frame between a roofing contractor removing existing roof coverings and being ready to install finish materials is generally short, typically within a day or two. In order to manage the existing inspection workload for all projects throughout the city and maintain a next day inspection schedule, the Community Development Department recommends contracting roof inspections to a private firm. Currently, the cost of roof permits are assessed based on the project valuation (cost of job), which would cover the cost of the third-party inspection services. Based on historical roof permit data, staff is requesting the contract be established for 500 permits, for a not to exceed contract amount of \$49,000. The actual costs will be based on permits issued and inspections conducted.

- Contract engineering for development review services \$75,000. As highlighted in the 2017 budget highlights in the public works department, there has been a considerable influx of new development applications and the city contracted for these services in 2017. This need continues to increase and additional services are needed to meet development review demand. Contracting allows staff to manage peak workload without having to hire full-time staff. If this trend continues at its current pace and beyond 2017, the city will consider adding additional FTEs rather than continuing to contract for these services.
- Contract for management and succession planning for public works and community development departments \$28,000. The public works department and the community development department have been working together, with the aid of a consultant, to manage operations of the departments as well as obtain guidance on succession planning. There are several employees who will be retiring over the next year who have a wealth of knowledge and experience in the engineering department. It is crucial that the city prepare and plan for this transition. A consultant is able to focus on areas of need and provide a strategic plan for the departments.
- Organizational development \$60,0000. The City Manager's office would like to work with the Leadership Team in improving organizational focus and alignment of goals, managing the recent change in city-wide management, communication, and leadership effectiveness with all department directors. The Leadership Team would engage in discussions to establish an operating guide and organizational goals that can be clearly communicated down the organization to front-line staff.

This increase in appropriations will reduce the ending fund balance by \$346,200. While this is an increase in the total budget, the city has historically been under budget in the general fund at the end of the year.

Conservation Trust Fund - \$86,000

Xcel Energy and Partners in Energy recently performed an energy audit at Bemis Library which discovered the need to replace lighting at the library. The city can capitalize on \$45,165 of rebates through Xcel Energy to replace several hundred existing light fixtures at the library with new LED lighting. Not only will this dramatically improve the lighting throughout the library, it will also realize energy savings between 40 and 60 percent, depending on the type of fixture that is being replaced. The total cost of the project is estimated to be \$130,890. After rebates of \$45,165 offered by Xcel Energy, the total cost to the city would be \$86,000. This project is an eligible expenditure from the Conservation Trust Fund and staff recommends using these funds for the project.

The 2017 budgeted ending fund balance is \$244,090. This increase would reduce the estimated fund balance to \$158,090.

STAFF ANALYSIS:

Amending the annual appropriation bill is a typical process that the city conducts at the end of the year. Staff will review budget needs throughout the year and will prepare and present budget amendments periodically.

FISCAL IMPACTS:

The 2017 budget appropriation is recommended to increase by \$432,200.

STAFF RECOMMENDATION:

Staff recommends council consider amending the 2017 budget with first reading on June 27, 2017.

1	CITY OF LITTLETON, COLORADO
2	
3	ORDINANCE NO.
4	Series, 2017
5 6	INTRODUCED BY COUNCILMEMBERS
7 8 9 10 11 12 13 14 15	AN ORDINANCE OF THE CITY OF LITTLETON, COLORADO, AMENDING ORDINANCE NO. 21 SERIES OF 2016 KNOWN AS THE "ANNUAL APPROPRIATION BILL" FOR ALL MUNICIPAL PURPOSES OF THE CITY OF LITTLETON, COUNTIES OF ARAPAHOE, JEFFERSON AND DOUGLAS, STATE OF COLORADO, FOR THE FISCAL YEAR BEGINNING JANUARY 1, 2017 AND ENDING DECEMBER 31, 2017.
16	
17	
18	WHEREAS, Ordinance No. 21, Series of 2016 established the annual
19	appropriation for municipal purposes for the City of Littleton, Colorado,
20	
21	WHEREAS, appropriations have theretofore been made for the expenditures of
22	monies pursuant to said budget; and
23	
24	WHEREAS, the necessity of receiving and expending additional monies from the
25	various funds could not have been reasonably anticipated during the time of adoption of the
26	budget and appropriation of funds in accordance therewith;
27	
28	NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF
29	THE CITY OF LITTLETON, COLORADO, THAT:
30	
31	Section 1: The budget of the City of Littleton for the fiscal year beginning
32	January 1, 2017, and ending December 31, 2017, is hereby amended by additions to the
33	following funds:
34	
35	<u>FUND</u> <u>EXPENDITURE</u>
36	
37	General Fund \$ 346,200
38	
39	Conservation Trust Fund\$ 86,000Total\$ 432,200
40	
41	Section 2: The provisions of the annual appropriations Ordinance No. 21,
42	Series of 2016, are hereby amended with the total of all fund expenditures amended to
43	\$87,634,920.
44	
45	
46	

1	INTRODUCED, AS A BILL at the regularly	v scheduled meeting of the city council of
2	the of the City of Littleton, Colorado, on the 27 th day of Jun	e, 2017, passed on first reading by a vote
3	of FOR and AGAINST; and ordered published b	y posting at the Littleton Center, Bemis
4	Library, the Municipal Courthouse and on the City of Littlet	on Website.
5	PUBLIC HEARING on the Ordinance to t	ake place on the 18 th day of July, 2017,
6	in the Council Chamber, Littleton Center, 2255 West Be	erry Avenue, Littleton, Colorado, at the
7	hour of 6:30 p.m., or as soon thereafter as it may be heard	
8	PASSED on second and final reading, foll	owing public hearing, by a vote of
9	FOR and AGAINST on the 18 th day of July, 2017	7 and ordered published by posting at
10	Littleton Center, Bemis Library, the Municipal Courthous	e and on the City of Littleton Website.
11	ATTEST:	
12		
12		e O. Beckman
13	CITY CLERK MAY	
15		
16	APPROVED AS TO FORM:	
17		
18		
19	Kenneth S. Fellman	
20	ACTING CITY ATTORNEY	
21		



Staff Communication

2(a)

File #: ID# 17-166, Version: 1

Agenda Date: 6/13/2017

Subject:

Presentation of the draft housing study by BBC Research and Consulting

Presented By: Mike Braaten, Deputy City Manager

BACKGROUND:

City Council directed staff in the 2016 budget to complete a housing study. The study looks at affordability, accessibility, residents' opinions on housing, opportunities, and ways to address identified housing issues in Littleton. The study is intended to help inform council policy decisions regarding housing issues moving forward.

The project was initially managed by the former city manager and was significantly delayed due to his termination in mid-2016. Once the project got back on track, a competitive selection process was pursued and a contract was awarded to BBC Research and Consulting of Denver.

A small housing advisory panel assisted in the development of the scope of study as well as providing some initial guiding input to the consultants in the development of the study. The advisory panel included councilmembers Peggy Cole and Bill Hopping, former RTD board member Kent Bagley, Realtors Stew Meagher and Kay Watson, and Jo Hamit and Kyle Henderson representing South Metro Housing Options/Littleton Housing Authority. Deputy City Manager Mike Braaten and Community Development Director Jocelyn Mills staffed the project.

For citizen outreach, the consultant conducted a statistically-valid random sample land-line & mobile telephone survey of 401 Littleton residents, held focus groups that included realtors, business owners, community non-profits and members of the "sunshine" citizen advocacy group. There was also an open on-line resident survey that was marketed through the city's social media sites and webpage that resulted in 350 responses.

The consultant team from BBC Research and Consulting will present the draft findings from the report. From this session, BBC will take council comments and prepare a final report. The project will then proceed to the development of draft implementation strategies with the assistance of the advisory panel. Those strategies will be presented to council at future study session later this summer for final review and approval.



Littleton Housing Study

City of Littleton

DRAFT REPORT

Draft Report

June 6, 2017

Littleton Housing Study

Prepared for

City of Littleton 2255 W. Berry Ave. Littleton, CO 80120

Prepared by

BBC Research & Consulting 1999 Broadway, Suite 2200 Denver, Colorado 80202-9750 303.321.2547 fax 303.399.0448 www.bbcresearch.com bbc@bbcresearch.com



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Executive Summary

Littleton Housing Study

EXECUTIVE SUMMARY

In early 2017, BBC Research & Consulting was contracted to conduct a Housing Study for the City of Littleton. The study is organized around the following sections:

- Section I. Demographic Profile provides a general overview of Littleton's demographic and economic environment to set the context for the housing market analysis.
- Section II. Housing Profile and Market Analysis provides an analysis of Littleton's housing market including a discussion of housing stock, trends in the owner and rental markets, an analysis of scrapes and an overview of publicly assisted rental housing. The section concludes with a gaps analysis to examine mismatches in supply and demand of housing in Littleton.
- Section III. Community Input describes the findings from the public participation component of the housing study, which included three focus groups, a random sample telephone resident survey and an online resident survey. The public input process was designed to assess community culture and community perceptions of housing issues.
- Section IV. Resources and Options summarizes housing challenges and opportunities in the form of a SWOT analysis; reviews resources available for affordable housing creation; analyzes the city's current housing policies and programs; and discusses zoning and transit corridors in the context of addressing housing needs.

The ultimate purpose of the study is to provide recommendations that serve to guide future city policy decisions relating to housing. This draft reflects the first phase of the overall study—an analysis of trends, community perceptions and resources related to Littleton's housing market and potential housing needs. The second phase of the study is to craft recommendations for addressing the identified housing needs. Those recommendations will be developed in conjunction with the city and the Littleton Housing Study Advisory Committee through a strategic planning process scheduled for the summer of 2017.

This Executive Summary highlights the key findings from each report section and then summarizes the top needs to set the context for future recommendations. The Executive Summary concludes with a discussion of why the city may desire to address housing needs.

Key Findings

Demographic trends:

Littleton is currently home to about 45,000 people. Residents between 35 and 54 years old are the largest cohort in the city (28% of the population). Seniors (65 and older) represent 17 percent of the population and millennials (18 to 34) represent 21 percent of the population. Since 2010 the population in Littleton has increased by about 10% overall; the

proportion of seniors has increased, the proportion of children decreased slightly and the proportion of millennials has remained fairly constant.

- The median household income in the City of Littleton was \$65,221 in 2015, up 30 percent from 1999, when median income was \$50,245. Over that period, owners experienced higher income growth (34%) than renters (19%).
- Typical of national trends, income growth was not uniform across all income categories: Workers in high-paying professions and residents with accumulated wealth saw their incomes increase during the past 15 years, while lower income residents were disproportionately affected by the economic downturn.

Housing market trends:

- Littleton currently has a well-balanced and relatively diverse housing stock. Just over half of Littleton's housing stock is single family detached homes and 47 percent is attached housing (20% in structures with fewer than 10 units and 27% in structures with 10 or more units). In addition, 2 percent of the housing stock is mobile homes.
- Since early 2012, home prices have increased sharply in Littleton and in peer communities throughout the metro area. In 2016, the median sale price for homes in Littleton was \$370,000. Single family detached homes sold for a median sale price of \$410,000, significantly higher than the median sale price for attached homes (\$247,750).
- Falling interest rates have allowed potential buyers to increase their purchasing power even though home prices are rising faster than incomes. However, the lack of supply particularly homes under \$300,000—caused ownership constraints (in 2016, homes under \$300,000 stayed on the market for a median of 4 days).
- Cost burden among both renters and owners increased between 1999 and 2015—that is, more households are spending more than 30 percent of their income on housing. The proportion of both renters and owners spending at least half of their income has also increased (severe cost burden).
- Littleton renters lost purchasing power between 1999 and 2015 as rents increased faster than incomes: median rent increased from \$709 to \$1,008 (42%) and incomes would have needed to increase by about \$12,000 to keep pace, but the actual increase in renter median income was only \$6,000.
- To examine how well Littleton's current housing market meets the needs of its residents BBC conducted a modeling effort called a "gaps analysis" which compares the supply of housing at various price points to the number of households who can afford such housing.
 - Altogether, the city has a shortage of rental units priced affordably for renters earning less than \$25,000 per year of 1,350 units. These households consist of students, working residents earning low wages, residents who are unemployed and residents who are disabled and cannot work.

- The for sale gaps analysis shows the Littleton market to be relatively affordable for renters earning more than \$75,000 per year. For renters earning between \$50,000 and \$75,000, the market does offer proportional affordability but it is contingent on a willingness to consider townhomes and condos.
- Overall, the average Denver metro worker—earning \$60,215 per year—could afford 80 percent of Littleton's rental units and 15 percent of the homes sold in Littleton in 2016 (96% of which are attached homes).
- If current trends continue (home prices rising faster than incomes) and lending conditions remain constant, affordability is likely to decline substantially over the next five to fifteen years in Littleton. For example, forecasts conducted for this study indicate that a household earning 150 percent of the median income could afford 71 percent of homes in 2016 but only 33 percent in 2032. A renter household earning half the median income could afford 29 percent of rentals in 2016 but only 18 percent of rentals in 2032.

Community input: In general, the community input for the housing study highlights Littleton's strong community culture and appreciation for quality of life assets such as good schools, parks and green space—similar to resident perspectives included in the Comprehensive Plan. The primary housing needs identified were affordability and single-level, small yard downsize options. Residents and most stakeholders shared a desire to accommodate a mix of appropriately scaled product types to address the range of housing needs.

- Stakeholders emphasized housing needs related to affordability and accessibility. Real estate professionals specifically highlighted the need for homes priced from \$280,000 to \$400,000 and more product diversity including small attached and patio homes.
- Stakeholders also advocated for more predictability and consistency in the design and development process.
- Resident survey respondents indicated that cost was the most important factor in choosing their current home but quality public schools were also influential. Residents chose Littleton over other communities for a number of factors including schools, proximity to work (or spouse's work), good place to raise a family and community values.
- Housing for middle class families and housing affordable to residents in public service received are top priorities among Littleton residents, along with housing for residents with mobility challenges, housing for low income residents and options for first-time buyers.
- Responses from millennials and seniors indicated similar priorities, though millennials focused more on starter homes and apartments while seniors focused more on affordability for those with a fixed income and accessible housing.
- The types of homes residents considered "appropriate" for Littleton were consistent with the types of homes they considered important. Medium-sized single family homes (1,500 to 3,000 square feet) and more affordable types of homes (co-housing, townhomes, and small homes) were all widely accepted—most were comfortable with these housing types in any

Littleton neighborhood. Among traditional rental product types, small apartment buildings (10 or fewer units) were considered to be the most appropriate for Littleton.

Resources and options:

- Core strengths of Littleton's housing context include a strong economy with low unemployment, increasing resident incomes, diverse housing stock and middle-market home prices. These strong market indicators are coupled with high levels of resident satisfaction and appealing community assets such as good schools and small-town charm.
- However, these community assets also increase demand for living in Littleton and contribute to rising home prices. The market analysis revealed market weaknesses, particularly related to declining affordability as home costs rise faster than incomes. Residents and stakeholders also indicated a shortage of units that accommodate seniors and people with disabilities—specifically single-level, low-maintenance housing options (attached and detached).
- Market threats that add to the challenge of addressing current housing needs include the pace of home prices increases relative to income growth, the risk of rising interest rates, an aging population and the regional context. However, Littleton is well-situated to address housing concerns based on its current housing market strengths, community support for housing that can address needs and national housing development trends that can be leveraged to help address needs.
- Financial resources to address housing needs in Littleton are limited. The city owns 28 units of affordable housing and the Littleton Community Development Department Neighborhood Resources Division administers some community building programs and grants but Littleton primarily relies on South Metro Housing Options (the local public housing authority) along with county and state funds for affordable housing resources.
 - SMHO, formerly the Littleton Housing Authority, owns and manages various housing programs in Littleton accounting for 600 units of affordable housing in the community. SMHO also administers housing choice vouchers for both the City of Littleton and Arapahoe County.
 - Littleton has an additional 350 affordable rental units developed under the Low Income Housing Tax Credit (LIHTC) program—a federally funded public-private partnership program that is the largest single producer of affordable rental housing in the country.
 - Arapahoe County receives federal "block grant" funds that can be used for a number of housing and community development activities to support low and moderate income residents. Littleton is allocated a portion of the county funds annually for qualifying projects which typically include emergency and essential home repair, health-related public services, public housing improvement projects and infrastructure improvement projects.
- One of the most common local governmental constraints to the private production of affordable housing is zoning, subdivision, and land development regulations. Best practices

for zoning that fosters affordable development include allowing a diversity of housing types, relaxing minimum dimensional standards, and proactive measures such as incentives for affordable development.

Next Steps and Action Plan

As discussed in the introduction, the ultimate purpose of the study is to provide recommendations that serve to guide future city policy decisions relating to housing. Recommendations, though not part of this draft, will be developed in conjunction with the city as part of a strategic planning process scheduled for the summer of 2017. Recommendations should offer a balanced approach for promoting housing affordability within Littleton. A collaborative engagement, which spreads the cost, impact, and rewards among all interested parties, will have the greatest chance for success.

Future recommendations should focus on actions that would best help the city preserve its existing strengths and address the following core needs:

- Additional affordable rentals, specifically for residents earning less than \$25,000—the city currently has a shortage of 1,350 units priced below \$623 per month. Note that Littleton residents consider small-scale rental structures with fewer than 10 units to be the most "appropriate" for Littleton.
- Starter homes and family homes priced near or below \$300,000. Residents are open to a variety of product types that could help meet this need.
- Housing options attractive to aging seniors—primarily single-level homes with low maintenance yards (could be patio homes, other small-lot options and small attached products without stairs).

Why Work to Address Housing Needs?

A balanced housing stock accommodates a diverse resident population which in turn supports the local economy and contributes to Littleton's unique culture. The city has historically been relatively affordable to households across the income spectrum but recent trends indicate that many current and future residents may be priced out of Littleton as prices increase. Actions that help mitigate price increases and preserve both market-rate and publicly assisted housing affordability will also help preserve the culture and identity of Littleton itself.

Currently the average worker in only two of the city's top ten industries has wages high enough to afford the 2016 median sale price of \$370,000.¹ By 2032 those workers will also be priced out of Littleton (at the median). Households earning 150 percent of the area median income will only be able to afford one-third of the homes for sale in Littleton by 2032 (currently these households can afford 71% of for-sale homes in Littleton).

¹ Calculation assumes a 30-year mortgage with a 10 percent down payment and an interest rate of 3.85 percent and incorporates property taxes, insurance and utilities (assumed to collectively account for 30% of the monthly payment). Housing costs are restricted to be 30 percent of total income or less.

SECTION I.

Demographic Profile

SECTION I. Demographic Profile

This section provides a general overview of Littleton's demographic and economic environment to set the context for the housing market analysis. The discussion is organized around population levels and trends, household diversity and economic health.

Population Levels and Trends

Population. The 2015 American Community Survey (ACS) reports that Littleton has a population of 44,553, up from 40,340 in 2000 (a 10% increase). Over the same period, Arapahoe County's population increased by 25 percent and the Denver Metro's population overall increased by 30 percent (and increase of 790,000 people).¹ As shown in Figure I-1, much of Littleton's growth since 2000 has occurred within the last five years.

Figure I-1. Littleton Population, 2000, 2010 and 2015

		Total Population		Total Growth Annual Growth Rate		
	2000	2010	2015	2000-2015	2000-2010	2010-2015
Littleton	40,340	41,737	44,553	4,213	0.3%	1.3%
Arapahoe County	487,967	572,003	608,310	120,343	1.6%	1.2%
Denver Metro	2,629,980	3,090,874	3,418,876	788,896	1.6%	2.0%

Note: "Denver Metro" is defined as the Denver Metro Combined Statistical Area and includes Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, Park and Weld Counties.

Source: 2000 and 2010 U.S. Census, 2015 5-year ACS and BBC Research & Consulting.

Population by age. According to the 2015 ACS, the median age of residents in Littleton is 42, seven years older than the Arapahoe County and Denver metro median ages (both 36). Figure I-2 shows that residents between the ages of 35 and 54 years old are the largest cohort in the city, representing 28 percent of the population. Seniors (65 and older) represent 17 percent of the population and millennials (18 to 34) represent 21 percent of the population.

Between 2010 and 2015 the population of children in Littleton declined slightly, (from 22% of the population to 20% of the population) and the population of residents 55 or older increased. Millennials, as a proportion of the total population remained fairly constant, with a slight increase in post-college-age millennials (aged 25 to 34).

¹Throughout this report "Denver Metro" is defined as the Denver Metro Combined Statistical Area and includes Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, Park and Weld Counties.

Figure I-2. Age, City of Littleton, 2000, 2010 and 2015

_	200	0	201	.0	201	5	2010-2015 Numerical	2010-2015 Pct. Pt.
	Number	Percent	Number	Percent	Number	Percent	Change	Change
Under 5 years	2,301	6%	2,364	6%	2,265	5%	-99	-1%
5 to 17 years	7,080	18%	6,777	16%	6,652	15%	-125	-1%
18 to 24 years	3,322	8%	3,566	9%	3,786	8%	220	0%
25 to 34 years	5,237	13%	5,089	12%	5,703	13%	614	0%
35 to 54 years	13,008	32%	12,480	30%	12,395	28%	-85	-2%
55 to 64 years	3,667	9%	4,630	11%	6,285	14%	1,655	3%
65 years and over	5,725	14%	6,446	16%	7,467	17%	1,021	1%

Source: 2000 U.S. Census, 2010 5-year ACS and 2015 5-year ACS and BBC Research & Consulting.

Figure I-3 displays net migration by age for Arapahoe County. Between 2000 and 2010, 62 percent of new Arapahoe County residents were post-college-aged millennials (25 to 34). However, Littleton has not captured much of that county-wide millennial growth.

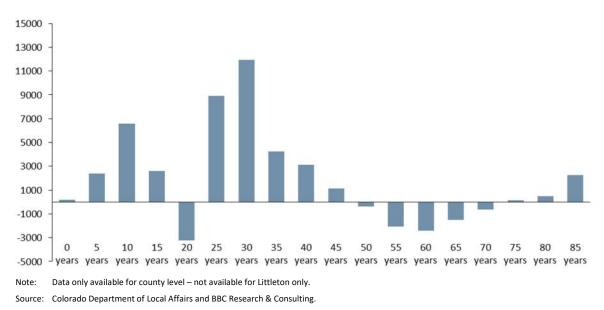


Figure I-3. Net Migration by Age, Arapahoe County, 2000 to 2010

Population projections. Population forecasts were not available for the City of Littleton, but estimates for Arapahoe County indicate population growth over the next twenty years is likely to be similar to that of the last decade—forecasts show a 1.6 percent projected compound annual growth rate for 2015 to 2040, the same rate as the county experienced between 2000 and 2010.

Figure I-4 displays forecasted population growth by age group for Arapahoe County. Between 2015 and 2040 the senior population (65 and older) is expected to increase by 3.3 percent per

year, compared to 1.6 percent for the population overall. The county's population of 18 to 24 year olds is forecasted to have the slowest growth at 1.0 percent per year.

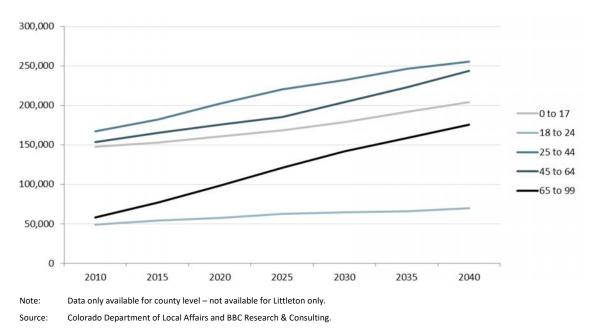


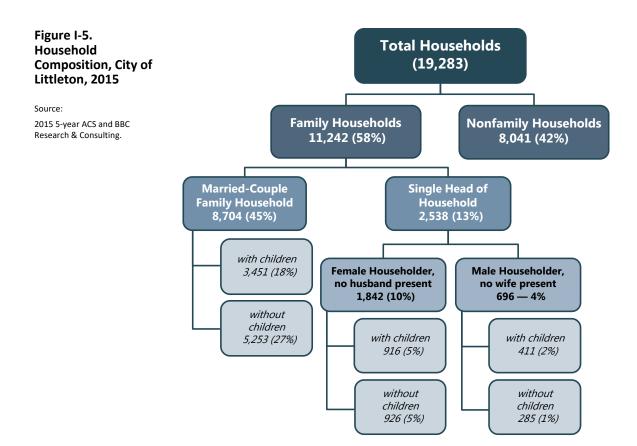
Figure I-4. Population Forecasts, Arapahoe County, 2010 through 2040

Population/household growth in Littleton is likely to be lower than Arapahoe County overall as it is constrained by the city's buildout capacity. Assuming a similar rate of growth as the city experienced between 2010 and 2015 (0.7% CAGR), Littleton could reach 52,575 residents by 2040.

Household Diversity

Household types. About three out of five Littleton households are family households, most of which are comprised of married couples with or without children. Forty-two percent of households are non-family households, which include unrelated persons living together or individuals living alone.

Overall, 27 percent of households include children (married couple and single head of household), down slightly from 29 percent in 2010. Single parent households make up 7 percent of all Littleton households. Figure I-5 displays the city's 2015 household composition.



Disability. In 2015, about 4,500 Littleton residents—10 percent of the total population—had at least one type of disability. About half of those disabled residents were 65 or older. The proportion of residents with a disability in Littleton (10%) is similar to the Denver metro (9%) and the state overall (10%).

Nearly one-third of all seniors (65 years and over) in Littleton are living with at least one disability. Seniors are most affected by ambulatory and independent living disabilities and children are most affected by cognitive and vision disabilities.

The high percentage of seniors living with disabilities, coupled with the population growth among this age group in Littleton (Figure I-6), suggests that the number of total residents living with a disability will increase in the future.

Understanding the needs of seniors with disabilities, primarily with physical disabilities, in terms of housing and community resources will ensure that the City of Westminster is prepared and equipped to accommodate this growing community.

Figure I-6.
Incidence of Disability by Age, City of
Littleton, 2015

Source:
2015 5-year ACS and BBC Research & Consulting.

	Number of Residents	
Total Residents with a Disability	4,447	10%
Residents 5 years and younger	0	0%
Residents 5 to 17 years	269	4%
Hearing	20	0%
Vision	12	0%
Cognitive	241	4%
Ambulatory	14	0%
Self-care	3	0%
Population 18 to 64 years	1,894	7%
Hearing	407	1%
Vision	315	1%
Cognitive	975	3%
Ambulatory	835	3%
Self-care	401	1%
Independent living	761	3%
Population 65 years and over	2,284	32%
Hearing	1,129	16%
Vision	457	6%
Cognitive	495	7%
Ambulatory	1,213	17%
Self-care	432	6%
Independent living	854	12%

Race and ethnicity. Eighty-two percent of Littleton residents are non-Hispanic white; the other 18 percent belong to a minority group. About 12 percent are Hispanic, 2 percent are Asian, 1 percent are African American and 3 percent are two or more races. Although minority populations have experienced faster growth than non-Hispanic whites over the past 15 years, there have only been modest changes in the city's overall racial/ethnic distribution since 2010. Figure I-7 presents the racial and ethnic composition of city residents and how the composition has changed since 2000.²

² It should be noted that Census data on race and ethnic identification vary with how people choose to identify themselves. The U.S. Census Bureau treats race and ethnicity separately: the Bureau does not classify Hispanic/Latino as a race, but rather as an identification of origin and ethnicity. In 2010 the U.S. Census Bureau changed the race question slightly, which may have encouraged respondents to check more than one racial category.

Figure I-7. Race and Ethnicity, City of Littleton, 2000, 2010 and 2015

	2000		2010		2015		2000-2015 Percent
	Number	Percent	Number	Percent	Number	Percent	Change
Total population	40,416		41,352		44,553		10%
Race							
American Indian and Alaska Native	189	0%	332	1%	189	0%	0%
Asian	707	2%	1,184	3%	959	2%	36%
Black or African American	443	1%	623	2%	663	1%	50%
Native Hawaiian and Other Pacific Islander	19	0%	18	0%	36	0%	89%
White	37,081	92%	36,564	88%	40,810	92%	10%
Two or more races	904	2%	992	2%	1,194	3%	32%
Ethnicity							
Hispanic or Latino	3,347	8%	5,234	13%	5,129	12%	53%
Non-Hispanic White	35,098	87%	33,205	80%	36,667	82%	4%

Note: The ACS question on Hispanic origin was revised in 2008 to make it consistent with the 2010 Census Hispanic origin question. As such, there are slight differences in how respondents identified their origin between the 2000 Census and 2015 ACS.

Excludes "Some Other Race" category due to inconsistency of reporting between 2000 Census and 2015 ACS.

Source: 2000 U.S. Census, 2010 5-year ACS and 2015 5-year ACS.

Economic Health

Income. The median household income in the City of Littleton was \$65,221 in 2015—higher than the state overall (\$63,909) and Arapahoe County (\$63,265) but lower than the Denver metro overall (\$70,361).

Figure I-8 displays median household income of both renters and owners in Littleton for 1999, 2007, 2010 and 2015. Overall, median household income increased by 30 percent between 1999 and 2015—from \$50,245 to \$65,221.Much of that increase occurred within the last five years.

Renters experienced a 19 percent income increase (from \$31,333 to \$37,359) and owners experienced a 34 percent increase (from \$65,117 to \$87,394).³

³ It is important to note that the median used in housing programs is a HUD-determined figure based on household incomes in the Denver-Aurora region, adjusted for household size. The 2016 HUD-determined median for a family of four in the Denver-Aurora metropolitan statistical area (MSA) is \$79,900.

Figure I-8. Median Household Income by Tenure, City of Littleton, 1999, 2007, 2010 and 2015

Source: 2000 Census; 2007 3-year ACS, 2010 and 2015 5-year ACS and BBC Research & Consulting.

	All Households	Owners	Renters
Median HH Income			
1999	\$50,254	\$65,117	\$31,333
2007	\$55,742	\$75,744	\$29,694
2010	\$54,512	\$78,950	\$28,564
2015	\$65,221	\$87,394	\$37,359
Percent Change in MHI			
1999 to 2007	11%	16%	-5%
2007 to 2010	-2%	4%	-4%
2010 to 2015	20%	11%	31%
Total change 1999-2015	30%	34%	19%

Income growth was not uniform across all income categories, as shown in Figure I-9. The city now has more owners earning more than \$75,000 than in 1999—and fewer owners earning \$25,000 to \$75,000. However, owners living in poverty (earning less than \$25,000) increased slightly, by 8 percent.

As discussed above, renters' incomes grew 19 percent overall between 1999 and 2015. Growth was most prominent for renters earning more than \$100,000: the number of renters earning at least \$100,000 more than doubled. This could be due to an increase in the incomes of current renters as well as in- and out-migration of renter households.

These changes typify the growing "income gap" experienced in many cities in the country. Workers in high-paying professions and residents with accumulated wealth saw their incomes increase during the past 15 years, while lower income residents were disproportionately affected by the economic downturn, particularly those in recession-vulnerable professions, such as housing construction.

Figure I-9. Income Shifts,		2000		2015		2000-2015 Numerical	2000-2015 Percent	
City of Littleton, 2000 and 2015		Number	Percent	Number	Percent	Change	Change	
	Total	17,389		19,283		1,894	11%	
Source:	Owners							
2000 Census; 2015 5-year	Less than \$25,000	1,136	7%	1,227	6%	91	8%	
ACS and BBC Research & Consulting.	\$25,000 - \$50,000	2,666	15%	1,740	9%	-926	-35%	
consulting.	\$50,000 - \$75,000	2,433	14%	1,974	10%	-459	-19%	
	\$75,000 - \$100,000	1,620	9%	1,900	10%	280	17%	
	\$100,000+	2,929	17%	5,023	26%	2,094	71%	
	Total	10,784	62%	11,864	62%	1,080	10%	
	Renters							
	Less than \$25,000	2,444	14%	2,418	13%	-26	-1%	
	\$25,000 - \$50,000	2,388	14%	2,154	11%	-234	-10%	
	\$50,000 - \$75,000	1,136	7%	1,476	8%	340	30%	
	\$75,000 - \$100,000	352	2%	651	3%	299	85%	
	\$100,000 +	285	2%	720	4%	435	153%	
	Total	6,605	38%	7,419	38%	814	12%	

Poverty. Over 4,000 Littleton residents (9% of the population) are living in poverty. Children (under 18 years old) are the most likely age group to be living in poverty (12%) and residents over 35 are the least likely to be living in poverty (7% of 35-64 year olds and 7% of seniors). The city has a lower poverty rate than Arapahoe County (11%) and the Denver metro area overall (14%). Figure I-10 displays poverty by age for Littleton residents in 2015.

Figure I-10. Poverty Levels by Age, City of Littleton, 2015		Total	Number Below Poverty	Percent Below Poverty
Sources	Total Population	44,110	4,131	9%
Source: 2015 5-year ACS and BBC Research & Consulting.	Under 5 years	2,246	280	12%
	U5 to 17 years	6,625	761	11%
	18 to 34 years	9,443	1,319	14%
	35 to 64 years	18,615	1,267	7%
	65 years and over	7,181	504	7%

Geospatial distribution of poverty within Westminster has changed little since 1999, except for a rise in the northern portion of the city outside the Santa Fe corridor and in the Census tracts that border Littleton to the east and west (see Figures I-11 and I-12). Generally speaking, neighborhoods with poverty rates exceeding 40 percent are considered to be "concentrated poverty" and are statistically associated with higher levels of social dysfunction and community stressors. None of Littleton's neighborhoods have a poverty rate of 40 percent.

E Quincy Ave E Quincy Ave S Clarkson St Percent in Poverty, 1999 88 by Census Tract W Belleview Ave S Lowell Blvd 88 Less than 5% 5 - 10% 10 - 15% W Littleton Ave W Bowles Ave E Orchard Rd 15% or more S Windern Littleton Boundaries S Broad Ridge Rd Kipling Pkwy W Coal Mine Ave 85 E Arapahoe Rd S Pierce St 0 W Ken Caryl Ave E Dry Creek Rd 75 121) W Chatfield Ave 470 N-Gounty-Line Rd 470 Ute Ave Chatfield Reservoir 235 85 **Chatfield State** Park

Figure I-11. Poverty Rates by Census Tract, City of Littleton, 1999

Source: 2000 Census, TIGER/Line, Esri, and BBC Research & Consulting.

E Quincy Ave E Quincy Ave st S Clarkson Percent in Poverty, 2015 88 by Census Tract S Lowell Blvd 88 Less than 5% 5 - 10% W Littleton Av. 10 - 15% W Bowles Ave E Orchard Rd 15% or more Littleton Boundaries Kipling Pkwy Ridge Rd W Coal Mine Ave E Arapahoe Rd 85 St S Pierce S W Ken Caryl Av E Dry Creek Rd 75 121) W Chatfield Ave 470 ounty Line Rd 470 Ute Ave Chatfield Reservoir 85 **Chatfield State** Park

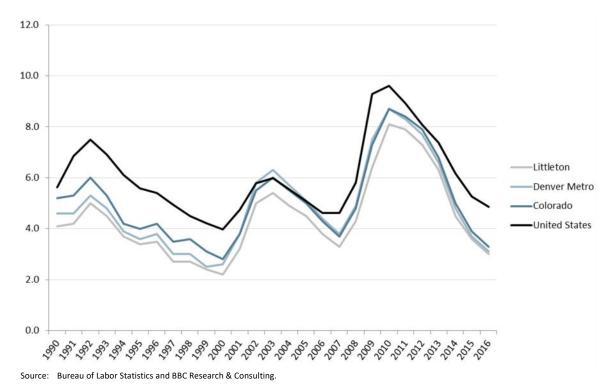
Figure I-12. Poverty Rates by Census Tract, City of Littleton, 2015

Source: 2015 5-year ACS, TIGER/Line, Esri and BBC Research & Consulting

Jobs and Unemployment. Among Littleton residents aged 16 and older, 68 percent participate in the labor force. This indicates these residents were currently employed (either part-time or full-time) or were actively looking for a job.

Unemployment. As displayed by Figure I-13, the city has historically exhibited relatively low rates of unemployment. As of January 2017, Littleton's unemployment rate was 2.9 percent—just below the rate for the Denver metro area (3.1%) and the State of Colorado (3.3%).

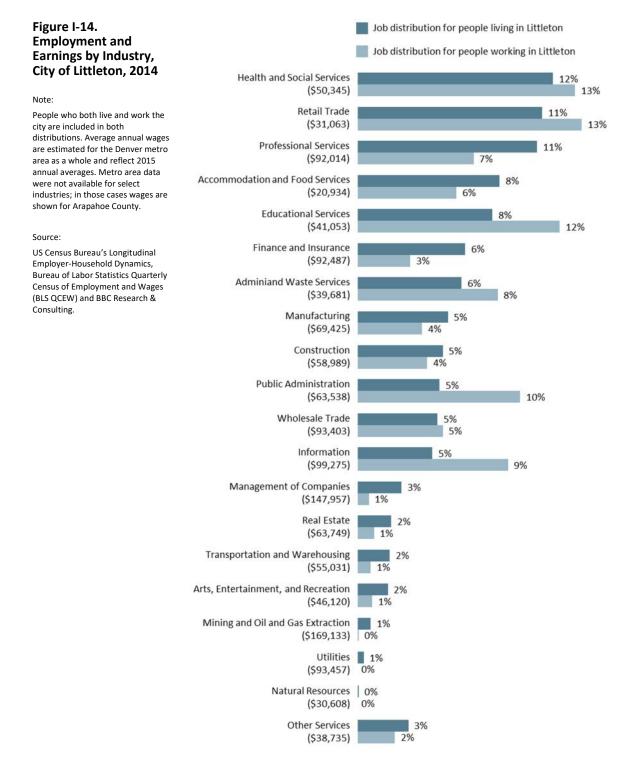




Industry and Earnings. According to the US Census Bureau's Longitudinal Employer-Household Dynamics, there are 19,846 working Littleton residents (either employed in the city or commuting to work outside the city) and 29,524 workers whose primary jobs are located in Littleton (some of these workers live in the city and some live outside the city). Figure I-14 displays employment by industry for people working in the city and for people living in the city. The figure also displays the average 2016 wage for each industry.

Over half (56%) of Littleton jobs are concentrated in five industries: health and social services (13%), retail (13%), education (12%), public administration (10%) and information services (9%). Littleton residents, most of whom are out-commuters, have a broader industry distribution with health and social services accounting for the most jobs (12%) followed by retail (11%) and professional services (11%).

Mining and Management of companies have the highest average annual pay (\$169,000 and \$148,000, respectively) but account for a small proportion of the workforce (1% of workers with jobs in Littleton and 4% of working residents). Average annual wages in the Denver metro across all industries is \$60,215.



Commuting patterns. Among the 29,524 Littleton workers and the 19,846 employed residents, there are just 2,325 people that both live and work in Littleton. As shown in Figure I-15, about 27,000 people work in Littleton but live elsewhere (in-commuters) and 17,521 people live in Littleton but commute to jobs elsewhere (out-commuters).

In other words, 88 percent of working Littleton residents are out-commuters and 92 percent of Littleton's jobs are held by in-commuters.

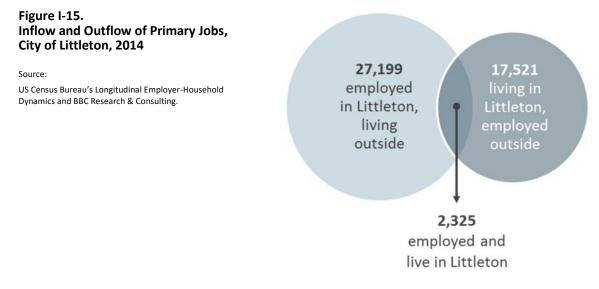


Figure I-16 displays the top daily destinations of in-commuters, out-commuters to/from Littleton. Denver is the top destination: 28 percent of Littleton residents work in Denver and 15 percent of Littleton workers live in Denver.

Figure I-16.

In-Commuter and Out-Commuter Destinations, City of Littleton, 2014



Source: US Census Bureau's Longitudinal Employer-Household Dynamics and BBC Research & Consulting.

Section Summary

This section has reviewed demographic trends in Littleton to set the context for the analysis of housing demand in Section II. Primary findings include:

- Littleton is currently home to about 45,000 people. Residents between 35 and 54 years old are the largest cohort in the city (28% of the population). Seniors (65 and older) represent 17 percent of the population and millennials (18 to 34) represent 21 percent of the population. Since 2010 the population in Littleton has increased by about 10% overall; the proportion of seniors has increased, the proportion of children decreased slightly and the proportion of millennials has remained fairly constant.
- Littleton's 45,000 residents occupy about 28,000 households. Fifty-eight percent are family households; 28 percent include children under 18.
- In 2015, about 4,500 Littleton residents—10 percent of the total population—had at least one type of disability (similar to the Denver metro and state overall). About half of those disabled residents were 65 or older.
- About 18 percent of Littleton's residents identify as racial/ethnic minorities (12% Hispanic, 2% Asian, 1% African American and 3% two or more races). Although minority populations have experienced faster growth than non-Hispanic whites over the past 15 years, there have only been modest changes in the city's overall racial/ethnic distribution since 2010.
- The median household income in the City of Littleton was \$65,221 in 2015, up 30 percent from 1999, when median income was \$50,245. Over that period, owners experienced higher income growth (34%) than renters (19%).
- Typical of national trends, income growth was not uniform across all income categories: Workers in high-paying professions and residents with accumulated wealth saw their incomes increase during the past 15 years, while lower income residents were disproportionately affected by the economic downturn.
- Over 4,000 Littleton residents (9% of the population) are living in poverty; children (under 18 years old) are the most likely age group to be living in poverty (12%). The city has a lower poverty rate than Arapahoe County (11%) and the Denver metro area overall (14%). Within Littleton, poverty is concentrated in the northern portion of the city, particularly along the Santa Fe corridor.
- The average metro area worker earns about \$60,000 annually. About two-thirds of Littleton residents participate in the labor force and Littleton's unemployment rate is below that of the metro and the state overall.
- There are about 29,500 primary jobs in Littleton and about 19,800 employed residents. However, there are just 2,325 people that both live and work in Littleton. That is, 88 percent of working Littleton residents are out-commuters and 92 percent of Littleton's jobs are held by in-commuters.

SECTION II.

Housing Profile and Market Analysis

SECTION II. Housing Profile and Market Analysis

This section provides an analysis of Littleton's housing market. It begins with a discussion of housing stock then examines trends in the owner and rental markets. It also includes an analysis of scrapes in Littleton and an overview of publicly assisted rental housing. The section concludes with gaps analysis to examine mismatches in supply and demand of housing in Littleton.

Existing Housing Stock

According to the 2015 ACS there are 20,205 housing units (occupied and vacant) in Littleton, up from 19,176 in 2010—a 5 percent increase. Nearly two thirds (62%) of households in the city are owner-occupied; 38 percent are renter occupied.

Housing type. Just over half of Littleton's housing stock is single family detached and 47 percent is attached housing (paired homes, townhomes, apartments, condos, etc). In addition, 2 percent of the housing stock is mobile homes. The distribution of housing type in Littleton is similar to Arapahoe County overall.

The vast majority of Littleton owners (75%) live in single family detached houses and the vast majority of renters (84%) live in attached units. Figure II-1 displays housing type by tenure for Littleton.

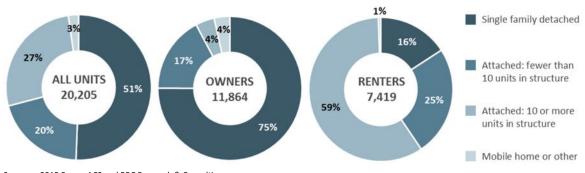
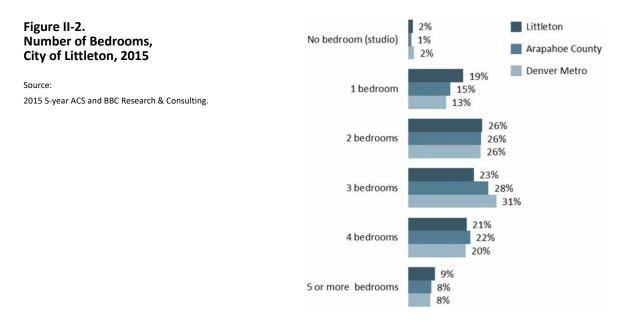


Figure II-1. Housing Type by Tenure, City of Littleton, 2015

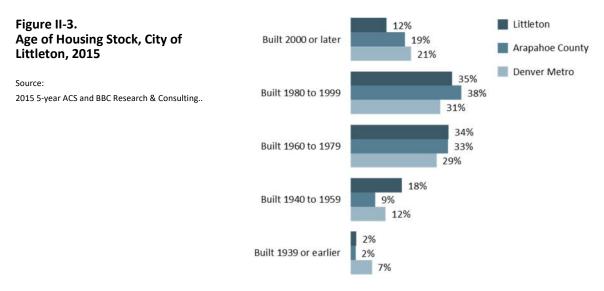
Source: 2015 5-year ACS and BBC Research & Consulting.

Household size and bedrooms. The average household size in Littleton is 2.29—smaller than Arapahoe County (2.63) and the Denver metro as a whole (2.59). About one-quarter of housing units in Littleton have three bedrooms; 47 percent have fewer than three bedrooms and 30 percent have four or more bedrooms. As shown in Figure II-2, Littleton has a higher proportion of one bedroom units and fewer three bedroom units than Arapahoe County and the Denver metro overall.



On average, owner-occupied households in Littleton are larger (2.45 people) than renter occupied households (2.02 people). Owner occupied units also tend to have more bedrooms than renter occupied units—77 percent of owner occupied homes have three or more bedrooms, compared to just 19 percent of renter occupied homes.

Age of housing stock. About 12 percent of Littleton's housing stock was built in the past 15 years (since 2000). Over one third (35%) was built between 1980 and 2000. Over one third (35%) was built between 1940 and 1980 and just one percent was built before 1940. Figure II-3 displays the city's housing stock by age; data for Arapahoe County and the Denver Metro are included for comparison.



When examined by tenure, the city's owner occupied units have a similar age distribution as renter occupied units: 53 percent of both owner and renter occupied units were built prior to 1980. However, fewer rentals than owner units were built between 1980 and 2000 (32%

compared to 36%) and more rentals than owner units were built in the past 15 years (15% compared to 11%).

Most of Littleton's housing stock was built after 1940, therefore reducing the risk of lead-based paint.¹ Age of homes can be an important indicator of housing condition: older houses tend to have more condition problems and are more likely to contain materials such as lead based paint. Just 2 percent of the housing units in Littleton were built before 1940 and nearly half were built after 1980.

Overcrowding and substandard conditions. Other key factors to examine in evaluating housing condition are overcrowding and substandard units. Overcrowding in housing can threaten public health, strain public infrastructure, and points to an increasing need of affordable housing. This study uses HUD's definition of having more than one person per room to identify overcrowded units.² Approximately two percent of the city's households—or about 384 households—are overcrowded.

The 2015 ACS reported that 33 units (vacant and occupied) in the city lacked complete plumbing facilities and 75 housing units (vacant and occupied) lacked complete kitchens. These 108 severely substandard units represent less than one percent of the city's total housing units.

Current and Future Development

Like many areas across the country, residential development in Littleton slowed in the wake of the recession but has experienced resurgence over the past few years. Figure II-4 displays residential permitting over the past 16 years, broken out by housing type. Data for 2017 reflects only the first quarter (January through March).

Permitting has been high over the past three years, relative to recent history. Most notably, the number of multifamily housing permits issued has been especially high over the past three years.

¹ Lead-based paint was banned from residential use in 1978. Housing built before 1978 is considered to have some risk, but housing built prior to 1940 is considered to have the highest risk. After 1940, paint manufacturers voluntarily began to reduce the amount of lead they added to their paint. As a result, painted surfaces in homes built before 1940 are likely to have higher levels of lead than homes built between 1940 and 1978.

² The HUD American Housing Survey defines a room as an enclosed space used for living purposes, such as a bedroom, living or dining room, kitchen, recreation room, or another finished room suitable for year-round use. Excluded are bathrooms, laundry rooms, utility rooms, pantries, and unfinished areas.

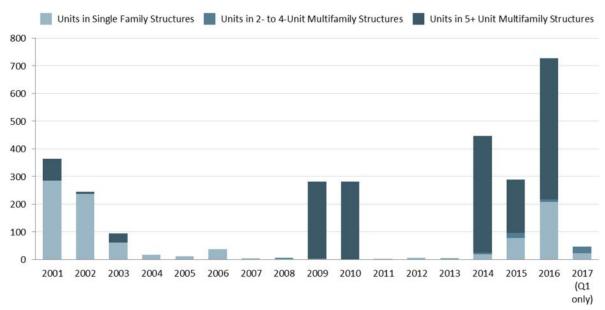


Figure II-4. Building Permits Issued, City of Littleton, 2001 through Q1 2017

Figure II-5 shows the number of existing units by type as well as permitted units for 2014 through 2017 to evaluate how current development may impact the overall housing type distribution in Littleton. Currently, single family homes (detached and attached) comprise 61 percent of the overall housing stock in Littleton. Given the types of housing units permitted for construction, the proportion of single family homes will drop to 59 percent—a relatively small decline. Projects show an associated 2 percentage point rise in the proportion of units in multifamily structures.

Figure II-5.

Future Development by Housing Type, City of Littleton

-	Nu	Housing Stock			
Type of Housing	Existing Housing Stock	Building Permits Issued 2014-2017	Possible Future Housing Stock	Current	Future
Units in Single Family Structures	12,383	329	12,712	61%	59%
Units in 2- to 4-Unit Multifamily Structures	587	57	644	3%	3%
Units in 5+ Unit Multifamily Structures	6,773	1124	7,897	34%	36%
Mobile Home and other	462	0	462	2%	2%
Total Units	20,205	1,510	21,715	100%	100%

Source: 2015 5-year ACS, HUD State of the Cities Data Systems Building Permit Database and BBC Research & Consulting.

Profile of Renters and Owners

Littleton is home to more owners (62%) than renters (38%). Owners tend to be older and earn higher incomes than renters (median income for renters is less than half that of owners). Owners are also more likely to be non-Hispanic white. Owners and renters are equally likely to

Source: HUD State of the Cities Data Systems Building Permit Database and BBC Research & Consulting.

have children living in the home—26 percent of renters and 27 percent of owners are households with children. Renters are more likely than owners to be living alone.

Figure II-6 summarizes characteristics of renters and owners in Littleton. The figure displays the number and distribution of renter and owner households by demographic characteristic and also provides the homeownership rate by income, age group, household type and race/ethnicity.

	Renters		Owr	ners	Ownership
	Number	Percent	Number	Percent	Rate
Total Households	7,419	100%	11,864	100%	62%
Median Income	\$37,359		\$87,394		
Income Distribution					
Less than \$25,000	2,418	33%	1,227	10%	34%
\$25,000 - \$50,000	2,154	29%	1,740	15%	45%
\$50,000 - \$75,000	1,476	20%	1,974	17%	57%
\$75,000 - \$100,000	651	9%	1,900	16%	74%
\$100,000+	720	10%	5,023	42%	87%
Age of Householder					
Young millennials (15-24)	866	12%	20	0%	2%
Post-college millennials (25-34)	1,809	24%	714	6%	28%
Ages 35-44	1,359	18%	1,858	16%	58%
Ages 45-64	2,023	27%	5,712	48%	74%
Seniors (65 and older)	1,362	18%	3,560	30%	72%
Household Type					
Family household without children	1,893	26%	3,195	27%	63%
Family household with children	1,219	16%	4,935	42%	80%
Nonfamily household - living alone	3,634	49%	3,187	27%	47%
Other nonfamily household	673	9%	547	5%	45%
Race/Ethnicity of Householder					
Non-Hispanic white	5,890	79%	10,919	92%	65%
Hispanic	1,037	14%	566	5%	35%
Other minority	492	7%	379	3%	44%

Figure II-6. Profile of Renters and Owners, City of Littleton, 2015

Source: 2015 5-year ACS and BBC Research & Consulting.

Ownership Market Trends

Similar to most housing markets across the country, Littleton experienced substantial increases in home values between 2000 and 2008 followed by a drop in values and sales activity as the housing bubble burst. However, the impact in Littleton (and regionally) was not as severe as in the U.S. as a whole.

Since early 2012, home prices have increased sharply in Littleton and in peer communities throughout the metro area. Figure II-7 uses Zillow data to compare long-term trends in Littleton home prices to other communities in the metro area and to the United States overall.

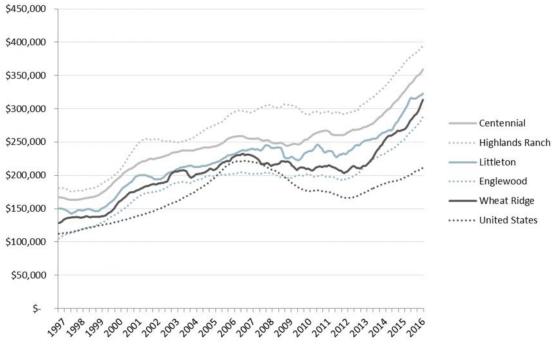


Figure II-7. Median Sale Price, Littleton and Surrounding Communities, 1997 - 2016

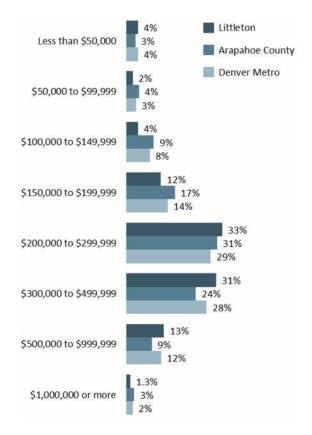
Source: Zillow median sale price and BBC Research & Consulting.

Home value. According to the 2015 5-year ACS, the median value of owner-occupied homes in Littleton was \$284,000, up from \$192,200 in 1999 and \$269,500 in 2010. (Median value reflects the self-reported value of all homes—not just those listed or sold; as such median value is typically below median sale price in any community).

Figure II-8 displays the distribution of home values in Littleton, along with Arapahoe County and the Denver metro for comparison. One-third of Littleton owners report their home value to be between \$200,000 and \$300,000 and nearly another third report their home value to be between \$300,000 and \$500,000. About 10 percent of Littleton homes are valued below \$150,000. Compared to Arapahoe County and the Denver Metro, Littleton has fewer homes valued below \$200,000 and more homes valued between \$200,000 and \$1 million.

Figure II-8. Home Value Distribution, City of Littleton, Arapahoe County and the Denver Metro, 2015

Source: 2015 5-year ACS and BBC Research & Consulting.

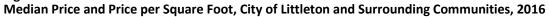


Home sales. In 2016, about 3,500 homes were listed for sale or sold in Littleton for a median price of \$370,000. Over 70 percent of sales were single family detached homes, a proportion slightly below the 75 percent of owner-occupied homes in the city that are single family detached. Single family detached homes sold for a median sale price of \$410,000, significantly higher than the median sale price for attached homes (\$247,750).

Littleton's median sale price of \$370,000 was similar to surrounding areas and peer cities in the metro area. As shown in Figure II-9 Highlands Ranch had the highest median sale price at \$425,000 and Englewood had the lowest at \$325,000.

Median price per square foot still shows Littleton in the middle of the peer city range but Englewood and Wheat Ridge move to the upper end and Highlands ranch and Centennial fall below Littleton.

Figure II-9.





Source: Genesis Group MLS data and BBC Research & Consulting.

Figure II-10 shows characteristics of the homes listed/sold in Littleton during 2016. Fifteen percent of homes were bought with cash, 66 percent were bought through conventional mortgages and the remaining 19 percent of homes were bought with FHA, VA or other financial terms. Most of the city's home sales (57%) were priced between \$300,000 and \$500,000; onequarter were priced below \$300,000.

On average, the homes listed or sold in Littleton in 2016 were 2,500 square feet with 3 bedrooms and 3 baths and were on the market for just 23 days before going under contract.

Characteristics, City of		Attached Homes	Detached Homes	All Homes
,10				
	Total Homes			
	Number	990	2,350	3,340
LS data and BBC Research &	Percent of All Homes	29%	29%	100%
	Financial Terms			
	Cash	22%	12%	15%
	Conventional	59%	69%	66%
	Other (FHA, VA, etc.)	19%	19%	19%
	Price			
	Sale Price of < \$300k	73%	5%	25%
	Sale Price of \$300k - \$500k	26%	70%	57%
	Sale Price of > \$500k	1%	25%	18%
	Average Characteristics			
	Square Feet	1,500	3,032	2,522
	Number of Baths	2.3	3.2	2.9
	Number of Bedrooms	2.3	3.8	3.3
	Year Built	1992	1984	1986
	Days on Market	13	26	23

Figure II-10. Home Sales Littleton, 20

Genesis Group MLS Consulting.

Source:

Days on market are lowest for homes priced below \$300,000 (average of 14 days and median of 4 days) and highest for homes priced over \$500,000 (average of 46 days and median of 20 days). This indicates demand (and competition) is very high for homes in the most affordable price range.

Price distribution. Figure II-11 displays the distribution of home listed/sold prices in Littleton compared to the South Metro overall (Arapahoe, Douglas and Jefferson counties). Compared to the South Metro, Littleton has fewer homes priced below \$200,000 but more homes priced between \$300,000 and \$500,000.

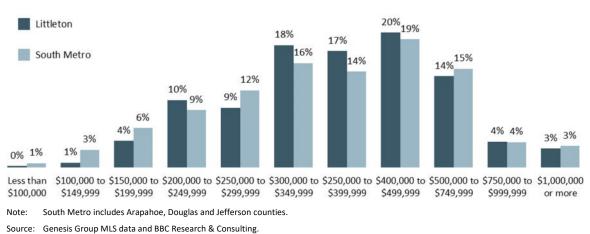
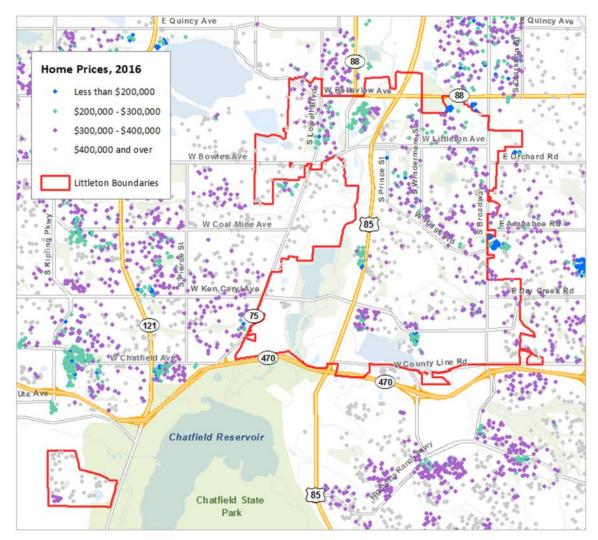




Figure II-12 displays the geographic distribution of homes listed/sold in 2016 by price point in Littleton; Figure II-13 displays the same detail but for the core metro area. As illustrated by the maps, very few homes were sold for less than \$200,000 in 2016 and those that did sell at that price point were primarily located in Aurora.

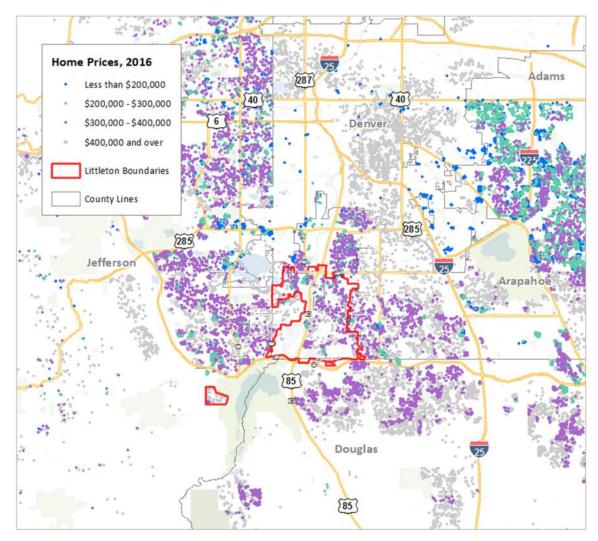
In the City of Littleton, homes priced below \$300,000 were clustered in the northwest portion of the city or in several developments along transportation corridors.

Figure II-12. Homes Listed/Sold by Price, City of Littleton, 2016



Source: Esri, USGS, Genesis Group MLS data and BBC Research & Consulting.

Figure II-13. Home Values, South Metro Area, 2016



Source: Esri, USGS, Genesis Group MLS data and BBC Research & Consulting.

Scrapes. Rising home prices in any market—particularly markets with a substantial portion of older housing stock—can incentivize investors or owners to purchase a property with the intent of demolishing the existing structure and replacing it with a higher value structure. This activity, commonly called "scarping" can include replacing a single family structure with a larger single family home or replacing a single family unit with a higher density form, such as a duplex or townhomes.

BBC matched demolition permit data with assessor's data (before and after demolition and construction) to calculate the number and location of scrapes in Littleton over the past 10 years. In total, there were 43 residential demolition permits issued in Littleton between January 2007 and February 2017. Of those, 24 appear to be scrapes—22 properties have proceeded with demolition and either completed or started construction on a replacement structure; and 2 properties permitted in 2017 are likely to be scraped. (Demolitions not categorized as scrapes include vacant lots, small residential outbuilding demos and mobile homes).

About half of the demolished homes were replaced with larger single family homes (double the pre-scrape value on average) and about half were replaced with higher density developments including split-lot single family detached, duplexes, townhomes or condos. Figure II-14 maps scraped properties in Littleton.

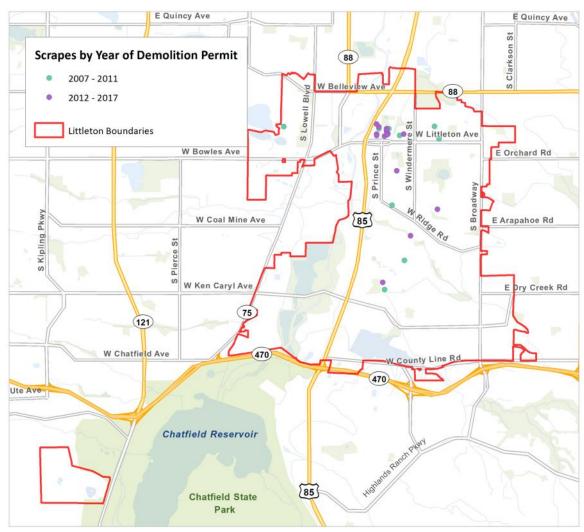


Figure II-14. Properties Identified as Scrapes, City of Littleton, January 2007 through February 2017

Source: City of Littleton Demolition Permits, Esri, USGS and BBC Research & Consulting.

Ownership affordability. As discussed in the Demographic Profile, owners experienced higher percentage gains in median income than renters between 1999 and 2015. For owners, median income increased by 34 percent over the period, from \$65,117 to \$87,394. Median income for all households increased by 30 percent, from \$50,254 to \$65,221.

Median sale prices increased even faster, nearly doubling between 1999 and 2015 and then rising further in 2016. However, falling interest rates between 1999 and 2015 have allowed potential buyers to increase their purchasing power meaning ownership affordability has

actually improved at the median. In other words, even though home prices increased, it became easier to buy because potential homebuyers could afford a higher-priced home.

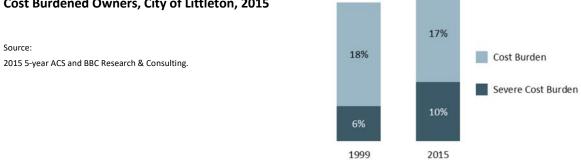
This is demonstrated in Figure II-15, which shows the change in income, home prices and purchasing power in Littleton. Income shown is for all residents, not just owners in order to include renters who may wish to purchase homes. In 1999, the median household income of \$50,254 could afford to purchase a home priced at \$158,000 (based on a 7.44% interest rate with 10% down on a 30 year fixed loan and assuming 30% of monthly housing costs go toward insurance, utilities and taxes). In 2015, the median household income of \$65,221 could afford a home priced at \$395,000 based on a much lower interest rate of 3.85 percent (and otherwise the same lending assumptions). Over that fifteen year period, purchasing power increased by 151 percent for median income households and the median sale price increased by 97 percent.

Figure II-15. Changes in Purchasing		<u>1999</u>	<u>2015</u>	<u>% Change</u>
Power, City of Littleton, 1999 to 2015	Median Sale Price	\$160,000	\$315,000	97%
Note: Purchasing power calculation assumes 10% down on a 30 year	Median Income	\$50,254	\$65,221	30%
fixed loan and 30% of monthly housing costs go toward insurance, utilities and taxes.	Prevailing Interest Ra	te 7.44%	3.85%	-3.6
Source: 2000 Census 2015 5-year ACS, Zillow, Freddie Mac and BBC Research & Consulting .	Purchasing Power at the Median Income	\$158,000	\$395,000	151%

However, purchasing power is not the only—and may not the best—measure of affordability dynamics in a given market. Although purchasing power increased as interest rates dropped, the rising home prices make it more challenging to save for a down payment to purchase a home. Assuming a 10 percent down payment, the median sale price in 1999 required a \$16,000 down payment—about 32 percent of the median household's annual income. In 2015, the median sale price required a \$31,500 down payment, about 48 percent of the median household's income. For renters looking to purchase a home, rising rental prices also impact the ability to save for a down payment.

Cost burden, defined as spending 30 percent or more on housing costs is another measure of affordability trends. As shown in Figure II-16 the proportion of owners (with a mortgage) who are cost burdened increased from 24 percent in 1999 to 27 percent in 2015. The proportion of owners (with a mortgage) who are severely cost burdened—spending over half their income on housing costs—increased from 6 percent to 10 percent. These increases may reflect existing owners with rising property taxes and/or new owners purchasing above their affordability levels to keep up with rising home prices.

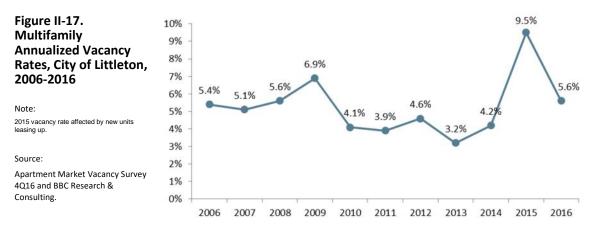
Figure II-16. Cost Burdened Owners, City of Littleton, 2015



Rental Market Trends

According to market reports, apartment vacancy rates in the Denver metro area were at a nine year low in late 2014 at 3.9 percent—indicating an extremely tight rental market. Vacancy rates have increased somewhat since then but still reflect a relatively tight rental market and average rents have continued to rise. As of Q4 2016, the Denver metro vacancy rate was 6.2 percent and the average rent was \$1,347. In Littleton, the 2016 Q4 vacancy rate was 5.8 percent and the average rent was \$1,303.³

Vacancy rates. Vacancy rates around 5 percent typically indicate a competitive equilibrium in the rental market. Rates that fall below 5 percent indicate a very tight market. As shown in Figure II-17, between 2006 and 2009 multifamily vacancies in Littleton hovered between 5.1 and 6.9 percent but fell to 4.1 percent in 2010. Vacancies stayed below 5 percent through 2014 (reaching a low of 3.2% in 2013). The market responded by increasing multifamily construction in 2015 and 2016 and vacancy rates have now returned to 5.6 percent. (Note that the 2015 vacancy rate appears high but actually reflects new units leasing up as projects were completed).



³ Apartment Market Vacancy Survey 4Q16. The Vacancy Survey is based on a survey of multifamily structures and does not include single family rental units. In contrast, the ACS provides self-reported rents among all renters, regardless of structure.

Distribution of rents. According to ACS data, the median rent in Littleton was \$1,008 in 2015 within \$2 of the median rent in the metro overall (\$1,006). As shown in Figure II-18, median rent in Littleton is higher than Englewood and Wheat Ridge but lower than Centennial and Highlands Ranch.

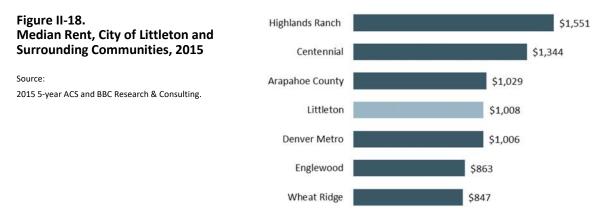
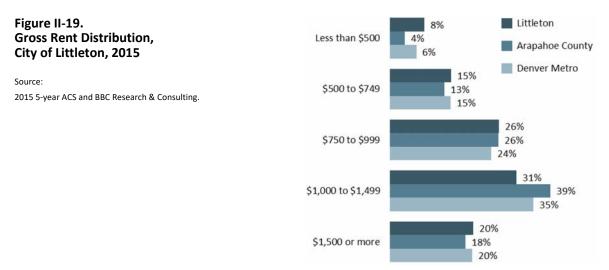


Figure II-19 displays the distribution of rents for Littleton, Arapahoe County and the Denver metro. Most Littleton renters (72%) pay between \$500 and \$1,500 for their units. Eight percent pay less than \$500 and 20 percent pay more than \$1,500 per month.



Market rates. The ACS data on median rent and rental distribution is a comprehensive analysis of what all renters currently pay for rent. However, those data might not reflect what is available on the market for a household looking to rent. A survey of apartment complexes in the Greater Denver Metro shows that average rents region-wide were \$1,347 in 2016, up from \$936 in 2011 (44% increase). Average rent by unit size ranged from \$1,117 for a studio to \$1,844 for a three-bedroom, two-bath unit. Average rent was highest for apartment communities with 200 to 350 units at \$1,400 and lowest for small complexes (8 or fewer units) at \$1,039.⁴

⁴ Apartment Market Report, Greater Denver Metro Area. Second Quarter 2016. Apartment Association Metro Denver Publication.

Average rent in Littleton was \$1,303 in 2016, up from \$963 in 2011. Average rent by unit size ranged from \$890 for studios to \$1,887 for three bedroom units. Similar to the metro overall, average rents in Littleton tend to be higher in larger complexes.⁵

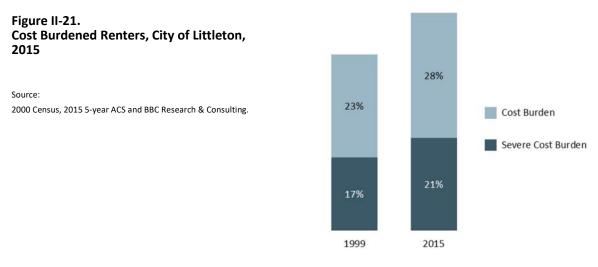
Renter affordability. Between 1999 and 2015 renters in Littleton lost purchasing power as rents increased faster than incomes. Median rent increased by 42 percent in Littleton from \$709 in 1999 to \$1,008 in 2015. In order to afford the increase in rent, renters' annual incomes would have needed to increase by \$11,960 between 1999 and 2015; however actual increase in renter median income was only \$6,026.

Figure II-20. Pontal Sizo Rental Affordability, City of Littleton, 2015

, City of Littleton, 2015	Heintal bize	Median Kent	meonie nequirea	
	1-bedroom	\$831	\$33,240	
	2-bedroom	\$1,108	\$44,320	
h & Consulting.	3-bedroom	\$1,389	\$55,560	
	4-bedroom	\$1,743	\$69,720	

Modian Pont Income Pequired

Nearly half of all Littleton renters (49%), 2,554 households, are cost burdened, spending 30 percent or more of their income on housing costs. One in five renters (1,059 households) are severely costs burdened, spending at least half of their income on housing costs. The increase in cost burdened renters between 1999 and 2015 (demonstrated in Figure II-21) is consistent with the decline in purchasing power among renters over the same period.



Publicly assisted rental housing. Eligibility for housing assistance programs is generally based on how a resident's income falls within HUD-determined income categories. The categories are based on the regional Area Median Income of AMI. In Littleton, the AMI used for a family of four is \$83,900, which is the regional AMI for the Denver-Aurora metro area. Extremely low income households are those earning 30 percent of AMI and low income households are those earning 50 percent AMI—both typically qualify for publicly assisted rental housing.

⁵ Apartment Market Report, Greater Denver Metro Area. Second Quarter 2016. Apartment Association Metro Denver Publication.

There are currently 1,036 households in Littleton living in publicly assisted housing or using a housing choice voucher. About one-third of those households live in Low Income Housing Tax Credit (LIHTC) properties, one-quarter live in Project Based Section 8 units and 20 percent use Housing Choice Vouchers. The remainder live in public housing units, scattered site family public housing or other publicly supported housing developments. The city does not have any income restricted units for owners.

Figure II-22. Publicly Assisted Housing, City of Littleton, 2017

Source: SMHO and BBC Research & Consulting.

Program	Number of Units	Percent of all Units
LIHTC	350	34%
Project-Based Section 8	266	26%
Public Housing (includes scattered site)	143	14%
Housing Choice Vouchers	230	22%
Other Programs	47	5%
Total Units	1,036	100%

Over half of the Littleton households in publicly assisted housing earn less than \$15,000 per year and 90 percent earn less than \$25,000 per year. Just over one quarter of occupants of Littleton's publicly supported housing are children and nearly one-third are seniors (62 years or older).

Gaps Analysis

To examine how well Littleton's current housing market meets the needs of its residents—and to determine how likely it is to accommodate demand of future residents and workers—BBC conducted a modeling effort called a "gaps analysis." The analysis compares the supply of housing at various price points to the number of households who can afford such housing. If there are more housing units than households, the market is "oversupplying" housing at that price range. Conversely, if there are too few units, the market is "undersupplying" housing. The gaps analysis conducted for renters in Littleton addresses both rental affordability and ownership opportunities for renters who want to buy.

Mismatch in the rental market. Figure II-23 compares the number of renter households in Littleton in 2015, their income levels, the maximum monthly rent they could afford without being cost burdened, and the number of units in the market that were affordable to them. The "Rental Gap" column shows the difference between the number of renter households and the number of rental units affordable to them. Negative numbers (in parentheses) indicate a shortage of units at the specific income level; positive units indicate an excess of units.

Figure II-23. Mismatch in Rental Market, City of Littleton, 2015

	Max Affordable	Rent	ers	Rental	Units	Rental	Cumulative
Income Range	Rent	#	%	#	%	Gap	Gap
Less than \$5,000	\$125	383	5%	15	0%	(368)	(368)
\$5,000 to \$9,999	\$250	331	4%	147	2%	(184)	(552)
\$10,000 to \$14,999	\$375	573	8%	257	3%	(316)	(868)
\$15,000 to \$19,999	\$500	602	8%	221	3%	(381)	(1,250)
\$20,000 to \$24,999	\$625	529	7%	428	6%	(101)	(1,350)
\$25,000 to \$34,999	\$875	883	12%	1,861	24%	978	(372)
\$35,000 to \$49,999	\$1,250	1,271	17%	2,333	30%	1,062	690
\$50,000 to \$74,999	\$1,875	1,476	20%	1,797	23%	321	1,012
\$75,000 to \$99,999	\$2,500	651	9%	553	7%	(98)	914
\$100,000 or more	\$2,500+	720	10%	78	1%	(642)	369
Total/Low Income Ga	ıp	7,419	100%	7,691	100%	(1,350)	

Source: 2015 5-year ACS and BBC Research & Consulting.

The gaps analysis in Figure II-23 shows that:

- Seventeen percent of renters (1,287 households) living in Littleton earn less than \$15,000 per year. These renters need units that cost less than \$375 per month to avoid being cost burdened. Just 5 percent of rental units (419 units) in the city rent for less than \$375/month (including subsidized rental units). This leaves a "gap," or shortage, of 868 units for these extremely low income households.
- Over 1,100 renters earn between \$15,000 and \$25,000 per year. There are only 649 rental units priced at their affordability range (between \$375 and \$625/month), leaving a shortage of 482 units.
- Altogether, the city has a shortage of rental units priced affordably for renters earning less than \$25,000 per year of 1,350 units. These households consist of students, working residents earning low wages, residents who are unemployed and residents who are disabled and cannot work.⁶

In sum, the private rental market in Littleton largely serves renters earning between \$25,000 and \$75,000 per year—78 percent of rental units are priced within that group's affordability range. The market fails to adequately serve the 33 percent of renters earning less than \$25,000 per year—even when accounting for the impact of subsidized housing programs.

The "shortage" shown in the gaps model for high income renters (earning more than \$75,000 per year) suggests those renters are spending less than 30 percent of their income on housing—perhaps in order to save for a down payment on a home purchase.

⁶ It is important to note that these renters are not homeless. Those renters who cannot find affordability priced rentals are living in units that cost more than they can afford. These households are "cost burdened."

Gaps in the For Sale Market. A similar gaps analysis was conducted to evaluate the market options affordable to renters who may wish to purchase a home in Littleton. Again, the model compared renters, renter income levels, the maximum monthly housing payment they could afford, and the proportion of units in the market that were affordable to them. The maximum affordable home prices shown in Figure II-24 assume a 30-year mortgage with a 10 percent down payment and an interest rate of 3.85 percent. The estimates also incorporate property taxes, insurance and utilities (assumed to collectively account for 30% of the monthly payment).

The "Renter Purchase Gap" column in Figure II-24 shows the difference between the proportion of renter households and the proportion of homes listed or sold in 2016 that were affordable to them. Negative numbers (in parentheses) indicate a shortage of units at the specific income level; positive units indicate an excess of units.

The for sale gaps analysis shows the Littleton market to be relatively affordable for renters earning more than \$75,000 per year. For renters earning between \$50,000 and \$75,000, the market does offer proportional affordability but it is contingent on a willingness to consider townhomes and condos—78% of the affordable units in their price range are attached housing options. Renters earning less than \$50,000 per year can afford a max home price of \$205,000. Only 212 homes were listed or sold in Littleton in 2016 in that price range (6% of all listed/sold homes); 98 percent of those were attached homes.

It is important to note that home size, condition and housing preferences are not considered in the affordability model. The model also assumes that renters are able to save for a 10 percent down payment (up to \$31,000 for a household earning less than \$75,000 annually).

	Max Affordable			Homes Listed/Sold in 2016		Renter Purchase	Percent of Homes that are Attached	
Income Range	Home Price			# %		Gap		
Less than \$35,000	\$143,711	3,301	44%	29	1%	(44%)	100%	
\$35,000 to \$49,999	\$205,304	1,271	17%	183	5%	(12%)	97%	
\$50,000 to \$74,999	\$307,958	1,476	20%	721	20%	1%	78%	
\$75,000 to \$99,999	\$410,612	651	9%	1,298	37%	28%	15%	
\$100,000 to \$149,999	\$615,919	481	6%	912	26%	19%	4%	
\$150,000 or more	\$615,919+	239	3%	385	11%	8%	2%	
Total/ Gap below \$50,0	00	7,419	100%	3,528	100%	(56%)		

Figure II-24.

Market Options for Renters Wanting to Buy, City of Littleton, 2016

Note: Maximum affordable home price is based on a 30 year mortgage with a 10 percent down payment and an interest rate of 3.85%. Property taxes, insurance and utilities are assumed to collectively account for 30% of the monthly payment.

Source: 2015 5-year ACS, 2016 Genesis Group MLS data and BBC Research & Consulting.

What can workers afford? Figure II-25 displays affordable rental and ownership options for workers earning the average wage by industry. Among the five largest industries of Littleton residents (those who live and work in the city as well as out-commuters), which account for about half of all resident workers: three industries have average wages high enough to afford the city's median rent and only one of the five industries has average wages high enough to afford

the 2016 median sale price of \$370,000. Affordability for Littleton workers (those who live and work in the city as well as in-commuters) is similar: three of the top five industries can afford median rent and one of the top five industries can afford the median home price.

Overall, the average Denver metro worker—earning \$60,215 per year—could afford 80 percent of Littleton's rental units and 15 percent of the homes sold in Littleton in 2016 (96% of which are attached homes).

Figure II-25. Affordability for Workers by Industry, Littleton, 2015/2016

Industry	Average Annual Wage in Metro Denver	Job distribution for Littleton residents	Job distribution for Littleton workers	Max Affordable Rent	Can Afford Median Rent?	Max Affordable Home Price	Can Afford Median Home Price?
Private, Total, all industries	\$60,215	100%	100%	\$1,505	yes	\$247,252	no
Health and Social Services	\$50,345	12%	13%	\$1,259	yes	\$206,724	no
Retail Trade	\$31,063	11%	13%	\$777	no	\$127,550	no
Professional Services	\$92,014	11%	7%	\$2,300	yes	\$377,824	yes
Accommodation and Food Services	\$20,934	8%	6%	\$523	no	\$85,958	no
Educational Services	\$41,053	8%	12%	\$1,026	yes	\$168,570	no
Finance and Insurance	\$92,487	6%	3%	\$2,312	yes	\$379,766	yes
Admin and Waste Services	\$39,681	6%	8%	\$992	no	\$162,936	no
Manufacturing	\$69,425	5%	4%	\$1,736	yes	\$285,070	no
Construction	\$58,989	5%	4%	\$1,475	yes	\$242,218	no
Public Administration	\$63 <i>,</i> 538	5%	10%	\$1,588	yes	\$260,897	no
Wholesale Trade	\$93,403	5%	5%	\$2,335	yes	\$383,527	yes
Information	\$99,275	5%	9%	\$2,482	yes	\$407,639	yes
Management of Companies	\$147,957	3%	1%	\$3,699	yes	\$607,535	yes
Real Estate	\$63,749	2%	1%	\$1,594	yes	\$261,763	no
Transportation and Warehousing	\$55,031	2%	1%	\$1,376	yes	\$225,966	no
Arts, Entertainment, and Recreation	\$46,120	2%	1%	\$1,153	yes	\$189,376	no
Mining and Oil and Gas Extraction	\$169,133	1%	0%	\$4,228	yes	\$694,487	yes
Utilities	\$93,457	1%	0%	\$2,336	yes	\$383,749	yes
Natural Resources	\$30,608	0%	0%	\$765	no	\$125,681	no
Other Services	\$38,735	3%	2%	\$968	no	\$159,052	no

Source: US Census Bureau's Longitudinal Employer-Household Dynamics, Bureau of Labor Statistics Quarterly Census of Employment and Wages (BLS QCEW), Genesis Group MLS data, 2015 5-year ACS and BBC Research & Consulting.

Future Housing Need

Over the past 15 years, rents and home prices in Littleton rose faster than incomes. If that trend continues an increasing proportion of households may be priced out of the market. Figure II-26 models affordability changes over the next 15 years, using trends from the past 15 years to forecast changes in income and housing costs. The forecast model presents income a as percent of the HUD Area Median Income and for the sake of simplicity, lending conditions are assumed to remain constant. Income and housing costs in the model are based on the following historical trends and conditions:

- HUD Area Median Family Income (HAMFI) for the Denver metro area (the HUD standard for Littleton) increased by 24 percent between 2001 and 2016 (1.47% CAGR). BBC applied the same CAGR to model income growth through 2032. BBC used HAMFI for a 3-person household to forecast owner affordability and HAMFI for a 2-person household to forecast renter affordability based on median household size by tenure for Littleton.
- Median gross rent in Littleton increased from \$709 in 1999 to \$1,008 in 2015—an increase of 42 percent, or 2.22 percent CAGR. BBC assumed the same BBC applied the same CAGR to model rent growth through 2032.
- Median sale price from homes in Littleton increased by 71 percent between 2000 and 2016 (from about \$189,000 to about \$323,000). BBC applied the same CAGR (3.4%) to model increases in home prices through 2032.

Figure II-26. Affordability Forecasts, City	Owner affordability forecasts						
of Littleton 2016 - 2032	Income Range	Max Affordable	Perce	nt of Hor	nes Affor	dable	
	(3-person hh)	Home Price	2016	2022	2027	2032	
Note:							
2016 HUD AMI is \$72,100 for a 3-person	50% HAMFI	\$148,027	1%	1%	0%	0%	
household and \$64,100 for a 2-person	100% HAMFI	\$296,054	23%	17%	14%	9%	
household.	150% HAMFI	\$444,081	71%	59%	47%	33%	
Source: BBC Research & Consulting.	Rental affordabil	ity forecasts					
	Income Range	Max Affordable	Perce	nt of Ren	tals Affor	dable	
	(2-person hh)	Rent	2016	2022	2027	2032	
	50% HAMFI 100% HAMFI	\$801 \$1,603	29% 83%	21% 80%	21% 77%	18% 75%	
		<i>φ</i> 1,005	05%	oU%	///0	1370	

As demonstrated in the figure, affordability of both rentals and for-sale homes declines substantially over the forecast period. In 2016, a household earning the median income could afford nearly one-quarter of all homes listed/sold in Littleton; by 2032 that household could afford fewer than one in ten. At 150 percent of the median, a household could afford 71 percent of homes in 2016 but only 33 percent in 2032. Rental affordability declines as well, though not as quickly. A household earning half the median income could afford 29 percent of rentals in 2016 but only 18 percent in 2032. At the median, rental affordability drops from 83 percent in 2016 to 75 percent in 2032.

Section Summary

Key findings from this section include:

- Littleton currently has a well-balanced and relatively diverse housing stock. Just over half of Littleton's housing stock is single family detached homes and 47 percent is attached housing (20% in structures with fewer than 10 units and 27% in structures with 10 or more units). In addition, 2 percent of the housing stock is mobile homes.
- Littleton is home to more owners (62%) than renters (38%). Owners tend to be older and earn higher incomes than renters (median income for renters is less than half that of owners). Owners and renters are equally likely to have children living in the home.
- Since early 2012, home prices have increased sharply in Littleton and in peer communities throughout the metro area. In 2016, the median sale price for homes in Littleton was \$370,000. Single family detached homes sold for a median sale price of \$410,000, significantly higher than the median sale price for attached homes (\$247,750).
- In 2016, days on market were lowest for homes priced below \$300,000 indicating demand (and competition) is very high for homes in the most affordable price range.
- The Littleton housing market is priced in the mid-range of surrounding communities such as Highlands ranch, Centennial, Englewood and Wheat Ridge—this is true for median sales, price, median price per square foot and median rent.
- In the past 10 years, there have been about two-dozen "scrapes" in Littleton—about half of the demolished homes were replaced with larger single family homes (double the prescrape value on average) and about half were replaced with higher density developments including split-lot single family detached, duplexes, townhomes or condos.
- Falling interest rates have allowed potential buyers to increase their purchasing power even though home prices are rising faster than incomes. However, the lack of supply particularly homes under \$300,000—caused ownership constraints (in 2016, homes under \$300,000 stayed on the market for a median of 4 days).
- Cost burden among both renters and owners increased between 1999 and 2015—that is, more households are spending more than 30 percent of their income on housing. The proportion of both renters and owners spending at least half of their income has also increased (severe cost burden).
- Littleton renters lost purchasing power between 1999 and 2015 as rents increased faster than incomes: median rent increased from \$709 to \$1,008 (42%) and incomes would have needed to increase by about \$12,000 to keep pace, but the actual increase in renter median income was only \$6,000.
- To examine how well Littleton's current housing market meets the needs of its residents and to determine how likely it is to accommodate demand of future residents and workers—BBC conducted a modeling effort called a "gaps analysis." The analysis compares

the supply of housing at various price points to the number of households who can afford such housing.

- Altogether, the city has a shortage of rental units priced affordably for renters earning less than \$25,000 per year of 1,350 units. These households consist of students, working residents earning low wages, residents who are unemployed and residents who are disabled and cannot work
- The for sale gaps analysis shows the Littleton market to be relatively affordable for renters earning more than \$75,000 per year. For renters earning between \$50,000 and \$75,000, the market does offer proportional affordability but it is contingent on a willingness to consider townhomes and condos.
- Overall, the average Denver metro worker—earning \$60,215 per year—could afford 80 percent of Littleton's rental units and 15 percent of the homes sold in Littleton in 2016 (96% of which are attached homes).
- If current trends continue (home prices rising faster than incomes), affordability is likely to decline substantially over the next five to fifteen years in Littleton. For example, forecasts conducted for this study indicate that a household earning 150 percent of the median income could afford 71 percent of homes in 2016 but only 33 percent in 2032. A renter household earning half the median income could afford 29 percent of rentals in 2016 but only 18 percent of rentals in 2032.

SECTION III.

Community Input

SECTION III. Community Input

This section describes the findings from the public participation component of the housing study. The public input process was designed to assess community culture and community perceptions of housing issues. Opportunities for public participation included:

- Three stakeholder focus groups facilitated by BBC—28 participated;
- A statistically valid representative telephone survey of Littleton residents—401 respondents completed the survey; and
- An online resident survey—350 residents responded.

Focus Groups

BBC designed the focus group engagement to solicit perspectives of Littleton stakeholders, with a focus on real estate and development professionals as well as social service providers. To that end, BBC scheduled two focus groups and encouraged participation through city networks of real estate professionals, business and property owners, and service providers.

However, as BBC began soliciting feedback from potential participants and from the Littleton Housing Study Advisory Committee, it became clear that a local informal watchdog group with an active voice in the real estate development and political landscape of Littleton should also be included. In response to these comments BBC decided, with the consent of the city, to add a third focus group with members of Sunshine (or the Sunshine Boys).

Findings from the real estate professionals focus group and from the social service provider group are used to gather professional insight about the housing market and about Littleton's housing and community needs. Findings from the Sunshine focus group provide perspective from that specific advocacy group about their perception of housing needs and development preferences in Littleton. Resident perspectives are gathered through the survey efforts described later in this section.

Service providers. BBC invited social service providers to participate in this focus group through the city's network of non-profits, grant recipients and human service and affordable housing providers. Participants included representatives from Aging Well, the James Resource Network, South Metro Housing Authority, Arapahoe County Housing and Community Development, Doctors Care, Highlands Ranch housing, Denver Seminary (student housing services) and Historic Littleton. The focus group was held on March 23 at the Littleton Museum.

The discussion centered around housing needs of the populations served by attendees. Key themes are described below.

- Affordability is a primary concern. Across all service populations, affordability—or the lack thereof—was a primary concern. The rental market and for-sale market are extremely tight and there are very few options for low income and even middle income households. Service providers noted increases in the homeless population as well as growing needs among residents and seniors with fixed incomes. Demand for services and requests for housing/rental assistance are also on the rise. Participants noted that housing affordability is an issue throughout the region, not just in Littleton.
- Housing for people with disabilities also a concern. Providers also expressed concern about options for residents with disabilities (both seniors and non-seniors). Affordability but also accessibility of the housing stock limits supply for this population. There is also a need for more integrated housing options for people with cognitive disabilities.
- **Other needs.** In addition to housing affordability and accessibility, stakeholders discussed the need for better public transportation, increased funding for emergency rental assistance, and more landlords willing to accept housing choice vouchers.
- Social/community impacts of pricing out. The group was quick to point out the social and community impacts of Littleton's affordability shortage. Displacement of residents and families due to high home prices can also disrupt their support network, access to health and services, and social stability. This has a particularly adverse impact on seniors, who may rely on friends and family for care/support and on school children, for whom housing and school stability is a significant indicator of success and wellness. The community as a whole may also experience negative impacts by pricing out long-time residents and by creating a more exclusive community.
- NIMBYism (LIHTC). One potential solution to the lack of affordable housing is construction of LIHTC or other affordable developments. However, in the past projects in Littleton have been met with community opposition—"not in my back yard" or NIMBYism. There is a misconception about affordable housing and the tenants thereof. Focus group participants suggested educating residents about affordable development and the needs within the community to help mitigate community opposition.
- Need two-bedroom senior units, small attached, casitas and multi-generational housing products. In addition to the general need for more affordable housing, stakeholders discussed specific housing types that are in high demand and that could provide affordable solutions for Littleton. Small attached products (condos, townhomes and du-/tri-plexes) as well as "casitas" or accessory dwelling units were identified as good solutions that could be integrated in existing neighborhoods. Housing that accommodates multiple generations under one roof is also needed and would accommodate families that choose to double-up for cost savings. Service providers also discussed the need for two-bedroom units for seniors to accommodate residents that require live-in assistance and/or need additional space for medical equipment.
- Potential solutions. Focus group participants provided the following recommendations to the city as potential solutions to address the needs identified by the group:

- > Work to change resident perception of affordable housing;
- > Offer incentives for infill development of attainable/affordable housing;
- > Create opportunities for owners to add casitas or accessory dwelling units; and
- Consider shared housing programs (e.g., Silvernest) which facilitate homeshares and roommate matching as an affordability solution.
- Littleton community culture. One of the core strengths of Littleton, according to stakeholders, is the strong community culture. Residents are known to be engaged citizens and have a reputation of taking care of those in need (most often through personal connections and church support). Focus group participants also discussed the balance of preserving Littleton's historic feel and accommodating infill development.

Real estate professionals and business owners. The real estate and business owner focus group was held on April 7th at the Littleton Museum and included 7 participants, most of whom were real estate professionals. The discussion focused on housing demand in Littleton, housing availability for workforce and regulatory and market barriers to housing creation. Key themes are discussed below.

- Ranches/single level du- and tri-plexes (paired ranches) and starters. When asked about demand for specific product types, focus group participants expressed concern about the limited inventory and noted specifically a shortage of smaller attached and detached product types for seniors and starters. The highest perception of need was for ranches, starter homes and single level attached (duplexes, triplexes and paired homes).
- Downsize options would free up family homes. Real estate agents in particular felt the limited supply of family homes is exacerbated by a lack of downsize options for seniors. Their opinion was that an increase in senior-friendly downsize options would increase turnover of traditional family-oriented products, which are in very high demand among young families.
- Need more \$280k-\$400k. Affordability was also a concern among real estate professionals and business owners. The biggest gap in market-provided options is between \$280,000 and \$400,000. There was also concern that even homes priced in the \$300,000 to \$400,000 range need substantial investment so the true price is even higher than list. Part of the affordability challenge may be related to the lack of condo development (due to legislative issues around construction defects).
- Young couples/families. A key demographic that desires to live in Littleton are young couples and young families. These include people who grew up in Littleton and wish to return as they form households as well as young professionals tired of living in the urban core. Littleton's assets, including good schools, parks and trails and community culture are a strong draw for this demographic. However, lack of affordable inventory and available starter homes limit the ability of these households to find a suitable home in Littleton.
- Perceive Littleton to be difficult for developers. The perception among real estate and business professionals is that Littleton's development process poses significant challenges for developers. Key concerns were difficulty getting projects through permitting, planning

and approvals; unpredictability in the development process (rules seem to change on a case-by-case basis) and outdated zoning regulations.

- Infill opportunities and urban renewal. This market-oriented focus group indicated Littleton has a number of good location for infill development and urban renewal, including vacant parcels and underutilized commercial development. The group was strongly in favor of designating urban renewal areas and focusing infill and renewal opportunities on housing and mixed use development. Some specific suggestions included live-work spaces and coop office space, like Galvanize. Focus areas for urban renewal included Sant Fe and Littleton Boulevard.
- Allow diverse stock. Focus group participants would like to see the city allow more diversity in the housing stock to meet market demand. One example of where this was done well is the Steeplechase development which includes well-designed condos and townhomes—demand for these units is extremely high.

Sunshine. According to the Littleton Independent, Sunshine formed in the early 2000s, galvanized by an effort to repeal Littleton's grocery tax. The group continues to hold informal weekly meetings to discuss city business and often attends city council meetings. There is no formal membership or charter but the group is associated with a mission "to promote transparency in local government and carefully considered growth within the city."¹

BBC coordinated with the group's leadership to encourage Sunshine regulars to participate in a focus group to discuss housing needs in Littleton. BBC facilitated the discussion on April 3, 2017 at the Littleton Museum; 11 attendees participated. Key themes from the discussion included:

- Low density preferences. For the most part, participants expressed strong preferences for low density development. The group was concerned that apartments—especially largerscale multifamily developments—are being overbuilt. Concerns related to culture, crime and traffic impacts were associated with perceptions of increasing density without consideration of context and location.
- Value Littleton culture and green space. The group included a number of long-time Littleton citizens who expressed great appreciation and fondness for the culture and community of Littleton. Overall the group felt that Littleton is a great place to live and to work. Green space, in particular, is a strong value among the group and some concerns related to building density centered around the loss of green space.
- Perceptions that city accommodates developers over design and zoning standards and citizen preferences. Similar to the real estate focus group, Sunshine participants also felt the development process is somewhat unpredictable and felt that developments are considered on a case-by-case basis instead of driven by defined standards and expectations. However, Sunshine, unlike the realtor group, felt this process favored developers. Perception among this group was that the city offers too many accommodations to

¹ http://littletonindependent.net/stories/Sunshines-impact-sparks-heated-debate,221972

developers—specifically related to relaxing design standards and setback requirements. Members of the group indicated that the comprehensive plan is a good guiding document but were frustrated that it doesn't seem to be a strong guide for actual development.

- Need for patio homes and/or single story down-size options. When asked about Littleton's housing stock and whether it meets the needs of residents, focus group participants reported a need for patio homes, ranches and single-level downsize options, particularly for seniors. Specifically, homes with a main floor master and/or no stairs along with little to no yard maintenance are desired. Perception is that newly constructed townhomes could be a good option except that most of these are multi-story. Participants stressed the need for appropriate scale—mixed use and attached products can be great as long as they fit in the neighborhood context.
- Address regional issues—housing & transportation. The group also discussed the regional complexities of Littleton's housing and transportation concerns and encourages the city to work on regional issues. Traffic impacts in particular were attributed to development occurring all around Littleton (in addition to increasing density within Littleton). The group expressed a need to understand how density impacts traffic and desires for the city to develop a transportation plan.

Littleton Resident Survey

The Littleton resident phone survey contacted a statistically valid representative sample of residents to better understand their housing choices as well as perception of current and future housing needs in the city. The survey randomly sampled residents via both landline and cell phone. As part of the analysis, results are weighted to match the existing tenure and income profile of the city. A total of 401 residents completed the survey.

BBC designed the telephone survey instrument with review from Littleton City staff and the Littleton Housing Study Advisory Committee. Many of the questions had been validated in previous surveys conducted by BBC in housing studies across the country. The survey included questions related to current housing choice, living in Littleton, future housing choice, Littleton's housing spectrum and demographic questions.

Figure III-1 compares resident survey respondent demographic and socioeconomic characteristics with city residents overall. Survey respondents tend to be slightly older than residents overall and are more likely to be non-Hispanic white.

Figure III-1. Survey Respondent Demographics

Note: N=401.

Source:

BBC Research & Consulting from the 2017 Littleton Live Work Survey and 2015 5-year ACS.

	Survey Respondents (weighted)	Littleton Residents
Age		
18 to 24	6%	8%
25 to 34	11%	13%
35 to 44	19%	13%
45 to 64	38%	29%
65 to 74	17%	9%
75 or older	10%	8%
Housing Tenure		
Homeowner	62%	62%
Renter	37%	38%
Living with others but not paying rent	2%	
Income		
Less than \$25,000	19%	19%
\$25,000 up to \$50,000	20%	20%
\$50,000 up to \$75,000	18%	18%
\$75,000 up to \$100,000	13%	13%
\$100,000 up to \$150,000	15%	15%
\$150,000 or more	15%	15%
Race or Ethnicity		
White	86%	82%
Hispanic	9%	12%
Two or more races	2%	2%
Black or African American	1%	2%
Asian or Asian Indian	1%	2%
American Indian and Alaska Native	0%	0%
Native Hawaiian or other Pacific Islander	0%	0%

Current housing choice. Most survey respondents (58%) live in a single family detached home; 12 percent live in a townhome or duplex and 27 percent live in a multifamily building such as a condo or apartment building. The remaining 3 percent live in a mobile home, accessory dwelling unit or retirement community. About half of all respondents have lived in their current home more than 10 years—12 percent have lived in their current home for 30 years or more.

Survey respondents identified the single most important factor that led to their choice of home. Figure III-2 displays results from all respondents (the general market sample) along with responses from millennials (aged 18 to 34) and seniors (aged 65 or older).

For the general market sample, cost was the most important factor, followed by quality public schools and Littleton location. Millennials also selected cost as the top factor, followed by access to transit and proximity/access to job opportunities. Seniors put the highest importance on Littleton location followed by cost and the type/layout of the home.

All three groups considered proximity to quality public schools to be one of the top five factors in choosing their current home—a particularly important finding among millennials and seniors

who are less likely to school-aged children at home. This finding indicates all residents place a high value on the local education system and acknowledge its impact on housing choice.

Figure III-2.

	General Market	Millenials (18 to 34)	Seniors (65+)
Cost/I could afford it	37%		61% 28%
Close to quality public schools	23%	14%	17%
Located in Littleton	19%	7%	28%
Liked the neighborhood	17%	15%	16%
Location/Area (General)	11%	9%	13%
Type or layout of home	11%	2%	18%
Close to bus/transit/light rail stops	11%	22%	9%
Close to work/job opportunities	10%	19%	9%
Close to family/friends	8%	12%	9%
Close to services	5%	12%	3%
Large yard/size of yard	5%	3%	6%
Low crime rate/safe	4%	2%	2%
Close to parks and open space	3%	0%	0%
Restaurants/entertainment/shopping	3%	1%	3%
Liked the type of home/apartment	3%	0%	3%
Family owned it already	2%	3%	2%
Near downtown Littleton	2%	0%	1%
No or low maintenance	2%	0%	2%
Quiet	2%	0%	1%
Close to mountains	2%	1%	2%
Number of bedrooms	1%	4%	2%
Want to live near people like me	1%	0%	3%
Close to health care facilities and services	1%	0%	2%
Availability	1%	1%	3%
Good investment	1%	0%	1%
Require accessibility improvements	1%	0%	1%
Other	2%	2%	2%

What is the factor that was most important to you in choosing your current home or apartment?

Note: General market sample n=401, Millennial sample n=66, Senior sample n=104.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Overall, respondents were very satisfied with their current home in Littleton—the average satisfaction rating on a scale of 1 to 10 was 8.1 (where 1 means very dissatisfied and 10 means very satisfied). Just five percent of respondents were somewhat or very unsatisfied (rating of 0-4) with their housing. Top reasons include:

- Rent was too high;
- Bad/rude/loud neighbors;

- HOA/housing rules; and
- Landlord won't make repairs.

Living in Littleton. Residents shared their perspectives on the desirability of living in Littleton. Residents in general, were very happy with their choice to live in Littleton—over 80 percent said if they were looking to rent or buy today, they would you still make the choice to live in Littleton.

Choosing Littleton. Just over half of Littleton residents participating in the survey considered living in other communities when searching for their current home. These included Denver, Centennial, Englewood, Highlands Ranch and surrounding suburbs.

Residents chose Littleton over other communities for a number of factors. As shown in Figure III-3, these include schools, proximity to work (or spouse's work), good place to raise a family and community values. The consistency of responses across market segments indicates the strong cultural appeal of Littleton to residents in a variety of life phases and age cohorts.

General Market Millenials (18 to 34) Seniors (65+) Good schools 20% 22% 11% Close to work/spouse's work 16% 22% 19% Good place to raise a family 8% 9% 8% Close to family 8% 9% 9% Small town charm 8% 8% 7% Affordability 7% 9% 8% Grew up here 6% 6% 5% Location (general) 5% 7% 4% Community values 4% 11% 2% Type of neighborhood/subdivision 3% 2% 4% Proximity to Denver 2% 3% 2% Safe 2% 6% 1% More house for the money 2% 0% 2% Stable neighborhood 2% 0% 3% Access to the mountains 2% 0% 0% Downtown Littleton 2% 3% 1% Medical facilities 2% 0% 3% Trails and open space 1% 2% 2% Types of homes available 1% 0% 2% Access to light rail 1% 1% 1% Retail/shopping options 1% 6% 1% Quiet 0% 1% 1% Welcoming community for all types 1% 0% 2% Diversity (cultural, racial, ethnic) 1% 0% 0% The piece of property 1% 1% 1% Entertainment options | 1% 0% 0%

Figure III-3. When you were looking for a place to live, why did you choose to live in Littleton?

Note: General market sample n=401, Millennial sample n=66, Senior sample n=104.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Among residents that only considered Littleton, the top reasons for focusing their housing search on Littleton were schools, proximity to work, proximity to family, affordability and community values.

Tradeoffs. Respondents were also asked about tradeoffs, or sacrifices, they made to live in Littleton over other communities. About one-quarter indicated they did make a trade-off to live in Littleton but the array of trade-offs residents were willing and un-willing to make reveal no consistent themes, except that personal preferences are driving factors in housing choice.

Figure III-4. Tradeoffs Residents made to live in Littleton



Note: n=401.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Changes in Littleton Living. As discussed in detail in Section II, home prices and rents in Littleton have increased substantially over the past decade. That trend is reflected in the resident survey results as well. Respondents were asked about the price they paid for a home or for a rental when they first moved to Littleton. Figure III-5 displays the average rent or home price based on when residents moved to Littleton.

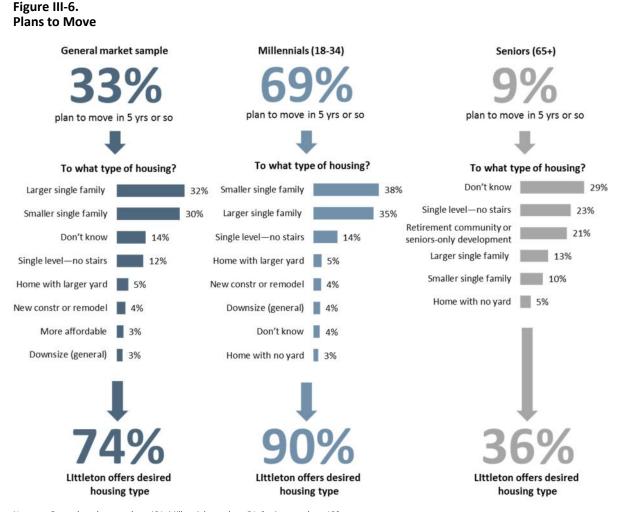
Figure III-5. When you moved into your first home or apartment in		Mean Rent	Mean Home Price	% Owners	n=
Littleton, what did you pay for	Before 1980	\$275	\$46,903	71%	50
your rent/home?	1980 to 1999	\$603	\$124,206	66%	105
Source:	2000 to 2009	\$922	\$217,767	58%	119
BBC Research & Consulting from the 2017	2010 or later	\$930	\$285 <i>,</i> 434	28%	123
Littleton Live Work Survey.	Total change	239%	509%	-43%	

For those that moved to Littleton prior to 1980, average rent was \$275 and the average home price was \$47,000; 71 percent of those respondents purchased homes when they first moved to

Littleton. Among residents that moved to Littleton after 2010, average rent was \$930 and the average home price was \$285,000. Just 28 percent of those respondents purchased homes when they moved to Littleton.

Future housing plans. About one-third of the general market sample report that they plan to move in the next five years, as shown in Figure III-6. The proportion is much higher for millennials (69%) and much lower for seniors (9%). Among seniors, 87 percent reported they plan to stay in their current home as long as possible and 4 percent report they would like to stay in their home but are concerned they may not be able to (primarily for financial or maintenance/housekeeping concerns).

Most residents in the general market sample and the millennial sample that planned to move want to live in a single family home but were split between wanting a smaller single family home and a larger single family home. Seniors were less likely to know what kind of home they might look for when they move but 23 percent indicated they would need a home without stairs and 21 percent indicated they would look for a retirement or seniors-only community.



 Note:
 General market sample n=401, Millennial sample n=51, Senior sample n=103.

 Source:
 BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Littleton's housing spectrum. The survey also included questions about resident perception of housing needs and appropriate product types. Specifically, residents were asked the following:

"On a scale of 1 to 10, where 10 means extremely important and 1 is not at all important, how important to you is it that Littleton's housing supply includes the following types of homes?"

Housing for middle class families and housing affordable to residents in public service received the highest ratings (7.8 and 7.5 respectively). Respondents also placed high importance on housing for residents with mobility challenges, housing that is affordable to residents with relatively low incomes (those on fixed incomes and those working retail jobs) and starter homes for first-time buyers. Figure III-7 displays the average rating among the general market sample.

Figure III-7.

How important to you is it that Littleton's housing supply includes the following types of homes?

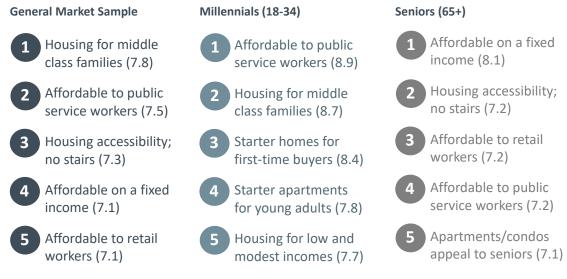
Not at a importa								Fs	sentia
0	1	2	3	4	5	6	7	8	9
Housing for middle class families								• 7.8	:
Housing affordable to residents working in Littleton public service, like librarians and teachers							• 7.5		
Housing that meets the needs of residents who are losing mobility and need housing with no stairs							• 7.3		
Housing affordable to residents living on a fixed income, like Social Security							• 7.1		
Housing affordable to residents working in Littleton retail jobs like grocery stores							• 7.1		
Starter homes for first-time homebuyers						• 7.0			
Housing for low and modest income families					• 6.9				
Housing for households looking to move up from their starter home					6.6				
Apartments or condos that appeal to seniors					• 6.6				
Housing for multigenerational households that includes a main floor bedroom for older relatives		• 6.5							
Starter apartments for young adults working or starting families in Littleton	• 6.3								
Housing that meets the needs of residents looking to downsize	• 6.1								
Housing for larger households needing four or more bedrooms	• 5.3								
Apartments or condos that appeal to Millenials					•	5.1			

Note: n=401.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Responses from millennials and seniors indicated similar values, though millennials focused more on starter homes and apartments while seniors focused more on affordability for those with a fixed income and accessible housing. Figure III-8 displays the top responses and ratings for each group.

Figure III-8. How important to you is it that Littleton's housing supply includes the following types of homes?



 Note:
 General market sample n=401, Millennial sample n=66, Senior sample n=104.

 Source:
 BBC Research & Consulting from the 2017 Littleton Live Work Survey.

In a separate question, respondents were asked about specific housing product types (e.g., townhomes, large-lot single family homes, tiny homes, etc.). Respondents were asked to state whether each product type was appropriate in their neighborhood, appropriate in other Littleton neighborhoods or not appropriate in Littleton. Figure III-9 displays responses from the General Market sample; products are shown in order of most to least accepted in Littleton (either in "my" neighborhood or "other" neighborhoods).

Medium-sized single family homes (1,500 to 3,000 square feet) were the most widely accepted product type—for Littleton as a whole and in "my" neighborhood. Co-housing or shared communities for seniors was also widely accepted for Littleton overall but received a more mixed response about whether it was most appropriate in "my" or "other" neighborhoods. Townhomes (with the same setback and height as neighboring homes) and small homes (with less than 1,500 square feet) were also widely accepted as appropriate. Among traditional rental product types, small apartment buildings (10 or fewer units) were considered to be the most appropriate for Littleton.

Tiny homes and accessory dwelling units had the highest percentage of "not appropriate in Littleton" responses, though both still had majority approval for Littleton.

Figure III-9.

Please state whether the following types of housing are appropriate in your neighborhood, other Littleton neighborhoods or not appropriate in Littleton.

	Appropriate in my neighborhood	Appropriate in other neighborhoods	Not apprpriate in Littleton	
Medium-sized single family homes between 1,500 and 3,000 square feet		82%		11% 7%
Co-housing or shared communities for seniors	51%		39%	10%
Townhomes with the same setback and height as neighboring homes	59%		26%	15%
Small homes with less than 1,500 square feet	59%		25%	17%
Small apartment buildings with 10 or fewer units	40%	38%	ŝ	22%
Medium lots of 6,000 to 10,000 square feet	49%		28%	22%
Duplex homes on the same lot size as neighboring single family homes	51%		27%	22%
Large single family homes with more than 5,000 square feet	39%	36%		25%
Small lots of 5,000 square feet or less	46%	26%	5	28%
Apartment buildings with 5 or more stories close to light rail or bus stops or major roads	41%	31%		28%
Apartment buildings up to 5 stories close to light rail or bus stops or major roads	37%	31%		31%
Large lots of 10,000 square feet or more	36%	32%		32%
Tiny Homes	38%	25%		37%
Accessory dwelling units	40%	20%		40%

Note: n=401.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Compared to the general market, millennials tended to consider more product types "appropriate" for Littleton and seniors tended to consider fewer product types "appropriate." Figure III-10 displays the proportion of each group that considered each product type as appropriate in Littleton (includes appropriate in "my" and "other" neighborhoods). The Difference columns display how responses from millennials and seniors differed from the general market sample.

Figure III-10.

Please state whether the following types of housing are appropriate in your neighborhood, other Littleton neighborhoods or not appropriate in Littleton.

	Approria (in "my" or "oth	Difference from General Market			
	General Market	Millennials	Seniors	Millennials	Seniors
Medium-sized single family homes between 1,500 and 3,000 square feet	93%	100%	86%	7%	-7%
Co-housing or shared communities for seniors	90%	92%	84%	2%	-6%
Townhomes with the same setback and height as neighboring homes	85%	79%	83%	-6%	-2%
Small homes with less than 1,500 square feet	83%	96%	73%	12%	-10%
Small apartment buildings with 10 or fewer units	78%	92%	64%	14%	-14%
Medium lots of 6,000 to 10,000 square feet	78%	70%	82%	-8%	4%
Duplex homes on the same lot size as neighboring single family homes	78%	92%	69%	14%	-8%
Large single family homes with more than 5,000 square feet	75%	93%	69%	18%	-6%
Small lots of 5,000 square feet or less	72%	80%	58%	8%	-14%
Apartment buildings with 5 or more stories close to light rail or bus stops or major roads	72%	78%	72%	6%	0%
Apartment buildings up to 5 stories close to light rail or bus stops or major roads	69%	77%	69%	9%	1%
Large lots of 10,000 square feet or more	68%	69%	59%	1%	-9%
Tiny Homes	63%	72%	56%	9%	-7%
Accessory dwelling units	60%	55%	57%	-5%	-3%

Note: General market sample n=401, Millennial sample n=66, Senior sample n=104.

Source: BBC Research & Consulting from the 2017 Littleton Live Work Survey.

Specifically, millennials were much more approving of large single family homes (more than 5,000 square feet), duplex homes on the same lot size as neighboring single family homes, small apartment buildings and small homes (less than 1,500 square feet)—for each of those product types the proportion of millennials that considered it appropriate for Littleton was at least 10 percentage points higher than the general market sample. Seniors were less approving of small homes, small apartment buildings and small lots than the General Market sample by a margin of 10 percentage points or more.

Online Resident Survey

To further expand opportunities for participation in the study, an online survey, similar to the telephone survey, was publicly promoted through the city's website and partner networks. While the results of the online survey do not statistically represent any particular population, they provide additional depth to the study and perspective on the experience of residents with regard to housing preferences and community needs.

The online surveys were hosted by SurveyMonkey.com, a certified Section 508 compliant website.

Demographics. On average, resident respondents to the online survey had higher incomes (55% have incomes over \$100,000 per year), were more likely to be homeowners (78%) and were less likely to have children under 18 living in the home (35% compared to 73%). The online survey captured a similar proportion of millennial responses but fewer senior responses. Respondents aged 35 to 64 were over-represented in the online survey, accounting for 65 percent of online respondents compared to 57 percent in the phone survey.

Current housing choice. Similar to phone survey respondents, online survey respondents were very satisfied with their current home: the average satisfaction rating was 7.9 (on a 10-scale). About three-quarters of online respondents live in single family detached homes (compared to 58% of phone survey respondents) and 45 percent have lived in Littleton fewer than five years (compared to 27% of phone respondents).

Despite these differences between online and phone survey respondents, when asked about the most important factors in choosing their current home, the two groups placed the most emphasis on the same four factors: neighborhood, cost/affordability, Littleton location and proximity to quality schools. The Online survey respondents, however, placed higher importance on proximity to parks and open space and on proximity to downtown/Historic Littleton than phone survey respondents.

Living in Littleton. Both the online and the phone survey asked residents why they chose to live in Littleton when looking for a place to live. Good schools was the top response in both surveys and "good place to raise a family" and "small town charm" were in the top five among both groups. Online respondents placed more importance on safety, access to trails and open space and neighborhood stability than phone survey respondents. Conversely, online respondents placed less emphasis on proximity to work, proximity to family and affordability than phone survey respondents.

Future housing plans. About the same proportion of online respondents as phone respondents indicated they planned to move in the next five years or so (about one-third). However, online respondents were much more likely to say they wanted to move to a more affordable home (31% of online respondents compared to 3% of phone respondents) and were less confident that Littleton offers the type of housing they would like to move to (only 43% said Littleton has the housing they want to move to, compared to 74% in the phone survey).

Littleton's housing spectrum. The online survey, similar to the phone survey, asked residents about Littleton's housing spectrum—specifically, the types of homes that are important and appropriate for Littleton. Similar to phone survey respondents, online respondents placed the highest importance on housing for middle class families and housing

affordable to residents working on public service. Online respondents also felt it was very important that Littleton's housing supply include starter homes for first-time homebuyers. Online respondents, more so than phone respondents, indicated the importance of Littleton offering a full range of housing options including starter homes, downsize options and options for residents looking to move up from their starter homes.

When asked about the appropriateness of specific housing products for Littleton, online survey respondents had similar preferences to phone respondents and were most accepting of medium-sized single family homes, townhomes with the same setback as neighboring homes and co-housing or shared communities for seniors. For rental products, online respondents were most accepting of small apartment buildings with 10 or fewer units.

Section Summary

In general, the community input for the housing study highlights Littleton's strong community culture and appreciation for quality of life assets such as good schools, parks and green space— similar to resident perspectives included in the Comprehensive Plan. The primary housing needs identified were affordability and single-level, small yard downsize options. Residents and most stakeholders shared a desire to accommodate a mix of appropriately scaled product types to address the range of affordability and mobility housing needs.

Key findings from stakeholder engagement include:

- Social service providers emphasized housing needs related to affordability and accessibility. Specific product types they considered to be undersupplied included two-bedroom senior units, small attached homes, casitas (or ADUS) and multi-generational housing products. Their primary recommendations to the city included reducing NIMBYism, incentives for developing attainable/affordable housing, allow ADUs and consider shared housing programs.
- Real estate professionals also highlighted the need for more affordability in the market (\$280,000 to \$400,000) and increased diversity in product types—specifically small attached and patio homes. A key demographic of buyers looking to live in Littleton are young professional couples and families but lack of affordable inventory and available starter homes limit are a barrier for these households. Their recommendations to the city included focusing on infill and urban renewal and allowing a broader array of housing products in Littleton.
- Similar to the other groups, Sunshine also identified a need for patio homes and/or single story down-size options. The group expressed a need to balance housing demand with protecting the culture and green space of the existing community. Key recommendations to the city included addressing the regional complexities of housing and transportation concerns, considering the impact of increasing density, and upholding the city's Comprehensive Plan.
- Both real estate professionals and Sunshine advocated for more predictability and consistency in the design and development process.

Key findings from resident engagement include:

- Survey respondents indicated that cost was the most important factor in choosing their current home but quality public schools were also influential. Even Millennials and seniors—who are less likely to have school-aged children at home—also included proximity to quality public schools to be one of the top five factors in choosing their current home.
- Residents chose Littleton over other communities for a number of factors including schools, proximity to work (or spouse's work), good place to raise a family and community values. The consistency of responses across market segments indicates the strong cultural appeal of Littleton to residents in a variety of life phases and age cohorts.
- Seniors are likely to age-in-place: 87 percent of seniors reported they plan to stay in their current home as long as possible and 4 percent report they would like to stay in their home but are concerned they may not be able to (primarily for financial or maintenance/housekeeping concerns). Focus group results indicate that more seniors might choose to move if there were more single-level, low maintenance housing products available in Littleton.
- Housing for middle class families and housing affordable to residents in public service received are top priorities among Littleton residents, along with housing for residents with mobility challenges, housing for low income residents and options for first-time buyers.
- Responses from millennials and seniors indicated similar priorities, though millennials focused more on starter homes and apartments while seniors focused more on affordability for those with a fixed income and accessible housing.
- The types of homes residents considered "appropriate" for Littleton were consistent with the types of homes they considered important. Medium-sized single family homes (1,500 to 3,000 square feet) and more affordable types of homes (co-housing, townhomes, and small homes) were all widely accepted—most were comfortable with these housing types in any Littleton neighborhood. Among traditional rental product types, small apartment buildings (10 or fewer units) were considered to be the most appropriate for Littleton.
- Compared to the general market, millennials tended to consider more product types "appropriate" for Littleton and seniors tended to consider fewer product types "appropriate."
- Online survey respondents, on average, had higher incomes, fewer children, were "newer" residents of Littleton and were more likely to be homeowners than phone survey respondents. Despite these differences, online respondents expressed similar housing preferences and similar visions for the Littleton housing market overall. These included emphasis on Littleton's high quality schools, small town charm and housing products that help maintain affordability, especially for public servants and first-time buyers.

SECTION IV.

Resources and Options

SECTION IV. Resources and Options

This section evaluates the resources and options available to the city to address housing challenges identified in Sections I through III of this report. It begins with a summary of the housing challenges and opportunities discussed in previous sections; reviews resources available for affordable housing creation; analyzes the cities current housing policies and programs; and discusses zoning and transit corridors in the context of addressing housing needs.

SWOT Analysis

A summary of Littleton's housing market and community attributes is provided below in the framework of a SWOT analysis, designed to assess challenges and opportunities related to addressing Littleton's housing needs.

Strengths. Core strengths of the Littleton's housing context include a strong economy with low unemployment, increasing resident incomes, diverse housing stock and middle-market home prices. These strong market indicators are coupled with high levels of resident satisfaction and appealing community assets such as good schools and small-town charm.

- The median household income in the City of Littleton was \$65,221 in 2015, up 30 percent from 1999, when median income was \$50,245. Over that period, owners experienced higher income growth (34%) than renters (19%).
- Littleton currently has a well-balanced and relatively diverse housing stock. Just over half of Littleton's housing stock is single family detached homes; 47 percent is attached housing (20% in structures with fewer than 10 units and 27% in structures with 10 or more units); and 2 percent of the housing stock is mobile homes.
- The Littleton housing market is priced in the mid-range of surrounding communities such as Highlands Ranch, Centennial, Englewood and Wheat Ridge—this is true for median sales price, median price per square foot and median rent.
- The for sale gaps analysis shows the Littleton market to be relatively affordable for potential buyers earning more than \$75,000 per year. For potential buyers earning between \$50,000 and \$75,000, the market does offer proportional affordability but it is contingent on a willingness to consider townhomes and condos.
- In general, the community input for the housing study highlights Littleton's strong community culture and appreciation for quality of life assets such as good schools, parks and green space—similar to resident perspectives included in the Comprehensive Plan. Residents are highly satisfied with their current housing situation and the vast majority of current residents would choose Littleton again if they were looking for housing today.

Weaknesses. The weaknesses identified in the market analysis are primarily related to declining affordability as home costs rise faster than incomes. Residents and stakeholders also indicated a shortage of units that accommodate seniors and people with disabilities—specifically single-level, low-maintenance housing options (attached a detached).

- Since early 2012, home prices have increased sharply in Littleton and in peer communities throughout the metro area. In 2016, the median sale price for homes in Littleton was \$370,000. Single family detached homes sold for a median sale price of \$410,000, significantly higher than the median sale price for attached homes (\$247,750).
- Falling interest rates have allowed potential buyers to increase their purchasing power even though home prices are rising faster than incomes. However, the lack of supply particularly homes under \$300,000—caused ownership constraints (in 2016, homes under \$300,000 stayed on the market for a median of 4 days).
- Typical of national trends, income growth was not uniform across all income categories in Littleton: Workers in high-paying professions and residents with accumulated wealth saw their incomes increase during the past 15 years, while lower income residents were disproportionately affected by the economic downturn.
- Littleton renters lost purchasing power between 1999 and 2015 as rents increased faster than incomes: median rent increased from \$709 to \$1,008 (42%) and incomes would have needed to increase by about \$12,000 to keep pace, but the actual increase in renter median income was only \$6,000.
- Cost burden among both renters and owners increased between 1999 and 2015—that is, more households are spending more than 30 percent of their income on housing. The proportion of both renters and owners spending at least half of their income has also increased (severe cost burden).
- The city has a shortage of rental units priced affordability for renters earning less than \$25,000 per year of 1,350 units. These households consist of students, working residents earning low wages as well as residents who are unemployed and/or who are disabled and cannot work.
- The primary housing needs identified by residents and stakeholders were affordability and single-level, small/low-maintenance-yard downsize options.

Opportunities. Littleton is well-situated to address housing concerns based on its current housing market strengths, community support for housing that can address needs and national housing development trends that can be leveraged to help address needs.

Littleton already has a solid foundation in place for meeting the housing needs of residents (e.g., product diversity and moderate prices) and can focus on addressing acute needs while maintaining the current strengths of the housing market. Key focus areas for addressing acute needs are affordable rentals, specifically for residents earning less than \$25,000; starter homes and family homes priced near or below \$300,000; and housing options attractive to aging seniors—primarily single-level homes with low maintenance yards (could be patio homes, other small-lot options and small attached products without stairs).

- Housing needs and housing priorities identified by residents are well-aligned. The resident survey identified common perspectives on housing preferences, housing needs and product solutions among a diverse set of age cohorts in Littleton and both residents and most stakeholders shared a desire to accommodate a mix of appropriately scaled product types (including attached products) to address the range of affordability and mobility housing needs.
- National market trends focusing on "missing middle"¹ product types are likely to fit well within Littleton's housing context and can help meet demand for affordable and senior-friendly products. With more developers producing these homes and relatively high demand expressed for them, Littleton has an opportunity to encourage development to meet the needs of residents by making sure zoning and land use plans allows these missing middle product types in the appropriate context.

Threats. Market threats that add to the challenge of addressing current housing needs include the pace of home prices increases relative to income growth, the risk of rising interest rates, an aging population and the regional context.

- If current trends continue (home prices rising faster than incomes), affordability is likely to decline substantially over the next five to fifteen years in Littleton. For example, forecasts conducted for this study indicate that a household earning 150 percent of the median income could afford 71 percent of homes in 2016 but only 33 percent in 2032. A renter household earning half the median income could afford 29 percent of rentals in 2016 but only 18 percent of rentals in 2032.
- Mortgage interest rates have remained low as prices have increased over the past few years. So far, falling interest rates have allowed owners and potential buyers to maintain purchasing power. However, if interest rates rise substantially in the coming years, affordability will decline even faster than forecasted.
- The proportion of Littleton residents aged 65 or older is likely to increase faster than other age cohorts over the next 15 years. Meeting the housing and service needs of this population—many of whom may have ambulatory or self-care disabilities—pose unique challenges. Most seniors prefer to age in place (in their current homes) but for those who are not able to do so, it is important for the city to accommodate development of housing types attractive to aging seniors (single-level homes, low/no-maintenance yards, co-housing options, etc.).

¹ The term Missing Middle was crafted by Daniel Parolek of the planning and design firm Opticos. He uses the term to define a particular residential product type: "multi-unit or clustered housing types" that are compatible in scale with single family homes and which are targeted to help meet a growing demand for "walkable urban living." Many take this definition to be synonymous with middle income households. In many, but not all, markets, Missing Middle products are more affordable than detached single family products. Yet changing market preferences for lower maintenance, walkable residential environments—largely driven by Millennials and Baby Boomers—can make Missing Middle products less affordable.

The regional context can pose both an opportunity and a threat to Littleton's housing goals. For any community that operates in the context of a metropolitan area, housing, transportation and employment choices are all impacted by the broader regional market. As such, it remains important for Littleton to maintain a regional perspective on housing issues and to adapt to changing regional dynamics.

Housing Policies, Programs and Resources

Financial resources to address housing needs in Littleton are limited. The city owns 28 units of affordable housing and the Littleton Community Development Department Neighborhood Resources Division administers some community building programs and grants but Littleton primarily relies on South Metro Housing Options (the local public housing authority) along with county and state funds for affordable housing resources.

City programs. Through the Neighborhood Resources Division, the City of Littleton provides mediation services to the community and manages neighborhood block grant and the business place-making grant programs. The City also owns Geneva Village, an affordable housing complex for seniors and people with disabilities. These programs are described below:

- Geneva Village in an affordable housing complex of 28 units owned by the City of Littleton and operated by South Metro Housing Options. The complex was acquired in the 1970s as part of a larger land acquisition to build the Littleton Center and the city has maintained the units as an affordable housing option for residents aged 61 and older. The Geneva Village Fund is an enterprise fund with annual revenues (rental payments and investment earnings) averaging \$128,000 annually and expenditures (operations and maintenance) averaging \$133,000 annually.
- The Community Mediation Program—the Conflict Resolution Center, or CRC—was established in 2015 and focuses on mediating neighbor-to- neighbor, landlord/tenant, homeowner association, code compliance, animal control, business/consumer, and noncriminal police issues.
- The city also facilitates community volunteer services including clean-up projects, minor home repair assistance and snow removal for the residents who are elderly and/or have a disability.
- Littleton's community grants program includes small community-building grants (up to \$500) to encourage neighborhood outreach and engagement (e.g., newsletters, block parties and clean-up events) and large community-improvement grants (up to \$9,999) to facilitate community improvement projects. The city budgets approximately \$60,000 for these neighborhood grants, annually.

Other city grant programs, administered by the Economic Development Department, include the Revitalization Incentive Grant and the Main Street Historic Grant. These grant programs encourage private investment and capital improvements that benefit residents and help make revitalization efforts more affordable. The Revitalization Incentive Grant offers matching funds for projects and is budgeted for \$100,000 of funding in 2017. The Main Street Historic Grant is budgeted for \$50,000.

The city has also made direct investments in community revitalization through streetscapes, roadway improvements, and parks development. These investments provide benefit to residents and the overall community and can be targeted to enhance specific neighborhoods and/or contribute to place-based development objectives.

South Metro Housing Options (SMHO). Housing authorities are the primary providers of rental assistance in most communities—and the same is true for the City of Littleton. Direct subsidies to renters come in the form of housing choice vouchers (Section 8, a federal program administered locally). SMHO, formerly the Littleton Housing Authority, owns and manages various housing programs in Littleton accounting for 600 units of affordable housing in the community. SMHO also administers housing choice vouchers for both the City of Littleton and Arapahoe County.

The following is an excerpt from SMHO's annual plan and provides a brief description of the programs and services that SMHO provides for the residents within the City of Littleton.

- Housing Choice Vouchers Through Annual Contribution Contracts with HUD, the Authority receives funding to subsidize the rent of low income families in the private market and earns an administrative fee to cover the program's operating costs. In 2016, the Authority was authorized to issue 288 vouchers.
- Public Housing The Authority owns and operates Bradley House a 72-unit elderly housing complex and 71 units of disbursed family housing for low income individuals and families in the City of Littleton.
- Section 8 New Construction Under multi-family contracts with HUD, the Authority receives funding for three project-based housing facilities to provide subsidized rent for 260 low income households. These three properties are Amity Plaza, Alyson Court, and John W. Newey Family Housing.
- Development The Authority is involved with developing and rehabbing new acquisitions and the construction of low income housing. This fund also accounts for the Authority's interest in various properties, including 2 office buildings, an interest in a Low Income Housing Tax Credit project, and other affordable housing projects.
- Powers Circle Apartments This 69-unit apartment complex was purchased by the Authority in 2008. On July 30, 2013 the property was sold to the Powers Circle Apartments LLLP tax credit partnership. Partners include Countryside Corporate Tax Credits XXI (as a Limited Partner) and Littleton Area Neighborhood Development (LAND) (as the General Partner). Littleton Housing Authority is the developer of the project and acts as the Management Agent. The property will remain affordable in the community for a period of 15 years in accordance with the tax credit requirements and for an additional 15 years in accordance with the Land Use Restriction Agreement.
- Housing Rehab Program With funding received through the HOME investment partnership program and program income, low income homeowners receive low interest loans to rehabilitate their homes that are in need of major repairs, health and safety problems or home

improvements. In 2014, this program was put on hiatus in order to redesign its financial structure and scope. The previous loans are serviced and accounted for in this Fund.

Libby Bortz Assisted Living Center – The Authority owns and operates a 111-unit elderly assisted living property designed for moderate income frail elderly. Services provided include three meals a day, weekly housekeeping and laundry service, medication administration and 24 hour protective oversight.

The majority of SMHO's funding is from the U.S. Department of Housing and Urban Development (HUD) and consists of Section 8 housing assistant payments, capital fund grants and operating subsidies and other smaller grants.

Arapahoe County CDBG and HOME Funds. Arapahoe County receives federal "block grant" funds that can be used for a number of housing and community development activities to support low and moderate income residents. Littleton is allocated a portion of the county funds annually for qualifying projects. Arapahoe County receives approximately \$1.04 million in Community Development Block Grant (CDBG) and \$530,000 in HOME funds annually. Ten percent of county CDBG funds are set aside for the "North" neighborhood of Littleton, which is a local target area for community development investment and 2 percent of county CDBG funds are set aside for other Littleton projects. Additional projects in Littleton can be funded with County CDBG funds and are awarded based on competitive applications county-wide. HOME funds are allocated throughout the county based on project applications as well. Goals, strategies and funding priorities for CDBG and HOME funds are described in detail in the Arapahoe County Community Development Consolidated Plan.² In Littleton, these funds are typically used for emergency and essential home repair, health-related public services, public housing improvement projects and infrastructure improvement projects.

Low Income Housing Tax Credits (LIHTC). The LIHTC program originated in 1986 under the Tax Reform Act and was part of an effort by the federal government to devolve the obligation of publicly-supported housing to states and local governments. Today, the LIHTC is the largest single producer of affordable rental housing in the country. At the most basic level, the LIHTC provides investors with a credit against their taxes in exchange for equity capital to support development of affordable rental units. States administer the program, including setting the criteria for scoring applications. State annual Qualified Allocation Plans (QAP) establish state priorities, guiding principles, and scoring criteria for LIHTC applicants. There have been six LIHTC developments in Littleton (all between 1992 and 2014), producing 350 units of affordable rental housing for residents.

Private sector. The programs available in any community depend on the size and funding sources and are typically inadequate to address housing needs. As such, the role of the private sector in providing housing is crucial for housing affordability. The private sector creates and maintains a significant portion of the housing stock, an estimated 90 percent of the rental units and 100 percent of the for-sale homes in Littleton. Cities typically use land use planning, zoning

² Available online at http://www.co.arapahoe.co.us/index.aspx?NID=330

and development incentives to encourage private sector development of housing that supports community needs and values.

Zoning and Transit Corridors

One of the most common local governmental constraints to the private production of affordable housing is zoning, subdivision, and land development regulations. In some cases, land use regulations that intentionally or unintentionally cause barriers to affordable development can offset the impact of affordable housing subsidies or increase the need for subsidies as a vehicle for meeting affordable housing goals.

A number of studies, including a 2006 book by Jonathan Levine (Zoned Out), have documented the impact of zoning regulations on the supply of affordable housing.^{3, 4} Common zoning regulations negatively impacting affordable development include:

- Minimum house size, lot size, or yard size requirements;
- Prohibitions on accessory dwelling units;
- Restrictions on land zoned and available for multifamily and manufactured housing; and
- > Excessive subdivision improvement standards.

Best practices for zoning that fosters affordable development are described below. These best practices are derived from work conducted by Don Elliott of Clarion Associates and focus on land use regulations that can have significant impacts on housing affordability and availability.

- Permitted uses, or types of housing units allowed (e.g., multifamily parcels, manufactured homes, accessory dwelling units, mixed use districts, and group housing). In order to promote affordability, the zoning code should allow for a diversity of housing types and should accommodate the construction of multifamily and manufactured housing as well as encouraging housing production in close proximity to employment. Best practices for residential uses that foster affordable development are described below:
 - Mixed Use—housing should be allowed near businesses that employ workers, particularly moderate and lower income employees.
 - Multifamily Parcels—at least one zone district (or overlay district, or permit system) should allow the construction of multifamily housing, and enough land should be mapped into that district to allow a reasonable chance that multifamily housing will be developed. Failure to provide opportunities for multifamily development has been identified as one of the four leading regulatory causes of increased housing costs.

³ Levine, Jonathan, <u>Zoned Out</u> (RFF Press, Washington, D.C., 2006).

⁴ Colorado Deportment of Local Affairs, *Reducing Housing Costs through Regulatory Reform* (Denver: Colorado Department of Local Affairs, 1998).

- Accessory Dwelling Units—the code should allow accessory dwelling units in at least one zone district—preferably more—either as an additional unit within an existing home structure or in an accessory building on the same lot.
- Manufactured Homes—manufactured housing that meets HUD safety standards should be allowed in at least one zone district; ideally in a residential zone where the size and configuration matches the scale and character of the area.
- Residential development standards. Dimensional standards, such as lot size, house size and density have a substantial impact on housing costs. Parking standards can also be a barrier to affordable development, particularly for multifamily developments.
 - Density and lot size—minimum lot size requirements are the type of regulation most responsible for increasing housing costs. In addition, lot width requirements should be reasonable and consistent with minimum lot sizes.
 - Minimum house sizes—minimum house size requirements are not common but have been identified as a significant cause of increased housing price in those communities where they are in place.
 - Parking standards—although the traditional standard of two parking spaces per dwelling unit may be reasonable for many areas, a lower standard can and generally should be used for affordable housing, multi-family housing, group housing, and special needs housing.
 - Architectural design standards—architectural design standards can coexist with affordable residential development if they follow two key principles. First, objective standards that can be reviewed by city staff for compliance (without the need for individualized review and negotiation in front of a committee) are preferable. Second, there is sometimes room for adopting lower design standards—or exempting affordable projects from some standards—without significantly compromising neighborhood or historic character.
- Other proactive measures to help foster the production of affordable housing include purpose statements, flexible nonconforming structure regulations and affordable development incentives.
 - Purpose statements—the code should reflect the jurisdiction's purpose to provide housing choice for its residents and to comply with applicable federal and state law regarding housing choice.
 - Flexibility on Nonconforming Structures—although zoning codes generally require that nonconforming structures damaged or destroyed through fire or natural causes can only be rebuilt in compliance with the zoning code, an increasing number of codes are exempting affordable housing from this requirement.
 - Incentives for affordable development—in order to encourage the development of affordable housing, the code should recognize the difficult economics involved and should offer incentives. Common incentives include smaller lots, increased

density in multi-family areas, reduced parking requirements, or waivers or reductions of application fees or development impact fees.

The City of Littleton is currently in the process of updating its zoning ordinance and subdivision regulations, which are over 20 and 40 years old, respectively. In late 2014 the city retained Clarion Associates to assist with assessment and amendment of the Zoning Ordinance. Clarion completed the initial assessment in 2015 and prepared a draft of revised permitted use regulations in 2016. Currently, the Zoning Code Land Use Table review is on hold. However, Subdivision Regulations are actively under review.

Littleton's Citywide Plan was updated in 2014 and the Neighborhoods and Corridors Plan was revised in 2000 with a minor update in 2016. The City is also in the process of completing Master Plans for its two light rail stations (the Downtown Station and the Mineral Avenue Station).

Based on the strengths and challenges of the housing market in Littleton BBC recommends the following considerations for the city's land use, zoning and transportation planning:

- Accommodate the development of diverse housing products with a focus on "missing middle" and small-scale attached products. The city may also want to consider allowing accessory dwelling units to increase affordability and product diversity.
- Incorporate development incentives for the production of affordable housing.
- Streamline the development process and increase transparency in design standards and the development approval process.
- Use transit corridors and TOD sites to increase housing choice and encourage appropriately dense mixed use development that helps address identified housing needs and preserves community character.

It should be noted that Littleton is close to build out and does not have a great deal of vacant land for development. In addition the city has limited economic incentives to offer developers. As such, strategies that rely on zoning and land use to create and /or preserve affordability may be limited and should consider infill and/or redevelopment opportunities.

Section Summary

- Core strengths of Littleton's housing context include a strong economy with low unemployment, increasing resident incomes, diverse housing stock and middle-market home prices. These strong market indicators are coupled with high levels of resident satisfaction and appealing community assets such as good schools and small-town charm.
- However, these community assets also increase demand for living in Littleton and contribute to rising home prices. The market analysis revealed market weaknesses, particularly related to declining affordability as home costs rise faster than incomes. Residents and stakeholders also indicated a shortage of units that accommodate seniors and people with disabilities—specifically single-level, low-maintenance housing options (attached and detached).

- Market threats that add to the challenge of addressing current housing needs include the pace of home prices increases relative to income growth, the risk of rising interest rates, an aging population and the regional context. However, Littleton is well-situated to address housing concerns based on its current housing market strengths, community support for housing that can address needs and national housing development trends that can be leveraged to help address needs.
- Financial resources to address housing needs in Littleton are limited. The city owns 28 units of affordable housing and the Littleton Community Development Department Neighborhood Resources Division administers some community building programs and grants but Littleton primarily relies on South Metro Housing Options (the local public housing authority) along with county and state funds for affordable housing resources.
 - SMHO, formerly the Littleton Housing Authority, owns and manages various housing programs in Littleton accounting for 600 units of affordable housing in the community. SMHO also administers housing choice vouchers for both the City of Littleton and Arapahoe County.
 - Littleton has an additional 350 affordable rental units developed under the Low Income Housing Tax Credit (LIHTC) program—a federally funded public-private partnership program that is the largest single producer of affordable rental housing in the country.
 - Arapahoe County receives federal "block grant" funds that can be used for a number of housing and community development activities to support low and moderate income residents. Littleton is allocated a portion of the county funds annually for qualifying projects which typically include emergency and essential home repair, health-related public services, public housing improvement projects and infrastructure improvement projects.
- One of the most common local governmental constraints to the private production of affordable housing is zoning, subdivision, and land development regulations. Best practices for zoning that fosters affordable development include allowing a diversity of housing types, relaxing minimum dimensional standards, and proactive measures such as incentives for affordable development.

Littleton Housing Study — PRIMARY FINDINGS

June 13, 2017

Prepared for:

Littleton City Council

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AGENDA

Demographic Profile

Housing Profile and Market Analysis

Community Input

Resources and Options

Next Steps – Action Plan

DEMOGRAPHIC PROFILE

DEMOGRAPHIC OVERVIEW

Littleton

Population: **44,553** Change from 2000: **10%**

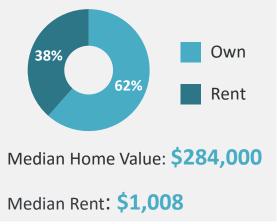
Households: 19,283

Median Age: 42

Median Income: \$65,221

Average Household Size: 2.29

Total Housing Units: 20,205



Arapahoe County

Population: **608,310** Change from 2000: **25%**

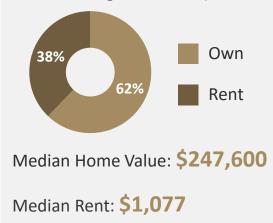
Households: 229,601

Median Age: 36

Median Income: \$63,265

Average Household Size: 2.63

Total Housing Units: 241,431



Denver Metro

Population: **3,418,876** Change from 2000: **32%**

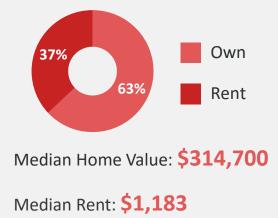
Households: 1,298,356

Median Age: 36

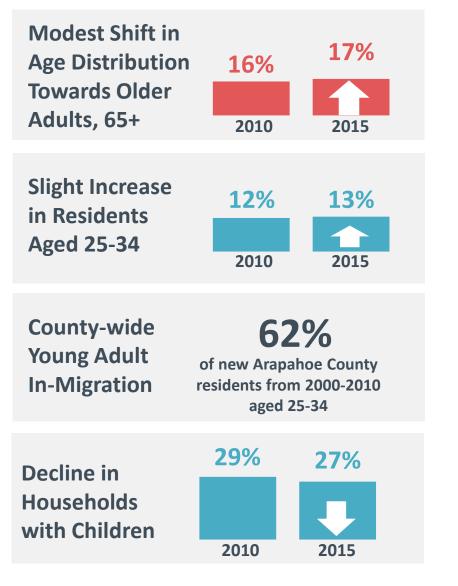
Median Income: \$70,361

Average Household Size: 2.59

Total Housing Units: 1,367,782



SOCIOECONOMICTRENDS: LITTLETON



11% 9% **6% Residents Living** in Poverty 2000 2010 2015 **Older Adult Child Poverty Rate Poverty Rate** 12% 8% 7% 5% 2015 2000 2015 2000 Metro-wide Economic 62% Segregation **Median Income** \$87,394 own \$65,117 \$65,221 \$50,254 all \$37,359 rent **\$31,333**

1999

2007

Poverty and Economic Segregation

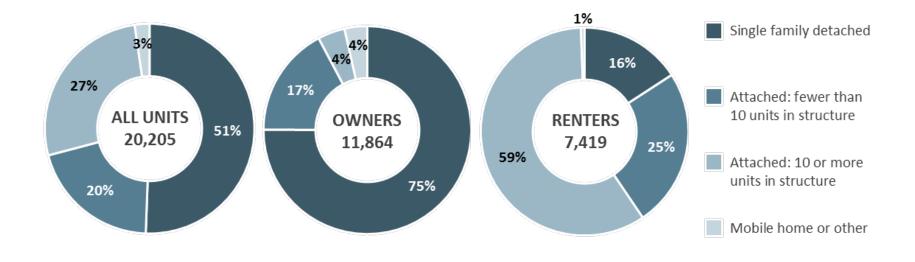
2015

2010

HOUSING PROFILE & MARKET ANALYSIS

HOUSING STOCK

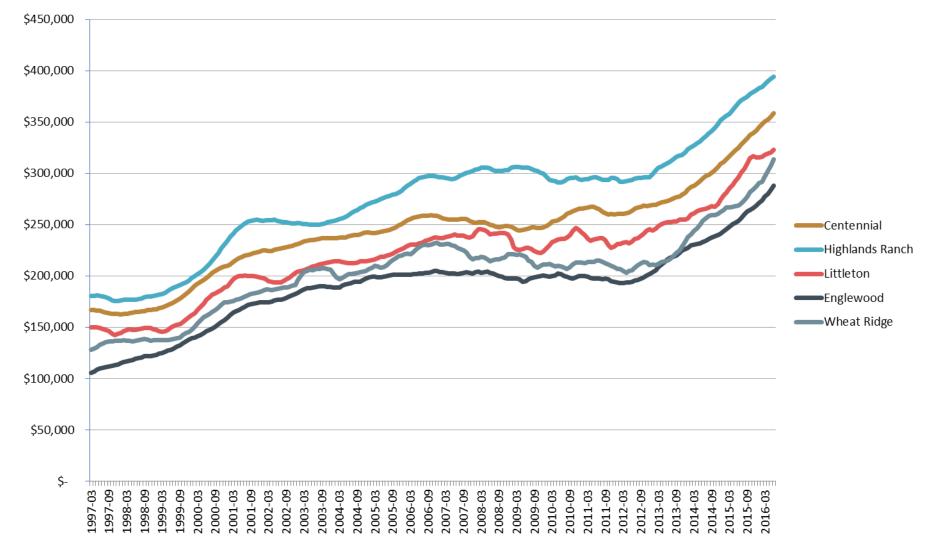
Well-balanced, diverse housing stock



Note: building permitting has been relatively high over the past three years—particularly for multifamily structures. However, even with that recent multifamily development surge; overall, Littleton's housing stock profile is not projected to change substantially (SF detached and attached drops from 61% to 59%)

FOR-SALETRENDS

12-month rolling average of monthly median sale price: 1997 through 2016

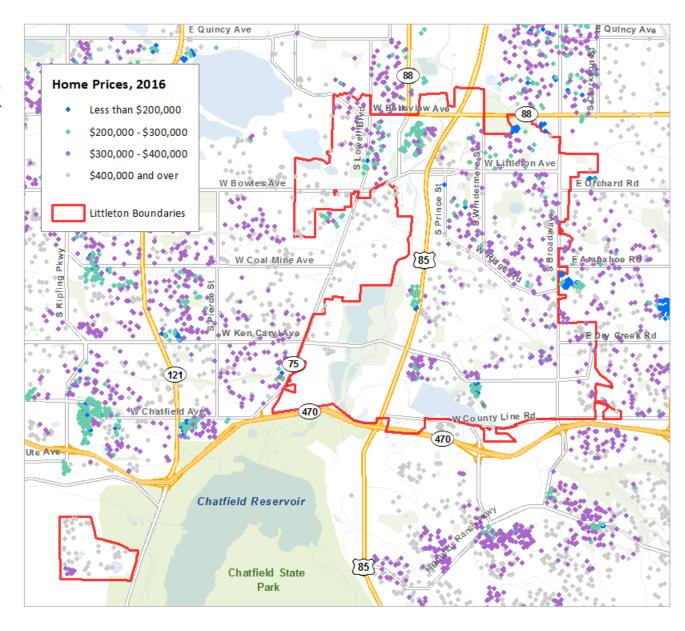


CHANGES IN AFFORDABILITY

Median rents and median home prices increased faster than incomes in Littleton between 2000 and 2015, but declining interest rates have helped buyers maintain purchasing power.

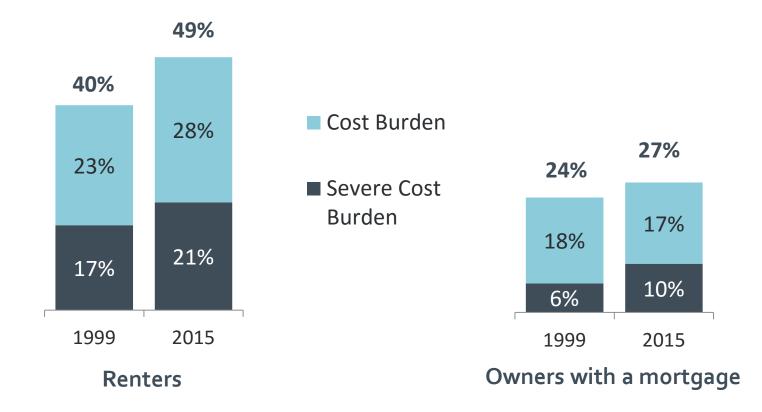
	<u>1999</u>	<u>2015</u>	<u>% Change</u>
Median Gross Rent	\$709	\$1,008	42%
Median Sale Price	\$151,000	\$299,000	98%
Median Income	\$50 , 254	\$65,221	30%
Purchasing Power	\$158,000	\$395,000	151%

HOMES LISTED OR SOLD IN 2016



COST BURDEN

- > Cost burden: spending 30% or more of income on housing costs
- > Severe cost burden: spending 50% or more of income on housing costs



MISMATCH IN THE RENTAL MARKET

Gap of 1,350 units priced below \$625 per month (affordable to renters earning \$25,000 or less)

	Max Affordable	Renters		Rental	Units	Rental	Cumulative		
Income Range	Rent	#	%	# %		Gap	Gap		
Less than \$5,000	\$125	383	5%	15	0%	(368)	(368)		
\$5,000 to \$9,999	\$250	331	4%	147	2%	(184)	(552)		
\$10,000 to \$14,999	\$375	573	8%	257	3%	(316)	(868)		
\$15,000 to \$19,999	\$500	602	8%	221	3%	(381)	(1,250)		
\$20,000 to \$24,999	\$625	529	7%	428	6%	(101)	(1,350)		
\$25,000 to \$34,999	\$875	883	12%	1,861	24%	978	(372)		
\$35,000 to \$49,999	\$1,250	1,271	17%	2,333	30%	1,062	690		
\$50,000 to \$74,999	\$1,875	1,476	20%	1,797	23%	321	1,012		
\$75,000 to \$99,999	\$2,500	651	9%	553	7%	(98)	914		
\$100,000 or more	\$2,500+	720	10%	78	1%	(642)	369		
Total/Low Income Ga	p	7,419	100%	7,691	100%	(1,350)			

AFFORDABILITY FOR WORKERS

Industry	Average Annual Wage in Metro Denver	Job distribution for Littleton residents	Job distribution for Littleton workers	Max Affordable Rent	Can Afford Median Rent?	Max Affordable Home Price	Can Afford Median Home Price?
Private, Total, all industries	\$60,215	100%	100%	\$1,505	yes	\$247,252	no
Health and Social Services	\$50,345	12%	13%	\$1,259	yes	\$206,724	no
Retail Trade	\$31,063	11%	13%	\$777	no	\$127,550	no
Professional Services	\$92,014	11%	7%	\$2,300	yes	\$377,824	yes
Accommodation and Food Service	s \$20,934	8%	6%	\$523	no	\$85,958	no
Educational Services	\$41,053	8%	12%	\$1,026	yes	\$168,570	no
Finance and Insurance	\$92,487	6%	3%	\$2,312	yes	\$379,766	yes
Admin and Waste Services	\$39,681	6%	8%	\$992	no	\$162,936	no
Manufacturing	\$69,425	5%	4%	\$1,736	yes	\$285,070	no
Construction	\$58,989	5%	4%	\$1,475	yes	\$242,218	no
Public Administration	\$63,538	5%	10%	\$1,588	yes	\$260,897	no

COMMUNITY INPUT

FOCUS GROUPS

Small group discussions focused on housing market trends, needs and preferences.

Service Providers

- Affordability is a primary concern
- Housing for people with disabilities also a concern
- Social/community impacts of pricing out
- NIMBYism (LIHTC)
- Need 2 BR senior units, small attached, ADUs, multi-generational hsg
- Culture of taking care of residents but also fiscally conservative

Real Estate Pros

- Ranches/single level duand tri-plexes (paired ranches) and starters
- Downsize options would free up family homes
- Need more \$280k-\$400k
- Young couples/families
- Perceive Littleton to be difficult for developers (outdated zoning, unpredictable process, etc.)
- Infill opportunities
- Allow diverse stock

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Sunshine

- Low density preferences
- Value Littleton culture and green space
- Perceptions that city accommodates developers over design and zoning standards and citizen preference
- Need for patio homes and/or single story down-size options
- Address regional issues housing & transportation

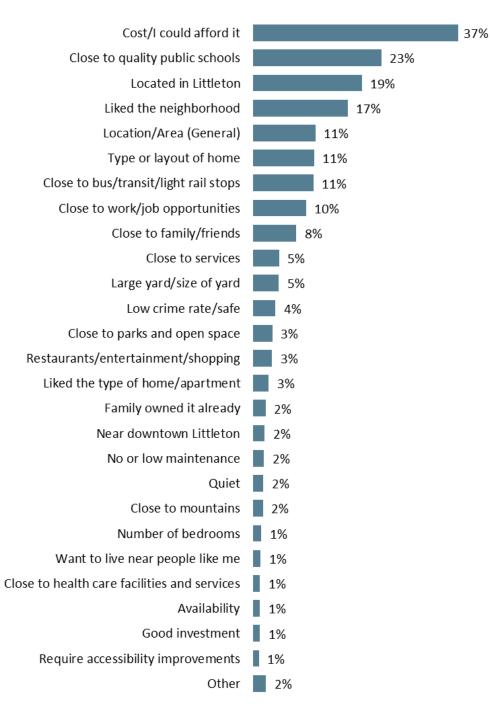
RESIDENT SURVEY RESULTS

- 401 random digit dial completes
- > 350 online respondents

	Survey Respondents (weighted)	Littleton Residents
Age		
18 to 24	6%	8%
25 to 34	11%	13%
35 to 44	19%	13%
45 to 64	38%	29%
65 to 74	17%	9%
75 or older	10%	8%
Housing Tenure		
Homeowner	62%	62%
Renter	37%	38%
Living with others but not paying rent	2%	
Income		
Less than \$25,000	19%	19%
\$25,000 up to \$50,000	20%	20%
\$50,000 up to \$75,000	18%	18%
\$75,000 up to \$100,000	13%	13%
\$100,000 up to \$150,000	15%	15%
\$150,000 or more	15%	15%
Race or Ethnicity		
White	86%	82%
Hispanic	9%	12%
Two or more races	2%	2%
Black or African American	1%	2%
Asian or Asian Indian	1%	2%
American Indian and Alaska Native	0%	0%
Native Hawaiian or other Pacific Islander	0%	0%

HOUSING CHOICE

What factor was most important to you when you chose your current home?



HOUSING CHOICE

What factor was most important to you when you chose your current home?

General Market Sample



- Cost/I could afford it (37%)
- - Close to quality public schools (23%)



- Located in Littleton (19%)
- Liked the 4 neighborhood (17%)



Location/Area (general) (11%)

Millennials (18-34)



Cost/I could afford it (61%)



Close to bus, transit, light rail (22%)



- Close to work or job opps (19%)
- Liked the neighborhood (15%)



Close to quality public schools (14%)

Seniors (65+)



Located in Littleton



Cost/I could afford it (28%)



Type or layout of home (18%)



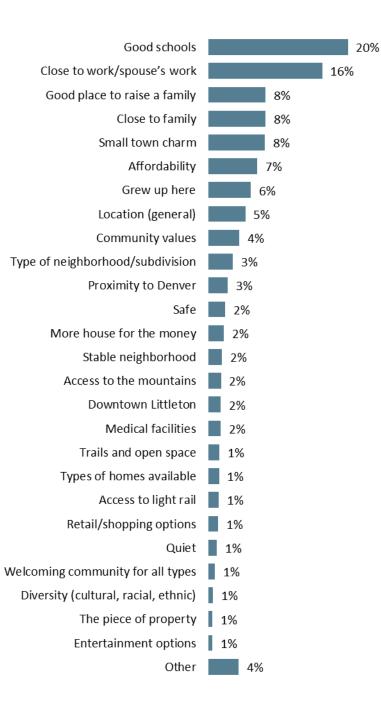
Close to quality public schools (17%)



Liked the neighborhood (16%)

LIVING IN LITTLETON

When you were looking for a place to live, why did you choose to live in Littleton?



LIVING IN LITTLETON

When you were looking for a place to live, why did you choose to live in Littleton?

General Market Sample

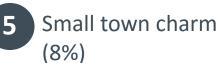


Good Schools (20%)

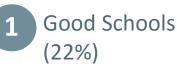
Close to work or spouse's work (16%)



- Good place to raise a family (8%)
- Close to family 4 (8%)



Millennials (18-34)





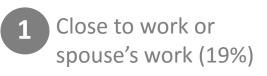
Close to work or spouse's work (22%)

Community values (11%)

Good place to raise a family (9%)



Seniors (65+)







Close to family (9%)

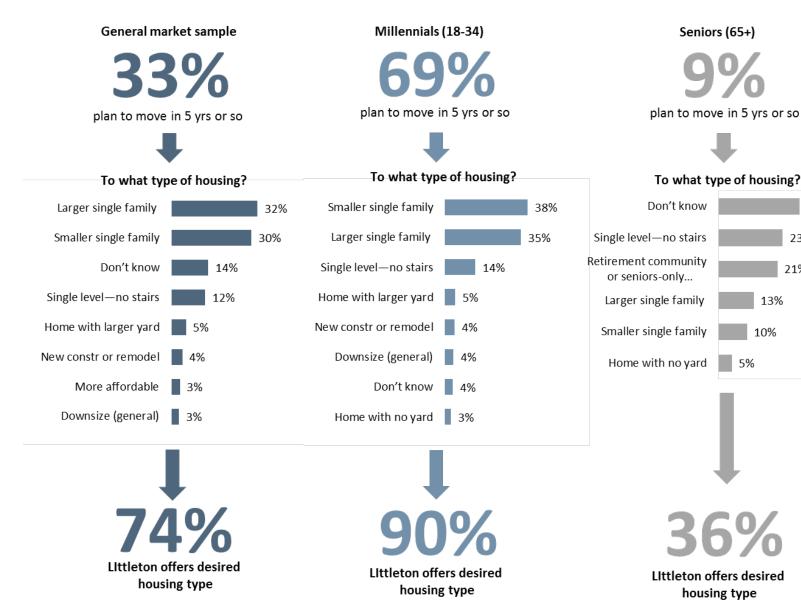




family (8%)

More affordable than other suburbs (8%)

FUTURE HOUSING CHOICE: PLANS TO MOVE



29%

23%

21%

13%

10%

5%

FUTURE HOUSING CHOICE

How important to you is it that Littleton's housing supply includes the following types of homes?

	Not at all important											Essential			
						0	1	2	3	4	5	6	7	8	9
				Housing for m	niddle class	families								• 7.8	
Housing affor	rdable to residents wo	orking in Littleto	n public s	ervice, like libra	arians and	teachers								7.5	
Housing that meet	ts the needs of reside	nts who are losi	ng mobili	ty and need hou	ousing with	no stairs							•	7.3	
	Housing affordal	ole to residents	living on a	a fixed income,	, like Social	Security	• 7.1						7.1		
ŀ	Housing affordable to	residents work	ing in Littl	eton retail jobs	s like groce	ry stores							• 7	7.1	
			Starter	homes for first	t-time hom	ebuyers							• 7.	0	
		H	lousing fo	r low and mode	est income	families							• 6.9	Ð	
	Housing	Housing for households looking to move up from their starter hom							• 6.6						
		Α	o seniors	• 6.6											
Housing for multigenerational households that includes a main floor bedroom for older relative				relatives	• 6.5										
	Starter apartme	nts for young ad	lults work	ing or starting f	families in	Littleton						•	6.3		
	Ноц	ising that meets	the need	s of residents lo	ooking to c	downsize						•	6.1		
	Ηοι	ising for larger h	nousehold	ls needing four	or more b	edrooms					•	5.3			
		Ара	rtments o	or condos that a	appeal to N	/illenials					•	5.1			

FUTURE HOUSING CHOICE

Please state whether the following types of housing is appropriate in your neighborhood, other Littleton neighborhoods or not appropriate in Littleton.

	Appropriate in my neighborhood	Appropriate in other neighborhoods	Not apprpriate in Littleton	e
homes are feet		82%		11% 7%
nunities seniors	51%		39%	10%
ack and homes	59%		26%	15%
n 1,500 are feet	59%		25%	17%
with 10 er units	40%	3	8%	22%
10,000 are feet	49%		28%	22%
t size as homes	51%		27%	22%
h more are feet	39%	36%		25%
t or less	46%	2	6%	28%
stories or roads	41%	31%		28%
close to or roads	37%	31%		31%
or more	36%	32%		32%
Homes	38%	25%		37%
ng units	40%	20%		40%

Medium-sized single family homes between 1,500 and 3,000 square feet

Co-housing or shared communitie for senior

Townhomes with the same setback and height as neighboring homes

Small homes with less than 1,50 square fee

Small apartment buildings with 10 or fewer unit

Medium lots of 6,000 to 10,000 square feet

Duplex homes on the same lot size as neighboring single family homes

Large single family homes with mor than 5,000 square fee

Small lots of 5,000 square feet or less

Apartment buildings with 5 or more stories close to light rail or bus stops or major roads

Apartment buildings up to 5 stories close t light rail or bus stops or major road

Large lots of 10,000 square feet or mor

Tiny Home

Accessory dwelling unit

RESOURCES & OPTIONS

SWOT ANALYSIS

Strengths:

- Strong economy/low unemployment
- Increasing resident incomes
- Diverse housing stock
- Middle-market home prices
- High levels of resident satisfaction
- Appealing community assets (e.g., good schools, small-town charm)

Market Threats:

- Pace of home prices increases relative to income growth
- Risk of rising interest rates,
- Aging population
- Regional context

Weaknesses:

- Declining affordability as home costs rise faster than incomes
- Undersupply of homes <\$300,000</p>
- Rental gap of 1,350 units <\$650</p>
- Shortage of units that accommodate seniors and people with disabilities (e.g., single-level, low maintenance)

Opportunities:

- Preserve housing market strengths
- Community support for housing that can address needs
- National housing development trends that can be leveraged to help address needs

RESOURCES The city has limited financial resources to address housing needs and relies on SMHO and county/state.

- The city owns 28 units of affordable housing and the Comm. Dev. Dept. Neighborhood Resources Div administers some community building programs and grants.
- SMHO owns and manages various programs in Littleton accounting for 600 units of affordable housing; SMHO also administers housing choice vouchers.
- LIHTC developments add 350 affordable rental units to Littleton's stock (federally funded public-private partnership program that is the largest single producer of affordable rental housing in the country).
- Arapahoe County receives federal CDBG funds that can be used for housing and community development to support low/moderate income residents. Projects include emergency home repair, health-related public services, public housing improvement projects and infrastructure improvement projects.
- The private sector's role in providing housing affordability is crucial. Cities typically use land use planning, zoning and development incentives to encourage private sector development of housing that supports community needs and values.

NEXT STEPS & ACTION PLAN

ACTION PLAN— SUMMER 2017

The ultimate purpose of the study is to provide recommendations that serve to guide future city policy decisions relating to housing Future recommendations should focus on actions that would best help the city preserve its existing strengths and address core needs:

- Additional affordable rentals, specifically for residents earning less than \$25,000. Note that Littleton residents consider small-scale rental structures with fewer than 10 units to be the most "appropriate" for Littleton.
- Starter homes and family homes priced near or below \$300,000. Residents are open to a variety of product types that could help meet this need.
- Housing options attractive to aging seniors—primarily single-level homes with low maintenance yards (could be patio homes, other small-lot options and small attached products without stairs).

WHY WORK TO ADDRESS HOUSING NEEDS?

A balanced housing stock accommodates a diverse resident population which in turn supports the local economy and contributes to Littleton's unique culture. The city has historically been relatively affordable to households across the income spectrum but recent trends indicate that many current and future residents may be priced out of Littleton as prices increase.

Actions that help mitigate price increases and preserve both market-rate and publicly assisted housing affordability will also help preserve the culture and identity of Littleton itself.

QUESTIONS?





Staff Communication

2(b)

File #: ID# 17-189, Version: 2

Agenda Date: 06/13/2017

Subject: Discussion of issues related to the proposal for Fire Unification

Presented By: Mark Relph, City Manager

BACKGROUND:

An initial proposal had been received on May 3rd for the unification of fire services with South Metro Fire Rescue (South Metro), Cunningham Fire Protection District and the three partners of Littleton Fire Rescue (fire partners); Highlands Ranch Metropolitan District, Littleton Fire Protection District and the city of Littleton. After review of the proposal, the fire partners agreed additional detail was necessary and sent a letter (Attachment 1) to South Metro making that request.

This study session is an opportunity for the council to discuss what additional issues or questions you want addressed in a revised proposal. The Center for Public Safety Management (CPSM) is retained by the city of Littleton to assist in the development of those questions and to evaluate a revised proposal once it is resubmitted by South Metro. CPSM will be present at the study session to facilitate the discussion.

Our fire partners of Highlands Ranch Metropolitan District and the Littleton Fire Protection District have already made a submittal back to South Metro. As reference, Attachment 2 lists their issues and questions.

In preparation for the council discussion, staff and CPSM have developed a proposed list of issues (Attachment 3) the council may wish to consider in a revised proposal. They are intended as suggestions to begin the conversation. The next steps after the study session would include staff working with CPSM to submit a final list to South Metro.







Laura Simon Chair And Robert Baker Fire Chief South Metro Fire Rescue 9195 E. Mineral Avenue Centennial, Colorado 80112

May 31, 2017

CC: Chief Armstrong, Littleton Fire Rescue Chief Rhodes, Cunningham Fire Protection District

Dear Ms. Simon and Chief Baker:

The Highlands Ranch Metro District, the Littleton Fire Protection District and the City of Littleton (LFR Partners) are in receipt of the 2017 Unification Proposal, dated May 3, 2017, that was prepared by Chiefs Armstrong, Baker and Rhodes. In order for the LFR Partners to consider unifying with South Metro Fire Rescue and Cunningham Fire Protection District we require more information than is provided in the May 3rd proposal. We will provide a list of the required information and comments on the initial proposal to Chief Armstrong in the near future.

We look forward to receiving a revised unification proposal that is approved by the South Metro Fire Rescue Board of Directors.

Sincerely,

Terry Nolan General Manager Highlands Ranch Metro District

Mark Relph City Manager City of Littleton

attau Cindy Hathaway

Executive Director Littleton Fire Protection District



SMFR Unification Proposal Needs

- A. In order for the Metro District to consider a proposal to unify with South Metro Fire Rescue the following information is needed in addition to the information already provided:
 - 1. Specific resources that will be provided in Highlands Ranch including:
 - a. Stations with general location;
 - b. Ladders, engines, medic units and other apparatus including locations and hours per day, days per week in service and ALS capability;
 - c. Number of personnel and basic qualifications (firefighter or paramedic) assigned to each apparatus;
 - d. Costs for capital improvements and purchases and who pays.
 - 2. Ownership of stations and equipment.
 - a. Allowance for value of stations upon unification?
 - 3. Cost of the service as follows:
 - a. Dollars per year;
 - b. Cost per call
 - c. Sources of revenue
 - d. Who would run/pay for any required election?
 - e. Rationale for set mill levy versus dollars per call or dollars per year
 - f. Prognosis for stability of future costs.
 - 4. First responding unit response time in Highlands Ranch (90%):
 - a. Actions proposed to reduce travel time in Highlands Ranch such as forward deployment/dispersal vs. all units in stations.
 - b. Goal urban or suburban standard response times?
 - c. Provide map with projected response times within Highlands Ranch.
 - 5. Recommended governance:
 - a. Contract
 - b. Authority
 - c. Inclusion
 - d. Phased approach
 - e. Representation?
 - f. Rationale.
- B. Cost of service is a concern for the Metro District and the initial proposal included two service levels that seem excessive as follows:
 - 1. Four firefighters per engine when multiple units are always dispatched to fires;
 - 2. All medic units are manned 24/7/365 when the vast majority of calls occur between 9:00 a.m. and 9:00 p.m.;
 - 3. Please comment on these specifically and how the proposed service will provide high quality service efficiently.



Littleton Fire Protection District

SMFR Unification Proposal Needs

- 1. Communicated that we will be counter proposing a cost structure similar to what was proposed for Highlands Ranch, in that HR does not see full cost until their specific service improvements (e.g., new stations) are implemented. We should have the same treatment, and will also be looking to set the initial rate based on \$ and not necessarily on mills.
- 2. What prevents South Metro from "abandoning" LFPD West?
- 3. Confirm commitment for continued staffing of Station 13 during period when we have auto-aid with West Metro // confirm it's "both/and"
- 4. When would an auto-aid agreement with West Metro be secured?
- 5. What is "Plan B" if an auto-aid agreement cannot be secured?
- 6. Clarify / provide information on the obligations of West Metro in an auto-aid agreement? Can they choose not to respond? In other words, what specifically can be <u>guaranteed</u> to change on the west side with an auto-aid agreement as opposed to what we <u>hope</u> would change?
- 7. The proposal identifies an "immediate" plan and a "future" plan. When does "immediate" end? We would require a commitment on the duration of this period.
- 8. When will a decision be made on building a new station? Additional stations? The proposal says "at least one additional station"...
- 9. When would an additional station(s) be built?
- 10. Would the answers to 7-9 change if we were willing to build a station now?
- 11. When will a decision be made on relocating Station 13?
- 12. How is the proposal affected if the City of Littleton doesn't participate in a unification, and Stations 11, 12, 19, and maybe 16 are potentially not part of the service?
- 13. How would the proposal accommodate special missions particularly dive if the City of Littleton doesn't participate in a unification?
- 14. Clarify comment on page 21 regarding an "ARM car" to be located at Station 15.
- 15. We request a detailed review of the assumptions for the 2018-2020 projections included in the proposal, with the addition of a comparison to 2017 budgets.
- 16. Tables 1 and 2 in the proposal show only operating budgets. What are the projected capital requirements for 2018-2020?
- 17. How far out does SMFR project fund balances? What are the projections for the various fund balances for 2018 and beyond?

City of Littleton City Council Fire Unification Proposal Clarification/Negotiating Points June 13, 2017

The following are a series of questions and negotiating points that are offered to city council in order to obtain key information in considering contracting for Fire, EMS and Support Services from the South Metro Fire Rescue. For the purpose of this document, the city of Littleton is referred to as the "City" and the South Metro Fire Rescue will be referred to as "South Metro".

- 1. Is the proposed pricing for the City to obtain services from South Metro based on a flat contract amount that is specified for the first three years of operation as a "not to exceed amount", including Dispatch and support services? Are those rates as follows?
 - a. 2018.....\$7,380,579
 - b. 2019.....\$7,542,952
 - c. 2020.....\$7,693,811
- 2. Are the future annual rates based on the 2020 Base rate plus a negotiated cost of inflation (COI) increment for years 4 through 6 (2021, 2022 and 2023 e.g CPI rate for Denver Boulder, Greeley area)?
- 3. What does South Metro foresee for the City beyond 2020? (i.e. continue contracting, vote for inclusion?)
- 4. Does the above pricing include fire prevention and inspection services, plus fire plans review?
- 5. Under a contract for service how will vehicle maintenance and insurance liability coverage for all rolling stock, equipment and fire station facilities be handled? How would these be handled if the City votes for inclusion into the South Metro District?
- 6. Will the City be allowed to negotiate as part of the agreement with South Metro, the pricing for EMS transport services and fire plans review services utilized within the municipal boundaries of the City?
- 7. Does the above pricing include the response of special teams services?
 - a. Hazardous Materials Response (Level 3)
 - b. High Angle Rescue
 - c. Wildland Fire Response
 - d. Swift Water Rescue
 - e. Heavy/Technical Rescue

- 8. The City would not expect to transfer any of its capital assets initially (under contract service), but would like to negotiate an annual leasing fee for the initial contract period, including a specified amount of insurance liability coverage for all rolling stock, capital equipment and fire station facilities that is to be paid to the City by South Metro.
- 9. The City cannot force employees to stay employed with the city, therefore should not dictate who can and cannot be transferred to SMFR.
- 10. Would South Metro be willing to negotiate with the City, a payment for EMS transport revenues that is paid to the City by South Metro from the revenues collected from those patients whose call originates within the municipal jurisdiction of Littleton?
- 11. Would South Metro be willing to establish a series of performance measures that will be the basis for ALS, BLS and non-emergent service delivery within the municipal boundaries of the City, including;
 - a. Dispatch handling times and 911 call transfer time.
 - b. Responder turn-out times.
 - c. Responder travel times.
 - d. Inspection and plans review processing times.
 - e. Staffing levels on units and at stations and associated employee training/certifications.
 - f. The deployment of resources, including peak-period units and alternative response vehicles.
- 12. Would South Metro be willing to negotiate as part of the agreement the level of training and the certification levels of responding personnel assigned and operating within the City?
- 13. Would South Metro be willing to negotiate as part of the agreement the type and level of reporting for service delivery to the City?
- 14. Would South Metro be willing to negotiate as part of the agreement a designated point of contact for both the City and South Metro who shall meet periodically (monthly during the first year of service which can be moved to quarterly for years 2 and 3 of the agreement), to discuss the terms and outcomes relating to the service agreement?
- 15. Would South Metro be willing to negotiate as part of the agreement a formal mechanism for lodging written complaints or for making official inquiries regarding service delivery with specific timelines for obtaining a written response or resolution of the issue from South Metro?

- 16. Would South Metro be willing to negotiate as part of the agreement a series of criteria for meeting the negotiated performance measures and a financial penalty to be paid by South Metro to the City when such measures are not met or corrected after official notice has been provided and the resolve period has elapsed?
- 17. Would South Metro be willing to negotiate as part of the agreement the level of training and certifications held by personnel assigned to deliver fire code enforcement, inspections, plans review and arson investigation services?
- 18. Would South Metro be willing to negotiate as part of the agreement the periodic adoption of the latest edition of a model fire code (minimum every five years) to be used within the City?
- 19. Would South Metro be willing to negotiate as part of the agreement the adoption of a Wildland Urban Interface Code (WUI) to be used within the City?
- 20. Would South Metro be willing to negotiate as part of the agreement a fuels reduction/mitigation plan with periodic updates within the City?
- 21. Would South Metro be willing to negotiate as part of the agreement a provision that restricts South Metro from changing any adopted level of service criteria without first discussing and having written agreement with the City?
- 22. Would South Metro be willing to negotiate as part of the agreement the adoption of large scale disaster planning and emergency management exercises that address catastrophic occurrences including be not limited to;
 - a. Mass casualty incidents involving transportation accident (rail, air, roadway)
 - b. Acts of terrorism
 - c. Flooding and weather events
 - d. Winter storms/blizzards
 - e. Drought emergencies
- 23. Would South Metro be willing to negotiate as part of the agreement a termination process, including the time lines for notification and the causes for termination?
- 24. Would South Metro be willing to negotiate as part of the agreement a quarterly payment schedule for the payment of the City's annual service fee?
- 25. Would South Metro be willing to negotiate as part of the agreement the ability to obtain stand-by Fire or EMS services and inspection services at a designated number of City sponsored special events at no additional charge to the City?

- 26. Would South Metro be willing to negotiate as part of the agreement the City being notified in writing of any automatic aid or initial response agreements that provide initial emergency response into the City from an agency other than South Metro?
- 27. Would South Metro be willing to negotiate as part of the agreement a process where prior to any out-sourcing of services by South Metro that the city be first notified in writing and approve this change, if it results in a decrease of agreed services?
- 28. Would South Metro be willing to negotiate as part of the agreement the ability to obtain, at no charge any official incident report, including dispatch audio tapes allowable for release under law, regarding a specific incident requested by the City?



Staff Communication

2(c)

File #: ID# 17-175, Version: 1

Agenda Date: 06/13/2017

Subject: Smart Cities / Littleton's Digital Strategy / IS update

Presented By: Ken Price, Information Services Director

BACKGROUND:

Technological, economic and environmental evolution have generated interest across the country in "Smart Cities", including economic restructuring, adapting to the move to online retail and entertainment, climate change, aging demographics, urban population growth and pressures on public finances. During this study session, staff will present information on the benefits of Smart Cities including:

- 1. Why would the City of Littleton want to be a Smart City?
- 2. What is a Smart City?
- 3. How do we become a "smarter" city?

Staff will also update council on completed smart city initiatives and potential future options.



Littleton's Smart City Roadmap



Overview

Why would we want to be a smart city? What is a smart city? How do we become a "smarter" city? What initiatives have we completed? What are potential future initiatives?

- economic restructuring -- online retail and entertainment -- climate change -

Major technological, economic and environmental changes have generated interest in smart cities

> - aging populations -- urban population growth -- pressures on public finances -



Source: "Smart city" definition from Wikipedia. (10 April 2017). Retrieved April 12, 2017 from https://en.wikipedia.org/wiki/Smart_city.







Littleton is impacted by changes such as the urbanization of the population





A *smart city* is a community vision to integrate data and technology to improve the efficiency of services and manage city assets



What makes smart cities smart?

Collect data (facts, truth, evidence) – real-time Analyze data (automation) – real-time Modify service delivery – real-time



Real-time data-driven decision making!



Six Components found in most Smart Cities - Smarter Transportation -- Smart Digital Infrastructure -- Citizen Engagement - Smart & Big Data -- Data Visualization - Leadership & Vision -



Source: Shark, A. R., Toporkoff, S., and Levy, S. (2014). Smarter Cities for a Bright Sustainable Future: A Global Perspective. (pp. 3 – 9).

Charlotte, NC

Over the past decade, Charlotte has undergone tremendous growth. According to the U.S. Census Bureau, Charlotte saw the 10th largest increase in population among large cities.

Chicago, IL

Chicago has decidedly embraced smart city principles. As Mayor Rahm Emanuel's top tech lieutenant put it, Chicago wants to become "the most data-driven government in the world."

📕 Philadelphia, PA

Philadelphia has embraced smart city initiatives to help promote equity throughout the city. Much of the city's urban population density is a result of its historically industrial economy, which by the 1970s had largely relocated or disappeared.



San Francisco, CA

San Francisco is a worldwide tourist destination that houses some of the world's largest financial institutions and is known as a city of innovation and technology.

Smart Cities



Digital Strategy Vision

Build, maintain, and enhance multidirectional digital connections amongst city employees, citizens, business, and government



Source: City of Vancouver Digital Strategy. (2013). Retrieved April 20, 2016, from http://vancouver.ca/files/cov/City_of_Vancouver_Digital_Strategy.pdf.



Source: City of Vancouver Digital Strategy. (2013). Retrieved April 20, 2016, from http://vancouver.ca/files/cov/City_of_Vancouver_Digital_Strategy.pdf.



Intelligent Transportation Systems (ITS)





Potential Engagement + Access Initiatives

Storm allo	Storm allows city to launch snow removal app for first time			
By Mallory Panus	By Mallory Panuska mpanuska@newspost.com Mar 14, 2017			
The City of Frederick Snow Removal Progress				
Browse - Search	Entire Repository Search			
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<u>City Services</u> » <u>City Departments</u> »

Information Services

The Big Picture

Government operates on information, particularly digital information, arguably its most important resource other than its human resources."



Government information must be systematically and efficiently managed, just as other key resources are managed, in the interest of economical government and responsive public service"

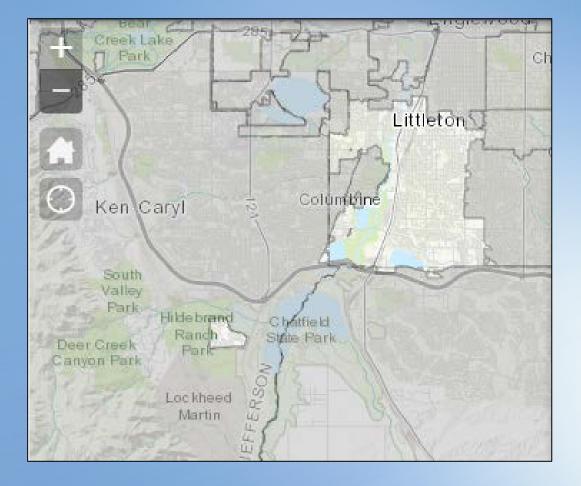
Source: Dr. Bruce W. Dearstyne, CIO Leadership for Cities and Counties: Emerging Trends and Practices (Public Technology Institute: 2009), 23.

Department Mission

Responsible for technology and communication systems used to collect, manage, store, and deliver information that supports the operations, management, and decision-making of the City of Littleton.

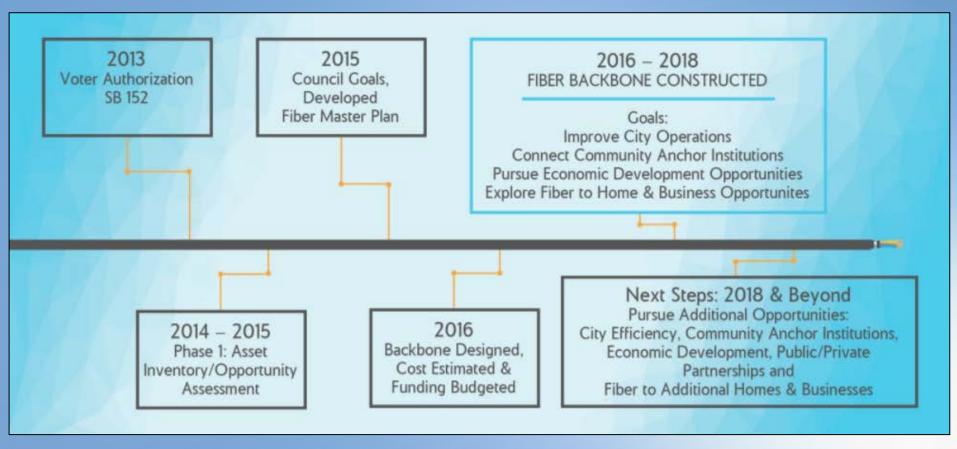
Completed Infrastructure & Assets Initiatives





Potential Infrastructure & Assets Initiatives





Potential Infrastructure & Assets Initiatives



ARTICLE 10 UNDERGROUNDING OF OVERHEAD FACILITIES

§10.1 <u>Underground Electrical Lines In New Areas</u>. The Company shall, upon payment to the Company of the charges provided in its tariffs or their equivalent, place all newly constructed electrical distribution lines in newly developed areas underground in accordance with applicable laws, regulations and orders.

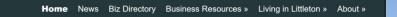
§10.2 Underground Conversion At Expense Of Company.

A. <u>Underground Fund</u>. The Company shall budget and allocate an annual amount, equivalent to one percent (1%) of the preceding year's Electric Gross Revenues (the "Fund"), for the purpose of undergrounding existing overhead distribution facilities in the City, as may be requested by the City, provided that the undergrounding shall extend for a minimum distance of one (1) block or 750 feet, whichever is less, or as may be mutually agreed by the parties. Except as provided in §6.8.F, no relocation expenses which the Company would be required to expend pursuant to Article 6 of this franchise shall be charged to this allocation.

B. <u>Unexpended Portion And Advances</u>. Any unexpended portion of the Fund shall be carried over to succeeding years and, in addition, upon request by the City designee, the Company agrees to expend amounts anticipated to be available under the preceding

Potential Infrastructure & Assets Initiatives





usiness Resources »

Business Resources & Services

Business Resources »

Grants & Incentives

- Finance	City Services » City Departments » Finance »			
- Business & Sales/Use Tax License	Business & Sales/Use Tax License			
Business License & Sales/Use Tax Application	Font Size: 💽 🚍 🚹 <u>Share & Bookmark</u> <u>Feedback</u> 🍓 <u>Print</u>			
Sales/Use Tax Payments	Online Business License & Sales/Use Tax Application			
+ Sewer/Storm Drainage Payments	Sewer/Storm Drainage			
How would you balance the city's budget?	Before completing the form above, use the <u>Address Wizard</u> to verify that the business location is within the Littleto city limits. You will need to know the answer to this when filling out your application and it will determine whether yo			
+ Budgets & Financial Reports	al Reports application will require zoning review. For questions about this form, contact the <u>Revenue and Sales Tax Technician</u> a 303-795-3768.			
Bid Opportunities	If you have a new business, check out <u>Starting a Business</u> and other no-cost business resources provided by the City of			
Sales Tax Seminars	Littleton. For more information about these services, contact the Economic Development Department 💣 at 303-795- 3749.			
Senior Property Tax Refunds				
Legal Notices - Finance	Demit cales (use tay yet) ups and nour outs to:			
Document Downloads	Remit sales/use tax returns and payments to:			
Staff Directory - Finance	City of Littleton P.O. Box 1305 Englewood, CO 80150-1305			

Completed Economic Initiatives



Broadband, Property Values And Economic Growth

FALL 2016 | www.bbcmag.com | BROADBAND COMMUNITIES | What Fiber Broadband Can Do For Your Community | 19

2014

Fiber to the Home Council Americas releases a study finding higher per capita GDP in U.S. metropolitan areas in which gigabit internet is widely available. Infrastructure investment, job creation, entrepreneurship, productivity gains and companies relocating to or expanding in gigabit cities are all elements of this growth. R ecent studies continue to show that access to high-quality broadband boosts property values and contributes to economic vitality.

2016

Michael Render of RVA LLC surveyed MDU residents in the U.S. and Canada to find out what they would pay for access to ultra-high-speed, reliable broadband.

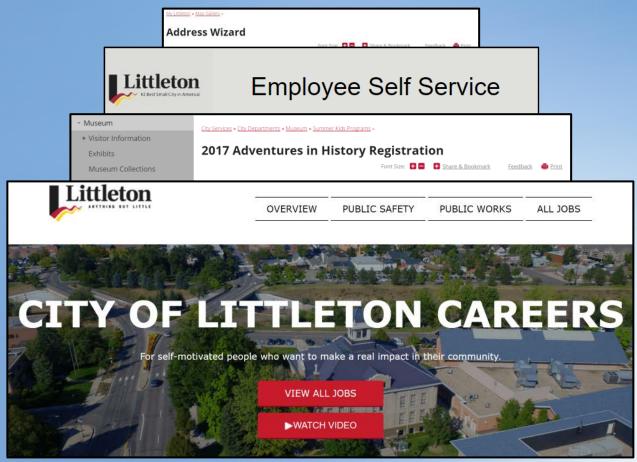
Fiber access increases residents' satisfaction with their homes and appears to reduce churn, helping building owners and operators maintain high levels of occupancy and provide a quality living environment.

2015

FTTH Council Americas finds that access to fiber to the home increases a home's value by up to 3.1 percent. Using the National Broadband Map and a nationwide sample of real estate prices from 2011 to 2013, the study's authors investigated the relationship between fiber-delivered internet services and housing prices.



Potential Economic Initiatives



Completed Organizational Digital Maturity Initiatives





Completed Organizational Digital Maturity Initiatives

Event Permits

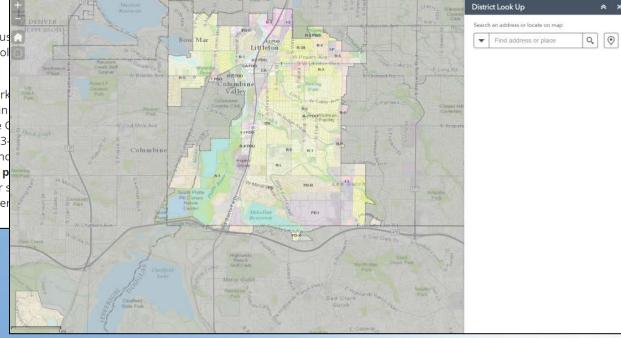
Font Size: 🛨 🚍 🛛 🛨 Share & Bookmark

<u>Feedback</u> 🛑 <u>Print</u>

Policies and Procedures

The purpose of this policy is to help regulate the temporary us also designed to help citizens, businesses, civic groups, school issue the permit.

- 1. Events with more than 100 attendees held in a city park
- 2. Most parks in the city are managed by South Suburban that the city manages that are available for events are C the Littleton Museum. For other parks, call SSPR at 303-
- 3. For events requiring minimal city staff involvement, and permit request must be received **at least two weeks p** minimal city staff involvement, and/or alcohol sales or s **eight weeks prior to the event.** The city may deny per



Potential Organizational Digital Maturity Initiatives



What makes smart cities smart?

Collect data (facts, truth, evidence) – real-time Analyze data (automation) – real-time Modify service delivery – real-time



Real-time data-driven decision making!

Littleton



Questions?





CENTER FOR CITY SOLUTIONS AND APPLIED RESEARCH

Trends in Smart City Development

*

About This Publication

Research for this guide and the original draft of the document were completed by graduate students at the American University Department of Public Administration and Policy. Contributors include Reena Shrestha, Cynthia Castro, and Fletcher Smith. These students worked in partnership with Brooks Rainwater and Nicole DuPuis at the National League of Cities (NLC) to conduct an analysis of smart city implementation across the country and around the world. The final report was prepared by Nicole DuPuis and Elias Stahl at NLC.

The National League of Cities is the nation's oldest and largest organization devoted to strengthening and promoting cities as centers of opportunity, leadership, and governance. NLC is a resource and advocate for more than 1,600 member cities and the 49 state municipal leagues, representing 19,000 cities and towns and more than 218 million Americans. NLC's Center for City Solutions and Applied Research provides research and analysis on key topics and trends important to cities, creative solutions to improve the quality of life in communities, inspiration and ideas for local officials to use in tackling tough issues, and opportunities for city leaders to connect with peers, share experiences and learn about innovative approaches in cities.

Acknowledgements

Thank you to Soren Messner-Zidell, who created the data visualizations, cover illustration and report design, and to Paul Konz for editing the report. We are also grateful to all of the city officials, thought leaders, and experts who took the time to speak to us about smart cities. A very special thanks to our colleagues at the Smart Cities Council, who lent their time and expertise as outside reviewers of this report: Sarah Blanchard, Stuart Cowan, and Liz Enbysk. Finally, thanks to Sonja Walti, Assistant Professor in the Department of Public Administration and Policy at American University, who facilitated this partnership.

Trends in Smart City Development

CASE STUDIES AND RECOMMENDATIONS



CENTER FOR CITY SOLUTIONS AND APPLIED RESEARCH

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Foreword

Cities are ever-changing; the dynamism of the urban environment is a microcosm of the societal interactions that we have built throughout history.

Technology has always been a critical force deeply intertwined with the evolution of cities. From the first human settlements millennia ago to the industrial revolution to today, technological breakthroughs have impacted the buildings we use, the way we get around, and how we live, work, and play in the urban space.

Now, as we are on the cusp of further rapid shifts in cities precipitated by technology, it is worth imagining what the connected smart city of the future will look like – and the associated impact it will have on our everyday lives.

Take a typical day in the life of a community member in this hypothetical future who wakes up in their connected house with artificial intelligence automating everything from temperature preference to light levels to health monitoring and more – and scale it to the city at large.

Cities are beginning to, and will continue to, integrate technological dynamism into municipal operations, from transportation to infrastructure repair and more. The back ends of these systems are not always apparent to the end user – but as the integration of smart cities technologies becomes more visible in our everyday lives, we could begin to see large scale changes in our cities.

Autonomous vehicles on our roadways and the data that they provide could create environments where traffic lights become obsolete, traffic itself becomes a thing of the past, and cities can once again be for people rather than cars, as different modes of transportation work in tandem and communicate with each another. Wi-Fi hotspots at scale like we are already starting to see in New York with LinkNYC could help transform the way we access information and help alleviate the digital divide.

Thinking even further out, we can imagine that security protocols like facial recognition technology could help transform building security in cities, making entrances and building design more fluid as we move away from the need to usher people through front doors. Similarly, as we move toward greater usage of shared vehicles, we can move away from parking either below buildings or on streets, enabling cities to recapture land for people and allowing developers to reduce the costs of buildings since parking garages will become an unnecessary expense.

Energy sources could be completely renewable in the smart city of the future as well, with technology paving the way for better integration into our cities and thereby helping to create a cleaner environment for everyone. At the same time, the smart city of the future can be safer with streetlight networks that use embedded sensors to detect gunshots or flash their lights during emergencies – and the further integration of these systems will allow cities to collect information from sources such as smart water, electric, and gas meters.

All of this is predicated on the premise NLC's Center for City Solutions and that technologies can help make people's Applied Research strives to strengthen lives better in cities. At the end of the communities, transform and improve day, technological developments will cities, and assist city leaders. We do this enhance our urban experience - but they by knowing and learning about cities, also risk leaving more people behind. To identifying and sharing promising city this end, we must be deliberate in the practices, fostering effective solutions and development of smart cities and imbue innovation, and challenging city leaders to equity as a primary goal so that the city lead. of the future is a city for everyone.

Cities are focused on these goals right now, and they are beginning to think about how these systems can be integrated to create feedback loops that improve operations and enhance the experience of community members. Fully connected smart cities are coming, and we want to help cities prepare for their arrival and provide local leaders with best practices in this arena.

The National League of Cities (NLC) is pleased to share with you Trends in Smart City Development, which presents case studies and discusses how smart cities are growing nationwide and globally. It is our hope that this report will spark conversation and action among city leaders about how to incorporate these strategies into their own communities.

We wish to thank the cities who participated in this study. Created with our partners at the American University Department of Public Administration and Policy, this guidebook is meant to be a resource for cities as they lead the way forward in this exciting and ever-evolving space.

Brooks Rainwater

Senior Executive and Director Center for City Solutions National League of Cities

TRANSPORTATION CONGESTION SENSORS

Smart transportation systems use sensors to detect congestion and bottlenecks in traffic patterns. They also rely on cameras to enforce speed and traffic infractions. In doing so, these tools gather real time information that can be used by city DOTs to make mobility networks safer and more efficient.

WATER AND WASTEWATER MONITORING

Monitoring devices can detect leaks as well as changes in water pressure to determine whether water infrastructure is working properly.

PARKING APPS AND KIOSKS

Apps coordinate with smart parking meters to inform drivers of where there is parking availability.

BRIDGE INSPECTION SYSTEMS

Sensors monitor the structural soundness of bridges and inform city engineers of any issues. Drones are used to inspect hard to reach areas.

SELF-DRIVING CARS

3

5

6

Self-driving cars shuttle people in and out of the city, providing rides for others and making deliveries while their owners are occupied with work or other activities.

WASTE MANAGEMENT SENSORS

Sensors detect the amount of garbage in recepticals around the city so that sanitation workers can maximize efficiency in their routes.

LIGHTING

LED lights are weather adaptive and communications are automatically sent to the Department of Public Works when the bulbs need to be changed

FIRE DETECTION

Sensors monitor conditions in public parks and wooded areas that might be prone to fire. Sensors can also detect fires in buildings and initiate a call to the fire department in an emergency.

ENERGY MONITORING

Power plants can be monitored for safety and city officials can be informed of any influx in radiation levels.

SOLAR PANELS

Solar panels can be monitored to determine how much energy they are providing and whether they need maintenance.

INTERNET OF THINGS IN CONNECTED CITIES

very consumer product and piece of infrastructure increasingly has the ability to consumer's preferences and sense surrounding stimuli, to communicate with other devices and people, and to draw on the computing and storage power of the cloud. This phenomenon has been dubbed the **internet of** things. The more smart devices

SMART LOGISTICS/FREIGHT

Platooning trucks carry freight efficiently from the port to their final destination. Smart inventory systems inform operators about when freight is moved between different locations.

VEHICLE FLEET COMMUNICATION

Public transit and city fleet vehicles communicate 12 with their home agency when it is time for maintenance or replacement.



and sharing platforms there are, the more data is generated about habits. But what does this mean for cities? Smart cities are employing the same technology to connect their disparate utility, infrastructure, and public service grids, generating real-time aggregate data. This, in turn, can

help cities manage their programs and services more effectively and gauge their impact immediately. The city of the future is an interconnected one, where devices communicate with one another in a constant stream of data that provides real-time information to the public and to the municipality.



DRONES

Drones can be used for law enforcement and firefighting, as rural ambulances, for infrastructure inspections, and for environmental monitoring. Commercial uses include precision farming, aerial photography, and in the near future, package delivery.

SURVEILLANCE CAMERAS

Cameras ensure security by monitoring activity in areas that are not frequented by public safety officers. Areas that are not open to public access can be monitored to keep unauthorized personnel out.



BODY CAMERAS

Public safety officers can wear body cameras that capture footage of interactions between themselves and city residents to ensure safety for both parties.

(16)

WEARABLE DETECTION

Cities can build in smartphone and wearable detection sensors so that people can be an active part of the internet ecosystem, communicating with the city, and with each other.

BROADBAND INFRASTRUCTURE

A reliable internet ecosystem is the glue that holds the internet of things together.











Executive Summary

This report examines the meanings and practices associated with the term 'smart cities.' Smart city initiatives involve three components: information and communication technologies (ICTs) that generate and aggregate data; analytical tools which convert that data into usable information; and organizational structures that encourage collaboration, innovation, and the application of that information to solve public problems.

Hence, a smart city is a city that has developed some technological infrastructure that enables it to collect, aggregate, and analyze real-time data and has made a concerted effort to use that data to improve the lives of its residents. Such an effort should include explicit policy recommendations regarding 'smart' infrastructure and data, a functioning administrative component, and some form of community engagement.

To better understand smart cities in practice, this report outlines smart city initiatives in five cities. For each city, the report focuses on the organization of the initiatives, the policy and administrative components guiding the initiatives, and community engagement around smart development. The findings are summarized here:

- Chicago, IL: In 2012, Chicago Mayor Rahm Emanuel signed the city's open data policy. It created an open data platform and mandated cross-functional collaboration, all managed by the Department of Innovation and Technology. That policy and the administrative structure it created positioned the city to partner with universities and the private sector on sensor projects like the Array of Things, which aims to collect and disseminate real-time data, thereby catalyzing innovation in the city.
- Philadelphia, PA: In 2011, Mayor Michael Nutter issued an executive order establishing the Office of Innovation and Technology (OIT) of Philadelphia. The creation of this office allowed for city leaders to have a more hands-on approach to ICT initiatives in the city. City oversight as well as partnerships with private and public entities has moved Philadelphia toward many smart city concepts.

- Charlotte, NC: In 2011, Envision Charlotte was established as a public-private collaboration (PPC) to help the city sustain its accelerating population growth. As a new organization, Envision Charlotte is currently working on ways to reduce energy use in commercial buildings through behavioral changes.
- San Francisco, CA: San Francisco has a history of strong leadership interest in making the city smart and sustainable through environmental and transportation improvement measures. Furthermore, San Francisco's OpenData initiative, launched in 2009, supports smart cities initiatives that aim to meet greenhouse gas reduction goals and improve and increase public transportation service.
- New Delhi, India: New Delhi is in the initial planning stages of its tempered by realism. Cities should smart cities initiative, which is part critically examine smart city technologies of the broader overarching goal and the rhetoric that surrounds them. Cities should be mindful, too, of the of India's smart cities program that ties into the United Nation's organizational challenges that accompany Sustainable Development Goals. smart city implementation. Functional The city is following the lead of silos, the challenges of cross-sector the nation's existing environmental collaboration, and political gridlock will policy and land pooling policies. not disappear with the arrival of these

While ICT infrastructure makes the technological aspects of smart development easier, the organizational components remain challenging. Cities should work to lay the groundwork for smart development. Establishing the necessary policies (such as open data and e-governance policies) and administrative capacity (for example, a department for innovation and technology) in advance will better position cities to take advantage of these new technologies.

Rather than looking for solutions first, cities should consider the outcomes they want to achieve. They should find out what their residents and local businesses want to see happen, and turn those desires into clearly defined objectives before proceeding with smart initiatives. A city's existing comprehensive, transportation, and sustainability planning documents can help guide the establishment of goals. Conversely, smart cities can help to accelerate the goals outlined in those documents. Looking to other cities for frameworks and best practices can also provide valuable guidance, but not a set of instructions.

Leveraging technology to improve the sustainability and equity of cities is a powerful idea with enormous potential. Those ambitions, however, should be tempered by realism. Cities should

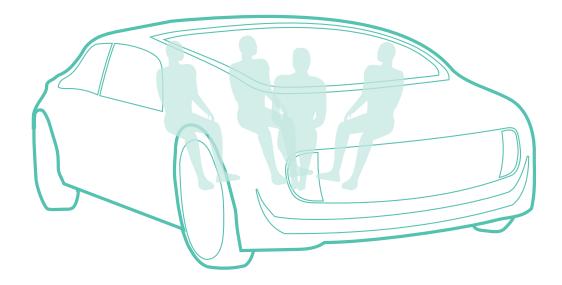
al collaboration, and political gridlock will not disappear with the arrival of these new 'smarter' systems. If these challenges can be overcome, then smart city development can prove beneficial.

Introduction

(ICTs) have made possible decades-old visions of smart cities where democracy and city management are guided by ICT-generated data.

According to the International Data vague and undefined. Though generally Corporation (IDC), the digital universe understood to mean the use of new (the amount of digital information created technologies and data platforms to and replicated in a year) increased by 62 percent in 2009, reaching 1.2 million petabytes in 2010. By 2020, the IDC involved. That is, in part, because the estimated that the digital universe concept of 'smart cities' is not limited to would be 44 times larger than in 2009. one system. Smart cities implementation Connectivity has also grown. Business and adoption involves a paradigm shift, Insider estimated that there were 1.9 billion in which cities commit not only to using devices connected to the internet in 2013. a new technology to act more efficiently, and that the number would grow to 9 but also to changing their policies and billion by 2018. This growth in data and operating procedures in a way that connectivity makes it possible to imagine supports their goal. Smart city adoption a world in which real-time information many different public problems. Smart can be gathered, analyzed, and used to influence public policy and the built cities systems also often involve actors environment in new, 'smart' ways. from each sector - public, private, and

For all of their promise, some believe that smart cities remain conceptually



Improvements in information and communications technologies

improve the functioning of cities, there are also concrete policies and practice shifts

- can comprise many different solutions to nonprofit - forming partnerships and working together on innovative ways to improve city life.

The emphasis on innovation also means that how we define smart cities changes continuously. When Cisco Systems helped South Korea turn Songdo into an automated urban environment in 2009, radio frequency identification (RFID) technology was cutting edge. By 2012, with the rise of smartphones, RFID was considered somewhat outmoded. Similarly, investment in municipal broadband was enough to make LaGrange, GA, the "Intelligent Community of the Year" in 2000, but is not enough to qualify it as a smart city today. The technology used in smart cities is often new or evolving, and prone to rapid change and development.

The overarching objectives, however, and the policy and administrative components required to realize those objectives, are more durable. Though RFID cards may no longer be the best way to forge a digital connection, enhancing that connection is still the purpose of much

smart city development. Cities interested in developing smart programs and embracing the smart city paradigm shift will need to consider how to initiate and govern those programs, address the concerns of their citizens, and cope with a rapidly changing environment.

To better understand the smart city trend, this report will offer five case studies detailing the ways in which specific cities are implementing smart city projects including: Chicago, IL; Philadelphia, PA; Charlotte, NC; San Francisco, CA; and New Delhi. India. These case studies will focus on what the initiatives are, how they are organized, structured, and administered, and how the community has been engaged in their development and implementation. Examined together, the cases will provide lessons for other cities considering smart city programs.

projects including:



This report offers five case studies detailing the ways in which specific cities are implementing smart city

Case Studies

Chicago, IL

Chicago has decidedly embraced smart city principles. As Mayor Rahm Emanuel's top tech lieutenant put it, Chicago wants to become "the most data-driven government in the world."

One initiative that aims to make that aspiration real is the Array of Things (AoT) project. The AoT is a network of sensors (called nodes) that will be mounted on streetlight traffic signal poles, where they will measure temperature, barometric pressure, light, vibration, carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, ambient sound intensity, pedestrian and vehicle traffic, and surface temperature. Fortytwo nodes were scheduled for installation during the summer of 2016, with a total of 500 to be deployed by the end of 2018.

The stated goal of the project is broad and ambitious. It aims to, "measure the city in sufficient detail to provide data to help engineers, scientists, policymakers and residents work together to make Chicago... healthier, more livable and more efficient."The connection between the sensor network and healthier, more efficient city life, however, is an open question. The immediate goal of the project is to collect data, aggregate it in a central server, and make it publicly available. Charlie Catlett, the project lead, thinks that providing this data to the public will inspire people to create "all sorts of applications taking advantage of the data." Not everyone in Chicago, however, is convinced that these applications will be as valuable



to the city as hoped. As The Chicago Tribune put it, it's unclear whether this, "will lead to meaningful improvements in urban life... or just enrich big tech vendors." Adie Tomer, a fellow and expert on smart infrastructure at the Brookings Institution's Metropolitan Policy Program, cautioned that claims of digital infrastructure investment leading to improved quality of life or economic performance are untested. Given that nodes are only now being deployed

- throughout the city, there isn't yet any evidence to evaluate the program's outcomes. It will, however, be evaluated nine months after the initial installation and every 12 months from that time on.

Policy

Chicago has been laying the policy groundwork for its smart city development for a while. In 2012, Mayor Emanuel issued an executive order establishing the city's open data policy. The order was intended to empower residents by providing them with information they need to participate in government, solve problems, and promote social progress and economic growth. To make the data public, the order required that an online data portal be created and maintained (the same portal that will be used for the AoT data). This executive order laid the groundwork for managing the data generated through sensor projects. It established transparency and open government as key commitments for the city. It also delineated what, when, and how data should be made public, and instituted reporting requirements to increase municipal accountability. Having those policies in place put the city in a stronger position to partner on smart city sensor projects.

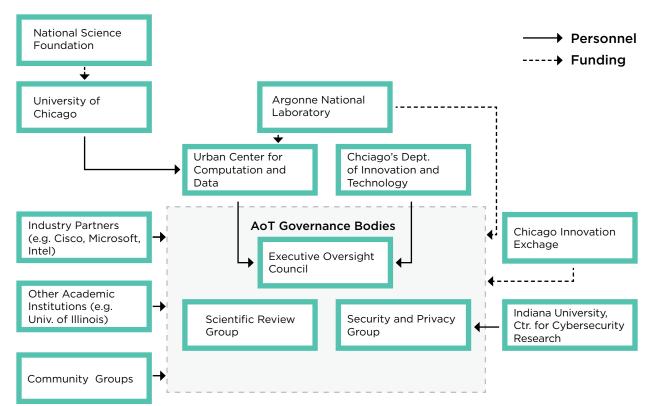
The AoT has also had to establish some of its own policies. A privacy policy, for example, details how data with personally identifiable information (PII) will be managed and secured. PII will not be made public, but may be contained

in data used to calibrate and test the machines. Any such data, however, will be housed in a secure facility and access will be restricted. This emphasis on privacy extends to the design of the nodes themselves. Images collected by the sensors will be processed into numerical data within the node itself, and the image data will be deleted.

Administration

Whether or not it improves city life, the AoT is instructive in how it was organized and developed. The project is a partnership among Argonne National Laboratory, the University of Chicago, and the city government, with input and support from an array of other

Figure 1: AoT Policy Field Map



universities and private corporations. such as AT&T, which will provide the wireless network to transmit the data (see Figure 1). The project is funded in part by a \$3.1 million grant from the National Science Foundation, part of the White House's investment in smart city development. Argonne National Laboratory has already invested over \$1 million in internal research, while the Chicago Innovation Exchange invested an additional \$150,000. Besides providing administrative support, the city funds the installation of the nodes and provides the small amount of electricity needed to run them.

The University of Chicago and Argonne National Laboratory will be the program's operators, responsible for the design, development, repair, replacement, and support of the nodes, while the city will provide oversight, policy guidance, and some technical support. An Executive Oversight Council (EOC), co-chaired by the Commissioner of the City's Department of Innovation and Technology (DOIT) and the Director of the Urban Center for Computation and Data at the University of Chicago, will be responsible for overseeing the program. There will also be a Security and Privacy Group (SPG) to advise the EOC and a Scientific Review Group (SRG). Thus, the partnership between the city and non-governmental actors is not just one of funding, but will include hands-on support and oversight.

In addition to laying the policy groundwork for programs like the AoT, Mayor Emanuel's open data executive order also developed the administrative capacity needed to manage the city's

smart initiatives. The order made the DOIT responsible for overseeing the open data policy. To administer it, the mayor designated a chief data officer at the DOIT, mandated that each agency designate open data coordinators, and created an Open Data Advisory Group to assess compliance and help agencies decide what data should be made available to the public. That administrative structure provided Chicago the personnel it needed to engage with the AoT.

The open data policy also precipitated Chicago's SmartData project, which was designed to "analyze and aggregate data, identify trends and offer problem-solving predictions." Operated by the DOIT,

the SmartData project looked through department workflows in Chicago for areas where predictive analytics could add value. Importantly, the analytics dashboard that the DOIT created and shared with all departments in the city was built to be open source and available to any interested city. Bloomberg Philanthropies provided a \$1 million grant to the project with the explicit goal of it spreading to other cities.

The AoT project is not the only smart city initiative being deployed in Chicago. City Digital, an endeavor of UI Labs, is deploying their own sensors to monitor flooding and create virtual maps of the cables and pipes beneath the city. Between those two projects and the city's existing open data policy, Chicago meets some of the smart city criteria, but not all. It has the capacity to generate and publicize data, but is relying heavily on external actors to put the data to use.

Community Engagement

The concern over privacy is not limited to project managers. There is still a question of how the community will respond to the sensors monitoring their neighborhoods. Lee Tien, a senior staff attorney at the Electronic Frontier Foundation, likened sensor projects to increased surveillance and wondered how much force such privacy policies will really have if the police, for example, request information that would violate them. The project managers are aware that concerns like these could be an issue. As part of their governance document, they've included provisions for community outreach in any areas where nodes might be placed. That outreach includes meeting with aldermen and women and community leaders, and holding community meetings with residents. In addition, they plan to hold workshops to, "introduce concepts, ranging from environmental science to electronics design to data analytics, to neighborhood youth."

The city's Smart Communities initiative includes a digital literacy and outreach program that increased rates of broadband adoption and internet usage, including job search[es] in the city's nine predominately African-American and Latino low- and middle-income neighborhoods. Between 2008 (when the program was implemented) and 2013, those neighborhoods in the initiative saw a 13 percentage point increase in internet usage.

While this program does not necessarily demonstrate high-tech delivery, it works to increase connectivity in the city, making it more likely that the resources developed through projects like the AoT will be utilized by and accessible to all city residents.

The Internet of Things

As wireless. Bluetooth, and sensor technology has become increasingly sophisticated and inexpensive it has moved from being found exclusively in expensive hi-tech products such as computers and cell phones to increasingly low-tech, even analog, items such as thermostats, coffee makers, and even toys. Together with the advent of cloud networked computer, which has minimalized the need for physical storage and computing power in a device, the devices around us are undergoing a conceptual reinvention. Every consumer product or piece of infrastructure increasingly has the ability to sense surrounding stimuli, to communicate with each other, and to draw on the computing and storage power of the cloud. This phenomenon has been dubbed the Internet of Things (IoT). Essentially, the seismic change that the internet brought to computers is now extending itself beyond computers to increasingly simple and inexpensive devices. Market incentives for this shift are high. The more smart devices there are, the more data is generated about consumer's preferences and habits. But what does this mean for cities? Smart cities are employing the



same technology to connect their disparate utility, infrastructure, and public service grids, generating realtime aggregate data. This in turn can help cities manage their programs and services more effectively and gauge their impact immediately. Sensors installed on water pipes can detect leaks and communicate them to the water utility instantly. Smart parking meters can notify parking agents when they are timed out, as well as residents when a space is free. Smart infrastructure communicating with its utilities is just a one-sided exchange. Increasingly, as autonomous vehicles and drones fill city streets and skylines, smart cities will invest in infrastructure to vehicle (I2V) technology, where traffic lights and public infrastructure communicates with the smart devices around them. The city of the future is an interconnected one, where devices communicate with one another in a constant stream of data that provides real-time information to the public and the municipality. As this trend accelerates, innovative cities will become more efficient, open, and responsive to their residents.





Philadelphia, PA

Philadelphia has embraced smart city initiatives to help promote equity throughout the city. Much of the city's urban population density is a result of its historically industrial economy, which by the 1970s had largely relocated or disappeared.



This downturn left Philadelphia with a high poverty rate. Since then, city officials have been challenged by balancing the needs of residents, "left behind by postindustrial economic restructuring and aggressively transforming Philadelphia into a competitive node in the globalized economy." According to the Center City District's 2015 annual report, Philadelphia ranked second in urban density to Midtown Manhattan. With high urban density and a poverty rate of 25.8 percent, Philadelphia still struggles with issues of income disparity and building an inclusive municipal economy. Much like many older, developed cities in the U.S., Philadelphia officials are looking for new ways to manage urban growth during an era of tight budgets and often conflicting priorities.

Policy

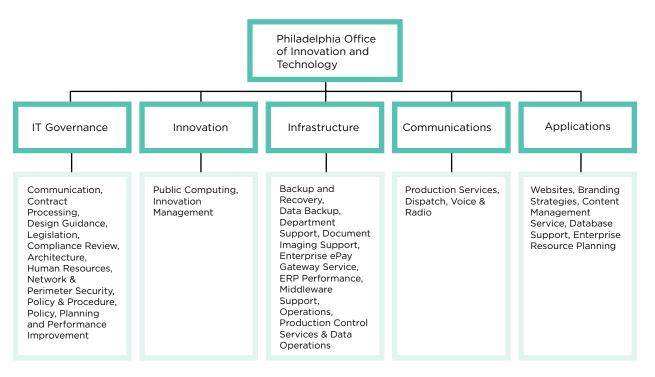
In 2011, Mayor Michael Nutter issued an executive order establishing the Office of Innovation and Technology (OIT) of Philadelphia. OIT's mission is to oversee all ICT initiatives for the city of Philadelphia. By creating this office, city officials hope to improve the effectiveness of any ICT initiatives in meeting the needs of the city. The OIT focuses on five branches of ICT: IT governance, innovation, infrastructure, communications, and applications. Within those branches are sub-branches that promote specific tasks and goals. Figure 2 outlines the structure of the OIT.

Administration

Additionally, Philadelphia is using ICTs within the Philadelphia Police Department (PPD) to develop preventative measures that will lower the city's crime rate. The "Smart Policing Initiative" (SPI) or "SMART" (Strategic Mapping Analysis Response and Tactics) is the city's effort to collect and analyze data on crimes within the city. The program looks at where crime is occurring in the city (also known as hotspots) and attempts to determine why. This data collection allows the city to use its limited resources on areas where they will have the biggest impact on reducing crime.¹ With grants provided by the Bureau of Justice Assistance (BJA), the program uses data analysis, including analytical models, GIS mapping, and predictive analysis to identify these hotspots so that a targeted response can be deployed to these areas faster.

As of 2013, out of the 38 police departments around the United States that have implemented SPI, Philadelphia has been among the most successful at lowering crime rates. Philadelphia's high

Figure 2: Philadelphia OIT Structure



crime areas have seen a drop in the crime rate since the implementation of SPI through the application of data analysis and an organizational change within the PPD. Although hotspot policing has been part of the PPD since the late 1990s, recent adaptations of analytical methods, such as GIS, have provided the PPD with a new way to look at existing data. As of 2014, the PPD had trained 26 police officers as analysts.²

City officials in Philadelphia have also partnered with outside sources to help research and implement smart city initiatives. In 2015, experts from Drexel University and the University of Pennsylvania's Institute for Urban Research joined the MetroLab Network as participants in a White House initiative to make universities and their local

- cities partners in using technology to solve the challenges that face growing urban areas.³ The MetroLab Network is supported by a \$1 million grant from the MacArthur Foundation that will focus on 60 smart city projects starting in 2015.
- ls, Research universities have the "physical and human resources to help their cities
- meet complex urban challenges through undertaking research, development and deployment of innovative projects at a lower cost."⁴ This network of partnerships focuses on sharing data, analytics, and innovative new practices. Pairing universities with policy makers provides a cost-effective way of implementing smart city initiatives within a city.
- According to Charles Haas, head of the Department of Civil, Environmental and Architectural Engineering at Drexel,

the university "has had a long history of working with agencies of the City of Philadelphia to apply knowledge and skills to help contribute to solutions to challenges that face the city."⁵ In collaboration with the city of Philadelphia, Drexel and the University of Pennsylvania will focus on incorporating technology and analytics to improve existing public service infrastructure, to measure the impact of new infrastructures (to include green infrastructure), and to address inclusive economic development.

The University of Pennsylvania is also partnering with the city of Philadelphia to promote data collection via geospatial technologies that are used to visualize, measure, and analyze the earth's features. The technologies include GPS, GIS, and remote sensing (RS). The OIT provides GIS services that help "develop and deliver state-of the art... technology and services to the enterprise (citywide)."⁶ GIS Services Group (GSG) provides city officials with the technology to help develop, deploy, and maintain spatial data, as well as provide 30 geospatial web services. With over 200,000 hits daily, the city's geospatial web services and applications provide relevant information on urban development and have broad applications for Pennsylvania's businesses and nonprofits.

Community Engagement

Another initiative that the OIT is working towards is Philly311, which will open the lines of communication between Philadelphia residents and the government. Philly311 uses social media and phone applications as a forum to communicate with citizens in real time.⁷ An example of this communication includes city leaders using Twitter to communicate to citizens about traffic patterns. As Philadelphia's urban population continues to grow, Philly311 has the potential to improve communication between public officials and residents.

Charlotte, NC

Over the past decade, Charlotte has undergone tremendous growth. According to the U.S. Census Bureau, Charlotte saw the 10th largest increase in population among large cities.

Charlotte grew by 17,695 people from July 2014 to July 2015, resulting in a total population of 827,097^{8.9}. While most large cities such as New York, Boston, and Chicago are seeing slow or negative growth, Charlotte has become a hub for major corporate expansions as well as an expanding suburban population. With vast amounts of rural area, warmer weather, and lower costs of living, southern cities such as Charlotte present not only opportunity for business owners but also a more hospitable environment for families aiming to move away from larger, overpopulated, and older cities.

Much of Charlotte's economic success is attributed to being the second biggest banking center in the country behind New York City. Charlotte hosts the headquarters of Bank of America, as we as major regional operational facilities fo a number of other institutions, including Citi, Ally Financial, JPMorgan Chase, and Wells Fargo. New jobs are quickly being added to Charlotte as these banking institutions contribute to a wide economy in financial services.¹⁰ With an increase in available jobs, there has beer an influx of younger people moving to Charlotte for education and employmen opportunities.¹¹ The city is currently facir the pressures of population growth, and focusing on ways to sustain this growth.



Policy

	Unlike other cities, where the city
	government plays a large role in many
È	smart city initiatives, city leaders in
	Charlotte have taken a more hands-off
	approach. Instead of actively collecting
	data and constructing metrics, the
-	municipality has embraced a market-
	oriented and facilitative role, aiming to
t	"encourage independent actions from
S	a wide range of participants." ¹² The city
	of Charlotte intends to use outside
	resources to educate citizens on how
	their behaviors contribute to problems
	such as energy waste, and how they car
5	change those behaviors. ¹³

Administration

e	One smart initiative is Envision
or	Charlotte, a non-profit public private
l	collaborative organization established
	in 2011 and funded by grants from the
	Department of Energy. Envision focuses
	on using sustainability to promote
er	economic development. Created by
	partnerships between Duke Energy,
ſ	Cisco, and Charlotte Center City
	Partners, Envision Charlotte aims to
nt	help "accelerate [initiatives] fueled by
ng	civic and corporate leaders committed
lis	to further transforming the city into
	the country's most sustainable core." ¹⁴

In a statement about partnering with Envision, Cisco Chairman and former CEO John Chambers said. "as cities all over the world experience significant population growth, the need to sustainably balance social, economic, and environmental resources becomes even more paramount... Cisco believes that technology can transform how the world manages these energy and environmental challenges."

Envision's first initiative was a partnership with Duke Energy to focus on reducing energy use in Charlotte's Center City. The project's primary focus is on reducing wasted energy consumption in commercial buildings within Charlotte's downtown area through innovative technologies that encourage energy efficiency and changes in consumer behavior.¹⁵ As of late 2015, the program successfully reduced power usage in participating buildings by 8.4 percent and saved more than \$10 million.¹⁶

Although fairly new, Envision has already impacted Charlotte. From partnering with Duke Energy on this initial project, Duke Energy has been able to commercialize "Smart Energy in Offices" (SEiO). By "adopting a team mindset and fostering ownership -- two key elements in any successful work environment- SEiO makes it simple... for property managers, building operators, and tenants to minimize workplace energy use."¹⁷ SEiO will help teams reduce energy waste with the following steps:

- **1.** Provide accessible information about energy use in buildings, load factors, historical trends, and how to interpret the information
- 2. Institute goals and opportunities through "Energy Action Plan"
- **3.** Create campaigns, games and other initiatives to motivate individuals to become "Smart Energy Workers"
- **4.** Receive recognition in the community as their building advances through "Levels of Achievement"¹⁸

Community Engagement

Envision Charlotte has also been a model for other cities in the United States to engage their residents to change their behaviors and to promote sustainable communities. A spin-off group called Envision America will help other cities learn from the Charlotte campaign. As of 2016, ten cities were selected to kick off Envision America initiatives and to attend workshops that will bring together city leaders, smart city experts, and corporate partners to learn about the successes of Envision Charlotte and to start facilitating project planning and implementation.

San Francisco, CA

San Francisco is a worldwide tourist destination that houses some of the world's largest financial institutions and is known as a city of innovation and technology.

In 2011. San Francisco was declared the Policv Greenest City in the U.S. and Canada Green City Index and the Cleantech To achieve its zero waste goal, San Capital of North America.¹⁹Like other Francisco displayed great political cities, San Francisco's leaders want to determination in passing a raft of make the city safer, more affordable legislation,²⁰ including Resolution Setting Zero Waste Date, the Mandatory and equitable, and reduce its emissions footprint. Unfortunately, the dramatic Recycling & Composting Ordinance, and the Mayor's Executive Order Enhancing population growth San Francisco has witnessed for the past decade has raised Recycling and Resource Conservation. the cost-of-living to one of the most The city also provides online tools using expensive nationally and strained the open source software and an open data citv's infrastructure and governance. For model to provide localized and accurate this reason, San Francisco has led the way results.²¹ To complement these policies, in incorporating sustainable, innovative, the city partners with like-minded and ambitious strategies to accelerate its organizations to develop new programs smart city adoption. and create a culture of recycling and composting. To reach San Francisco's goal of

In pursuit of this goal, San Francisco focuses on using technology to make building operations more efficient, becoming carbon-free by 2030, the reduce energy use, streamline waste city has implemented a comprehensive management systems, and improve set of incentive programs to improve transportation systems, all of which the performance of new and existing contribute toward greening the city. buildings. Various technology applications The city aims to achieve zero waste by have helped enhance these programs. 2020, become carbon-free by 2030, and For example, the San Francisco Energy meet transportation-related demand Map is a tool that tracks solar and wind by creating a safer and more efficient installations across the city. Residents or transportation experience for everyone. businesses can go to the website to see To achieve these goals, San Francisco their roof's solar potential and access uses a three-pronged approach that rebates. Likewise, the Honest Buildings addresses both policy and administrative program helps buildings save energy using challenges and works to actively engage a software platform. The online portal informs property owners, managers, and the community in all of these initiatives.



tenants about their building's performance and provides the most effective energy efficiency strategies to help them reduce utility costs.²²

Muni Forward is a project that takes a holistic view of transportation in San Francisco by making the system smarter. Using the 1973 Transit First Policy, which gave priority to public transit vehicles on San Francisco streets, along with improved technology and infrastructure, San Francisco aims to make getting around safer and more reliable. Muni Forward is replacing transit signals in San Francisco with new signals that can detect an oncoming Muni train or bus and hold the green light, allowing the transit vehicle to make it to the next stop faster, reducing traffic congestion, and improving reliability. The city has also created a state-of-the-art Transportation Management Center (TMC) to improve communication with Muni bus and train drivers, helping it monitor and improve transit services. Finally, the radio communication system was modernized and incorporated with an Intelligent Transportation System (ITS).

These are only some examples of how San Francisco is becoming a smart city leader by using technology to improve its public services. None of these smart city initiatives would have been possible without the city's open data platform, San Francisco OpenData. San Francisco OpenData is the city's open data portal and a product of the official open data program that was launched in 2009.²³ DataSF is the city's one-stop website for government data. The open data legislation requires city departments to make all non-confidential datasets under their authority available on DataSF. DataSF uses transportation data to improve transportation needs and commute times, and to help meet greenhouse gas reduction goals. The platform also provides an app for Muni bus or train commuters that lets commuters buy Muni tickets and plan their trips.

Administration

San Francisco's smart city programs are guite ambitious and require strong partnerships between public agencies and the private and non-profit sector. With its strong leadership, the city is attempting a collection of pragmatic and effective policy reforms. The San Francisco Municipal Transportation Agency (SFMTA) and the San Francisco Department of the Environment are playing prominent roles in the city's smart city initiatives and have cross cutting goals of improving San Francisco's transit while pursuing environmental goals like zero carbon. The city plans to implement Muni Forward in phases to optimize financing and minimize service disruption. On November 4, 2014, San Francisco voters approved Proposition A, which included \$150 million in funding to design and build Muni Forward projects. Future funding is expected from other sources for a combined total funding of \$230 million.²⁴ SFMTA also manages SFpark to improve parking in the city by collecting and distributing real-time information about available parking spots.

Community Engagement

The city's Open Data Policy highlights the social and economic benefits of increased government efficiency and civic engagement.²⁵ Making data publicly available is a great way for cities to engage with their communities. SFMTA proactively solicits community input and shares its plans, data, and success widely and visibly. SFMTA uses its interactive performance dashboards to collect feedback and track its progress i meeting the goals and objectives outline in its strategic plan. SFMTA also uses the 'capital improvements' map to inform the projects and programs across the city. Likewise, the San Francisco Department of the Environment put its mission into action by mobilizing communities. To meet its 2020 goal of zero waste, it continues to develop new programs and expand community outreach. The agenc believes that community engagement enables city staff to better understand barriers and challenges to zero waste an carbon free programs, create or adjust programs, and plan for the future.

Another smart city initiative Mayor Ed Lee introduced is the Living Innovation Zones

ly in ed e	project. The project helps businesses transform prototypes into products and services by designating zones throughout the city where businesses can use city assets to demonstrate new and emerging technologies. The project provides innovators with a real-world setting to test new ideas, evaluate next generation technologies, and collect data about impact. It also encourages businesses to engage in advancing the city's sustainability goals, promotes efficient government, and ensures a better quality of life for San Francisco residents, all while educating the public about innovative solutions in the process. ²⁶
t d cy nd .ee	Mayor Lee's leadership supports San Francisco's sustainability goals by developing the city's Cleantech, transportation, energy, waste, built environment, and other sectors for maximum effectiveness and environmental benefit. ²⁷ With so many smart city initiatives on the ground and the city's reputation for being technologically innovative, it is unsurprising that San Francisco is a global leader in smart city development

New Delhi, India

New Delhi is the largest commercial center in northern India. The population of Delhi has increased rapidly over the past decade, reaching 18.6 million in 2016, and it is expected to grow another 40 percent by 2020.²⁸



At this rate of accelerated urbanization, the government is under tremendous pressure to deliver public services like transportation, water, electricity, and affordable housing. In the past two decades, Delhi's urban area has almost doubled, leading the average commute to increase from 8.5 kilometers to 10.4 kilometers.²⁹ Distant city residents rely on automobiles, contributing to traffic congestion, rising greenhouse gas emissions, air pollution, and poor public health. Without the right design and planning by the city, existing problems of congestion, traffic, pollution, and safety will only metastasize and worsen.

The government of India has historically promoted various urban development initiatives, such as the Integrated Development of Small and Medium Towns (IDSMT) program in 1979 and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in 2005. However, many urban development goals have barely been met. Due to either economic, technological, or political reasons, only a few local governments have been able to take sufficient steps towards implementing best practices and meeting these goals in their cities.³⁰

Policy

After more than 40 years of studies into a rail-based mass transit system,

Delhi Metro Rail Corporation (DMRC) was established in 1995 and began construction on October 1, 1998.³¹ The Delhi Metro project became the first railway project in the world to be certified for carbon credits for reducing greenhouse gas emission by the United Nations.³² To improve the train system's efficiency, DMRC partnered with Google India (through Google Transit) in 2010 to provide free train schedule and route information to commuters through mobile devices with Google Maps.³³ By the second-half of 2016. DMRC is planning to provide free high-speed broadband internet to its 2.7 million passengers.³⁴ Commuters will then be able to access real-time information regarding train location, approach, and destination, and navigate between different lines. The Delhi Government plans to introduce a Common Mobility Card2016, which will allow riders to access Metro trains. Delhi Transportation Corporation buses, and cluster buses.³⁵ Delhi Metro is an excellent example of a city transportation system that gradually adopted smart city systems.

As the country's government changed in 2014, an emphasis was placed on the use of smart principles for improving conditions in existing towns and cities across the country.³⁶ In June 2015, the Smart Cities Mission was launched as yet another attempt at enabling better living there is no information available to the conditions and achieving higher economic public regarding the deployment of open growth in 100 Indian cities.³⁷ Prime data or use of specific technologies like Minister Narendra Modi saw challenges as cloud storage or big data, as outlined an opportunity and introduced his smart by the relevant policies and laws.⁴⁰ cities initiative.³⁸ Drawing on the practices adopted by cities across the world, the Centre for In parallel to the New Delhi Municipal Internet & Society suggests that smart Council's smart city project cities in India should adopt robust implementation, the Delhi Development regulatory and governance frameworks Authority (DDA) has introduced a land regarding technical standards, open data, pooling policy to address one of Delhi's and data security and data protection primary challenges: affordable housing policies.⁴¹ Nevertheless, India's Open Data to accommodate its growing population Policy and data protection standards as well as to lay the infrastructure to under section 43A of the Information implement ICT technology as proposed Technology Act (ITA) do apply and help by the municipal council for the to ensure the sustainability and efficiency smart cities challenge grant. Besides

of the county's smart cities while regulating the land pooling policy, DDA safeguarding individual rights. is also committed to accountability and transparency by allowing the Administration population to monitor its infrastructure projects online. All construction-related The central government approved a data are updated in real-time in online budget of INR 48,000 crore (USD 7.8 measurement books that then link billion) to be spent over a five-year them with a contractor's payment and period (FY 2016 to FY 2020) on smart customer feedback to ensure higher cities initiatives in 100 designated cities quality of work.³⁹ The system also offers a in India. The state and local governments library of General Packet Radio Services are expected to equally match the of construction sites and status reports.

New Delhi residents and the local government are using social media actively during planning and implementation. In the wake of smart cities initiatives and active social media, no enabling legislation or policy has been formulated by the central government, apart from releasing a "Mission Statement and Guidelines" for the smart cities competition. Neither the national nor the local government provides any relevant applicable laws and policies for the initiative. Likewise,

central government funds. According to the Smart City Mission Statement & Guidelines (2015), India's objective is to promote cities that provide core infrastructure and give a decent guality of life to its citizens, a clean and sustainable environment, and application of smart solutions. The focus is on sustainable and inclusive development in compact areas to create a replicable model for other aspiring cities.⁴²

Among 100 cities, NDMC received a grant from the central government to foster the efficient management of urban services

through the application of technology. These services included water supply, sanitation, housing, waste management, and urban mobility. NDMC consulted with New Delhi residents on their requirement as a smart city and plans to develop smart bus stops, app-integrated cycle tracks, sensor-based smart parking, e-surveillance, including electronic tickets for traffic violations, automatic sewer cleaning machines and geo-tagging of bins. Other projects include providing Wi-Fi access points, air-quality sensors, noise-pollution sensors, and renovating Gole market.⁴³

As New Delhi progresses with its smart cities initiative, the city government has tentative plans to launch an app-based air conditioned bus service. The city's Transport Department stated that the new app-based services would enable commuters to reduce wait times by reserving seats on buses. Buses operating under this service scheme will be required to install two CCTV cameras. Wi-Fi. GPS, fire extinguishers, and first-aid kits. The original announcement of this new service indicated deployment in June of 2016. However, the project is currently placed on hold while the city seeks public opinion on the project's implementation.44

Community Engagement

The smart cities initiative in New Delhi is in a very early stage. The mission guidelines stipulate that each city needs to prepare a Smart City Plan that comprises an area development proposal and a pan-city initiative using smart solutions for delivery of urban services. It seems a natural fit for DDA to implement a land pooling policy ahead of NDMC's smart city project. This approach gives NDMC the infrastructure to incorporate digital solutions while providing affordable housing to the NDMC residents.

New Delhi's smart city initiative is a part of India's holistic smart cities plan that taps into the UN's Sustainable Development Goals (SDGs). A report by Price Waterhouse Coopers states that "the pillars of a smart sustainable city are completely aligned with the proposed UN's Sustainable Development Goals (SDGs) and the closer the integration of sustainability into India's '100 Smart Cities' initiative, the greater will be the linkages with the SDGs."45 At Prime Minister Modi's request, the Asian Development Bank (ADB) has committed to support the Ministry of Urban Development in its development of smart cities on the areabased development component of the smart city guidelines.⁴⁶ ADB has agreed in principle to set aside \$1 billion for extending loans to the smart city projects and the World Bank could provide up to \$500 million in long-term loans.

Case Study Comparison

The five case studies in this report research different data collection systems only compose a small fraction of cities such as GIS. Several of the cities, including Philadelphia, Chicago, San Francisco, implementing smart city initiatives. While the five cities cannot represent every and Delhi, also partnered with the federal smart city, their commonalities and government in their pursuit of smart city differences are instructive. Table 1 highlights projects, in some cases receiving grant the similarities of each city, focusing on support for various smart city initiatives. the policy domains covered, levels of Finally, the majority of the cities are using government involved, non-governmental smart city tactics to promote sustainability and overcome challenges associated with partners engaged, and instruments used. population growth.

Four out of the five cities focused on making data open and widely available. In Chicago and Philadelphia, for example, both mayors have signed executive orders establishing an open data policy. In addition, most of the cities are partnering with non-governmental entities, including universities and businesses, to develop smart city programs. For example, city officials in Philadelphia have partnered with the University of Pennsylvania to

Categories	Sub-Categories	Chicago	Charlotte	Delhi	Philadelphia	San Francisco
	Open Data	1	1		1	✓
Policy Domains	Sustainability		✓	1	1	✓
	Transportation			1		✓
Administration	Designated Department or Office	1			1	1
	National	1		1	1	1
Level of Government Involvement	Regional				1	✓
	Local	1	✓	1	1	✓
Non-Governmental	Universities	1	✓		1	✓
Partners	Private Companies	1	1	1	1	1
	Behavioral Nudge		1			1
Instruments	Open Sensor Data	1				1
Instruments	Land Pooling			1		
	Market Creation			1		1

These case cities are using a variety of instruments to achieve their policy goals. Rather than large policy changes, Charlotte is encouraging people to change their behavior and adopt energy-saving habits. Chicago, on the other hand, is attempting to catalyze innovation by making more data publicly available. Whatever the method, all of the cities are hoping to use ICTs to improve the lives of their residents.

Recommendations

The preceding case studies provide a glimpse into the on-theground reality of smart development. Cities are taking many different approaches to solving public problems, and there is no one-size-fits-all way to adopt and implement smart city systems. Through examination of the existing literature on smart cities and the experiences with smart development in our case cities, we have arrived at a set of general recommendations aimed to help guide other cities considering similar projects.

Recommendation 1: Cities should consider the outcomes they want to achieve.

public policy and what administrative capacity is needed to put the data to use. What that use is will vary by city. Not all cities face the same challenges or are suited to the same solutions. Before investing in smart city infrastructure, cities should consider what they need, not just what other cities are doing. Small cities don't necessarily face the same problems as large cities. San Francisco's smart parking program, SFpark, for example, might be an appropriate response to congestion problems in San Francisco but would be unnecessary in smaller urban areas that don't have the same problems. Though the conversation around smart cities has been largely driven by the private sector, it is not their job to define the city's objectives, only to provide them with the technology needed to achieve those objectives. Cities need to consider first and foremost what problems they

Data collection is not an end in itself. To be useful and relevant, it needs to be analyzed. The information that results from that analysis can then drive real applications to public problems. Cities should consider what public problems they want the initiative to address and how the data collected will help address those public problems. Additionally, assessment of public problems and data collection should be derived from and tied to existing city comprehensive plans, visions, and sector planning documents. The improvement in ICTs has made data collection considerably easier. In some of the case cities, the ease of data collection appears to have inspired cities to invest in smart initiatives without clearly defining what initiatives they seek to achieve. The challenge for cities is not a technical one of gathering or disseminating data - it's an organizational one. Cities need to consider how new data will influence want to solve, and then develop a model for how smart city technology can help them achieve those ends. Furthermore, cities should rigorously evaluate smart city investments and look at an array of options before committing themselves.

Recommendation 2: Cities should look for ways to partner with universities, non-profits, and the private sector.

Many of our case cities partnered with non-governmental actors. As with Chicago's Array of Things, those partnerships can cut across sectors and include a wide-range of actors. Cities can even partner with other cities on smart city initiatives.

Partnerships provide many benefits to cities. They give cities access to funding and expertise that might not otherwise be available. Many public problems are complex and can be too diverse for any single organization to tackle. That makes collaboration advantageous. Organizations are often able to do more together than they could alone.⁴⁷ Partnerships also allow cities to share the risks of development, which is especially valuable giving the evolving and often untested nature of smart city technologies. Finally, partnerships give projects continuity. Without external commitments and support, shifts in political power might cause a project to be cancelled or ignored.

That does not mean that there are not also drawbacks to collaboration. There are different organizational cultures, different missions, and different stakeholder groups that need to be negotiated and

aligned for a collaboration to work.⁴⁸ For example, it is important that there be a clear, mutually agreed upon purpose or mission for the partnership. Cities should weigh the motivation and commitment of their partners. They should consider the structure and governance of the collaboration, clearly delineating authority and responsibility. Formal arrangements, regular meetings, and informed points-ofcontact can help ensure that partnerships stay on track.⁴⁹ Cities should also consider how authority and responsibility will be balanced and what each partner is accountable for.⁵⁰ Taking all of these organizational pieces into account will improve the chances of a successful partnership. Furthermore, smart city partnerships come with their own set of specific considerations, such as how rights to intellectual property developed by the project will be handled and who owns the physical infrastructure deployed.

Cities need to consider the incentives and motivations of private actors. It is the job of companies in the smart city market to develop and sell technological solutions. As with the early days of e-government, cities should be cautious of unwarranted optimism and realistic about the powers of ICT systems.⁵¹ Elected city officials should carefully consider both the public and private sector interests inherent in smart city projects, whether they align with existing goals, and whether the project they have in mind is appropriate. There can be benefits and opportunities in fairly negotiated public-private partnerships, including maximizing scare municipal budgets. Even so, city officials should not enter into these partnerships in haste, or without asking the right questions about objectives and public good.

It's been noted that "while many of the technologies offer clear benefits, the 'smart' concept itself suggests a positive and uncritical stance towards urban development."⁵² Cities should look past the rhetorical dressing of smart city technologies and focus on what is appropriate for their cities. A strong administrative foundation backed by established smart city policies provides

Recommendation 3: Cities should continue to look for best practices and frameworks for 'smart city' development.

There is a lot of variability in the smart Though this report provides a window technologies being deployed. Some into what some cities are doing now, cities and universities are developing smart development is a rapidly changing their own pioneering sensors, like the field. Cities interested in becoming Array of Things nodes. Others are looking smart should continue to look for best to large private firms to supply ICT practices and frameworks for this type of solutions. The diversity in technology development. and the lack of agreed upon principles Though not yet fully implemented, for redesigning the built environment the National Institute of Standards presents a challenge for interested cities. and Technology (NIST), part of the The newness of smart development U.S. Department of Commerce, is means that not much has been codified.

cities with both the structure they need to take advantage of public-private partnerships, and the knowledge they need to critically examine smart city proposals.

Furthermore, it is worth reiterating that smart city development should be driven by demand in cities, not top-down or by supply alone.⁵³ Smart cities have been criticized for "turning cities into digital marketplaces for large multinational firms, blurring the lines between public and private and concealing new forms of social and economic inequalities."54 The smart city discourse often centers on technological questions not well understood by the public and therefore often dominated by private companies.⁵⁵ Bottom-up, democratic development would obviate some of these concerns and lead to more equitable growth.

working on a framework for smart city development.⁵⁶ The framework is designed to address two main concerns: the interoperability and portability of ICT development across cities, and the need for standard architectural principles. Their goal is to standardize enough that systems can be integrated across cities, without standardizing so much as to be an obstacle for further innovation.⁵⁷ In addition, the Smart Cities Council has developed a Smart Cities Readiness Framework that has been used by dozens of cities internationally to set a strategic direction.⁵⁸ Cities should monitor progress on frameworks like that being developed by the NIST and the SCC.

Continually keeping apprised of new developments and innovations in the smart development arena will also help cities manage the path-dependent dynamics of technological development.⁵⁹ Frameworks like NIST's can influence the way cities approach smart city development, helping them avoid being limited to the suite of proprietary technologies in which they initially invest by ensuring that those technologies can be integrated with new ones.⁶⁰

Leveraging ICT technology to improve the sustainability and equity of cities is a powerful idea with enormous potential. Those ambitions, however, should be tempered by realism. Cities should critically examine smart city technologies and the rhetoric that surrounds them. Cities should be mindful, too, of the organizational challenges that accompany smart city development. Functional silos, the challenges of cross-sector collaboration, and political gridlock will not disappear with the arrival of ICT

technology. However, if these challenges can be acknowledged and overcome, then smart city development can not only increase a city's efficiency, accountability, and transparency, but also leave behind an organizational legacy of innovation and collaboration that will continue to improve local governance.

Appendix

Definition

The conceptual uncertainty of smart cities has not stopped their advance. In September of 2015 the White House announced a smart cities initiative that will invest \$160 million in federal research to help local communities tackle their challenges.

In the announcement, the White House defined smart cities as. "communities that are building an infrastructure to continuously improve the collection, aggregation, and use of data to improve the life of their residents." The Initiative aims to harness the powers of the, "growing data revolution, low-cost sensors, and research collaborations," to assist those communities.

According to the Smart Cities Council city development, creating a global (SCC), a leading industry association, market that's expected to grow to \$1.4 "a smart city uses information and trillion by 2020. communications technology to enhance its livability, workability, and As the supply of new, smart ICT systems sustainability." Smart cities have been has grown, so have urban populations broadly characterized as employing ICTs and the problems of efficiency and social to solve problems in a wide range of sustainability. The barriers to smart city public policy domains, including energy, successes are often more organizational waste management, transportation, than technological. In most cases, healthcare, security, public administration, cities need to consider the policies education, and more. ICT systems can and administrative components that collect, transmit, and aggregate data from undergird, enable, and guide smart city the environment, allowing that data to initiatives. be analyzed and put to use. ICT systems can also enable objects and environments to sense, communicate, network, and produce information, forming the Internet of Things (IoT).

As the White House Initiative suggests, smart cities are not exclusively technological, but also involve creating collaborative environments and making the human capital investments necessary to catalyze learning and innovation. Thus, smart cities have two distinct focuses:

- **1.** leveraging ICT systems to solve public problems; and
- **2.** developing organizational structures that encourage the spread of knowledge and innovation.

The technological evolution of ICT systems has facilitated this first focus. Global businesses like Siemens, Cisco, IBM, and Microsoft have developed and pushed technologies to support smart

For the purpose of this report, smart city initiatives are defined as involving three components: ICT systems to generate and aggregate data; analytical tools which convert that data into usable information; and organizational structures that encourage collaboration, innovation, and the application of that information to solve public problems. Hence, a smart city is a city that has developed some technological infrastructure that enables it to collect, aggregate, and analyze realtime data, and has made a concerted effort to use that data to improve the lives of residents. Such an effort should include an explicit policy for 'smart' infrastructure and data, a functioning administrative component, and some form of community engagement.

It is important to remember that being smart is a process and not an end-state. There are many steps to developing smart environments and solutions, some of which may not register as smart city initiatives. For example, expanding broadband access through community outreach or the creation of new networks increases connectivity and lays the groundwork for future smart development, but does not itself constitute smart city implementation. Other programs meet some but not all of the criteria. The development of open data policies and platforms to share existing data can encourage innovation and prepare cities to handle future ICT-generated data pools, but do not necessarily include the analytical tools necessary to qualify as smart city initiatives. Alternatively, many of these endeavors represent important steps along the way.

Case Study Methodology

The case study comparison explores how a variety of cities have approached smart city development. While considered leaders, the case cities are mostly in the early stages of the smart city system adoption. While some are further along than others, many of the programs discussed are recently deployed. NLC is not, therefore, in the position to rigorously evaluate the outcomes of these initiatives. Instead, this report focuses on answering the following questions:

- What are the initiative's objectives and instruments?
- How is the initiative funded and organized?
- What policies structure and direct the initiative?
- How is the initiative administered?
- How has the community been engaged and responded to the initiative?

Cases were selected for their diversity in size, demographics, and geography. This type of case selection ensures that the best practices implemented in these cities and described in this report will be broadly applicable to other cities interested in smart development. To answer the key questions above, we reviewed academic articles, census data, policy papers, government documents, and newspaper articles from the case cities. In addition, we interviewed two subject matter experts (SMEs) on smart cities, as well as local leaders from the case cities.

TRENDS IN SMART CITY DEVELOPMENT

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