LUTHERAN LEGACY CAMPUS MASTER PLAN

APPENDICES

ADOPTED OCTOBER 25, 2021

City of Wheat Ridge

SCL Health

MIG

CONTENTS

APPENDIX A.1
MARKET CONDITIONS

MEMORANDUM

To: City of Wheat Ridge; MIG, Inc

From: Economic & Planning Systems

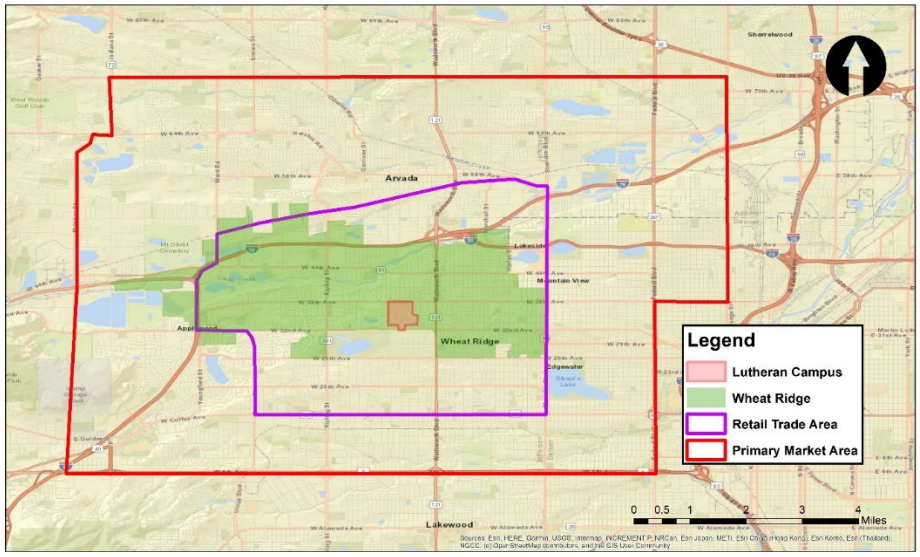
Subject: Lutheran Campus Master Plan Existing Conditions – Preliminary Findings

Date: May 19, 2021

This memorandum provides a summary of the preliminary findings related to existing demographic, economic, and market conditions present in Wheat Ridge and the surrounding area. The memorandum also contains a high-level strengths, weaknesses, opportunities, and threats (SWOT) evaluation for the site in terms of capturing new development. Lastly, some major plan considerations are provided.

Economic & Planning Systems (EPS) evaluated conditions within the City of Wheat Ridge and within a Primary Market Area that was defined to encompasses areas in the western portion of the metro area that have similar conditions and are likely to compete for capture of new development. The Primary Market Area boundary is illustrated in **Figure 1.**

Figure 1 Primary Market Area



The Economics of Land Use

Economic & Planning Systems, Inc.
730 17th Street, Suite 630
Denver, CO 80202-3511
303 623 3557 tel
303 623 9049 fax

Denver
Los Angeles
Oakland
Sacramento

www.epsys.com

Demographic Conditions

The City of Wheat Ridge has been growing in population and households at a slower rate than the surrounding Market Area and Denver-Aurora-Lakewood MSA (MSA or Metro Area) as a whole. In fact, the City lost population (856 residents) between 2000 and 2020 despite adding 450 housing units during this period.

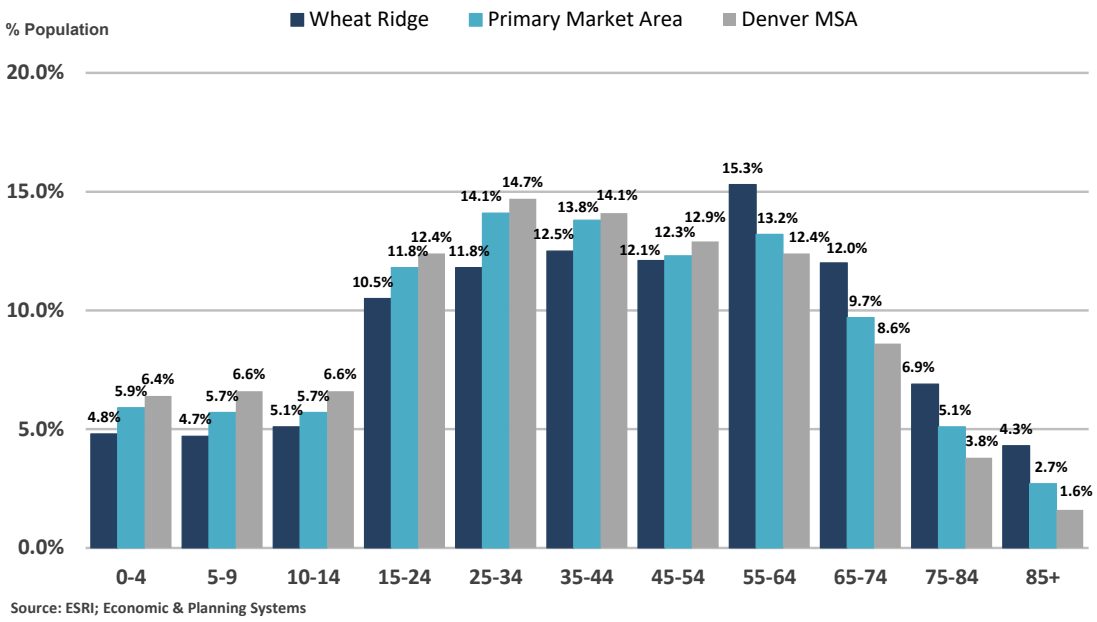
Table 1. Population, Households, and Housing Units, 2000-2020

Description	2000	2010	2020	2000-2020 Total	2000-2020 Ann. #	2000-2020 Ann. %	2010-2020 Total	2010-2020 Ann. #	2010-2020 Ann. %
Population									
Wheat Ridge	32,688	30,153	31,832	-856	-43	-0.13%	1,679	168	0.54%
Primary Market Area	236,582	226,287	254,787	18,205	910	0.37%	28,500	2,850	1.19%
Denver MSA	2,179,469	2,543,482	2,988,896	809,427	40,471	1.59%	445,414	44,541	1.63%
Households									
Wheat Ridge	14,466	13,964	14,709	243	12	0.08%	745	75	0.52%
Primary Market Area	94,906	95,634	107,203	12,297	615	0.61%	11,569	1,157	1.15%
Denver MSA	852,252	1,004,696	1,174,923	322,671	16,134	1.62%	170,227	17,023	1.58%
Housing Units									
Wheat Ridge	14,837	14,856	15,286	449	22	0.15%	430	43	0.29%
Primary Market Area	97,916	101,823	111,901	13,985	699	0.67%	10,078	1,008	0.95%
Denver MSA	891,120	1,078,837	1,238,723	347,603	17,380	1.66%	159,886	15,989	1.39%

Source: ESRI; Economic & Planning Systems

The average (mean) household income in the City of Wheat Ridge is $83,964 and the median household income is $61,291. The City has a lower average and median household income than the Primary Trade Area and MSA. The City has a smaller average household size (2.13), and the average size has declined since 2000 (2.20). The median age Wheat Ridge residents is 46 years old, which is higher than the average for the Market Area and MSA. The City has a greater share of residents 55 years old and older than primary market area, despite similar housing conditions outside the city.

Figure 2. Age Distribution, 2020



Source: ESRI; Economic & Planning Systems

Economic Conditions

The City of Wheat Ridge is home to over 17,000 jobs based on data from the US Census LEHD tool. The largest employment sector is Health Care anchored by the SCL Health Lutheran Medical Center. The Health Care industry has 4,900 jobs in Wheat Ridge and accounts for 28 percent of jobs in the City. A recent parking study completed for the Campus found that there are 1,275 full time jobs located on the Campus. However, the total employment on the site is likely greater and the total capacity of the site (workers plus patients plus visitors) is likely significantly higher at peak hours. Employment in the City has declined since 2002, however employment totals have rebounded from low points in the late 2000's. Employment in the City has grown by nearly 700 jobs from 2010 to 2018.

Table 2. Wheat Ridge Employment by Industry, 2002-2018

Description		2002	2010	2018	2002-2018 Total	2002-2018 Ann. #	2002-2018 Ann. %	2010-2018 Total	2010-2018 Ann. #	2010-2018 Ann. %
Agriculture, Forestry, Fishing and Hunting	11	13	5	49	36	2	8.65%	44	6	33.02%
Mining, Quarrying, and Oil and Gas Extraction	21	14	17	12	-2	0	-0.96%	-5	-1	-4.26%
Utilities	22	22	42	29	7	0	1.74%	-13	-2	-4.52%
Construction	23	1,328	897	1,590	262	16	1.13%	693	87	7.42%
Manufacturing	31-33	1,545	939	831	-714	-45	-3.80%	-108	-14	-1.52%
Wholesale Trade	42	874	699	955	81	5	0.56%	256	32	3.98%
Retail Trade	44-45	2,614	2,515	2,162	-452	-28	-1.18%	-353	-44	-1.87%
Transportation and Warehousing	48-49	271	154	240	-31	-2	-0.76%	86	11	5.70%
Information	51	376	339	132	-244	-15	-6.33%	-207	-26	-11.12%
Finance and Insurance	52	648	569	354	-294	-18	-3.71%	-215	-27	-5.76%
Real Estate and Rental and Leasing	53	247	243	224	-23	-1	-0.61%	-19	-2	-1.01%
Professional, Scientific, and Technical Services	54	1,459	1,084	1,647	188	12	0.76%	563	70	5.37%
Management of Companies and Enterprises	55	63	24	75	12	1	1.10%	51	6	15.31%
Administrative and Waste Services	56	1,455	951	1,190	-265	-17	-1.25%	239	30	2.84%
Educational Services	61	76	228	430	354	22	11.44%	202	25	8.25%
Health Care and Social Assistance	62	4,977	5,702	4,899	-78	-5	-0.10%	-803	-100	-1.88%
Arts, Entertainment, and Recreation	71	130	88	122	-8	-1	-0.40%	34	4	4.17%
Accommodation and Food Services	72	1,586	1,315	1,534	-52	-3	-0.21%	219	27	1.94%
Other Services (except Public Administration)	81	789	697	810	21	1	0.16%	113	14	1.90%
Public Administration	92	424	96	11	-413	-26	-20.41%	-85	-11	-23.72%
Total		**18,911**	**16,604**	**17,296**	**-1,615**	**-101**	**-0.56%**	**692**	**87**	**0.51%**

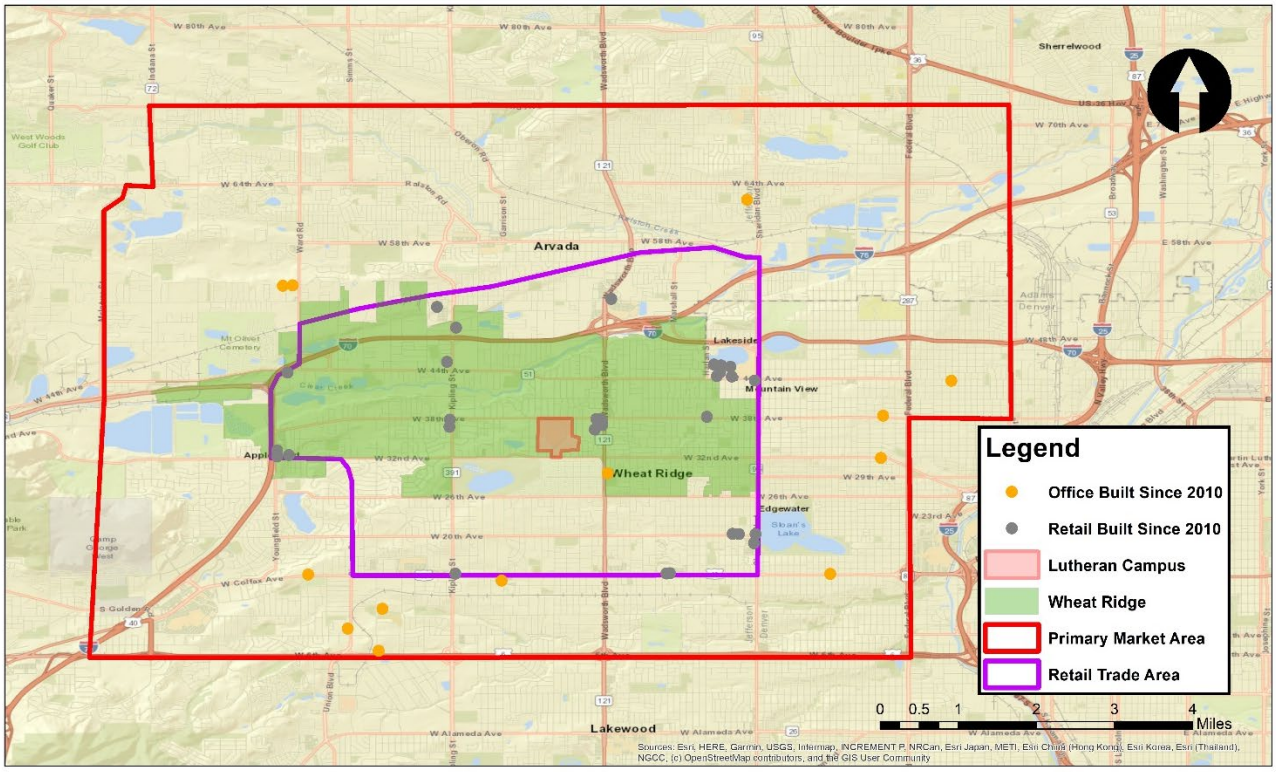
Source: LEHD; Economic & Planning Systems

Market Conditions

Office and Retail

Wheat Ridge has had a limited amount of new development occur in the City despite activity in the primary market area that surrounds most of the city. There has been no new office development in the City since 2010 and average rental rates are much lower than the Market Area ($15.97 per square foot (SF) versus $21.85/SF). The City has been successful in capturing new retail development. The City captured 167,205 square feet of retail space since 2010. The presence of newer retail spaces has generated higher average rents per square foot than the Market Rate. New retail development has occurred along Wadsworth Blvd near the Lutheran Campus, along Kipling Avenue, and in the western portion of the City in the Applewood area along I-70.

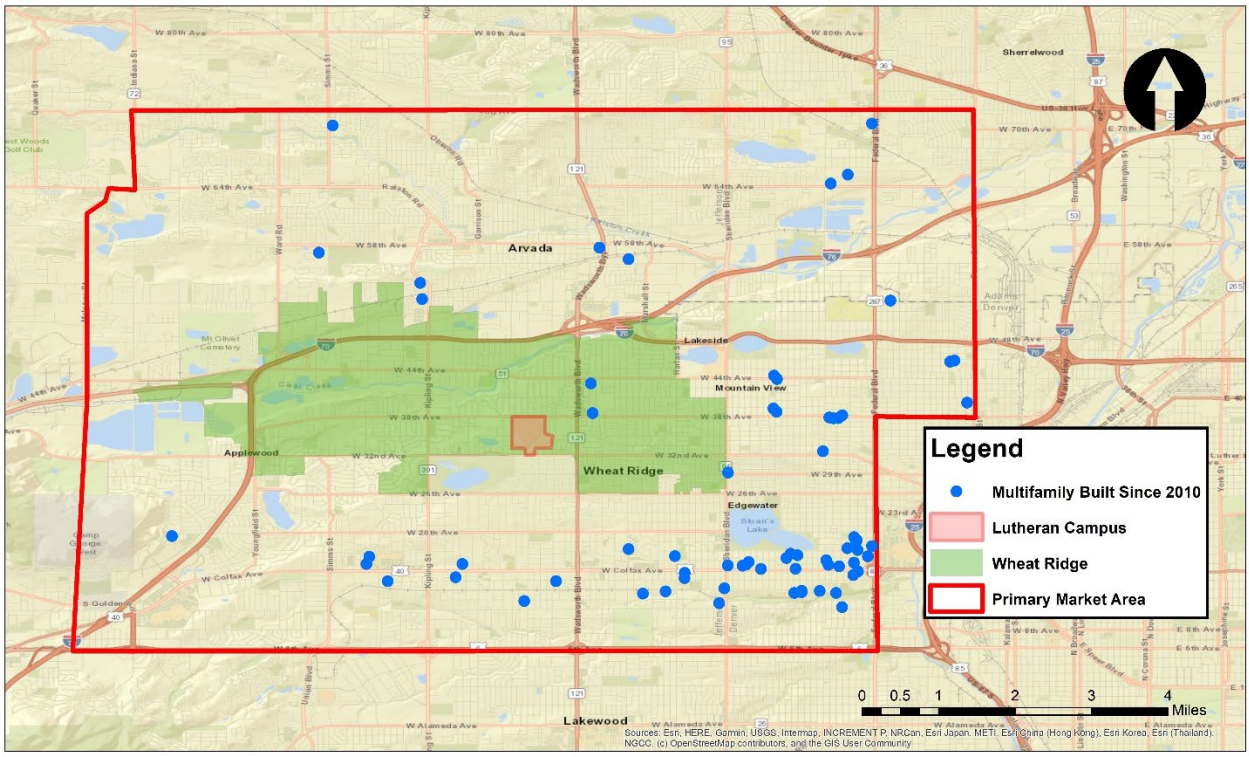
Figure 3. Retail and Office Development, 2010-2021



Multifamily Residential

There has been a significant amount of multifamily development in the Market Area over the past 10 years. However, most of this development has occurred outside of Wheat Ridge in the City of Denver (along 38th Avenue and Colfax Avenue), in the City of Lakewood (along Colfax Avenue), and in the City of Arvada near Olde Town. The City of Wheat Ridge captured 628 new apartment units since 2010. The average monthly apartment rental rate in Wheat Ridge (according to CoStar) is $1.57 per square foot. This rate has increased by an annual rate of 4.38% percent since 2010. In contrast, the average rate in the Market Area is slightly higher, $1.67 per square foot and $1.80 in the MSA. The average rental rates in the Market Area and MSA increased by smaller annual percent (Market Area – 3.29%, MSA – 3.37%) than rents in Wheat Ridge since 2010. The newer projects in Wheat Ridge (e.g., West End 38 and the Edison) have out-performed estimates for absorption and rental rates based on interviews with area developers.

Figure 4. Multifamily Development, Primary Market Area, 2010-2021



Strengths, Weaknesses, Opportunities, and Threats (SWOT)

A SWOT analysis was completed to evaluate the potentials for the Lutheran Campus. The findings are summarized below.

Strengths

- The Lutheran Campus is a known destination in the community and the connotation of the site with a redevelopment project will help bring awareness and familiarity with the project.
- The Lutheran Campus is centrally located in the western portion of the Denver Metro Area. The location has close access to I-70 (via Wadsworth Blvd and Kipling Avenue) and equal distance proximity to the foothills and Downtown Denver.
- The surrounding market area for the Lutheran Campus is growing and has captured new development in most major asset classes (for-sale and for-rent housing, retail, office) in the recent past.

- The Lutheran Campus is a large infill site of approximately 100 acres. The site's infrastructure currently supports a significant amount of traffic and visitors to the sites (employees, patients, and visitors).

Weaknesses

- The Lutheran Campus is accessed by either 38th Avenue or 32nd Avenue. These streets have relatively low traffic volumes compared to other nearby arterials such as Wadsworth Blvd. The lack of frontage and access from Wadsworth limits the appeal for employment uses, especially retail.
- The site has a mixture of buildings with differing ages and scales. A large portion of the buildings are likely not good candidates for re-use; if they cannot be repurposed, they would require demolition and for any environmental issues to be addresses (e.g., asbestos).
- There has been a limited amount of new market activity in Wheat Ridge in the recent past, which will make proving out supportable rental rates and land prices more difficult for project types that are in less demand (e.g., office and retail). As well, the recent retail development near the site on Wadsworth Blvd has lost its anchor retailer (Lucky's Market) and has absorbed more slowly than expected.

Opportunities

- The demand for residential uses is likely to be strong on the Lutheran Campus site including demand for multiple product types.
- Some of the existing buildings on the site have potential for re-use including the more recently built structures and some of the historic structures (e.g., Chapel and blue house).
- A significant portion of the medical office uses on the site are in buildings that are more modern and house tenants that may not desire to move once the hospital moves.
- The site configuration and topography provide the opportunity for superior views of the mountains and surrounding areas. As well, the height of existing buildings and topography of the site allow for buildings greater than three stories to be fit in with the existing conditions and surrounding neighborhoods with limited impacts on existing views and site lines.
- The Campus is largely imbedded into its surrounding neighborhood and can easily be connected to surrounding residential areas through new access points.

Threats

- Despite the site's central location, there are competitive retail and employment areas that have better regional access and locations along major arterials and/or transit that may be major competitors for new development.

- The Lutheran Campus has been a major employment location in the City for generations. The loss of the hospital may lead to surrounding medical oriented businesses to relocate or leave the site.
- The capture of new retail and employment uses on the Lutheran Campus may cannibalize potential for reinvestment or new development in other locations in Wheat Ridge.

Master Plan Considerations

- The Lutheran Campus has potential capture a mixture of uses and a significant amount of new housing development. The capacity to serve new development using existing utilities and infrastructure may be more limiting in some instances than market demand.
- The re-use of existing buildings and/or maintaining some existing uses/users can help support the creation of a mixed-use destination. The condition of the existing buildings will have a major impact on their future uses in the redevelopment of the site.
- The limitations to height of residential uses are major barriers to some potential uses that can be attracted to the site. The current three-story height limit will impact feasibility of residential uses without an amendment to the City Charter identifying areas within the development where additional height may be allowed.
- The legacy of the site as an employment location may be diminished as the site redevelops, at least in terms of the amount of people working on the site. Creative strategies are needed to maintain employment uses on the site. Potential opportunities to create or maintain employment uses include the continuation of some health care uses especially oriented to senior care or living, incorporation of small scale agricultural oriented uses (e.g., restaurants, farmers market), maintaining the existing medical office buildings and users, and potentially the relocation of civic or cultural uses on to the site.

APPENDIX A.2
MARKET FINDINGS

Draft Final Report

Wheat Ridge Lutheran Legacy Campus Master Plan Market Study

The Economics of Land Use

Prepared for:
City of Wheat Ridge; MIG, Inc

Prepared by:
Economic & Planning Systems, Inc.

EPS #203152

September 26, 2021

Economic & Planning Systems, Inc.
730 17th Street, Suite 630
Denver, CO 80202-3511
303 623 3557 tel
303 623 9049 fax

Denver
Los Angeles
Oakland
Sacramento

www.epsys.com

Table of Contents

List of Tables

List of Figures

1. Introduction and Summary of Findings

Introduction

The City of Wheat Ridge and SCL Health are creating a master plan for the redevelopment of the Lutheran Medical Center campus (Lutheran legacy campus). The Lutheran campus is in the core of the City of Wheat Ridge between West 38th Avenue and West 32nd Avenue in the western portion of the Denver Metro Area. Lutheran Medical Center has a been a long-standing destination and employer for the City of Wheat Ridge. SCL Health is moving the hospital and medical services to a new campus in western Wheat Ridge along I-70. SCL owns the majority of the land that comprises the campus and has a few existing land leases that may result in uses remaining on the campus. SCL plans to sell the campus to a master developer(s) but is interested in maintaining legacy elements at the campus and to work with the community to maintain the campus importance as a community destination.

To support the Master Planning effort, Economic & Planning Systems, Inc. (EPS) was retained to complete a market study and provide guidance on the supportable land uses that it recommends be planned for as part of the redevelopment. The goal is to create a marketable and feasible development framework that the City of Wheat Ridge and SCL Health can use to guide the project going forward. This report provides a summary of the findings related to existing demographic, economic, and market conditions present in Wheat Ridge and the surrounding area to inform the land use plan for the campus.

Summary of Findings

The major findings of the market analysis for Wheat Ridge and Lutheran legacy campus are summarized below.

1. ***Wheat Ridge is an attractive community to live in and there is strong demand for a variety of housing uses that will continue over the next decade. The Lutheran legacy campus is well suited for residential development and there is strong demand for single family, attached, and multifamily units on the site.***

   Market demand is strong. All residential product types will absorb at a relatively fast rate given the competitive strength of the Wheatridge market. The plan capacity, configurations, and product mix are more determined by supply considerations, rather than demand factors.

EPS estimates that the campus could accommodate over 2,200 units during the buildout of the project. The Wheat Ridge City Charter limits residential density (except for specified areas) to 21 units per acre. The City Charter also limits heights of residential uses to three stories (except for specified areas). The density cap is applied to the entire 100-acre Lutheran campus, which limits the development capacity for residential units to 2,100 units. EPS estimates the market can support capture of this this amount of housing. However, the limitations on height and density for the campus will likely be greater limit on the number of units provided in the campus than the market constraints.

The height limit on the City Charter restricts the potential for multifamily development on the site. Given the existing height of the Lutheran Medical Center and surrounding office uses, there is a strong argument that taller residential buildings will not have a negative impact on the surrounding neighborhoods. The core of the campus between the irrigation ditch and West 38th Avenue, where the main hospital buildings and parking are currently located, represent the best location for taller buildings both from a neighborhood context perspective and a market attractiveness standpoint. The City and SCL Health should seek an amendment to the City Charter to modify this height limit to allow for four and five story residential projects. This increase in height limit will create a core within the development that will create positive synergy among other uses. This change will also increase the value of the property and provide more flexibility for providing public amenities in the redevelopment.

2. ***The Lutheran legacy campus is embedded into a neighborhood context within Wheat Ridge and lacks visibility and access to major arterial roadways, which limits its appeal for non-residential uses.***

The lack of access to a major arterial road or highway limits the appeal for office and retail uses. The traffic levels on West 38th Avenue and West 32nd Avenue are relatively low compared to the north/south arterials in Wheat Ridge (Wadsworth Boulevard and Kipling Street) where most of the retail and office uses in the city are located. EPS evaluated similar urban campus redevelopment projects completed in the recent past in the Denver Metro Area. Analysis of these comparable campus redevelopments illustrate the challenges for the Lutheran campus. The comparable projects generally had a greater density of jobs and housing in the vicinity of those projects. They are also located on or proximate to large arterial roads with greater traffic volumes. The Midtown redevelopment project has comparable traffic levels and is a primarily residential project, while the other examples have more robust retail and office components to the projects. To overcome the lack of access and visibility, destination uses are needed to increase appeal for supporting office or retail space.

3. There is limited demand for retail space on the Lutheran legacy campus, especially without a retail or entertainment anchor use.

EPS estimates the Lutheran campus can capture up to 30,000 square feet of retail space. Type of retail that would likely be in demand is convenience retail and eating & drinking. Without a major anchor store (or entertainment or civic anchors, the site may be challenged to capture more than 20,000 to 30,000 square feet of retail space due to the level of density in the surrounding area, traffic levels, and employment uses on the site. The attraction of an anchor retail uses, such as a grocery store or pharmacy, will increase potential for retail space.

The retail space that is planned on the site should be located with visibility and access off West 38th Avenue. The Lutheran Boulevard access street can serve as a potential retail street that would allow retail uses to be located along it from West 38th Avenue to the south for no more than two or three small blocks.

4. Demand for new office space in Wheat Ridge is limited and development of larger office space in the city is likely not feasible.

While Wheat Ridge has not traditionally had a strong office market, there is potential for a diversified tenant mix that could drive new demand on the campus. The total office demand in Lutheran over this 20-year period would be 241,231 square feet of office space or an average of 12,062 square feet annually. However, the achievable rental rates found in the Primary Market Area indicate that the feasibility of new development is likely a challenge and is a major barrier to market capture. Average rental rates $21.85 per square foot in the Primary Market Area are much lower than the likely minimum of $30 per square foot rates needed to support new office speculative product. There is potential to capture a build-to-suit or single tenant to the site, but the attractiveness of the site makes this a challenge.

To preserve the strong employment of the site, creative and alternative approaches are likely necessary. Some potential opportunities to provide flexibility for or encourage incorporation in the ultimate development include:

- **Existing Medical Office Buildings –** The existing medical office buildings on the campus are in various conditions. The newer medical office buildings have the potential for reconfiguration and use for a broader set of tenants beyond medical services. Working with SCL and the entity that currently has a ground lease for some of the medical office buildings to identify strategies for continued use and investment in these buildings can help capture the office demand and to maintain an employment presence.
- **Entertainment Uses** - There may be potential for unique entertainment uses on the site supported by the city that could maintain the site's employment. The re-use of the historic chapel as a performing arts venue may present an opportunity. The city likely needs to take an active role in

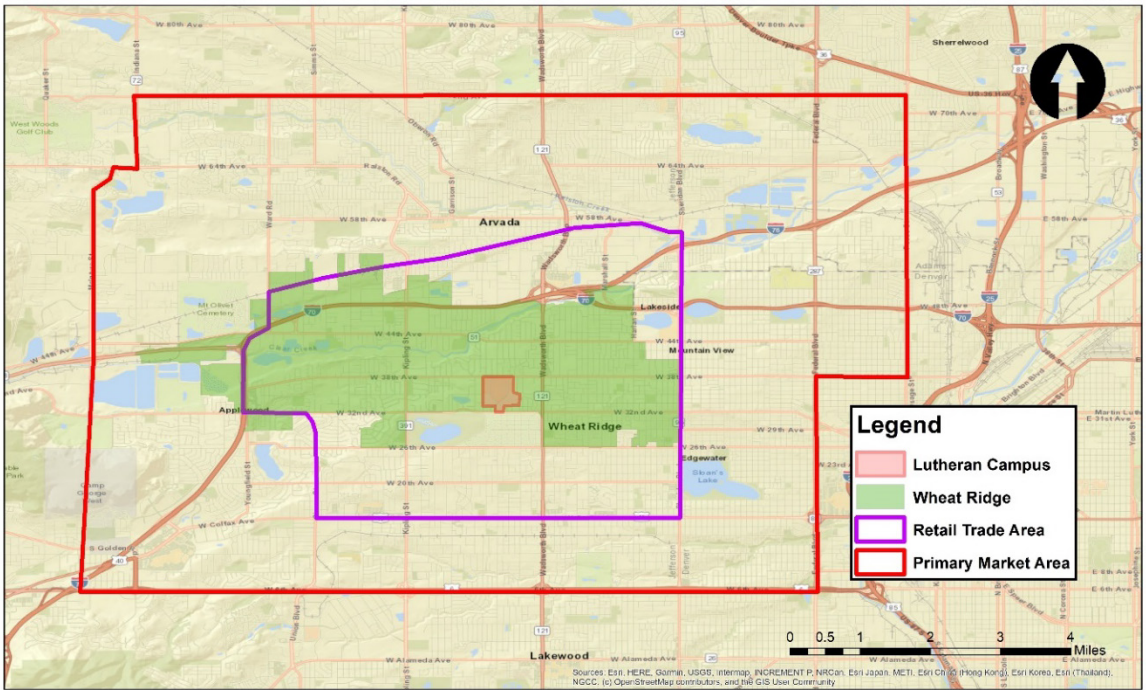
finding partners and funding for creation and operations of this type of venue. The inclusion of entertainment uses can help bolster demand for non-residential uses and provide vitality to the project.

- **Resident Oriented Health Care -** The presence of health care services can be a way to maintain an employment presence on the campus. The inclusion of housing products that include health care services as part of the product is an opportunity. These include housing products that provide a continuum of care (e.g., senior oriented units, assisted living, memory care, hospice).
- **Civic Uses –** A major move that could preserve the employment legacy of the campus would be for the City of Wheat Ridge to locate civic uses on the campus. The relocation of City Hall and/or other city administration uses onto the site can help activate the core of the campus.

2. Economic and Demographic Conditions

EPS identified a primary market area and a retail trade area for the Lutheran Legacy Campus to evaluate area conditions and trends, shown in **Figure 1**. These two areas (Primary Market Area shown in red) and the (Retail Trade Area shown in purple) are compared to the City of Wheat Ridge (shown in green).

Figure 1. Primary Market Area and Retail Trade Area



Population and Households

The City of Wheat Ridge has been growing in population and households at a slower rate than the surrounding Primary Market Area and Denver-Aurora-Lakewood MSA (MSA or Metro Area) as a whole, as shown in **Table 1**. The city lost a total population of 856 residents between 2000 and 2020 despite adding 450 housing units during this period. In recent years, growth has accelerated in Wheat Ridge with the addition of 1,679 residents or 0.54 percent annual growth between 2010 and 2020. However, the city still lags population and household growth in the Primary Market Area and Denver MSA over the same period. The slower growth rates in Wheatridge, relative to the other geographies noted in the table below, is attributed to supply constraints. As noted elsewhere in this report, demand factors are strong. The generally slow growth rates are not representative of the market position of the City of Wheatridge or the Lutheran redevelopment site.

Table 1. Population, Households, and Housing Units, 2000-2020

Description	2000	2010	2020	2000-2020 Total	2000-2020 Ann. #	2000-2020 Ann. %	2010-2020 Total	2010-2020 Ann. #	2010-2020 Ann. %
Population									
Wheat Ridge	32,688	30,153	31,832	-856	-43	-0.13%	1,679	168	0.54%
Primary Market Area	236,582	226,287	254,787	18,205	910	0.37%	28,500	2,850	1.19%
Denver MSA	2,179,469	2,543,482	2,988,896	809,427	40,471	1.59%	445,414	44,541	1.63%
Households									
Wheat Ridge	14,466	13,964	14,709	243	12	0.08%	745	75	0.52%
Primary Market Area	94,906	95,634	107,203	12,297	615	0.61%	11,569	1,157	1.15%
Denver MSA	852,252	1,004,696	1,174,923	322,671	16,134	1.62%	170,227	17,023	1.58%
Housing Units									
Wheat Ridge	14,837	14,856	15,286	449	22	0.15%	430	43	0.29%
Primary Market Area	97,916	101,823	111,901	13,985	699	0.67%	10,078	1,008	0.95%
Denver MSA	891,120	1,078,837	1,238,723	347,603	17,380	1.66%	159,886	15,989	1.39%

Source: ESRI; Economic & Planning Systems

The average household income in the City of Wheat Ridge in 2020 is $83,964 and the median household income is $61,291, as shown in **Table 2**. The City has a lower average and median household income than the Primary Trade Area and MSA. The City has a smaller average household size (2.13) than the broader Primary Market Area and Denver MSA, and its average size has declined since 2000 (2.20), as shown in **Table 3**. The median age of Wheat Ridge residents is 46 years old, which is higher than the average for the Market Area and Denver MSA, as shown in **Figure 2**. The City has a greater share of residents 55 years old and older than Primary Market Area, despite similar housing conditions outside the city.

Table 2. Per-Capita and Household Income, 2020

Description	Income (2020)		
	Per Capita	Average HH	Median HH
Wheat Ridge	$38,952	$83,964	$61,291
Primary Market Area	$37,554	$89,390	$65,833
Denver MSA	$42,894	$109,026	$80,666

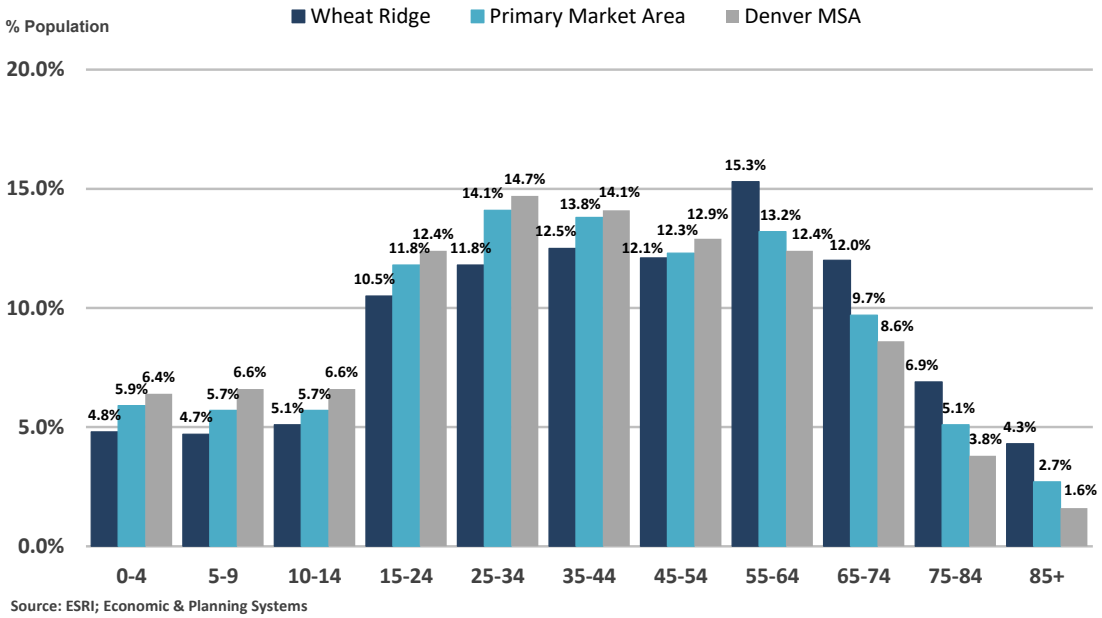
Source: ESRI; Economic & Planning Systems

Table 3. Average Household Size, 2000-2020

Household Size	2000	2010	2020
Wheat Ridge	2.20	2.12	2.13
Primary Market Area	2.44	2.33	2.34
Denver MSA	2.52	2.50	2.51

Source: ESRI; Economic & Planning Systems

Figure 2. Age Distribution, 2020



Source: ESRI; Economic & Planning Systems

Employment

The City of Wheat Ridge is home to over 17,000 jobs based on data from the US Census LEHD tool, as shown in **Table 4** on the following page. The largest employment sector is Health Care, which is anchored by the SCL Lutheran Medical Center. The Health Care industry has approximately 4,900 jobs in Wheat Ridge and accounted for 28.3 percent of jobs in the City in 2018. A recent parking study completed for the legacy campus found that there are 1,275 full time jobs located on the campus. However, the total employment on the site is likely greater and the total capacity of the site (workers plus patients plus visitors) is likely significantly higher at peak hours. Employment in the City has declined since 2002, however employment totals have rebounded from low points in the late 2000's. Employment in the City has grown by nearly 700 jobs from 2010 to 2018, growing at an annual rate of 0.51 percent.

Employment Forecasts

Employment forecasts for the Denver Metro Area are presented in **Table 5** on page 10. The forecasts are based on the Denver Regional Council of Governments (DRCOG) 2015 to 2040 regional growth model totals. DRCOG prepares employment forecasts in six aggregated industry sectors; Production, Retail, Services, Restaurants, Entertainment, and Education. This forecast was converted to forecasts for the 21 NAICS industries using DRCOG's aggregation scheme that lists the individual industries in the six aggregated sectors.

Total employment is estimated to grow at an annual average of 24,300 jobs from 2015 to 2030 to reach 2.05 million jobs, which is a 1.3 percent annual growth rate. Applying the same growth rates from 2030 to 2040 would add a total of 302,720 jobs or an average of 30,300 jobs per year as shown.

Table 4. Wheat Ridge Employment by Industry, 2002-2018

Description		2002	2010	2018	2002-2018 Total	2002-2018 Ann. #	2002-2018 Ann. %	2010-2018 Total	2010-2018 Ann. #	2010-2018 Ann. %
Agriculture, Forestry, Fishing and Hunting	11	13	5	49	36	2	8.65%	44	6	33.02%
Mining, Quarrying, and Oil and Gas Extraction	21	14	17	12	-2	0	-0.96%	-5	-1	-4.26%
Utilities	22	22	42	29	7	0	1.74%	-13	-2	-4.52%
Construction	23	1,328	897	1,590	262	16	1.13%	693	87	7.42%
Manufacturing	31-33	1,545	939	831	-714	-45	-3.80%	-108	-14	-1.52%
Wholesale Trade	42	874	699	955	81	5	0.56%	256	32	3.98%
Retail Trade	44-45	2,614	2,515	2,162	-452	-28	-1.18%	-353	-44	-1.87%
Transportation and Warehousing	48-49	271	154	240	-31	-2	-0.76%	86	11	5.70%
Information	51	376	339	132	-244	-15	-6.33%	-207	-26	-11.12%
Finance and Insurance	52	648	569	354	-294	-18	-3.71%	-215	-27	-5.76%
Real Estate and Rental and Leasing	53	247	243	224	-23	-1	-0.61%	-19	-2	-1.01%
Professional, Scientific, and Technical Services	54	1,459	1,084	1,647	188	12	0.76%	563	70	5.37%
Management of Companies and Enterprises	55	63	24	75	12	1	1.10%	51	6	15.31%
Administrative and Waste Services	56	1,455	951	1,190	-265	-17	-1.25%	239	30	2.84%
Educational Services	61	76	228	430	354	22	11.44%	202	25	8.25%
Health Care and Social Assistance	62	4,977	5,702	4,899	-78	-5	-0.10%	-803	-100	-1.88%
Arts, Entertainment, and Recreation	71	130	88	122	-8	-1	-0.40%	34	4	4.17%
Accommodation and Food Services	72	1,586	1,315	1,534	-52	-3	-0.21%	219	27	1.94%
Other Services (except Public Administration)	81	789	697	810	21	1	0.16%	113	14	1.90%
Public Administration	92	424	96	11	-413	-26	-20.41%	-85	-11	-23.72%
Total		**18,911**	**16,604**	**17,296**	**-1,615**	**-101**	**-0.56%**	**692**	**87**	**0.51%**

Source: LEHD; Economic & Planning Systems

Table 5. Employment Forecast by Industry, 2015-2040

NAICS Industry	2015	2020	2030	2040	2015-2030 Change	2015-2030 Ann. #	2015-2030 Ann. Rate	2030-2040 Change	2030-2040 Ann. #	2030-2040 Ann. Rate
Ag./Forest/Hunting	3,305	3,539	4,057	4,745	752	50	1.4%	688	69	1.6%
Mining	13,369	14,314	16,410	19,193	3,040	203	1.4%	2,783	278	1.6%
Utilities	7,030	7,526	8,628	10,092	1,599	107	1.4%	1,463	146	1.6%
Construction	101,675	108,862	124,796	145,964	23,121	1,541	1.4%	21,167	2,117	1.6%
Manufacturing	99,261	106,277	121,833	142,498	22,572	1,505	1.4%	20,665	2,066	1.6%
Wholesale Trade	87,230	93,395	107,066	125,226	19,836	1,322	1.4%	18,160	1,816	1.6%
Retail Trade	138,603	149,602	174,289	201,791	35,686	2,379	1.5%	27,502	2,750	1.5%
Transport./Warehousing	62,187	66,097	74,669	85,544	12,482	832	1.2%	10,875	1,088	1.4%
Information	58,871	62,572	70,687	80,983	11,816	788	1.2%	10,295	1,030	1.4%
Finance/Insurance	83,989	89,269	100,847	115,535	16,858	1,124	1.2%	14,688	1,469	1.4%
Real Estate	31,717	33,711	38,083	43,630	6,366	424	1.2%	5,547	555	1.4%
Prof. & Tech Services	164,763	175,121	197,833	226,647	33,070	2,205	1.2%	28,814	2,881	1.4%
Mgmt	33,749	35,870	40,522	46,424	6,774	452	1.2%	5,902	590	1.4%
Admin/Waste Mgmt	111,424	118,429	133,788	153,274	22,364	1,491	1.2%	19,486	1,949	1.4%
Education	112,574	118,489	131,268	139,315	18,694	1,246	1.0%	8,047	805	0.6%
Health Care	205,166	218,065	246,346	282,225	41,179	2,745	1.2%	35,880	3,588	1.4%
Arts/Rec	31,916	33,128	35,692	38,927	3,776	252	0.7%	3,235	323	0.9%
Accommodations	201,222	218,577	257,908	301,846	56,686	3,779	1.7%	43,938	4,394	1.6%
Other	51,019	54,227	61,260	70,182	10,240	683	1.2%	8,922	892	1.4%
Public Admin	83,835	89,106	100,662	115,323	16,827	1,122	1.2%	14,661	1,466	1.4%
Unclassified	0	0	0	0	0	0	---	0	0	---
Total	**1,682,905**	**1,796,291**	**2,046,643**	**2,349,363**	**363,738**	**24,249**	**1.3%**	**302,720**	**30,272**	**1.4%**

Source: Denver Regional Council of Governments (DRCOG); Economic & Planning Systems

3. Market Conditions and Trends

This chapter summarizes the trends and conditions of office, retail, and multifamily housing in the City of Wheat Ridge, the Retail Trade Area, and the Primary Market Area including inventory, vacancy rates, rental rates, and recent development activity.

Retail and Office

EPS tracked retail and office developments built since 2010, as shown in **Figure 3**. Since 2010, a number of retail developments and just one office development came online in the City of Wheat Ridge. In addition, retail and office developments under construction and proposed are also indicated in **Figure 4**.

Figure 3. Retail and Office Development, 2010-2021

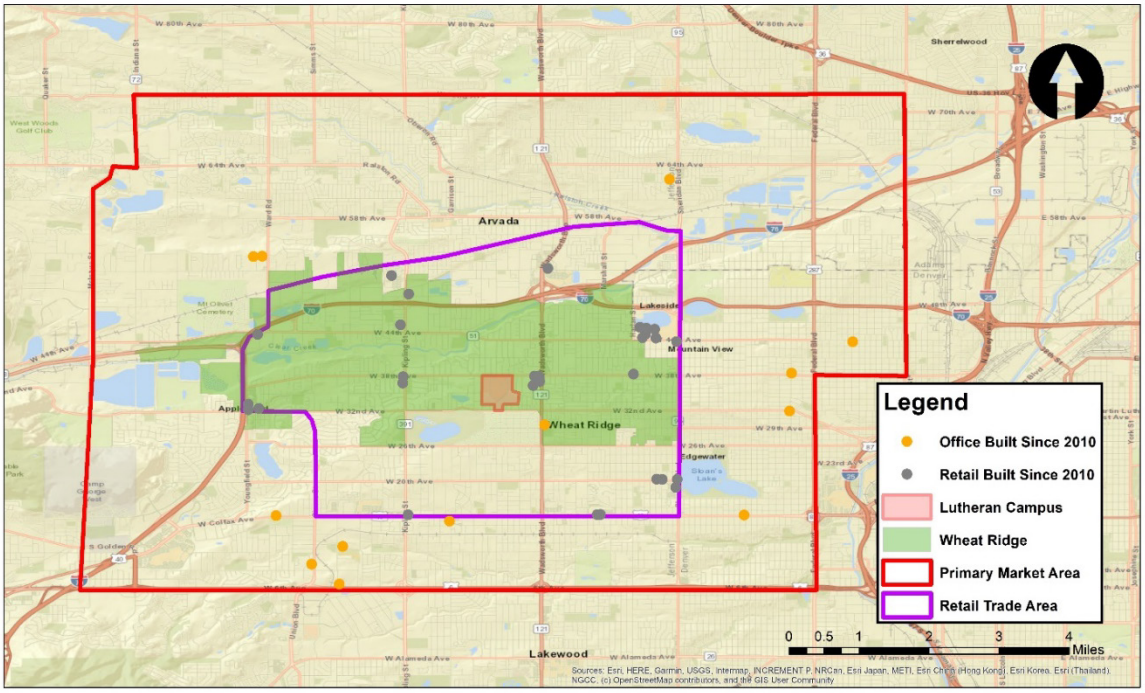
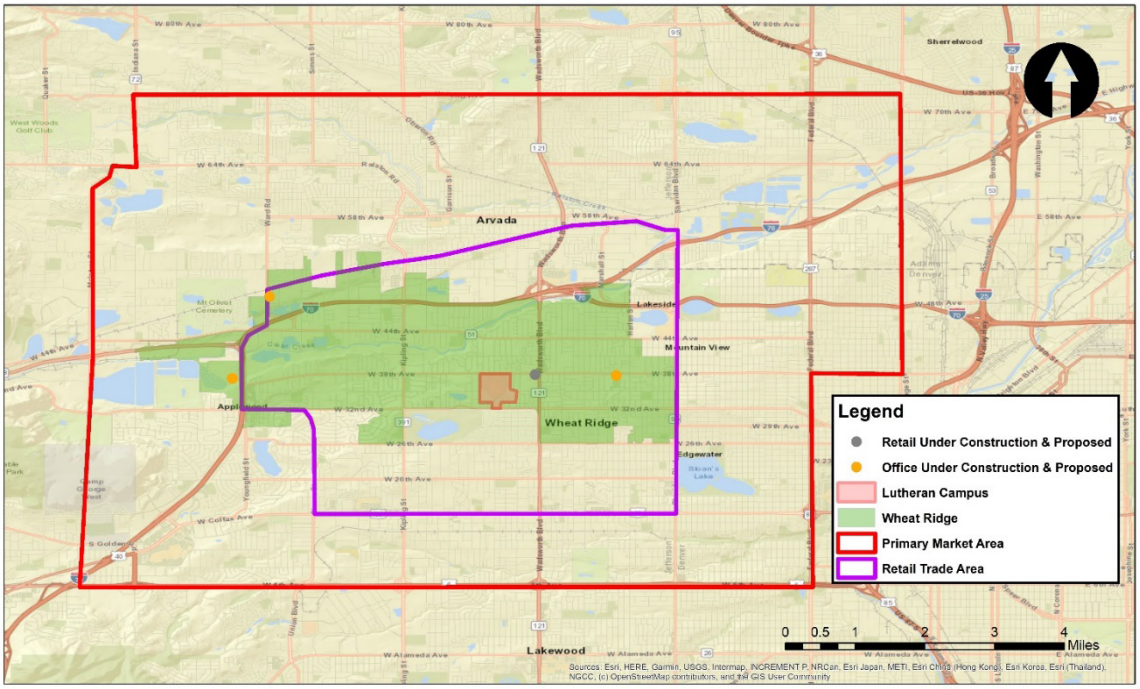


Figure 4. Retail and Office Under Construction and Proposed



Office Development Trends

The City of Wheat Ridge has a total 2021 office inventory of 1.5 million square feet, as shown in **Table 6**. Wheat Ridge accounts for 17.3 percent of the Primary Market Area's inventory and just 0.87 percent of the total office space in the MSA. The City of Wheat Ridge's office inventory remained stagnant and did not change over the past decade, while the Primary Market Area experienced an additional 416,565 square feet of office space since 2010, adding approximately 37,870 square feet of space during that time and growing by 0.43 percent annually. Both the City of Wheat Ridge and the Primary Market Area were outpaced by the Denver MSA's office inventory growth, which added 1.5 million square feet of space and grew by 0.91 percent annually since 2010.

Table 6. Office Market, 2010-2021 YTD

Description	Wheat Ridge			Primary Market Area			Denver MSA		
	Deliveries	NNN Rent per sq. ft.	Vacancy	Deliveries	NNN Rent per sq. ft.	Vacancy	Deliveries	NNN Rent per sq.ft.	Vacancy
Starting Inventory	**1,557,654**			**8,553,472**			**162,663,274**		
2010	0	$14.02	10.7%	0	$16.42	13.2%	1,370,142	$17.80	13.4%
2011	0	$13.88	11.9%	30,067	$16.18	12.7%	609,198	$18.12	12.7%
2012	0	$13.29	12.1%	32,918	$16.59	14.0%	894,903	$18.71	12.5%
2013	0	$13.73	11.8%	32,748	$17.66	16.1%	1,013,493	$19.42	11.7%
2014	0	$15.02	6.7%	0	$18.57	14.9%	1,061,057	$20.32	11.0%
2015	0	$16.37	5.7%	132,795	$18.44	13.9%	2,184,586	$20.71	10.4%
2016	0	$18.00	7.8%	142,392	$19.17	12.0%	1,283,605	$21.46	10.2%
2017	0	$16.09	7.3%	0	$20.01	10.1%	2,552,711	$22.31	10.4%
2018	0	$16.39	6.5%	0	$21.20	8.6%	3,744,322	$23.27	10.2%
2019	0	$16.36	5.0%	31,245	$22.29	8.7%	1,512,065	$23.72	9.9%
2020	0	$16.25	7.4%	0	$21.78	9.9%	1,313,344	$24.42	12.7%
2021 YTD	0	$15.97	7.1%	14,400	$21.85	9.9%	800,887	$24.49	14.1%
Ending Inventory	**1,557,654**			**8,970,037**			**179,699,445**		
Change	**0**	**$1.95**	**-3.60%**	**416,565**	**$5.43**	**-3.30%**	**17,036,171**	**$6.69**	**0.70%**
Ann. #	**0**	**$0.18**	**-0.33%**	**37,870**	**$0.49**	**-0.30%**	**1,548,743**	**$0.61**	**0.06%**
Ann. %	**0.00%**	**1.19%**	**--**	**0.43%**	**2.63%**	**--**	**0.91%**	**2.94%**	**--**

Source: CoStar; Economic & Planning Systems

The vacancy rate for office space in Wheat Ridge stood at 7.1 percent at the end of the second quarter of 2021 and was lower than the Primary Market Area average of 9.9 percent and significantly lower than the metro area average of 14.1 percent. The average rental rate was $15.97 (full service) in the City of Wheat Ridge, which was significantly lower than the Primary Market Area average of $21.85 per square foot and the $24.49 per square foot average witnessed in the Denver MSA.

The conflicting data trends noted above are significant. The Wheatridge submarket has both lower rents than the metro area as well as lower vacancy rates. Typically, these two metrics move in opposite directions, with high vacancy rates correlated to low rents. The likely factors causing this anomaly are based on the lack of new product. The rents are lower, given that the product is older. The vacancies are lower given the relatively desirable of the west side and the lack of sites to accommodate demand.

Retail Development Trends

The City of Wheat Ridge's retail market added 167,205 square feet of retail space since 2010, and as of the second quarter of 2021 its total inventory stood at 2.6 million square feet, as shown in **Table 7**. This accounts for nearly 33 percent of the Primary Market Area's total retail inventory and 2.0 percent of total retail inventory in the Denver MSA.

The vacancy rate for retail space in Wheat Ridge stood at 7.1 percent at the end of the second quarter of 2021 and was higher than the Primary Market Area and the metro area average of 6.9 and 5.3 percent respectively. The average rental rate was $23.82 (full service) in the City of Wheat Ridge, which was significantly higher than the Primary Market average of $15.24 per square foot and the $18.34 per square foot average witnessed in the Denver MSA.

Table 7. Retail Market, 2010-2021 YTD

Description	Wheat Ridge			Retail Trade Area			Denver MSA		
	Deliveries	NNN Rent per sq. ft.	Vacancy	Deliveries	NNN Rent per sq. ft.	Vacancy	Deliveries	NNN Rent per sq.ft.	Vacancy
Starting Inventory	**2,439,776**			**7,032,970**			**146,417,702**		
2010	0	$14.06	4.7%	0	$12.43	5.2%	649,268	$14.77	7.2%
2011	7,200	$12.74	5.2%	9,523	$12.58	5.4%	1,060,122	$14.51	6.6%
2012	0	$13.61	4.5%	153,372	$12.79	7.3%	952,102	$14.55	6.2%
2013	10,423	$13.11	5.1%	10,423	$12.81	5.9%	1,401,332	$15.04	5.6%
2014	0	$14.43	3.4%	47,765	$14.78	4.8%	883,343	$15.14	5.1%
2015	44,478	$15.82	3.3%	105,862	$15.06	4.2%	1,196,704	$15.58	4.8%
2016	0	$13.91	3.6%	475,137	$14.09	4.8%	1,660,439	$16.29	4.4%
2017	2,324	$24.81	5.9%	2,324	$17.83	4.3%	1,690,237	$17.60	4.2%
2018	81,460	$21.74	4.5%	87,518	$16.64	3.3%	1,794,320	$18.24	3.7%
2019	16,320	$19.66	4.5%	24,820	$16.07	6.0%	1,076,284	$17.98	4.1%
2020	5,000	$22.61	5.9%	11,484	$15.75	6.4%	936,779	$18.30	5.1%
2021 YTD	0	$23.82	7.1%	3,500	$15.24	6.9%	104,433	$18.34	5.3%
Ending Inventory	**2,606,981**			**7,964,698**			**159,220,227**		
Change	**167,205**	**$9.76**	**2.40%**	**931,728**	**$2.81**	**1.70%**	**12,802,525**	**$3.57**	**-1.90%**
Ann. #	**15,200**	**$0.89**	**0.22%**	**84,703**	**$0.26**	**0.15%**	**1,163,866**	**$0.32**	**-0.17%**
Ann. %	**0.60%**	**4.91%**	**--**	**1.14%**	**1.87%**	**--**	**0.76%**	**1.99%**	**--**

Source: CoStar; Economic & Planning Systems

Residential Development Trends

Wheat Ridge Building Permits

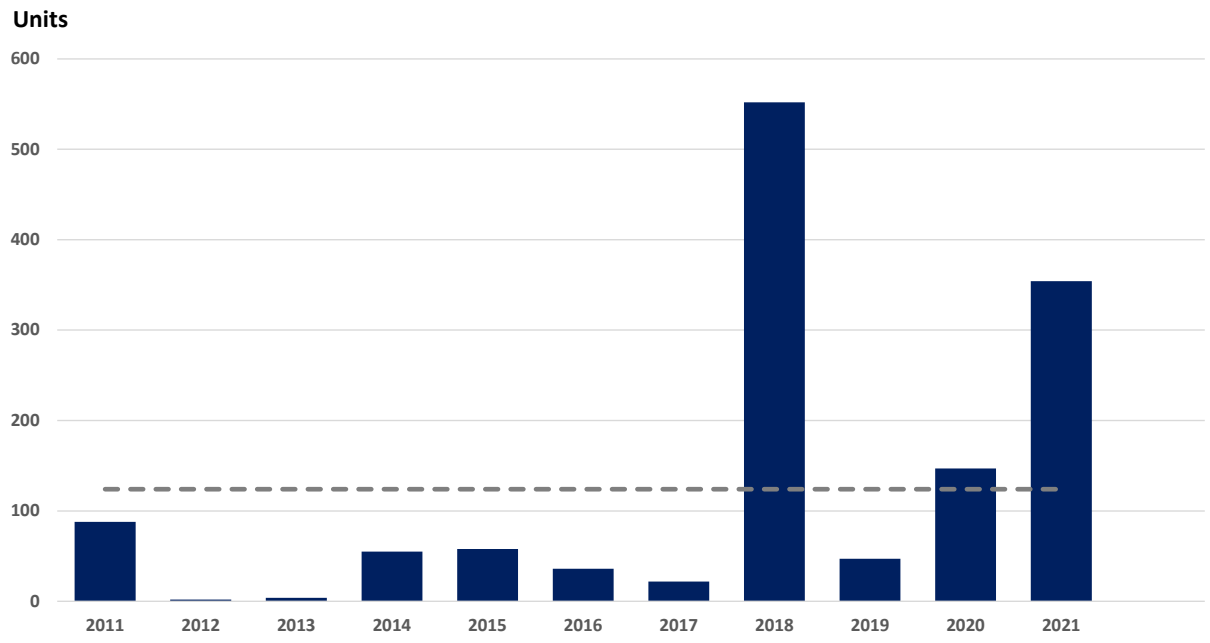
EPS tracked building permit data to analyze the number of residential permit units by housing type added since 2011, as shown in **Table 8** and **Figure 5**. Between 2011 and 2021, the City of Wheat Ridge added approximately 1,365 residential units, with multifamily units totaling 66 percent of total units added since 2011 in the City and single family units totaling 32 percent of total units added. Much of the permitting activity over the past decade was concentrated over the last three years, with 1,100 total units permitted since 2018.

Table 8. Wheat Ridge Residential Unit Summary, 2011-2021

Description	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2011-2021 Total	2011-2021 Ann. #	2011-2021 Ann. %
Duplex	0	0	2	4	1	2	0	0	5	4	0	18	2	---
Multifamily	88	0	0	1	0	0	0	532	0	0	280	901	90	---
Single-Family	0	2	2	50	57	34	22	20	42	143	74	446	45	---
Total	**88**	**2**	**4**	**55**	**58**	**36**	**22**	**552**	**47**	**147**	**354**	**1,365**	**137**	**---**

Source: Wheat Ridge Building Division; Economic & Planning Systems

Figure 5. Wheat Ridge Residential Unit Summary, 2011-2021



Source: Wheat Ridge Building Division; Economic & Planning Systems

Multifamily Development Trends

Multifamily developments that have delivered over the past decade in Wheat Ridge and the Primary Market Area are tracked below, as shown in **Figure 6**. In addition, multifamily projects currently under construction or proposed are also indicated, as shown in **Figure 7**.

There has been a large amount of multifamily housing development occurring over the past decade in the Primary Market Analysis. Despite the development activity in the Primary Market Area, just three multifamily projects delivered since 2010 in the City of Wheat Ridge. The limitations on housing density and height in the City's Charter for much of the city has limited capture in the city. There are four multifamily projects are under construction or proposed in Wheat Ridge.

Figure 6. Multifamily Development, Primary Market Area, 2010-2021

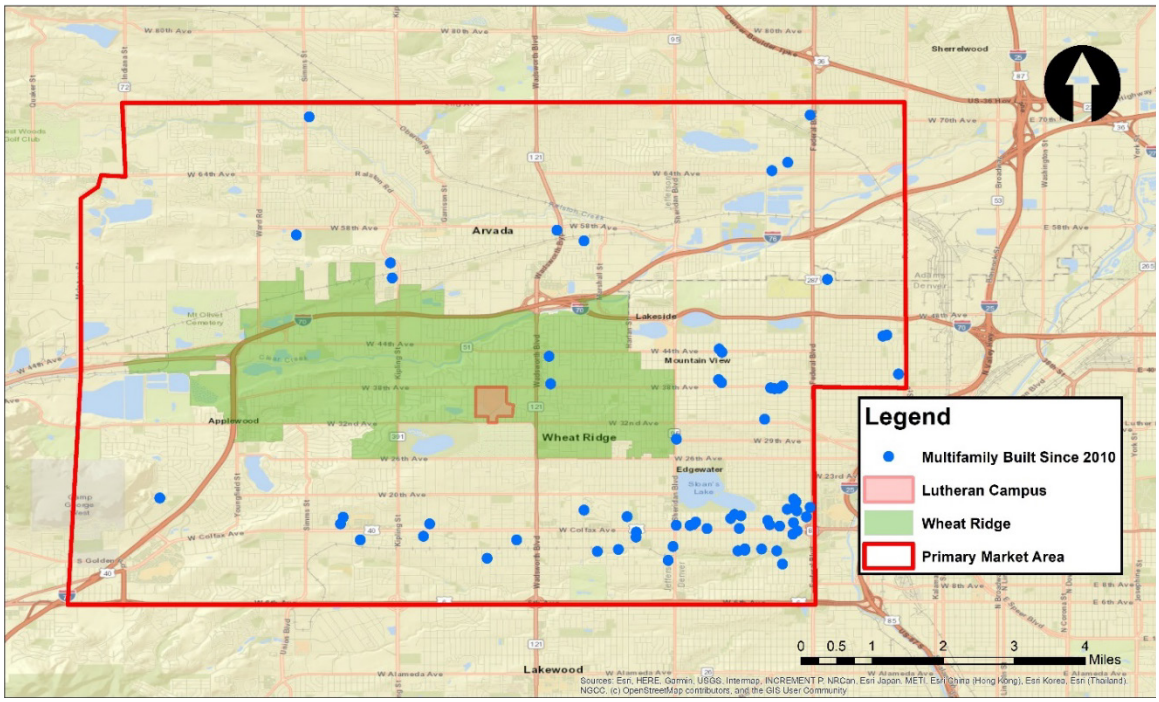
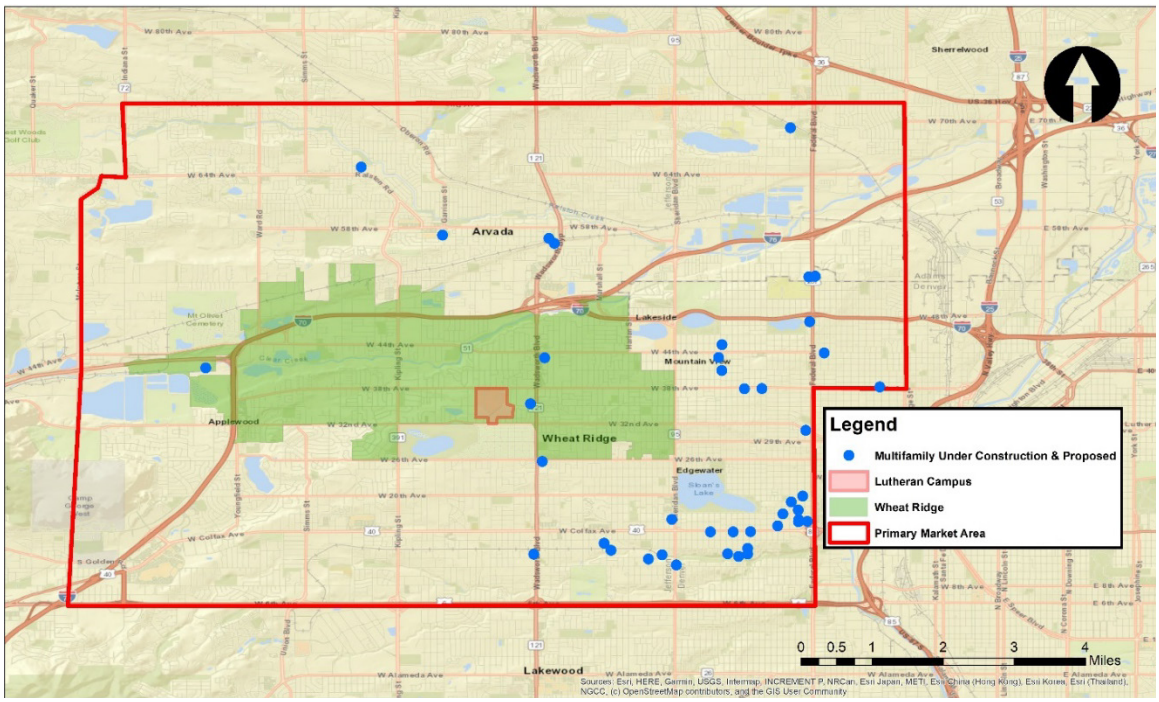


Figure 7. Multifamily Under Construction and Proposed, Primary Market Area



The Primary Market Area has attracted 7,140 multifamily units since 2010. The rate of growth in the Primary Market Area has matched the rate for the larger metro area. The City of Wheat Ridge's multifamily market added 628 units since 2010, and as of the second quarter of 2021 its total inventory stood at 3,684 units, as shown in **Table 9**. This accounts for approximately 12.6 percent of the Primary Market Area's total retail inventory and just 1.0 percent of total retail inventory in the Denver MSA.

The vacancy rate for multifamily property in Wheat Ridge stood at just 4.3 percent at the end of the second quarter of 2021 and was lower than the Primary Market Area and the metro area average of 6.2 and 6.8 percent respectively, which indicates demand. The average rental rate was $1.57 per square foot in the City of Wheat Ridge is lower than the Primary Market Area average of $1.67 per square foot and the $1.80 per square foot average witnessed in the Denver MSA. The lower rental rates in Wheat Ridge are largely due to the age of the units and lack of new product to bring rental rates up. Despite the lack of development in Wheat Ridge, the average rental rate has grown more quickly in the city than compared to the Primary Market Area and Denver MSA. The rate of rental rate increases, and the vacancy rate indicate strong demand for multifamily units in Wheat Ridge.

Table 9. Multifamily Market, 2010-2021 YTD

Description	Wheat Ridge			Primary Market Area			Denver MSA		
	Deliveries *Units*	NNN Rent *per sq. ft.*	Vacancy	Deliveries *Units*	NNN Rent *per sq. ft.*	Vacancy	Deliveries *Units*	NNN Rent *per sq.ft.*	Vacancy
Starting Inventory	**3,056**			**21,926**			**236,942**		
2010	0	$0.98	4.9%	62	$1.17	5.6%	1,410	$1.25	6.5%
2011	0	$1.00	5.0%	200	$1.20	5.6%	598	$1.29	6.2%
2012	88	$1.02	3.6%	122	$1.24	4.4%	2,668	$1.34	5.1%
2013	378	$1.05	5.6%	521	$1.29	4.4%	4,381	$1.41	5.1%
2014	0	$1.19	3.9%	190	$1.35	4.0%	9,504	$1.47	5.6%
2015	0	$1.27	3.9%	946	$1.42	6.2%	9,580	$1.55	5.9%
2016	0	$1.33	5.3%	252	$1.46	5.2%	6,936	$1.57	7.0%
2017	0	$1.39	5.9%	1,235	$1.50	7.1%	10,986	$1.61	7.3%
2018	0	$1.45	4.1%	686	$1.57	5.7%	11,656	$1.67	7.1%
2019	0	$1.51	4.7%	1,376	$1.62	6.5%	11,597	$1.71	7.4%
2020	162	$1.51	4.8%	1,463	$1.59	7.3%	11,083	$1.70	7.6%
2021 YTD	0	$1.57	4.3%	149	$1.67	6.2%	1,344	$1.80	6.8%
Ending Inventory	**3,684**			**29,066**			**317,275**		
Change	**628**	**$0.59**	**-0.60%**	**7,140**	**$0.50**	**0.60%**	**80,333**	**$0.55**	**0.30%**
Ann. #	**57**	**$0.05**	**-0.05%**	**649**	**$0.05**	**0.05%**	**7,303**	**$0.05**	**0.03%**
Ann. %	**1.71%**	**4.38%**	**--**	**2.60%**	**3.29%**	**--**	**2.69%**	**3.37%**	**--**

Source: CoStar; Economic & Planning Systems

4. Comparable Projects

The redevelopment of large campus in urban areas in the Denver Metro Area has occurred in a few different locations in the recent past. Four comparable projects were analyzed to illustrate the potential and barriers for the Lutheran Legacy Campus. The four projects evaluated are the 9th and Colorado redevelopment (the site of the former University of Colorado Hospital), the former St. Anthony's hospital campus near Sloan Lake in Denver, the Boulevard One development (the last major development parcel in the Lowry Air Force Base redevelopment), and the Midtown development in unincorporated Adams County. EPS surveyed these four comparable projects and collected pertinent information including unit mix, commercial square footage, and development context data, as shown in **Table 10** on the following page. Project profiles and detailed summaries begin on page 21.

Table 10. Comparable Projects

Attributes	9th and Colorado	St. Anthony	Boulevard One	Midtown	Lutheran
Location	9th Ave and Colordo Blvd, Denver	Colfax Ave and Raleigh St, Denver	Quebec St and 1st Avenue, Denver	Pecos St and 68th Ave, Adams County	38th Avenue and Lutheran Pkwy, Wheat Ridge
Acres	39	32	21	122	100
Development					
Residential					
Single Family Homes	--	--	130	650	--
Attached/Townhome	--	--	250	60	--
Multifamily				--	--
For-Sale Condo	--	--	110	--	--
Market Rate Apartments	801	--	420	--	--
Affordable Apartments	--	176	--	--	--
Total Units	**801**	**176**	**910**	**710**	**0**
Height Range (stories)					
Commercial (Sq. Ft.)					
Retail	128,500	82,600	25,000	77,280	--
Office	64,648	57,000	163,065	--	219,184
Total Commercial (Sq. Ft.)	**193,148**	**139,600**	**188,065**	**77,280**	**219,184**
Height Range (stories)	(1-9)	(1-3)	(1-4)	(1-2)	(1-6)
Adaptive Re-use					
Re-Use of Existing Buildings	No	Yes	No	No	No
Uses	Office	Retail, restaurant, office, movie theatre			
Development Context					
Surrounding Density (2 miles)					
Households	49,048	36,566	42,387	16,205	23,095
Employment	55,124	44,985	46,713	23,655	27,144
Average Daily Traffic Counts	52,500	37,200	28,400	23,890	13,300
Street Reference	Colorado Blvd	Colfax Avenue	Quebec St	Pecos Street	38th Avenue

Source: ESRI; CoStar Economic & Planning Systems

9th and Colorado – A mixed-use project located at 9th and Colorado Boulevard with approximately 801 multifamily units and 193,148 square feet of commercial space. The site is at the former location of University of Colorado Hospital facilities that were demolished in 2015 and 2018. In 2018, in the first phase of the project, a 275-unit multifamily development, The Theo, came online. This phase also included 50,000 square feet of general retail. In 2019, 34,500 square feet of retail space was added to the site, and an additional 526 units were added across two multifamily projects in 2020: The Milo (319 units) and Overture (207 units). Further, a 44,000 square foot AMC theatre and 64,648 square feet of office space was added in the latter half of 2020. The project utilized tax increment financing dollars through the Denver Urban Renewal Authority to support the redevelopment of the former medical campus.

St. Anthony Redevelopment – The St. Anthony project is a mixed-use redevelopment project located at the former St. Anthony Central Hospital campus. It includes four project phases: Block 7 West, Block 7 East, Block 9, and Block 3. Block 7 West and Block 7 East include 19 acres of the former St. Anthony Central Hospital in northwest Denver.

In 2015, the western portion of the site (Block 7 West) was purchased by Alamo Sloan's LLC (Alamo) and redeveloped into a movie theatre with in-movie food and beverage service and a full-service restaurant. The project cost an estimated $15 million but achieved $3.4 million in developer reimbursement through TIF. The eastern portion of the site (Block 7 East) was purchased by an office developer, which has plans to reconstruct and convert the building into approximately 57,000 rentable square feet of professional office and ground floor retail space. Estimated projects costs for Block 7 East totaled $11 million, and $1.65 million in TIF was allocated to the project. Is Block 7 East complete? I know the Block 7 West is past tense.

The two remaining portions of the project include Block 9 and Block 3. Block 9 was approved in 2017 and includes the planned 217,000 square foot facility that will include 112 senior affordable rental apartments at 60% AMI, and an additional 64 senior affordable units ranging from 30% to 60% AMI. The project is also expected to include a 20,000 square foot health clinic and senior activity center. Block 9 is projected to cost $58.3 million yet is anticipated to receive $5.5 million in TIF. Block 3 is the final component of the project and is expected to

include the rehabilitation of the 44,000 square foot historic Kuhlman Building into 49 affordable rental apartments at 60% of AMI. The project is also expected to include 7,500 square feet of retail space, and 25 market rate townhomes. The project was approved in 2017 and is expected to cost $31.9 million and receive $6.9 million in TIF.

Boulevard One – Approximately 300 new luxury townhomes have been built in three separate projects over the last five years at Boulevard One at Lowry, a 70-acre redevelopment project at Quebec and 1st Avenue. All three were completed by Koebel Development and include the Orion Series, Matador Series, and Interlude Series. A majority of the townhomes have already sold, with pricing starting at $700,000 to over $1.2 million with just a few units remaining.

Midtown – Approximately 650 single family homes and 60 townhomes have been built over the past five years at Pecos Street and 68th Avenue. Upon completion, the 122-acre project is expected to include 1,300 residences. In addition, two commercial pads, totaling 77,280 square feet, are for sale at northeastern portion of the site.

5. Market Demand

EPS evaluated the demand for office, retail, and housing uses for the Lutheran Legacy Campus to support the Master Plan. This chapter provides a summary of the estimated demand for each use type for the Primary Market Area and the Lutheran Legacy Campus.

Office Demand Forecasts

Regional Demand 2020 to 2040

This section presents the estimated demand for office space in the Denver Metro Area for the 2020 to 2040 period based on the employment forecasts previously presented in **Table 5**. The percent of employment using office space by NAICS is estimated based on data from the National Association of Realtors, as shown in **Table 11** on the following page.

The composition of office space ranges from between 6 percent of Wholesale Trade and 10 percent of Retail Trade employment on the low side to 80 percent of Finance and Insurance and Management on the high side. An average gross space of 275 square feet per employee is then applied to the net employment growth in each sector to estimate the demand for new office space. The employment-based office space demand is factored up to total required construction by applying the current office vacancy factor of 9 percent. Based on these factors, the Denver region is estimated to demand a total of 25.3 million square feet of office space over the 2020 to 2030 period or an average of 2.5 million square feet per year as shown in **Table 11**. This compares to average construction of 2.3 million square feet over the last decade. Total demand is forecast to increase to 31.0 million over the 2030 to 2040 time period or an average of 3.1 million square feet per year.

Table 11. Office Space Demand Forecast, 2020-2040

Industry	Percent in Office Space	Sq. Ft./ Empl.	2020	2030	2035	2040	2020-2030 Change	2020-2030 Ann. #	2020-2030 Ann. Rate	2030-2035 Change	2030-2035 Ann. #	2030-2035 Ann. Rate	2030-2040 Change	2030-2040 Ann. #	2030-2040 Ann. Rate
Ag./Forest/Hunting	5.0%	275	49,000	56,000	60,000	65,000	7,000	700	1.3%	4,000	800	1.4%	9,000	900	1.5%
Mining	30.0%	275	1,181,000	1,354,000	1,464,000	1,583,000	173,000	17,300	1.4%	110,000	22,000	1.6%	229,000	22,900	1.6%
Utilities	25.0%	275	517,000	593,000	642,000	694,000	76,000	7,600	1.4%	49,000	9,800	1.6%	101,000	10,100	1.6%
Construction	20.0%	275	5,987,000	6,864,000	7,423,000	8,028,000	877,000	87,700	1.4%	559,000	111,800	1.6%	1,164,000	116,400	1.6%
Manufacturing	30.0%	275	8,768,000	10,051,000	10,870,000	11,756,000	1,283,000	128,300	1.4%	819,000	163,800	1.6%	1,705,000	170,500	1.6%
Wholesale Trade	6.0%	275	1,541,000	1,767,000	1,911,000	2,066,000	226,000	22,600	1.4%	144,000	28,800	1.6%	299,000	29,900	1.6%
Retail Trade	10.0%	275	4,114,000	4,793,000	5,157,000	5,549,000	679,000	67,900	1.5%	364,000	72,800	1.5%	756,000	75,600	1.5%
Transport./Warehousing	30.0%	275	5,453,000	6,160,000	6,594,000	7,057,000	707,000	70,700	1.2%	434,000	86,800	1.4%	897,000	89,700	1.4%
Information	65.0%	275	11,185,000	12,635,000	13,524,000	14,476,000	1,450,000	145,000	1.2%	889,000	177,800	1.4%	1,841,000	184,100	1.4%
Finance/Insurance	80.0%	275	19,639,000	22,186,000	23,747,000	25,418,000	2,547,000	254,700	1.2%	1,561,000	312,200	1.4%	3,232,000	323,200	1.4%
Real Estate	60.0%	275	5,562,000	6,284,000	6,726,000	7,199,000	722,000	72,200	1.2%	442,000	88,400	1.4%	915,000	91,500	1.4%
Prof. & Tech Services	65.0%	275	31,303,000	35,363,000	37,850,000	40,513,000	4,060,000	406,000	1.2%	2,487,000	497,400	1.4%	5,150,000	515,000	1.4%
Mgmt	80.0%	275	7,891,000	8,915,000	9,542,000	10,213,000	1,024,000	102,400	1.2%	627,000	125,400	1.4%	1,298,000	129,800	1.4%
Admin/Waste Mgmt	70.0%	275	22,798,000	25,754,000	27,566,000	29,505,000	2,956,000	295,600	1.2%	1,812,000	362,400	1.4%	3,751,000	375,100	1.4%
Education	40.0%	275	13,034,000	14,439,000	14,875,000	15,325,000	1,405,000	140,500	1.0%	436,000	87,200	0.6%	886,000	88,600	0.6%
Health Care	30.0%	275	17,990,000	20,324,000	21,753,000	23,284,000	2,334,000	233,400	1.2%	1,429,000	285,800	1.4%	2,960,000	296,000	1.4%
Arts/Rec	10.0%	275	911,000	982,000	1,025,000	1,070,000	71,000	7,100	0.8%	43,000	8,600	0.9%	88,000	8,800	0.9%
Accommodations	10.0%	275	6,011,000	7,092,000	7,673,000	8,301,000	1,081,000	108,100	1.7%	581,000	116,200	1.6%	1,209,000	120,900	1.6%
Other	40.0%	275	5,965,000	6,739,000	7,213,000	7,720,000	774,000	77,400	1.2%	474,000	94,800	1.4%	981,000	98,100	1.4%
Public Admin	25.0%	275	6,126,000	6,920,000	7,407,000	7,928,000	794,000	79,400	1.2%	487,000	97,400	1.4%	1,008,000	100,800	1.4%
Unclassified	0.0%	275	0	0	0	0	0	0	---	0	0	---	0	0	---
Total Occupied Space	**36.3%**		**176,025,000**	**199,271,000**	**213,022,000**	**227,750,000**	**23,246,000**	**2,324,600**	**1.2%**	**13,751,000**	**2,750,200**	**1.3%**	**28,479,000**	**2,847,900**	**1.3%**
CoStar Office Inventory Vacancy Rate			9.0%	9.0%	9.0%	9.0%									
Total Space Demand			**191,867,250**	**217,205,390**	**232,193,980**	**248,247,500**	**25,338,140**	**2,533,814**	**1.2%**	**14,988,590**	**2,997,718**	**1.3%**	**31,042,110**	**3,104,211**	**1.3%**

Source: Nat'l Assoc. of Realtors and John Burns Consulting; DRCOG; Economic & Planning Systems

Primary Market Area Capture

The Primary Market Area has captured approximately 416,565 square feet of office space between 2010 and 2021, which equates to just 2.45 percent of the 17 million square feet of office space in the Denver region added since 2010. Since 2010, downtown Denver has experienced a resurgence of office development, as well as the emergence of new locations such as the River North (RiNo) District north of downtown, and an acceleration of demand in the South I-25 associated with TOD projects located at RTD light rail stations.

Based on historic capture rates, the estimated capture of office development in the Primary Market Area ranges from 1.5 percent to 2.5 percent over the next 20 years. A 1.5 percent capture rate results in 38,007 square feet per year from 2020 to 2030 and 46,563 per year from 2030 to 2040, as shown in **Table 12**. The total office demand in the Primary Market Area over this 20-year time period would be 845,704 square feet of office space or an average of 42,285 square feet annually. The high range of 2.5 percent capture results in 63,345 square feet per year from 2020 to 2030 and 74,501 square feet per year from 2030 to 2040. The total office demand in the Primary Market Area over this 20-year period would be 1.3 million square feet of office space or an average of 68,923 square feet annually.

Based on its sizeable position in the Wheat Ridge office market, Lutheran has the potential to capture approximately 17.5 percent of the total office demand of the Primary Market Area. A low range capture of the Primary Market Area is estimated to result in 6,651 square feet per year from 2020 to 2030. The high range capture results in 11,085 square feet per year from 2020 to 2030. The average of the low and high capture for the next ten years is 89,000 square feet.

Table 12. Office Demand Capture (sq. ft.), 2020-2040

Demand Capture	2020-2030			2030-2040			2020-2040	
	% Capture	Total	Ann. #	% Capture	Total	Ann. #	Total	Ann. #
Office (sq. ft.)								
Denver Metro		25,338,140	2,533,814		31,042,110	3,104,211	56,380,250	2,819,013
Primary Market Area								
Low Capture	1.5%	380,072	38,007	1.5%	465,632	46,563	845,704	42,285
High Capture	2.5%	633,454	63,345	2.4%	745,011	74,501	1,378,464	68,923
Lutheran								
Low Capture	17.5%	66,513	6,651	17.5%	81,486	8,149	147,998	7,400
High Capture	17.5%	110,854	11,085	17.5%	130,377	13,038	241,231	12,062

Source: Economic & Planning Systems

Retail Demand

Future retail demand estimated for the Primary Market Area is based on household and income growth and the portion of total income spent in retail stores as estimated in the steps below.

- Total Personal Income (TPI) growth is estimated based on household growth multiplied by average household income.
- Based on the U.S. Census of Retail Trade, the percent spent by retail store category is then estimated.
- The amount of retail space supported by the growth in trade area expenditures is estimated by dividing expenditure potential by average annual sales per square foot estimates for each store category.

Population and household projections were developed for the Primary Market Area and based on the historical annual growth rates from 2000 to 2020. The Primary Market Area is estimated to reach 118,419 households by 2030 and 130,808 households by 2040, as shown in **Table 13** , based on a 1.0 percent annual growth rate.

Table 13. Population and Household Projections, 2000-2040

Description	2000	2010	2020	2000-2020 Total	2000-2020 Ann. #	2000-2020 Ann. %	2000-2010 Total	2000-2010 Ann. #	2000-2010 Ann. %	2010-2020 Total	2010-2020 Ann. #	2010-2020 Ann. %	2030	2040
Population														
Wheat Ridge	32,688	30,153	31,832	-856	-43	-0.1%	-2,535	-254	-0.1%	1,679	168	0.5%	33,604	35,476
Primary Market Area	236,582	226,287	254,787	18,205	910	0.4%	-10,295	-1,030	0.4%	28,500	2,850	1.2%	281,443	310,889
Households														
Wheat Ridge	14,466	13,964	14,709	243	12	0.1%	-502	-50	0.1%	745	75	0.5%	15,494	16,320
Primary Market Area	94,906	95,634	107,203	12,297	615	0.6%	728	73	0.6%	11,569	1,157	1.1%	118,419	130,808

Source: U.S. Census; ESRI Business Analyst; Economic & Planning Systems

The Primary Market Area currently has 107,203 households and an average household income of $89,390, which results in $9.5 billion of total personal income, shown in **Table 14**. The Primary Market Area is estimated to increase by 23,605 households over the next 20 years. This growth in households results in an increase of $2.1 billion of TPI as shown.

Table 14. Primary Market Area Total Personal Income, 2020-2040

Primary Market Area	2020	2030	2040	2020-2040 Total
Households	107,203	119,006	130,808	23,605
Avg. Household Income	$89,390	$89,390	$89,390	---
Total Personal Income	**$9,582,876,170**	**$10,637,903,113**	**$11,692,930,057**	**$2,110,053,887**

Source: US Census; ESRI; Economic & Planning Systems

Based on data from the 2017 Census of Retail Trade, the average Colorado household spends approximately 35 percent of its income on retail goods annually. The estimated percent of income spent on retail sales by store category is shown in **Table 15**. Total retail expenditures by Primary Market Area residents are estimated at $3.3 billion. Retail expenditure potentials in the Primary Market Area are estimated to increase by $370 million by 2030 and $741 million by 2040 as shown.

Table 15. Primary Market Area Expenditure Potential, 2020-2040

Store Type	Retail Sales % TPI (2017)	2020 ($000s)	2030 ($000s)	2040 ($000s)	2020-2030 ($000s)	2020-2040 ($000s)
Total Personal Income (TPI)	**100`%**	**$9,582,876**	**$10,637,903**	**$11,692,930**	**$1,055,027**	**$2,110,054**
Convenience Goods						
Supermarkets and Other Grocery Stores	6.9%	$663,059	$736,059	$809,058	$72,999	$145,999
Convenience Stores (incl. Gas Stations)	2.0%	$189,671	$210,553	$231,434	$20,882	$41,764
Beer, Wine, & Liquor Stores	1.1%	$103,181	$114,541	$125,901	$11,360	$22,720
Health and Personal Care	1.7%	$159,611	$177,184	$194,756	$17,572	$35,145
Total Convenience Goods	**11.6%**	**$1,115,523**	**$1,238,336**	**$1,361,150**	**$122,813**	**$245,627**
Shopper's Goods						
General Merchandise						
Department Stores	1.4%	$132,698	$147,307	$161,917	$14,609	$29,219
Warehouse Clubs & Supercenters	5.8%	$555,807	$616,998	$678,190	$61,192	$122,383
Subtotal	**7.2%**	**$688,505**	**$764,306**	**$840,107**	**$75,801**	**$151,602**
Other Shopper's Goods						
Clothing & Accessories	2.2%	$206,299	$229,012	$251,724	$22,713	$45,425
Furniture & Home Furnishings	1.2%	$112,890	$125,318	$137,747	$12,429	$24,857
Electronics & Appliances	1.1%	$102,198	$113,449	$124,700	$11,251	$22,503
Sporting Goods, Hobby, Book, & Music Stores	1.3%	$120,833	$134,136	$147,439	$13,303	$26,606
Miscellaneous Retail	1.3%	$123,664	$137,279	$150,894	$13,615	$27,230
Subtotal	**6.9%**	**$665,883**	**$739,194**	**$812,504**	**$73,310**	**$146,621**
Total Shopper's Goods	**14.1%**	**$1,354,388**	**$1,503,499**	**$1,652,611**	**$149,111**	**$298,223**
Eating and Drinking	**6.1%**	**$583,564**	**$647,811**	**$712,059**	**$64,247**	**$128,495**
Building Material & Garden	**3.3%**	**$312,912**	**$347,362**	**$381,812**	**$34,450**	**$68,900**
Total Retail Goods	**35.1%**	**$3,366,386**	**$3,737,009**	**$4,107,631**	**$370,622**	**$741,245**

Source: 2017 Census of Retail Trade; Economic & Planning Systems

This growth in potential store sales is translated into demand for retail space using national averages for sales per square foot by store category. Overall, the Primary Market Area is estimated to have the potential to capture approximately 1.0 million square feet of demand over the next 10 years and 2.0 million square feet of retail demand over the next 20 years, as shown in **Table 16**. This assumes current sales levels at existing retailers. Some of this future demand may be captured by existing stores in the Primary Market Area (e.g., Costco capturing more General Merchandise sales) and therefore may not produce additional retail space.

To estimate the portion of the Primary Market Area's retail demand that could potentially be located in Wheat Ridge, capture rates were applied to the future citywide sales growth. Convenience goods stores (including grocery, drug, health, and personal care) are more locally serving with a higher capture of demand from city residents and thus have a higher estimated capture rate compared to other shoppers' goods categories. Overall, Wheat Ridge is expected to capture approximately 18 percent of total retail goods from the Primary Market Area. This translates into an estimated 371,450 square feet of retail development demand in Wheat Ridge through 2040.

The potential demand and capture of retail in Wheat Ridge may not result in substantial new development. The city currently has several older commercial centers that may be candidates for reconfiguration to capture new retail demand. As well, the city has attracted a significant amount of new retail development in recent years including the development of anchor retail uses such as the Lucky's Market, Sprouts Farmers Market, and HomeGoods. The recent redevelopment of the Applewood Village Shopping Center illustrates the potential shifts in existing shopping centers in Wheat Ridge. Future demand may be captured by existing space that is reconfigured to match with demands of new tenants.

The three major retail areas in Wheat Ridge (Wadsworth Blvd corridor, Kipling Street corridor, and the I-70 corridor) will continue to be the focus for large scale commercial development. The Lutheran Legacy Campus site lacks the same traffic volumes as these locations. The potential capture on the Lutheran Legacy Campus is 30,000 square feet over the next 10 years (16 percent of the citywide demand).

Table 16. Primary Market Area Retail Demand, 2020-2040

Store Type	Avg. Sales Per Sq. Ft.	Supportable Space 2020	New Demand 2020-2030	New Demand 2020-2040	Wheat Ridge Percent Capture	Wheat Ridge Capture (2020-2030)	Wheat Ridge Capture (2020-2040)
Convenience Goods							
Supermarkets and Other Grocery Stores	$400	1,658,000	182,000	365,000	25%	45,500	91,250
Convenience Stores (incl. Gas Stations)	$400	474,000	52,000	104,000	25%	13,000	26,000
Beer, Wine, & Liquor Stores	$300	344,000	38,000	76,000	25%	9,500	19,000
Health and Personal Care	$400	399,000	44,000	88,000	25%	11,000	22,000
Total Convenience Goods		**2,875,000**	**316,000**	**633,000**		**79,000**	**158,250**
Shopper's Goods							
General Merchandise							
Department Stores	$300	442,000	49,000	97,000	10%	4,900	9,700
Warehouse Clubs & Supercenters	$500	1,112,000	122,000	245,000	10%	12,200	24,500
Subtotal		**1,554,000**	**171,000**	**342,000**		**17,100**	**34,200**
Other Shopper's Goods							
Clothing & Accessories	$350	323,000	65,000	130,000	10%	6,500	13,000
Furniture & Home Furnishings	$250	409,000	50,000	99,000	10%	5,000	9,900
Electronics & Appliances	$500	242,000	23,000	45,000	10%	2,300	4,500
Sporting Goods, Hobby, Book, & Music Stores	$350	353,000	38,000	76,000	10%	3,800	7,600
Miscellaneous Retail	$250	2,664,000	54,000	109,000	10%	5,400	10,900
Subtotal		**3,991,000**	**230,000**	**459,000**		**23,000**	**45,900**
Total Shopper's Goods		**5,545,000**	**401,000**	**801,000**		**40,100**	**80,100**
Eating and Drinking	$350	**1,667,000**	**184,000**	**367,000**	30%	**55,200**	**110,100**
Building Material & Garden	$300	**1,043,000**	**115,000**	**230,000**	10%	**11,500**	**23,000**
Total Retail Goods		**11,130,000**	**1,016,000**	**2,031,000**	18%	**185,800**	**371,450**

Source: 2012 Census of Retail Trade; Economic & Planning Systems

Housing Demand

To estimate housing demand, EPS forecasted household growth for the Primary Market Area based on the historical annual growth rate and residential building permits as a benchmark. The household growth forecast was used to translate demand for housing units by type.

Based on the historical annual growth rate from 2000 to 2020, the Primary Market Area is estimated to grow by nearly 23,605 households by 2040, shown in **Table 17**. A vacancy rate of 4.0 percent was applied based on the historical average vacancy rate from 2000 to 2020 to project demand for housing units. This equates to demand for 24,357 housing units over the next 20 years or an average of 1,218 units per year.

Table 17. Primary Market Area Demand Forecast, 2020-2040

Forecast	Factor	2020	2030	2040	2020-2040 Total	2020-2040 Ann. #	2020-2040 Ann. %
Primary Market Area							
Population		254,787	281,443	310,889	56,102	2,805	1.0%
Pop per HH		*2.38*	*2.38*	*2.38*			
Households		107,203	118,419	130,808	23,605	1,180	1.0%
Housing Units	4% Vacancy	111,901	123,156	136,258	24,357	1,218	1.0%

Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

The demand for housing units is split by housing unit type (single family, attached, and multifamily) based on residential building permit trends in the City of Wheat Ridge over the past 10 years. This breakdown of unit type includes 30 percent single family, 10 percent attached, and 60 percent multifamily. Based on the total housing unit demand of 11,300 units from 2020 to 2030, approximately 3,390 units will be single family, 1,130 attached units, and 6,780 multifamily units, as shown in **Table 18**. From 2030 to 2040, the estimated total housing demand is 13,100 units, which includes 3,930 single family, 1,310 attached, and 7,860 multifamily units.

Table 18. Primary Market Area Housing Demand by Unit Type, 2020-2030

Housing Types	Factor	2020-2030	2030-2040	Change 2020-2040 Total #	Change 2020-2040 Ann. #
Primary Market Area Housing Demand					
New Housing Units		11,300	13,100	24,400	1,220
Units By Type					
Single Family	30%	3,390	3,930	7,320	366
Attached	10%	1,130	1,310	2,440	122
Multifamily	60%	6,780	7,860	14,640	732
Total	**100%**	**11,300**	**13,100**	**24,400**	**1,220**

Source: U.S. Census; Economic & Planning Systems

Based on this estimate, there is ample potential demand for multifamily housing that can be captured in the Primary Market Area over the next 10 years. In addition, EPS estimated the demand for housing at Lutheran, shown in **Table 19**. Based on historic residential capture in Wheat Ridge, Lutheran can capture at least 20 percent of the single family and multifamily market over a 10-year period through 2030. This results in a total of 904 single family units added over the 10-year period and an additional 1,356 multifamily units added over the same period.

The limitation on the amount of housing the Lutheran Legacy Campus can capture is the physical configuration of the site and the height and density limits that are present in the City of Wheat Ridge Charter. There are very few large development sites on the western side of the Denver Metro Area that have the same attributes that Legacy Campus has. This creates the opportunity for a wide variety of housing products that could be attracted to the site. The demand estimate illustrates that just 20 percent of the forecast growth for the Primary Trade Area exceeds the density limit for the site. The site could capture more units if the limits didn't exist, and the physical configuration and infrastructure can support them.

Table 19. Lutheran Housing Demand by Unit Type, 2020-2030

Housing Types	Market Area 2020-2030	Lutheran Capture	Lutheran 10-Year Total #	Lutheran 10-Year Ann. #
Primary Market Area Housing Demand				
New Housing Units	11,300			
Units By Type				
Single Family/Attached	4,520	20%	904	90
Multifamily	6,780	20%	1,356	136
Total	**11,300**	**20%**	**2,260**	**226**

Source: U.S. Census; Economic & Planning Systems

Lutheran Campus Capture

The estimated capture of potential demand for residential, office, and retail uses over the next 10 years is summarized in **Table 20**. EPS estimates the potential capture of residential units over 10 years for the campus is up to 2,260 units, which is 20 percent of the estimated demand for the Primary Market Area between 2021 and 2031. EPS estimates that 50 percent of the demand is for multifamily units and the remainder is for single family or attached units. The estimated land demand for housing based on this number of units is 157 acres, which is larger than the Lutheran legacy campus (100 acres).

Table 20. Lutheran Campus Estimated Demand, 2021-2031

Description	10-Year Demand	Annual	Density	Estimated Acres
Residential Demand				
Single Family	452	45	6.0	75
Attached	452	45	12.5	36
Multifamily	1,356	136	30.0	45
Subtotal	**2,260**	**226**	**14.4**	**157**
Non-Residential Demand				
Office	89,000	8,900	0.35	5.8
Retail	30,000	3,000	0.20	3.4
Subtotal	**119,000**	**11,900**	**0.29**	**9.3**

Source: Economic & Planning Systems

The demand for non-residential uses is limited. EPS estimates the demand for office and retail uses on the campus is 119,000 square feet over the next 10 years. The non-residential uses are estimated to generate relatively modest demand for land within the campus. EPS estimate demand for 9 to 10 acres in total to accommodate the estimated capture of development.

The potential office capture is estimated to be 89,000 square feet. While there is demand for office uses, the feasibility of development of new office uses is likely limited. The supportable rental rate for office uses in the Primary Market Area are lower than are needed to support new development. The estimated demand would have to be captured within the existing medical office buildings on the Lutheran Legacy Campus.

Estimated capture for retail development on the campus is 30,000 square feet over the next 10 years. The types of retail that can be attracted to the site include convenience-oriented stores including health/beauty stores and salons, small retail boutiques or shops, service retailers (e.g., dry cleaner), fitness uses, beer/ wine/liquor stores, and restaurants. The capture of retail space may be higher if an anchor retail use (e.g., grocery store, pharmacy) or destination civic or entertainment uses are attracted to the site driving up traffic and demand at the site.

APPENDIX B
TRANSPORTATION ELEMENT

Lutheran Campus Master Plan – Transportation Assessment

Introduction

This section describes the transportation assessment and recommendations for the Lutheran Campus site. It includes a future traffic analysis based on the land use conditions which are assumed to generate the most demand. It analyzes the need to improve the existing and 2045 transportation conditions entering and existing the site and provides recommendations to improve traffic operation and safety for vehicles, pedestrians, and bicyclists. In addition to this quantitative assessment for one specified land use scenario, this section provides general recommendations for consideration to improve the transportation circulation, efficiency, and comfort for all modes. These recommendations include operational improvements, internal circulation and site access enhancements, and Transportation Demand Management strategies.

Future Traffic Analysis

The future traffic analysis analyzes potential transportation impacts resulting from the redevelopment of the Lutheran Campus site. Potential redevelopment land uses were used to estimate future site generated trips. Since the land use plan for the site will not be finalized until it is closer to redevelopment, this analysis took a "worst-case scenario" approach and looked at the maximum density of land uses that could be built on this site to determine the traffic impacts in this greatest density scenario. If the final development is ultimately less dense than the scenario analyzed, the generated trips would likely have less of an impact on traffic operations than what is shown in this report.

The future traffic analysis estimated what future traffic operations will look like in the year 2045 for the three intersections providing access into and out of the Lutheran Campus site:

1. Lutheran Parkway West/38th Avenue
2. North Lutheran Parkway/38th Avenue
3. 32nd Avenue/North Lutheran Parkway

The future traffic analysis builds off of the existing conditions traffic analysis previously conducted. The existing conditions traffic analysis found that two of the three intersections operate acceptably (LOS C or better per City of Wheat Ridge standards) under existing conditions. **However, the intersection of Lutheran Parkway West /38th Avenue currently does not operate at an acceptable level of service in both the AM and PM peak hours.** For more details on the existing conditions traffic analysis and results see **Appendix A** for the full existing conditions transportation report.

Overall, a future redevelopment of the Lutheran Campus site is likely to have minimal impacts to traffic operations of the surrounding intersections. At the end of this section, potential mitigation strategies are discussed that the city or future developer could consider for the North Lutheran Parkway/38th Avenue intersection, which does not operate acceptably per City of Wheat Ridge Level of Service standards in both the existing conditions and future analysis scenarios.

Analysis Methodology

Analysis Scenarios

The weekday AM and PM peak hours were included in the transportation analysis to evaluate the potential impacts on the transportation network. The following two scenarios were analyzed:

- **2045 Background Conditions**
  The 2045 Background Conditions scenario assumed no redevelopment of the site occurs. In this scenario, the Foothills Medical Office Building and Lutheran Hospice are the only land uses on the Lutheran Campus site. This scenario was analyzed in order to have an appropriate comparison for the Build scenario.
- **2045 Build Conditions**
  The 2045 Build Conditions scenario assumes the full redevelopment of the Lutheran Campus site with the maximum density of development as described previously. This scenario also assumes the Foothills Medical Office Building and Lutheran Hospice still exist on the site along with the redevelopment.

Evaluation Methodology

The following evaluation methodology was completed as part of the transportation analysis:

- **Determine existing traffic volumes for the existing conditions analysis**. Due to current travel patterns being affected by the COVID-19 pandemic, new traffic counts were not able to be collected for this analysis. In order to estimate pre-pandemic traffic patterns on the through streets in the study area, traffic counts previously collected in 2007 for the *Northeast Wing Addition Traffic Analysis Report* were used as a baseline and extrapolated to 2019 based on changes over those 12 years. Background traffic was determined to not have changed between 2007 and 2017. This analysis was based on the closest available data, applying CDOT counts on Kipling Street and Wadsworth Boulevard that, on average, did not change between these two dates.

- **Determine growth rate and volumes for the future scenario**. In order to determine the future growth rate of the background volumes, CDOT counts and forecasted volumes near the Lutheran Campus site were used. CDOT is estimating about 11% growth for volumes on CDOT roadways in the area between now (2021) and the future analysis year (2045). This growth rate was applied to the existing through street traffic volumes to obtain the 2045 Background volumes.

- **Evaluate the Background Scenarios**. This analysis determined the operational performance of the study intersections with estimated traffic, existing geometry, and traffic control for 2045 if the site is not redeveloped and only the Foothills Medical Office Building and Lutheran Hospice remain on the site.

- **Calculate the trip generation**. Trip generation was calculated based on the number of dwelling units for the multifamily housing, the amount of square feet for the office space, the amount of square feet for the retail stores, and the acres of park that are proposed for the development.

- **Distribute and assign generated trips**. The distribution percentages were developed based on existing traffic patterns. Trips were assigned through the study intersections using the distribution percentages.

- **Evaluate the Build Scenarios**. Determine the operational performance of the study intersections with a redevelopment of the site for 2045.
- **Discuss results and mitigation strategies**. Discuss the results of the analysis and what traffic operation mitigation strategies existing to improve performance of the study intersections.

Traffic Model Development

Transportation operations for the study area were analyzed using the Synchro 11 software program. Synchro is based on procedures outlined in the 6th edition of the Highway Capacity Manual. Synchro models were developed for each scenario and include the following existing data:

- Lane configuration
- Traffic control
- Posted speed limit
- Peak Hour Factor (PHF)

Level of Service Criteria

To measure and describe the operational status of the local roadway network and corresponding intersections, transportation engineers and planners commonly use a grading system called level of service (LOS) put forth by the Transportation Research Board's HCM 6th Edition. LOS characterizes the operational conditions of an intersection's traffic flow; ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed the design capacity, resulting in long queues and delays). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Traffic conditions of LOS D, E, or F, are considered unacceptable by City of Wheat Ridge standards and represent travel delay, increased accident potential, and less efficient motor vehicle operation. The LOS is determined differently depending on the type of control at the intersection.

For signalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the overall intersection, which includes all approaches.

At unsignalized intersections, the average delay per vehicle for the worst approach is used as the LOS for that intersection. **Table 1** summarizes the relationship between delay and LOS for signalized intersections and **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

Table 1: Signalized Intersection Level Of Service Definitions

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	>10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	>20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	>35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	>55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

Source: *Highway Capacity Manual (Transportation Research Board, 2016).*

Table 2: Unsignalized Intersection Level Of Service Definitions

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	<10
B	Short traffic delay.	>10 to 15
C	Average traffic delays.	>15 to 25
D	Long traffic delays.	>25 to 35
E	Very long traffic delays.	>35 to 50
F	Extreme traffic delays with intersection capacity exceeded.	>50

Source: *Highway Capacity Manual (Transportation Research Board, 2016).*

Background Conditions

This section presents the 2045 Background Conditions. The 2045 Background Conditions provide the baseline conditions for comparative purposes with the Build Conditions. In this scenario, it is assumed that the Lutheran Medical Center and associated existing land uses no longer occupy the site. This scenario also assumes that the Foothills Medical Office Building and Lutheran Hospice remain on the site.

In order to determine the 2045 Background Conditions peak hour turning movement volumes, background traffic volumes used in the previous existing conditions analysis were increased by a total growth rate of 11 percent in the AM and PM peak hours to account for CDOT's forecasted traffic growth between 2021 and 2045 on nearby segments of Wadsworth Boulevard. In addition to the background traffic (traffic not affiliated with the project site), estimated trips generated by the Foothills Medical Office Building and Hospice Center were added to the background volumes to reflect the amount of site traffic that will remain once the Lutheran Medical Center and associated land uses no longer occupy the site. The estimated trips generated by these two sites is shown in **Table 3**.

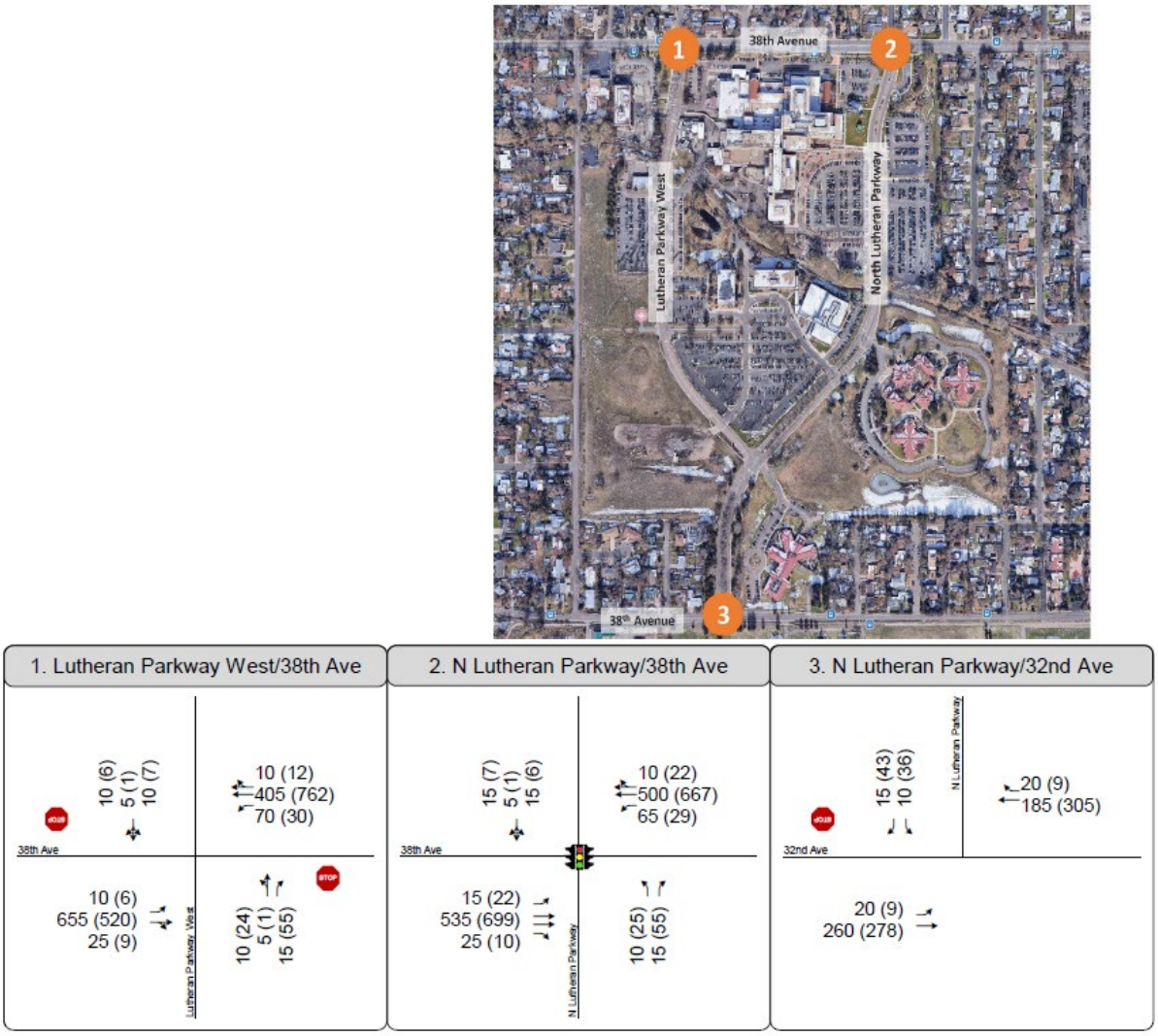
Table 3: Estimated Trip Generation for Foothills MOB & Lutheran Hospice

Land Use	ITE Code	Size	Unit	Daily Trips	AM Peak Hour					PM Peak Hour				
					In		Out		Total Trips	In		Out		Total Trips
					%	Trips	%	Trips		%	Trips	%	Trips	
Proposed Land Use														
Medical Office Building	720	109	KSF	3793	78%	236	22%	67	303	28%	106	72%	271	377
Hospice Care Center	620	36	KSF	239	80%	16	20%	4	20	43%	9	57%	12	21
ITE Subtotal														
				4,032		252		71	323		115		283	398
MXD+ Trip Reductions														
			-14%	-555	-15%	-38	-15%	-11	-49	-16%	-18	-16%	-44	-62
Net New Project Trips														
				3,477		**214**		**60**	**274**		**97**		**239**	**336**

Key: DU = Dwelling units, KSF = Thousand Square Feet

Figure 1 shows the projected 2045 Background Conditions peak hour volumes at the study intersections, as well as the lane configurations.

Table 4 provides the results of the level of service analysis of the 2045 Background Conditions for the AM and PM peak hours. **Appendix B** provides the Synchro HCM level of service reports for the 2045 Background Conditions.



Legend: AM (PM)

Figure 1: Traffic Volumes & Lane Configurations - 2045 Background Conditions

Table 4: 2045 Background Conditions Intersection Level of Service Results

ID	Intersection	Control[1]	Approach	2045 Background Conditions			
				AM		PM	
				Delay (veh/sec)	LOS	Delay (veh/sec)	LOS
1	Lutheran Pkwy W/38th Ave	SSSC[3]	NB/SB	33	D	37	E
2	N Lutheran Pkwy/38th Ave	Signal[2]	Overall	6.2	A	5	A
3	N Lutheran Pkwy/32nd Ave	SSSC[3]	SB	11	B	12	B

Notes:
1 Signal equals signalized intersection. SSSC indicates side-street stop-controlled intersection.
2 Whole intersection weighted average LOS and control delay expressed in seconds per vehicle for signalized intersections.
3 Worst approach LOS and delay in vehicle per seconds shown for side street stop-controlled intersections
Source: Fehr & Peers, September 2021

The LOS of all intersections improve in the 2045 Background Conditions analysis when compared to the existing conditions analysis (see **Appendix A**) because the number of trips entering and existing the site is lower in the 2045 Background Scenario since the Lutheran Medical Center and associated land uses will no longer occupy the site. Even though the delay and LOS improve in this scenario, the results indicate that the **Lutheran Pkwy West/38th Avenue intersection does not operate acceptably during the AM and PM peak hour under 2045 Background Conditions**. The other intersections would operate acceptably under the 2045 Background Conditions.

2045 Build Conditions

The 2045 Build Conditions assumes full build out of a redevelopment on the Lutheran Campus site. In this scenario, it was assumed the Foothills Medical Office Building and Lutheran Hospice remained on the site as well. The volumes used in this analysis were the background volumes (discussed in 2045 Background Conditions section) with the site trips added to those volumes (both the redevelopment trips and estimated trips from the Foothills Medical Office Building and Hospice Center).

Trip Generation

The future estimated vehicle trips associated with the Lutheran Campus site after redevelopment were calculated from the proposed land uses. Trips were generated utilizing the MainStreet tool powered by MXD+. MainStreet is a web-based application developed by Fehr & Peers for estimating trip generation for mixed-use developments. Current accepted methodologies, such as the Institute of Transportation Engineers (ITE) Trip Generation methodology, are primarily based on data collected at suburban, single-use, freestanding sites. These defining characteristics limit their applicability to mixed-use or multi- use development projects, which is in a high-density walkable setting with frequent and nearby local and regional transit service. The land use mix, design features, and setting of the proposed development would include characteristics that influence travel behavior differently from typical single-use suburban developments. Thus, traditional data and methodologies, such as ITE, would not accurately estimate the project vehicle trip generation. Further explanation and validation of this tool can be found in **Appendix C**.

It is expected that the Project will have a net total of 9,294 daily trips, 672 trips in the AM peak hour, and 863 trips in the PM peak hour. **Table 5** provides the trip generation and assumed land uses.

Table 5: Estimated Project Trip Generation - 2045 Build Conditions

Land Use	ITE Code	Size	Unit	Daily Trips	AM Peak Hour					PM Peak Hour				
					In		Out		Total Trips	In		Out		Total Trips
					%	Trips	%	Trips		%	Trips	%	Trips	
Proposed Land Use														
Low-Density Residential (LDR)	210	161	DU	1520	25%	30	75%	89	119	63%	100	37%	59	159
Medium-Density Residential(MDR)	220	233	DU	1706	23%	25	77%	82	107	63%	82	37%	48	130
1 - Medium to High-Density Residential (MHDR)	221	420	DU	2285	26%	39	74%	112	151	61%	113	39%	72	185
2 - Medium to High-Density Residential (MHDR)	221	360	DU	1958	26%	34	74%	96	130	61%	96	39%	62	158
Office (OFF.)	710	230	KSF	2240	86%	230	14%	37	267	16%	42	84%	223	265
Retail (RET)	820	25	KSF	944	63%	15	38%	9	24	48%	46	52%	49	95
Hospice Care Center	620	36	KSF	239	80%	16	20%	4	20	43%	9	57%	12	21
Park	411	3	Acres	2	N/A	0	N/A	0	0	N/A	0	N/A	0	0
ITE Subtotal														
				10,894		389		429	818		488		525	1,013
MXD+ Trip Reductions														
			-15%	-1,600	-18%	-70	-18%	-76	-146	-15%	-72	-15%	-78	-150
Net New Project Trips														
				9,294		**319**		**353**	**672**		**416**		**447**	**863**

Key: DU = Dwelling units, KSF = Thousand Square Feet

Source: MainStreet, Fehr & Peers, September 2021

Trip Distribution

The project trip distribution values were determined directly from the existing traffic volumes. The project trip distribution is as follows:

Inbound Trips

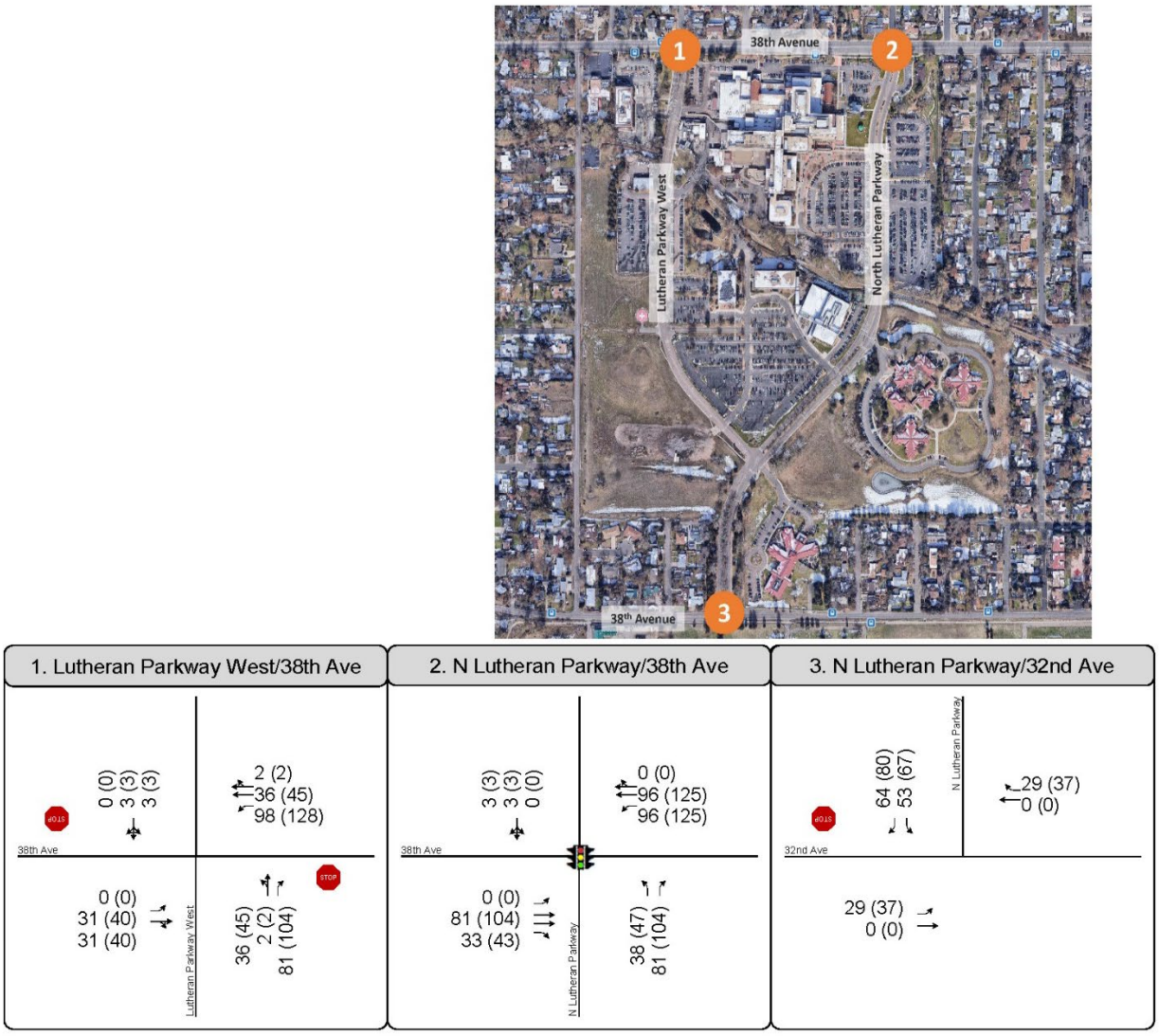
- West 38th Avenue (West direction): 19%
- West 32nd Avenue (East direction): 9%
- West 38th Avenue (East direction): 60%
- West 32nd Avenue (West direction): 9%
- Cody Street (north of W 38th Street): 1.50%
- N Balsam Street (north of W 38th Street): 1.50%

Outbound Trips

- West 38th Avenue (West direction): 20%
- West 32nd Avenue (East direction): 15%
- West 38th Avenue (East direction): 46%
- West 32nd Avenue (West direction): 18%
- Cody Street (north of W 38th Street): 1%
- N Balsam Street (north of W 38th Street): 0%

Trip Assignment

Vehicular traffic was assigned by applying the trip distribution to the estimated trip generation. **Figure 2** displays the Project trip assignment.



Legend: AM (PM)

Figure 2: Trip Assignment of Lutheran Campus Site Trips and Lane Configurations - 2045 Build Conditions

2045 Build Transportation and Intersection Operations

The 2045 Build Scenario combines the volumes from the 2045 Background Scenario and the vehicle trips generated by the Project. An analysis was conducted to evaluate the impact on the study intersections. **Figure 3** shows the projected 2045 Build Conditions peak hour volumes at the study intersections, as well as the lane configurations. Intersection controls and lane configurations will remain the same as Background Conditions.

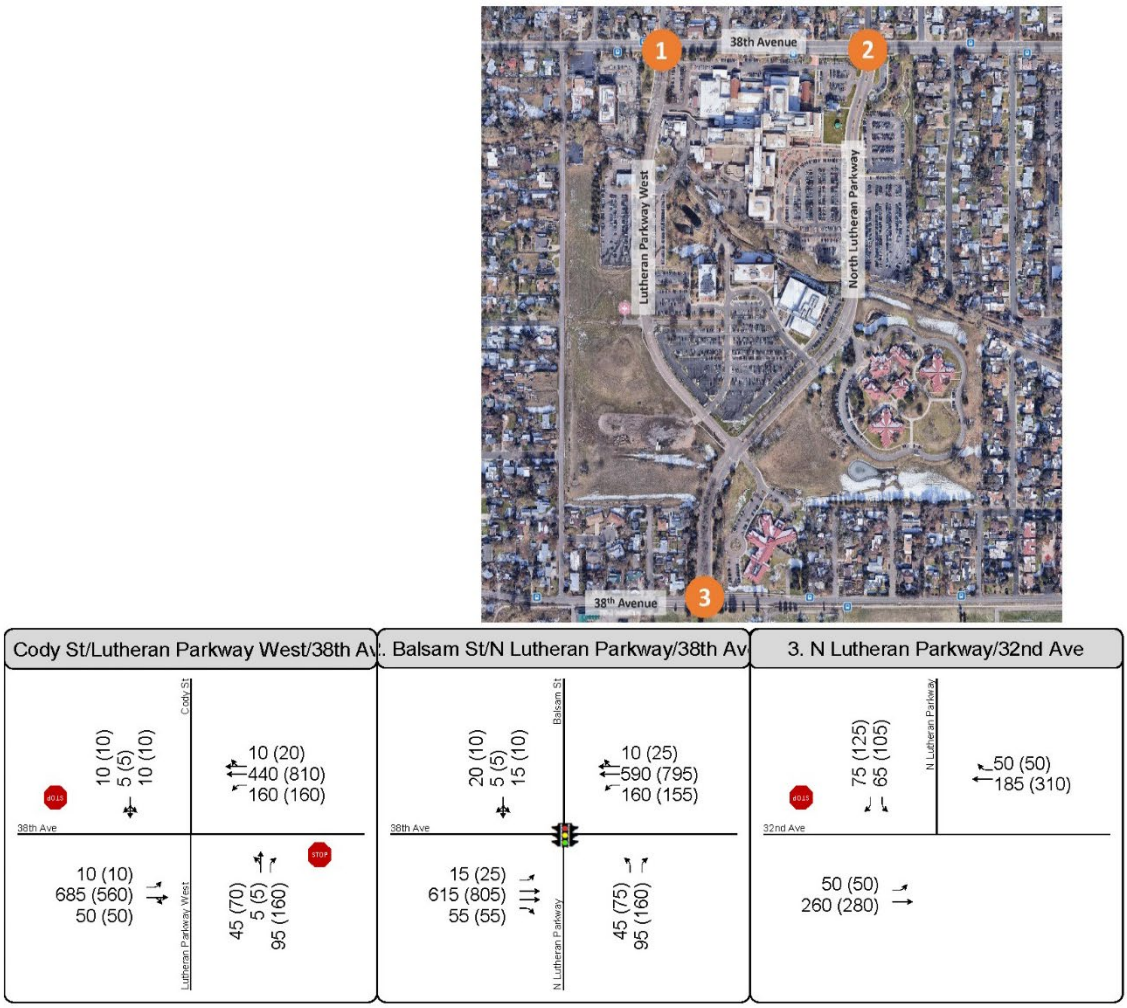
Table 6 presents the delay and LOS results for the study intersections under 2045 Build Conditions. **Appendix B** provides the LOS calculations for the 2045 Build Conditions.

Table 6: 2045 Build Conditions Intersection Level of Service Results

ID	Intersection	Control[1]	Approach	2045 Build Conditions			
				AM		PM	
				Delay (veh/sec)	LOS	Delay (veh/sec)	LOS
1	Lutheran Pkwy W/38th Ave	SSSC[3]	NB	103	F	>200	F
2	N Lutheran Pkwy/38th Ave	Signal[2]	Overall	11	B	10	B
3	N Lutheran Pkwy/32nd Ave	SSSC[3]	SB	12	B	15	B

Notes:
1 Signal equals signalized intersection. SSSC indicates side-street stop-controlled intersection.
2 Whole intersection weighted average LOS and control delay expressed in seconds per vehicle for signalized intersections.
3 Worst approach LOS and delay in vehicle per seconds shown for side street stop-controlled intersections
Source: Fehr & Peers, September 2021

The results indicate that **one of the study intersections would operate unacceptably under 2045 Build Conditions.** The Lutheran Parkway West/38th Avenue intersection would operate at LOS F with a delay of 103 seconds in the AM peak hour and LOS F with a delay of more than 200 seconds in the PM peak hour under the 2045 Build Conditions as a side-street, stop controlled intersection. The other two intersections would operate at acceptable LOS under these conditions.



Legend: AM (PM)

Figure 3: Traffic Volumes & Lane Configurations - 2045 Build Conditions

Summary of Findings and Potential Mitigation Strategies

Under existing conditions (2021), 2045 Background Conditions, and 2045 Build Conditions, the intersection of Lutheran Parkway West/38th Avenue does not operate at an acceptable level of service in both the AM and PM peak hours per City of Wheat Ridge standards which require intersections to operate at LOS C or better. To be in alignment with City of Wheat Ridge standards, this intersection, and possible mitigation strategies, should be further studied to improve operations. Two possible mitigation strategies for the intersection of Lutheran Parkway West/38th Avenue that can be explored are:

- **Making the south leg of the intersection right-in, right-out**
  Restricting the south leg of the intersection to right-in right-out movements would eliminate all left turns into or out of Lutheran Parkway West as well as the northbound through and southbound through movements. Further study would be required to determine whether or not left turns in and out of Cody Street should be maintained. This mitigation strategy could improve operations by eliminating the movements causing delay on the south leg of the intersection. Right-in/right-out access at Lutheran Parkway West, which would shift left-turn access to North Lutheran Parkway, results in LOS E at North Lutheran Parkway without any changes to signal timing, LOS C if splits are optimized, and LOS B if the cycle length is optimized at a cycle length of 70 seconds. Compared to signalization, making the south leg of Lutheran Parkway West/38th Avenue right-in, right-out would likely be a lower cost mitigation strategy.

- **Signalizing the intersection**
  Signalizing the intersection could improve the operation of the intersection because it would give the side-street movements a separate phase or phases, rather than cars having to wait for gaps in traffic on 38th Avenue. This would make being able to execute side-street movements at the intersection more reliable and therefore reduce the average delay of those movements. The peak hour signal warrant of the 2045 Build Conditions is met at this intersection.

Overall, a future redevelopment of the Lutheran Campus site, even with higher density land uses than are likely to be built, is not likely to have significant impacts on the traffic operations of the study intersections. The intersection of Lutheran Parkway West/38th Avenue is not operating acceptably under existing conditions and not estimated to operate acceptably under 2045 Background Conditions, so mitigation strategies to improve operations will likely be necessary with or without redevelopment of the site.

Multimodal Connections, Programs, and Policies

Internal Circulation and Site Access

- Internal circulation of the site for people walking, biking, and driving will be important to ensure that people can move both through the site and to specific destinations efficiently and comfortably. This section also discusses site access, which identifies additional connections between the site and the surrounding transportation network. Increasing these connections will help provide access to the planned locally serving uses and create a street grid that fosters connectivity. This section describes the internal circulation and site access considerations for each zone.

All Zones

- A fully connected and intuitive multimodal path and sidewalk network should be completed within the site. The existing site has an extensive path and sidewalk network with only a few missing gaps or substandard facilities; the first priority is to complete these missing gaps and upgrade deficient sidewalks with ADA (Americans with Disabilities Act)-compliant widths and curb ramps. Depending on the development patterns of the site, modifying the current path network to create a gridlike layout would be the next priority. This gridlike structure will provide more direct access for people walking and biking, create a more intuitive experience, and provide users with more route options.
- For people biking looking for a more direct route, they may choose to bike on internal roadways rather than the path network. Given the forecasted volume and speeds on internal roadways, bike lanes are recommended. If vehicle speeds are greater than or equal to 25 mph or vehicle volumes are greater than 3,000 vehicles per day, a bike lane is needed to provide a low-stress experience for people biking,
- Depending on development patterns and the approach to site development, the existing internal roadways will either be maintained or re-envisioned. If the existing roadways are maintained, the previous recommendations regarding the path network identify opportunities for providing more of a street grid within the site. If internal roadways are relocated, they should be done so in a grid. This will create a more human scale, improve connectivity, distribute traffic, and improve walkability.

Zone 1

- Consider extending West 35th Avenue east of Dudley Street to connect to Lutheran Parkway West. Depending on the nature of the land use selected, this roadway should serve all modes—people walking, biking, and driving. This additional connection will further integrate the site into the surrounding neighborhood and street grid. It will also provide additional access for traffic entering and existing the site, relieving pressure from the existing three access points. Lastly, this will provide a direct connection to Wheat Ridge High School. If additional vehicular connection is deemed inappropriate, a bicycle/pedestrian connection on West 35th Avenue from Dudley Street to Lutheran Parkway West should still be considered.
- Consider constructing bicycle and pedestrian cut-thrus—or paths that provide bicycle and pedestrian access but not vehicular access. In Zone 1, these should be considered along the Rocky Mountain Ditch, formalizing the trail that currently exists and supporting the ditch as a public amenity. The ditch provides a potential easement to connect the site to Wheat Ridge

High School. A connection at West 35th Avenue was previously described and should be considered. Depending on the site plan, a connection across West 34th Avenue could also be considered to foster a grid-like pattern for people walking and biking; this grid pattern increases walkability and bikeability by reducing out of direction travel.

Zone 2

- Enhanced pedestrian crossings across West 38th Avenue should be evaluated. There are currently no marked pedestrian crossings at Lutheran Parkway West and West 38th Avenue. Pedestrian enhancements should be aligned with other intersection improvements as discussed in the operational improvements section. The City should coordinate with RTD to see if the bus stop on 38th Avenue/Brentwood Street can be relocated to 38th Avenue/North Lutheran Parkway. This will provide more comfortable and convenient access for pedestrians, allowing them to use the controlled marked crossing. If the bus stop cannot be relocated, an additional pedestrian crossing that provides access to the existing bus stop on West 38th Avenue/Brentwood Street should be assessed. In order to determine the appropriate treatments for a crossing at this location, vehicle volumes, vehicle speeds, and pedestrian counts should be collected. A treatment should be selected based on the City of Wheat Ridge's guidelines for midblock pedestrian crossings. If pedestrian volumes are too low for a controlled treatment, a median refuge island can be implemented to provide opportunities for a two-stage crossing.

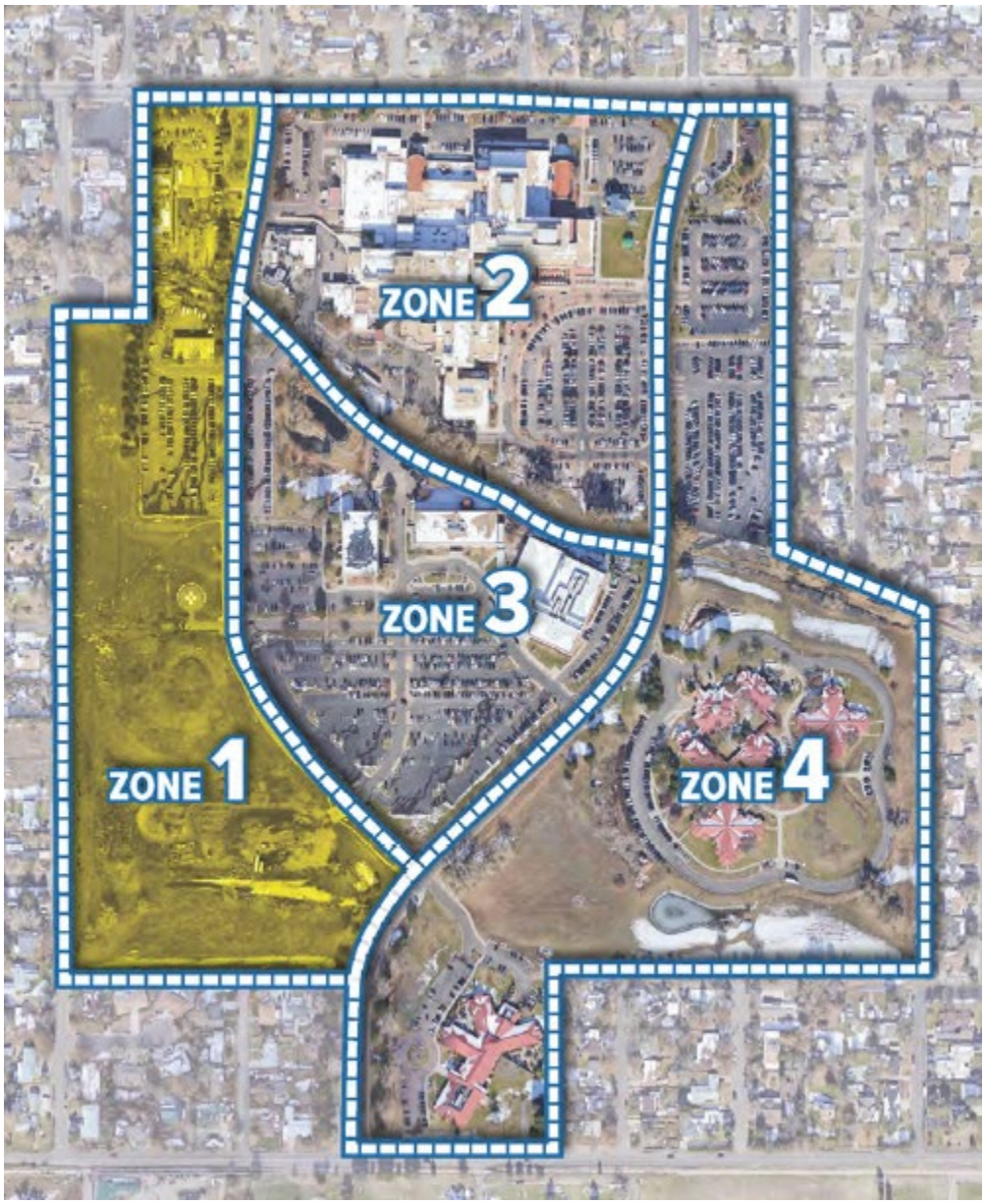
Zone 3

- Consider developing a 'main street' character along either Lutheran Parkway West or North Lutheran Parkway. This character can be fostered by the inclusion of street elements such as on-street parking, bike lanes, landscaping, and placemaking.

Zone 4

- Consider constructing bicycle and pedestrian cut-thrus—or paths that provide bicycle and pedestrian access but not vehicular access. In Zone 4, these should be considered along the Rocky Mountain Ditch, formalizing the trail that currently exists and supporting the ditch as a public amenity. Depending on the site plan, a connection along the alignment of West 33rd Avenue could also be considered to foster a grid-like pattern for people walking and biking; this grid pattern increases walkability and bike-ability by reducing out of direction travel.
- There is currently not a marked pedestrian crossing at North Lutheran Parkway and West 32nd Avenue. Pedestrian enhancements should be aligned with other intersection improvements as discussed in the operational improvements section. If the intersection remains side street stop control, a controlled pedestrian crossing can still be evaluated. In order to determine the appropriate treatments for a crossing at this location, vehicle volumes, vehicle speeds, and pedestrian counts should be collected. A treatment should be selected based on the City of Wheat Ridge's guidelines for midblock pedestrian crossings. If pedestrian volumes are too low for a controlled treatment, a median refuge island can be implemented to provide opportunities for a two-stage crossing.
- There are missing gaps and deficient sidewalk segments in the pedestrian network along West 32nd Avenue adjacent to the site. These sidewalk gaps should be complete and maintain the buffer that is present between the sidewalk and roadway in other locations on West 32nd

Avenue. Deficient sidewalks and curb ramps should be upgraded in order to meet ADA requirements.



Considerations for Transit Oriented Development (All Zones)

Due to the site's location adjacent to RTD's Route 38, and potential future opportunities to increase the frequency of this route, finding opportunities to leverage transit is an important opportunity for future developments on this site. Developments near transit stops or stations that are designed to promote accessing the site via transit are called Transit Oriented Developments (TODs). TODs consider both the completeness, ease, and comfort of walking and biking routes between the site and transit stops, as well as providing information and amenities that make riding transit accessible and convenient. TODs also include a mix of land use types on a site, so that once people arrive on the site, they can access different amenities they might need throughout the day without needing to drive. TODs provide many benefits

including reducing the need for people to drive to and from the site, reducing the amount of parking needed on the site, and creating a comfortable environment for walking and biking around the site. This section details improvements and amenities any future developments on this site should consider in order to better leverage transit access to and from the site.

Recommendations

- Prioritize enhanced pedestrian and bicycle infrastructure that creates direct and comfortable paths from buildings on the site to the bus stops on 38th Avenue, particularly enhanced crossings of 38th Avenue to improve access to bus stops on the north side of the street.
- Provide clear wayfinding throughout the site directing people walking, bicycling, or using wheelchairs on how to navigate between the bus stops and different destinations on the site.
- Additional strategies for leveraging transit access to the site are included in the following section on Transportation Demand Management (TDM) strategies. The most relevant of these strategies to transit oriented development are:
    - Free or subsidized transit passes
    - Improved passenger waiting areas
    - Pedestrian-oriented design
    - Transit information kiosks
    - Real time transit information displays
    - Appropriate parking policies (in order to encourage transit ridership through adjusting supply and pricing of parking)

Bicycle & Pedestrian TDM Strategies

Pedestrian oriented design and mix of land uses

Pedestrian oriented design is based on a qualitative assessment of how well the design of a parcel caters to pedestrians. At a minimum, project elements should include traffic calming, sidewalks on all building frontages, pedestrian access via sidewalks, and block distances not exceeding 600 feet. Buildings close to the road with little or no set back, windows facing any pedestrian facilities, pedestrian scale lighting, and no parking lots separating pedestrian facilities and buildings are also important components of pedestrian-oriented design.

Bike parking

Bike parking provides a safe and protected place for residents, employees, or visitors to store their bikes once on site. It is important to provide easily accessible bike parking at each destination on site so that bike storage is clear and convenient. Bike parking can consist of bike racks or more secure bike lockers or storage rooms. Traditional bike racks can also include shelters to protect bikes from weather.

Public bike repair station

Bike repair stations provide bicyclists with the tools to complete basic repairs and maintenance. Tools may include a pump, a multi-purpose bike tool, tire levers, a tire patch kit, and tubes in common sizes. Repair stations makes traveling by bicycle a more reliable option.

Bicycle end-of-trip facilities

End-of-trip facilities include bike parking, showers, and lockers. Showers and lockers at workplaces can be used to give individuals cycling or walking to work a place to freshen up before beginning their

workday and provide a place to store extra clothing. This can also be seen as a general benefit for employees who wish to exercise during the workday.

Transportation Demand Management (All Zones)

Transportation Demand Management (TDM) strategies are policies, services, and programs to encourage people to travel by walking, rolling, bicycling, using transit, or carpooling, rather than driving alone. Shifting travel modes away from driving alone allows existing infrastructure (like roadways, signals, and sidewalks) to operate more efficiently. TDM strategies are a cost-effective compliment to infrastructure and help optimize available infrastructure and services and improve transportation options for everyone. The following section details possible TDM strategies that could be integrated into future development and operations of the Lutheran Campus site. These TDM strategies are organized into categories: Bicycle & Pedestrian, Transit, Parking, and Additional TDM Programs.

Transit TDM Strategies

Free or subsidized transit passes for residents or employees

Providing free or subsidized transit passes to residents and employees can increase transit ridership to and from the project site, give people more transportation options, and reduce demand for parking. Employer or neighborhood RTD EcoPass Programs allow an employer or neighborhood/apartment building to purchase a discounted EcoPass for all employees or residents, which grants unlimited rides on RTD transit services. Employers can also reimburse employees for traditional transit tickets.

Improved passenger waiting area

Work with RTD to create (or improve) comfortable and safe passenger waiting at all bus stops near the site, which include shelters that protect riders from both sun and weather, benches, and trash cans, and adequate lighting. Waiting areas should be large enough for multiple people to wait comfortably for the bus and for people using wheelchairs to comfortably navigate. Passenger waiting areas should have designated entities in charge of performing regular maintenance including snow removal.

Transit information kiosks

Kiosks can be placed around the project site which include real-time transit arrival times, maps, and schedules for nearby Routes 38, 76 and 100.

Real time transit information displays

Implement changeable LED signs at stations and in building lobbies that display real-time arrival of nearby buses (Routes 38, 76 and 100) using GTFS data (available from RTD) linked to displays.

Parking TDM Strategies

Parking cash-out

With parking cash-out, employees who choose to give up their employer-provided parking space are offered a payment that can be used to pay for transit or vanpool fares, to pay for bike purchases or maintenance, or kept as cash. Parking cash-out rewards commuting via alternative modes and helps employers who provide free parking to improve fairness by assuring that all employees receive a benefit regardless of how they get to work. By providing benefits for more than just parking, cash-out programs increase transit ridership. Employers that provide cash-out can often realize cost savings when parking spaces are leased or where parking is overutilized.

Car share subsidies and preferential parking

Car share programs include services such as Colorado CarShare, ZipCar, Car2Go, Gig, and other ad hoc short-term rental services. Generally, vehicles are parked in parking spaces on-site, and available for residents, employees, and visitors to use on an hourly or per-mile basis. Car shares allow households to own fewer vehicles and give employees who did not drive to work an option if they need a car during the day. Designated car share spaces should be considered for this site. If car share is located on site, employers and residences should consider providing subsidies for use of this program.

Shared parking

Shared parking is a tool through which nearby properties can share their parking lots, permitting the parking spaces to be used by more than one land use. This allows parking facilities to be used more efficiently and reduces the number of spaces that need to be provided on individual properties. Parking on this site should be planned and developed based on a shared parking framework.

Unbundling parking

Unbundling parking is separating the cost of parking from the cost of buying or renting a residential unit. This requires a resident to make a choice about whether they wish to pay for parking. This policy can result in fewer residents opting to own personal vehicles and create more affordable housing options. Paired with coordination with local governments and land use regulations, this policy can also allow developers to build less parking in areas where there is proximate reliable transit and a variety of TDM strategies are being employed.

Additional TDM Strategies

Guaranteed Ride Home

Employers can purchase access to DRCOG's WayToGo regional Guaranteed Ride Home (GRH) program to provide their employees who do not drive alone to work with a free ride home in case of an approved emergency. This "commuter insurance" for those who carpool, take transit, bicycle, walk or vanpool to work is a low-cost program that removes a barrier to employees' use of alternative modes of transportation. In case of an emergency, such as illness, the need to pick up a sick child from school, or unscheduled mandatory overtime, the program covers the cost of participants taking a taxi, Lyft/Uber, or a rental car to get home.

Employee/resident outreach

Outreach should educate residents and employees about their transportation options. This information should include transit schedules, bicycle maps, information on available subsidies, and transportation programs. Starting a new job or moving to a new home is one of several behavior change moments when a person is more willing to try new travel options. New employees and residents should be provided with information on the travel options and programs available to help them get around.

APPENDIX B.1
EXISTING CONDITIONS

FEHR PEERS

Memorandum

Date: September 24, 2021

To: Stephanie Stevens, City of Wheat Ridge

From: Carly Sieff and Sydney Provan, Fehr & Peers

Subject: Lutheran Campus Master Plan – Existing Transportation Conditions

DN21-0682

Existing Conditions: Transportation

Project Site Description

The Lutheran Medical Center campus site is bordered by West 38th Avenue on the north side, West 32nd Avenue on the south side, Dudley Street on the west side, and Zephyr Court/Allison Court on the east side. From West 38th Avenue, there are two access points to the site—North Lutheran Parkway and Lutheran Parkway West. There is one access point to the site from West 32nd Avenue—North Lutheran Parkway. There are no access points to the Lutheran campus from the east or west. The internal streets of the site—North Lutheran Parkway and Lutheran Parkway West—travel north-south and provide direct access to individual campus parking lots and buildings. The configuration of the roadways adjacent and within the site are shown in **Figure 1**. West 38th Avenue has a posted speed limit of 35 MPH and is a five-lane roadway east of Lutheran Parkway West and turns to a three-lane roadway west of Lutheran Parkway West. West 32nd Avenue is a two-lane roadway with turn pockets and has a posted speed limit of 35 MPH east of North Lutheran Parkway and drops to 30 MPH west of North Lutheran Parkway.

These roadways are primarily one travel lane in either direction with turn pockets. In addition to roadways, there is a network of sidewalks and paths throughout that site that will be described in this memorandum.

Multimodal Access

In addition to vehicular travel to and within the Lutheran campus, travelers can access the site by transit, walking or bicycling. This section describes the infrastructure and services available within close proximity to the site.

Transit Service

Regional Transportation District (RTD) operates fixed route bus service along West 38th Avenue (route 38) and Wadsworth Boulevard (route 76). Route 38 connects downtown Denver to the Ward Street/I-70 Park-n-Ride, operating along West 38th Avenue. Service operates between 4:48 AM and 12:02 AM at 30 minute frequency (except during early morning and late evening when it operates at hour frequency) seven days per week. The most proximate bus stops to the Lutheran campus are located immediately north of the site on West 38th Avenue between North Lutheran Parkway and Lutheran Parkway West.

Route 76 connects the US 36 and Broomfield Station to the north to the Wadsworth/Hampden Park-n-Ride and Southwest Plaza on Bowles Avenue to the south, operating along Wadsworth Boulevard. Service operates between 5:22 AM and 1:10 AM at 30 minute frequency (except during early morning and late evening when it operates at hour frequency) seven days per week. The most proximate bus stops to the Lutheran campus are located east of the site on Wadsworth Boulevard at West 38th Avenue and West 32nd Avenue.

Bicycle Network

There are designated bike lanes on West 32nd Avenue, along the southern boundary of the site. There are no designated bicycle facilities on West 38th Avenue or internal to the site.

Pedestrian Network

The sidewalk network on West 38th Avenue adjacent to and approaching the site is complete. The sidewalk is at least five feet wide in all locations between Dudley Street and Wadsworth Boulevard. The sidewalk varies between attached (without a buffer) and detached (with a buffer between the sidewalk and travel lanes). The sidewalk along West 32nd Avenue is consistent along the south side, connecting to the trails of Crown Hill Park. The sidewalk on the north side of West 32nd Avenue is inconsistent with no sidewalks present between Yarrow Street and Dudley Street, except for the one block immediately adjacent to the site (Balsam Street to N Lutheran Parkway). Sidewalks internal to the site are missing in many sections along North Lutheran Parkway and Lutheran Parkway West. There is a multiuse path internal to the site, along the Rocky Mountain Ditch, that travels east-west connecting Lutheran Parkway West and North Lutheran Parkway.

Crash Analysis

There were seven crashes between January 1, 2011 and December 31, 2019 at the intersection of West 38th Avenue and Lutheran Parkway West. Two of the crashes had no details, two crashes were rear-end from turning northbound vehicles, one was a pedestrian-involved collision, and two were broadside crashes from a westbound vehicle turning into the Lutheran campus.

There were seventeen crashes during the same time period on roadways internal to the site. Six of those crashes have no detailed information. The remaining eight of eleven crashes were in parking lots from travelers entering or exiting spaces. Of the remaining three, two were rear end crashes and one was a vehicle hitting an object.

Traffic Volumes

Due to travel patterns being affected by the COVID-19 pandemic, new traffic counts were not able to be collected for the existing conditions analysis. In order to estimate pre-pandemic traffic patterns in the study area, traffic counts previously collected in 2007 for the *Northeast Wing Addition Traffic Analysis Report* were used as a baseline. These 2007 counts were scaled up by a growth factor of 1.23 for any movements relating to traffic coming to or from the Lutheran Medical Center Campus. This growth factor was determined using the growth rate of employees on the campus from the 2007 counts to 2017 as a proxy for traffic growth into and out of the site. Background traffic (traffic on 38th Avenue and 32nd Avenue not affiliated with the Lutheran Medical Campus) was determined to not have changed between 2007 and 2017. This analysis was based on the closest available data, applying CDOT counts on Kipling Street and Wadsworth Boulevard that, on average, did not change between these two dates. The volumes at are shown in **Figure 1**.

These volumes were used to study the operations of the following three intersections under the existing conditions:

1. Lutheran Parkway West & 38th Avenue
2. N Lutheran Parkway & 38th Avenue
3. 32nd Avenue & North Lutheran Parkway

The methodology and results of this analysis are presented in the *Existing Intersection Operations* section of this report.

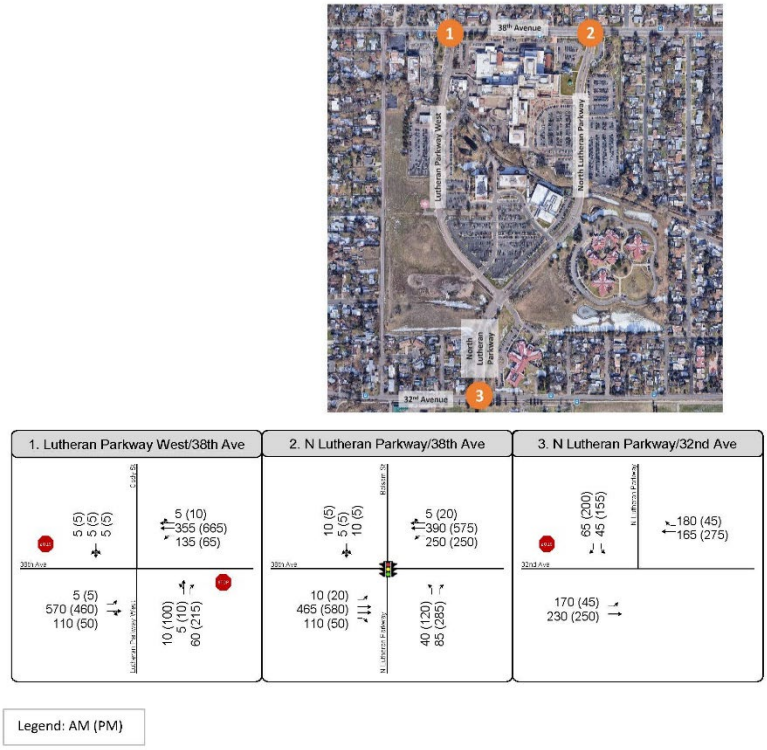


Figure 1: Peak Hour Traffic Volumes and Lane Configurations (Existing Conditions Forecasted- 2017)

Existing Intersection Operations

Methodology

The intersection grading system called level-of-service (LOS) put forth by the Transportation Research Board's Highway Capacity Manual (HCM) 6th Edition and HCM 2000 were used in this study to measure the operational status of the intersections within the study area. (HCM 2000 was used for the signalized intersection at N Lutheran Parkway & 38th Avenue due to the non-NEMA phasing of that signal.) LOS characterizes the operational conditions of an intersection's traffic flow; ranging from LOS A (indicating free flow traffic conditions with little or no vehicle delay) to LOS F (representing over-saturated conditions where traffic flows exceeds the design capacity, resulting in long queues and vehicle delays). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Although LOS A through C, are desired levels, LOS D is considered acceptable. The LOS is determined differently depending on the type of control at the intersection.

At signalized intersections, the operational analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the intersection's volume-to-capacity (v/c) ratio. For signalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the overall intersection, which includes all approaches.

At unsignalized intersections, the operational analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and stop-controlled approaches) to estimate the intersection's v/c ratio. For unsignalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the highest delay approach for side-street stop and the average delay for the whole intersection for all-way stop and roundabout intersections. **Table 1** summarizes the relationship between delay and LOS for signalized intersections and **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 1: SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	>10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	>20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	>35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	>55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

TABLE 2: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)

A	Little or no delay	<10
B	Short traffic delay	>10 to 15
C	Average traffic delays	>15 to 25
D	Long traffic delays	>25 to 35
E	Very long traffic delays	>35 to 50
F	Extreme traffic delays with intersection capacity exceeded	>50

Results

The intersections of N Lutheran Parkway & 38th Avenue and N Lutheran Parkway & 32nd Avenue operate acceptably under existing conditions (2017) in both the AM and PM peak hours. The intersection of Lutheran Parkway West & 38th Avenue operates at LOS E with a delay of 38 seconds/vehicle in the AM peak hour and LOS F with a delay of 52 seconds/vehicle in the PM peak hour. **In summary, under existing conditions one of the three intersections studied does not operate acceptably in the AM and PM peak hours.**

TABLE 3: EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control[1]	Approach	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Lutheran Parkway West & 38th Avenue	SSSC	NB	**38**	**E**	**52**	**F**
2	N Lutheran Parkway & 38th Avenue	Signal	Overall[2]	36	D	34	C
3	N Lutheran Parkway & 32nd Avenue	SSSC	SB	13	B	15	C

Notes:
1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. **Bold** indicates an intersection operating at LOS E or LOS F.

APPENDIX B.2
SYNCHRO L.O.S. REPORTS

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	655	25	70	405	10	10	5	15	10	5	10
Future Vol, veh/h	10	655	25	70	405	10	10	5	15	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	0	-	-	500	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	712	27	76	440	11	11	5	16	11	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	739	0	0	1123	1351	-	1348	1359	226
Stage 1	-	-	-	-	-	-	748	748	-	598	598	-
Stage 2	-	-	-	-	-	-	375	603	-	750	761	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	-	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1108	-	-	865	-	-	171	150	0	118	148	778
Stage 1	-	-	-	-	-	-	404	419	0	457	490	-
Stage 2	-	-	-	-	-	-	619	487	0	403	413	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1108	-	-	865	-	-	151	135	-	106	134	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	135	-	106	134	-
Stage 1	-	-	-	-	-	-	400	415	-	452	447	-
Stage 2	-	-	-	-	-	-	550	444	-	394	409	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.4	32.9	29.6
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	145	-	1108	-	-	865	-	-	173
HCM Lane V/C Ratio	0.112	-	0.01	-	-	0.088	-	-	0.157
HCM Control Delay (s)	32.9	0	8.3	-	-	9.6	-	-	29.6
HCM Lane LOS	D	A	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.4	-	0	-	-	0.3	-	-	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	535	25	65	500	10	10	0	15	15	5	15
Future Volume (vph)	15	535	25	65	500	10	10	0	15	15	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.0	5.5		5.5		4.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3529		1770		1583		1719	
Flt Permitted	0.44	1.00	1.00	0.95	1.00		1.00		1.00		0.98	
Satd. Flow (perm)	818	3539	1583	1770	3529		1863		1583		1719	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	594	28	72	556	11	11	0	17	17	6	17
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	16	0
Lane Group Flow (vph)	17	594	28	72	565	0	11	0	17	0	24	0
Turn Type	Perm	NA	Free	Prot	NA		Perm		Free	Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases	2		Free				8		Free	4		
Actuated Green, G (s)	36.2	36.2	59.0	4.1	45.3		2.7		59.0		3.2	
Effective Green, g (s)	36.2	36.2	59.0	4.1	45.3		2.7		59.0		3.2	
Actuated g/C Ratio	0.61	0.61	1.00	0.07	0.77		0.05		1.00		0.05	
Clearance Time (s)	5.5	5.5		5.0	5.5		5.5				5.0	
Vehicle Extension (s)	1.5	1.5		3.0	1.5		2.0				2.0	
Lane Grp Cap (vph)	501	2171	1583	123	2709		85		1583		93	
v/s Ratio Prot		c0.17		c0.04	0.16							
v/s Ratio Perm	0.02		0.02				0.01		0.01		0.01	
v/c Ratio	0.03	0.27	0.02	0.59	0.21		0.13		0.01		0.26	
Uniform Delay, d1	4.5	5.3	0.0	26.6	1.9		27.0		0.0		26.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	0.1	0.3	0.0	6.9	0.2		0.3		0.0		0.5	
Delay (s)	4.6	5.6	0.0	33.6	2.1		27.3		0.0		27.3	
Level of Service	A	A	A	C	A		C		A		C	
Approach Delay (s)		5.3			5.6			10.7			27.3	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	260	185	20	10	15
Future Vol, veh/h	20	260	185	20	10	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	225	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	280	199	22	11	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	221	0	-	0	523	199
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	324	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1348	-	-	-	514	842
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1348	-	-	-	506	842
Mov Cap-2 Maneuver	-	-	-	-	506	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	733	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1348	-	-	-	506	842
HCM Lane V/C Ratio	0.016	-	-	-	0.021	0.019
HCM Control Delay (s)	7.7	-	-	-	12.3	9.4
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	520	10	30	765	15	25	5	55	10	5	10
Future Vol, veh/h	10	520	10	30	765	15	25	5	55	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	0	-	-	500	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	565	11	33	832	16	27	5	60	11	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	848	0	0	576	0	0	1078	1507	-	1501	1504	424
Stage 1	-	-	-	-	-	-	593	593	-	906	906	-
Stage 2	-	-	-	-	-	-	485	914	-	595	598	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	-	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	787	-	-	995	-	-	184	120	0	92	121	579
Stage 1	-	-	-	-	-	-	491	493	0	298	354	-
Stage 2	-	-	-	-	-	-	533	351	0	490	490	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	787	-	-	995	-	-	168	114	-	85	115	579
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	114	-	85	115	-
Stage 1	-	-	-	-	-	-	484	486	-	294	342	-
Stage 2	-	-	-	-	-	-	498	339	-	478	483	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	34.1	36.8
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	-	787	-	-	995	-	-	140
HCM Lane V/C Ratio	0.209	-	0.014	-	-	0.033	-	-	0.194
HCM Control Delay (s)	34.1	0	9.6	-	-	8.7	-	-	36.8
HCM Lane LOS	D	A	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.8	-	0	-	-	0.1	-	-	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	700	10	30	670	25	25	0	55	10	5	10
Future Volume (vph)	25	700	10	30	670	25	25	0	55	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.0	5.5		5.5		4.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00		0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3520		1770		1583		1730	
Flt Permitted	0.36	1.00	1.00	0.95	1.00		1.00		1.00		0.98	
Satd. Flow (perm)	669	3539	1583	1770	3520		1863		1583		1730	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	778	11	33	744	28	28	0	61	11	6	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	10	0
Lane Group Flow (vph)	28	778	11	33	769	0	28	0	61	0	18	0
Turn Type	Perm	NA	Free	Prot	NA		Perm		Free	Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases	2		Free				8		Free	4		
Actuated Green, G (s)	39.4	39.4	60.6	2.5	46.9		2.7		60.6		3.2	
Effective Green, g (s)	39.4	39.4	60.6	2.5	46.9		2.7		60.6		3.2	
Actuated g/C Ratio	0.65	0.65	1.00	0.04	0.77		0.04		1.00		0.05	
Clearance Time (s)	5.5	5.5		5.0	5.5		5.5				5.0	
Vehicle Extension (s)	1.5	1.5		3.0	1.5		2.0				2.0	
Lane Grp Cap (vph)	434	2300	1583	73	2724		83		1583		91	
v/s Ratio Prot		c0.22		0.02	c0.22							
v/s Ratio Perm	0.04		0.01				c0.02		0.04		0.01	
v/c Ratio	0.06	0.34	0.01	0.45	0.28		0.34		0.04		0.19	
Uniform Delay, d1	3.9	4.8	0.0	28.4	2.0		28.1		0.0		27.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	0.3	0.4	0.0	4.4	0.3		0.9		0.0		0.4	
Delay (s)	4.2	5.2	0.0	32.8	2.2		29.0		0.0		27.8	
Level of Service	A	A	A	C	A		C		A		C	
Approach Delay (s)		5.0			3.5			9.1			27.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	280	310	10	40	45
Future Vol, veh/h	10	280	310	10	40	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	225	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	301	333	11	43	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	344	0	-	0	656	333
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	323	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1215	-	-	-	430	709
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	734	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1215	-	-	-	426	709
Mov Cap-2 Maneuver	-	-	-	-	426	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	734	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1215	-	-	-	426	709
HCM Lane V/C Ratio	0.009	-	-	-	0.101	0.068
HCM Control Delay (s)	8	-	-	-	14.4	10.4
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.2

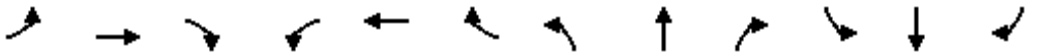
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	685	50	160	440	10	45	5	95	10	5	10
Future Vol, veh/h	10	685	50	160	440	10	45	5	95	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	0	-	-	500	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	745	54	174	478	11	49	5	103	11	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	489	0	0	799	0	0	1384	1631	-	1629	1653	245
Stage 1	-	-	-	-	-	-	794	794	-	832	832	-
Stage 2	-	-	-	-	-	-	590	837	-	797	821	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	-	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1072	-	-	822	-	-	111	101	0	74	98	756
Stage 1	-	-	-	-	-	-	381	399	0	330	383	-
Stage 2	-	-	-	-	-	-	462	381	0	379	388	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1072	-	-	822	-	-	86	79	-	58	76	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	79	-	58	76	-
Stage 1	-	-	-	-	-	-	377	395	-	327	302	-
Stage 2	-	-	-	-	-	-	353	300	-	370	384	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.8	103.2	54.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	85	-	1072	-	-	822	-	-	99
HCM Lane V/C Ratio	0.639	-	0.01	-	-	0.212	-	-	0.274
HCM Control Delay (s)	103.2	0	8.4	-	-	10.6	-	-	54.6
HCM Lane LOS	F	A	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	3	-	0	-	-	0.8	-	-	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	615	55	160	590	10	45	0	95	15	5	20
Future Volume (vph)	15	615	55	160	590	10	45	0	95	15	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.0	5.5		5.5		4.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3530		1770		1583		1708	
Flt Permitted	0.40	1.00	1.00	0.95	1.00		0.87		1.00		0.98	
Satd. Flow (perm)	742	3539	1583	1770	3530		1620		1583		1708	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	683	61	178	656	11	50	0	106	17	6	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	20	0
Lane Group Flow (vph)	17	683	61	178	665	0	50	0	106	0	25	0
Turn Type	Perm	NA	Free	Prot	NA		Perm		Free	Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases	2		Free				8		Free	4		
Actuated Green, G (s)	32.7	32.7	60.4	7.1	44.8		4.6		60.4		5.1	
Effective Green, g (s)	32.7	32.7	60.4	7.1	44.8		4.6		60.4		5.1	
Actuated g/C Ratio	0.54	0.54	1.00	0.12	0.74		0.08		1.00		0.08	
Clearance Time (s)	5.5	5.5		5.0	5.5		5.5				5.0	
Vehicle Extension (s)	1.5	1.5		3.0	1.5		2.0				2.0	
Lane Grp Cap (vph)	401	1915	1583	208	2618		123		1583		144	
v/s Ratio Prot		c0.19		c0.10	0.19							
v/s Ratio Perm	0.02		0.04				c0.03		0.07		0.01	
v/c Ratio	0.04	0.36	0.04	0.86	0.25		0.41		0.07		0.17	
Uniform Delay, d1	6.5	7.9	0.0	26.1	2.5		26.6		0.0		25.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	0.2	0.5	0.0	27.4	0.2		0.8		0.1		0.2	
Delay (s)	6.7	8.4	0.0	53.6	2.7		27.4		0.1		25.9	
Level of Service	A	A	A	D	A		C		A		C	
Approach Delay (s)		7.7			13.4			8.8			25.9	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	260	185	50	65	75
Future Vol, veh/h	50	260	185	50	65	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	225	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	280	199	54	70	81

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	253	0	-	0	587	199
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1312	-	-	-	472	842
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1312	-	-	-	453	842
Mov Cap-2 Maneuver	-	-	-	-	453	-
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	686	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1312	-	-	-	453	842
HCM Lane V/C Ratio	0.041	-	-	-	0.154	0.096
HCM Control Delay (s)	7.9	-	-	-	14.4	9.7
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.3

Intersection	
Int Delay, s/veh	12.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	560	50	160	810	20	70	5	160	10	5	10
Future Vol, veh/h	10	560	50	160	810	20	70	5	160	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	0	-	-	500	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	609	54	174	880	22	76	5	174	11	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	902	0	0	663	0	0	1449	1908	-	1900	1924	451
Stage 1	-	-	-	-	-	-	658	658	-	1239	1239	-
Stage 2	-	-	-	-	-	-	791	1250	-	661	685	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	-	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	751	-	-	924	-	-	100	68	0	47	66	556
Stage 1	-	-	-	-	-	-	452	460	0	186	247	-
Stage 2	-	-	-	-	-	-	350	244	0	451	447	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	751	-	-	924	-	-	77	54	-	37	53	556
Mov Cap-2 Maneuver	-	-	-	-	-	-	77	54	-	37	53	-
Stage 1	-	-	-	-	-	-	445	453	-	183	201	-
Stage 2	-	-	-	-	-	-	271	198	-	439	440	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	227	95.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	75	-	751	-	-	924	-	-	65
HCM Lane V/C Ratio	1.087	-	0.014	-	-	0.188	-	-	0.418
HCM Control Delay (s)	227	0	9.9	-	-	9.8	-	-	95.5
HCM Lane LOS	F	A	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	6	-	0	-	-	0.7	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	805	55	155	795	25	75	0	160	10	5	10
Future Volume (vph)	25	805	55	155	795	25	75	0	160	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.0	5.5		5.5		4.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3523		1770		1583		1730	
Flt Permitted	0.31	1.00	1.00	0.95	1.00		0.83		1.00		0.98	
Satd. Flow (perm)	583	3539	1583	1770	3523		1552		1583		1730	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	894	61	172	883	28	83	0	178	11	6	11
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	10	0
Lane Group Flow (vph)	28	894	61	172	908	0	83	0	178	0	18	0
Turn Type	Perm	NA	Free	Prot	NA		Perm		Free	Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases	2		Free				8		Free	4		
Actuated Green, G (s)	32.7	32.7	60.6	7.1	44.8		4.8		60.6		5.3	
Effective Green, g (s)	32.7	32.7	60.6	7.1	44.8		4.8		60.6		5.3	
Actuated g/C Ratio	0.54	0.54	1.00	0.12	0.74		0.08		1.00		0.09	
Clearance Time (s)	5.5	5.5		5.0	5.5		5.5				5.0	
Vehicle Extension (s)	1.5	1.5		3.0	1.5		2.0				2.0	
Lane Grp Cap (vph)	314	1909	1583	207	2604		122		1583		151	
v/s Ratio Prot		c0.25		c0.10	0.26							
v/s Ratio Perm	0.05		0.04				c0.05		0.11		0.01	
v/c Ratio	0.09	0.47	0.04	0.83	0.35		0.68		0.11		0.12	
Uniform Delay, d1	6.7	8.6	0.0	26.2	2.8		27.2		0.0		25.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	0.6	0.8	0.0	23.7	0.4		11.7		0.1		0.1	
Delay (s)	7.3	9.4	0.0	49.9	3.1		38.9		0.1		25.6	
Level of Service	A	A	A	D	A		D		A		C	
Approach Delay (s)		8.8			10.6			12.5			25.6	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	280	310	50	105	125
Future Vol, veh/h	50	280	310	50	105	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	225	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	301	333	54	113	134

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	387	0	-	0	742	333
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1171	-	-	-	383	709
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1171	-	-	-	365	709
Mov Cap-2 Maneuver	-	-	-	-	365	-
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1171	-	-	-	365	709
HCM Lane V/C Ratio	0.046	-	-	-	0.309	0.19
HCM Control Delay (s)	8.2	-	-	-	19.2	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3	0.7

APPENDIX B.3
MAIN STREET MEMO

FEHR PEERS

Subject: **MainStreet - Trip Generation**

This memo provides you some background information on the trip generation MXD tool we utilized for the 4120 Brighton Boulevard traffic impact study. This memorandum provides a brief description of the proposed trip generation methodology.

Trip Generation Methodology

Current accepted methodologies, such as the Institute of Transportation Engineers (ITE) Tr*ip Generation* methodology, are primarily based on data collected at suburban, single-use, freestanding sites. These defining characteristics limit their applicability to mixed-use or multi-use development projects, such as the proposed Transit-Oriented-Development, which is in a high-density walkable setting with frequent and nearby local and regional transit service. The land use mix, design features, and setting of the proposed development would include characteristics that influence travel behavior differently from typical single-use suburban developments. Thus, traditional data and methodologies, such as ITE, would not accurately estimate the project vehicle trip generation. In response to the limitations in the ITE methodology, and to provide a straightforward and empirically validated method of estimating vehicle trip generation at mixed-use developments, the US Environmental Protection Agency (EPA) sponsored a national study of the trip generation characteristics of multi-use sites. Travel survey data was gathered from 239 mixed-use developments (MXDs) in six major metropolitan regions, and correlated with the characteristics of the sites and their surroundings. The findings indicate that the amount of external traffic generated is affected by a wide variety of factors, each pertaining to one or more of the following characteristics:

- **The relative numbers of residents and jobs on the site** – the better the site jobs/ housing balance, the greater the proportion of commute trips that remain internal.
- **The amount of retail and service use on the site relative to the number of residences** – the greater the degree to which retail and service opportunities match the needs generated by site residents, the greater the internalization of household-generated shopping, personal services and entertainment travel.
- **The amount of retail and service use relative to the number of employees** – the better the balance of employee-oriented retail and service opportunities, the greater the

internal capture of lunchtime and after-work dining, shopping and errands by site employees.

- **The overall size of the development** – the larger the scale of the development in terms of acreage and total amounts of residential and commercial use, the greater the likelihood that travel destinations can be satisfied within the site as a whole
- **The density of development** – the greater the concentration of dwellings and commercial space per acre, the greater the likelihood that the interacting land uses will be near enough together to encourage walking or short-distance internal driving.
- **The internal connectivity for walking or driving among different activities** – measured in terms of the ratio of intersections to total land area within the site directly influences trip internalization and the number of trips made by walking instead of driving.
- **The availability of transit** – the greater the number of jobs within a reasonable travel time via transit, the greater the share of travel likely to occur by transit, and the lower the traffic generation.
- **The number of convenient trip destinations within the immediate area** – the number of retail and other jobs in neighborhoods immediately surrounding the multi-use site reduces the amount of walking to/from the site and reduce traffic generation.

These characteristics were related statistically to the trip behavior observed at the study development sites using Hierarchical Linear Modeling (HLM) techniques. This quantified relationships between characteristics of the MXDs and the likelihood that trips generated by those MXDs will stay internal and/or use modes of transportation other than the private vehicle. These statistical relationships produced equations, known as the EPA MXD model, that allows predicting external vehicle trip reduction as a function of the MXD characteristics. Applying the external vehicle trip reduction percentage to "raw trips", as predicted by ITE, produces an estimate for the number of vehicle trips traveling in or out of the site.

Validation of MXD model

Since the conclusion of the EPA sponsored study, Fehr & Peers has been actively enhancing the MXD model to improve sensitivity to various site characteristics, improve peak hour performance, and continue to validate the model against MXDs where data is available.

A set of 28 independent MXD sites across the country that were not included in the initial model development have been tested to validate the model. These sites represent locations where it is expected that traditional data and methodologies, such as ITE, would not accurately estimate the Project vehicle trip generation. **Table 2** presents the performance of the MXD model against ITE and ITE internalization procedures.

TABLE 2
MXD MODEL
VALIDATION STATISTICS COMPARISON

Validation Statistic	ITE raw	ITE with internalization	MXD model
Daily			
Average Model Error[1]	30%	17%	**4%**
% RMSE[2]	42%	28%	**17%**
R-Squared[3]	0.72	0.87	**0.95**
AM Peak Hour			
Average Model Error	57%	53%	**3%**
% RMSE	58%	76%	**34%**
R-Squared	0.56	0.56	**0.91**
PM Peak Hour			
Average Model Error	56%	41%	**22%**
% RMSE	96%	81%	**59%**
R-Squared	-0.56	-0.11	**0.41**

1. Average model error measures the difference between the estimated trip generation and the counted trip generation of the 28 survey sites.
2. RMSE stands for percent root mean squared error is a demand assessment of performance of transportation models in that it does not apply average that would allow over-estimates and under-estimates to cancel one another out and it penalizes proportionally more for large errors. A % RMSE of less than 40% is generally considered acceptable in transportation modeling.
3. R-squared is a statistical measure that indicates, in this case, the degree to which each method explains the variation in trip generation among the 28 survey sites. A R-Squared value closer to 1.0 indicates that the method fully explains the variation in trip generation amongst the survey sites and would be suitable to be used for that set of site types.

Source: Fehr & Peers, 2012.

Based on all statistical measures, the MXD model performs better than the ITE recommended procedures for these types of sites.

The MXD model has been approved for use by the EPA[1]. It has also been peer-reviewed in the ASCE Journal of Urban Planning and Development[2], peer-reviewed in a 2012 TRB paper evaluating various smart growth trip generation methodologies[3], recommended by SANDAG for use on mixed-use smart growth developments[4], and has been used successfully in multiple certified EIRs in California.

---

[1] Trip Generation Tool for Mixed-Use Developments (2012). www.epa.gov/dced/mxd_tripgeneration.html

[2] "Traffic Generated by Mixed-Use Developments—Six-Region Study Using Consistent Built Environmental Measures." Journal of Urban Planning and Development, 137(3), 248–261.

[3] Shafizadeh, Kevan et al. "Evaluation of the Operation and Accuracy of Available Smart Growth Trip Generation Methodologies for Use in California". Presented at 91st Annual Meeting of the Transportation Research Board, Washington, D.C., 2012.

[4] SANDAG Smart Growth Trip Generation and Parking Study.
http://www.sandag.org/index.asp?projectid=378&fuseaction=projects.detail

APPENDIX C
FACILITIES ASSESSMENT

Lutheran Campus Master Plan

Existing Facility Assessment

The Abo Group performed a high-level assessment of the existing buildings on site. The methods used for the assessment were visual observations of the existing conditions, scans of drawings and other documents where available and interviews and data received from the building owner's representatives and maintenance staff. The assessment is provided for general information only. Further evaluations and investigations into the functionality and life expectancy of the existing building systems will need to be performed to adequately ascertain their conditions.

The buildings on the site are either owned by SCL Health or a private ownership represented by Ventas. The following are a list of buildings on site. Further information is contained in a matrix that follows:

- Lutheran Hospital
- Chapel
- Physical Plant
- Metal Storage Building
- Blue House
- Foothills Medical Office Building
- Medical Office Building (MOB) 1 (attached to the hospital)
- Medical Office Building (MOB) 2
- Medical Office Building (MOB) 3
- Medical Office Building (MOB) 4
- Bridges (house)
- West Pines Behavioral Health
- Collier Hospice

Existing Hospital Building

The largest asset on the site is of course the hospital building. The hospital building has almost a million square feet on 6 floors. The hospital has undergone many iterations of additions and renovations starting in 1923 when the original hospital was built on 38th Avenue. This older section of the hospital was replaced with a new addition in 2008 and is called the North Pavilion and serves as the current entry to the hospital. There are older sections of the hospital that have asbestos containing materials and the heating and cooling systems have reached the end of their useful life. It could be assumed that the 2008 North Pavilion would be suitable for an adaptive reuse but there would need to be extensive investigation of how to deconstruct the remainder of the hospital. The North Pavilion has approximately 385,000 square feet.

Other areas of the hospital could also be renovated for re-use, however the large floor plates (except for the tower) would not allow for natural daylighting in the interior spaces. Reuse of the tower can be allowed under the City Charter height limits as it is an existing condition.

The central utility plant that currently serves the entire hospital would more than likely be replaced or extensively modified to accommodate a new use.

Chapel

The historic Chapel that was built in 1932 is in fair condition and could be repurposed as community space or some other type of gathering or performing art space. There is an elevator that connects the lower and main level of the building. The toilet rooms have been upgraded to provide ADA access.

Physical Plant
The Central Utility Plant (CUP) serves the heating and cooling requirements for the Existing Hospital and MOB 1. The CUP has been constructed in various stages and is in good condition. If the hospital building were to be repurposed, the CUP would probably remain as a viable utility. Also, if all or part of the hospital were to be repurposed and MOB 2, 3, and 4 were to be consolidated under one ownership, the CUP might also be viable. If all or part of the existing hospital were to be demolished, the CUP would probably not be re-used and would be demolished.

Metal Storage Building
The Metal Storage Building on the west end of the campus is a prefabricated steel building that stores maintenance equipment and vehicles. It is functional but in not in very good shape. It could be used as a material and equipment storage building during construction, but would probably need be demolished in any redevelopment.

Blue House
The Blue House at the entrance to the existing hospital was built in 1905 and its history dates to the very beginning of the hospital when it housed the nurses. The building is currently not occupied and is in very poor condition and has substantial amounts of asbestos containing materials. Converting this building into commercial use would require substantial investment to abate the hazardous materials and bring the building up to the current building code standards. Even though the Blue House is not listed on any historic registered, it is likely eligible to be designated a historically significant structure.

Foothills Medical Office Building
The Foothills Medical Office Building was recently purchased by SCL Health and at the time of this writing is undergoing interior renovations. The building is located directly off 38th Avenue and has ample parking. Its location would make it an attractive candidate to remain as a medical office building or be converted to conventional offices.

Medical Office Building (MOB) 1 (attached to the hospital)
MOB 1 was originally constructed as a free-standing structure. The hospital expanded to the south and connected to MOB 1. We understand that this building is in very poor shape and is not a likely candidate for re-use.

Medical Office Buildings (MOB) 2, 3, and 4
MOB's 2,3, and 4 are owned by a Real Estate Investment Trust (REIT) and managed by an independent building management firm. MOB 2 was built in 1976 and is in fair condition. MOB 2 stands alone on the west end. MOB 3 and 4 are newer and in excellent condition. They are connected by an enclosed walkway. These three buildings have an abundance of parking. There is also an irrigation ditch and a pond to the north of these buildings which could be developed into an attractive amenity.

Bridges (house)
This structure at the northeast corner of the property was once the residence of the hospital director. It is currently vacant. Its most recent function was offices for alternative medicine practices. If the facility were to be used for commercial purposes, a thorough code study would need to be performed to

determine if the building would meet all of the current commercial code requirements. The structure could also be converted back to a single family residence.

West Pines Behavioral Health

West Pines Behavioral Health was built to provide behavior health treatments in a residential setting. The building is in fair condition and the layouts of the "pods" create very interesting outdoor courtyards and spaces. The main pod has administrative offices. The North Pod is the dining and kitchen. The south pod contains a gymnasium and the east pod has classrooms and meeting rooms. The two residential pods to the east are separate buildings. This property could be easily converted into a hostel like hotel or kept as a residential center for the homeless or some other specialized population.

Collier Hospice

Collier Hospice is a relatively new facility providing hospice care. It is in excellent condition an SCL Health intends to maintain ownership and operation as a hospice.

Lutheran Campus Master Plan
Facility Assessment

	Building	Address	Ownership	Building Condition	Tier	Function	Year Constructed	Major Reinvestment	Major Tenant	Building Area (GSF)	Building Area (RSF)	Vancant Area	% Vacant Space	Parking Spaces	Number of Floors	Floor Plate Size	Adaptive Re-Use	Connected to Central Plant	Notes
	Existing Hospital	8300 W. 38th Ave. Wheat Ridge, CO 80033	SCL	Varies	3	Med. Hospital	1923-2008	Varies	SCL	925,000**				908	5	Ground Level 196,000**	Yes	Yes	The hospital has been built over several decades. There is asbestos containing materials but much has been abated
	Chapel		SCL	Good	3	Vacant	1932	n/a	Vacant	9,800**			100%		3	Ground Level 4,950**	Yes	No	
	Central Utility Plant		SCL	Good	3	CUP	1970-1992	n/a	SCL	12,235**				-	1	Ground Level 8,250**	No	Yes	
	Metal Storage Building		SCL	Poor	3	Storage	?	n/a	SCL	5000**				-		5000**	No		
	Blue House		SCL	Poor	4	S.F.Res.	1905	n/a	Vacant				100%	-	2		?	No	Riddled with asbestos
	Foothills MOB	8506 W. 38th Avenue	SCL	Excellent	1	MOB	1987	2021		44,803	38,759			197	3	15000**	Yes	No	Currently undergoing tenant improvemnts
	MOB 1	8350 W. 38th Avenue	SCL	Poor	4	MOB	?	n/a	SCL	38,500**				79	4		Yes	Yes	Very poor shape
	MOB 2	3550 Lutheran Parkway	Ventas	Fair	3	MOB	1976	n/a	SCL-Cancer Center	n/a	34,180	16,461	48.07%		2	13k	n/a	No	
	MOB 3	3555 Lutheran Parkway	Ventas	Excellent	1	MOB	2004	n/a	SCL- ASC	n/a	#####	0	0%	116*	2	38k	n/a	No	
	MOB 4	3455 Lutheran Parkway	Ventas	Excellent	1	MOB	1991	n/a	Pedes West	n/a	#####	0	0%		3	15k	n/a	No	
	Bridges	3895 Upham Street	SCL	Good	2	S. F. Res.	1960's	n/a	Vacant	3,300**			100%	16	1			No	Originally the residence of the President of the hospital. Last used for alternative medicine
	West Pines Behavioral Health	3400 Lutheran Parkway	SCL	Fair	3	M.F. Res.	1988	n/a	SCL Heath	14,240				95	1			No	No longer being used as a residential behavioral health facility.
	Collier Hospice	3210 Lutheran Parkway	SCL	Excellent	1	Hospice	2006	n/a	SCL Health	36,000**				96	1			No	Performing asset for SCL Health that they will keep.

* Parking Spaces – Ventas has a non-exclusive easement on all campus parking areas
** Approximate

Legend

Building Condition		Tier		Hold Period	
E	Excellent	1	Performing Asset	Long	15 + Years
G	Good	2	Performing Asset Needing Investment	Mid	6-15 years
F	Fair	3	Under Performing Asset	Short	0-5 years
P	Poor	4	Non Performing Asset		

APPENDIX D.1
GREEN INFRASTRUCTURE BEST MGMT. PRACTICES

BMP Suggestions

One of the components of the Utility and Drainage Analysis includes Best Management Practices (BMPs) for Green Stormwater Infrastructure (GSI). These recommendations are based on the Development Types identified in Chapter 4.

Lower Density Neighborhood

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways or driveways while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Disconnected Downspouts & Rain Gardens - Disperse stormwater from a buildings downspout across a vegetated area of lawn or rock. This can be sized to infiltrate the water and slow runoff, reducing peak flows in the stormwater sewer system. Downspout runoff may be directed to a rain garden for additional runoff reduction.
- Downspout Rain Collection - Collect stormwater from a buildings downspout. This can be collected in a rain barrel. State regulations allow up to two rain barrels per single family residence. Water can be used for lawn irrigation or just slowly released. This will reduce peak flows in the stormwater sewer system.
- Roadside Bioretention Bumpouts – Provide separation between the roadway and sidewalk while filtering roadway runoff. The bumpouts help to calm traffic and reduce pedestrian crossing distances. Bioretention may lined or unlined depending on soil conditions.

Middle Density Neighborhood

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways or driveways while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Underground Infiltration – Collected runoff is stored in underground chambers or drain rock bed where it can infiltrate into the ground. Underground infiltration can me located beneath shared driveways.
- Downspout Rain Collection - Collect stormwater from a buildings downspout. This can be collected in a rain barrel. State regulations allow up to two rain barrels per single family residence. Water can be used for lawn irrigation or just slowly released. This will reduce peak flows in the stormwater sewer system
- Bioretention Planters – Similar to rain gardens, but with a smaller footprint, bioretention planters use an engineered soil mix and carefully selected plants to filter stormwater. Planters typically have concrete sidewalls but may be unlined to allow infiltration or unlined to restrict it.
- Roadside Bioretention Bumpouts – Provide separation between the roadway and sidewalk while filtering roadway runoff. Bioretention may be lined or unlined depending on soil conditions.

High Density Neighborhood

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways or parking lots while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Green Roofs - Are vegetated areas on the roof of a building which will absorb some stormwater and reduce runoff. Green roofs can also provide heat island reduction and habitat ecosystems services.
- Underground Infiltration – Collected runoff is stored in underground chambers or drain rock bed where it can infiltrate into the ground. Underground infiltration can me located beneath parking lots or plazas.
- Bioretention Planters – Similar to rain gardens, but with a smaller footprint, bioretention planters use an engineered soil mix and carefully selected plants to filter stormwater. Planters typically have concrete sidewalls but may be unlined to allow infiltration or unlined to restrict it.
- Roadside Bioretention Planters – Are similar to roadside bioretention bumpouts but typically have concrete sidewalls that allow for a smaller footprint. They may include pedestrian footbridges to connect parking and sidewalks. Bioretention may be lined or unlined depending on soil conditions.

Office Node

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways or parking lots while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Green Roofs - Are vegetated areas on the roof of a building which will absorb some stormwater and reduce runoff. Green roofs can also provide heat island reduction and habitat ecosystems services.
- Vegetated Buffer – Are gently sloping vegetated areas that disperse and slow flow while allowing infiltration. Can be used on sites with sufficient open space to facilitate dispersion of downspouts.
- Underground Infiltration – Collected runoff is stored in underground chambers or drain rock bed where it can infiltrate into the ground. Underground infiltration can me located beneath parking lots or plazas.
- Bioretention Planters – Similar to rain gardens, but with a smaller footprint, bioretention planters use an engineered soil mix and carefully selected plants to filter stormwater. Planters typically have concrete sidewalls but may be unlined to allow infiltration or unlined to restrict it.
- Roadside Bioretention Planters – Are similar to roadside bioretention bumpouts but typically have concrete sidewalls that allow for a smaller footprint. They may include pedestrian footbridges to connect parking and sidewalks. Bioretention may be lined or unlined depending on soil conditions.

Restaurant and Retail Destination

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways or parking lots while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Underground Infiltration – Collected runoff is stored in underground chambers or drain rock bed where it can infiltrate into the ground. Underground infiltration can me located beneath parking lots or plazas.
- Bioretention Planters – Similar to rain gardens, but with a smaller footprint, bioretention planters use an engineered soil mix and carefully selected plants to filter stormwater. Planters typically have concrete sidewalls but may be unlined to allow infiltration or unlined to restrict it.
- Roadside Bioretention Planters – Are similar to roadside bioretention bumpouts but typically have concrete sidewalls that allow for a smaller footprint. They may include pedestrian footbridges to connect parking and sidewalks. Bioretention may be lined or unlined depending on soil conditions.

Civic Campus

GI Techniques

- Permeable Pavement or Pavers – Provide durable surfacing that can be used for walkways, parking lots, or plaza areas while allowing for infiltration of storm water, reducing runoff and filtering stormwater.
- Green Roofs - Are vegetated areas on the roof of a building which will absorb some stormwater and reduce runoff. Green roofs can also provide heat island reduction and habitat ecosystems services.
- Vegetated Buffer – Are gently sloping vegetated areas that disperse and slow flow while allowing infiltration. Can be used on sites with sufficient open space to facilitate dispersion of downspouts.
- Underground Infiltration – Collected runoff is stored in underground chambers or drain rock bed where it can infiltrate into the ground. Underground infiltration can me located beneath parking lots or plazas.
-
- Bioretention Planters – Similar to rain gardens, but with a smaller footprint, bioretention planters use an engineered soil mix and carefully selected plants to filter stormwater. Planters typically have concrete sidewalls but may be unlined to allow infiltration or unlined to restrict it.
- Roadside Bioretention Planters – Are similar to roadside bioretention bumpouts but typically have concrete sidewalls that allow for a smaller footprint. They may include pedestrian footbridges to connect parking and sidewalks. Bioretention may be lined or unlined depending on soil conditions.

APPENDIX D.2
DISTRICT PROVIDER MEMO(S)

Memorandum

TO: Lauren Mikulak, Planning Manager

FROM: Mary Keilhauer, MIG, Civil Designer
Nathaniel Riedy, MIG, PE Civil Engineer

DATE: November 19, 2021

SUBJECT: Lutheran Legacy Campus Master Plan - Utility Review Supplement

---

PURPOSE

The purpose of this memorandum is to provide a summary of existing and proposed water and sanitary sewer infrastructure on the Lutheran Legacy Campus. This document provides supplemental guidance and background for the future utility (water and sanitary sewer) build out of the Master Plan. Refer to notes at the end of this document for meetings with Water and Sewer Districts.

BACKGROUND

This memorandum is meant to supplement the Lutheran Legacy Campus Master Plan 2021(Master Plan). Background and project overview can be found in the Executive Summary and Chapter 1 of the Master Plan.

SANITARY SEWER

Existing Sanitary Sewer

Although records for the onsite sanitary sewer system are incomplete, it appears that all buildings on campus north of W 33rd Ave flow north to the 8" sanitary sewer (SS) main on W 38th Ave. There is also an 8" SS main on Dudley St that flows north and is part of the same sewer basin as the 8" SS main on W 38th Ave. The 8" SS main on W 38th Ave flows east to Ammons St then becomes a 15" SS main that turns north to W 44th Ave. A parallel 8" SS main on Ammons St collects sanitary side sewers from the homes along Ammons St. On W 44th Ave, a flow splitter sends a portion of sanitary sewer flows west to the Wheat Ridge Sanitation District (WRSD) 44th Pl outfall (connection to Metro Water Recovery). The other portion of the sanitary sewer flow north along Brentwood St to the WRSD's Miller outfall. There are no known capacity issues downstream of site or planned capital improvement projects in consideration for system enhancements at this time.

Estimated average daily flows for the existing condition, are 201,000 gallons per day (GPD), as described in the Master Plan Chapter 4. It should be noted that the estimated existing site sewer flows exceed the existing measured water usage (which include cooling and irrigation loads) as described in the water section below. This may indicate that the sewer flow estimating methodology used for the Master Plan is conservative. For the estimated hospital demands, 450

GPD per bed and 388 beds (from SCL Health website) were used for Master Plan calculations.

Proposed Sanitary Sewer

To estimate the sanitary sewer flow with the full Master Plan built out, the following assumptions were used. For residential uses, 148 GPD dwelling unit was assumed which is standard for WRSD and matches assumptions used by Metro Water Recovery. For commercial uses, WRSD typically uses rates from the Sanitary Sewer Design Technical Criteria Manual (City and County of Denver Department of Public Works, 2008). As described in the Master Plan Chapter 4, the estimated average daily demand is 224,000 GPD. The WRSD uses a peaking factor of 3.5, which includes I/I, and an 80% q/Q criteria for determining required pipe sizing.

Design Considerations

Location and condition of many existing onsite sanitary sewers are not known. Relocation and/or reconstruction of the onsite sanitary sewers may be required as the Master Plan is implemented. The WRSD has completed a preliminary analysis of the existing offsite system to determine if the Master Plan build out would necessitate downstream system improvements. From the sanitary sewer flows estimated for the Master Plan, it does not appear that offsite improvements will be required. This determination is preliminary and will need to be confirmed during the design phase, as described in the process section below.

Sanitary sewer offsite improvements costs would be borne by the developer and will require Developer Extension Agreements and Easement Agreements. The WRSD does support options for developer cost recovery for offsite upsizing.

In order to expedite the development review and permitting process the developer is encouraged to:

- Set up a pre-submittal meeting with the WRSD. WRSD is on the City referral list but it is recommended that the developer reach out as soon as possible to begin analysis and identify potential off-site improvements. In the standard referral sequence, WRSD may not receive plans until the final design phase.
- Once the developer submits a Development Info Sheet and pays the advance fees, the WRSD would perform downstream modeling. The developer will pay participation fee based on single family equivalents (SFE).

Water

Existing Water

Wheat Ridge Water District (WRWD) provides water service via public water mains to all portions of the site north of W 33rd Ave. Water service for the Collier Hospice, south of W 33rd Ave, is supplied by Consolidated Mutual Water Company via public water mains. WRWD provides service to a total of 13 water meters on the site, including the Foothills Medical Office Building. Onsite WRWD water mains run south from W 38th Ave on both Lutheran Pkwy and N Lutheran Pkwy. WRWD water mains also cross the Lutheran Legacy Campus connecting into Dudley St and W 35th Ave. The existing Lutheran Hospital is the largest WRWD system user by volume, representing approximately 7% of the total system annual usage. The actual average daily demand calculated from monthly usage data provided by WRWD from December 2018-October 2021 is approximately 117,000 GPD. *Actual* daily demand is lower than the *estimated* average daily demand based on the demand calculation methodology described in the Master

Plan.

The 35th and Garrison Pump station provides pressure for fire flow at the existing Lutheran Legacy Campus. This pump station has single source pipeline, supplied by the Denver Water Conduit #94. The existing 16" source pipeline has surpassed its designed life expectancy and in the case of increased flow, would likely need to be replaced because of capacity issues. WRWD, with Denver Water, is considering analyzing opportunities to add redundancy in case of an outage at the pump station or the Conduit #94. Solutions may include adding a secondary source for the pump station or potentially a second pump station in the vicinity.

Proposed Water

Estimated average daily flow for the full build out of the Lutheran Legacy Campus is 280,000 GPD, as described in the Master Plan Chapter 4. As noted in the section above, the estimated average daily demand may be conservative and should be refined as further information is known about the full buildout of the site. In particular, water pipe sizing is typically governed by fire flow requirements, which require knowledge of building sizes, building materials, and exact locations, not defined in the Master Plan. Fire flow requirements are dictated by the West Metro Fire Protection District. The developer would be responsible for costs of new or relocated mains within the site (e.g. new loops around buildings).

Design Considerations

Existing onsite public utility mains can likely be reused if the existing street network is maintained, pending confirmation of fire flows. Additional onsite main extensions and fire loops would likely be required. Offsite improvements would likely only be required if overall demand increases from the existing condition and triggers upgrading the pump station source main or a redundant system is required.

In order to expedite the development review and permitting process the developer is encouraged to:

- Reach out to WRWD as soon as possible to set up a joint pre-submittal meeting with WRWD and Denver Water. Upon submittal from developer, WRWD would need to evaluate capacity and condition of existing pump station and source mains and determine if any rehabilitation or upsizing is required. Approval and signature by both agencies is required for a Proof of Submission.
- Set up a meeting with the City and WRWD to review the development submittal process. Typically, WRWD requires final plans prior to issuing Proof of Submission, but the City typically requires a Proof of Submission prior to reviewing preliminary plans. Clarification of this process early on may save redesign costs on the part of the developer.
- Coordinate up a meeting with West Metro Fire Protection District early on to determine about fire flow, water mains, hydrant, and easement requirements.

Meeting Notes: Wheat Ridge Sanitation District (WRSD)

Lutheran Legacy Campus Master Plan | Sanitary Sewer Kick Off Meeting

September 29, 2021
2:00-2:45 PM

Agenda

Welcome/Introductions

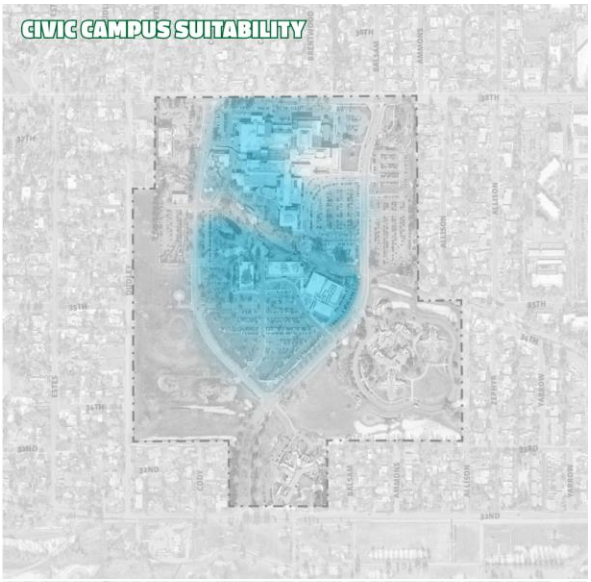
- *Consultants*
  - *Nathaniel Riedy, MIG*
  - *Mark De La Torre, MIG*
- *Client*
  - *Mark Westberg, City of Wheat Ridge*
- *Wheat Ridge Sanitation District*
  - *Bill Willis, Principal, Martin/Martin Consulting Engineers*

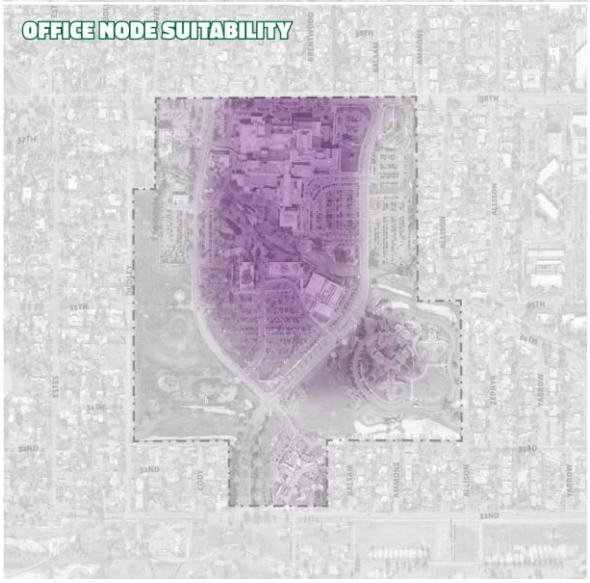
Project Background

✓ Project Intro

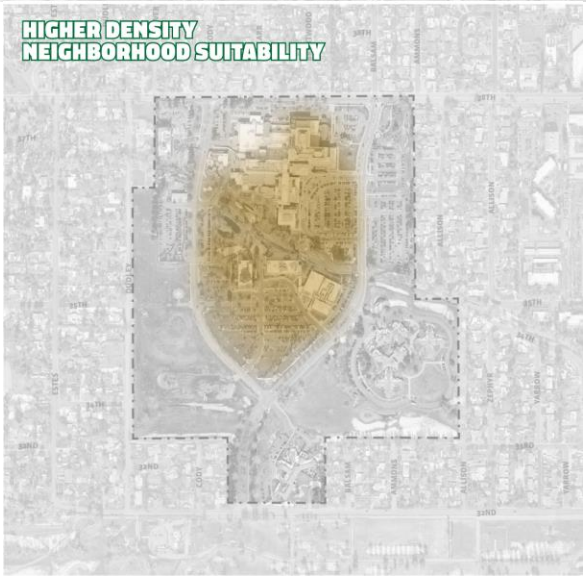
- *Site Boundaries*
- *Master Plan Study Purpose*

- *Potential Land Uses*






RETAIL AND RESTAURANT
DESTINATION SUITABILITY


HIGHER DENSITY
NEIGHBORHOOD SUITABILITY

Existing Facilities

- Confirmed all site areas north of 33rd Ave to drain to 38th Ave sewer main.
- Confirmed 38th Ave sewer main is 8" diameter. There is also an 8" line in Dudley. 38th main flows east to Ammons then becomes 15" line and turns north along Ammons to 44th. A parallel 8" line in Ammons collects laterals from Ammons homes. On 44th there is a flow splitter, a portion of flows continue west to the District's 44th Pl outfall (connection to Metro). The other portion flows north on Brentwood to the District's Miller outfall.
- District does maintain a numerical model for the sewer system. District determines sufficient capacity based on peak flow is less than 80% of pipe capacity (Q/Q).
- In addition to pipe capacity District has flow limits at each of the Metro outfall locations.
- *Any known problem areas downstream in existing condition?* No known capacity issues downstream of site. No CIP projects in consideration for upsizing. Lines are surveyed every few years for structural deficiencies, then CIP is developed to address deficiencies.

Demand Summary Approach


Avg. Flow: 94 GPM
Peak Flow: 315 GPM
Avg. Flow: 141 GPM
Peak Flow: 442 GPM
Avg. Flow: 83 GPM
Peak Flow: 283 GPM
Avg. Flow: 121 GPM
Peak Flow: 388 GPM
Avg. Flow: 67 GPM
Peak Flow: 236 GPM
Avg. Flow: 100 GPM
Peak Flow: 330 GPM
Avg. Flow: 36 GPM
Peak Flow: 140 GPM
Avg. Flow: 60 GPM
Peak Flow: 214 GPM
38TH
ALLISON
ALLISON
DUDLEY
35TH
34TH
ZEPHYR
32ND
CODY
BALSAM
AMMONS
ALLISON
32ND

Estimate of Sanitary Sewer (SS) and Water (W) Demands - Based on Land Use

	SS Average Daily Demand	W Average Daily Demand
	thousands of gpd	thousands of gpd
Existing	314	393
Full Buildout*	340	380

*Calculations are based anticipated highest use development, accounting for current market conditions. Maximum demands based on the most intense development allowed by zoning may be higher.

- *Feedback on demand assumptions*
    - *District Planning standards* – Use Metro flow values for SFR, 148 gpd/unit. Use City and County of Denver values for non-residential land uses. Use peaking factor of 3.5, includes I&I.
    - *Existing site demand assumptions* – District can provide based on existing model. Follow up with request email.
- *Potential Off-site Improvements*
    - *Conveyance System* – District can review based on Master Plan revised flows.
    - *System Capacity (Metro discharge limits)* – Similar to above.

<u>Development Process</u>

- *Development Plan review* – District is on the City referral list but it is recommended that the Developer reach out as soon as possible to begin analysis and identify potential off-site improvements. In standard referral sequence, District may not receive plans until
- *Future Offsite Analysis* – Developer submits Development Info Sheet and pays advance fees.
- District performs downstream modeling. Developer pays participation fee based on SFE (single family equivalents)
- *Agreements* - Upsizing costs would be borne by the Developer. Extension costs would also be borne by the Developer, but work would be performed by the Developer's contractor after appropriate Developer Extension Agreements and Easement Agreements have been executed.
- District supports options for Developer cost recovery. (repayment by other future developments for upsizing cost).

Meeting Notes: Wheat Ridge Water District (WRWD)

Lutheran Legacy Campus Master Plan | Water Kick Off Meeting

October 13, 2021
1:00-2:00 PM

Agenda

Welcome/Introductions

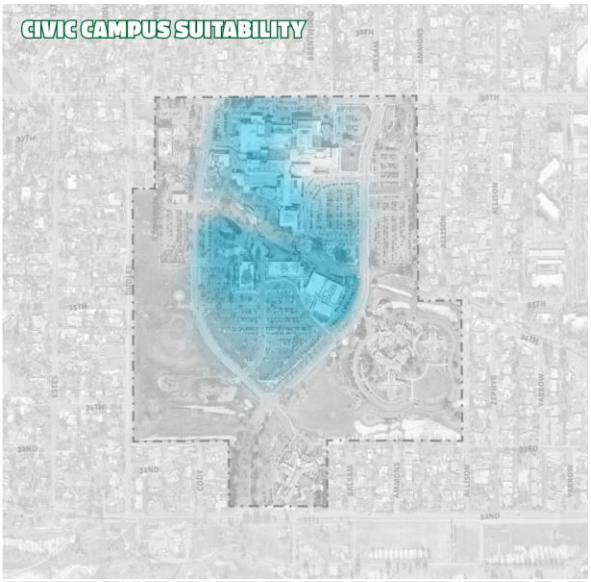
- *Consultants*
  - *Nathaniel Riedy, MIG*
  - *Mary Keilhauer, MIG*
- *Client*
  -
- *Wheat Ridge Water District (WRWD)*
  - *Doug Berling*
  - *Barry Hudson*

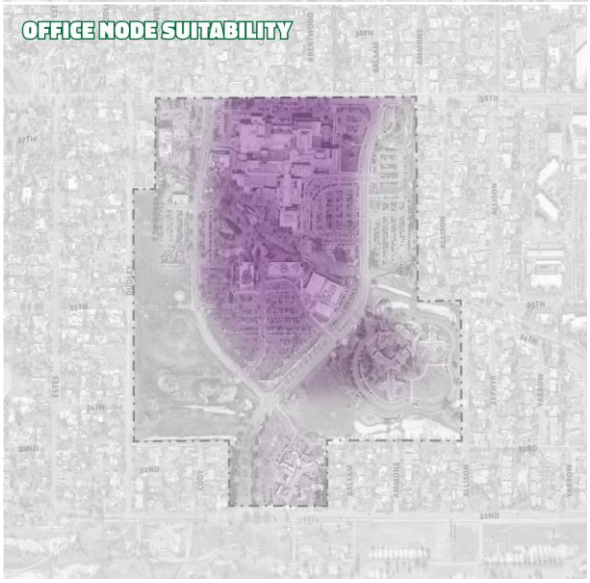
Project Background

✓ Project Intro

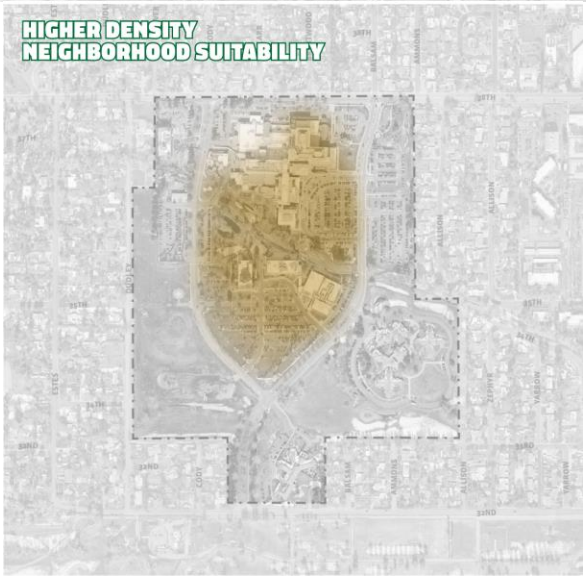
- *Site Boundaries*
- *Master Plan Study Purpose*

- *Potential Land Uses*






RETAIL AND RESTAURANT
DESTINATION SUITABILITY


HIGHER DENSITY
NEIGHBORHOOD SUITABILITY

Existing Facilities

- *Southern square peninsula is served by Consolidated Mutual Water Company (Mutual). MIG noted that this is not currently anticipated to redevelop with the rest of the site.*
- *Any known problem areas surrounding in existing condition?*
    - *(35th and Garrison) Pump station provides required pressure for fire flow at the existing site*
        - *Pump station has single source pipeline, supplied by the Denver Water Conduit #94.*
        - *Source pipeline (16") is aged and if demand increases would likely need to be replaced.*
        - *The District is analyzing (with Denver Water) opportunities to increase redundancy in case of an outage at the pump station or the Conduit #94. Solutions may include adding a second pump station in the vicinity.*
    - *WRWD has a Master meter (approximately 35th and Allison)*
        - *This is one of the connections from Denver Water*
    - *Some water lines and features may have been updated in 2007 as part of the new entrance project along 38th*
    - *The District noted that Denver Water map should not be used for exact locations*
        - *Doug – District may review differences from Denver Water maps and actual lines in the field, but will likely not be done in time for the Master Plan water memo*
    - *There was an old road that connected to Dudley from the site.*
- *Existing Lutheran Hospital*
    - *The largest WRWD user (~7% of the total demand)*
    - *This may likely exceeds any proposed design demand*
    - *WRWD will send actual existing site demand and fire flow testing results*
    - *Denver Water might have some additional calculations and assumptions*

Demand Summary Approach

Estimate of Sanitary Sewer (SS) and Water (W) Demands - Based on Land Use

	SS Average Daily Demand	W Average Daily Demand
	thousands of gpd	thousands of gpd
Existing	314	393
Full Buildout*	340	380

*Calculations are based anticipated highest use development, accounting for current market conditions. Maximum demands based on the most intense development allowed by zoning may be higher.

- *Feedback on demand assumptions*
    - District Planning standards
        - *No official WRWD standards for planning level demand calculations.*
        - *Tap calculations are based on final design fixture counts*
        - *Fire demand calculations require a detailed site plan.*
        - *Denver Water has some great demand forms but need detailed information to fill out (e.g. #of fixtures)*

- *Potential Off-site Improvements*
    - Conveyance System
        - *if keeping the existing road alignment, existing on-site lines could likely be retained.*
        - *As noted above, extensions would likely be needed to meet fire requirements*
        - *Also as noted above, any increase in overall site demand may require replacement of the 16" pump station source line.*
    - *System Capacity*
        - *Generally defined by fire flow requirements*
            - *Governed by West Metro Fire Protection District*
            - *WRWD recommends getting calculations for fire flow from Martin Martin from their past work at the hospital (large fire flow ~4000gpm)*
        - *Consumption increases would be reviewed by Denver Water.*

<u>Development Process</u>

- *Development Plan review*
    - *No formal process for pre-submittal meeting*
        - *Developer encouraged to reach out to WRWD as soon as possible to set up joint pre-submittal meeting with WRWD and Denver Water.*
    - *City typically requires a "Proof of Submission" signed by the WRWD prior to reviewing site plans. WRWD requires final plans prior to issuing Proof of submission. Developer is encouraged to meet with WRWD and City for a pre-submittal meeting to clarify this process.*
    - *All development plans require approval by both WRWD and Denver Water.*
    - *Development "pays its own way," meaning any new or relocated new mains within the site be paid by the Developer (e.g. new loops around buildings)*

    - *Developer will also need to meet with West Metro Fire Protection District early on to determine about fire flow, water mains, hydrant and easement requirements.*

- *Future Offsite Analysis*
    - *Upon submittal from Developer, WRWD would need to evaluate capacity and condition of existing pump station and source mains and determine if any rehabilitation or upsizing is required.*

- *Agreements*
    - *N/A*

APPENDIX E.1
FOCUS GROUPS, ROUND 1

SCL Health

LUTHERAN CAMPUS FOCUS GROUPS

Envision Wheat Ridge Key Values

- Reslient Local Economy Based on a Balanced Mix of Uses
- Vibrant Neighborhoods and an Array of Housing Options
- Community Character and Quality Design
- Transportation Connections and Options
- Quality Amenities, Services, and Resources
- Ensure a Sustainable Future

Group A

Questions or Concerns

- if commercial, want to see local businesses, not just nat'l chains
- access to ditch has been restricted
- connectivity, bike, ped access and safety is a current concern
- may not fit overall character of WR
- high density housing - more rentals
- concern about connecting dudley to campus (more cars in neighborhood)
- safer access to property adn to crown hill - formalize connectivity
- lots of dogs, no dog park currently
- need to account sufficiently for parking so it doesnt overflow into adjacent neighborhoods
- berm serves as buffer, want to retain berm on dudley side
- +1
- concern with idea of putting housing for homelessness on campus

Opportunities

- parking (possible garage) to prevent spillover into neighborhoods
- family friendly
- gated residential community component - lower density 1-2 stories
- +1
- "commons" movies on the lawn, rec center, farmers market
- public space park playground
- keep character of wheat ridge - couple stories, doesn't look too prefab
- there are residents who are ok with higher density housing - it's hard to find housing (own or rent) - this site is an opportunity to model after other examples of good design - want to remove negative connotation associated with density
- dog park
- microbrewery
- some are not opposed to high density housing
- mix of housing, locally owned businesses, retail, entertainment - similar to old town arvada or golden - something to walk to!
- +1
- main street feel - retail, restaurant, coffee - can take kids, dog, walk, parks on the perimeter
- neighborhood feel, multiple destinations
- high density does not always mean low income (good ex. Sloan's Lake & Downtown)
- walkable
- +1

Campus Map

Group B

Questions or Concerns

- we don't want to detract from other businesses nearby (this isn't a Bel Mar)
- some housing at low density
- park/play areas & open space
- don't add traffic to adjacent neighborhoods
- route traffic to 38th
- +1
- edge as open space
- minimize height outside our back door
- +2
- height might be okay if it's in the middle
- Use the footfrinpts we have
- event Mailings/ Flyers (Beyond Online)
- advertising in print as much as possible
- expand in-person options in COVID
- expand key values

Opportunities

- park & open space
- rec center
- +1
- place for kids to play
- we don't have sidewalks, but we don't need sidewalks
- transit opporunities
- town center
- ampitheather
- play fields
- community gathering
- view looking south at Tower of Memories
- complementary Businesses
- sidewalks to connect us to it
- keep neighborhood character
- higher density/ intensity could work if done right and stepped down near enighbors
- small businesses
- gear towards walkabie/bikeable

SCL Health

LUTHERAN CAMPUS FOCUS GROUPS

Envision Wheat Ridge Key Values

- Reslient Local Economy Based on a Balanced Mix of Uses
- Vibrant Neighborhoods and an Array of Housing Options
- Community Character and Quality Design
- Transportation Connections and Options
- Quality Amenities, Services, and Resources
- Ensure a Sustainable Future

Group A

Questions or Concerns

- high density does not = affordable
- relocate any city/public services to the site?
- worst possible scenario: walled off community that is internally facing, need to pay attention to edge treatment; needs to be context sensitive
- +1
- don't want to cannibalize 38th or elsewhere
- may be good to save some buildings, but it can also be a constraint (tail wags the dog)
- everyone is used to the visual of exisitng buildings (height, structure, massing) in city center - can we explore reuse options?
- blue house, chapel, other buildings reuse may alleviate concerns because would limit amount of change
- lots of cut through traffic to the north now - does it get better or worse?
- edge treatment - if density keep in middle - lower heights at edge
- bike/ped activity on 32nd needs to be safer

Opportunities

- chance to think about branding (or more than 1 brand since it's a big campus) what's the story?
- would be nice to be able to walk over, have walking paths, open space, shopping, restaurants, small downtown feel
- opportunity to relocate city's "center of gravity"
- +1
- walkable and accessible to all
- green area (similar to central park neighborhood) surrounded by housing, public uses (eg library), markets, antiques, public events
- like idea of library here - could reuse house or chapel?
- +2
- improve safety, bike/ped access on 32nd
- fluid integration of different uses - office to residential to commercial - blurry lines between

Campus Map

Group B

Questions or Concerns

- don't fill it up with too much housing, development, streets
- +1
- don't want to drive unaffordability - think inclusive!
- affordable housing
- traffic, congestion, noise, viewsheds
- no need to repurpose
- height
- some density okay, but not along the edge
- beautiful architecture and lots of green space!
- no high rises! want for something architecturally pleasing
- Don't want a "Lucky's" situation - vacant storefronts
- maintain health-related legacy
- concern comes back to not wanting too much right outside existing back yards
- reuse of West Pines for similar recovery/treatment purpose
- owners vs. rentals?
- young families want streets to stay as dead end

Opportunities

- use the existing built area
- green space border
- +1
- keep the green space on southwest and southeast sides
- Wadsworth-type uses
- Walkable for this neighborhood
- responding to changing makeup of the community
- Internal connections, too!
- bikeway
- Walkability without having to cross Wadsowrth
- keep the pond
- dog park
- ACCESS
- government buildings - good neighbors -
- Civic
- Housing
- Open Space
- JOBS
- water features
- yes employment, but maybe not PRIMARY employment center
- who do we want to appeal to? young families? retirees?
- tastefully built housing, green space to south

SCL Health

LUTHERAN CAMPUS BUSINESS FOCUS GROUP

Envision Wheat Ridge Key Values

- Reslient Local Economy Based on a Balanced Mix of Uses
- Vibrant Neighborhoods and an Array of Housing Options
- Community Character and Quality Design
- Transportation Connections and Options
- Quality Amenities, Services, and Resources
- Ensure a Sustainable Future

Questions or Concerns

- housing that doesn't connect or address needs of the community
- financing will be difficult
- on what basis are some people concerned about building height? (A: likely general fear of change, some real view shed issue at SEC)
- uniform height limit (35') limits architectural variety, expression, roof forms
- more building height gives you more open space!
- disconnected from green belt
- metro district - be cautious about what those $$ are used for so amenities still are/ feel public

Campus Map

Opportunities

- opportunity for diverse housing
- mixed use, open space, housing on perimeter increasing density to middle +1
- vertical mixed use
- affordable housing! (30% to 120% AMI, mixed income) opp to have housing integrated into overall development and close to jobs and transportation +1
- affordable home ownership, condo, TH, and 30-80AMI rental, and special populations
- diverse housing in terms of product, population, and tenure - can serve a broad need
- hospital operational and construction impacts have been minimal to date despite being a relatively intense use - any change likely less intensive and is great opportunity in middle of city
- historic tax credits may be unique tool
- more building height gives you more open space!
- open space is an amenity
- story book finish!
- opportunity for quality commercial product (currently lacking in WR market)
- large floorplate is a challenge but can be unique reuse (eg Lowry storage)
- case studies: FRH in Arvada 3ac, Loretta Heights, Lowry (historic town center 55ac and Blvd One 70ac), Boulder Hospital site, Johnson & Wales
- opportunity for better connections to Crown Hill and Wads
- supply and demand - opportunity to create more supply to keep things affordable
- library
- balanced mix of uses

APPENDIX E.1
FOCUS GROUPS, ROUND 2

SCL Health

LUTHERAN CAMPUS FOCUS GROUPS

COMMUNITY GROUP #1
ROUND 2 - PRELIMINARY ALTERNATIVES

Comments and Clarifications

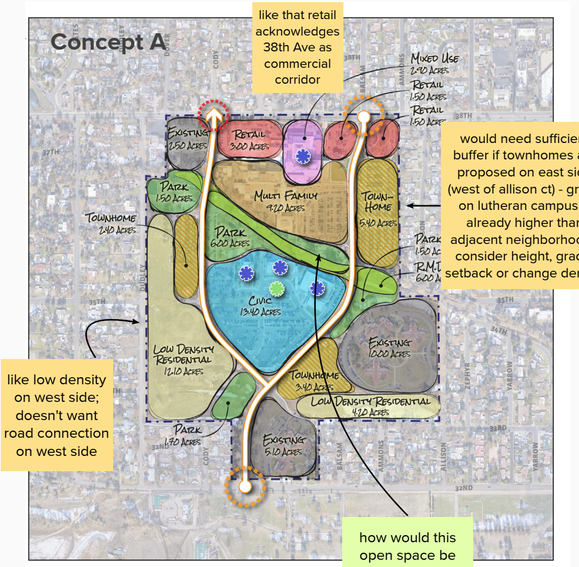
Q: have we decided or talked about where street connections into the adjacent neighborhoods will/wont change?
A: transportation connectivity will be reviewed after land use concepts

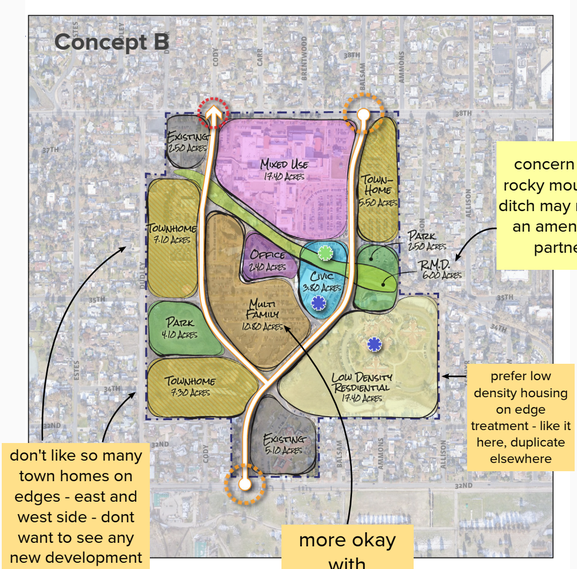
Q: can rocky mountain ditch be converted to bike/ped path like high line canal? goes through so much of the City

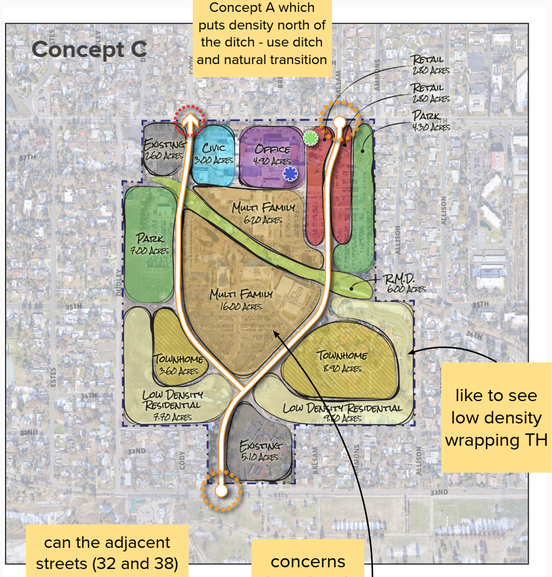
Q: why are we considering TH/multifamily/so much residential? (community doesnt want it)
A: strong market for residential, not as strong a market for office/commercial; can only achieve public amenities if have density/land use mix that can pay for those amenities; community feedback is not on the whole opposed to density, strong feelings on where - refer to public input to date

Q: is the 4 lanes on 38th ave still necessary in this segment if the hospital goes away?
A: it was needed for the hospital, future design may depend on what the future land uses are

Q: why doesnt is specify senior housing?
A: don't limit the residential housing in that way, will include in text of document which markets could make sense, but these alternatives focus on land use category







SCL Health

LUTHERAN CAMPUS FOCUS GROUPS

COMMUNITY GROUP #2
ROUND 2 - PRELIMINARY ALTERNATIVES

Comments and Clarifications

Q: does the plan include ransportation and bike/ped connections?
A: not yet

speeds on dudley are currently excessive - consider traffic calming along length of dudley

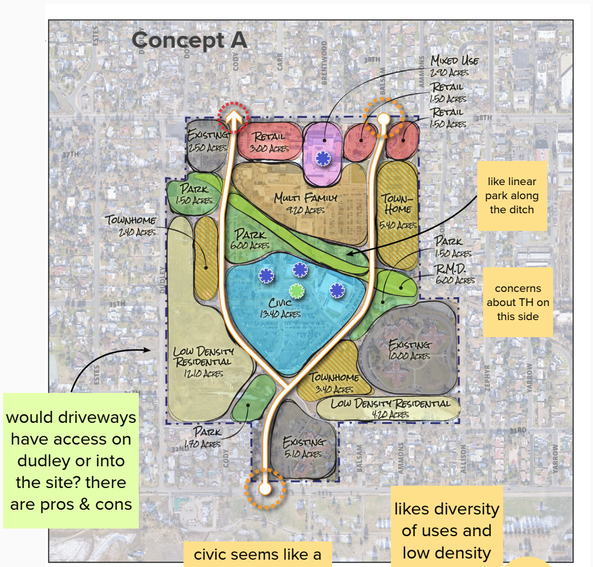
edge condition on dudley is critical - new driveways may be better than backyard fences

concerns about where local streets may connect through eg Cody, Dudley, Balsam

Q: are the office buildings staying along the ditch
A: MOB tenants aren't sure if they're staying yet - still have 20 yr ground lease; buildgns may be reusable if they go

Q: how do we get input from the rest of the community?
A: public meeting Aug 3 and week-long online activity

are there other areas of the city better suited for a small music venue? town center park or the green?



like linear park along the ditch

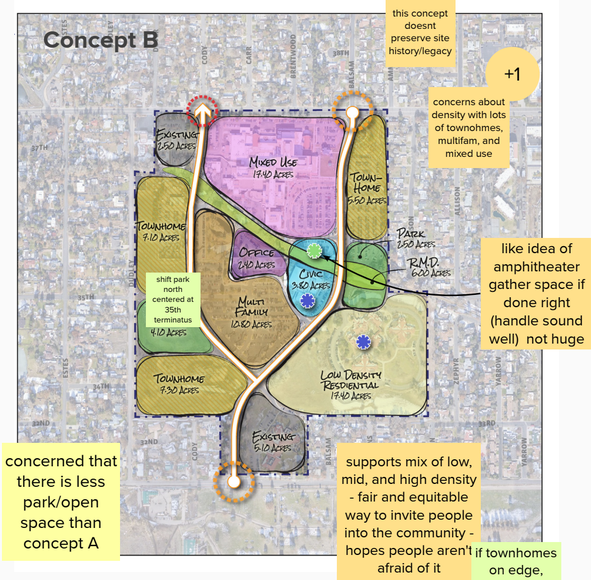
concerns about TH on this side

would driveways have access on dudley or into the site? there are pros & cons

likes diversity of uses and low density on edges

+1 on low density

civic seems like a great anchor, usually quieter in evenings and weekends, usually has good green space



this concept doesnt preserve site history/legacy

+1

concerns about density with lots of townohmes, multifam, and mixed use

like idea of amphitheater gather space if done right (handle sound well) not huge

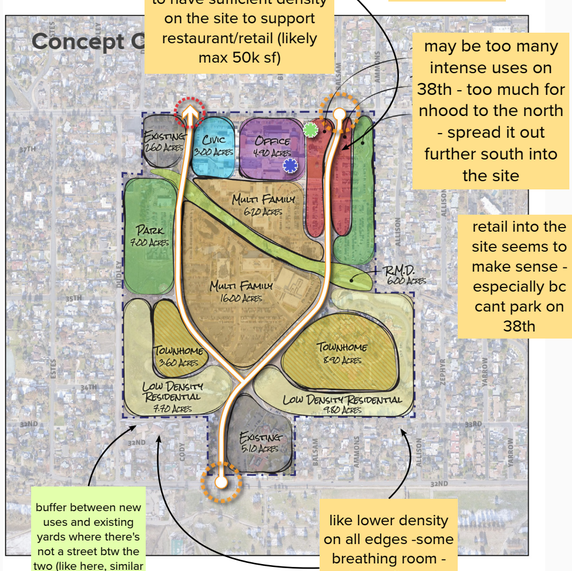
shift park north centered at 35th terminatus

concerned that there is less park/open space than concept A

supports mix of low, mid, and high density - fair and equitable way to invite people into the community - hopes people aren't afraid of it

if townhomes on edge, need to keep that traffic internal

like MU but would want larger civic use adjacent to MU area



concern about empty retail and cannibalism; love the idea (like South Gaylord) if there's enough of a market -- would HAVE to have sufficient density on the site to support restaurant/retail (likely max 50k sf)

how does the retail back up to the park - maybe just one side? back side has loading and trash

may be too many intense uses on 38th - too much for nhood to the north - spread it out further south into the site

retail into the site seems to make sense - especially bc cant park on 38th

buffer between new uses and existing yards where there's not a street btw the two (like here, similar condition elsewhere)

like lower density on all edges -some breathing room - gives adjacent nhood what they're used to

dont move police to the civic area here (so quiet and less coming and going at night)

civic component too small in this concept as well

SCL Health

LUTHERAN CAMPUS FOCUS GROUPS

BUSINESS FOCUS GROUP
ROUND 2 - PRELIMINARY ALTERNATIVES

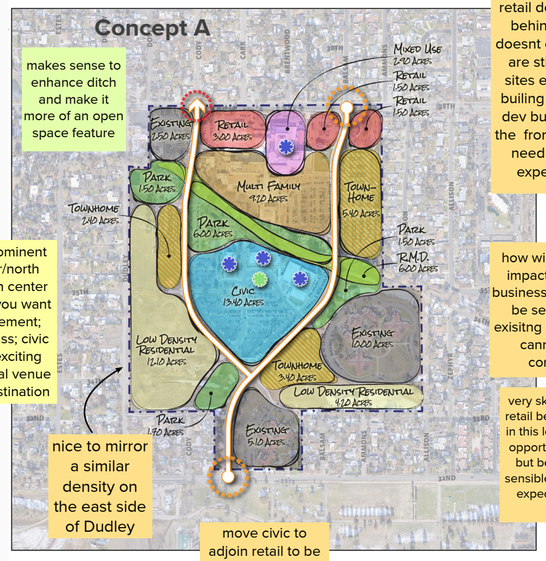
Comments and Clarifications

example project: midtown project by brookfield in berkeley neighborhood - nice greenbelt walkway serves as front yard

Q: about existing buildings
A: the plan will incorporate the community's desire to repurpose and incorporate into the development the blue house and chapel

the green is being used for some events - carnation festival is outgrowing current location - think about what kind of event space is missing from the community

Concept A



makes sense to enhance ditch and make it more of an open space feature

retail development often lags behind. what happens if it doesnt come to fruition - there are still vacancies and pad sites elsewhere in the City - builing in the market with res dev but may create a void at the front of the development - need to be realistic about expectations and timing

needs more prominent node in center/north area; need main center entry feature if you want to create excitement; need critical mass; civic use could be exciting enough if cultural venue that is a real destination

how will this retail impact 38th ave businesses - need to be sensitive to exisitng businesses- cannibalism concerns

very skeptical of new retail being successful in this location - retain opportunity for retail, but be flexible; not sensible to zone for or expect exclusively retail

nice to mirror a similar density on the east side of Dudley

move civic to adjoin retail to be more activated; especially if noise producing, entertainment venues

Concept B

vertical mixed use is challenging; perhaps even more so than the retail on 38th in concept A

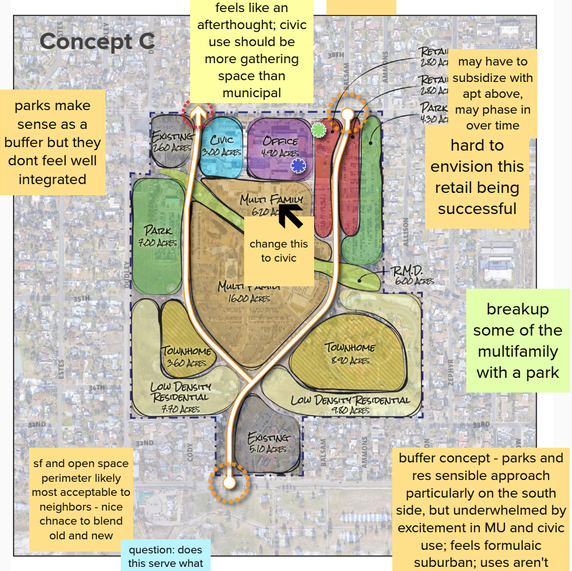
bigger and more central civic (cultural /event) space

phase-in retai/permanent uses; create amenity spaces for food trucks and other things that can activate the site in the short term; civic space can build over time - informal food truck gathering space to start with, can be reserved to evolve over time and adapt with the market

need leadership on what the civic use could be - exciting node that we're going to build our community around - more central and further north - better if more cultural in nature v city hall use

sculpture garden at arvada center, event space is a good example of placeholder use

Concept C



office is unlikely

civic component feels like an afterthought; civic use should be more gathering space than municipal

may have to subsidize with apt above, may phase in over time

parks make sense as a buffer but they dont feel well integrated

hard to envision this retail being successful

change this to civic

breakup some of the multifamily with a park

sf and open space perimeter likely most acceptable to neighbors - nice chnace to blend old and new

question: does this serve what the city needs? tax producing? big enough civic component?

buffer concept - parks and res sensible approach particularly on the south side, but underwhelmed by excitement in MU and civic use; feels formulaic suburban; uses aren't integrated; opportunity to do something fun and exciting

APPENDIX E.1

STAKEHOLDER STEERING COMMITTEE

LUTHERAN LEGACY CAMPUS MASTER PLAN

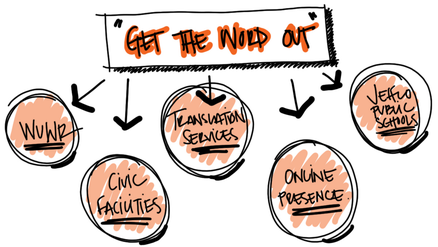
STAKEHOLDER STEERING COMMITTEE KICK-OFF MEETING

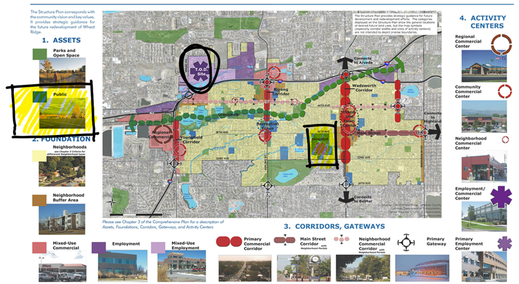
APRIL 16th 2021

COMMUNITY OUTREACH AND ENGAGEMENT

- ENSURE DIVERSITY OF INPUT.
- MAKE SURE INTERPRETATION IS INCLUDED
  - CONNECTANDO (SPANISH SPEAKING COMM. IN JEFFCO
- ENGAGE SCHOOLS
  - I.E. DIGITAL SIGN BOARDS
- TEAM WITH LOCAL WORKS ON THE GT
- SOCIAL MEDIA: I.E. WHEAT RIDGE NEIGHBORS.
  - CITY'S WEBSITE
  - ALSO NEXTDOOR, PAPERS & PRESS
- CONSIDER THAT EVERYTHING WILL BE ON FACEBOOK.
- STRONG, ACTIVE GROUPS IN THE COMMUNITY. (BAs, ROTARY, ETC.)
  - ENGAGE FOR OUTREACH/MESSAGING.
- USE BOARDS/COMMISSIONS TO GET THE WORD OUT
- USE COMMUNITY FACILITIES FOR SIGNAGE,
  - REC CENTER, ANDERSON POOL, ACTIVE SR. CENTER, JEFFCO LIBRARY.

CAMPUS TOUR





Create a Resilient Local Economy Based on a Balanced Mix of Land Uses

A diverse mix of land uses including residential neighborhoods, primary employment, and commercial goods and services will build and sustain a broad and resilient tax base.

See Chapter 4 – Economy and Land Use

Promote Vibrant Neighborhoods and an Array of Housing Options.

Maintaining the character of existing neighborhoods and establishing new housing options will retain and attract a range of household types.

See Chapter 5 – Neighborhoods and Housing

Enhance Community Character and Accentuate Quality Design.

Marketing Wheat Ridge's unique qualities and emphasizing quality design for new development and redevelopment will reposition Wheat Ridge as a unique community.

See Chapter 6 – Community Character

Increase Transportation Connections and Options.

Continued coordination and investment in transportation efficiency, travel options and connections will improve mobility for community residents, employees, and visitors.

See Chapter 7 – Transportation

Provide Quality Community Amenities, Services, and Resources.

A commitment to providing exemplary community services will maintain the high quality of life for community residents, and will help attract future households and employers.

See Chapter 8 – Community Services

Ensure a Sustainable Future.

Continued focus on the future implications of today's choices and their impact on the community's residents, the natural environment, and community prosperity will ensure a prosperous future for future generations.

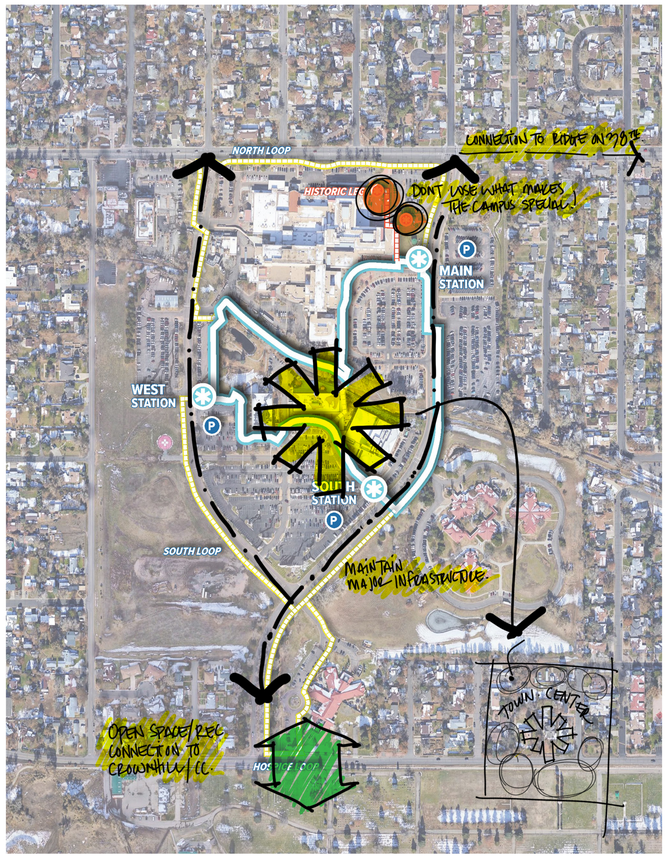
See Chapter 9 – Sustainable Future

HOUSING CHOICE

GATHERING PLACE

DEV. REALITIES

DIVERSE OUTREACH



ROLE OF THE LEGACY CAMPUS

- WE DON'T CURRENTLY HAVE:
  - ARTS CENTER?
  - ENTERTAINMENT? GREAT RESTAURANTS, BUT...
- PARK-LIKE SETTING ALLOWS FOR REC/OPEN SPACE.
- CONSIDER CIVIC/CITY USES. (RELOCATING FOR WADS)
- WILL NEED TO BALANCE DEVELOPMENT REALITIES
- "TOWNSQUARE" WITH A CENTRAL
  - RESIDENTIAL (W/ AFFORDABLE)
  - SURROUNDED BY COMMERCIAL
- STEVENS' GREEN IS THE CURRENT "CENTRAL" SPACE.
- INCREASED HOUSING DIVERSITY

DITO!

ARTS SPACE STUDY

PROGRAM CONSIDERATIONS.

"THERE IS NO NUCLEUS IN WHEAT RIDGE"

"WE NEED A COMMUNITY 'CENTER', GATHERING PLACE"

- SENIOR HOUSING
- AFF. HOUSING/ WORK FORCE
- MIX OF HOUSING CHOICES.

- WE'VE OUTGROWN OUR REC CENTER
- GROWING NEED FOR DAYCARE
  - "CRADLE TO THE GRAVE" THINKING
- CONSIDER THE "LEGACY" WHEN THINKING OF USE.
- NOT A "DRIVE TO" DESTINATION, PRIORITIZE THE "WALK TO" SPACE.
  - PRIORITIZE LIVE RESIDENTS
- HOSPICE/BEHAVIORAL HEALTH WILL REMAIN, WHAT ELSE?
- DON'T UNDERMINE "RIDGE ON 38TH" — COMPLIMENT, DON'T COMPETE.
- PHYSICAL CONNECTIVITY ALONG THE CORRIDOR.
- KEEP THE BLUE HOUSE & THE CHAPEL.
  - BE CONTEXTUAL W/ SCALE (GROUNDS) & HISTORY.
- ENVIRONMENTAL SENSITIVITY.

LUTHERAN LEGACY CAMPUS MASTER PLAN

STAKEHOLDER STEERING COMMITTEE SECOND MEETING

JULY 7th 2021

PRIORITIZATION OF INPUT

- FOCUS ON OPEN SPACE (PASSIVE IN NATURE)
  - NEED TO BALANCE FINANCIALLY VIABLE
- USE NATURAL PHYSICAL CONSTRAINTS TO CONCEAL DEVELOPMENT & PRESERVE OPEN SPACE.
- RETAIL/ET: RESTRICTED TO 38TH EDGE
- INTENSITY/DENSITY GRADIENT
- "THIS IS OUR COMMUNITY (GATHERING PLACE)"
  - USE BUFFERS TO CREATE SOMETHING SPECIAL
- NRS: "WE WANT A PLACE WE CAN WALK TO, EAT, ETC."
  - YOU HAVE TO THE PEOPLE TO SUPPORT THOSE USES
  - "HEADS IN BEDS"
- TIE THIS AREA (WALK/BIKE) TO ADJACENT NEIGHS.
- SHOULD BE DESTINATION!
  - MEANING, SOME PEOPLE WILL NEED TO DRIVE THERE
- CAMPUS SHOULD BE A CONNECTOR TO OPEN SPACE, NOT JUST/ONLY A PROVIDER OF IT.
  - = WE ALREADY HAVE CROWN HILL!
- ADDITIONAL RECREATION OPPORTUNITIES: ← DITTO! (DOUBLE DITTO!)
  - FARMER'S MARKET
  - AMPHITHEATRE OF SCALE → TIED TO ET. /DINING
- DON'T USE OPEN SPACE AS A MEANS OF RESTRICTING DEV.
- DON'T CANNIBALIZE RIDGE ON 38TH
  - THE GREEN IS GREAT, BUT LIMITED/ SPACE CONSTRAINED

DENSITY = OPEN SPACE.

"IT'S NOT ALL OR NOTHING"

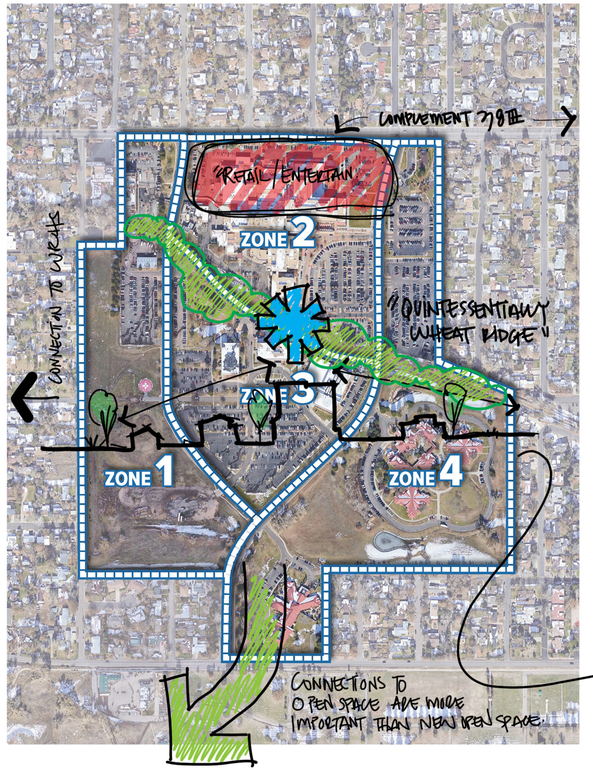
"CONNECTOR OF OPEN SPACE"

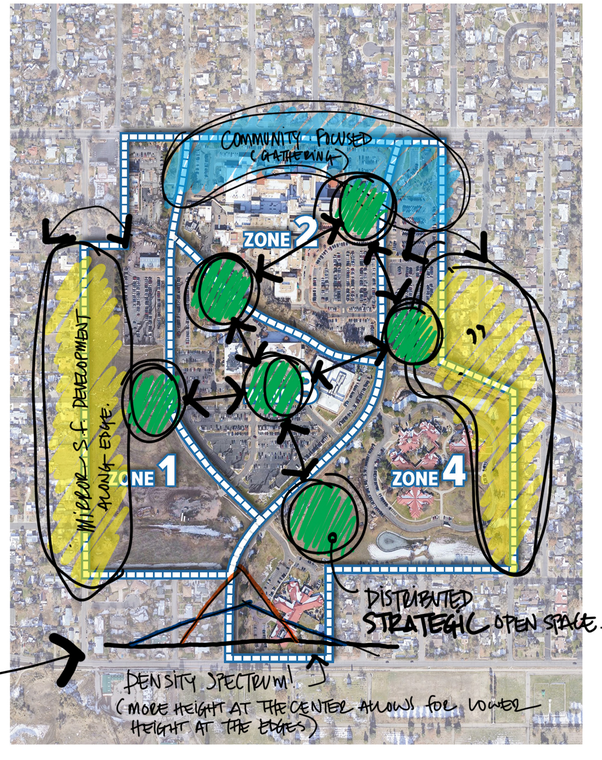
BENEFIT

SCL 38TH

- NEED TO BETTER PRESENT/EDUCATE TRAFFIC IMPACTS.
- ADAPTIVE REUSE!
- HOW DOES NEW HOUSING IMPACT SCHOOL DISTRICTS?
- COMMERCIAL NEED POST COVID?
- WHEAT RIDGE HAS EVOLVED A LOT IN RECENT YEARS
  - HOW DO WE HOUSE THE DIVERSE NEEDS
  - PROPERTY GIVES THE OPPORTUNITY TO RESPOND TO THE NEEDS OF FAMILIES
- COMMUNITY GARDENS AS A NOD TO AGRICULTURAL PAST
  - COMMERCIAL KITCHEN (TIED TO FOOD CULTURE)
- ARE TARGETED PRODUCTS
- MAKERSPACE (COMMUNITY BUILDING, REPAIR, ETC). ← SUPPORTING COMMUNITY USE ← PAIRED
- JEFFCO ED.
  - ENTREPER.... INCUBATOR. (STEM CHEK)
- MENTAL HEALTH SERVICES. (FOR CHILDREN)
  - OFFICE/MEDICAL

LOOK FOR PARTNERSHIPS!





LUTHERAN LEGACY CAMPUS MASTER PLAN

STAKEHOLDER STEERING COMMITTEE MEETING #3

REFLECTION OF COMMUNITY INPUT + MARKETING TOOL = AN EFFECTIVE & SUCCESSFUL PLAN

QUESTIONS AND CLARIFICATIONS

DITTO!

- CONSENSUS BASED DECISION MAKING
- "REQUIRE" AFFORDABLE HOUSING?
  - PREFERRED MIXED INCOME.
  - VARIETY OF RENTAL/ OWNERSHIP
  - NO CODE REQS. RE: AFFORDABLE HOUSING CURRENTLY — ACTIVELY WORKING TO ADDRESS THAT IN COUNCIL.
- FINANCING OPTION AS A URA?
  - URA VERY LIKELY.
  - WOULD REQUIRE NEW URA AREA. — CHALLENGING DUE TO NEW REQUIREMENTS
- "NOT ONE OF THEM IS A BAD ONE"
- OUTSIDE PERIMETER SHOULD MIRROR EXISTING ADJACENT USES (EG. N. of 38TH) OR BE SET BACK.
  - USE DESIGN STANDARDS/GUIDELINES TO REGULATE QUALITY LANDSCAPE DESIGN/SETBACKS.
- MIXED INCOME IS GREAT!
- FRAMEWORK. COULD/SHOULD ADDRESS OPEN SPACE REQUIREMENTS
- WHAT ARE THE OTHER FUNDING OPPORTUNITIES?
  - DOLA GRANTS.
  - LIHTC FOR ALF. HOUSING.
  - DISTRICTS
  - BONDING
  - CONSIDER: FOUNDATION/IMPACTS & HIGH NET-WORTH INDIVIDUALS
- RESPECT FOR THE EXISTING TOPOGRAPHY.
- OPPORTUNITY FOR MAKERSPACE
- ADOPTION WILL BE OF FULL PLAN DOCUMENT.
- MARKET WILL HELP DRIVE DIVERSE PRODUCTS THROUGH FINANCING CHALLENGES

Lutheran Campus Master Plan

Preferred Concept

Legend

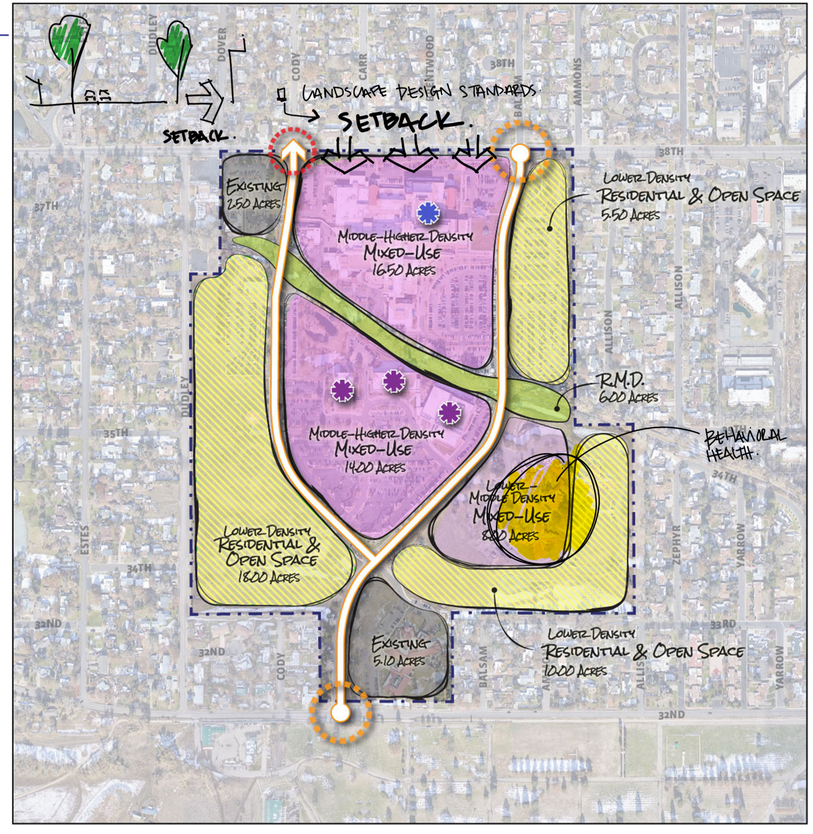
Lutheran Campus Boundary

Concept Diagrams

- Existing Use to Remain
- Lower Density Residential & Open Space
- Middle - Higher Density Mixed-Use
- Lower - Middle Density Mixed-Use
- Rocky Mountain Ditch
- Primary Circulation
- Connection to Existing Road Network
- Adaptive Reuse
- Existing Medical Office Building (M.O.B.)

"WHAT AN AMAZING AND COMPREHENSIVE PROCESS!"

THE SNOWCONE OF LAND USE!!



LAND USE HEAT MAPS