



July 21, 2023

Hunter Floyd
Live Forward Development
915 S Pearl Street
Denver, CO 80209

Re: Live Forward Residential Louisville
Trip Generation Comparison Letter
Louisville, Colorado

The purpose of this letter is to support a requested rezone application to provide a trip generation comparison between possible traffic uses for the existing zoning and the proposed zoning of the parcel located south of Griffith Street and west of State Highway 42 (SH-42) in Louisville, Colorado. Specifically, at 1301 Courtesy Road and Outlot 1, approximately 2.5 acres is proposed to be rezoned from Commercial Community – Mixed Use (CC-MU) to Mixed-Use Residential (MU-R). Therefore, the potential intensity associated with the existing CC-MU zoning and the proposed MU-R zoning trip generation is compared and summarized in this letter. A conceptual site plan of the conceptual development is attached for reference. This traffic letter provides a trip generation comparison for the purpose of the rezoning application; however, it is understood that a full traffic impact study will be required later in association with a site development plan application.

SITE INFORMATION AND TRIP GENERATION COMPARISON

The existing site is vacant and is currently zoned for Commercial Community – Mixed Use (CC-MU) that allows a mix of uses outlined in the City of Louisville Municipal Code. The potential size density allowed under the existing zoning is believed to be approximately 25,000 square feet of retail, an assumed floor area ratio (FAR) of 0.25. The rezoning to MU-R may include 109 multifamily dwelling units and a 4,000 square foot retail space.

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Manual average rate equations that apply to Strip Retail Plaza (ITE Code 822) for potential development associated with the CC-MU zoning designation and fitted curve equations that apply to Multifamily Low-Rise Housing (ITE Code 220) and average rates that apply to Strip Retail Plaza (ITE Code 822) for the anticipated development. The following **Table 1** compares the trip generation of the development potential with the current zoning and the conceptual development with rezoning (calculations attached).

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

Table 1 – Live Forward Residential Louisville Traffic Generation Comparison

Use & Size	Weekday Vehicles Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Existing Zoning (CC-MU)							
Strip Retail Plaza (ITE 822) 25,000 Square Feet	1,362	35	24	59	82	83	165
Proposed Rezone (MU-R)							
Multifamily Low-Rise Housing (ITE 220) 109 Dwelling Units	774	14	44	58	43	25	68
Strip Retail Plaza (ITE 822) 4,000 Square Feet	218	5	4	9	13	13	26
Total Traffic Volumes	992	19	48	67	56	38	94
Net Difference in Trips	-370	-16	24	8	-26	-45	-71

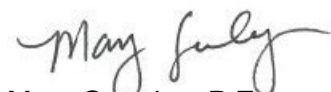
As shown in the table, the potential development intensity associated with the existing CC-MU zoning with 25,000 square feet of retail is calculated to generate approximately 1,362 weekday daily trips with 59 trips occurring during the morning peak hour and 165 trips occurring during the afternoon peak hour. The proposed rezoning to MU-R with 109 multifamily housing dwelling units and 4,000 square feet of retail is anticipated to generate 992 daily trips with 67 morning peak hour trips and 94 afternoon peak hour trips. Therefore, the proposed rezoning of these parcels would have the potential to generate 370 fewer daily trips, eight (8) more morning peak hour trips, and 71 fewer afternoon peak hour trip compared to the existing CC-MU zoning.

CONCLUSION

In summary, a trip generation comparison was made between the potential development traffic intensity for the existing Commercial Community – Mixed Use (CC-MU) and the proposed rezoning to Mixed-Use Residential (MU-R). The proposed rezoning of these parcels from CC-MU to MU-R would have the potential to generate approximately 370 fewer daily trips, eight (8) more morning peak hour trips, and 71 fewer afternoon peak hour trips compared to the potential development within the existing CC-MU zoning. The afternoon peak hour is typically the critical hour that controls the need for intersection improvements, and the project is expected to generate 71 fewer trips during this critical hour. Therefore, it is believed that the rezoning and potential uses will not increase the number of trips compared to the existing zoning. If you have any questions or require anything further, please feel free to call me.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.



Mary Gormley, P.E.
Project Traffic Engineer



Trip Generation Worksheets

Project Live Forward Residential Louisville (Existing Zoning)
Subject Trip Generation for Strip Retail Plaza (<40k)
Designed by MAG Date June 07, 2023 Job No. 196777000
Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Strip Retail Plaza (<40k) (822)

Independent Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = 25,000 Square Feet

X = 25.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 230)

Average Weekday	Directional Distribution:	60% ent.	40% exit.
T = 2.36 * (X)	T = 59	Average Vehicle Trip Ends	
T = 2.36 * 25	35 entering	24	exiting
	35 + 24 = 59		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 231)

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 6.59 * (X)	T = 165	Average Vehicle Trip Ends	
T = 6.59 * 25	82 entering	83	exiting
	82 + 83 = 165		

Weekday (800 Series page 229)

Average Weekday	Directional Distribution:	50% entering, 50% exiting	
T = 54.45 * (X)	T = 1362	Average Vehicle Trip Ends	
T = 54.45 * 25	681 entering	681	exiting
	681 + 681 = 1362		

Project Live Forward Residential Louisville (Rezone)
 Subject Trip Generation for Multifamily Housing (Low-Rise)
 Designed by MAG Date June 07, 2023 Job No. 196777000
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Low-Rise) (220)

Independent Variable - Dwelling Units (X)

$$X = 109$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 255)

$(T) = 0.31 (X) + 22.85$	Directional Distribution:	24% ent.	76% exit.
$(T) = 0.31 * (109.0) + 22.85$	T = 58	Average Vehicle Trip Ends	
	14 entering	44 exiting	
	14 + 44 = 58		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 256)

$(T) = 0.43 (X) + 20.55$	Directional Distribution:	63% ent.	37% exit.
$(T) = 0.43 * (109.0) + 20.55$	T = 68	Average Vehicle Trip Ends	
	43 entering	25 exiting	
	43 + 25 = 68		

Weekday (200 Series Page 254)

$(T) = 6.41 (X) + 75.31$	Directional Distribution:	50% ent.	50% exit.
$(T) = 6.41 * (109.0) + 75.31$	T = 774	Average Vehicle Trip Ends	
	387 entering	387 exiting	
	387 + 387 = 774		

Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

Land Use: 221

Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (mid-rise) (Land Use 226), and mid-rise residential with ground-floor commercial (Land Use 231) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.5 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, Ontario (CAN), Oregon, Utah, and Virginia.

Source Numbers

168, 188, 204, 305, 306, 321, 818, 857, 862, 866, 901, 904, 910, 949, 951, 959, 963, 964, 966, 967, 969, 970, 1004, 1014, 1022, 1023, 1025, 1031, 1032, 1035, 1047, 1056, 1057, 1058, 1071, 1076

Project Live Forward Residential Louisville (Rezone)
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TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Strip Retail Plaza (<40k) (822)

Independent Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = 4,000 Square Feet

X = 4.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 230)

Average Weekday	Directional Distribution:	60% ent.	40% exit.
T = 2.36 * (X)	T = 9	Average Vehicle Trip Ends	
T = 2.36 * 4	5 entering	4 exiting	
	5 + 4 = 9		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 231)

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 6.59 * (X)	T = 26	Average Vehicle Trip Ends	
T = 6.59 * 4	13 entering	13 exiting	
	13 + 13 = 26		

Weekday (800 Series page 229)

Average Weekday	Directional Distribution:	50% entering, 50% exiting	
T = 54.45 * (X)	T = 218	Average Vehicle Trip Ends	
T = 54.45 * 4	109 entering	109 exiting	
	109 + 109 = 218		

Conceptual Site Plan

CONCEPTUAL SITE PLAN

NOTE: SITE PLAN IS CONCEPTUAL. FUTURE DEVELOPMENT IS NOT TIED TO THIS SITE PLAN



Urban wildflowers



Patio concepts

Internal green spaces



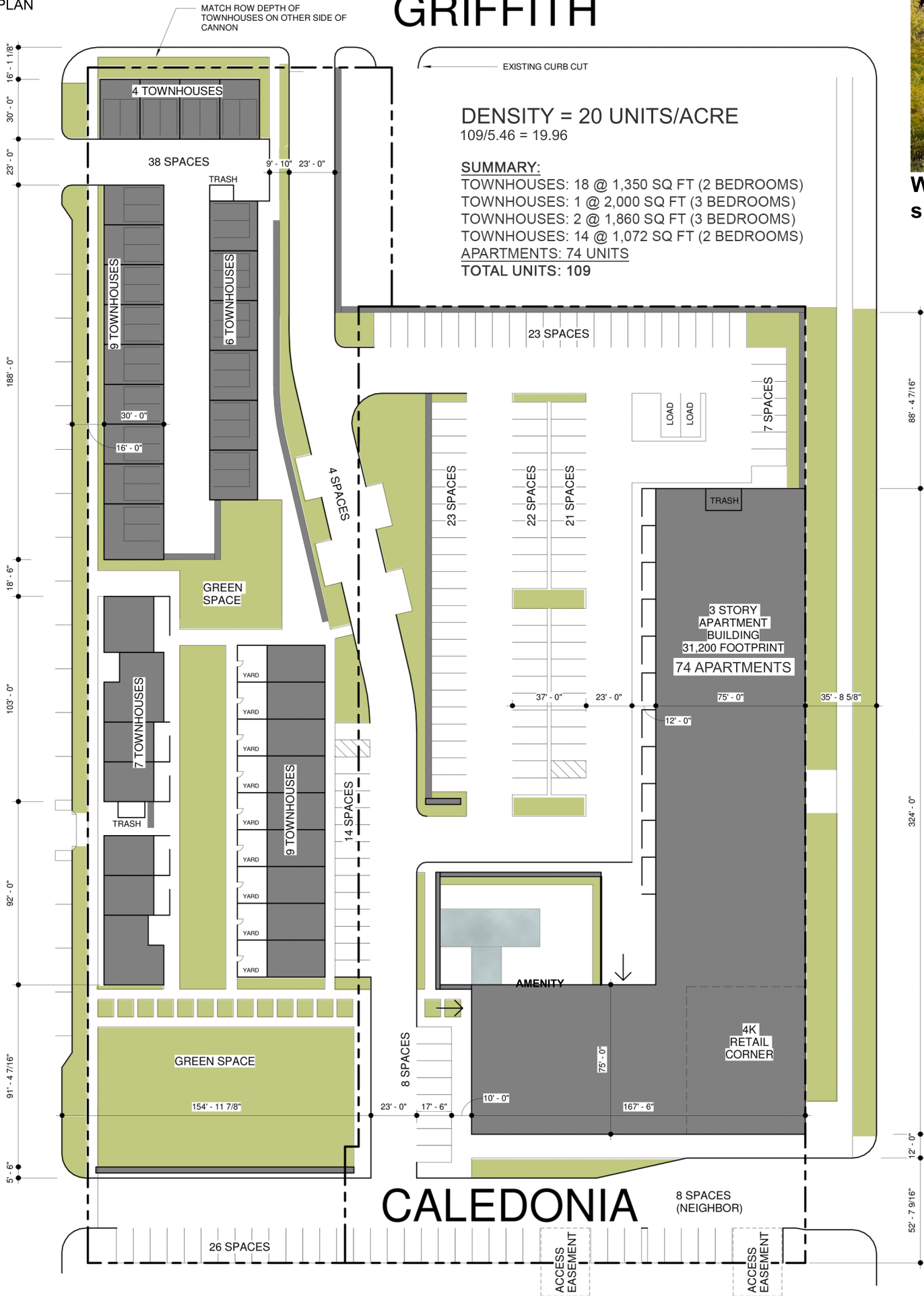
Compact amenity space



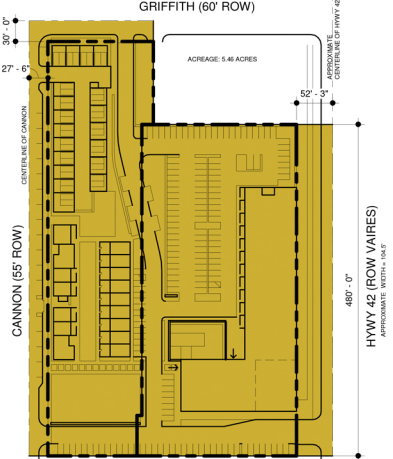
Multifunction green spaces

CANNON

GRIFFITH



Wild grasses, unmanicured spaces



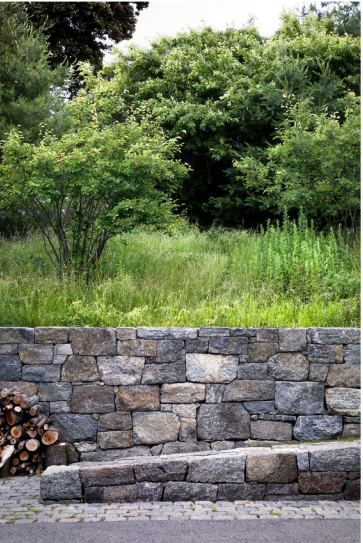
Density diagram



Thoughtful in between spaces



Urban gardens



Rustic site walls

HYWY 42



Useable outdoor green spaces

CALEDONIA

8 SPACES (NEIGHBOR)