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Memorandum

SRF No. 10237

To: Tom Lovelace, City Planner
City of Apple Valley

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Date: July 5, 2017

Subject: Review of Residential Density Assumptions – DRAFT FOR REVIEW

Overview

This memorandum reviews residential land acreages and densities in Apple Valley. The memo is organized into two sections, each with its own objective:

1. **Existing Residential Densities** – This section reviews the existing acreage distribution for very low, low, medium, and high-density residential.
2. **2040 Residential Consumption Estimates** – This section provides two alternative future density arrangements that would enable the City to accommodate the Metropolitan Council's forecasted population growth. Both arrangements increase overall density. The first achieves this by emphasizing growth in medium-density housing, such as townhouse-style development. The second achieves it by increasing the acreage for high-density apartments. These arrangements may correspond to different strategies for infill and redevelopment.

   We have also looked at the relationship between land use and zoning. Specifically, we have compared existing densities to zoning specifications to analyze how City code is manifested in practice, and can pursue this further once the densities and land consumption estimates have been discussed and agreed upon.

1. Existing Residential Densities

The Metropolitan Council has stressed that its population, household, and employment forecasts must be used throughout the comprehensive plan. Thus, one key component of the future land use plan is to allocate residential acreage that responds to forecasted housing demand. This memo aims to provide an estimate of how much residential acreage is necessary to accommodate the Met Council's forecast. Because Apple Valley is nearly built out, this acreage allocation may not be realistic for Apple Valley. If that is the case, it is useful to know at the outset of the planning process so expectations can be revised.

The first step in planning for residential acreages is to determine how residential acreages are currently applied. Apple Valley has several residential zoning districts that permit a range of densities for single-family and multi-family development. These densities are classified as follows in the 2008 comprehensive plan:

- Low density (LDR) | less than 6 units/acre
- Medium density (MDR)| 6-12 units/acre
- High density (HDR)| more than 12 units/acre

There are further zoning breakdowns within these ranges, but the simplified stratification offers a starting point for analysis (see Section 3 for a more detailed discussion of zoning). For the following analysis, a fourth category, very low density, was created for single-family parcels larger than 1 acre (density less than 1 unit per acre). Low density was redefined as 1-6 units per acre.

Method

Existing residential densities were calculated for Apple Valley using the parcels dataset from Dakota County GIS. Residential land uses were coded as Very Low Density (less than 1 unit/acre), Low Density (1-5.99 units/acre), Medium Density (6-11.99 units/acre), or High Density (12 or more units/acre). The parcels dataset provides several key pieces of information to make this determination. Key variables include:

- ACRES_POLY (total acreage of the parcel/polygon)
- NUM_UNITS (total units on the parcel)
- USE1_DESC (description of the land use of the parcel, including 'RESIDENTIAL', 'RESIDENTIAL-TOWNHOUSE', 'APARTMENT', and 'APARTMENT-MOBILE HOME PARK')

A preliminary density calculation was obtained by dividing the number of units by the total acreage for each polygon that is classified as a residential use. The original parcels dataset specifies units for most but not all parcels. For individual single-family lots with unspecified units, the number of units was set equal to 1. However, a determination of units was not initially possible for some large residential parcels, such as the mobile home parks and other higher-density areas were platted as a planned unit development (PUD). These areas were ignored at the outset of the analysis.

While the units/acre operation is a useful starting point, it tends to overstate density in certain instances, resulting in a map that is inconsistent with City zoning and land use. This is because there are many instances in the parcels dataset where small residential lots (high units/acre) are located within a larger "envelop", which may contain acreage for parking, interior vehicle circulation, shared open space, storm water features, etc. **(Figure 1)** This is especially true of many PUDs, which offer smaller, alternative housing styles such as townhouses but also ample amenities and open space. In these cases, the size of housing units may not reflect the "feeling" of the development.

To get more accurate acreages, further calculation was necessary. When an "envelope" was apparent, its acreage was added to the housing acreage and the number of units was averaged over the new acreage total. This aggregation method creates a smoother, more accurate representation of the data. **(Figure 2.)**

Figure 1

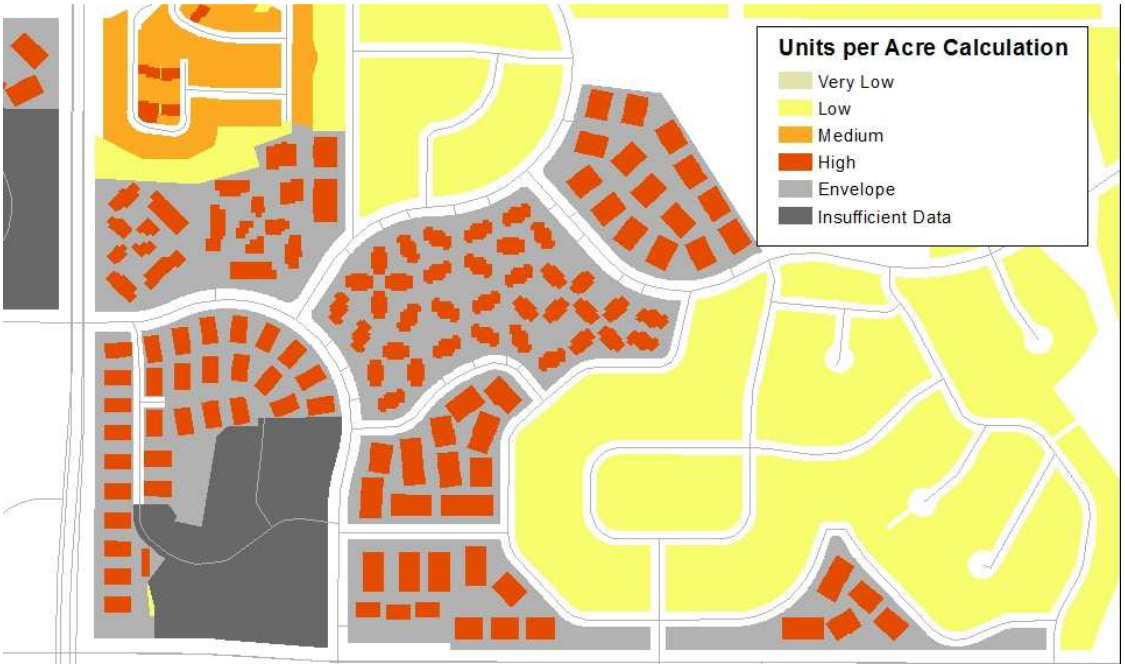
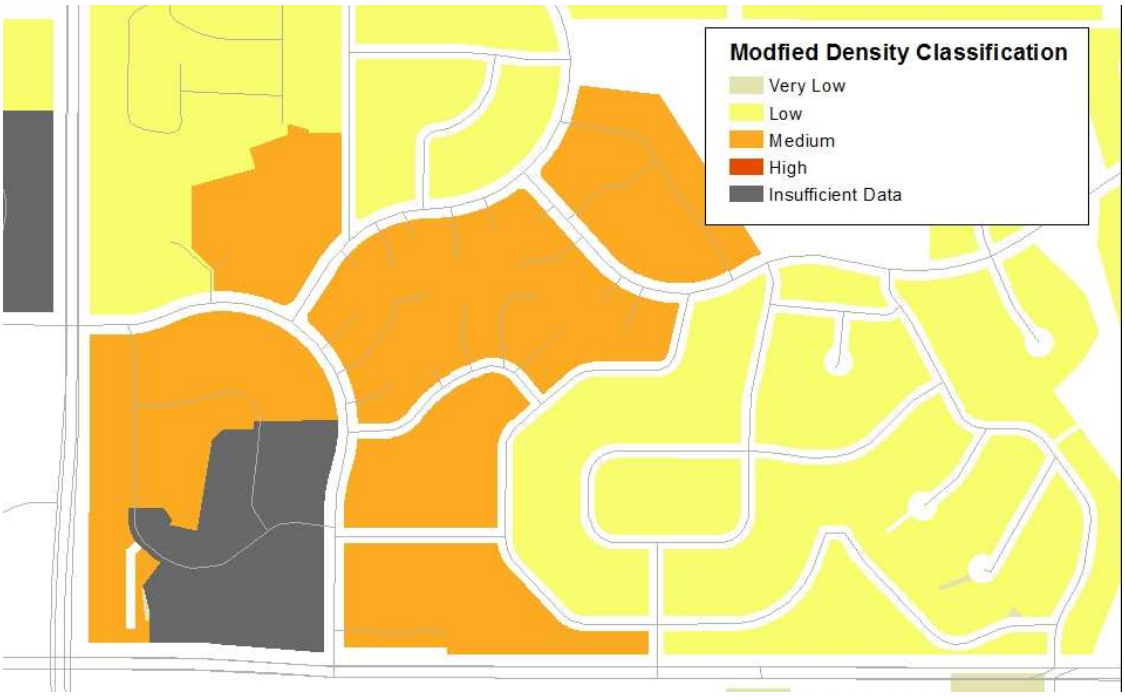


Figure 2



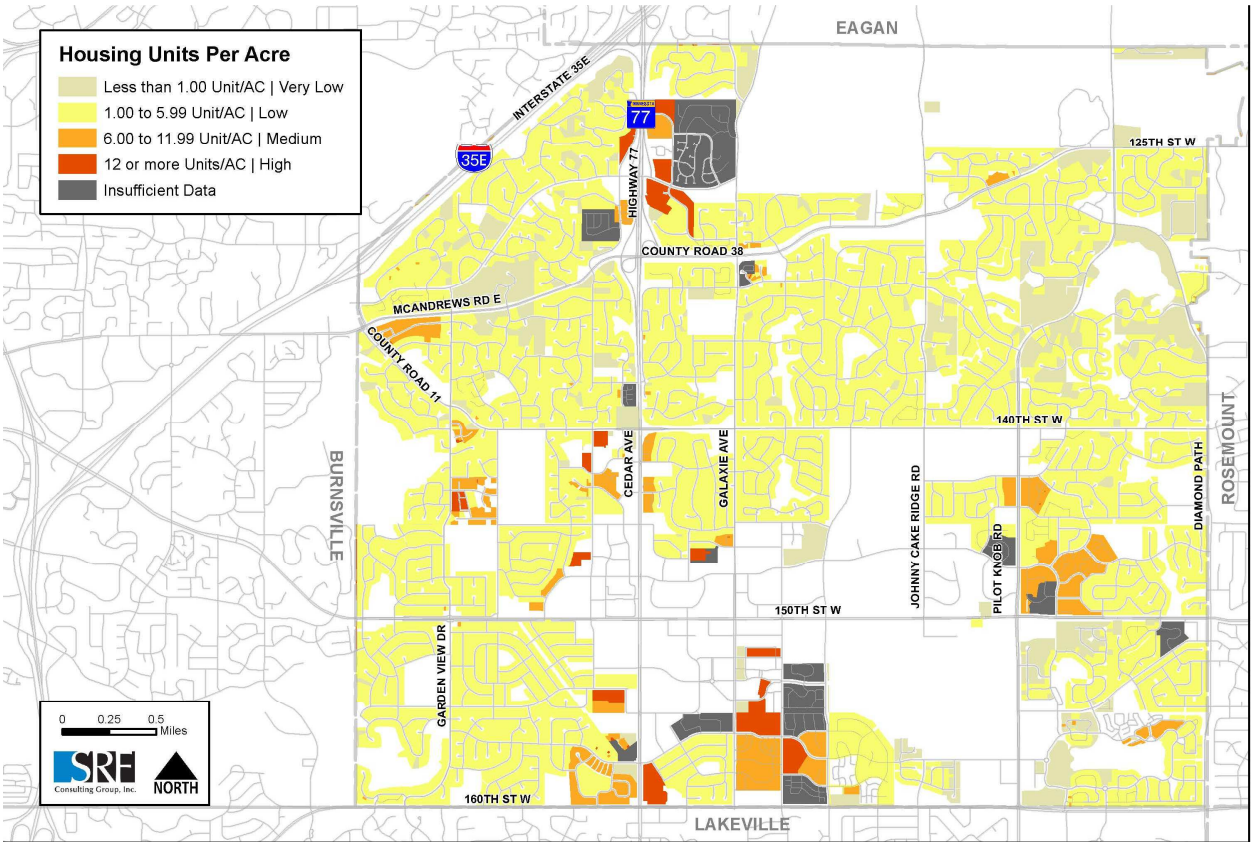
Findings

Figure 3 shows the new housing density map for Apple Valley. Areas with insufficient data are marked in dark gray. There are some inconsistencies between the housing density map and the existing land use map that was previously provided. The land use map was based on two assumptions:

1. All residential townhouses were classified as medium density
2. All apartments were classified as high density.

The new map shows that these assumptions were not entirely accurate. There are several multi-family developments with densities lower than 6.00 units per acre. There are also instances of single-family detached housing with densities greater than 12.00 units per acre.

Figure 3



The vast majority of the acreage is in low-density residential. Medium- and high-density residential tend to be located at the north and south ends of the city, near the Cedar Avenue corridor and in the south-central part of the city. Further densification along strategic corridors and specific locations will support transit ridership and walkability.

Table 1 provides summary statistics about the density distribution in Apple Valley. The table includes an estimate for the number of units in the areas with insufficient data.* In the Total Acres column, the previously assumed acreages are included in parenthesis.

Table 1 – Apple Valley Density Statistics

Density Category	Range	Total Units	Total Acres	Mean Acres	Units/Acre	Percent Total Acres	Percent Total Units
Very Low	Less than 1 Unit/AC	1,269	459 (0)	1.71	0.59	89%	1.4%
Low	1-5.99 Units/AC	12,370	4007 (4,156)	0.32	3.09	77.6%	62.1%
Medium	6-11.99 Units/AC	2,016	299 (920)	0.14	6.73	5.8%	10.1%

High	12 or more Units/AC	116	117 (240)	4.15	21.74	2.3%	12.8%
Subtotal / Weighted Average		17,199	4,882	--	3.52	--	--
Unknown Area*		2718*	280	--	9.71*	5.4%	13.6%
Grand Total		19,917	5,162		3.85	100%	100%

*Total units were estimated for the unknown areas using the Minnesota Demographer's updated estimate for households, which is 19,917. If one household corresponds to one housing unit, the total units in the unknown acreage is 2,718, the difference of 17,199 from 19,917. The remaining units/acre were calculated as 9.71. On average, the density of this area is medium, a finding that mostly agrees with the existing land use map.

There are several takeaways from this dataset.

- There is more low density than was previously assumed.
- There is less medium density than was previously assumed
- There is less high density than was previously assumed.
- The average Units/Acre column shows that low- and medium-density housing tends to be developed at the low end of the permitted-density range. (The permitted density range for medium-density housing is 6.00-11.99 units per acre; average density is 6.73.) This is probably related to the use of minimum density requirements in the zoning code.
- Conversely, high-density housing tends to be developed at the upper range of the density spectrum. Apartments are frequently developed at densities greater than 20.00 units per acre.
- The data in Table 1 is used to estimate future acreage consumption in Section 2 of this report.

2. 2040 Residential Consumption Estimates & Metropolitan Council Forecast

The Metropolitan Council forecasts that the total number of households will reach 24,900 by 2040. **(See Table 2.)** This would be an increase of 4,983 units from 2016. For reference, the Orchard Place redevelopment site is approximately 414 acres. *If this entire site were dedicated for housing, the density would have to average more than 12 units per acre to meet the Metropolitan Council's forecast.* The City would have to strike a balance to achieve these numbers along with its stated economic goal of supporting 19,000 jobs. It is clear that redevelopment and infill must be primary strategies moving forward. But there are also indications that the Council's forecasts may be overly high. The population grew 2,254 from 2010 to 2016 (322 persons per year over 7 years). Under the current forecast, remaining population growth from 2016 to 2020 would have to equal 4,162 (1040 persons per year over 4 years) to reach the 2020 forecast of 55,500. Future growth forecasts may need to be reconsidered. For now, however, the given numbers are used analyze to future land use needs.

Table 2 – Metropolitan Council Forecasts

YEAR	HOUSING UNITS	TOTAL EMPLOYMENT	POPULATION
2010	18,875	14,279	49,084
2016	19,917	NA	51,338
2020	21,700	15,800	55,500
2030	23,300	16,400	59,200
2040	24,900	17,100 (19,000)	63,600
2040-2016	4,983	NA	11,662

Housing Development Scenarios

The following assumptions were made for housing scenario development:

- Average densities are assumed as follows: 4.0 units/acre for LDR, 9.0 units/acre for MDR, and 24.0 units/acre for HDR. These densities are higher than existing densities, but reflect recent trends toward smaller lot sizes and alternative housing arrangements, such as "granny flats" or live-work units.
- In addition to raw housing acreage, some acreage will be required for ROW dedication. ROW needs are assumed to represent 20% of low-density development and 10% of medium- and high-density development. Lower ROW assumptions for high-density and

medium-density development reflect the fact that some ROW acreage was already taken into account when calculating the existing densities in Section 1.

- Low-density, single-family detached housing is assumed to occur only within the Orchard Place master planning area.
- In addition to Orchard Place, there are 106 acres of vacant land that could be developed for residential use. All of this acreage is assumed to be developed for residential use. The remaining acreage must be accommodated through redevelopment of existing properties.
- Acreage requirements are assessed in terms of the housing forecast rather than the population forecast. Average household size is currently 2.6, and this figure is forecasted to remain stable. In reality, household sizes are not uniform across different housing types. According to the 2015 American Community Survey, the average household size is approximately 2.7 for single-family detached but only 2.0 for multifamily apartments and attached single-family. Placing a concerted emphasis on MDR and HDR may attract different household demographics. But this assumption cannot be made without disrupting the Met Council's population forecast. Therefore, population is implicitly ignored in the scenarios.

Scenario 1 – Medium Density Emphasis

Scenario 1 allocates 440 acres for future MDR (400 acres plus 10 percent ROW), 55 acres for future HDR, and 30 acres for future LDR. All LDR would be located in Orchard Place. This acreage is similar to what was proposed by SRF after a review of Kimley-Horne's master plan concept. If the focus for Orchard Place is creating jobs, residential infill and redevelopment would have to occur elsewhere. Scenario 1 estimates that 319 acres would be required for residential redevelopment. This assumes that all existing housing stock is improved/maintained, so only existing properties which are non-residential (i.e., commercial, industrial, or institutional properties) could be redeveloped for residential purposes. Scenario 1 results in housing growth of 4,900 units and consumes 525 total acres at approximately 9.1 units per acre.

Table 3 – Housing Growth Scenario 1

	Low Density	Medium Density	High Density	Total
Housing Acres	25	400	50	**475**
Average Units/Acre	4.0	9.0	24.0	**9.1**
Housing Units	100	3,600	1,200	**4,900**
ROW Contribution	20%	10%	10%	**NA**
Total Acres Demanded	30	440	55	**525**
Orchard Place Acres	30	20	50	**100**
Other Infill Acres (Other Vacant)	Distribute as needed			**106**

Redevelopment Acres	Distribute as needed	**319**

Scenario 2 – High Density Emphasis

Scenario 2 allocates 165 acres for MDR and 165 acres for HDR (150 acres plus 10 percent ROW), and 24 acres for LDR. All LDR would be located in Orchard Place. Scenario 2 results in housing growth of 5,030 units and consumes 354 total acres at approximately 15.7 units per acre.

Table 4 – Housing Growth Scenario 2

	Low Density	Medium Density	High Density	Total
Housing Acres	20	150	150	**320**
Average Units/Acre	4.0	9.0	24.0	**15.7**
Units	80	1,350	3,600	**5,030**
ROW Contribution	20%	10%	10%	**NA**
Total Acres Demanded	24	165	165	**354**
Orchard Place Acres	24	20	56	**100**
Other Infill Acres (Other Vacant)	Distribute as needed			**106**
Redevelopment Acres	Distribute as needed			**148**

Summary

The two housing scenarios are estimated to require approximately 350 to 500+ acres. Significantly more acreage would be needed if single-family detached residential continued to be the dominant form of housing. Given acreage constraints, that is not considered to be a viable alternative for reaching the projected growth of nearly 5,000 households. Likewise, more acreage would be needed if MDR and/or HDR are planned at lower densities than assumed above.

If Apple valley succeeds in creating 3,000-4,000 new jobs by 2040, those jobs will also have a land requirement. Many workers may telecommute, but there would be substantial land demand for traditional-industry jobs, such as health care, education, and manufacturing. Some of this demand would be met by Orchard Place. The housing scenarios recognize this by limiting the amount of development that could occur in Orchard Place. However, if additional acreage were used for economic development, overall residential densities would need to increase both within Orchard Place and on other properties to accommodate Met Council forecasts.

An increase in MDR as part of the future land use mix would respond to the growth of the population over 55 in Apple Valley, and would allow for larger numbers of existing residents to remain in the community as they age. Increased numbers of MDR households would also provide

more affordable housing options, particularly for owner occupied housing if the dwelling units are developed with the intent to be sold rather than rented. In summary, this category of residential land use would respond to some of the issues identified in the Community Context portion of the comp plan update.