



# Transportation Department

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To: Dale Case, AICP, Director, Land Use Department

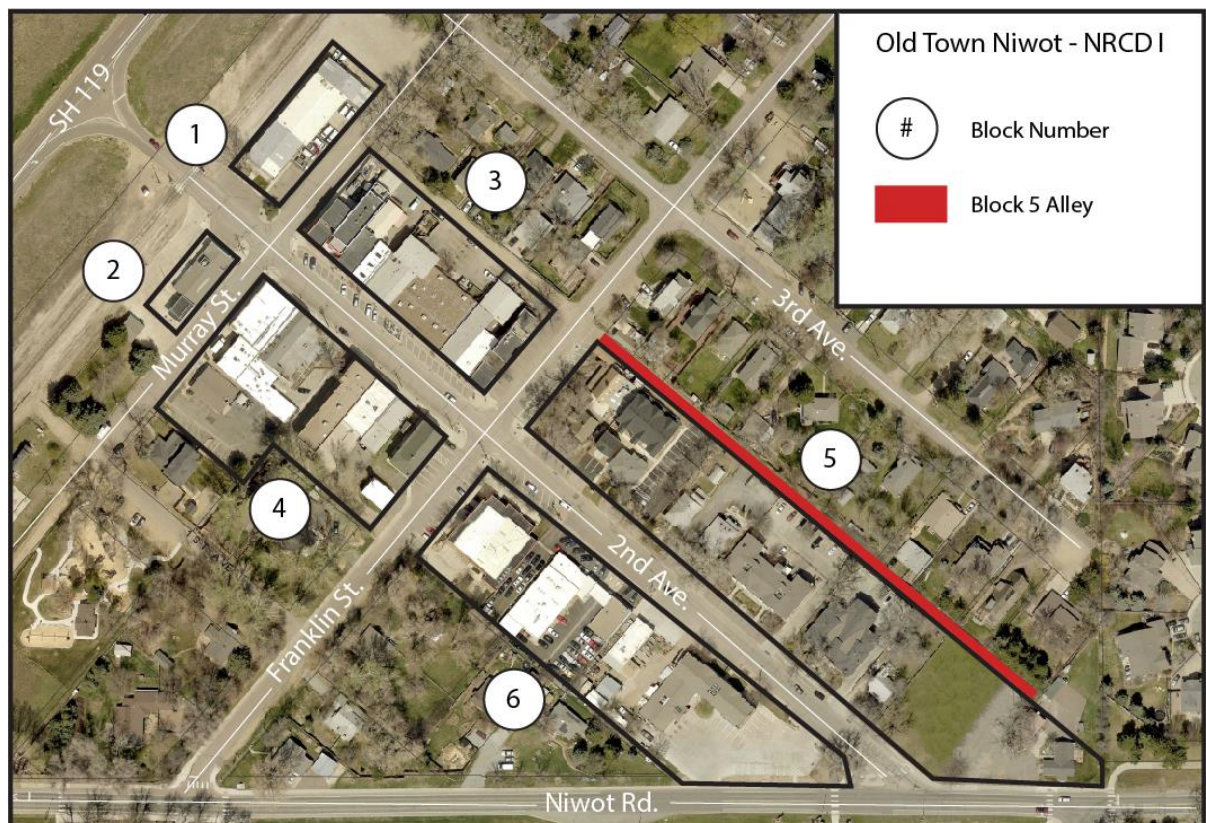
From: Mike Thomas, P.E., County Engineer

Subject: Study outcomes and recommended design guidelines for Alley between 2<sup>nd</sup> and 3<sup>rd</sup> Avenues east of Franklin Street

## Background

In 2018, the Boulder County Land Use and Transportation Departments began discussions with the business owners along the north side of 2<sup>nd</sup> Avenue (Block 5) in Old Town Niwot and the residents of 3<sup>rd</sup> Avenue to the north. These discussions centered on the access to, use of and improvements to the alley between these two areas, as shown in Figure 1, below. Concerns regarding access by the businesses, over-use by non-residents, parking, safety, pedestrian use, maintenance responsibilities and other issues created the need for an evaluation of the alley's current legal status, usage and physical condition, as well as development of design standards to guide future improvements.

Figure 1. Old Town Niwot – NRCD I



On April 23, 2019, the Board of County Commissioners held a public hearing and amendments to the County's Land Use Code Article 4-116 Niwot Rural Community District and related provisions. The Board directed the Transportation Department to obtain automobile traffic and pedestrian data along 2<sup>nd</sup> Avenue, including current vehicular counts using the driveways to the businesses, the alley behind them, and Franklin Street. From that information, staff was to develop a set of design standards to guide improvements to the alley necessary to accommodate greater use, should 2<sup>nd</sup> Avenue driveways close, with vehicular access and parking for those businesses directed to the rear of the buildings.

### Analysis of Traffic and Pedestrian Use

Staff used two methods to gather data for the analysis: 1) counts of actual traffic and pedestrian use; and 2) use of a trip generation model<sup>1</sup>. The study area encompassed the driveways and intersections along the Block 5 alley (i.e., north side of 2<sup>nd</sup> Avenue, on Franklin St. east of 2<sup>nd</sup> Avenue, and on the alley running between and parallel to 2<sup>nd</sup> and 3<sup>rd</sup> Avenues).

*Counts of Actual Conditions.* Counts of actual conditions were obtained between the dates of June 21 and 26, 2019. In addition to automobile counts at various driveways and intersections, pedestrian counts were collected on the sidewalk at the driveways along the north side of 2<sup>nd</sup> Avenue. Tables 1 through 4 show the count information, and Figure 2 graphically shows the maximum counts at each respective location. Maximum count numbers from each location were used in order to show the highest potential use as the baseline for purposes of the analysis. Of note, pedestrian use (maximum pedestrians at any one driveway) exceeds automobile counts at driveways by nearly 8-to-1.

Table 1. Pedestrian Counts

Driveway	Saturday, June 22, 2019	Monday, June 24, 2019
1	130	118
2	126	92
3	121	160
4	121	155
<b>Total</b>	<b>498</b>	<b>525</b>

Table 2. Automobile Trips - Driveways

Driveway	Friday, June 21, 2019	Saturday, June 22, 2019	Sunday, June 22, 2019	Monday, June 24, 2019	Tuesday, June 22, 2019	Wednesday, June 22, 2019	Thursday, June 22, 2019
1	24	22	27	22	20	23	25
2	36	34	29	25	40	30	41
3	14	6	5	29	26	19	27
4	20	10	0	17	26	32	33
<b>Total</b>	<b>94</b>	<b>72</b>	<b>61</b>	<b>93</b>	<b>112</b>	<b>104</b>	<b>126</b>

<sup>1</sup> Please note that trips are counted in both directions, for example one vehicle will produce two trips.

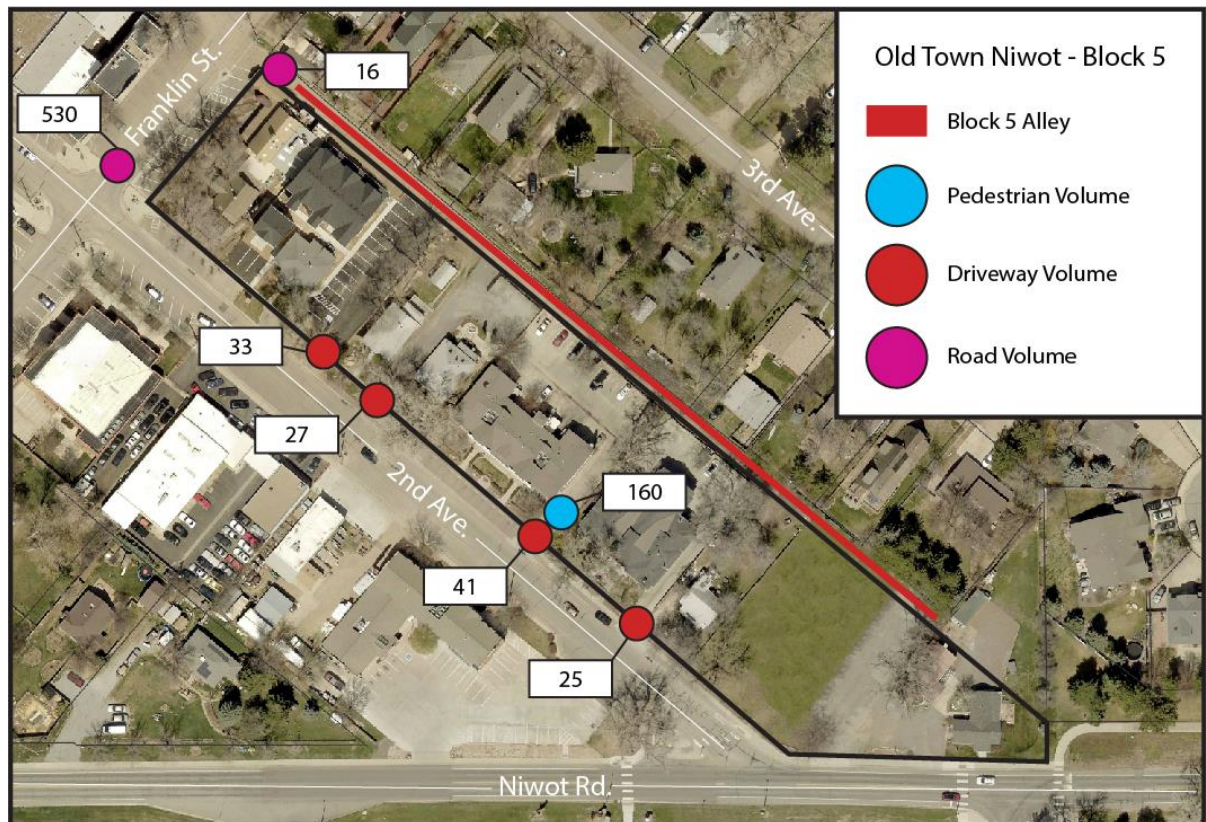
Table 3. Automobile Trips - Alley

Alley	Saturday, June 22, 2019	Sunday, June 22, 2019	Monday, June 24, 2019	Tuesday, June 22, 2022
Total	8	8	15	16

Table 4. Automobile Trips - Franklin Street

Alley	Saturday, June 22, 2019	Monday, June 24, 2019
Total	388	531

Figure 2. Count Locations



Based on the counts of actual automobile and pedestrian use during the study period, it appears that if all of the driveways on 2<sup>nd</sup> Avenue were closed, the baseline count of potential alley traffic would be approximately 142 auto trips per day (driveway and alley counts).

*Trip Generation Model Results.* Projected Average Daily Trips (ADTs) utilizing a transportation trip generation model based on the highest potential use of properties on Block 5 resulted in an



estimated 1,865 – 1,929 vehicle trips.<sup>2</sup> For purposes of the analysis we discounted those model outputs by 150 trips to account for on-street parking, thereby reducing the total projected ADTs on the alley to an estimated 1,715 – 1,779.

Using existing Block 5 conditions as model inputs the trip generation model estimates 809 ADTs, significantly higher than the actual count data. This suggests that the analysis should calibrate the model outputs based on actual count data to account for a variety of factors not captured in the model, such as multi-modal transportation. The difference in the observed 142 ADTs and projected estimates of 809 ADTs may be attributed to the use of on-street parking and multi-modal forms of transportation. Therefore, the total future trips on the alley may be less than the number provided by the transportation trip generation model. If the ratio between actual counts and the trip generation were to remain then the total trips expected for the alley would be in the 327 – 339 range, as shown in table 5.

Table 5. Summary of Analysis Results

Actual Counts	Model Output Counts – Assuming Existing Conditions	Ratio of Actual to Model Counts	Model Output Counts – Projected Buildout Conditions	Calibrated Model Results*
142	809	0.18	1,865 – 1,929	327 - 339

\* If results are calibrated to reflect the ratio of actual counts to model counts of existing conditions.

### Alley Design

Alleys are intended to function as local service and direct access facilities which account for low speeds and some sharing of the road width. As no other developed alleys exist in unincorporated Boulder County, there must be allowance for some discretion in design and features.

As such, a balance is incorporated between overall cost containment and traffic flow. Given the presence of power poles and building and slope encroachments into the right-of-way, additional consideration is given to the coexistence of travel width, drainage and walkability. Further, detailed analysis and design needs to be prepared prior to final approval to ensure drainage along the alley flows to Franklin Street, or another suitable destination away from existing residences and commercial structures.

A private access road template shown in the MultiModal Transportation Standards (July, 2012) requires two 9-foot driving lanes, with minor shouldering (see Figure 3, below). As unauthorized maintenance has occurred on the alley over time, any future improvements are required to improve drainage. This work will require some width reduction in the driving surface. As such, a narrower section of road is possible in order to provide for possible buffering and traffic calming (slowing) within the alley. Ideally, the template and construction could match the appearance of the alley west of Franklin Street.

Air quality requirements dictate dust mitigation for roads exceeding 200 ADT, dust palliatives such as environmentally friendly liquids or water must be applied regularly or else pavement should eventually be added to the surface. While a gravel surface significantly reduces the initial

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<sup>2</sup> The range in estimated vehicle trips are based on two scenarios: 1) maximum floor area buildout of retail/restaurant (80%) and residential (20%)(1,865 ADT); and 2) maximum floor area buildout of retail/restaurant (1,929 ADT).

construction costs one must be cognizant of the additional maintenance costs meeting air quality requirements might entail.

### Recommendation and Next Steps

Based on the analysis presented here, recommended design conditions for the 20-foot platted right-of-way alley are shown in Figure 3. As shown in the road section, recommended conditions include two 7.5-foot travel lanes and about a 5-foot buffer, which includes drainage improvements. Given the number of potential trips per day, the alley would function as a local access road, with pedestrians sharing the improved area of alley with vehicles. However, the reduced travel way will work to slow vehicles and allow pedestrians and vehicles to share the space. The surface should be hardened in order to minimize dust, given the potential trips per day.

Properties along the alley would be required to implement improvements to meet the adopted design standards upon submitting a development application or Access Permit to the county. At that time the county would also require applicants to provide an acceptable location on their property for an appropriate area and easement (types and extents are to be determined) to ensure adequate access and emergency turnaround from the alley.

Figure 3. Recommended Alley Conditions - Road Section

