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Technical Memorandum

To: Todd Boyce - Westwood Homes, LLC

From: Michael Ard, PE

Date: February 11, 2022

Re: Coburn Apartments – Plan Modification Trip Generation and Distribution

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This memorandum is written to provide information related to a proposed modification to the plan for the Coburn "Strong Road at 27th Street Subdivision" project that was approved in 2018. Under the prior project approval, a total of 209 single-family homes were to be constructed within the subject property. Following the recent approval of a zone change on a portion of the property, the site plan has been modified to include 143 single-family homes, 34 townhome dwelling units, and 200 apartment units. This memo provides information regarding the number of site trips generated under the old plan, under the new plan, and the net increase in traffic that will be experienced at affected intersections upon approval of the proposed plan modification.

PRIOR APPROVED DEVELOPMENT - TRIP GENERATION

Under the prior project approval, the subject property can currently be developed with 209 single-family homes. Since this development level has been approved already, the associated trips are already vested on the transportation system and must be accounted for as "in-process" development whenever additional land uses are proposed in the site vicinity. The daily and peak-hour trip volumes projected under the prior project approval are described in Table 1 below.

Table 1 - Prior Approved Development Scenario

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
209 Single-Family Homes	39	116	155	130	77	207	1972

REVISED DEVELOPMENT PLAN - TRIP GENERATION

The proposed revised development plan includes an overall increase in the number of dwelling units by utilizing the approved zone change on the subject property. This allows development of multi-family dwellings in addition to the single-family homes to increase overall density. In total, the revised plan includes 200 apartment units within the proposed Coburn Apartments at the south end of the subject property as well as 143 single-family homes and 34 townhome dwelling units in the remainder of the development area.

The daily and peak-hour trip volumes projected under the new proposed project plan are described in Table 2 below.

Table 2 - Proposed Development Scenario

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
200 Apartment Units (Mid-Rise)	19	53	72	54	34	88	1088
34 Townhome Units (Low Rise)	4	12	16	12	7	19	248
143 Single-Family Homes	27	79	106	89	53	142	1350
Proposed Development Total	50	144	194	155	94	249	2,686

NET CHANGE IN SITE TRAFFIC

When considering the impact of a proposed plan modification, it is appropriate to examine the net change in site traffic. Since the previous project approval means that the trips detailed in Table 1 are already vested on the transportation system, the net change in site trips represents how approval of the requested modification will impact traffic volumes in the site vicinity as compared to denial, which would maintain only the already-approved development levels as permissible. The net increase in site trip attributable to the proposed plan modifications is detailed in Table 3 below.

Table 3 - Net Change in Trip Generation

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
Proposed Development Total	50	144	194	155	94	249	2,686
- Prior Approved Development	-39	-116	-155	-130	-77	-207	-1,972
Net Increase In Site Trips	**11**	**28**	**39**	**25**	**17**	**42**	**714**

City of Salem Code Section 803.015 requires applicants to prepare a Traffic Impact Analysis (TIA) when a development that will generate 1,000 or more average daily trips onto a collector, minor arterial, major arterial or parkway. Since the proposed development will take access to roadways with collector or higher classifications and the proposed development results a net increase of 714 daily trips, the proposed change to the approved plan will fall below this analysis threshold. A more detailed discussion of traffic increases during the peak hours at area intersections is provided in the following section of this memorandum in order to facilitate discussion of relative impacts on safety and operations, the potential need for additional mitigation, and proportionality requirements pursuant to federal law.

SITE TRIP DISTRIBUTION PATTERNS AND ADDED TRAFFIC AT INTERSECTIONS

In order to quantify the potential change in site traffic volumes at each intersection resulting from the proposed revised development plan, trip distribution maps were prepared showing the assignment of trips to intersections in the site vicinity. For completeness, maps were prepared showing the prior approved project trips, the proposed project trips, and the net change in trips for each of six intersections in the site vicinity. The projected traffic increases for the peak hours are detailed in Table 4 below.

Table 4 - Net Change in Traffic Volumes at Area Intersections

Intersection	AM Peak Hour	PM Peak Hour
Battle Creek Road SE at Reed Road SE	4	5
Battle Creek Road SE at Site Access	34	37
Kuebler Boulevard at Commercial Street SE	11	13
Kuebler Boulevard at Battle Creek Road SE	30	32
Kuebler Boulevard at 27th Avenue SE	17	16
Kuebler Boulevard at I-5 Southbound Ramps	17	16

Based on the analysis, no area intersections are projected to experience an increase of 50 or more trips as a result of the proposed revisions to the development plan. This means that in addition to being below the 1,000-trip threshold that would trigger the need for a Traffic Impact Analysis, no area intersections are projected to experience a net increase of 50 or more peak-hour trips, which is the threshold commonly used to identify which intersections should be studied. Generally, the impacts at area intersections are relatively small and would not be expected to significantly impact intersection operation and safety as compared to the previously approved development plan. Additionally, pursuant to the requirements of federal law established under Dolan v. City of Tigard, any requirements for mitigation must be roughly proportional to the impact of the proposed development. Since the impacts are extremely small, any additional physical mitigations requested for area intersections would be disproportionate to the impact of the added site trips. A table showing the net increase in peak hour trips as a percentage of total intersection traffic volumes for area intersections is also provided in the attached technical appendix.

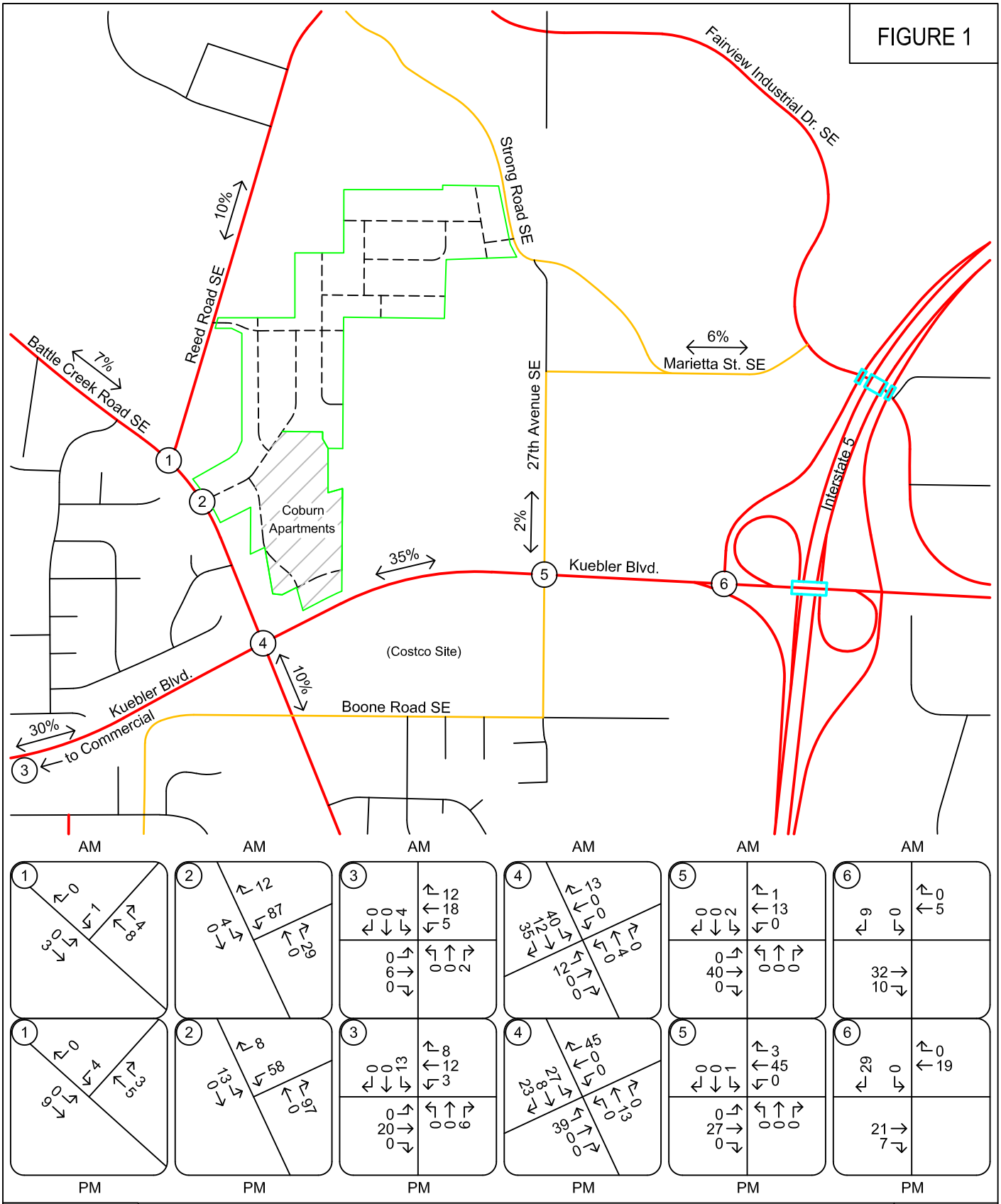
CONCLUSIONS

The proposed plan revision will not result in significant changes to traffic volumes, operation or safety at intersections in the site vicinity. The net increase in site trips also falls below the threshold which would require preparation of a Traffic Impact Study. Based on the analysis, no significant additional off-site transportation mitigation could reasonably be required in conjunction with the proposed plan revisions.

If you have any questions regarding this analysis, please feel free to contact me via email at mike.ard@gmail.com or via phone at 503-537-8511.

Appendix

FIGURE 1



TRAFFIC VOLUMES
Prior Traffic Impact Study - Original Study Site Trips
Morning and Evening Peak Hours

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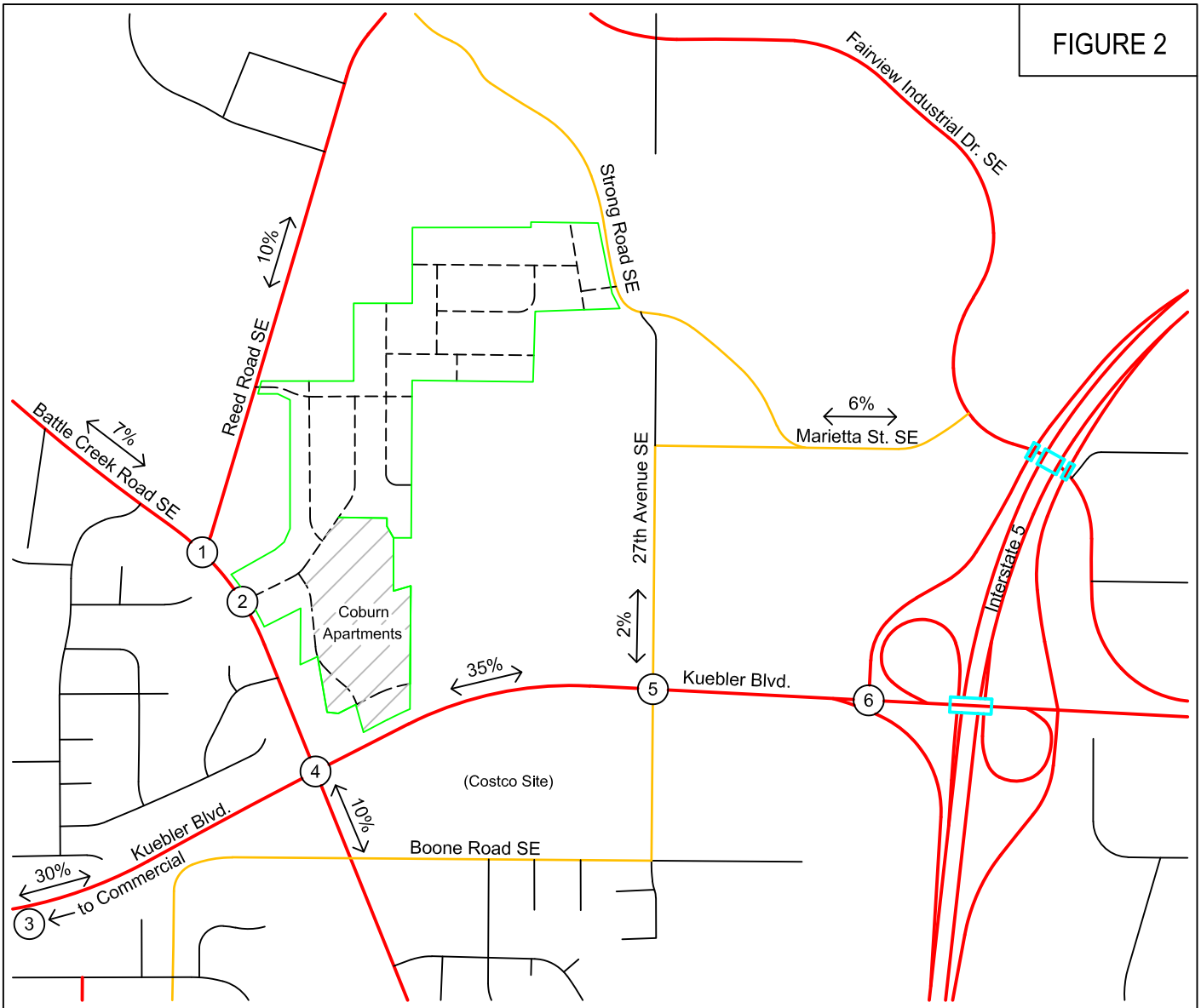
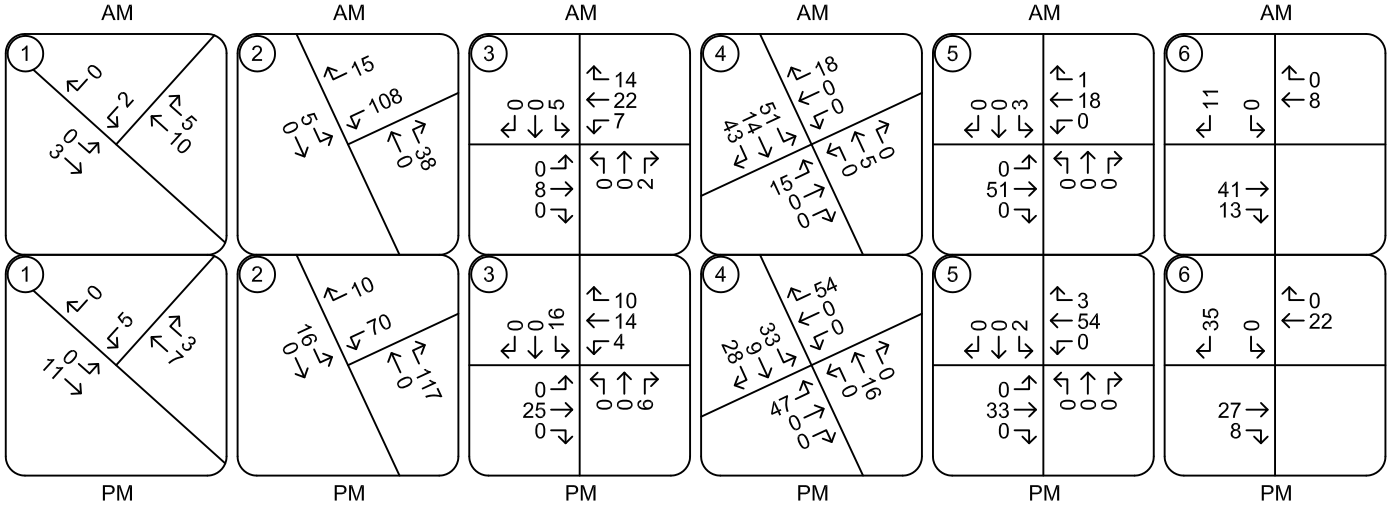
FIGURE 2





TRAFFIC VOLUMES
Proposed Development - Total Site Trips
Morning and Evening Peak Hours

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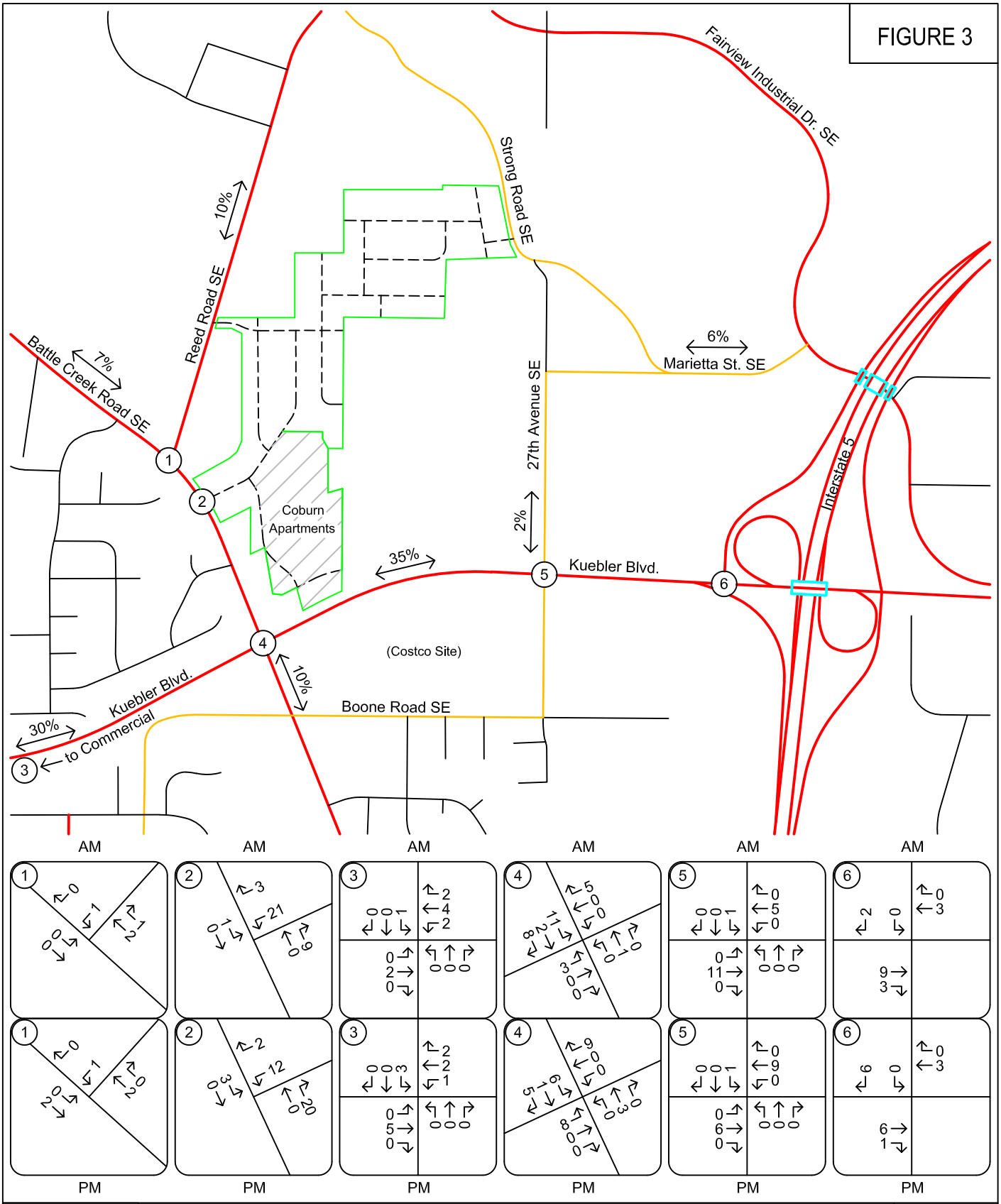
FIGURE 3



TRAFFIC VOLUMES
Net Change in Site Trips from Proposed Plan
Morning and Evening Peak Hours

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Trip Generation Calculation Worksheet

Land Use Description: Multi-Family Housing (Mid-Rise)
ITE Land Use Code: 221
Independent Variable: Dwelling Units
Quantity: 200 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.36 trips per dwelling unit
Directional Distribution: 26% Entering 74% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.44 trips per dwelling unit
Directional Distribution: 61% Entering 39% Exiting

Total Weekday Traffic
Trip Rate: 5.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

200 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	19	53	72
PM Peak Hour	54	34	88
Weekday	544	544	1088

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Multi-Family Housing (Low-Rise)
ITE Land Use Code: 220
Independent Variable: Dwelling Units
Quantity: 34 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.46 trips per dwelling unit
Directional Distribution: 23% Entering 77% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.56 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 7.32 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

34 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	4	12	16
PM Peak Hour	12	7	19
Weekday	124	124	248

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 143 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

143 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	27	79	106
PM Peak Hour	89	53	142
Weekday	675	675	1350

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 209 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

209 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	39	116	155
PM Peak Hour	130	77	207
Weekday	986	986	1972

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

Proportionate Impacts at Area Intersections - AM Peak Hour

Intersection	Total Site Trips	Approved Site Trips	Net Increase	Background Traffic	Percent Increase
Battle Creek Road SE at Reed Road SE	20	16	4	764	0.5%
Battle Creek Road SE at Site Access	166	132	34	838	4.1%
Kuebler Boulevard at Commercial Street SE*	58	47	11	2763	0.4%
Kuebler Boulevard at Battle Creek Road SE	146	116	30	3826	0.8%
Kuebler Boulevard at 27th Avenue SE	73	56	17	3110	0.5%
Kuebler Boulevard at I-5 Southbound Ramps**	73	56	17	3110	0.5%

Proportionate Impacts at Area Intersections - PM Peak Hour

Intersection	Total Site Trips	Approved Site Trips	Net Increase	Background Traffic	Percent Increase
Battle Creek Road SE at Reed Road SE	26	21	5	1159	0.4%
Battle Creek Road SE at Site Access	213	176	37	1253	3.0%
Kuebler Boulevard at Commercial Street SE*	75	62	13	3657	0.4%
Kuebler Boulevard at Battle Creek Road SE	187	155	32	5107	0.6%
Kuebler Boulevard at 27th Avenue SE	92	76	16	3814	0.4%
Kuebler Boulevard at I-5 Southbound Ramps**	92	76	16	3814	0.4%

* Background volumes on Commericial Street SE are not available. The reported numbers therefore only account for the known traffic volumes on the east leg of the intersection. Actual percent increase will be lower than reported.

** Background traffic volumes for the I-5 Kuebler Boulevard intersection are also not available. The reported numbers account only for the known traffic volumes on the west leg of the intersection. Actual percent increase will be lower than reported.