Summit Village

TRAFFIC IMPACT STUDY

July 20, 2016

Prepared For:
Unity Realty, LLC

Prepared By:
Priority Engineers, Inc.
PO Box 563
Garden City, MO 64747

July 20, 2016

Mr. Guy Swanson
Unity Realty, LLC

Re: Summit Village – Lee's Summit, MO

Dear Mr. Swanson:

In response to your request, Priority Engineers, Inc. has completed a traffic impact study for the above referenced project. The purpose of the analysis is to determine the potential traffic impacts associated with this development on the intersections and streets surrounding this site, primarily during the AM and PM peak hours. The following report documents our analysis and recommendations.

We appreciate the opportunity to work with you on this project. Please contact us with any questions or if you require additional information.

Sincerely,

PRIORITY ENGINEERS, INC.

Kristin L. Skinner, P.E., PTOE
President

Priority Engineers, Inc.
PO Box 563
Garden City, MO 64747
816.738.4400

Table of Contents

1) INTRODUCTION

The purpose of this study is to examine the potential traffic impacts associated with the proposed Summit Village development located south of Colbern Road to the east and west of Blue Parkway in Lee's Summit, Missouri. The development will have one access point onto Cobern Road, east of Blue Parkway, and several entrances onto Blue Parkway.

The study area is shown in Figure 1. The site layout is shown in Figure 2.

2) EXISTING CONDITIONS

The existing site is located at the southeast corner of Colbern Road and MO 350 Highway, and is on both sides of the newly constructed Blue Parkway. The property includes the vacated section of the old Blue Parkway alignment, and is currently vacant.

Blue Parkway is a four lane arterial which has recently been realigned south of Colbern Road. The posted speed limit on Blue Parkway is 40 miles per hour. The Colbern Road and Blue Parkway intersection is a single lane roundabout with right turn lanes for the eastbound and northbound movements.

Colbern Road is identified as a two lane arterial west of Douglas in the City of Lee's Summit Thoroughfare Master Plan. Between the MO 350 Highway interchange and the roundabout at Blue Parkway, Colbern Road has two eastbound lanes, and narrows to a single eastbound lane after the roundabout. The posted speed limit on Colbern Road is 45 miles per hour.

To the north of this property is Unity Village. Unity Villas are located on the south side of Colbern Road, with the remaining buildings located to the north of Colbern Road. The site is bordered on the west by MO 350 Highway, with undeveloped land beyond MO 350. The land to the east of this site is currently undeveloped land which is expected to eventually to become commercial, office, and light industrial uses. Further to the south, on the south side of I-470, are additional retail and light industrial uses.

Peak Hour turning movement traffic counts were collected for the intersections of Colbern Road with Pryor Road, the MO 350 Ramps, and Blue Parkway as well as the intersections of Blue Parkway with the I-470 Ramps. These counts were collected between the hours of 7:00 and 9:00 AM and from 4:00 to 6:00 PM on typical weekdays during June and July of this year. The peak hours were determined to be from 7:15 to 8:15 AM and from 4:45 to 5:45 PM. The complete traffic counts are shown in Appendix II.

The peak hour traffic volumes and existing lane configurations are shown in Figures 3-7.

3) PROPOSED DEVELOPMENT

The proposed site plan is shown in Figure 2. The site will include two hotels, and a small retail component. The remainder of the site will be office uses with the four buildings closest to the Colbern Road roundabout assumed to be medical or dental offices.

The proposed development will have one access point, labeled East Drive in this report, onto Colbern Road. This drive is approximately 700' east of the Unity Villas driveway. On the east side of Blue Parkway, there will be a right-in/right-out driveway approximately 280' south of the roundabout. A full-access intersection has been planned approximately 700' south of the

roundabout. This intersection will be at the location of the median break in Blue Parkway, and is referred to as "Main Entrance" in this report. Within the site, the road will extend to the east and connect to the east drive. Several minor drives will be constructed along this road which were not modeled. These drives meet the minimum spacing required in the City of Lee's Summit Access Management Code. One additional full-access intersection, labeled South Drive in this report, will be added near the southern boundary of the property. The South Drive will be a tee intersection extending to the west. This drive will exceed the minimum spacing standards to the Main Entrance intersection to the north for a major arterial. To the south, the next side street will be located approximately 233' south of this drive.

The site has been laid out to provide for good site circulation with clear channelization that will lead customers to their destinations within the site. Minimum throat length for each drive meets or exceeds 125'.

4) TRIP GENERATION

The vehicle trips generated by the proposed development were estimated using the Institute of Transportation Engineers' Trip Generation, 9th Edition. Land Use 720, Medical-Dental Office Building was assumed for 61,000 square feet of the lots labeled Office in the provided plan. The remaining office space was assumed to be Land Use 710, General Office Building. Two hotels are identified in the plan with a total of 96,500 square feet. To estimate the number of rooms represented in this space, it was assumed that there would be two rooms per 1000 square feet. Finally, the 9,000 square foot retail area was assumed to be Land Use 826, Specialty Retail. The estimated AM and PM peak hour traffic volumes associated with these uses are shown in Table 1.

Table 2: Summit Village Phase 1

				AM Peak			PM Peak		
Land Use	***ITE Code***	***Intensity***	***Daily***	***Total***	***In***	***Out***	***Total***	***In***	***Out***
Medical-Dental Office Building	720	61,000 SF	2279	146	115	31	187	52	135
General Office Building	710	405,000 SF	3801	586	516	70	532	90	542
Hotel	310	193 Rooms	1354	102	60	42	116	59	57
Specialty Retail	826	9,000 SF	423				43	19	24
Total		**571,500 SF**	**7857**	**834**	**691**	**143**	**878**	**220**	**758**

*Assumed 2 rooms per 1000 SF

5) TRIP DISTRIBUTION

As part of the Blue Parkway and Colbern Road improvement project, Lutjen, Inc submitted traffic models to both the City of Lee's Summit and to the Missouri Department of Transportaion for review. Traffic distribution for this for this study was assumed to be approximately the same as that assumed in the previously approved models. The assumptions for this study are as follows:

- 10 percent to/from the north on MO 350
- 5 percent to/from the south on MO 350
- 2.5 percent to/from the west on Colbern Road (Bannister)
- 2.5 percent to/from the south on Pryor Road
- 20 percent to/from the west on I-470
- 25 percent to/from the east on I-470
- 20 percent to/from the south on Blue Parkway
- 15 percent to/from the east on Colbern Road

The proposed development trips are shown in Figures 7-8.

6) LEVEL OF SERVICE AND VOLUME/CAPACITY ANALYSES

Capacity analysis was used to quantify the impacts of the increased traffic on the intersections studied. The methodology outlined in the Highway Capacity Manual, 2000 Edition, was used as a basis to perform the analysis for this study. Capacity analysis defines the quality of traffic operation for an intersection using a grading system called Level of Service (LOS). The LOS is defined in terms of average vehicle delay. Levels of service A through F have been established with A representing the best and F the worst.

Table 4: Level of Service Definitions

Level of Service	*Unsignalized Intersection*	*Signalized Intersection*
A	< 10 Seconds	< 10 Seconds
B	< 15 Seconds	< 20 Seconds
C	< 25 Seconds	< 35 Seconds
D	< 35 Seconds	< 55 Seconds
E	< 50 Seconds	< 80 Seconds
F	≥ 50 Seconds	≥ 80 Seconds

The study intersections were evaluated using Synchro and SIDRA analysis packages based on part on Highway Capacity Manual methods. The analysis reports are included in Appendix II.

Existing Conditions

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 5 and 6 in Appendix I.

The overall level of service at each of the signalized intersections was a B during both the AM and PM Peak Hour. Individual movements for both signalized and unsignalized intersections are a C or better.

Existing + Proposed Development Conditions

The levels of service, lane configuration, and queue lengths for proposed conditions are shown in Figures 9 and 10 in Appendix I.

The overall level of service at each of the signalized intersections was a B or better during both the AM and PM Peak Hour. Individual movements for both signalized and unsignalized intersections are a D or better with acceptable queue lengths.

7) FUTURE CONDITIONS

A future scenario was created in order to estimate traffic volumes through study intersections in the year 2035. A 2% growth factor was applied to background traffic volumes to generate this scenario which is illustrated in Figures 11-14 in Appendix I.

The overall level of service at each of the signalized intersections was a B or better during both the AM and PM Peak Hour. Individual movements declined to lower levels of service at some locations. The southbound and northbound movement at Pryor Road and Colbern Road (Bannister) declined to a Level of Service F, with the northbound movement experiencing a significant queue. Long delays at stop controlled intersections are not uncommon during peak periods. It is likely that this property along Pryor Road may develop in the future, which could lead to signalization of this intersection. The westbound left turn movement at the Main Entrance and Blue Parkway lowers to a level of service E in the Future PM Peak Hour. The future design models completed by Lutjen assumed that this intersection would become signalized as traffic volumes increased on Blue Parkway. Additional westbound left turn capacity may become necessary at that time.

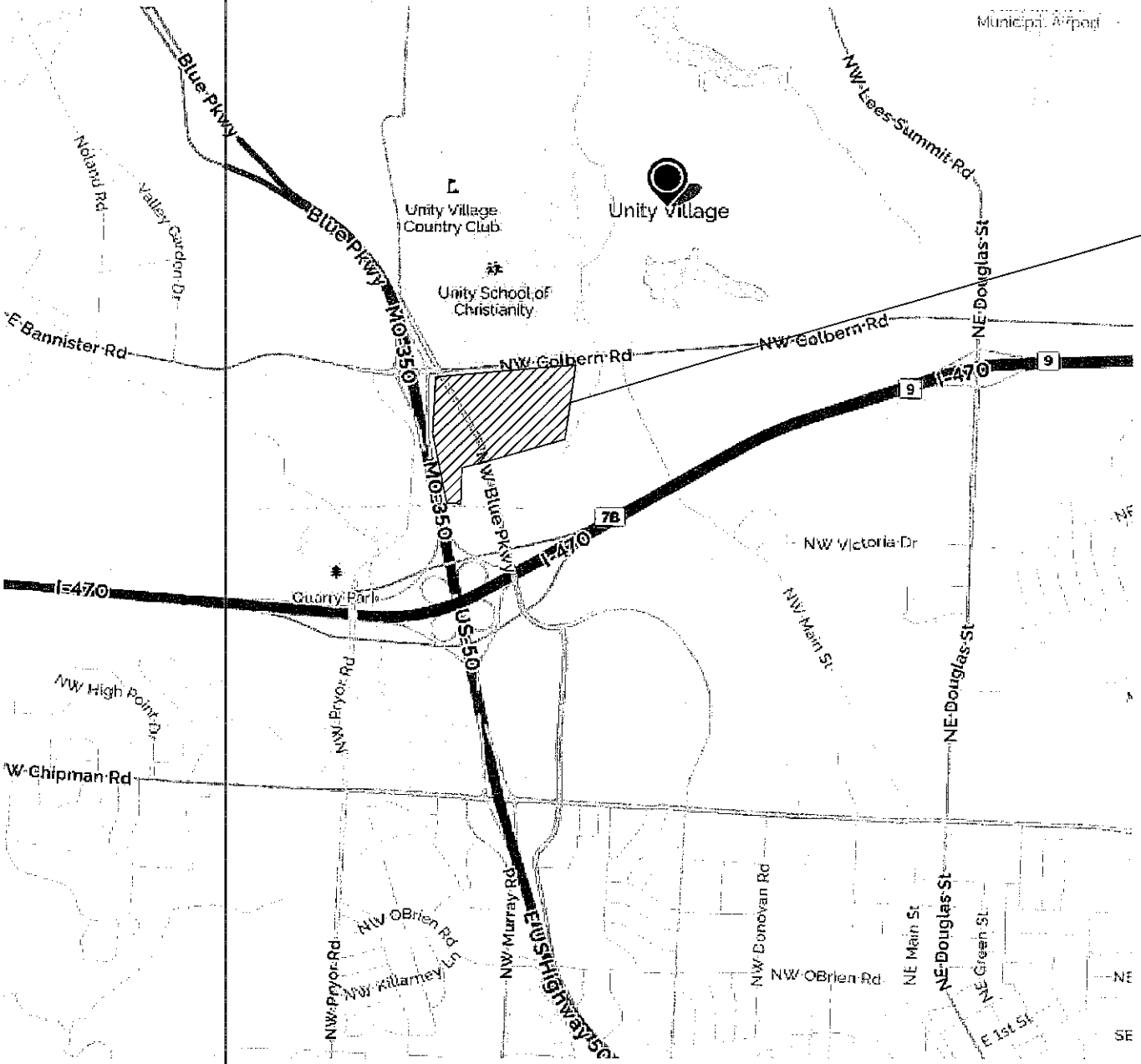
The roundabout at the intersection of Blue Parkway and Colbern Road continues to function well in the future scenario with an assumed 2% annual growth. Additional lanes may become necessary as traffic volumes increase due to development to the east and northeast of this site.

8) RECOMMENDATIONS & CONCLUSIONS

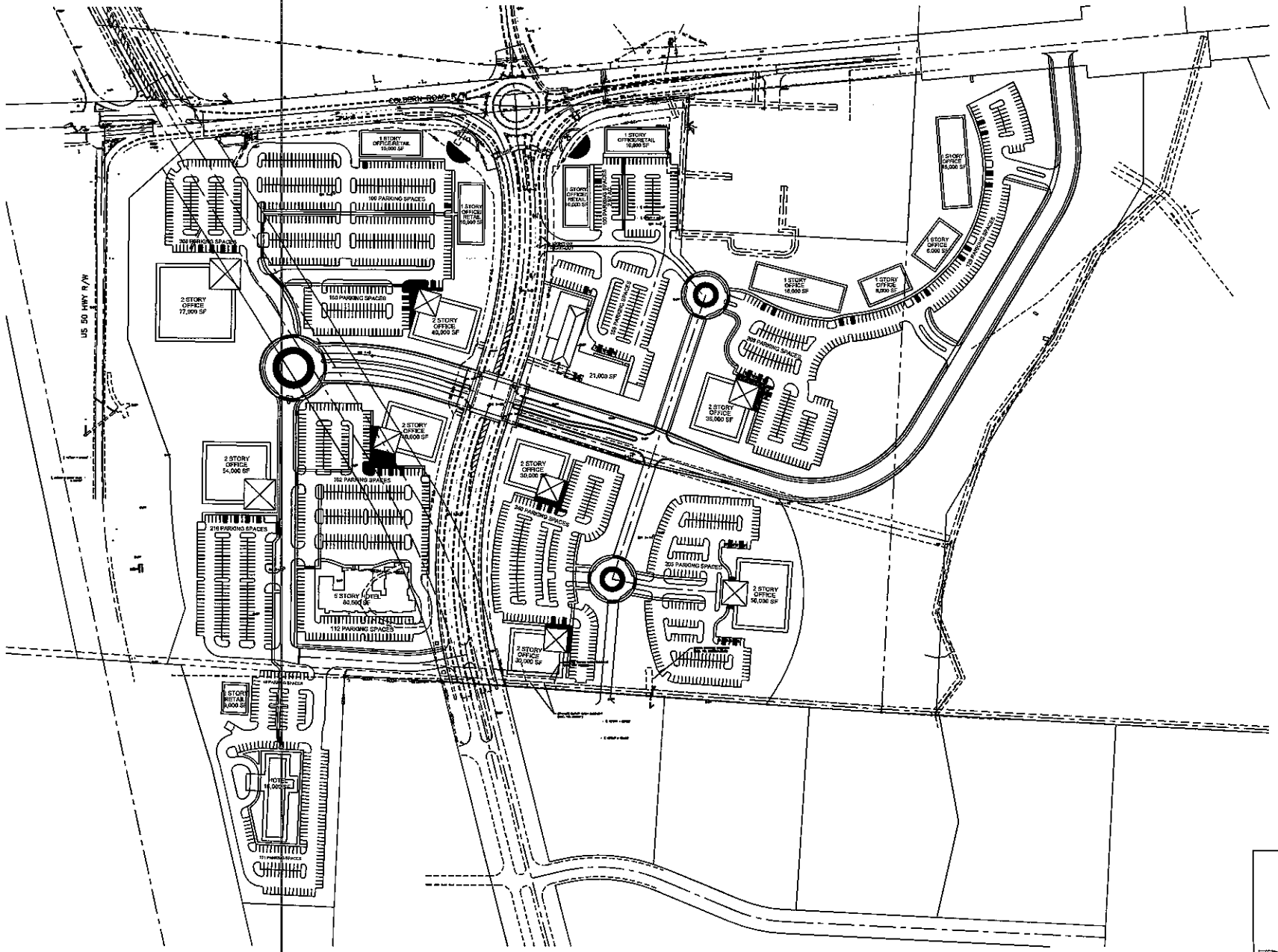
This study documents the impact of the proposed Summit Village Development on adjacent intersections and the surrounding streets. Blue Parkway was designed with future traffic volumes and development in mind. All study intersections work will in the proposed scenarios, and continue to operate will with a background growth factor of 2%.

No additional improvements are necessary as a result of this development.

APPENDIX I



Project Location	Summit Village Lee's Summit, MO	No Scale Figure 1	Priority ENGINEERS PO Box 563 Garden City, MO 64747 816.738.4400



Site Plan

Summit Village
Lee's Summit, MO

No Scale

Figure 2

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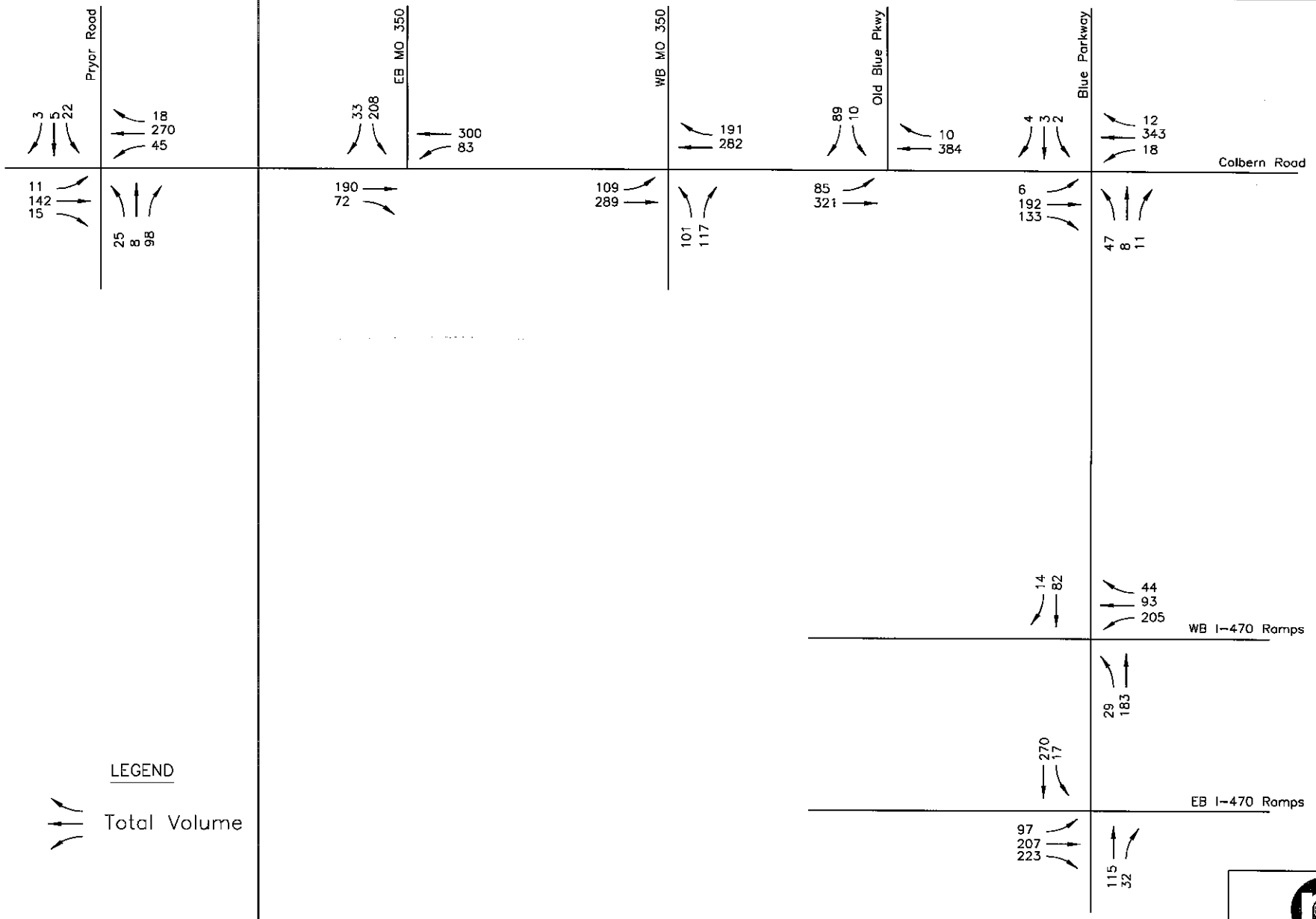

Existing AM Peak Hour
Traffic Volumes

Summit Village
Lee's Summit, MO

No Scale

Figure 3

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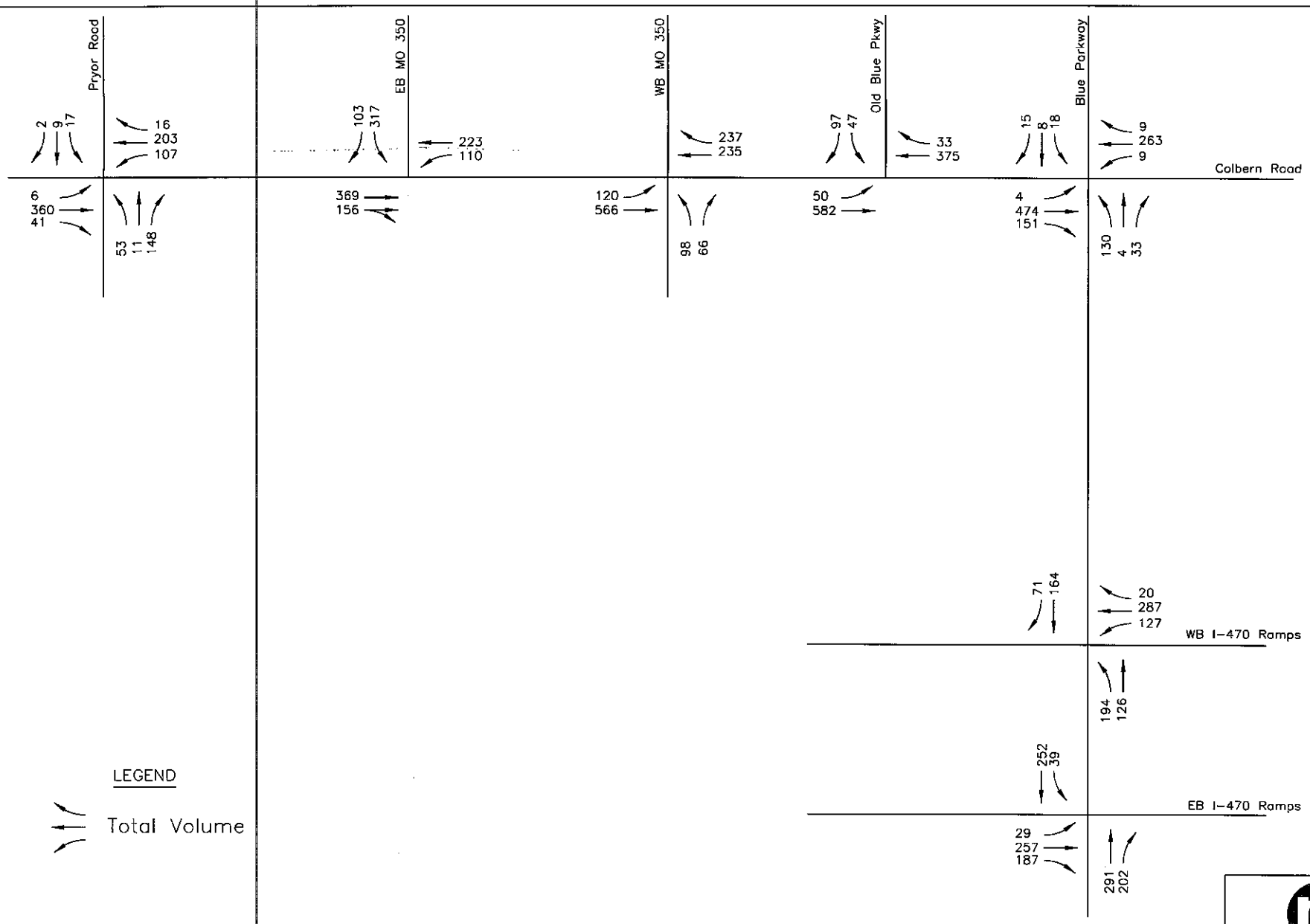
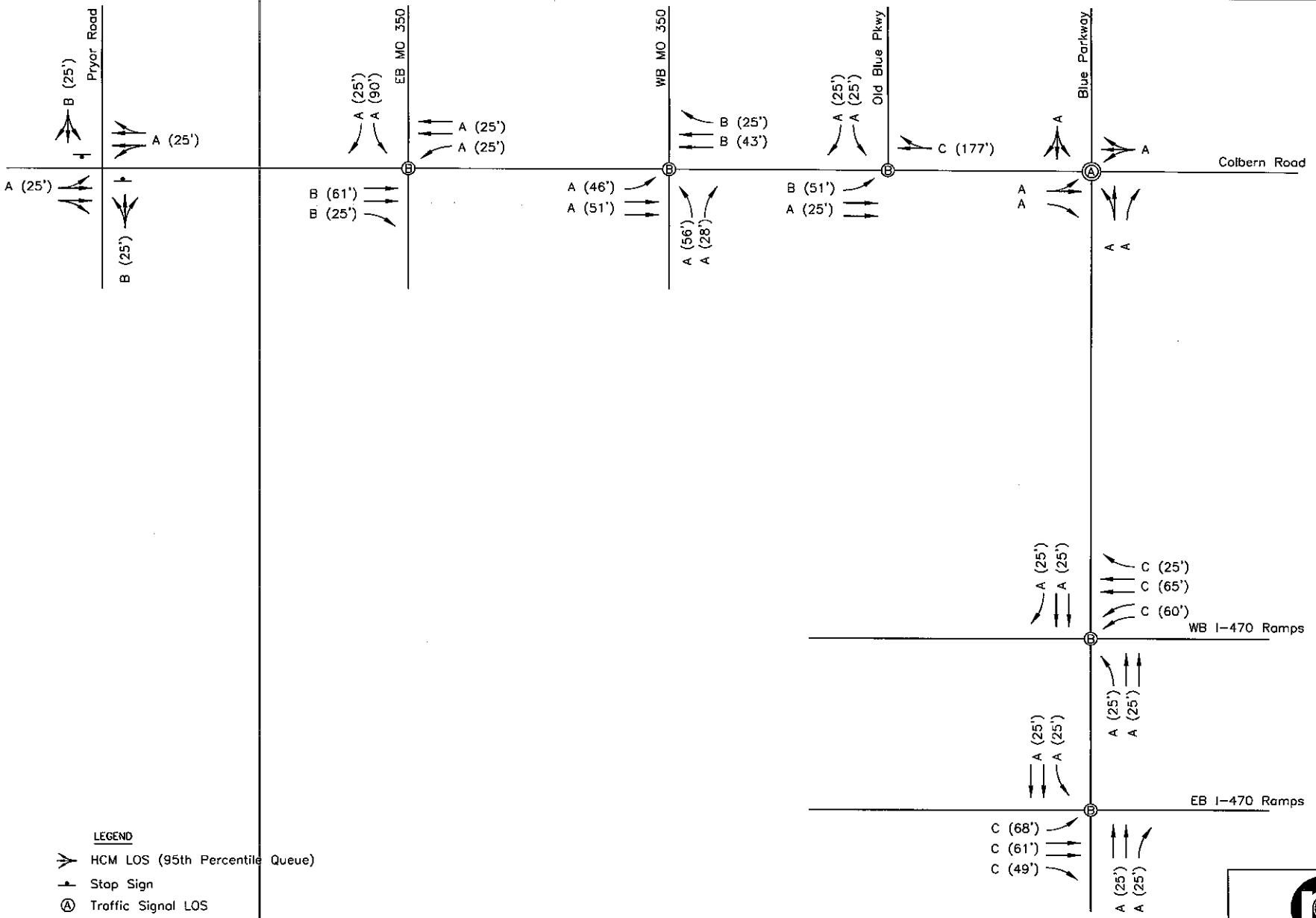


Existing PM Peak Hour Traffic Volumes	Summit Village Lee's Summit, MO	No Scale	Priority ENGINEERS PO Box 563 Garden City, MO 64747 816.738.4400
		Figure 4	



Existing AM Peak Hour
Lane Configuration &
Levels of Service

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Lee's Summit, MO

No Scale

Figure 5

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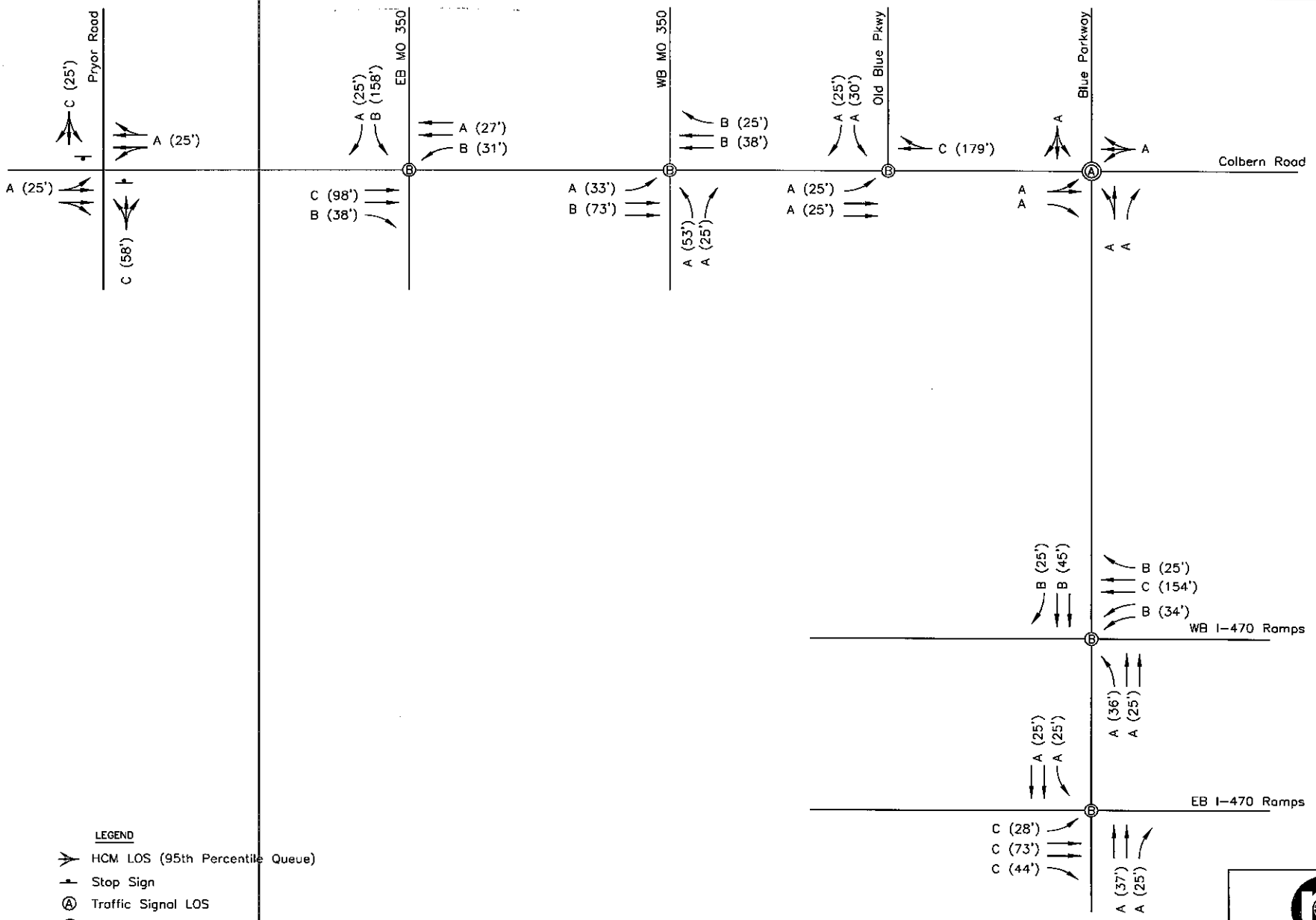

Existing PM Peak Hour
Lane Configuration &
Levels of Service

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Lee's Summit, MO

No Scale

Figure 6

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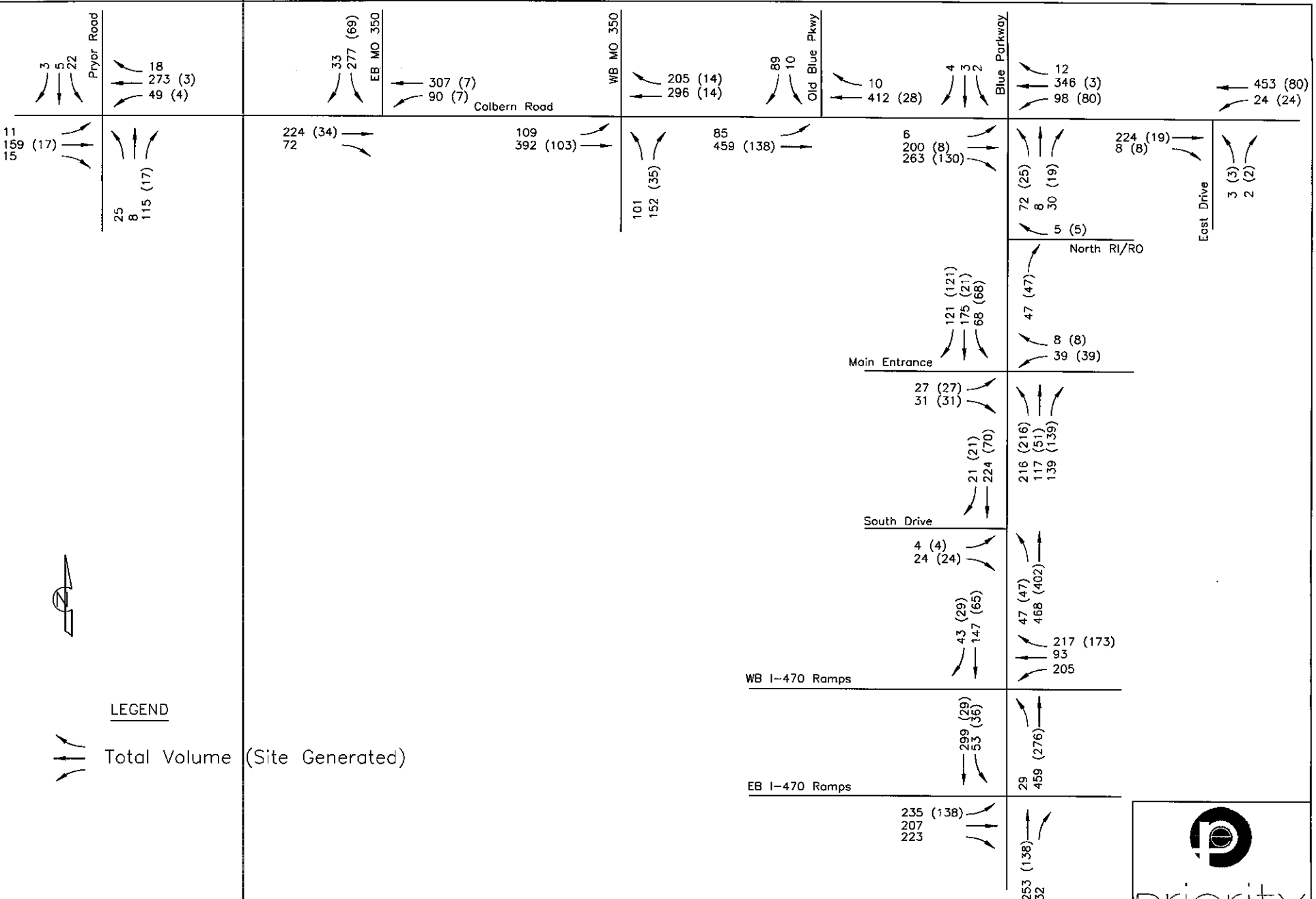

Existing + Proposed Development AM Peak Hour Traffic Volumes	Summit Village Lee's Summit, MO	No Scale Figure 7

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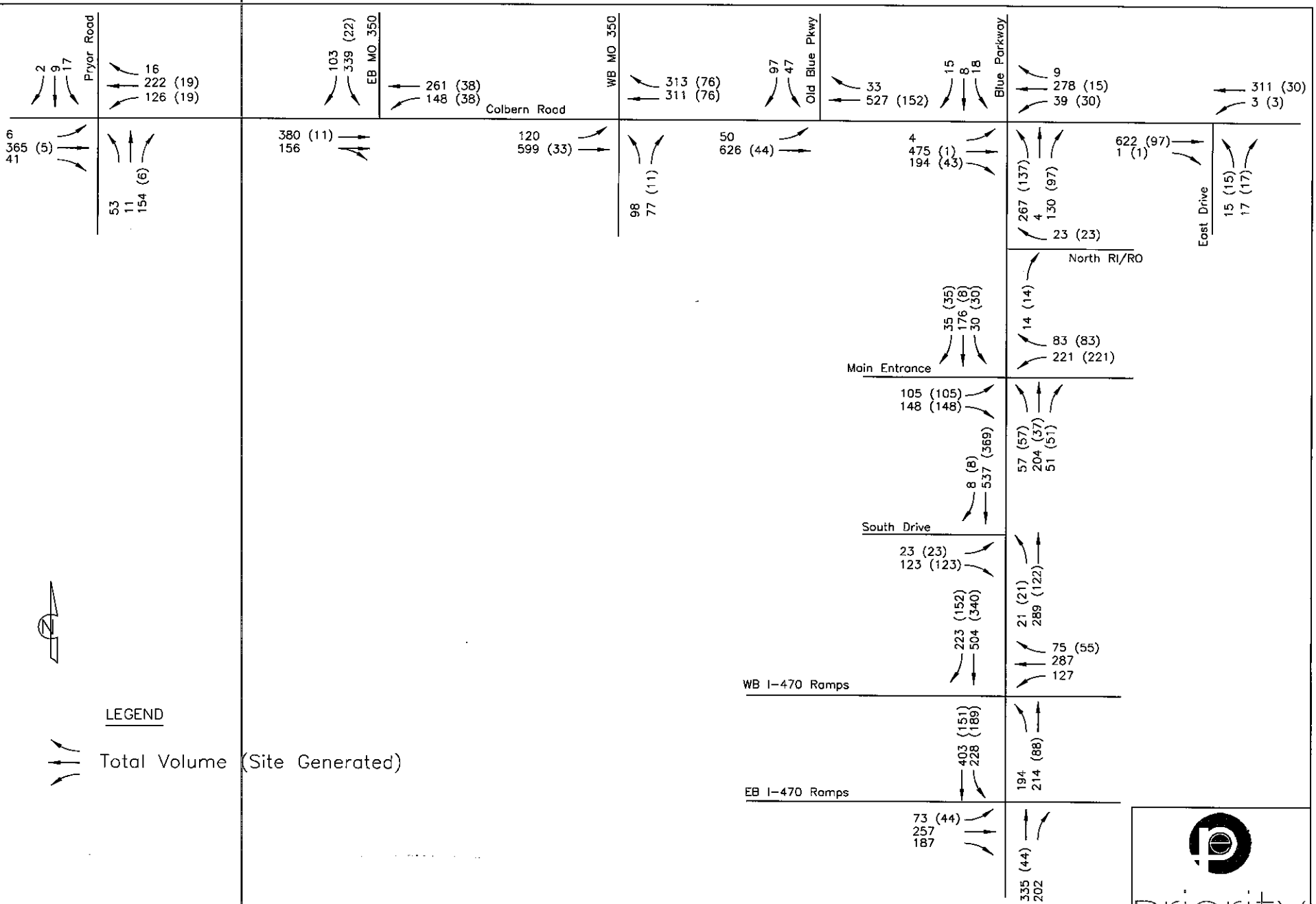

Existing + Proposed Development
PM Peak Hour
Traffic Volumes

Summit Village
Lee's Summit, MO

No Scale

Figure 8

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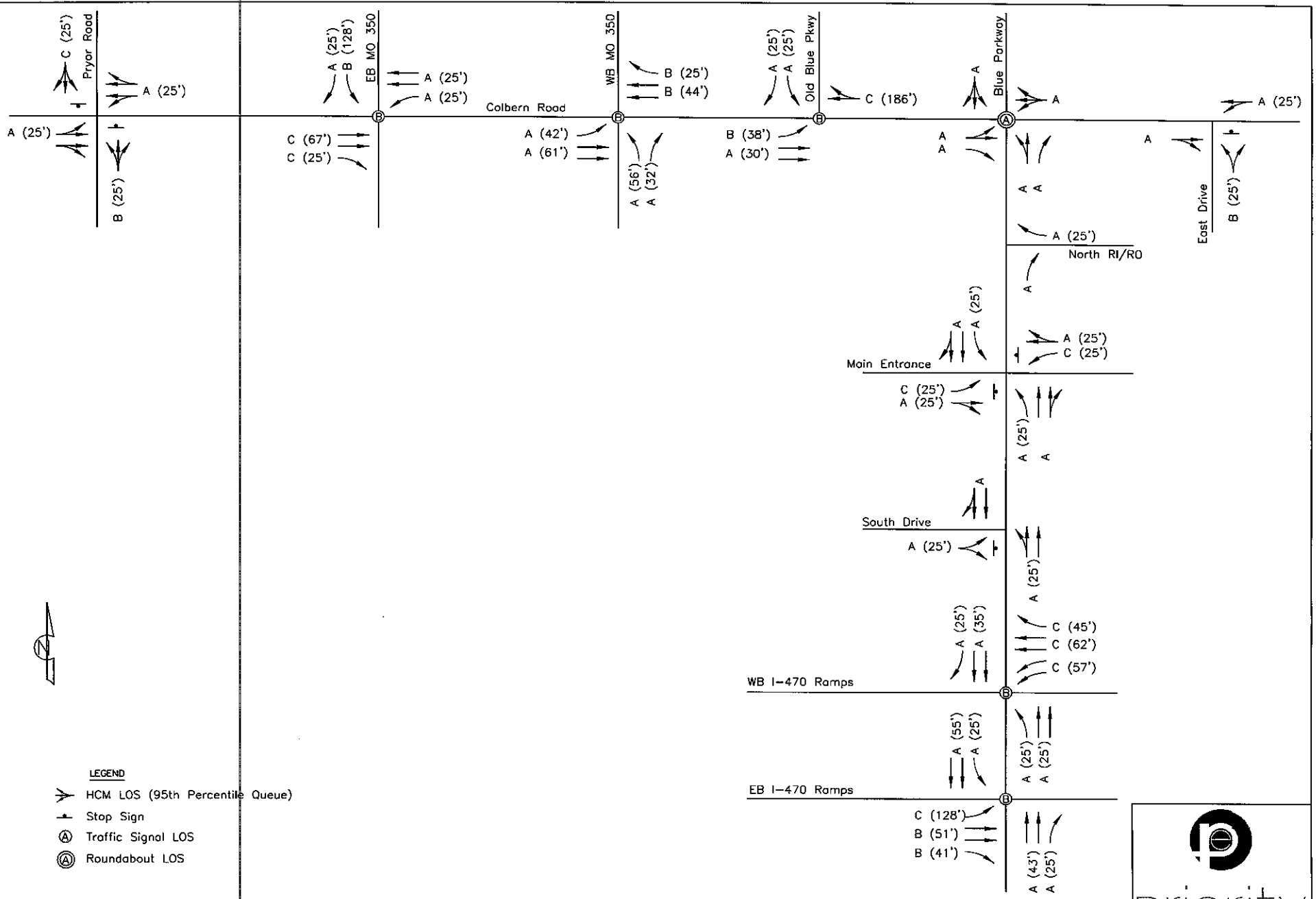

Existing + Proposed Development
AM Peak Hour
Lane Configuration &
Levels of Service

Summit Village
Lee's Summit, MO

No Scale

Figure 9

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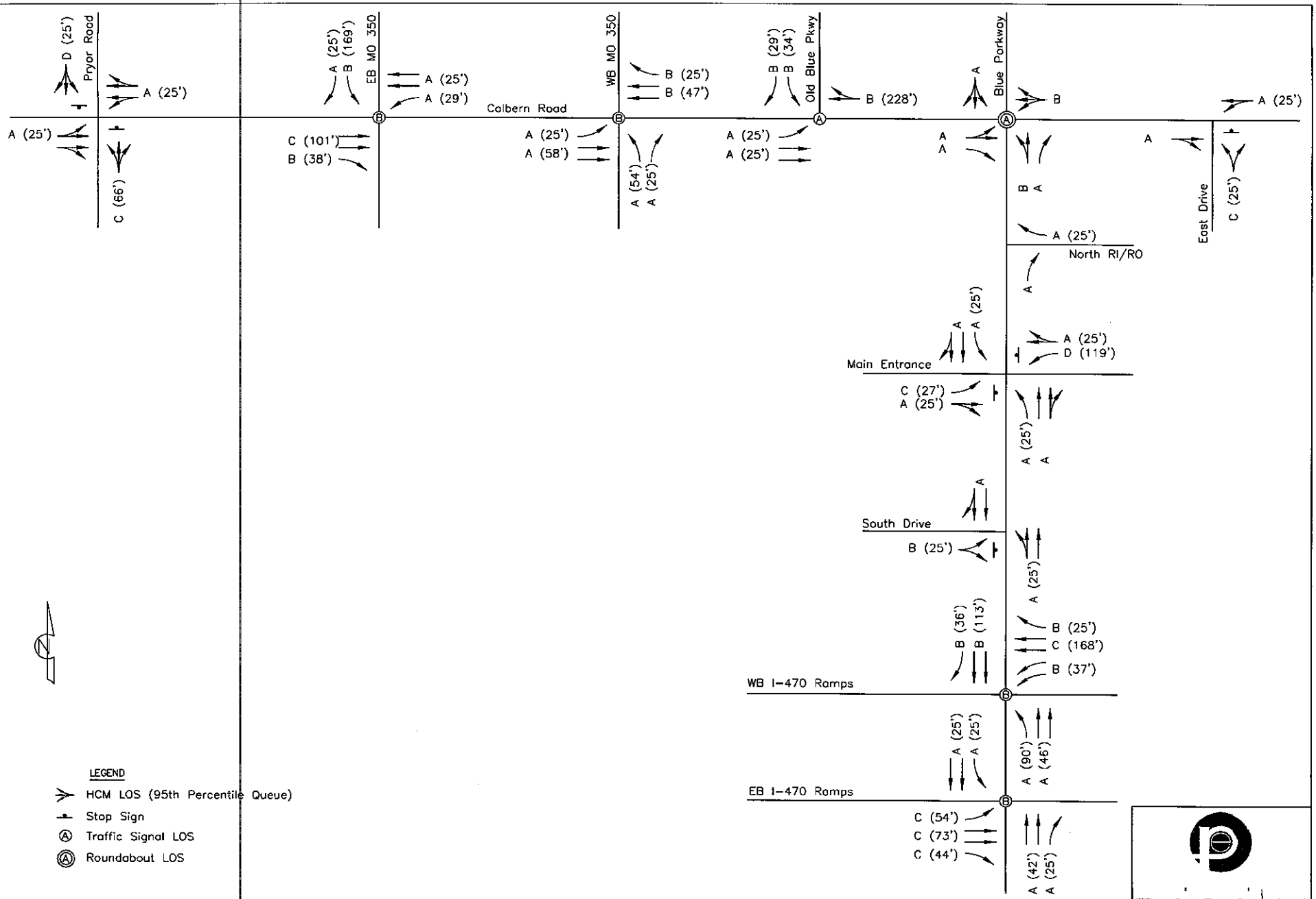

Existing + Proposed Development
PM Peak Hour
Lane Configuration &
Levels of Service

Summit Village
Lee's Summit, MO

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Figure 10

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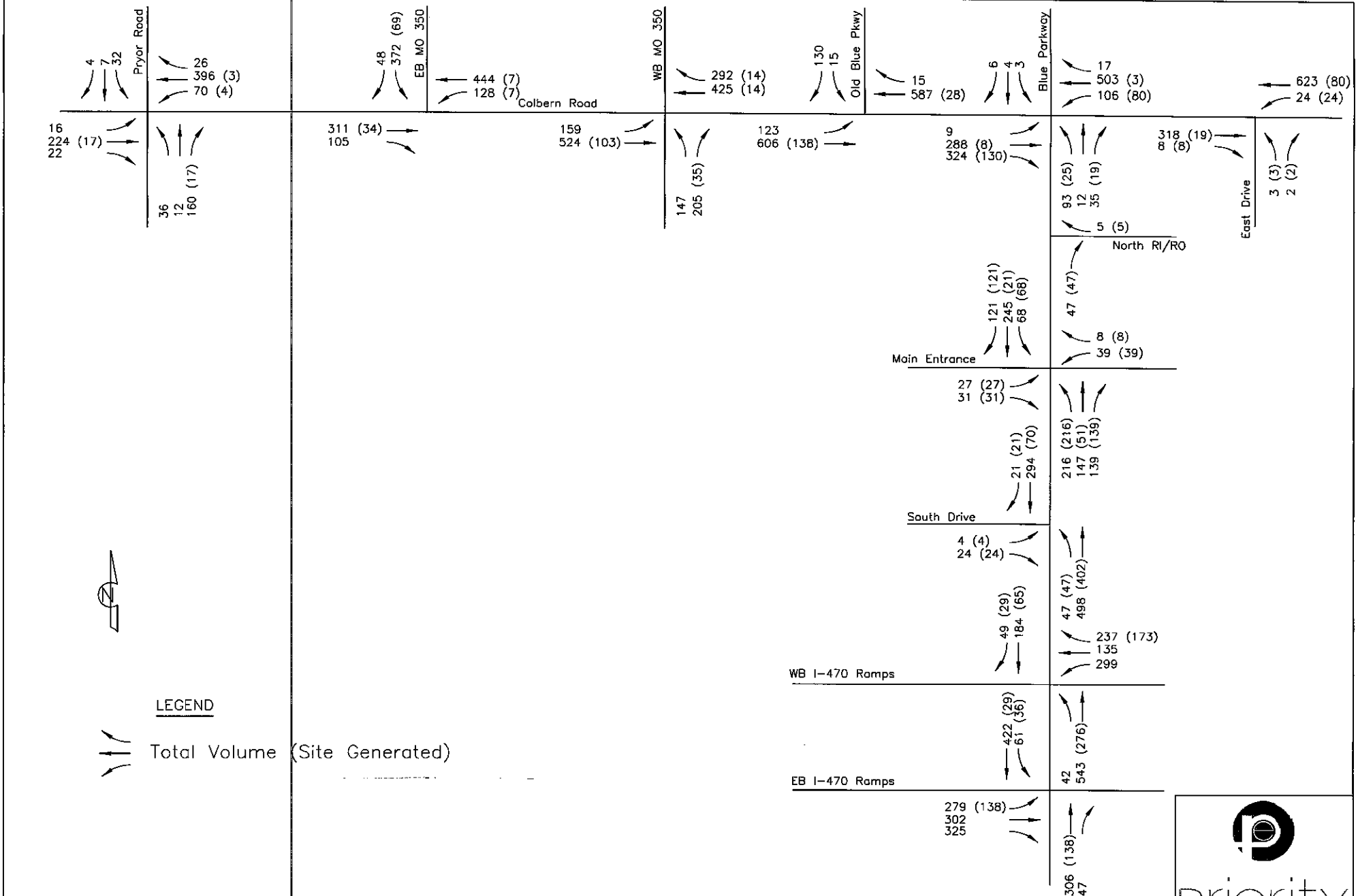

Future (2035)
AM Peak Hour
Traffic Volumes

Summit Village
Lee's Summit, MO

No Scale

Figure 11

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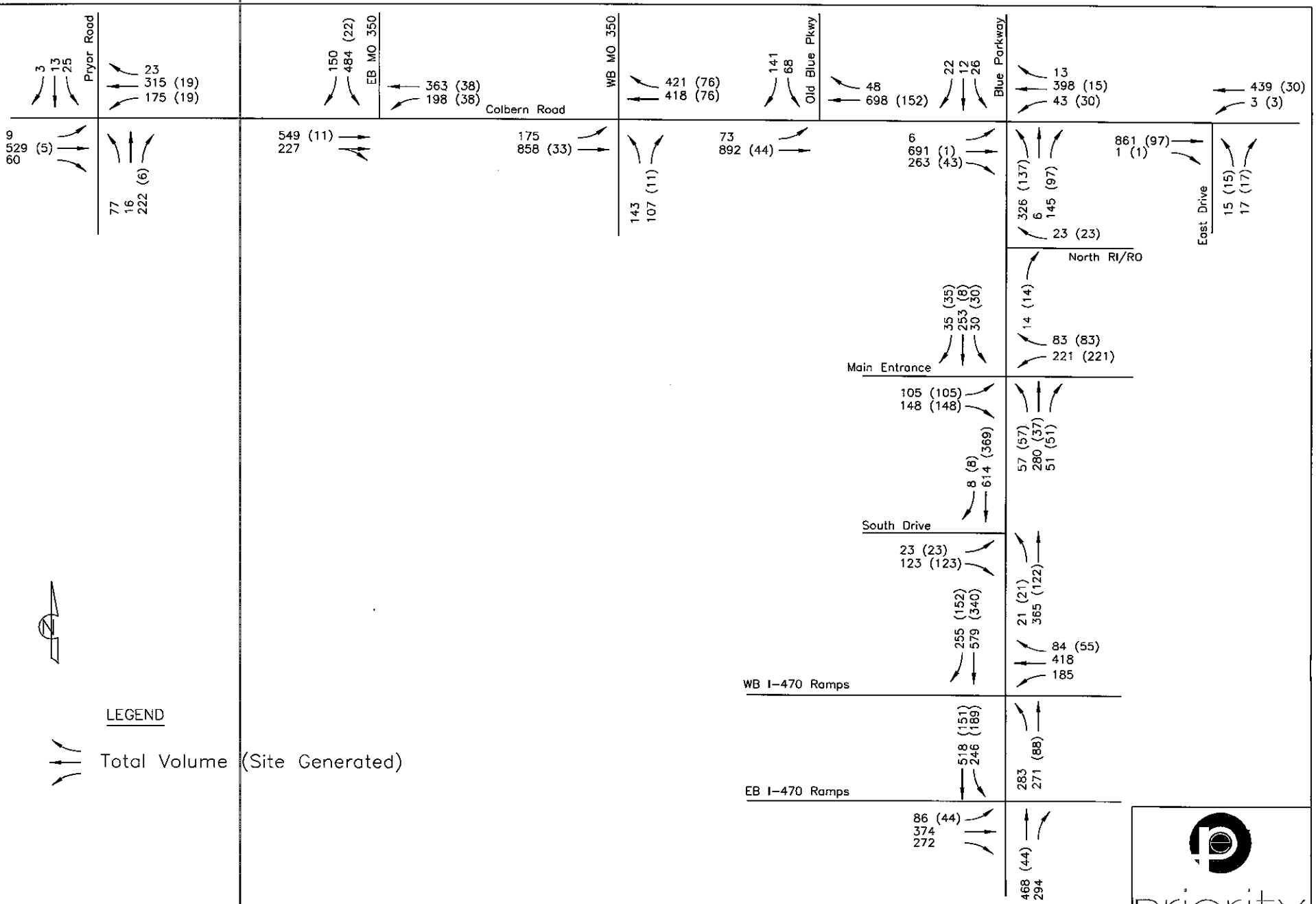

Future (2035)
PM Peak Hour
Traffic Volumes

Summit Village
Lee's Summit, MO

No Scale

Figure 12

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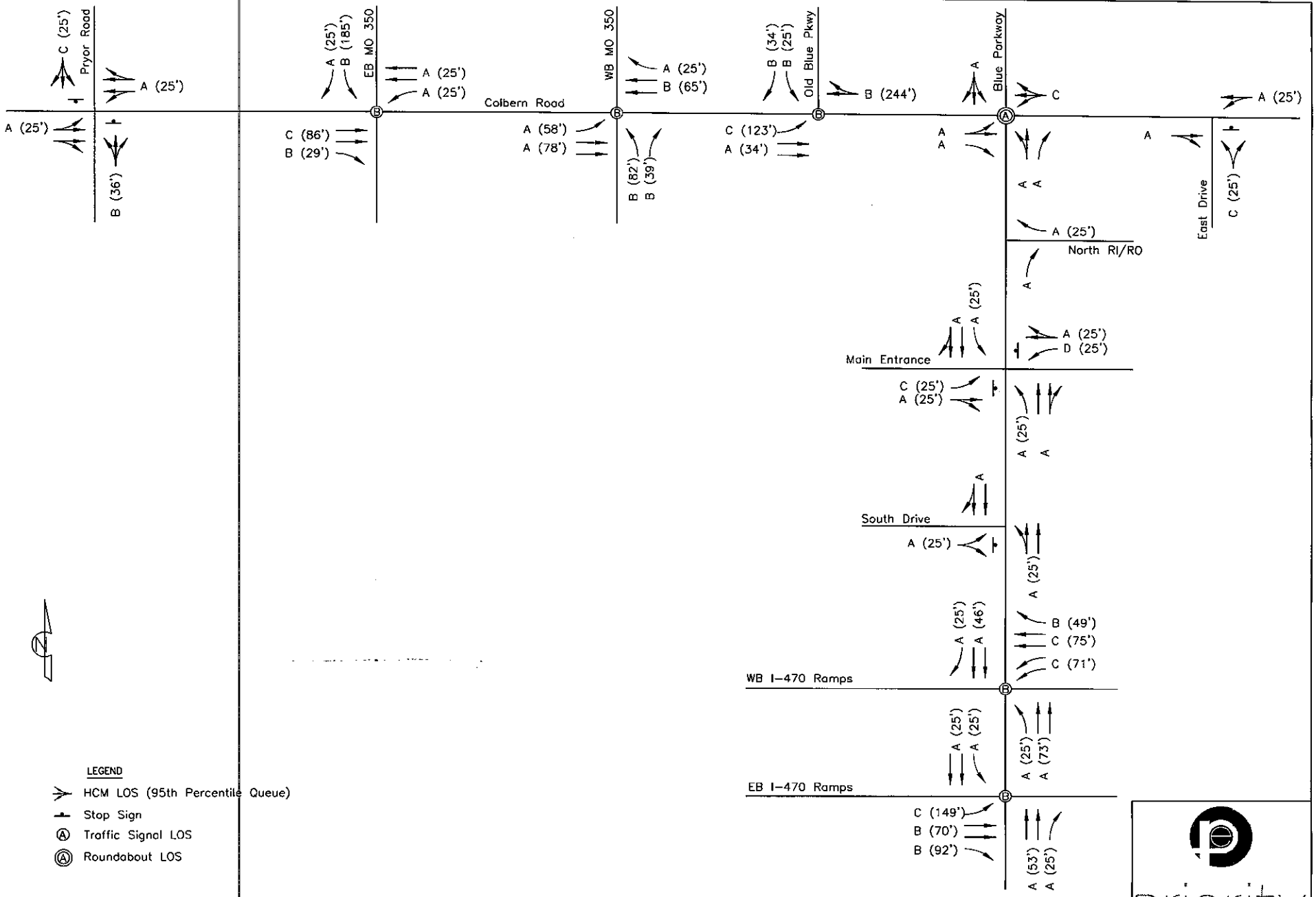

Future (2035)
AM Peak Hour
Lane Configuration &
Levels of Service

Summit Village
Lee's Summit, MO

No Scale

Figure 13

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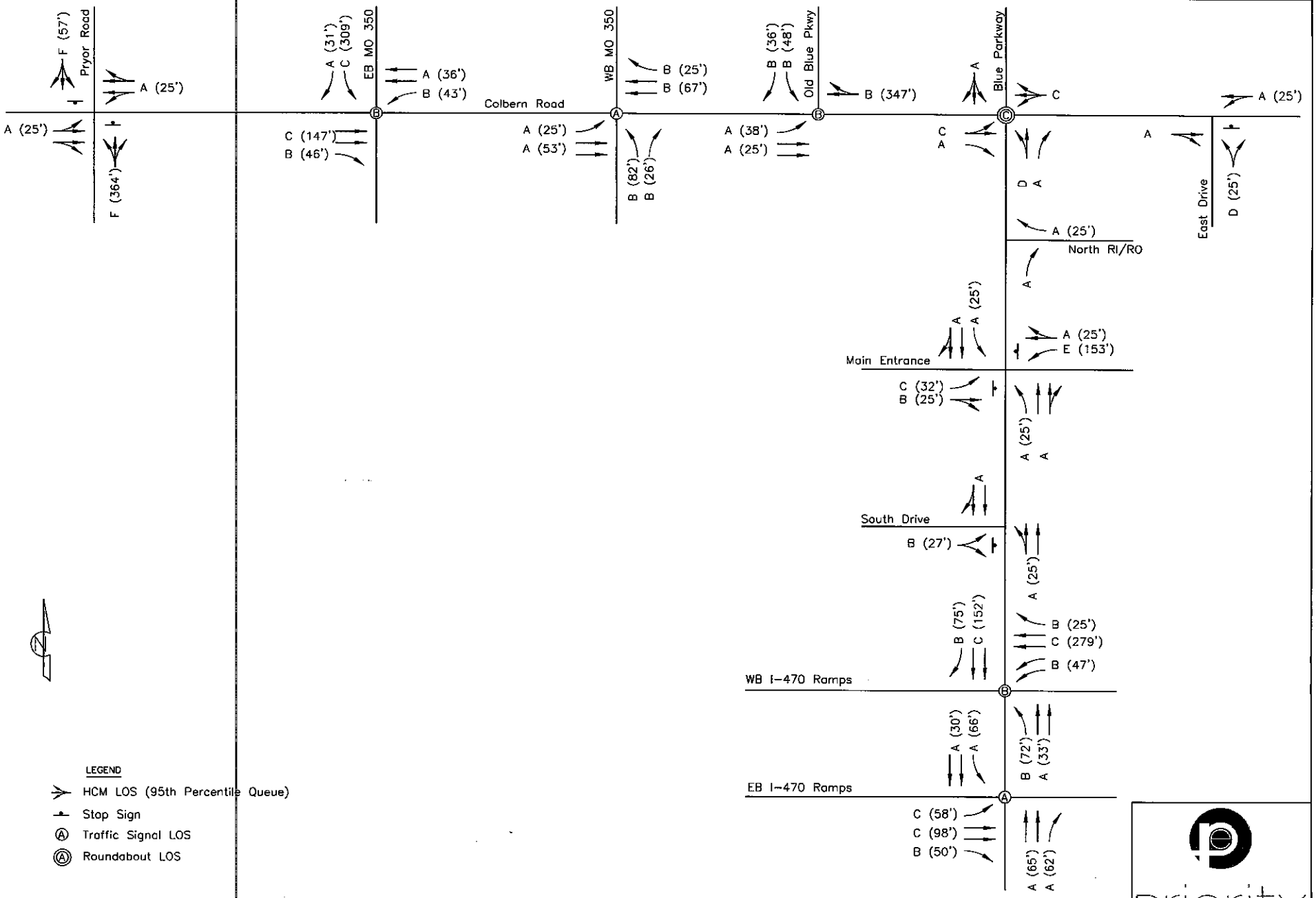

Future (2035)
PM Peak Hour
Lane Configuration &
Levels of Service

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Lee's Summit, MO

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Figure 14

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