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MAXWELL PROPERTY
TRAFFIC STUDY

FEBRUARY, 1982
REVISED MARCH, 1982

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PREPARED BY

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I. INTRODUCTION

This report addresses the impact to traffic flow on the adjacent street system caused by the development of a 52 acre tract of land known as the Maxwell Property. It is assumed that development of the site will take place in accordance with the information set forth in "Maxwell's Community Unit Plan" dated February 16, 1982, by reference, is also made a part of this report.

Webb Road and Douglas Avenue are the only arterials providing direct access to the site, consequently they will be impacted more signficantly than other arterials in the area. Kellogg Avenue, which lies approximately 600 feet south of the site, will also be affected as will Central Avenue. Any increase in traffic at Central and Webb can easily be handled due to the recent improvement of this intersection.

Three existing major traffic generators are located within the immediate study area. Beech Aircraft Company, Pizza Hut, Inc., and the Forrest Hills residential development each contribute to the existing traffic flows. Figure 1 shows the existing 4:30 to 5:30p.m. volumes. At present the p.m. peak occurs between 3:30 and 4:30 primarily because of shift change traffic at Beech Aircraft, another peak can be expected to occur during the normal 4:30 to 5:30 peak period once the Maxwell Property is fully developed.

The prediction of traffic impacts is a three part process. First, a trip generation analysis is performed to determine the volumes which can be expected based upon land use. Trip distribution, or the assignment of the predicted volumes to the street system, is the second step. Finally qualitative assessment of the impact is made using conventional capacity analysis techniques and design concept lane configurations.

II. LAND USE AND TRIP GENERATION

The number of trips forecasted to be generated by the development were computed from rates obtained in an Institute of Transportation Engineers informational report entitled "Trip Generation". This reference contains trip generation rates for a variety of land uses. For purposes of this report, only the average and maximum rates were tabulated. Although minimum rates are available, they were not considered relavent to this study. However, it should be realized that at this time the chances of the trip rate being either minimum or maximum are equal.

Since several land use options are permissible for each of the seven parcels noted on the C.U.P., two overall land use options were selected for evaluation; each representing a realistic concept. Land Use Options No. 1 and No. 2 are shown in Tables 1A and 1B respectively.

Land Use Option No. 1 represents the most intense use with respect to trip generation. The trip generation rates, trip ends per day, and P.M. peak period volumes are shown in Table 1A for each parcel. Note that both average and maximum figures are presented.

Option No. 2, Table 1B, represents a lower intensity of use with respect to trip generation.

Upon preliminary review by City of Wichita Traffic Engineering and Planning staff members, one trip generation rate for each parcel was agreed upon. This rate, shown in Table 1C, being the average of the maximum and average rates shown in Table 1A.

III. TRIP DISTRIBUTION AND CAPACITY ANALYSIS

The volumes derived from the trip generation analysis were assigned to drive exits which were located according to parcel traffic demands, the developments probable internal traffic flow pattern and spacing considerations. Directional distribution was based upon existing traffic flow patterns. It is reasonable to expect that traffic destined to or exiting Parcel 1 or Parcel 2 would use only the drives provided to these sites. The assumption was made that the entrance to Parcel 3 however would be required to accommodate all of the traffic from Parcels 3, 4, 5 6, and 7.

Figure 2 shows the traffic volume assignments for the adjusted trip generation rates, Table 1C.

Two capacity analysis techniques were employed. For the major intersections at Webb and Douglas and Webb and Kellogg a Critical Lane Analysis was used. A method presented in HRB Report 212 called Capacity at Unsignalized Intersections was used for evaluating the major entrances into the development. The results of these evaluations are presented in Table 2.

RECOMMENDATIONS AND CONCLUSIONS

It is quite apparent from the capacity analysis that Webb Road must be improved to accommodate the additional volumes generated by the Maxwell Development.

Two concept plans have been prepared illustrating the extent of the improvement required to accommodate the volumes generated.

Both plans involve the total reconstruction of Webb Road from a point north of Douglas to Kellogg. The plans differ only in the median design.

Improvement Plan "A", Figure 3, illustrates the use of raised channelization to create left turn bays at the major intersections and entrances. Plan "B", Figure 4 shows a concept with a continuous left turn lane. This lane would be interrupted at the public intersection approaches where a section of raised median is desirable to provide positive traffic control at the intersection proper.

Along with the geometric improvements proposed, there will be the need to signalize the intersection at Douglas Ave and Webb Road and the major entrance into parcel 3. The signal required at Douglas and Webb should be installed concurrently with the geometric improvements. The signal at the major entrance into parcel 3 may not be necessary until the site is fully developed. However, provisions should be made to interconnect these two signals to achieve their maximum benefit. Properly coordinated, they would be capable of not only controlling the traffic at the intersections proper, but would also provide gaps in the traffic between the two intersections which would improve the operation of the minor entrances.

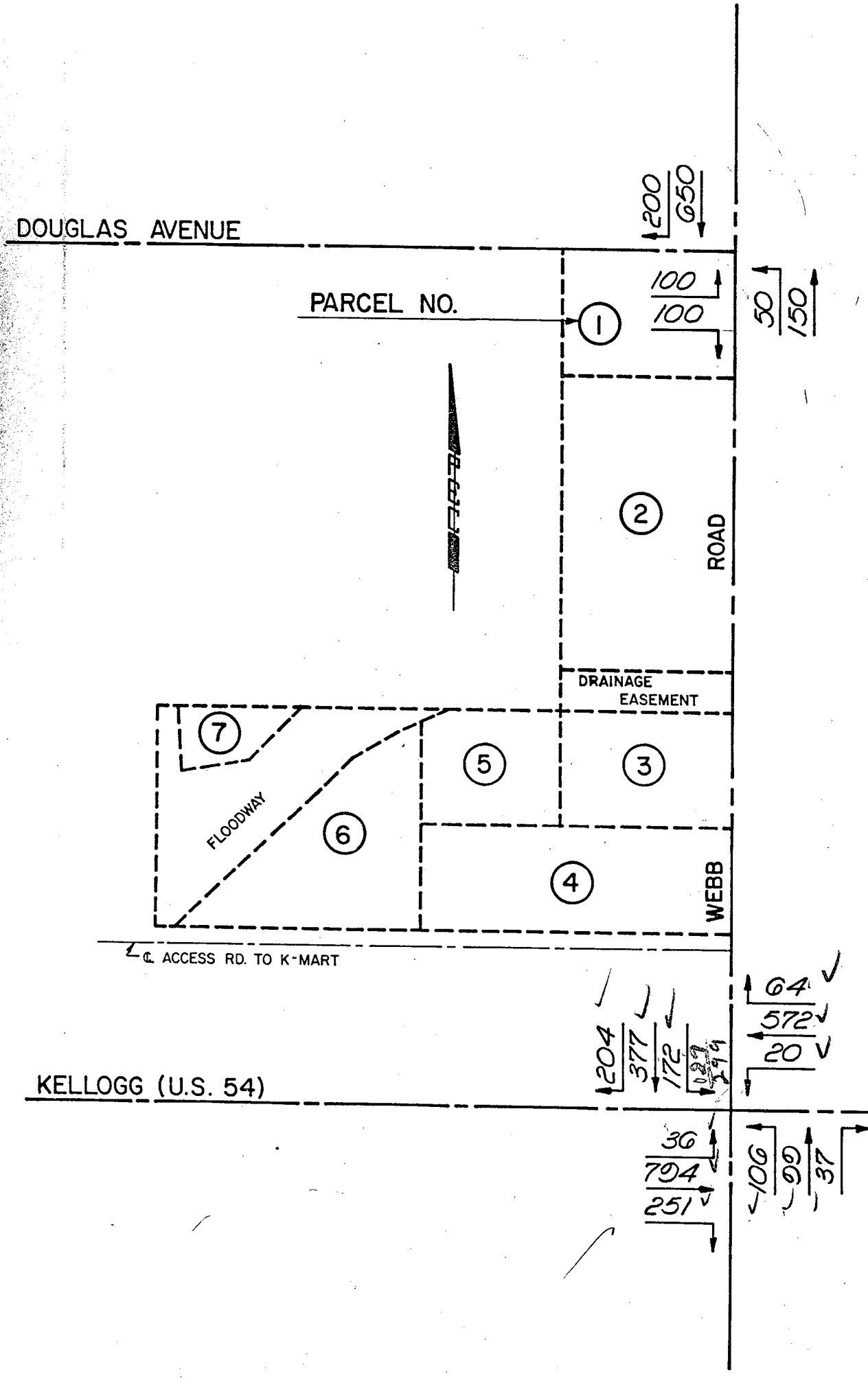

FIGURE 1 – EXISTING 4:30 – 5:30 PM TRAFFIC VOLUMES

TABLE 1 A

TRIP GENERATION ANALYSIS – LAND USE OPTION NO. 1

Parcel	Proposed Land Use	Size	Trip Gen. Rates (Daily)		Trip Gen. Rates – Peak *				Trip Ends per day		Trip Ends / Peak Hour *			
					Avg.		Max.				Avg.		Max.	
			Avg.	Max.	In	Out	In	Out	Avg.	Max.	In	Out	In	Out
1	General Office	89,000 GSF	11.69	43.50	0.19	1.48	0.43	3.19	1,040	3,870	17	132	38	284
2	Retail	194,400 GSF	60.40	103.70	2.60	2.90	4.50	5.00	11,740	20,160	505	564	875	972
3	Retail	93,472 GSF	60.40	103.70	2.60	2.90	4.50	5.00	5,650	9,690	243	270	420	467
4	General Office	143,360 GSF	11.69	43.50	0.19	1.48	0.43	3.19	1,680	6,240	27	212	62	457
5	General Office	146,497 GSF	11.69	43.50	0.19	1.48	0.43	3.19	1,710	6,370	28	217	63	467
6	General Office	213,500 GSF	11.69	43.50	0.19	1.48	0.43	3.19	2,490	9,290	41	316	92	681
7	Town House (Condo.)	50 D.U.	5.60	5.60	0.30	0.10	0.80	0.50	280	280	15	5	40	25

* PM Peak Hour is 4:30 to 5:30 PM

TABLE 1 B

TRIP GENERATION ANALYSIS – LAND USE OPTION NO. 2

Parcel	Proposed Land Use	Size	Trip Gen. Rates (Daily)		Trip Gen. Rates – Peak *				Trip Ends per day		Trip Ends / Peak Hour *			
					Avg.		Max.				Avg.		Max.	
			Avg.	Max.	In	Out	In	Out	Avg.	Max.	In	Out	In	Out
1	Town House (Condo.)	120 D.U.	5.60	5.60	0.30	0.10	0.80	0.50	672	672	36	12	96	60
2	Hotel	400 rms.	9.58	11.00	0.43	0.43	0.67	0.67	3,830	4,400	172	172	268	268
3	Office Park	93,472 GSF	20.65	30.30	0.33	1.84	1.00	3.24	1,930	2,830	31	172	93	303
4	Office Park	143,360 GSF	20.65	30.30	0.33	1.84	1.00	3.24	2,960	4,340	47	264	143	465
5	Office Park	146,497 GSF	20.65	30.30	0.33	1.84	1.00	3.24	3,025	4,440	48	270	146	475
6	Office Park	213,500 GSF	20.65	30.30	0.33	1.84	1.00	3.24	4,410	6,470	70	393	214	692
7	Town House (Condo.)	50 D.U.	5.60	5.60	0.30	0.10	0.80	0.50	280	280	15	5	40	25

* PM Peak Hour is 4:30 to 5:30 PM

TABLE 1 C

TRIP GENERATION ANALYSIS – ADJUSTED RATES

Parcel	Proposed Land Use	Size	Trip Gen. Rates (Daily)	Trip Generation Rates * Peak Adjusted		Trip Ends	Trip Ends / Peak Hour * Adjusted	
			Adjusted	In	Out	Per Day Adjusted	In	Out
1	General Office	89,000 GSF	27.6	0.31	2.34	2,460	28	208
2	Retail	194,400 GSF	82.05	3.55	3.95	15,950	690	768
3	Retail	93,472 GSF	82.05	3.55	3.95	7,670	332	369
4	General Office	143,360 GSF	27.6	0.31	2.34	3,960	45	335
5	General Office	146,497 GSF	27.6	0.31	2.34	4,040	45	343
6	General Office	213,500 GSF	27.6	0.31	2.34	5,890	66	500
7	Town House (Condo)	50 units	5.6	0.55	0.30	280	28	15

* PM Peak Hour is 4:30 to 5:30 PM

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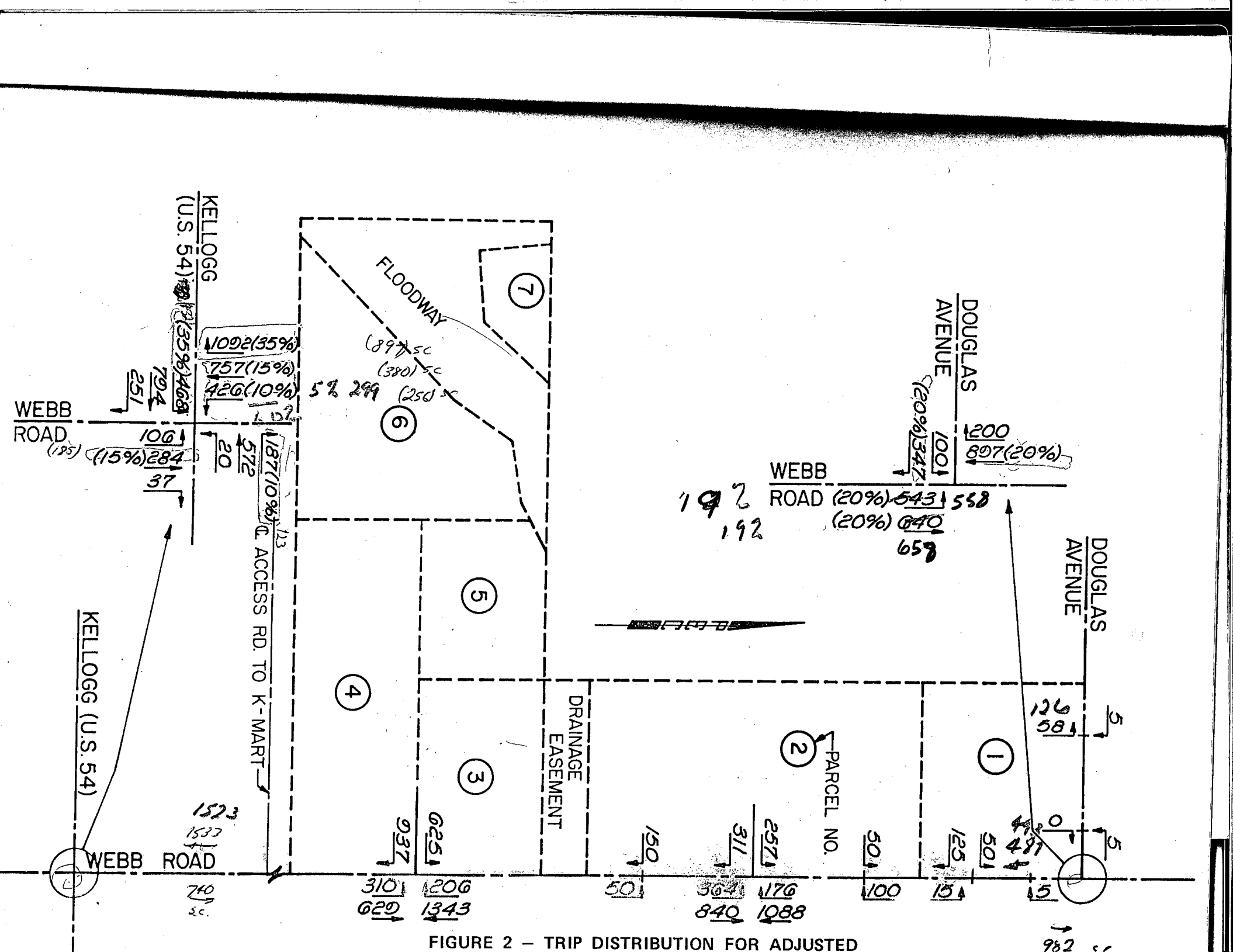

FIGURE 2 – TRIP DISTRIBUTION FOR ADJUSTED

TABLE 2
CAPACITY ANALYSIS SUMMARY

LOCATION	TRIP GEN. RATE	DESCRIPTION OF GEOMETRICS	METHOD OF ANALYSIS (1)	OVERALL LEVEL OF SERVICE	REMARKS
Webb & Douglas	Adjusted	Left turn bay – south approach Free Right – north approach Two thru lanes on Webb – both directions	2	C	Assumed signalized with 3-phase controller
Major Entrance Into Parcel 2	Adjusted	Decel lane with free right – in Left turn bay – in Separate left turn bay – out Free right with accel lane – out	1	E	
Major Entrance Into Parcel 3	Adjusted	Decel lane with free right – in Left turn bay – in Dual left turn bay – out Free right with accel lane – out	1	E	Signalization required; Resultant level of Service D
Webb & Kellogg	Adjusted	Two thru lanes each approach Free right east, west, & north approaches Dual left turn lanes – west approach Single left turn lane – all other approaches	2	B	Assumed signalized with 8-phase controller; with variable phase selection

(1) 1 – HRB interim report No. 212, Unsignalized Intersections
2 – Critical Lane Analysis