

OFFICE OF THE CITY MANAGER
DES MOINES, IOWA

CITY COUNCIL COMMUNICATION 97-073
FEBRUARY 17, 1997 AGENDA

SUBJECT:	TYPE:	SUBMITTED BY:
31ST AND KINGMAN INTERSECTION WIDENING AND TRAFFIC SIGNAL INSTALLATION	◆ RESOLUTION ORDINANCE RECEIVE/FILE	HAROLD E. SMITH CITY ENGINEER

SYNOPSIS —

As part of the review process for the 30th/31st Street Realignment Project, the Drake Neighborhood Association requested that the City consider installation of traffic signals on 31st Street at either Kingman Boulevard or Cottage Grove Avenue. Staff has conducted a traffic study of this area and recommends that a traffic signal be installed at the intersection of 31st Street and Kingman Boulevard, along with widening of 31st Street north and south of Kingman Boulevard to provide left-turning lanes. Staff also recommends that an application be submitted to the Iowa Department of Transportation (IDOT) for Traffic Safety Funds for a portion of the construction costs, which are estimated to be \$210,000.

FISCAL IMPACT —

Based on accident history at this location, it is estimated that \$135,000 could be obtained from the IDOT's Traffic Safety Improvement Program. The remaining cost, approximately \$75,000, would be programmed in a future CIP.

RECOMMENDATION —

Approve authorization for an application to be submitted to the IDOT for Traffic Safety Funds for the improvement of 31st Street and Kingman Boulevard, consisting of installation of traffic signals and intersection widening.

BACKGROUND —

Following a request from the Drake Neighborhood Association, staff prepared a traffic study for the intersection of 31st Street and Kingman Boulevard. A copy of this report, dated February 1997, is attached.

This item was reviewed by the Traffic Safety Committee and approved at their February 11, 1997, meeting.

Attachment

31st Street and Kingman Boulevard
 Traffic Signal Study
 City of Des Moines Engineering Department
 Division of Traffic and Transportation
 February, 1997

Background:

As part of the public input phase of the 30th/31st Street Corridor Improvement project which is proposed to realign 30th Street and 31st Street in the vicinity of University and Forest Avenues, a request was made from the Drake Neighborhood Association to study the need for a traffic signal on 31st Street between University Avenue and I-235. Concern was expressed over the number of accidents that have occurred at the intersections of 31st Street with Cottage Grove Avenue and with Kingman Boulevard, and also the difficulty that pedestrians currently have in crossing 31st Street in this area.

Staff has conducted a traffic study of the intersections of 31st Street with Cottage Grove Avenue and with Kingman Boulevard. This study included a review of the accident history at these locations, and also a review of the existing and future traffic volumes along the 31st Street corridor.

Existing Conditions:

Traffic counts were taken at these intersections in mid-December, 1996. These counts indicated traffic volumes of 2,150 vehicles per day on Kingman Boulevard and 2,350 vehicles per day on Cottage Grove. The counts taken on 31st Street recorded volumes of 9,900 vehicles per day. In May, 1993, the same area of 31st Street showed traffic volumes of 12,100 vehicles per day. Because the recent counts taken may not reflect the average volumes throughout the year, the higher volume counts on 31st Street were used for the traffic signal analysis.

Turning movement counts were also conducted during the morning and evening peak periods at each of the two intersections. The evening period had the highest volumes. The following table summarizes these counts:

At Cottage Grove:	Left	Thru	Right	Total
Eastbound a.m.	9	30	34	73
Westbound a.m.	10	15	14	39
Eastbound p.m.	11	32	52	95
Westbound p.m.	55	55	51	161

At Kingman:	Left	Thru	Right	Total
Eastbound a.m.	4	61	68	133
Westbound a.m.	25	16	4	45
Eastbound p.m.	18	45	29	92
Westbound p.m.	33	32	7	72

The accident history between 1992 through 1996 was reviewed at each location. A summary of the accidents by type is listed below:

Accident Type	31st/Kingman			31st/Cottage Grove			Total		
	PDO	PI	Total	PDO	PI	Total	PDO	PI	Total
Right Angle	12	9	21	18	8	26	30	17	47
Left turning	1	2	3	6	0	6	7	2	9
Rear end	2	1	3	1	1	2	3	2	5
Pedestrian			0	0	1	1	0	1	1
Out of Control			0	1	0	1	1	0	1
Parked vehicle			0	1	0	1	1	0	1
Total	15	12	27	27	10	37	42	22	64

The accident rate for the intersection of 31st Street and Kingman Boulevard is 1.27 Accidents per million entering vehicles (Acc/MEV). The rate for 31st Street and Cottage Grove Avenue is 1.71 Acc/MEV. These rates are higher than normal (0.75 to 1.00 Acc/MEV) but are below what is generally considered as a "high-accident location" (above 2.25 Acc/MEV).

There have been 5 right-angle accidents per year at 31st and Cottage Grove in both 1995 and 1996, and 6 right-angle accidents per year at 31st and Kingman for 1995 and 1996. These are generally the type of accident that can be reduced by installation of traffic signals.

Review of Traffic Signal Warrants:

Because Kingman Boulevard and Cottage Grove Avenue are parallel streets and only 2 blocks (700 feet) apart, it would not be appropriate to install traffic signals on 31st Street at both locations. One traffic signal placed in the appropriate intersection could both benefit the side-street traffic and at the same time minimize the stops and delays imposed on 31st Street traffic. If signals were justified along this corridor, Kingman Boulevard would be the logical location, since it is located midway (approximately 1/4 mile) between the existing traffic signals on 31st Street at University Avenue and at I-235.

The traffic volumes and accident history at 31st and Kingman were compared to the warrants for traffic signal installation as prescribed in the Iowa Manual on Uniform Traffic Control Devices, to determine if traffic signals are justified. Based on existing traffic counts and right-angle accident experience, traffic signals are warranted for 7 of the required 8 hours. It is anticipated that a portion of the traffic that currently uses Cottage Grove would be drawn to Kingman Boulevard if signals were installed. Assuming this diversion would be 25 percent of the through and southbound turning traffic from Cottage Grove, the 31st/Kingman signal warrants are met for 9 hours. Traffic volumes on 31st Street are also expected to increase to 15,000 vehicles per day once the I-235 reconstruction project is completed.

Staff Recommendation:

Traffic signals are warranted at the intersection of 31st and Kingman based on a combination of volume and accident experience. However, in order to place traffic signals at this intersection, 31st Street should be widened to provide for left-turn lanes. North of the Kingman Boulevard, this work can be accomplished within the existing right-of-way, except for a small sliver needed on the northwest corner. South of Kingman, An additional six-foot strip of right-of-way will be required from each side of 31st Street. The cost of this widening and signal installation is estimated to be \$210,000.

The City should pursue funding of this improvement through the Iowa Department of Transportation's Traffic Safety Improvement Program. Based on the projected benefit/cost ratio for this project, it is estimated that approximately \$135,000 could be obtained through this source of funds. The remainder of the costs (\$75,000) would be funded by the City. Staff recommends that an application be submitted by July 1, 1997, for the Iowa DOT's 1998 Traffic Safety Improvement Program. If approved by IDOT, the construction timetable would be planned to coincide with the 30th/31st Street realignment project, which is currently estimated for 1998 or 1999.

Signal Warrant Analysis

Location: 31st and Kingman

Date: Dec-96

Street Name=> No. of Appr. Lanes=> Approach Speed=> Time	Main Street 31st 1 30 2-way	Side Street Kingman 2 2 25 25 1-way 1-way		Warrant #1				Warrant #2			
				100%		80%		100%		80%	
				Maj	Min	Maj	Min	Maj	Min	Maj	Min
				500	200	400	160	750	100	600	80
12 - 1 am	184	20	13								
1 - 2 am	152	6	10								
2 - 3 am	78	5	8								
3 - 4 am	41	3	4								
4 - 5 am	58	8	4								
5 - 6 am	142	17	8								
6 - 7 am	517	56	23	X		X					
7 - 8 am	783	147	59	X		X		X	X	X	X
8 - 9 am	564	109	50	X		X		X			X
9 - 10 am	547	67	40	X		X					
10 - 11 am	505	57	54	X		X					
11 - 12 am	657	83	60	X		X					
12 - 1 pm	715	85	65	X		X				X	X
1 - 2 pm	632	88	69	X		X				X	X
2 - 3 pm	757	107	71	X		X		X	X	X	X
3 - 4 pm	818	132	80	X		X		X	X	X	X
4 - 5 pm	906	120	93	X		X		X	X	X	X
5 - 6 pm	940	124	97	X		X		X	X	X	X
6 - 7 pm	683	101	52	X		X		X	X	X	X
7 - 8 pm	650	73	36	X		X				X	X
8 - 9 pm	645	52	48	X		X				X	
9 - 10 pm	516	49	40	X		X					
10 - 11 pm	390	39	24								
11 - 12 pm	244	30	20								
Individual Hours Met=>				16	0	16	0	5	7	11	10
Warrant Hours met=>				0		0		5		9	

Date: 26-Dec-96 Comments: Using 31st count May 14, 1993, and overlaying Cottage Grove onto Kingman traffic (25% of thru and southbd movements).
 By: MPR

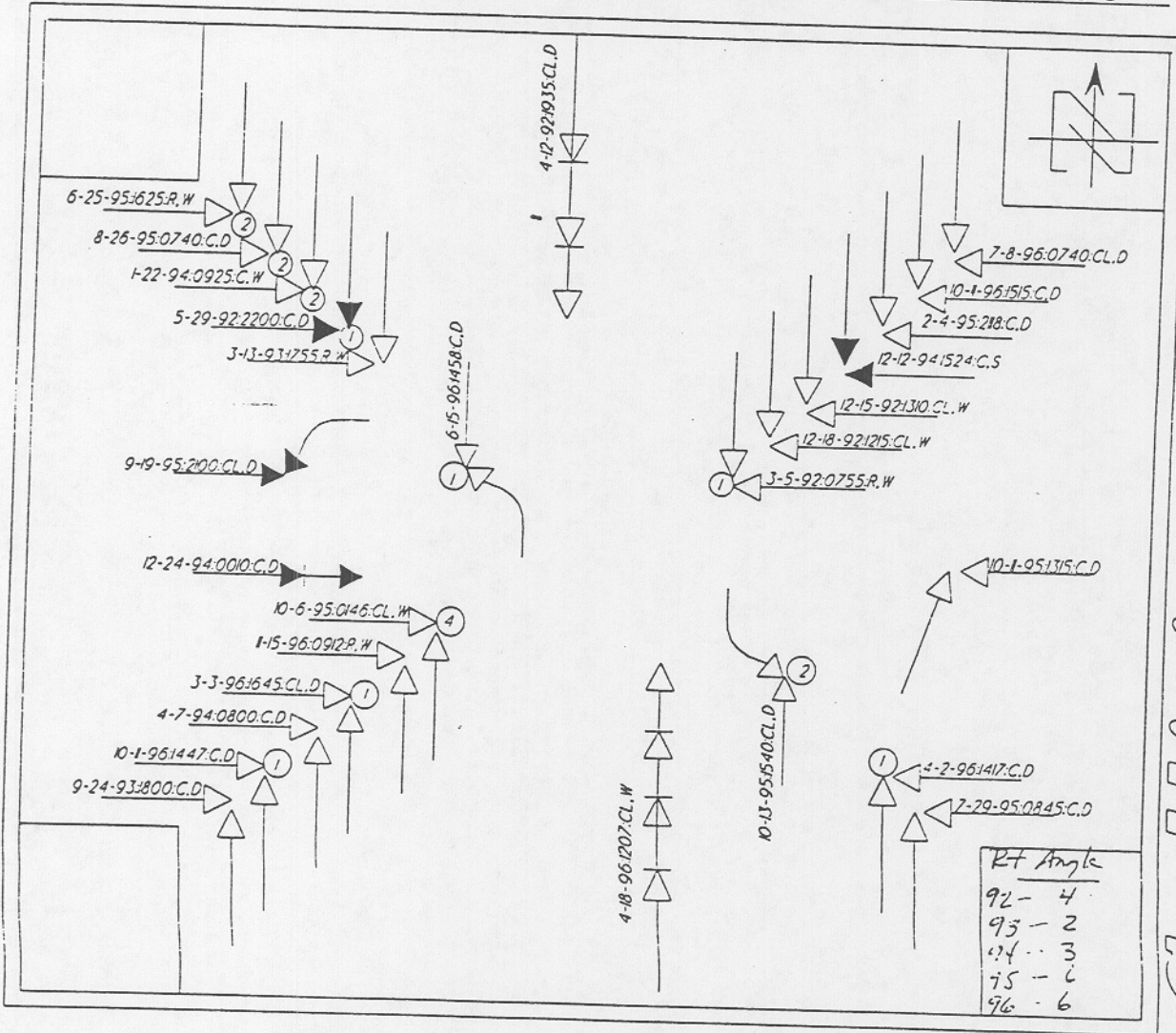
City of Des Moines

Traffic & Transportation Dept

Location: 31st Street & Kingman Boulevard

County: Polk City: Des Moines Date: 27 Dec 96

By: ALM Period - From: 1 Jan 92 To: 27 Dec 96



Collision Diagram

← Daylight ← Dark

- ↔ Motor Vehicle Backing
- Moving Motor Vehicle
- ⊗ Pedestrian
- ⊘ Non-Contact Vehicle
- ⊠ Parked Vehicle
- ⊡ Fixed Object:
- ⊔ Recr - End
- ⊕ Sideswipe
- ⊖ Out of Control
- ⊙ Fatal Accident
- ⊗ Personal Injury Accident
- ⊘ Property Damage Accident

Pavement: D-Dry, I-Icy, W-Wet
 Weather: C-Clear, F-Fog,
 R-Rain, SL-Sleet,
 S-Snow, WI-Windy,
 CL-Cloudy, U-Unknown

Accident Summary

Type	Fatal	Injury	P.D.	Total
Right Angle		9	12	21
Head - On				
Sideswipe				
M.V. Pedestrian				
Fixed Object				
Rear End		1	2	3
Parked Vehicle				
Out of Control				
L. Turn Collision		2	1	3
R. Turn Collision				
Totals		12	15	27

$$Acc\ Rate = \frac{27}{9} \times 10^6 = 1.27\ Acc/Inve-$$

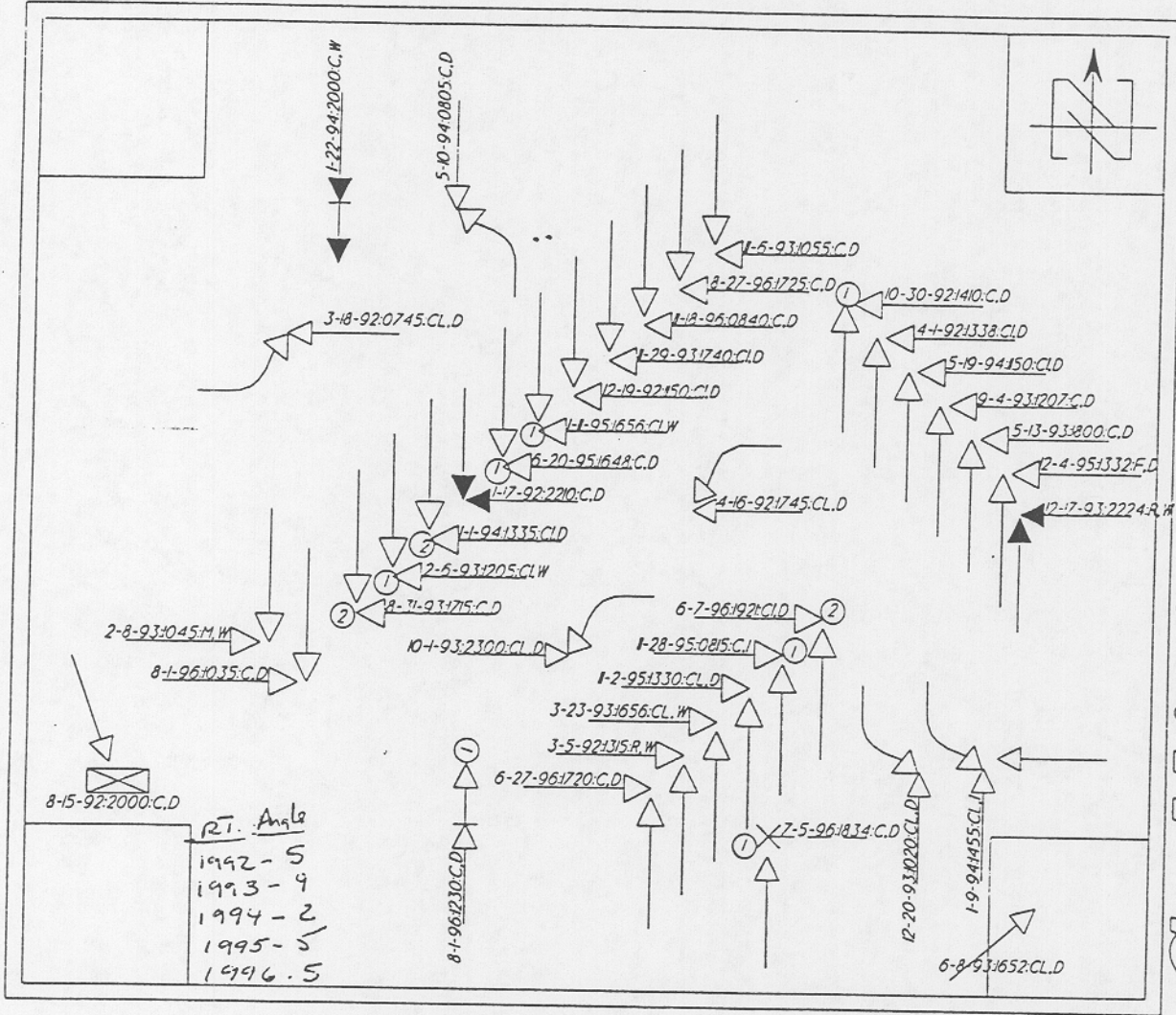
City of Des Moines
Traffic & Transportation Dept.

Location: 31st Street & Cottage Grove

County: Polk City: Des Moines Date: 27 Dec 96

By: ALM Period - From: 1 Jan 92 To: 27 Dec 96

Collision Diagram



Accident Summary

Type	Fatal	Injury	P.D.	Total
Right Angle		8	18	26
Head - On				
Sideswipe				
M.V. Pedestrian		1		1
Fixed Object				
Rear End		1	1	2
Parked Vehicle			1	1
Out of Control			1	1
L. Turn Collision			6	6
R. Turn Collision				
Totals		10	27	37

Acc Rate = $\frac{37}{5} \times 10^6 / 365(9500-2350) = 1.71 \text{ Acc/mey}$

DATE: 5/14/93
 DAY: Friday

Street: 31st Street
 LOCATION: University Ave, S of

HOURS	5/12		5/13		5/14		Average Weekday Traffic		TOTALS
	NB	SB	NB	SB	NB	SB	NB	SB	
12AM-1AM			77	78	100	113	89	96	184
1AM-2AM			76	61	70	93	73	79	152
2AM-3AM			34	31	51	39	43	35	78
3AM-4AM			10	29	19	24	15	27	41
4AM-5AM			16	47	13	39	15	43	58
5AM-6AM			36	110	31	107	31	109	142
6AM-7AM			80	437	85	432	83	435	517
7AM-8AM			190	585	209	582	200	584	783
8AM-9AM			192	352	219	361	206	358	564
9AM-10AM			217	292	233	352	225	322	547
10AM-11AM	104	255	205	308	242	402	184	322	505
11AM-12PM	236	335	260	407	317	415	271	386	657
12PM-1PM	288	383	313	410	353		318	397	715
1PM-2PM	267	378	239	379			253	379	632
2PM-3PM	299	416	326	473			313	445	757
3PM-4PM	402	402	384	447			393	425	818
4PM-5PM	420	448	502	411			461	445	906
5PM-6PM	519	403	514	414			532	409	940
6PM-7PM	283	374	297	411			290	393	683
7PM-8PM	238	414	265	383			252	399	650
8PM-9PM	223	400	241	426			232	413	645
9PM-10PM	216	288	219	309			218	299	516
10PM-11PM	158	209	203	210			181	210	390
11PM-12AM	95	120	131	142			113	131	244
TOTALS	3,748	4,825	4,570	7,185	1,942	3,962	4,987	7,132	12,120

Traffic Count

City of Des Moines

DATE: December 16 - December 18, 1996

DAY: Monday - Wednesday

STREET: Kingman Boulevard
LOCATION: 31st Street, E & W of

HOURS	12/16/96		12/17/96		12/18/96		Average Weekday Traffic		TOTALS
	EB	WB	EB	WB	EB	WB	EB	WB	
12AM-1AM									
1AM-2AM			11	7	24	12	18	10	27
2AM-3AM			2	5	10	10	6	8	14
3AM-4AM			2	6	8	7	5	7	12
4AM-5AM			3	0	2	5	3	3	5
5AM-6AM			8	4	4	1	6	3	9
6AM-7AM			12	7	19	7	16	7	23
7AM-8AM			52	19	47		50	19	69
8AM-9AM			130	51	130		130	51	181
9AM-10AM			98	38	94		96	38	134
10AM-11A	58	35	56	35	60	23	58	29	87
11AM-12PM	59	44	45	41	36	52	46	43	89
12PM-1PM	77	55	79	45			69	45	114
1PM-2PM	67	46	78	47			70	51	121
2PM-3PM	93	66	89	48			73	52	124
3PM-4PM	129	66	99	68			91	57	148
4PM-5PM	111	79	91	65			114	67	181
5PM-6PM	114	76	94	82			101	72	173
6PM-7PM	98	43	76	31			104	79	183
7PM-8PM	62	35	65	21			87	37	124
8PM-9PM	41	41	48	35			64	28	92
9PM-10PM	43	40	39	24			45	38	83
10PM-11PM	33	14	33	20			41	32	73
11PM-12AM	25	17	27	13			33	17	50
TOTALS	1,010	657	1,299	769	434	117	1,348	804	2,153

Traffic Count

City of Des Moines

DATE: December 16 - December 18, 1996

DAY: Monday - Wednesday

STREET: Cottage Grove

LOCATION: 31st Street, E & W of

HOURS	12/16/96		12/17/96		12/18/96		Average Weekday Traffic		TOTALS
	EB	WB	EB	WB	EB	WB	EB	WB	
	12AM-1AM			9		5	18	7	
1AM-2AM			0		3	12	2	12	14
2AM-3AM			2		1	7	2	7	9
3AM-4AM			3		0	5	2	5	7
4AM-5AM			7		7	5	7	5	12
5AM-6AM			3		6	9	5	9	14
6AM-7AM			30		22	24	26	24	50
7AM-8AM			77		76	46	77	46	123
8AM-9AM			54		61	60	58	73	131
9AM-10AM			47		37	51	42	68	110
10AM-11A	53		49		65		51	65	116
11AM-12PM	74		54		88		64	88	152
12PM-1PM	78		56		82		67	82	149
1PM-2PM	67		67		100		67	100	167
2PM-3PM	76		66		84		71	84	155
3PM-4PM	81		80		81		81	81	162
4PM-5PM	87		82		127		85	127	212
5PM-6PM	85		100		111		93	111	204
6PM-7PM	61		64		90		63	90	153
7PM-8PM	44		36		49		40	49	89
8PM-9PM	28		32		60		30	60	90
9PM-10PM	39		30		51		35	51	86
10PM-11PM	28		23		40		26	40	66
11PM-12AM	21		13		30		17	30	47
TOTALS	822	0	984	1,228	218	237	1,012	1,325	2,337

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CONCRETE 1910

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KINGMAN

12" PIPE

ASPHALT 1915

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- - proposed widening
- ▨ - add 1 R.O.W.

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HILL

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31 ST / KINGMAN

Intersection Improvement

1/2/47