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technical memorandum

Date: June 21, 2016

To: Steven Loveland, PE
From: Taryn Juidici, PE

Re: Traffic Volume Data and Travel Forecasting
Nixon Road Corridor

Traffic Data Collection

Traffic data was collected by Traffic Data Collection (TDC) on Tuesday February 23, 2016. The University of Michigan and Ann Arbor Public Schools were both in session during the counts. Traffic data collected included 24-hour and 6-hour video classification intersection turning movement counts recorded and logged using Miovision video scout cameras. 24-hour automatic traffic recorder volume counts were also collected during this time. The traffic data was processed into 15-minute and 60-minute aggregate summaries to identify peak period volumes for analysis.

The February count represents a typical day for motor vehicle traffic. With temperatures below freezing, pedestrian and bicycle activity were anticipated to be well below a typical warm weather day. Additional data was collected on Tuesday May 24, 2016. Ann Arbor Public Schools were in session during this count. The University of Michigan was in session for the Spring/Summer Term. Traffic data collected included 12-hour video and manual pedestrian and bicycle volume counts. Data was collected between 7:30 AM and 7:30 PM.

The average daily traffic (ADT) of Nixon Road ranged from 4,576 vehicles north of Green Road to 8,658 vehicles at the intersection with Plymouth. The morning peak occurs between 7:45am and 8:45am, and the afternoon peak occurs between 4:45 pm and 5:45 pm.

Table 1 – Existing 2016 Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	-	-	-	93	-	7	-	81	19	2	306	-
Nixon at Dhu Varren/Green	13	149	148	87	62	26	59	61	47	131	256	12
Nixon at Haverhill	-	-	-	15	-	3	-	164	3	1	491	-
Nixon at Traver	46	-	130	-	-	-	125	176	-	-	435	83
Nixon at Clague	-	-	-	33	-	72	-	221	73	87	470	-
Nixon at Meade/Bluett	2	1	16	112	0	23	3	273	40	26	477	0
Nixon at Sandalwood/Aurora	1	0	30	33	0	2	22	303	17	10	608	2
Nixon at Huron Pkwy	6	69	29	24	48	222	12	119	33	285	343	46
Nixon at Plymouth	83	610	104	44	654	88	10	9	5	125	78	157
Huron Pkwy at Plymouth	2	572	132	359	730	108	145	185	152	118	289	14

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Table 2 – Existing 2016 Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	-	-	-	46	-	2	-	341	92	4	93	-
Nixon at Dhu Varren/Green	21	85	98	53	159	158	127	254	92	39	84	16
Nixon at Haverhill	-	-	-	7	-	1	-	472	11	6	235	-
Nixon at Traver	28	-	64	-	-	-	84	501	-	-	204	39
Nixon at Clague	-	-	-	34	-	26	-	563	13	12	256	-
Nixon at Meade/Bluett	1	1	3	46	1	18	15	559	77	23	269	1
Nixon at Sandalwood/Aurora	0	0	41	30	1	20	28	644	43	9	320	3
Nixon at Huron Pkwy	71	68	40	58	71	280	25	362	61	126	239	26
Nixon at Plymouth	181	745	15	11	915	112	96	64	38	218	26	158
Huron Pkwy at Plymouth	6	820	177	186	912	115	207	296	283	119	158	17

Background Growth

In order to analyze the impacts of any future roadway improvements, traffic data was projected to 2035, the horizon year of the study. Traffic projections were based on WATS projections, which consider local and regional factors such as population, household, and employment. The WATS annual growth projections within the study area ranged from just under 0.2% south of Green to just over 0.6% north of Green. These growth projections were compared with growth factors used in previous corridor and traffic impact studies completed by Opus, Midwestern Consulting and Traffic Engineering Consultants. In order to account for the general impacts of traffic growth, a growth factor of 0.7% per year was used, compounded to the projected year of 2035. The selected growth rate is in line with the WATS recommendations and is the same order of magnitude used in previous studies.

Table 3 – Background Growth Adjusted Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	-	-	-	107	-	8	-	93	22	2	352	-
Nixon at Dhu Varren/Green	15	171	170	100	71	30	68	70	54	151	294	14
Nixon at Haverhill	-	-	-	17	-	3	-	189	3	1	565	0
Nixon at Traver	53	-	149	-	-	-	144	202	-	-	500	95
Nixon at Clague	-	-	-	38	-	83	-	254	84	100	540	-
Nixon at Meade/Bluett	2	1	18	129	0	26	3	314	46	30	548	0
Nixon at Sandalwood/Aurora	1	0	34	38	0	2	25	348	20	11	699	2
Nixon at Huron Pkwy	7	79	33	28	55	255	14	137	38	328	394	53
Nixon at Plymouth	95	701	120	51	752	101	11	10	6	144	90	181
Huron Pkwy at Plymouth	2	658	152	413	839	124	167	213	175	136	332	16

Table 4 – Background Growth Adjusted Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	-	-	-	53	-	2	-	392	106	5	107	-
Nixon at Dhu Varren/Green	24	98	113	61	183	182	146	292	106	45	97	18
Nixon at Haverhill	-	-	-	8	-	1	-	543	13	7	270	-
Nixon at Traver	32	-	74	-	-	-	97	576	-	-	235	45
Nixon at Clague	-	-	-	39	-	30	-	647	15	14	294	-
Nixon at Meade/Bluett	1	1	3	53	1	21	17	643	89	26	309	1
Nixon at Sandalwood/Aurora	0	0	47	34	1	23	32	740	49	10	368	3
Nixon at Huron Pkwy	82	78	46	67	82	322	29	416	70	145	275	30
Nixon at Plymouth	208	857	17	13	1052	129	110	74	44	251	30	182
Huron Pkwy at Plymouth	7	943	203	214	1049	132	238	340	325	137	182	20

Development Related Growth

In addition to the background growth, traffic generated by individual developments near the study area is anticipated. These include the Nixon Farms and Woodbury developments proposed along Nixon Road. In addition to these approved developments, the Opus study included three additional potential developments located further west.

Nixon Farms

A Traffic Impact Study for the proposed Nixon Farms property was completed in 2014 by Traffic Engineering Consultants. In accordance with standard industry practice, the study used the ITE Trip Generation Manual with the 9th edition data set to generate traffic. Trips were generated using the Luxury Condominium/ Townhouse land use (233). This land use generates a higher number of trips during the peak hours than the more common Residential Condominium/ Townhouse land use (230). The Impact Study anticipates the proposed development will generate 265 trips during the AM Peak Hour and 260 trips during the PM Peak Hour. Trips were distributed using existing traffic patterns.

Table 5 – Nixon Farms Generated Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	7	0	61	0	0	0	18	13	0	0	4	2
Nixon at Dhu Varren/Green	9	17	37	5	5	5	20	17	17	17	36	12
Nixon at Haverhill	34	0	34	0	0	0	11	20	0	0	68	10
Nixon at Traver	0	-	0	-	-	-	0	31	-	-	102	0
Nixon at Clague	-	-	-	0	-	0	-	31	0	0	102	-
Nixon at Meade/Bluett	0	0	0	0	0	3	0	28	0	6	96	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	28	0	0	96	0
Nixon at Huron Pkwy	2	0	0	0	0	14	0	12	0	44	45	7
Nixon at Plymouth	10	0	0	0	0	0	0	2	0	0	12	33
Huron Pkwy at Plymouth	0	0	0	0	0	6	0	8	0	21	23	0

Table 6 – Nixon Farms Generated Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	3	0	28	0	0	0	49	7	0	0	10	6
Nixon at Dhu Varren/Green	15	10	23	16	17	16	28	25	10	9	18	11
Nixon at Haverhill	19	0	13	0	0	0	22	44	0	0	25	32
Nixon at Traver	0	-	0	-	-	-	0	66	-	-	38	0
Nixon at Clague	-	-	-	0	-	0	-	66	0	0	38	-
Nixon at Meade/Bluett	0	0	0	0	0	2	0	64	0	2	36	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	64	0	0	36	0
Nixon at Huron Pkwy	7	0	0	0	0	25	0	32	0	13	21	2
Nixon at Plymouth	25	0	0	0	0	0	0	7	0	0	2	19
Huron Pkwy at Plymouth	0	0	0	0	0	8	0	17	0	7	6	0

Woodbury Club

A Traffic Impact Study for the proposed Woodbury Club property was completed in 2014 by Midwestern Consulting. In accordance with standard industry practice, the study used the ITE Trip Generation Manual with the 9th edition data set to generate traffic. Trips were generated using the Apartment Building land use (216). The Impact Study anticipates the proposed development will generate 118 trips during the AM Peak Hour and 146 trips during the PM Peak Hour. Trips were distributed using existing traffic patterns.

Table 7 – Woodbury Club Generated Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	0	0	0	0	0	0	0	23	0	0	84	0
Nixon at Dhu Varren/Green	1	0	0	0	0	7	0	15	0	28	56	5
Nixon at Haverhill	0	0	0	0	0	0	0	15	0	0	56	0
Nixon at Traver	0	0	0	-	-	-	0	15	-	-	56	0
Nixon at Clague	-	-	-	0	0	0	-	15	0	0	56	-
Nixon at Meade/Bluett	0	0	0	0	0	0	0	15	0	0	56	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	15	0	0	56	0
Nixon at Huron Pkwy	1	0	0	0	0	7	0	7	0	23	28	5
Nixon at Plymouth	6	0	0	0	0	0	0	1	0	0	9	19
Huron Pkwy at Plymouth	0	0	0	0	0	3	0	4	0	4	19	0

Table 8 – Woodbury Club Generated Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	0	0	0	0	0	0	0	45	0	0	90	0
Nixon at Dhu Varren/Green	5	0	0	0	0	28	0	57	0	15	30	3
Nixon at Haverhill	0	0	0	0	0	0	0	57	0	0	30	0
Nixon at Traver	0	0	0	-	-	-	0	57	-	-	30	0
Nixon at Clague	-	-	-	0	0	0	-	57	0	0	30	-
Nixon at Meade/Bluett	0	0	0	0	0	0	0	57	0	0	30	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	57	0	0	30	0
Nixon at Huron Pkwy	5	0	0	0	0	24	0	28	0	13	14	3
Nixon at Plymouth	21	0	0	0	0	0	0	7	0	0	2	12
Huron Pkwy at Plymouth	0	0	0	0	0	7	0	17	0	6	7	0

Pontiac Trail Development

An Intersection Improvement Study for the Nixon at Duh Varren and Green intersection was completed in 2015 by Opus. In addition to the proposed developments listed above, the study included three potential residential developments located in the adjacent Pontiac Trail Corridor. The North Sky, Barton Green and Brewer developments total 123 Acres. In accordance with standard industry practice, the study used the ITE Trip Generation Manual with the 9th edition data set to generate traffic. Trips were generated using codes for Single Family Residential (149), Multi-Family Residential (224) and Residential (420) land uses. Trips were distributed using existing traffic patterns. Once distributed the study anticipates that of the trips generated by these developments, only 33 trips during the AM Peak Hour and 73 trips during the PM Peak Hour will impact the Nixon corridor.

Table 9 – Pontiac Trail Development Generated Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	0	0	0	0	0	0	0	1	0	0	1	0
Nixon at Dhu Varren/Green	1	7	8	0	6	0	10	0	0	0	0	1
Nixon at Haverhill	0	0	0	0	0	0	0	10	0	0	8	0
Nixon at Traver	0	0	0	-	-	-	0	10	-	-	8	0
Nixon at Clague	-	-	-	0	0	0	-	10	0	0	8	-
Nixon at Meade/Bluett	0	0	0	0	0	0	0	10	0	0	8	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	10	0	0	8	0
Nixon at Huron Pkwy	1	0	0	0	0	6	0	3	0	3	4	1
Nixon at Plymouth	3	0	0	0	0	0	0	0	0	0	1	3
Huron Pkwy at Plymouth	0	0	0	0	0	2	0	4	0	1	2	0

Table 10 – Pontiac Trail Development Generated Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	0	0	0	0	0	0	0	1	0	0	3	0
Nixon at Dhu Varren/Green	1	10	9	0	28	0	22	0	0	0	0	3
Nixon at Haverhill	0	0	0	0	0	0	0	22	0	0	9	0
Nixon at Traver	0	0	0	-	-	-	0	22	-	-	9	0
Nixon at Clague	-	-	-	0	0	0	-	22	0	0	9	-
Nixon at Meade/Bluett	0	0	0	0	0	0	0	22	0	0	9	0
Nixon at Sandalwood/Aurora	0	0	0	0	0	0	0	22	0	0	9	0
Nixon at Huron Pkwy	2	0	0	0	0	9	0	11	0	3	6	0
Nixon at Plymouth	8	0	0	0	0	0	0	3	0	0	1	5
Huron Pkwy at Plymouth	0	0	0	0	0	3	0	6	0	1	2	0

Projected Volumes

The development-generated trips were added to the background adjusted traffic volumes to determine the 2035 Volumes used in this study. These volumes were compared with the future year volumes used in the Opus intersection improvement Study. The volumes used in the two studies are of similar magnitude. Slight differences in the numbers can be attributed to the normal daily fluctuations in traffic patterns, and are not cause for concern.

Table 11 – Projected 2035 Traffic Volumes AM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	7	0	61	107	0	8	18	130	22	2	441	2
Nixon at Dhu Varren/Green	26	195	215	105	82	42	98	102	71	196	386	32
Nixon at Haverhill	34	0	34	17	0	3	11	234	3	1	697	10
Nixon at Traver	53	-	149	-	-	-	144	258	-	-	666	95
Nixon at Clague	-	-	-	38	-	83	-	310	84	100	706	-
Nixon at Meade/Bluett	2	1	18	129	0	29	3	367	46	36	708	0
Nixon at Sandalwood/Aurora	1	0	34	38	0	2	25	401	20	11	859	2
Nixon at Huron Pkwy	11	79	33	28	55	282	14	159	38	398	471	66
Nixon at Plymouth	114	701	120	51	752	101	11	13	6	144	112	236
Huron Pkwy at Plymouth	2	658	152	413	839	135	167	229	175	162	376	16

Table 12 – Projected 2035 Traffic Volumes PM Peak

	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Nixon at Barclays	3	0	28	53	0	2	49	445	106	5	210	6
Nixon at Dhu Varren/Green	45	118	145	77	228	226	196	374	116	69	145	35
Nixon at Haverhill	19	0	13	8	0	1	22	666	13	7	334	32
Nixon at Traver	32	-	74	-	-	-	97	721	-	-	312	45
Nixon at Clague	-	-	-	39	-	30	-	792	15	14	371	-
Nixon at Meade/Bluett	1	1	3	53	1	23	17	786	89	28	384	1
Nixon at Sandalwood/Aurora	0	0	47	34	1	23	32	883	49	10	443	3
Nixon at Huron Pkwy	96	78	46	67	82	380	29	487	70	174	316	35
Nixon at Plymouth	262	857	17	13	1052	129	110	91	44	251	35	218
Huron Pkwy at Plymouth	7	943	203	214	1049	150	238	380	325	151	197	20