TN TDOT Department of Transportation

Planning Division Traffic Forecasting

The objective of our office is to collect, analyze, and develop traffic data for current and future projects.

Traffic Forecasting

It is used for many purposes such as estimating financial viability of projects, corridor planning, number of lanes, signal design, pavement design, length of turning lanes, and intersection analysis.

Traffic Forecasting is based on twenty years beyond the construction dates [Design Year]. The future is unknown, but special tools and models are used to estimate the future traffic forecasts.

Data provided is used to get base and Design Year average daily traffic, Design Hour Volumes, Truck percentages, and Axle Loads [ADL].

Requesting Traffic

• All requests for Traffic must fill out the Planning Traffic Form.

	TRAFFIC REPORT REQUEST
TO:	Tony Armstrong, <u>Tony Armstrong@tn.gov</u> Special Projects Office, Planning Division
FROM:	Aurora Davenport, Pavement Design, 505 Deadrick Street, Nashville, TN 37243
DATE:	<u>11/7/2021</u>
SUBJECT:	COUNTY: Davidson PIN: 131733.00 PROJECT NO. N/A PROJECT DESCRIPTION: SR-45, INTERSECTION @ S.R. 6 & S.R. 45. PROJECTED LETTING DATE: 1/29/2022.

TRAFFIC ASSIGNMENT:

BASE	YEAR		DES	IGN Y	'EAR		DES ROADV TRU	VAY %	DESIGN AVERAGE DAILY LOADS		
AADT	YEAR	AADT	DHV	%	YEAR	DIR. DIS.	DHV	AADT	FLEX	RIGID	

Reviewed By:

Approved By: _____ Date _____ Comments: _____ Date

S Furnish the 2022-2042 AADT & ADL for pavement design on a (6) lane roadway.

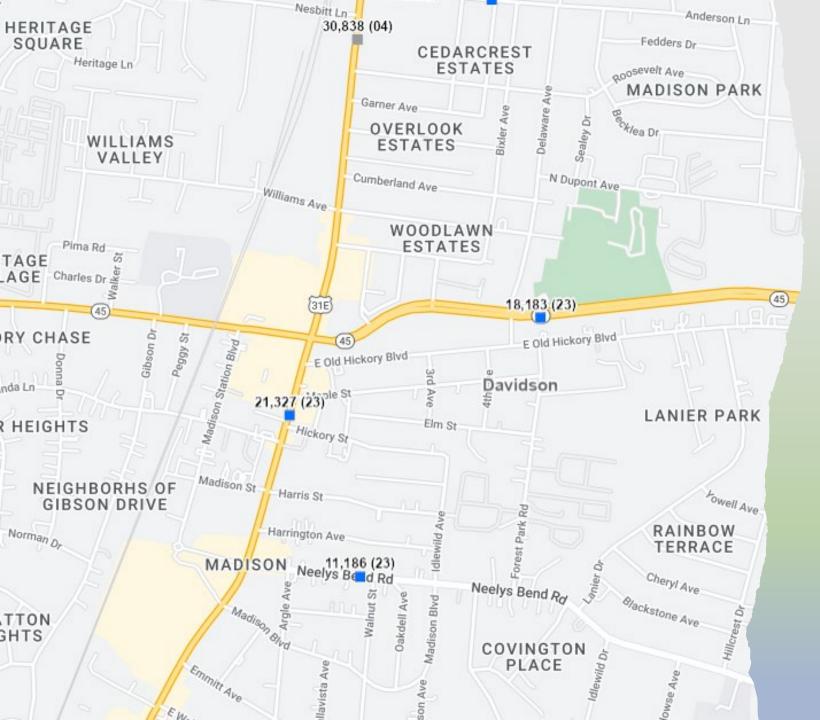
- Furnish the 20xx-20xx ADL for pavement design on a (number of lanes) lane roadway and the present ADT on all crossroads within the limits of the project.
- Furnish the 20xx-20xx ADL for pavement design on a (number of lanes) lane roadway and the present ADT on all crossroads outside the limits of the project. (specify locations)

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLS ARE NOT REQUIRED FOR ADTS OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS. SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

Types of Data Collected

- Traffic Volume Counts
- Tube Counts
- Ramp Counts
- Classification Counts
- Turning Movement Counts
- Trip Generation
- MPO/TPO Models



TN-Times Traffic Map

AADT a Turning Movement

Turning Movement Count

0600 - 0900 (Weekday 3h Session) (12-14-2021)

All vehicles

	٣	Ma	rthbou	und		Southbound				Eastbound					Westbound						
				Pike S	;	_			Pike N		TN	1-45 W			lvd		w	TN-45			
	Left			U-Turr		Left			U-Turr		Left			U-Turr		Left	Thru			App	Int
TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0600 - 0615	25	39	15	0	79	4	93	55	0	152	14	60	19	0	93	36	105	4	0	145	469
0615 - 0630	27	62	26	0	115	4	117	47	0	168	16	69	16	0	101	34	128	5	0	167	551
0630 - 0645	30	48	26	0	104	3	102	53	0	158	17	93	27	0	137	57	181	8	0	246	645
0645 - 0700	36	65	38	0	139	17	144	64	0	225	41	109	29	0	179	41	188	10	0	239	782
Hourly Total	118	214	105	0	437	28	456	219	0	703	88	331	91	0	510	168	602	27	0	797	2447
0700 - 0715	25	71	33	0	129	8	153	61	0	222	32	92	29	0	153	64	180	9	0	253	757
0715 - 0730	34	81	38	0	153	10	141	77	0	228	28	90	27	0	145	52	211	8	0	271	797
0730 - 0745	44	80	31	0	155	19	125	46	0	190	28	103	21	0	152	64	205	11	0	280	777
0745 - 0800	43	106	42	0	191	17	126	43	0	186	54	158	35	0	247	58	227	20	0	305	929
Hourly Total	146	338	144	0	628	54	545	227	0	826	142	443	112	0	697	238	823	48	0	1109	3260
0800 - 0815	26	109	28	0	163	14	166	43	0	223	32	109	42	0	183	67	144	20	0	231	800
0815 - 0830	28	93	32	0	153	10	126	40	0	176	43	124	48	0	215	60	110	19	0	189	733
0830 - 0845	36	115	33	0	184	16	147	56	0	219	33	84	44	0	161	49	113	12	0	174	738
0845 - 0900	32	122	25	0	179	21	113	34	0	168	48	83	36	0	167	81	112	17	0	210	724
Hourly Total	122	439	118	0	679	61	552	173	0	786	156	400	170	0	726	257	479	68	0	804	2995
																			-		
Grand Total	386	991	367	0	1744	143	1553	619	0	2315	386	1174	373	0	1933	663	1904	143	0	2710	8702
Approach %	22.13	56.82	21.04	0.00	-	6.18	67.08	26.74	0.00	-	19.97	60.73	19.30	0.00	-	24.46		5.28	0.00	-	
Intersection %	4.44	11.39	4.22	0.00	20.04	1.64	17.85	7.11	0.00	26.60	4.44	13.49	4.29	0.00	22.21	7.62	21.88	1.64	0.00	31.14	1
PHF	0.84	0.84 0.86 0.83 0.00 0.87					7 0.79 0.84 0.68 0.00 0.91			0.66 0.73 0.74 0.00 0.74				0.90 0.87 0.74 0.00 0.89				0.89			
																				1	

Turning Movement Count

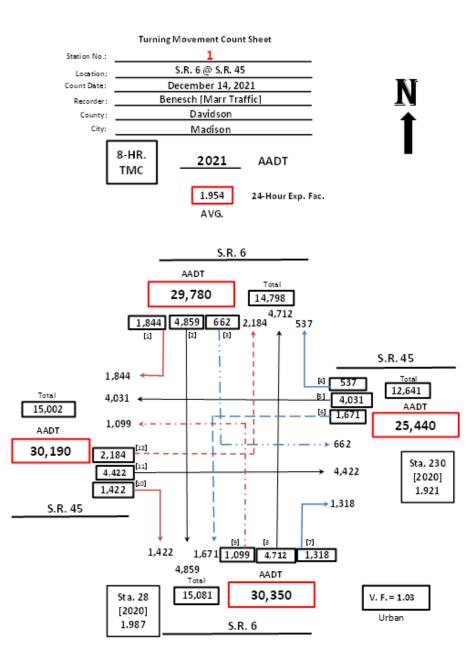
1100 - 1300 (Weekday 2h Session) (12-14-2021) All vehicles

		No	rthbou	ınd		Southbound					Eastbound					Westbound					
		TN-6 0	Gallatin	Pike S	ì		TN-6 G	iallatin	Pike N		TN	J-45 W	Old Hid	kory B	lvd			TN-45			
	Left	Thru	Right	Ú-Turr	Арр	Left	Thru	Right	Ú-Turr	Арр	Left	Thru	Right	U-Turr	Арр	Left	Thru	Right	Ú-Turr	Арр	Int
TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
1100 - 1115	47	160	48	0	255	13	136	81	0	230	60	125	67	0	252	64	99	9	0	172	909
1115 - 1130	31	186	47	0	264	27	144	88	0	259	89	120	46	0	255	41	100	19	0	160	938
1130 - 1145	51	183	45	0	279	19	169	83	0	271	69	111	45	0	225	56	109	18	0	183	958
1145 - 1200	40	183	39	0	262	27	161	62	0	250	70	124	43	0	237	47	92	13	0	152	901
Hourly Total	169	712	179	0	1060	86	610	314	0	1010	288	480	201	0	969	208	400	59	0	667	3706
1200 - 1215	31	175	47	0	253	17	143	69	0	229	71	126	52	0	249	65	107	20	0	192	923
1215 - 1230	42	164	40	0	246	24	174	56	0	254	68	115	73	0	256	54	91	18	0	163	919
1230 - 1245	28	198	52	0	278	17	168	60	0	245	66	125	66	0	257	51	79	14	0	144	924
1245 - 1300	22	145	23	0	190	16	156	68	0	240	92	126	73	0	291	43	95	25	0	163	884
Hourly Total	123	682	162	0	967	74	641	253	0	968	297	492	264	0	1053	213	372	77	0	662	3650
		_	_																		
Grand Total	292	1394	341	0	2027	160	1251	567	0	1978	585	972	465	0	2022	421	772	136	0	1329	7356
Approach %	14.41	68.77	16.82	0.00	-	8.09	63.25	28.67	0.00	-	28.93	48.07	23.00	0.00	-	31.68	58.09	10.23	0.00	-	
Intersection %	3.97	18.95	4.64	0.00	27.56	2.18	17.01	7.71	0.00	26.89	7.95	13.21	6.32	0.00	27.49	5.72	10.49	1.85	0.00	18.07	
PHF	0.75	0.98	0.95	0.00	0.95	0.83	0.91	0.86	0.00	0.93	0.84	0.95	0.89	0.00	0.95	0.80	0.94	0.88	0.00	0.89	0.97

Turning Movement Count

1500 - 1800 (Weekday 3h Session) (12-14-2021) All vehicles

		۴	No	rthbou	ınd		Southbound				۶	Fa	stbou	nd		Westbound					I I	
					Pike S	6			iallatin			TN		Old Hid		lvd			TN-45			
		Left			Ú-Turr		Left		Right		Арр	Left					Left	Thru		Ú-Turr	App	Int
	TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
	1500 - 1515	44	183	44	0	271	28	179	48	0	255	81	154	52	0	287	58	124	26	0	208	1021
	1515 - 1530	36	172	53	0	261	28	197	52	0	277	87	176	51	0	314	38	120	29	0	187	1039
	1530 - 1545	31	204	40	0	275	32	163	54	0	249	63	156	49	0	268	51	114	13	0	178	970
	1545 - 1600	36	203	47	0	286	23	156	53	0	232	90	184	59	0	333	47	109	19	0	175	1026
	Hourly Total	147	762	184	0	1093	111	695	207	0	1013	321	670	211	0	1202	194	467	87	0	748	4056
	1600 - 1615	41	180	49	0	270	20	141	64	0	225	108	198	42	0	348	50	127	13	0	190	1033
	1615 - 1630	35	225	58	0	318	17	188	47	0	252	101	179	33	0	313	47	90	24	0	161	1044
	1630 - 1645	39	185	49	0	273	48	172	57	0	277	117	229	53	0	399	54	133	20	0	207	1156
	1645 - 1700	40	199	61	0	300	34	151	64	0	249	93	210	52	0	355	57	134	22	0	213	1117
	Hourly Total	155	789	217	0	1161	119	652	232	0	1003	419	816	180	0	1415	208	484	79	0	771	4350
	1700 - 1715	32	198	55	0	285	32	199	53	0	284	117	186	46	0	349	46	102	23	0	171	1089
	1715 - 1730	29	171	50	0	250	34	177	54	0	265	111	201	44	0	356	51	113	18	0	182	1053
	1730 - 1745	36	214	49	0	299	21	167	54	0	242	107	201	52	0	360	49	115	22	0	186	1087
	1745 - 1800	22	193	55	0	270	42	165	58	0	265	138	202	51	0	391	39	74	29	0	142	1068
	Hourly Total	119	776	209	0	1104	129	708	219	0	1056	473	790	193	0	1456	185	404	92	0	681	4297
	Grand Total	421	2327	610	0	3358	359	2055	658	0	3072	1213	2276	584	0	4073	587	1355	258	0	2200	###
	Approach %	12.54	69.30	18.17	0.00	-	11.69	66.89	21.42	0.00	-	29.78	55.88	14.34	0.00	-	26.68	61.59	11.73	0.00	-	
L	Intersection %	3.31	18.32	4.80	0.00	26.43	2.83	16.18	5.18	0.00	24.18	9.55	17.92	4.60	0.00	32.06	4.62	10.67	2.03	0.00	17.32	
	PHF	0.88	0.95	0.88	0.00	0.92	0.77	0.88	0.89	0.00	0.95	0.94	0.90	0.92	0.00	0.91	0.91	0.90	0.90	0.00	0.91	0.95
																						1



Variation Factors [8]



Seasonal Factors By Day and Month for 1/1/2023 - 12/31/2023

Seasonal F	actors							
Group	Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Urban	Jan	1.431	1.026	0.999	0.987	0.98	0.936	1.14
Principal Arterial	Feb	1.344	0.989	0.932	0.961	0.99	0.907	1.104
	Mar	1.288	0.964	0.954	0.949	0.931	0.91	1.057
	Apr	1.249	0.958	0.926	0.936	0.923	0.901	1.015
	Мау	1.283	0.943	0.939	0.915	0.899	0.868	1.057
	Jun	1.285	0.996	0.941	0.945	0.917	0.874	1.053
	Jul	1.378	0.973	0.933	0.942	0.915	0.887	1.109
	Aug	1.369	0.954	0.916	0.924	0.907	0.872	1.085
	Sep	1.355	0.948	0.931	0.912	0.899	0.849	1.071
	Oct	1.376	0.969	0.927	0.93	0.914	0.87	1.072
	Nov	1.382	0.956	0.949	0.921	0.907	0.869	1.099
	Dec	1.364	0.924	0.922	0.909	0.893	0.868	1. <mark>1</mark> 23

Roadway Designations:

- 1. Freeway & Expressway
- 2. Lower FC (Rural County Rds.)
- 3. Rural Interstate
- 4. Rural Minor Arterial
- 5. Rural Principal Arterial
- 6. Urban Interstate
- 7. Urban Minor Arterial
- 8. Urban Principal Arterial

🕨 ... 🛛 Rural Principal Arterial

Urban Interstate Urban

Urban Minor Arterial Urban Principal Arterial

Traffic Counts

Station 28

Volume Count Report

Station 2	28
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AADT	0							Graph
	Year	AADT	DHV-30	К%	D %	PA	BC	Src
	2023	21,327	1,527	7	58	19,791 (93%)	1,536 (7%)	
	2022	28,597	2,375	8	53	27,194 (95%)	1,403 (5%)	
	2021	27,696 ⁷		8	53	25,287 (91%)	2,409 (9%)	
	2020	31,474	2,461	8	53	28,711 (91%)	2,770 (9%)	
	2019	29,881		10	57			
<<	<	> $>>$	1-5 of 3	9				

LOCATION INF	-0
Location ID	19000028
Туре	SPOT
Fnct'l Class	3
Located On	SR006
Loc On Alias	GALLATIN PK.
Direction	2-WAY
County	Davidson
Community	Nashville
MPO ID	
HPMS ID	
Agency	tdot

COUNT DATA INF	-0
Count Status	Accepted
Holiday	No
Start Date	Wed 3/11/2020
End Date	Thu 3/12/2020
Start Time	11:00:00 AM
End Time	11:00:00 AM
Direction	2-WAY
Notes	
Station	UL28272
Filename	20-03-12 J1900282 (Start
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	
Owner	jj01380

INTERVAL:15-M					
	1	5-min	Interv	al	Hourly
Time	1st	2nd	3rd	4th	Count
0:00-1:00	64	50	36	39	189
1:00-2:00	32	32	24	32	120
2:00-3:00	25	26	17	27	95
3:00-4:00	26	40	34	50	150
4:00-5:00	56	63	87	102	308
5:00-6:00	139	174	215	234	762
6:00-7:00	275	306	336	349	1,266
7:00-8:00	406	387	388	417	1,598
8:00-9:00	391	425	405	447	1,668
9:00-10:00	411	439	419	488	1,757
10:00-11:00 🔳	385	456	469	535	1,845
11:00-12:00	483	521	529	515	2,048
12:00-13:00	507	540	580	563	2,190
13:00-14:00	527	525	537	573	2,162
14:00-15:00	611	591	575	585	2,362
15:00-16:00	607	596	662	596	2,461
16:00-17:00	561	599	612	610	2,382
17:00-18:00	617	568	522	523	2,230
18:00-19:00	500	523	478	422	1,923
19:00-20:00	430	370	353	359	1,512
20:00-21:00	356	309	318	258	1,241
21:00-22:00	258	228	178	180	844
22:00-23:00	148	134	117	139	538
23:00-24:00	109	94	71	- 77	351
Total					32,002
AADT					31,474
AM Peak					:45-12:45 2,142
PM Peak				15	00-16:00: 2,461

Count Navigation: << < > >>

Directions: 2-WAY NB SB 😢

2010 Nashville MPO



MPO / TPO Models



Tools of the Trade

MPO / TPO Models

2040 Nashville MPO



2020 Classification Count

FHWA C	FHWA Classification 🕐															
Start Time	Motor cycle	Car	Pick up	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	Unk	Err	TOTAL
12:00 AM	0	269	35	0	3	0	1	4	1	0	1	0	0	0	0	314
1:00 AM	0	193	21	0	1	2	1	1	1	0	1	0	0	0	0	221
2:00 AM	0	164	19	0	1	1	0	1	1	0	0	0	0	0	0	187
3:00 AM	0	171	30	1	1	2	0	1	2	0	1	0	0	0	0	209
4:00 AM	0	256	57	0	5	4	0	4	9	0	0	1	1	0	0	337
5:00 AM	2	577	186	0	5	7	5	13	10	2	12	4	6	0	0	829
6:00 AM	3	798	221	1	16	10	16	38	9	6	38	25	52	0	0	1233
7:00 AM	11	1075	296	0	17	13	30	60	16	10	53	19	81	0	0	1681
8:00 AM	6	901	259	1	14	12	17	50	17	13	40	14	49	0	0	1393
9:00 AM	4	892	313	1	19	17	20	41	22	9	43	18	34	0	0	1433
10:00 AM	3	988	342	0	19	17	26	48	18	5	22	15	30	0	0	1533
11:00 AM	5	977	334	0	32	12	27	40	26	7	45	13	37	0	0	1555
12:00 PM	9	1051	356	1	25	10	32	63	16	7	35	23	33	0	0	1661
1:00 PM	8	1071	335	0	14	20	21	61	24	11	45	22	43	0	0	1675
2:00 PM	7	1185	351	0	18	14	30	62	20	11	69	28	49	0	0	1844
3:00 PM	6	1026	315	1	10	18	41	83	21	12	74	23	112	0	0	1742
4:00 PM	15	952	284	2	7	6	56	61	22	16	67	28	158	0	0	1674
5:00 PM	16	1001	266	3	4	23	42	79	16	20	102	36	142	0	0	1750
6:00 PM	5	1135	282	0	6	9	32	54	10	5	44	14	42	0	0	1638
7:00 PM	5	1057	222	0	7	8	13	34	8	5	22	13	10	0	0	1404
8:00 PM	1	952	148	0	5	3	8	15	6	2	12	4	4	0	0	1160
9:00 PM	5	794	123	0	5	5	10	16	3	0	9	3	2	0	0	975
10:00 PM	0	659	95	0	5	1	2	12	3	2	6	1	1	0	0	787
11:00 PM	0	448	57	0	1	0	3	5	0	0	3	1	1	0	0	519
TOTAL	111	18592	4947	11	240	214	433	846	281	143	744	305	887	0	0	27754

FHWA Vehicle Classification

Tools of the Trade

Vehicle Classification

Class I Motorcycles	0	Class 7 Four or more axle, single unit	
Class 2 Passenger cars		axie, single unit	
	610e		
		Class 8 Four or less sxle,	
		single trailer	
Class 3 Four tire,			
single unit		Class 9 S-Axle tractor semitration	
Class 4 Buses		Class 10 Six or more axle,	
		single trailer	
		Class I I Five or less skie, multi trailer	
Class 5 Two axle, six tire, single unit	offic	Class 12 Six sxle, multi-	
	To	trailer	
	Pro	Class 13 Seven or more axle, multi-trailer	
Class 6 Three axle, single unit			

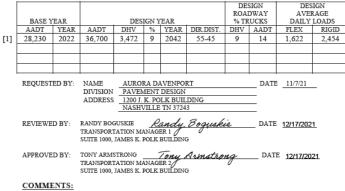
Completed Project

TENNESSEE DEPARTMENT OF TRANSPORTATION STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: <u>NH-45(36)</u> : 19S045-F8-003 COUNTY: <u>DAVIDSQN</u> PROJECT PIN NUMBER: <u>1</u> 31733.00	ROUTE: S.R. 45 CITY: MADISON			
PROJECT DESCRIPTION: INTERSECTION @ S.R. 6 &	S.R. 45			
[1] RESURFACING S.R. 451	FROM L.M. 7.13 TO L.M. 7.26			
DIVISION REQUESTING:				
	PAVEMENT DESIGN			
MAINTENANCE	STRUCTURES			
S.T.I.D.	SURVEY & ROADWAY DESIGN			
PROG. DEVELOPMENT & ADM.	TRAFFIC SIGNAL DESIGN			
PUBLIC TRANS. & AERO.	OTHER			
YEAR PROJECT PROGRAMMED FOR CONSTRUCTION	2022			

TRAFFIC ASSIGNMENT:

PROJECTED LETTING DATE: 2022



FURNISH THE 2022-2042 TRAFFIC DATA AND ADL'S FOR A SEVEN LANE ROADWAY.

THIS TRAFFIC IS BASED ON 2019 CYCLE COUNTS AND AN 8-HOUR TURNING MOVEMENT COUNT [DEC. 2021]. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE NASHVILLE MPO COMPUTER ASSIGNMENT MODEL. AADT's, DHV's AND ADL's ARE INCLUDED.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT. NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLS ARE NOT REQUIRED FOR ADTS OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS. SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 6/9/21)

TENNESSEE DEPARTMENT OF TRANSPORTATION STRATEGIC TRANSPORTATION INVESTMENT DIVISION

PROJECT NO.: NH-45(36) : 19S045-F8-003	ROUTE NO.: S.R. 45
COUNTY: DAVIDSON	CITY: MADISON
PROJECT DESCRIPTION: RESURFACING FROM L.M. 7.13 TO L.M.	7.26.

FAP Urban Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

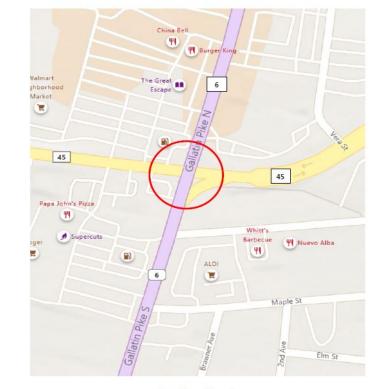
		ADT	Flexible		Rigid	
Type Vehicle		(No. Counted)	18-kip Factor	ADL	18-kip Factor	ADL
Pass. cars and						
motorc	ycles (1-2)	19,804	0.001	20	0.001	20
Pick-up	, Panel,					
Van	(3)	8,116	0.004	32	0.004	32
	Buses (4)	21	0.300	6	0.300	6
Sing.	2-axle,					
	6-tire (5)	179	0.260	47	0.260	47
Unit	3-axle or					
	more (6-7)	833	1.000	833	1.500	1,250
	4-axle (8)	923	0.640	591	0.800	738
Comb.	5-axle or					
	more (9-13)	2,589	1.200	3,107	1.900	4,919
	Totals					
(2032 AADT)		32,465		4,636		7,012

Suggested Percentages of Trucks in Design Lane

5,000 or less ADT	95%
5,000 - 10,000 ADT	90%
10,000 - 15,000 ADT	85%
15,000 - 20,000 ADT	80%
20,000 - 30,000 ADT	75%
30,000 - 40,000 ADT	70%
40,000 Plus	60%

No. of Lanes:			7				
% Trucks in Design Lane:			70%				
ADL in Design Lane:							
FLEX:	0.5	X	0.70	Х	4635.6	=	1,622
RIGID:	0.5	Х	0.70	Х	7012.1	=	2,454
ADL Calculations By: RANDY BOGUSKIE					Dat	e:	12/17/2021
Reviewed By: Tony Armst	rong				Dat	e:	12/17/2021





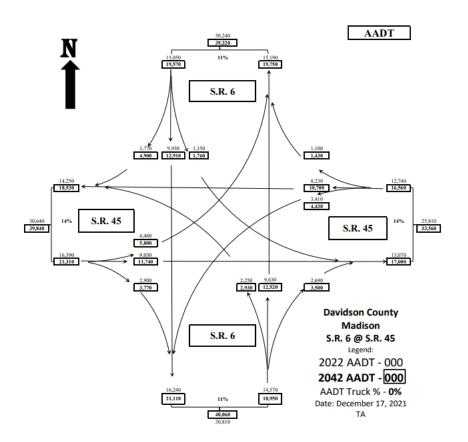
Davidson County

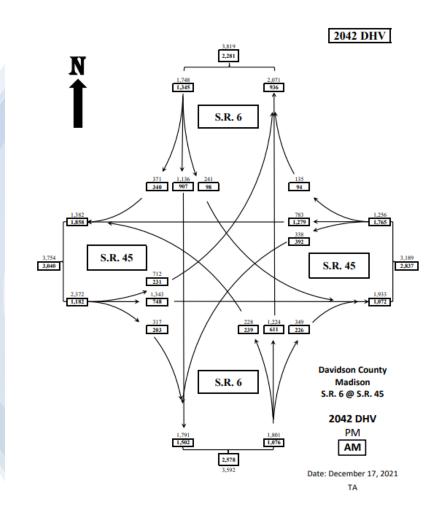
Madison

S.R. 6 @ S.R. 45

Resurfacing S.R. 45 From L.M. 7.13 to L.M. 7.26

Completed Project





How long does it take?

 The average Traffic forecast takes about six to eight weeks, which includes time needed for requesting and receiving special field count data. (Turning Movement Counts, Classification Counts, and Volume Counts)

• QUESTIONS?