

To: Jennifer Harris, PE

Date: October 24, 2013

From: Bradley Reynolds, PE, PTOE

Project #: R-3329, R-2559

Subject: US 74 Corridor Travel Time Comparison



This memo supersedes the sealed memo dated May 10, 2013 with no substantive changes.

At the request of the North Carolina Turnpike Authority (NCTA), HNTB evaluated current travel conditions along US 74. HNTB conducted travel time runs and compared field travel times to INRIX data for the same corridor limits and time periods. The following provides a description of the travel time runs, INRIX data, comparison of corridor data, existing travel time conditions along US 74.

Travel Time Corridor

The US 74 corridor was evaluated from I-485 west of Stallings Road to Elm Street in Marshville. The corridor is approximately 22.5 miles in length and consists of 30 signalized intersections. The travel time study corridor is shown on **Figure 1**.

Travel Time Runs

US 74 corridor travel time runs were completed by HNTB on March 19th, 20th and 21st, 2013 (Tuesday, Wednesday and Thursday) for the AM (6:30-9:00 AM), noon (11:30-1:30 PM) and PM (4:00-6:00 PM) peak periods. Travel time runs consisted on one staff continuously driving the corridor from end-to-end during each peak period using GPS tracking equipment. Travel time runs were completed using the "floating car" technique as described in the *Manual of Transportation Engineering Studies, 2nd Edition* and the *FHWA Travel Time Data Collection Handbook*. Corridor travel time limits were based on the *Monroe Connector/Bypass Draft Environmental Impact Statement, March 2009* Section 1.8.2 and INRIX data segment limits to provide the same corridor limits for comparison. *Tru-Traffic 9.0* traffic engineering software was used to calculate cumulative travel times and cumulative average speed along the corridor and between signalized intersections.

INRIX Data

INRIX is a company that collects and provides private traffic data to the public sector for real-time, predictive and historical traffic information. INRIX data is based on blending real-time road sensor data with real-time data points from GPS-enabled vehicles and mobile devices to provide real-time traffic flow data along roadway networks throughout the country. INRIX provides real-time, historical and predictive traffic flow information based on collected data. For the purposes of this analysis, INRIX data was collected for the US 74 eastbound and westbound for the same time periods as the field travel time runs to provide a direct comparison. INRIX data was also collected for a 2-month period from January 1st to February 28th, 2013 for each Tuesday, Wednesday and Thursday for 24-hour periods separated into 1-hour intervals. The 2-month period INRIX data was compiled to

determine current average travel speeds throughout an entire 24-hour period during weekday conditions, peak and off-peak conditions, and to validate March 19th-21st results.

Comparison of Travel Time and INRIX Data

Travel time run results and INRIX data were compiled for the US 74 corridor limits and are shown in **Table 1**. Overall, field collected corridor travel time speeds are approximately 40 mph with a 32 minute travel time along the 22.5 mile corridor. INRIX data results calculate corridor travel time speeds of approximately 44 mph with a 30 minute travel time. In comparison, INRIX data generally shows slightly lower average travel times (by 6 to 11%) and slightly faster average travel speeds (by 6 to 11%). It is important to note that while both sets of data are based on different methodologies, travel times and speeds are relatively similar with the INRIX data being consistently higher. Field travel time runs were based on a limited number of continuous 22.5 mile corridor runs using the floating car technique. INRIX data is based on GPS-enabled vehicles and devices in a variety of vehicle types and driver characteristics that are making a combination of continuous and segmented trips within the corridor. INRIX does not explicitly produce or provide corridor travel times, but rather provides segment travel times that can be compiled to calculate a travel time along identified roadway segments.

Table 1 – US 74 Corridor Travel Time and INRIX Data Summary

		Field Runs		INRIX Data	
		Travel Time (minutes)	Average Speed (mph)	Travel Time (minutes)	Average Speed (mph)
AM	Eastbound	32.0	41.7	30.2	44.9
	Westbound	33.1	40.5	31.2	43.6
	Cumulative	32.5	41.1	30.7	44.2
Noon	Eastbound	30.4	43.9	30.7	44.2
	Westbound	34.9	39.1	31.0	43.7
	Cumulative	32.9	41.3	30.8	43.9
PM	Eastbound	34.0	39.3	30.2	44.9
	Westbound	33.7	39.7	30.7	44.2
	Cumulative	33.8	39.5	30.4	44.5

* US 74 corridor approximately 22.5 miles from I-485 (west of Stallings) to Elm Street (in Marshville)

* Travel time runs and INRIX data were collected and compared between 3/19/2013 to 3/21/2013 (Tuesday thru Thursday) for the AM (6:30-9:00 AM), noon (11:30-1:30 PM) and PM (4:00-6:00 PM).

Existing Travel Time Conditions

INRIX average speed data along the US 74 corridor was compiled for a two month period, shown in **Table 2** (page 3), to evaluate existing travel time conditions. Overall, the US 74 eastbound and westbound corridor average travel speeds for the AM, noon and PM very closely correspond to the INRIX results in **Table 1**. While minor variability is present, this is to be expected based on the differences in each data set (time of year, length of collection period, etc.). Based on a review of average hourly travel speeds throughout a 24-hour periods, at no time during the day are average corridor speeds equal to or exceeding 50 mph.

Conclusions

In conclusion, the field runs and INRIX data travel times and average speeds are deemed valid for use and comparison purposes. While the INRIX data calculated slightly lower travel times and slightly higher average speeds, within 6% to 11%, the results are still reasonably similar based on the variables between methodologies.

Based on the validation of INRIX data and a review of the **Table 2**, INRIX information demonstrates that US 74 average corridor travel speeds are limited to less than 50 mph, even during off-peak periods and free-flow conditions with very little to no congestion.

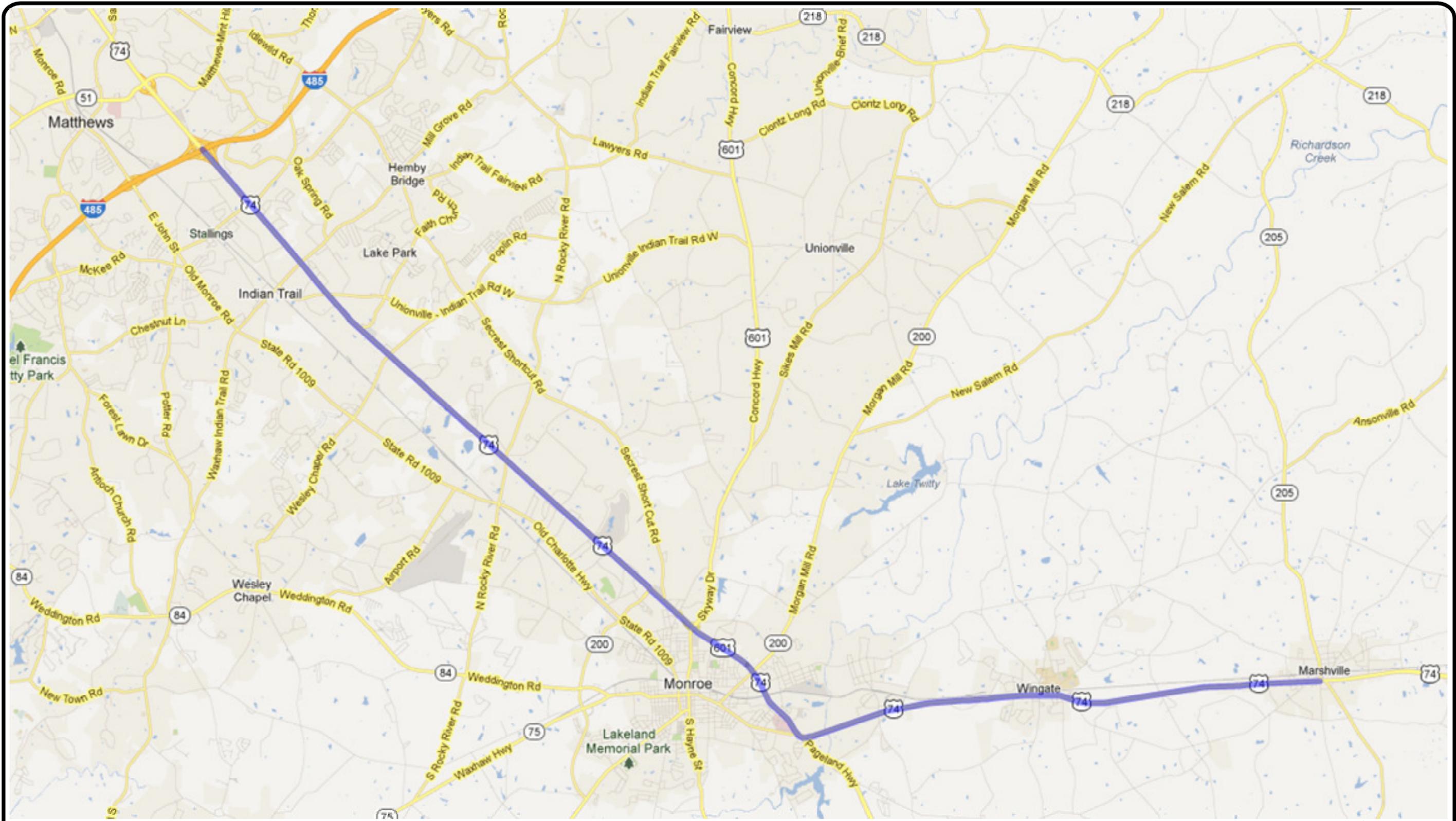
Table 2 - US 74 Corridor INRIX Average Speed Data
 January 2013 - February 2013, Tuesday - Thursday

**Average Speed for US 74 from I-485 to NC 205 (Elm St.)
 Eastbound US 74 Corridor Average Speed**

TMC CODE	SEGMENT NAME	LENGTH (MILES)	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
125P05817	I-485	0.76	56	56	56	56	57	56	56	56	57	57	57	57	57	57	57	57	55	52	53	54	55	56	56	56
125+05818	Stallings Rd	0.75	52	52	51	53	52	52	47	45	45	40	37	38	36	35	33	33	26	20	26	34	45	47	50	51
125+05819	Indian Trail Fairview Rd	1.27	52	52	52	53	53	52	48	48	48	48	48	47	46	46	45	41	37	36	37	42	47	47	50	51
125+05820	Roland Dr	6.86	49	50	50	50	50	50	48	46	46	48	50	48	48	48	47	48	48	47	47	45	47	46	48	49
125+05821	US-601/NC-200/Concord Hwy/Skyway Dr	1.58	43	44	44	44	44	43	42	41	38	36	36	34	33	32	34	34	35	33	34	37	39	37	41	42
125P05821	US-601/NC-200/Concord Hwy/Skyway Dr	0.35	51	50	51	50	51	52	51	51	51	51	51	51	50	50	51	50	50	50	50	49	50	50	50	50
125+07486	NC-200/Morgan Mill Rd	1.11	44	44	44	45	45	46	44	41	40	43	43	42	41	41	41	37	35	35	37	37	40	40	43	43
125+07487	E Franklin St	1.21	43	44	43	44	44	44	42	39	38	41	41	41	40	39	39	39	40	39	40	42	42	39	42	41
125+05822	US-601/Pageland Hwy	0.12	39	40	39	39	39	38	37	35	34	32	32	32	31	30	29	34	36	35	35	35	35	34	37	38
125P05822	US-601/Pageland Hwy	0.02	41	41	40	40	41	40	38	35	35	34	35	34	34	33	33	35	37	36	37	36	37	37	39	39
125+07488	NC-205/Elm St	8.54	49	49	49	49	49	49	49	48	48	49	49	49	49	48	48	47	48	47	48	48	48	48	49	49
Average US 74 EB Corridor Speed (mph)			48	49	49	49	49	49	48	46	46	47	47	47	46	46	45	45	45	44	45	45	46	46	48	48

**Average Speed for US 74 from NC 205 (Elm St.) to I-485
 Westbound US 74 Corridor Average Speed**

TMC CODE	SEGMENT NAME	LENGTH (MILES)	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
125-05822	US-601/Pageland Hwy	8.55	48	48	48	48	49	48	47	46	46	47	47	47	47	47	47	46	47	46	46	47	47	47	47	48
125N05822	US-601/Pageland Hwy	0.01	35	36	36	35	35	36	32	29	29	31	31	30	29	30	28	30	30	31	30	32	33	32	34	35
125-07487	E Franklin St	0.11	36	35	36	35	36	36	34	29	28	29	28	27	26	26	25	25	25	26	27	30	31	31	34	35
125-07486	NC-200/Morgan Mill Rd	1.22	41	41	41	41	42	42	41	36	36	34	33	34	33	33	32	34	33	33	36	38	39	37	39	41
125-05821	US-601/NC-200/Concord Hwy/Skyway Dr	1.07	44	44	44	44	45	46	46	43	42	40	39	38	38	38	38	41	42	42	41	42	42	41	43	44
125N05821	US-601/NC-200/Concord Hwy/Skyway Dr	0.30	49	49	49	49	50	50	50	50	49	49	49	49	49	48	49	50	50	49	49	48	48	48	49	49
125-05820	Roland Dr	1.66	44	45	45	45	45	45	44	36	34	39	40	38	36	36	37	39	42	39	36	37	38	39	42	44
125-05819	Indian Trail Fairview Rd	6.86	48	49	49	49	49	49	47	45	46	47	47	46	43	44	43	42	42	39	41	44	45	44	47	48
125-05818	Stallings Rd	1.26	51	50	51	51	52	51	44	36	41	48	50	48	48	48	48	45	45	39	40	43	46	46	49	50
125-05817	I-485	0.61	52	51	52	52	53	53	50	47	49	51	52	51	51	51	51	50	50	48	47	47	49	48	50	52
125N05817	I-485	0.91	56	55	55	56	56	55	55	44	47	56	57	56	55	56	56	56	55	54	54	54	54	54	55	56
Average US 74 WB Corridor Speed (mph)			48	48	48	48	49	48	47	44	44	46	46	45	44	45	44	44	44	42	43	45	45	45	46	48



HNTB	US 74 Corridor Travel Time Comparison	DATE: May 2013
	Travel Time Study Corridor	FIGURE 1

LEGEND	
 = Travel Time Study Corridor	