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Memorandum

Date: April 7, 2016

To: Bill Austin, MMMPO Executive Director

From: Jing Zhang, MMMPO Transportation Planner

Subject: Data Collection and Analysis for the TIGER Grant Application of Greenbag Rd Improvements

The purpose of this memorandum is document methodologies and resources that were used for the data collection and analysis in the TIGER Grant Application of Greenbag Rd Improvements. The project segment is Greenbag Rd (CR 857) from Dorsey Ave (CR 81) to Don Knotts Blvd (US 119), including intersections.

Crash Data Analysis

Crash data were obtained from the WV DOT OASIS system, an official online platform hosted by the WV DOT. The analysis included all the crashes reported from January 1, 2013 to December 31, 2015 on Greenbag Rd from Dorsey Ave to Don Knotts Blvd.

Crash rate was calculated as one crash per hundred million vehicle miles. The analysis used the following formula provided by the FHWA Roadway Safety Information Analysis: A Manual for Local Rural Road Owners:

$$R = \frac{100{,}000{,}000 \times C}{365 \times N \times V \times L}$$

Where:

R = Crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel (VMT).
C = Total number of crashes in the study period.
N = Number of years of data.
V = Number of vehicles per day (both directions).
L = Length of the roadway segment in miles.

Daily Travel Time Saving

The daily travel time saving is estimated by applying the peak hour time saving (AM and PM) to the ratio of the peak hour volume to the daily traffic volume in the project segment. The peak hour ratio was estimated as 0.17 and was used only for intersection delays. Delays for different turning movements at the intersection of Greenbag Rd and US 119 were average to estimate approach delays on the Greenbag Rd leg on that intersection.

The following table summarizes the intersection delays and travel time on Greenbag Rd in the project segment.

			Segment	US 119	Mississippi St	Dorsey Ave	**Total**	Total in Minutes
Existing Condition	AM Peak	To Downtown (Westbound)	126	1.5	0	10.5	138	2.3
		To CR 73 (Westbound)	126	17.5	0	10.5	154	2.6
		From Downtown (Eastbound)	126	28	1	10.5	165.5	2.8
		From CR 73 (Eastbound)	126	2.5	1	10.5	140	2.3
	PM Peak	To Downtown (Westbound)	126	5.5	0	25.5	157	2.6
		To CR 73 (Westbound)	126	131.5	0	25.5	283	4.7
		From Downtown (Eastbound)	126	9.5	1	65	201.5	3.4
		From CR 73 (Eastbound)	126	2	1	65	194	3.2
Improved Condition	AM Peak	To Downtown (Westbound)	123	0.5	0	9.5	133	2.2
		To CR 73 (Westbound)	123	13.5	0	9.5	146	2.4
		From Downtown (Eastbound)	123	7	0	9	139	2.3
		From CR 73 (Eastbound)	123	2.5	0	9	134.5	2.2
	PM Peak	To Downtown (Westbound)	123	3	0	9.5	135.5	2.3
		To CR 73 (Westbound)	123	24.5	0	9.5	157	2.6
		From Downtown (Eastbound)	123	9.5	0	16	148.5	2.5
		From CR 73 (Eastbound)	123	2	0	16	141	2.4

MPO staff used the following resource to estimate daily travel time saving.

Peak Hour Time Saving

Peak hour time saving data from the Greenbag Rd Corridor Study technical memorandum on time saving estimate for near-term improvements. The memorandum, dated on December 15, 2014, provided estimated intersection delays, base free flow speed reduction, peak hour factor. Synchro models were used for the analysis. Turning movement counts used in the model were collected by MPO staff in the fall of 2014. The memorandum is available at the following link: http://plantogether.org/Appendix%20H%20Memorandum%20on%20Time%20Saving%20Estimate%20for%20Near%20Term%20Improvements.pdf

Daily Traffic Volume

The daily traffic volume at the project segment was obtained from 2014 MPO annual traffic. The count station (#3114043) was located on the Greenbag Rd between US 119 and Mall Rd.

Demographic Characteristics

The analysis used the 2010-2014 American Community Survey from the US Census of Bureau. The related census tract and block group is: West Virginia - Monongalia County - Census Tract 110 - Block Group 1.

Household and employment information were obtained from the Morgantown Monongalia MPO's Travel Demand Model. MPO Staff used the Traffic Analysis Zones (TAZ) from the Travel Demand Model for demography analysis. The MPO's TAZs are essentially consistent with census tracts and block groups in the Morgantown area. Social economic data contained in the TAZs was based on

2013 Census data and was updated for I-79 Access Study in 2016.

Zoning

Zoning data was obtained from the Development Service Office of the City of Morgantown. The Zoning map was updated in 2015.

Truck Traffic Volume

Truck traffic volume was collected as a part of MPO's 2014 Annual Traffic Count. The percentage of trucks utilizing the project segment of Greenbag Rd was approximately 8% in 2014.

Intersection Improvement Evaluation

MPO staff used a synchro model to evaluate the peak hour performance of two intersections. The evaluation was based two scenarios and three time periods. Intersection turning movement counts were collected in the fall of 2014. Three criteria were used: Intersection LOS, Intersection Delay, and Intersection Capacity Utilization.

Greenbag Rd & US 119 Intersection Improvement Evaluation

AM	Intersection LOS			Intersection Signal Delay (s)			Intersection Capacity Utilization		
	2014	2020	2040	2014	2020	2040	2014	2020	2040
Improved	C	C	D	21	29	39	64%	70%	88%
No action	C	F	F	25	81	117	71%	77%	99%

PM	Intersection LOS			Intersection Signal Delay (s)			Intersection Capacity Utilization		
	2014	2020	2040	2014	2020	2040	2014	2020	2040
Improved	C	C	D	22	23	47	63%	68%	85%
No action	F	F	F	116	170	235	80%	87%	111%

Greenbag Rd & Dorsey Ave Intersection Improvement Evaluation

AM	Intersection LOS			Intersection Signal Delay (s)			Intersection Capacity Utilization		
	2014	2020	2040	2014	2020	2040	2014	2020	2040
Improved	B	B	C	12	18	28	57%	61%	69%
No action	C	E	F	20	77	110	84%	74%	88%

PM	Intersection LOS			Intersection Signal Delay (s)			Intersection Capacity Utilization		
	2014	2020	2040	2014	2020	2040	2014	2020	2040
Alternative I	C	D	E	31	37	75	69%	72%	86%
No action	D	F	F	45	103	227	84%	89%	106%

Transit Ridership

The transit ridership data was obtained from Route Efficiency & Vehicle Maximization Study conducted by the AECOM for the Mountain Line Transit Authority, the primary public transit service provider in the Morgantown area. Ridership information in the project area was presented as a part of the route performance analysis on the Orange Line, the only bus route serving that area.

The analysis shows that, on average, 60 passengers board or disembark at three locations other than the Mountaineer Mall during weekdays in the project area.