



December 6, 2016

Eric Griffin
Lewis & Clark County
3402 Cooney Drive
Helena, MT 59601

RE: Valley Drive Speed Limit Study

Dear Eric,

Per your request Abelin Traffic Services (ATS) has reviewed the existing speed limits on Valley Drive between the East Helena city limits and York Road. The posted speed limit on this road is currently 35 MPH. Lewis & Clark County requested that ATS perform a speed study to determine if the posted speed limits are appropriate for the existing road conditions and if the speed limits could be changed to create more uniform speeds for the route and provide more consistency with other routes in the area.

Existing Conditions

The study road segments begin at the north city limits of East Helena on Valley Drive (Intersection of Valley Drive and Lewis Street) and extends north to the intersection of Valley Drive and York Road. The road is straight and has a slight upward slope to the north. Valley Drive continues as a gravel road for 2.3 miles before terminating an intersection with Merritt Lane. The gravel section of Valley Drive was not studied for this report. The roadside environment consists of a mix of residential, light commercial, and open land areas. See **Figure 1** for a map of the study roadway.

Valley Drive is paved for most of the study area, with a .5-mile section of gravel road that runs from Howard Road to just south of Ayden Road. The gravel portion of the roadway has a width of 25 feet and the surface is in good condition. The paved portion of the roadway varies from 23 feet to 25 feet in width, which is narrower than the other north/south roads in this area (Wylie Drive and Lake Helena Drive). The study roadway has a right-of-way width that varies from 55 feet for the first 0.4 miles at the south end of the study area, 65 feet for the next 0.1 miles, and between 75 and 85 feet for the remaining length of the study roadway. The road surface is in moderate to good condition with some isolated patched areas. There are no formal road shoulders except near the intersection with Canyon Ferry Road. There are no passing zones within the study area. Visibility on the road is very good and the clear zones have few obstructions. The road currently has 24 public approaches and 74 private approaches.

Historic traffic data for Valley Drive was obtained from Lewis & Clark County. The historic Average Annual Daily Traffic (AADT) data for this location is presented in **Table 1**. The data indicates that traffic volumes along Valley Drive have increased steadily over the past ten years.

Table 1 – Historic Traffic Data

Valley Drive Location	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
South of Canyon Ferry Road	2,029	2043	1,836	2,963	2,066	2,494	2,062	1,976	na	2,266
North of Canyon Ferry Road	1,513	1656	1,423	878	1,652	1,891	1,722	1,427	na	1,713
North of Howard Road	410	401	386	709	na	310	516	na	na	423
South of York Road	330	371	345	684	491	384	496	na	na	464

Crash Data

ATS obtained vehicle crash data for the study roadway from the L&C County vehicle crash database. This data indicated that 15 vehicle crashes have occurred along Valley Drive over the past five years. Of these 15 crashes, seven were multi-vehicle accidents and six resulted in injuries. Three of the ten crashes occurred at the intersection with Canyon Ferry Road. Most of the crashes (67%) occurred in darkened conditions. The crash rate on Valley Drive is 1.0 crashes per million vehicle miles traveled, which is in line with the State average for collector roadways.

Speed Data

In order to analyze vehicle speed data engineers calculate a variety of operational characteristics based on vehicle speed distribution data. The significant data includes average vehicle speed, 85th percentile speed, and pace speeds. **Figure 2** shows a standard vehicle speed distribution with a 45 MPH average speed (red line). The 85th percentile speed is speed at which 85% of traffic travels at or below on the cumulative speed distribution line (purple line). The pace is the 10 MPH increment that has the highest number of observed vehicle speeds.

Figure 1 - Vicinity Map

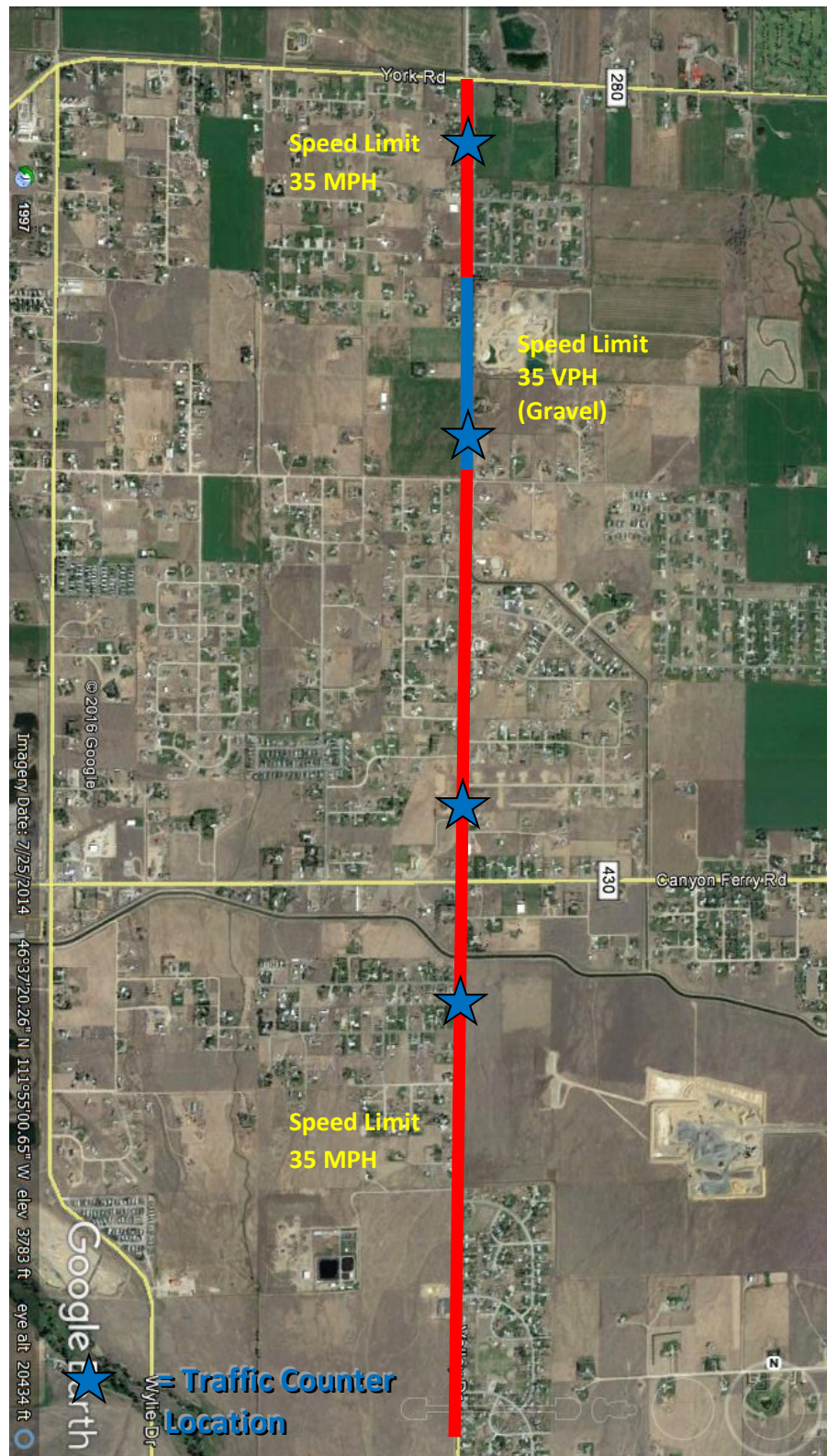
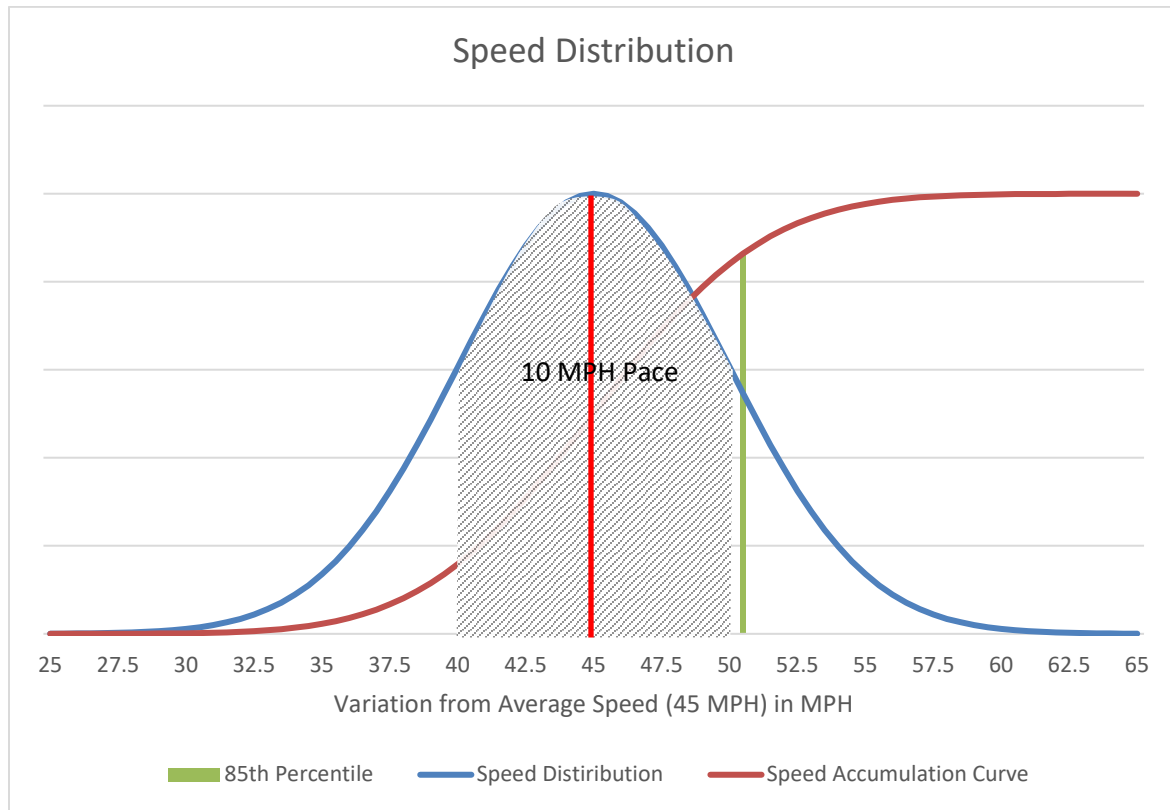


Figure 2 – Standard Speed Profile



Vehicle speed data was collected at four locations along Valley Drive from August 15th to 19th of 2016. The sites were located south of Canyon Ferry Road (Station 1), north of Canyon Ferry Road (Station 2), north of Howard Road (Station 3), and south of York Road (Station 4). The weather conditions during the traffic study were warm and dry with very good driving conditions throughout the data collection period. The data was collected continuously for 48 hour periods using Diamond Unicorn Limited traffic counters to record the individual speed data from every vehicle using the road. The results of the data collection are shown in **Table 2**. A detailed roadway characteristics and speed data table is included in the appendix.

TABLE 2 – Vehicle Speed Data

	Station 1	Station 2	Station 3	Station 4
Average Speed (MPH)	36.0	38.6	36.5	35.7
85% Percentile Speed (MPH)	40.3	44.4	43.4	42.3
10 MPH Pace Speeds (MPH)	30 – 40	35 – 45	30 – 40	30 – 40
Percent in Pace	78%	67%	56%	55%
Observed Daily Traffic (VPD)	2,910	2,266	1,713	464
Percent Trucks	2.5%	4.5%	13.4%	3.8%

The speed data indicates that the vehicle speeds along Valley Drive are fairly consistent. The most commonly used road operations characteristic for posting a speed limit is the 85th percentile speed.

However, it is reasonable to set a posted speed limit below the 85th percentile speeds if the road conditions and roadside environment are inconsistent with the observed vehicle speeds. The 85th percentile speeds at the four count locations varied from 40 to 44 MPH. The 10 MPH pace speeds (the 10 MPH range in which the most road users are driving) were 30 – 40 MPH for Stations 1, 3, and 4 while for Station 2 it was 35 – 45 MPH. In general it is desirable to have the majority of traffic on a roadway traveling within or around the 10 MPH pace. This decreases the variability in vehicle speeds and decreases vehicle conflicts. It is also notable that the percent of truck traffic on most of the road is low, except for the section north of Howard Road (Station 3) which experiences 13.4% truck traffic due to the adjacent gravel pit.

Based on the vehicle speed profiles for the roadway the posted speed limit on Valley Drive could range from 35 to 45 MPH. However, due to the approach density along the southern portion of the road, the narrow width of the road, the gravel section in the middle of the road segment, and the low pace speeds, it is appropriate to post a more restrictive speed limit.

Recommendations

Based on the current operational data for Valley Drive, the currently posted 35 MPH speed limit appears to be appropriate. It is recommended that the posted speed limit on Valley Drive remain at 35 MPH. The recommendation is based on the existing road conditions along Valley Drive and the existing vehicle speed profiles. The road is narrower and has a higher approach density than the other north/south roads in this area (Wylie Drive and Lake Helena Drive). The available data suggests that the existing 35 MPH speed limit is appropriate for the existing conditions. If you have any questions about these results please feel free to call me at 406-459-1443

Sincerely,

A handwritten signature in black ink, appearing to read 'Bob Abelin', written in a cursive style.

Bob Abelin, P.E.
Abelin Traffic Services, Inc.

Valley Drive

Section Number	Length	Start	End			Speed Limit	Avg. Speed	85% Speed	Pace	% in Pace	Road Width
1	0.7	0.0	0.7	Lewis St	Bandera Dr	35					24.6
2	0.7	0.7	1.4	Bandera Dr	Canal	35	36.0	40.3	30-40	78%	22.7
3	0.3	1.4	1.6	Canal	Byron Road (CFR)	35					Var.
4	0.6	1.6	2.2	Byron Road	Eichhoff Rd	35	38.6	44.4	35-45	67%	23.5
5	0.3	2.2	2.5	Eichhoff Rd	Howard Rd	35					23.5
6	0.5	2.5	3.0	Howard Rd	South of Ayden Dr	35	36.5	43.4	30-40	56%	25.0
7	0.5	3.0	3.5	South of Ayden	York Road	35	35.7	42.3	30-40	63%	25.3

Section Number	NB Lane	SB Lane	Road Condition	Roadside Environment	Alignment	ROW Width	Total App.	Approach Density	Percent Trucks	ADT Volume
1	12.3	11.0	Good	Residential/Open Land	Straight	55	29	40.8		2910
2	11.0	11.7	Moderate	East – Open Land	Straight	55	20	30.3	2.5%	2910
3	11.0	11.7	Good	Residential/Commercial	Straight	75	8	30.8		2266
4	11.2	12.3	Moderate	Residential/Commercial	Straight	75	14	25.5	4.5%	2266
5	11.2	12.3	Moderate	Residential/Commercial	Straight	120	6	18.2		1713
6	N/A	N/A	Gravel	Residential/Commercial	Straight	120	7	13.7	13.4%	1713
7	12.5	12.8	Good	Residential/Commercial	Straight	120	14	27.5	3.8%	464
Avg.								26.7		