Andy Beshear
GOVERNOR

COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET
transportation.ky.gov

Jim Gray
SECRETARY

MEMORANDUM

TO: Joseph Plunk, P.E.
             Chief District Engineer
             District 3 - Bowling Green

ATTN: Stewart Lich, P.E.

FROM: Mikael Pelfrey, P.E.   *MBP*
             Director
             Division of Planning

DATE: January 8, 2021

SUBJECT: Simpson County Traffic Forecast
             Improve US 31W from KY 1008 to KY 621
             Item No. 3-8856.00

In response to your November 4, 2020, request, we are providing the following forecasts on the attached report:

- 2020 and 2045 Average Daily Traffic and Design Hourly Volumes
- 2020 and 2045 Truck Percentages

If you have any questions, please contact Jay Balaji of this Division at (502) 782-5045 or David Souleyrette of this Division at (502) 782-5090.

MP/DS/BC

Attachments

C/att: Ben Hunt, P.E.
        Andrew Stewart, P.E.
        Wendy Southworth, P.E.

**Traffic Forecast Technical Report
Simpson County
Improve US 31W from KY 1008 to KY 621
Item No. 3-8856.00**

Prepared for:

Prepared by:
**David Souleyrette
Division of Planning
Kentucky Transportation Cabinet
January 4, 2021**

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Commonly Used Abbreviations and their Descriptions

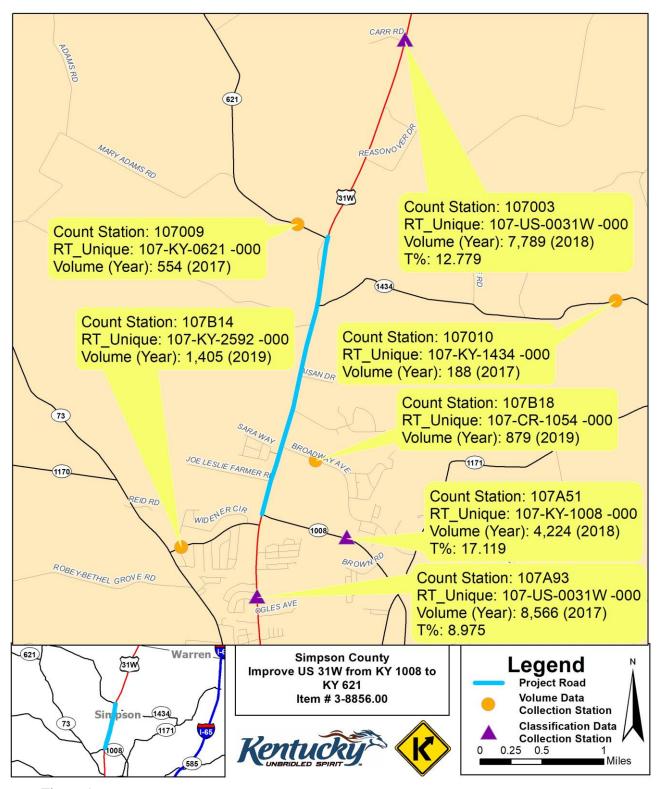|		
ADT	Average Daily Traffic	Without any adjustment
DHV	Design Hour Volume	30th highest hour of a year
FC	Functional Class	Refers to a road's importance
GR	Growth Rate	A value normally compounded annually
PHF	Peak Hour Factor	Considers a 15-minute spike in hourly counts
K-Factor	K-30th hour Factor	DHV divided by ADT (DHV/ADT)
D-Factor	Directional Factor	Percentage of dominant flow to total
MP	Mile Point	Miles increase easterly and northerly
ATR	Automatic Traffic Recorder	A permanent & continuous recording station
KYSTM	Kentucky Statewide Model	A computerized representation of KY roads
AADT	Annual Average Daily Traffic	The total volume of traffic for one year/365
AADTT	Annual Average Daily Truck Traffic	The total volume of truck traffic for a year/365
BCI	Bicycle Comfort Index	A Level of Service Concept for bicyclists

Vicinity Map

Figure 1

Traffic Forecast Executive Summary
Simpson County: Improve US 31W from KY 1008 to KY 621
Item No. 3-8856.00

FORECAST SUMMARY

The project calls for the widening of US 31W from two lanes and three lanes to five lanes between MP 8.477 and MP 10.799 (highlighted in blue on Figures 1 and 2). Hence, the purpose of this forecast was to analyze the current and future traffic of the corridor.

FORECAST TYPE

The following types of forecasts were developed:
- 2020 and 2045 ADT values
- 2026 and 2045 AADTT values
- 2026 and 2045 DHV values for trucks

CURRENT-YEAR VOLUMES

Current year volumes were based upon a 2018 count collected at traffic classification station 107003. Figure 1 shows this station as well as other stations in the project's vicinity.

DESIGN-YEAR/GROWTH FACTORS

Design-year growth rates were determined based on the historical traffic GR of 107003 and population projections of the county. Based on the above sources, a GR of 0.5% was used for this forecast.

TRUCK DESIGN HOUR FACTORS FOR 2045

In the most recent count, there were 93 trucks observed during the peak hour out of 1,036 trucks for the day, resulting in a K-factor of 8.98%. This K-factor was applied to the construction year AADTT and the design year AADTT, resulting in a construction year DHV of 99 trucks and a design year DHV of 105 trucks.

TRUCK PERCENTAGE

The truck percentages were calculated from an hourly classification count at 107003. A GR of 0.5% was used for trucks.

TURN MOVEMENTS

Turn movements were not requested and therefore not included.

Summary Map

US 31W near Franklin
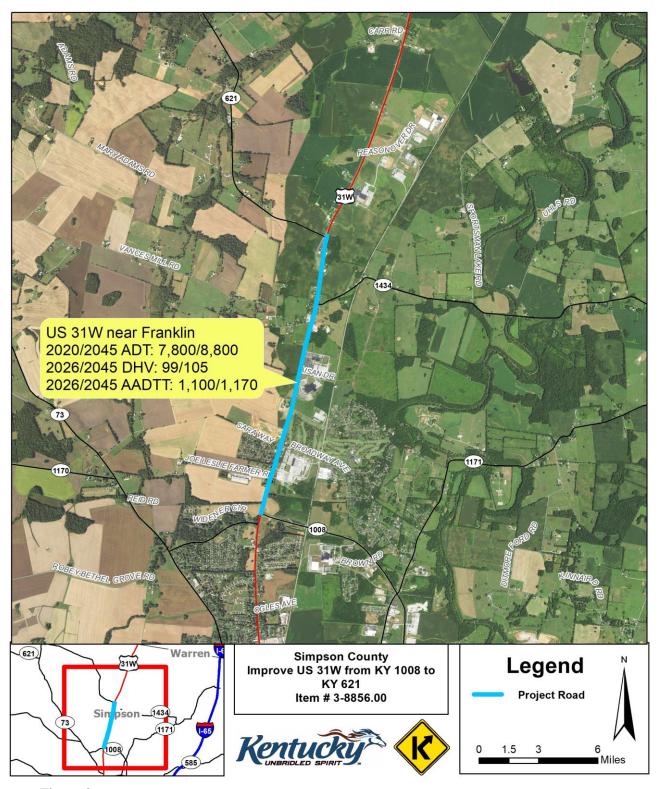2020/2045 ADT: 7,800/8,800
2026/2045 DHV: 99/105
2026/2045 AADTT: 1,100/1,170

Simpson County
Improve US 31W from KY 1008 to
KY 621
Item # 3-8856.00

Legend

Project Road

Kentucky
UNBRIDLED SPIRIT™

0   1.5   3   6
Miles

Figure 2

Pavement Design Factors for US 31W Widening

Project information:

Date of Forecast	1/4/2021
Name of Forecaster	David Souleyrette
Item Number	03-8856.00
County Name	Simpson
County Number	107
District	03
eMARS Number	1209701D
Function	FD52
Fund	12F0
Project Type	Major widening
Current Year	2020
Letting Year	
Construction Year	2026

Project Description: Improve US 31W from KY 1008 to KY 621

Route information:

Route ID	107-US-0031W -000
Road Name	
	Bowling Green Road
BMP	8.477
EMP	10.799
Functional Class	5 - Major Collector
Total Lanes (Both Ways)	2
1 or 2 Way	Two way
Pavement Type	Asphault
Are Trucks Prohibited in a Lane?	NO

Volume Information:

Volume ADT Station	107003
Current Year Volume	7,800
Design Year Volume	8,800

Truck % of ADT	13.3%
FC Average Truck %	13.2%
% of Trucks in Design Direction	57.5%
% of Trucks in Design Lane of Design Direction	100.0%

Truck Count and Truck Volume Information:

Truck Count Station	107003
Truck Count Volume	1,036
Truck Count Year	2018
Truck Volume in Design Direction	630
Truck Volume in Design Lane of Design Direction	630
Construction Year AADTT	**1,100**
Design Year AADTT	**1,170**

Truck Volume Growth Rate	**0.5%**

Distribution Factors for Functional Class: 5 - Major Collector

Daily Volume Distribution Factors by Vehicle Class

Vehicle Class		Truck Volume	Truck Percent
Bus	4	73	6.66%
2 axle, 6 tire single unit	5	373	33.88%
3 axles single unit	6	168	15.25%
4 or more axles, single unit	7	63	5.69%
3-4 axles, single trailer	8	113	10.23%
5 axles single trailer	9	309	28.09%
6 or more axles, single trailer	10	2	0.19%
5 or less axles, multi-trailer	11	0	0.00%
6 axles, multi trailer	12	0	0.00%
7 or more axles, multi-trailer	13	0	0.00%
All Vehicle Classes		1,100	100.00%

Hourly Volume Distribution Factors

0	12 AM to 1 AM	4	0.39%
1	1 AM to 2 AM	3	0.29%
2	2 AM to 3 AM	6	0.58%
3	3 AM to 4 AM	8	0.77%
4	4 AM to 5 AM	16	1.45%
5	5 AM to 6 AM	30	2.70%
6	6 AM to 7 AM	57	5.21%
7	7 AM to 8 AM	72	6.56%
8	8 AM to 9 AM	96	8.69%
9	9 AM to 10 AM	99	8.98%
10	10 AM to 11 AM	91	8.30%
11	11 AM to 12 PM	92	8.40%
12	12 PM to 1 PM	85	7.72%
13	1 PM to 2 PM	79	7.14%
14	2 PM to 3 PM	85	7.72%
15	3 PM to 4 PM	75	6.85%
16	4 PM to 5 PM	81	7.34%
17	5 PM to 6 PM	54	4.92%
18	6 PM to 7 PM	20	1.83%
19	7 PM to 8 PM	21	1.93%
20	8 PM to 9 PM	7	0.68%
21	9 PM to 10 PM	10	0.87%
22	10 PM to 11 PM	6	0.58%
23	11 PM to 12 AM	1	0.10%
	ALL Hours	1,100	100.00%

Coal Haul Information:

Annual Coal Tonnage:	
Coal Trucks per Day:	
Percentage of Trucks That Are Coal:	
Percentage of All Vehicles That Are Coal:	

Table 1