

Appendix B
Travel Demand Model Forecast Methodology and
Results

HEARTLAND

APPENDIX B TRAVEL DEMAND MODEL FORECAST METHODOLOGY AND RESULTS

FORECAST HORIZON YEAR AND ANALYSIS SCENARIOS

The following scenarios were developed for this study:

Existing and Future Baseline Conditions

2010 Existing Traffic: This scenario serves as the baseline condition and applies existing traffic counts. The baseline condition is compared to the Year 2035 forecast scenarios to establish anticipated differences attributable to various factors.

2035 without Improvements: This scenario evaluates the Year 2035 conditions based on traffic counts and growth trends, but does not reflect traffic that may result from making transportation improvements that would draw additional vehicles into the Heartland Expressway Corridor. This scenario is often referred to as the “No Build Alternative.”

Future “Build” Conditions

2035 with Heartland Improvements: This scenario highlights how improvements within the boundaries of the Heartland Expressway Corridor would influence the Year 2035 traffic volumes.

2035 with Heartland Improvements and Intensified Energy Resource Development: This scenario reflects the future importance of transportation increases associated with anticipated natural resource extraction activities involving intensified oil and gas and alternative energy development in the region, such as the Niobrara energy basin and wind energy potential.

2035 with All PTP Alliance Corridor Improvements: This scenario highlights how improvements along the entire PTP Alliance Corridor would influence the Year 2035 traffic volumes without considering impacts of the energy development. This scenario includes the Heartland Expressway Corridor improvements.

2035 with All PTP Alliance Corridor Improvements and Intensified Energy Resource Development: This is the long-term ultimate scenario reflecting all of the primary conditions that are expected to influence future traffic by the Year 2035. This scenario includes the Heartland Expressway Corridor and the entire PTP Corridor.

METHODS AND ASSUMPTIONS

The following discussions provide details regarding the forecast methodology, including details about the assumptions behind these scenarios.

Transportation Demand Model

A transportation demand model was built to evaluate impacts of Heartland Expressway Corridor improvements. This model was built to reflect the special rural roadway travel demand patterns of this part of Nebraska as well as to integrate traffic forecasts and methodologies from several different sources and states.

The modeled area was bounded by:

- Interstate 90 (I-90) on the north
- I-25 on the west
- I-76 to the southeast extending down to Denver
- Nebraska Highway 61 and South Dakota Highway 73 on the east

Roadway facilities within the modeled boundary included all Interstate, US, and State Highways along with selected county roads.

NDOR modeling data and results were used as a source data but model forecasts were not directly used because economic conditions outside of Nebraska were not accounted for in the NDOR model. There is some historic evidence to support a greater level of travel demand through the panhandle of Nebraska generated by surrounding states.

Traffic Analysis Zones

Model traffic was generated using 133 Traffic Analysis Zones (TAZ). A TAZ is an area where traffic generation assumptions can be made based on development characteristics within the zone. The model only considered the number of trips generated from TAZs to the regional highway network. Local trips on local roads within a TAZ were not used in the model.

The size of the individual TAZs varied substantially within the study area. Many major population centers such as Cheyenne and Denver were modeled as a single TAZ. Trips generated by these large TAZs only accounted for the trips either entering or leaving via the regional highway network. Internal trips, such as shopping trips or many work related trips were not specifically modeled as they were assumed to be within the zone and hence never reaching the modeled regional highway network. At the other end of the spectrum were smaller rural communities which could have a significant enough influence to change the traffic volume on the highway network passing through or near them. The result was a TAZ structure specifically designed to model rural traffic between cities and towns.

Modeling Steps

The methodology used to develop traffic forecasts followed the following steps:

- Identify existing Average Annual Daily Traffic (AADT) 2010 travel demands for both the total number of vehicles and for trucks. This was done by consulting the published traffic count maps from the four states (NDOR, CDOT, WYDOT and SDDOT).
- Trip generation totals for TAZs within Nebraska were taken from the NDOR statewide travel demand model. Trip generation totals for TAZs outside of Nebraska were initially estimated using an external trip rate derived from the NDOR model based on population. These initial estimates were refined in the next step.
- The model network was built with link speeds and distances. The shortest path between each TAZ pair was determined. An initial trip origin destination (OD) matrix was then estimated and assigned to the roadway network. Rates for trips generated outside of Nebraska were then varied to correspond or agree with the observed existing travel demands thereby calibrating the model results. Forecast travel demands were then compared to existing counts and a very reasonable fit was found to have taken place (See **Table 1**)
- The model forecasts were then “post processed” to account for local variations in travel demand such as increases in traffic near cities and towns since the calibrated link volumes were for those between the “influence areas” of cities. These adjustments were noted and used in the development of future forecasts.
- Future travel demands were developed in consultation with the following sources:
 - Expected growth in travel demand from the NDOR Statewide travel demand model
 - SDDOT Decennial Interstate Corridor Study, March, 2011
 - Mead County (South Dakota) Transportation Plan, November 2008
 - City of Gillette, Wyoming, 2009 Transportation Plan Update
 - Laramie County (Wyoming) Wyoming Planning Department Growth factors for population and travel demand
 - CDOT 20-year growth factors
 - North Front Range Metropolitan Planning Organization (Fort Collins, Colorado) 2035 travel demand forecasts
 - Denver Regional Council of Governments (Denver, Colorado) 2035 travel demand forecasts
 - WYDOT Interstate 80 Tolling Feasibility Study, Phase 2 Final Report, November 2009

The process began with identifying Travel Analysis Zones (TAZ). These TAZs were based on geographic boundaries and by adjacent highway segments where existing or proposed travel demand would vary. Once the TAZs were identified,

origins and destinations between TAZs were estimated with the goal of developing an origin/destination table that when assigned to the existing roadway network would result in volumes similar to those observed and counted. These origin/destination pairs did not include local traffic, only those trips that would be assigned to a segment of the Heartland Corridor study area.

The 2035 forecast were developed using the existing origin/destination detail developed for the existing conditions. Using the various forecast sources, individual origin/destination data was grown based on the estimated growth forecast for roadways adjacent to the zone. These 2035 origin/destination were then assigned to the 2035 No Build roadway network. **Table 2** presents the daily vehicle traffic for each TAZ in 2010 and 2035.

Table 1 Summary of Technical Assumptions Used in Travel Forecasts for the Build Alternatives

Scenario/ Assumptions	2035 With Heartland Improvements	2035 With Heartland Improvements and Intensified Energy Resource Development	2035 With All Ports to Plains Alliance Corridor Improvements	2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development
Population Growth	No Change from No Build, 15% increase from 2010	A 7% increase in the Panhandle area over No Build	A 7% increase in the Panhandle area over No Build	A 13% increase in the Panhandle area over No Build
Economic Conditions	Baseline economic conditions same as No Build	Significant additional development due to the increased energy activity.	Baseline economic conditions same as No Build	Significant additional development due to the increased energy activity.
Travel Behavior	Some shifting of travel demand to the Heartland Corridor, overall 9% increase over No Build	30% increase over No Build	63% increase over No Build	70% increase over No Build
Anticipated Freight Activity	Some shifting of Freight demand to the Heartland Corridor, overall 8% increase over No Build	52% increase over No Build	103% increase over No Build	124% increase over No Build
Major New Industrial Development (Niobrara and Other)	No Change from No Build	Energy development	No Change from No Build	Energy development

Table 2 Travel Analysis Zones: Daily Vehicle Traffic Attributed to the Model Area for 2010 and 2035

TRAVEL ANALYSIS ZONES (Name/Location)	All Vehicles		Trucks	
	2010	2035	2010	2035
Alliance Neb Node 4	4374	12500	403	569
Ault Eaton Pierce CO	8700	10345	432	470
Badlands Node 33	242	1799	101	291
Badlands SD East	4909	6005	244	208
Bayard NDOR Node 41	2009	3229	100	117
Beulah Wyo	674	818	281	452
Brighton CO	48593	80321	2411	2758
Brush CO	7671	9122	381	313
Buffalo Gap SD	260	1363	108	753
Burns Wyo	671	863	280	477
Chadron Neb Node 18	3807	4527	189	206
Cheyenne Wyo	381	493	159	234
Chugwater Wyo	867	6442	361	3559
Custer SD	7807	11395	387	423
Deadwood Lead SD	8131	10476	403	360
Degraw Node 42	286	1952	119	352
Denver, CO	142804	169809	7086	7730
Douglas Wyo	144	1067	60	65
Fort Collins CO	36931	43915	11090	15736
Fort Laramie Wyo	767	2046	120	131
Fort Morgan CO	5451	6482	271	295
Frederick Co	7292	17767	362	610
Ft. Lupton CO	10586	27632	525	1005
Gillette Wyo	834	6200	348	2992
Greeley CO	54657	77035	2712	2646
Guernsey Wyo	792	5888	39	202
Hawk Springs Wyo	579	2705	90	150
Hay Springs Neb Node 64	1150	4351	57	149
Henry NDOR Node 76	246	1830	31	67
Hermosa SD	645	4794	195	245
Hill City SD	1475	2687	615	1484
Hot Spring SD	2315	13230	115	454
Hudson CO	4093	9452	429	468
I-25 West to Casper	7822	9301	1233	1345
I-80 East	14791	17588	734	604
I-80 West to Laramie	13810	61960	685	2128
I-90 East of Rapid City	9507	27801	1419	2243
I-90 West to Sheridan	4917	8990	244	380
Julesburg CO	602	1164	83	132
Keensburg CO	2118	2785	105	96
La Grange Wyo	575	683	95	203

TRAVEL ANALYSIS ZONES (Name/Location)	All Vehicles		Trucks	
	2010	2035	2010	2035
Lake McConaughy Node 32	1027	4455	200	218
Lake Minatare NDOR Node 48	427	3174	120	156
Lawrence SD	647	1981	270	794
Limon Neb NDOR Node 52	1536	2366	365	742
Lingle Wyo	579	4300	127	161
Lochbuie CO	10964	23587	1866	2779
Lusk Wyo	579	860	193	210
Manville Wyo	1399	2669	69	92
Martin SD	693	1020	34	38
Mead Co	989	4601	49	167
Melbeta NDOR Node 55	1593	1895	664	1047
Milliken Johnstown Co	15247	42964	757	1476
Minatare NDOR Node 54	2335	16460	973	4143
Mitchell NDOR Node 50	4950	5886	246	268
Moorcroft Wyo	1261	2556	124	135
Morrell NDOR Node 51, 75	3237	24057	1350	13290
NDOR Node 10 Sydney	3895	4632	400	558
NDOR Node 11,12,28,30	3136	4438	1193	1354
NDOR Node 15, 16, 37	1649	3828	82	131
NDOR Node 21 Whitney	534	1336	223	738
NDOR Node 22 Crawford	1302	9678	124	352
NDOR Node 24	323	1613	16	55
NDOR Node 36 Kimball	1824	2169	91	99
NDOR Node 40	463	692	193	382
NDOR Node 47	447	532	97	149
NDOR Node 49	701	5209	72	189
NDOR Node 53	1119	1493	104	113
NDOR Node 58	1168	1793	65	81
NDOR Node 6	246	1827	102	144
NDOR Node 70 Harrison	434	576	181	318
NDOR Node 71 Jader	135	1002	7	34
NDOR Node 73	304	451	127	249
NDOR Node 74	284	723	118	194
NDOR Nodes 56, 46	15950	18966	791	863
NDOR Nodes 57, 60	2850	3388	141	204
NDOR Nodes 72, 23	820	1090	79	86
Neb 2 at SD Border	154	1142	64	105
Neb 2 East	625	743	93	101
Neb 61 South	4406	5239	377	835
Neb 92 East	188	1399	28	51
Neb Node 1 Harrisburg	752	895	250	480
Neb Node 13, 14, 44	1564	11625	652	1587
Neb Node 19	671	4988	33	171

TRAVEL ANALYSIS ZONES (Name/Location)	All Vehicles		Trucks	
	2010	2035	2010	2035
Neb Node 2, 43	556	4135	232	1065
Neb Node 3	179	318	46	51
Neb Node 39 Bridgeport	2327	2767	115	126
Neb Node 45, 34	1119	8315	261	302
Neb Node 5 Hemingford	1234	1468	93	128
Neb Node 61 Gordon	1628	2649	127	139
Neb Node 62	171	1270	46	50
Neb Node 63	320	2377	133	339
Neb Node 65 Rushville	1974	3850	552	652
Neb Node 68 Smith Lake	286	540	119	298
Neb Node 7	307	2283	49	83
Neb Node 8	692	5142	175	236
Neb Node 9	1347	1801	67	62
Neb Node 90	831	988	347	532
Neb Nodes 20, 25, 26, 27	1634	12142	81	417
Neb Nodes 67, 66	574	2181	28	77
Newcastle Wyo	437	3251	42	118
Node 34,45 Lisco	1120	4685	467	2588
Node 35	526	626	50	84
Oelrichs SD	48	360	20	102
Oglala SD	743	883	58	73
Pine Bluff Wyo	438	3252	58	118
Pine Ridge SD	2250	2675	173	239
Platteville CO	2599	5119	129	177
Rapid City SD	9494	15243	471	524
Scotts Airport NDOR Node 59	693	3292	289	799
SD 34 North	2954	3513	147	160
SD 44 East	1404	4236	585	805
SH 119 West, CO	35939	58451	1783	2125
SH 60 West, CO	2296	14167	114	487
SH 66 West, CO	13976	53677	694	1843
Spearfish SD	5706	9051	283	329
SR 7 West, CO	18967	22554	941	775
SR 71 South, CO	1796	6018	89	219
Sterling CO	22648	60578	1124	2080
Sturgis SD	10250	28620	509	983
Sundance Wyo	674	5008	218	237
Torington Wyo	579	688	241	263
Upton Wyo	1666	3287	695	1816
US 18 East in SD	740	881	309	486
US 20 East of SR 61	860	6388	272	297
US 34 East, CO	110	816	46	451
US 34 West, CO	38942	46306	1932	1590

TRAVEL ANALYSIS ZONES (Name/Location)	All Vehicles		Trucks	
	2010	2035	2010	2035
US 85 North End SD	6438	18547	319	637
Wellington CO	1597	11870	229	432
Wheatland Wyo	2991	11904	148	433
Wiggins CO	1304	2737	219	310
Windsor CO	8924	26078	443	896
Wright Wyo	4010	4769	199	217
TOTAL	735,991	1,414,872	63,979	115,695

Scenario Assumptions

Travel demand growth assumptions were developed for each “Build” scenario. These assumptions addressed population growth, economic conditions, anticipated freight activity and major new industrial operations with a potential to influence basic forecasts. **Table 1** summarizes the primary assumptions applied to the 2035 build scenarios.

As described previously, the “No Build” scenario or “2035 without Improvements” scenario evaluates the projected Year 2035 conditions based on traffic counts and growth trends, but does not reflect traffic that may result from making transportation improvements that would draw additional vehicles into the Heartland Expressway Corridor.

Future travel demands from the above mentioned sources were placed on the model roadway network. Future OD patterns were then estimated using the existing OD travel demand as a seed matrix. It became evident that the four to five percent total growth in travel demand assumed in the NDOR travel demand model between existing conditions and the Year 2035 was out of step with the much higher rate of growth expected in the surrounding states.

Based on this differential, the rate of growth in Nebraska was increased to accommodate the expected growth rates in the surrounding states. The resulting increase in overall traffic for all vehicles was 19 percent versus the five percent assumed in the NDOR model. The increase in truck demand needed to balance the surrounding demand rates was eight percent.

There is some historic evidence to support a greater level of travel demand through the panhandle of Nebraska generated by surrounding states. The one corridor within the panhandle that has seen growth in travel demand over the last ten years is the US 26 corridor between the Powder River, Wyoming energy production area and I-80. US 26 also serves as a shortcut around Cheyenne, Wyoming between I-80 and I-25. Given this pattern, it is likely that much of this growth in travel demand is due to trips with origins and destinations outside the panhandle area. Historic growth rates are depicted below in **Table 3**.

Table 3 Historic Growth Rates (Average Daily Traffic)

Location	2000		2010		% Change
	All Veh.	Trucks	All Veh.	Trucks	
NE 71					
At Colorado Border	810	140	820	135	1%
South of Kimball	2340	385	1610	355	-31%
North of Kimball	2140	330	2055	315	-4%
South of Gering	3450	395	3805	215	10%
North of Scottsbluff	2155	245	1860	185	-14%
North of SH 2	910	130	750	105	-18%
L7E					
West of US 385	2220	260	2470	435	11%
NE 2					
West of Hemingford	1550	155	1035	110	-33%
South of Hemingford	1825	235	1220	135	-33%
South of US 385	3390	340	3010	305	-11%
East of Alliance	830	160	1260	245	52%
I-80					
At Wyoming Border	8300	4335	7475	4350	-10%
East of Kimball	8290	4300	7285	4455	-12%
West of Sidney	7800	4320	7215	4420	-8%
West of I-76	7400	4150	7395	4515	0%
East of Ogallala	14130	6190	14865	6830	5%
I-76					
At Colorado Border	6197	1920	6500	2100	5%
US 26					
East of Henry	3500	420	4320	390	23%
West of NE 71	7025	380	7615	445	8%
East of Scottsbluff	5465	395	4890	350	-11%
East of Melbeta	2505	265	2510	285	0%
West of Bridgeport	2760	380	3175	440	15%
West of Lisco	1710	375	1315	285	-23%
East of Oshkosh	1970	365	1920	330	-3%
NE 92					
At Wyoming Border	460	60	540	70	17%
West of Scottsbluff	1865	165	1415	130	-24%
US 385					
North of Sidney	2365	370	2795	405	18%
South of SH 92	1715	350	2095	380	22%
South of Angora	3365	500	3230	580	-4%
South of Alliance	3760	525	3485	385	-7%
North of SH 2	1450	230	1960	305	35%
South of Chadron	3715	380	3370	230	-9%
At SD Border	1900	350	1790	235	-6%
US 20					
At Wyoming Border	865	195	550	125	-36%
East of Crawford	1850	240	1595	205	-14%
West of Chadron	4825	435	3515	290	-27%
East of Hay Springs	2440	210	2560	215	5%

The final set of growth rates that were applied are presented in **Table 4**.

Table 4 Assumed Baseline Growth in Travel Demand

State	2010 to 2035 Baseline Growth in Travel Demand	
	All Vehicles	Trucks
Nebraska	19%	8%
Wyoming	60%	48%
South Dakota	82%	67%
Colorado	118%	97%
Average	88%	56%

The following discussions elaborate on travel behavior, freight and energy development assumptions.

Travel Behavior Changes Related to Improvements

Travel behavior is the outcome of travel conditions faced by a driver, and in this case, route choices available to a motorist. Key factors associated with travel behavior include clear or perceived travel time savings, safety benefits, travel simplicity (fewer turns and route changes reduce complexities) and roadside attractions, features and services. New road alignments and access benefits that enhance a road system’s reach have the most significant influences on driver behavior.

The PTP Alliance Corridor is not a new route, but the overall set of anticipated improvements has the effect of creating a new major route option for many motorists. However, perhaps more importantly, a comprehensive package of improvements that upgrades everything from travel speeds and safety to drive amenities and directional signage is expected to draw existing and future travel demand into this corridor to varying degrees from Canada to Mexico. The modeling effort for the “Build” scenarios reflects this effect.

In September 2008, Texas DOT produced a document Great Plains International Trade Corridor Assessment, Connecting America’s Energy and Agricultural Heartland and the travel forecast section referred to the FAF3 data. This study concluded that the data was not disaggregated enough to conduct travel demand forecasts. However, the data can be used to estimate the added demand by fully improving the corridor as well as for expected increases in international trade due to the North American Free Trade Act (NAFTA) and other trade conditions and agreements.

In summary, just north of Limon, Colorado, Highway 71 carries approximately 870 vehicles per day, with 190 of those being trucks. The PTP Corridor Development and Management Plan prepared by CDOT in December 2004 for the States of Colorado, New Mexico, Texas, and Oklahoma estimated that traffic on Colorado Highway 71 north of Limon would grow as a result of the PTP improvements as well as ambient growth by approximately 210 percent. Truck travel is expected to increase from 190 vehicles per day (VPD) to 430 VPD by 2035 with corridor improvements.

At the Canadian border, there are approximately 2,640 vehicles crossing the border each day between US 191 in Montana and US 256 North of Minot, North Dakota. Of these crossings, approximately 720 are trucks. These boundaries for the crossings were selected as being those that could reasonably be expected to feed the improved PTP Alliance Corridor. The total volume of border crossings between I-15 and I-29 is approximately 11,520 with 3,200 being trucks.

To estimate the total number of crossings for the PTP Alliance Corridor, it was assumed that 70 percent of the crossings occurring between US 191 in Montana and US 256 would occur on the PTP Alliance Corridor. Additionally, an estimated one third of the remaining crossings between I-15 and I-29 would be diverted to the PTP Alliance Corridor. This results in a base border crossing at the PTP Alliance Corridor of 3,000 daily trips, with 820 being trucks, or approximately ¼ of the total crossings between I-15 and I-29. These results are summarized in

Table 5.

Table 5 Additional PTP Alliance Corridor Travel Demand

	Vehicles (Vehs) Per Day			
	To/From Canada		To/From Ports to Plains	
With Attraction Due to Improvements (2010)	4730	1300	1290	300
With Expected Trade Corridor Growth	7570	2860	2660	430

Additional volume will occur on the segments due to local trip generation. As the corridor proceeds northward, the Ports to Plains component decreases and the Canadian component increases as the corridor gets closer to the Canadian border, and the reverse occurs in the southbound direction. The changes in travel demand are attributable to cars entering or leaving the corridor at intersecting facilities. As expected, interstate highway crossings have a large influence on vehicles accessing the corridor. The two right-most columns depict total segmental trade component due to the combined impact of Ports to Plains and Canadian Border crossings. These results are summarized in **Table 6**.

Table 6 Additional Ports to Plains Alliance Corridor Travel Demand by Heartland Expressway Corridor Location

	To/From Canada		To/From Ports to Plains		Totals	
	All Vehs	Trucks	All Vehs	Trucks	All Vehs	Trucks
Between Canada and US 2	7570	3390	40	5	7610	3395
Between US 2 and ND 23	7080	3160	40	10	7120	3170
Between ND 23 and I-94	6930	3090	40	10	6970	3100
Between I-94 and US 12	2630	1080	70	20	2700	1100
Between US 12 and SD 20	2480	950	140	30	2620	980
Between SD 20 and I-90	2450	920	150	30	2600	950
Between I-90 and US 18	1650	210	510	60	2160	270
Between US 18 and US 20	1420	190	680	90	2100	280
Between US 20 and NE 2	1260	170	790	110	2050	280
Between NE 2 and US 26	1210	170	820	120	2030	290
Between US 26 and I-80	740	120	1160	190	1900	310
Between I-80 and CO 14	80	50	1640	280	1720	330
Between CO 14 and I-76	70	50	1770	300	1840	350

FUTURE TRAVEL DEMAND MODEL RESULTS

As shown in **Table 7**, AADT increases based on general traffic growth and anticipated community population changes ranging from low to high. With the addition of Heartland Expressway Corridor improvements, additional increases are evident. These increases are based on the value of the improvements for travelers in terms of travel time savings and increased safety on the new facilities. Larger increases are noticeable in the southern portion of the corridor when anticipated energy development activity is added to the forecasts. The largest increases are attributed to completion of the overall PTP Alliance Corridor improvements. Clearly, the formation of this new corridor from Canada to Mexico has substantial influences on travel route choices and reflects the importance of travel to and through Nebraska from distant origins and destinations.

Table 7 2010 Existing Traffic and 2035 Traffic Forecasts for Various Scenarios (AADT)

Location	2010 Existing Traffic		Future No Build 2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy Resource Development		2035 With All Ports to Plains Alliance Corridor Improvements		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
NE 71												
At Colorado Border	820	135	860	140	1020	220	1480	350	2180	820	2640	950
South of Kimball	1610	355	1690	370	1850	450	2310	580	2850	970	3310	1100
North of Kimball	2055	315	2160	330	2460	410	3080	500	3770	1110	4390	1200
South of Gering	3805	215	4000	230	4360	310	4430	330	6980	1200	7050	1220
North of Scottsbluff	1860	185	2900	330	3010	330	3160	330	3160	350	3310	350
North of NE	750	105	1950	190	1780	100	1830	100	1870	110	1920	110
L7E												
West of US 385	2470	435	2590	540	2650	550	3170	590	4010	730	4530	770
NE2												
West of Hemingford	1035	110	2590	460	2870	550	2970	550	3010	580	3110	580
South of Hemingford	1220	135	2000	160	2000	160	2020	160	2000	160	2020	160
South of US 385	3010	305	3160	320	3220	320	3380	330	4640	510	4800	520
East of Alliance	1260	245	1320	300	1320	300	1350	300	1320	300	1350	300
I-80												
At Wyoming Border	7475	4350	7800	4570	7750	4570	8150	4750	7920	4660	8320	4840
East of Kimball	7285	4455	8700	4620	8650	4620	9200	4780	8820	4710	9370	4870
West of Sidney	7215	4420	9600	4700	9650	4700	10010	4740	9750	4750	10110	4790
West of I-76	7395	4515	9600	4740	9660	4740	9870	4770	9710	4760	9920	4790
East of Ogallala	14865	6830	20400	9060	20400	9060	21080	9190	20400	9060	21080	9190
I-76												
At Colorado Border	6500	2100	18400	4170	18390	4170	18950	4240	18390	4170	18950	4240
US 26												
East of	4320	390	9340	480	9500	520	10970	550	9690	530	11160	560
West of NE 71	7615	445	13040	540	13200	580	14670	610	13390	590	14860	620

Location	2010 Existing Traffic		Future No Build 2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy Resource Development		2035 With All Ports to Plains Alliance Corridor Improvements		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
US 26 (Continued)												
East of Scottsbluff	4890	350	9140	630	9160	630	9830	700	9160	630	9830	700
East of Melbeta	2510	285	6030	490	6050	490	6720	560	6050	490	6720	560
West of Bridgeport	3175	440	6570	510	6550	510	7260	590	6550	510	7260	590
West of	1315	285	5450	780	5410	780	5850	830	5460	780	5900	830
East of Oshkosh	1920	330	6170	700	6120	700	6490	740	6170	700	6540	740
NE 92												
At Wyoming Border	540	70	1170	90	1190	100	1370	100	1210	100	1400	110
West of Scottsbluff	1415	130	2420	160	2450	170	2720	180	2480	170	2760	180
US 385												
North of Sidney	2795	405	4070	470	4070	470	4100	470	4070	470	4100	470
South of NE 92	2095	380	2510	470	2510	470	2630	480	2510	470	2630	480
South of Angora	3230	580	4690	610	4690	610	4740	610	4740	610	4790	610
South of Alliance	3485	385	3660	400	3720	400	4150	440	5140	590	5570	630
North of NE	1960	305	2060	320	2270	410	2400	420	3700	620	3830	630
South of Chadron	3370	230	3540	240	3750	330	3880	340	5180	540	5310	550
At South Dakota Border	1790	235	2610	340	2660	340	2710	340	4130	520	4180	520
US 20												
At Wyoming Border	550	125	580	180	460	180	460	180	470	190	470	190
East of Crawford	1595	205	2590	370	2300	280	2310	280	2300	280	2310	280
West of Chadron	3515	290	3690	300	3930	390	3990	390	4130	570	4190	570
East of Hay Springs	2560	215	4120	300	4120	300	4150	300	4320	480	4350	480

Table 8 provides a summary percent change in traffic growth along several Nebraska Highway segments in Nebraska. The percent increase in travel demand is from Year 2010 to Year 2035 Ultimate PTP Corridor condition. Some traffic volumes are anticipated to double or triple between Year 2010 and 2035. Tables 5 and 6 summarize how the traffic growth along the Heartland Expressway and the adjacent highways will see an increase in overall vehicle traffic and truck traffic with the completion of the overall Ports to Plains Corridor.

A couple of the largest traffic increases occur on US 26 and NE 71 corridors. US 26 provides a shorter route between I-80 and I-25 resulting in the increase in traffic and NE 71 is expected to have an increase in traffic south of Scottsbluff to the Nebraska/Colorado border. **Table 8** also provides a summary of the expected increase in truck traffic.

Table 8 Travel Forecasts Reflecting Percent Change from 2010 to 2035

Segment	2010		Ultimate 2035 With All PTP Alliance Corridor Improvements and Intensified Energy Development		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resources Development	
	Veh.	Trucks	Veh.	Trucks	Veh.	Trucks
NE 71						
At Colorado Border	820	135	2640	950	222%	604%
South of Kimball	1610	355	3310	1100	106%	210%
North of Kimball	2055	315	4390	1200	114%	281%
South of Gering	3805	215	7050	1220	85%	467%
North of Scottsbluff	1860	185	3310	350	78%	89%
North of NE 2	750	105	1920	110	156%	5%
L7E						
West of US 385	2470	435	4530	770	83%	77%
NE 2						
West of Hemingford	1035	110	3110	580	200%	427%
South of Hemingford	1220	135	2020	160	66%	19%
South of US 385	3010	305	4800	520	59%	70%
East of Alliance	1260	245	1350	300	7%	22%
I-80						
At Wyoming Border	7475	4350	8320	4840	11%	11%
East of Kimball	7285	4455	9370	4870	29%	9%
West of Sidney	7215	4420	10110	4790	40%	8%
West of I-76	7395	4515	9920	4790	34%	6%
East of Ogallala	14865	6830	21080	9190	42%	35%
I-76						
At Colorado Border	6500	2100	18950	4240	192%	102%

Segment	2010		Ultimate 2035 With All PTP Alliance Corridor Improvements and Intensified Energy Development		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resources Development	
	Veh.	Trucks	Veh.	Trucks	Veh.	Trucks
US 26						
East of Henry	4320	390	11160	560	158%	44%
West of NE 71	7615	445	14860	620	95%	39%
East of Scottsbluff	4890	350	9830	700	101%	100%
East of Melbeta	2510	285	6720	560	168%	96%
West of Bridgeport	3175	440	7260	590	129%	34%
West of Lisco	1315	285	5900	830	349%	191%
East of Oshkosh	1920	330	6540	740	241%	124%
NE 92						
At Wyoming Border	540	70	1400	110	159%	57%
West of Scottsbluff	1415	130	2760	180	95%	38%
US 385						
North of Sidney	2795	405	4100	470	47%	16%
South of NE 92	2095	380	2630	480	26%	26%
South of Angora	3230	580	4790	610	48%	5%
South of Alliance	3485	385	5570	630	60%	64%
North of NE 2	1960	305	3830	630	95%	107%
South of Chadron	3370	230	5310	550	58%	139%
At South Dakota Border	1790	235	4180	520	134%	121%
US 20						
Wyoming Border	550	125	470	190	-15%	52%
East of Crawford	1595	205	2310	280	45%	37%
West of Chadron	3515	290	4190	570	19%	97%
East of Hay Springs	2560	215	4350	480	70%	123%

Table 9 reflects the changes in travel behavior found during the modeling process. On the table are “cordons.” Cordons are imaginary lines drawn east-west across all north/south modeled facilities. The total AADT crossing the cordon is depicted on the table along with the percentage of the total that is on the Heartland Expressway.

Table 9 Daily Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) for the Modeled Area (in thousands)

Location	2010 Existing Traffic		2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy		2035 With All Ports to Plains Alliance Corridor Improvements		2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
VMT												
Nebraska	3,299	1,025	3,937	1,103	3,959	1,107	4,248	1,137	4,219	1,188	4,507	1,218
Wyoming	2,689	594	4,292	880	4,274	878	4,430	905	4,066	855	4,222	882
South Dakota	1,427	166	2,601	277	2,603	277	2,610	278	2,703	283	2,710	283
Colorado	10,216	1,245	22,283	2,454	22,280	2,452	23,586	2,589	22,458	2,451	23,764	2,588
Total	17,631	3,030	33,113	4,714	33,116	4,714	34,874	4,909	33,446	4,777	35,203	4,971
VHT												
Nebraska	52.1	17	66	21.7	62.1	18.1	67.7	18.9	66.8	19.5	72.4	20.5
Wyoming	41.9	9.8	70.1	17.1	66.1	14.3	69.7	15	63.6	14	67	14.7
South Dakota	25.9	3.3	47.5	5.6	47.5	5.5	48	5.6	49.6	5.7	50.3	5.8
Colorado	164.7	21.4	365.6	42.7	365.8	42.7	389.7	45.7	368.8	42.6	393.1	46
Total	284.6	51.5	549.3	87.1	541.5	80.6	575.1	85.2	548.8	81.8	582.8	87

The data in **Table 10** indicates that without improvements to the Heartland Expressway Corridor, the corridor’s overall share of the total travel demand will be significantly reduced. Improvements to the Heartland Expressway Corridor will help reverse some of the declines, but not all. It is only with the full corridor improvements that the total share of vehicles is roughly equal to the existing share. However, a much greater share of the truck traffic will be on the corridor with implementation of the full improvements to the PTP Alliance Corridor. This finding validates that as the corridor is improved the attraction for the trucking activity will increase.

Table 10 Changes in Travel Behavior Found during the Modeling Process

		2010 Existing Traffic		2035 without Improvements		2035 With Heartland Improvements		2035 With Complete PTP Improvements		
		All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	
Cordon	South of I- 90	AADT	27,330	2,990	44,780	5,070	44,790	5,080	45,530	5,170
		Heartland %	23.1%	31.5%	20.5%	26.8%	20.5%	26.8%	23.5%	29.8%
South of US 20	AADT	12,300	2,225	16,540	2,540	16,380	2,530	16,470	2,570	
		Heartland %	15.9%	13.7%	12.5%	12.6%	13.9%	16.2%	22.5%	24.1%
South of US 26	AADT	15,695	2,822	25,090	3,620	25,100	3,670	26,420	4,370	
		Heartland %	25.2%	8.0%	15.9%	6.4%	17.4%	8.4%	26.4%	27.5%
South of I-80	AADT	33,390	6,425	74,000	14,110	74,000	14,160	74,000	14,560	
		Heartland %	2.5%	2.1%	1.2%	1.0%	1.4%	1.6%	2.9%	5.6%

For economic analysis purposes and to determine what value accrues to the traveling public as a result of Heartland Corridor improvements, the number of new trips, the number of diverted trips, and changes to existing traffic were estimated for two measures of effectiveness (Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT)) for the six modelling scenarios.

New Trips: Traffic generated by enhanced economic activity such as oil and gas development associated with the Niobrara play, and traffic resulting from Ports to Plains (PTP) improvements south of the Heartland Expressway corridor.

Diverted Trips: Traffic diverted to the Heartland Expressway roadway segments from regional roadway network facilities.

Existing Trips: Traffic on existing roadway segments under existing travel demand (2010 and 2035).

This information is presented in **Table 11**.

Table 11 Existing, New and Diverted Traffic in 2010 and 2035 (Vehicle Miles Traveled and Vehicle Hours Traveled)

Location	2010 Existing Traffic		2035 w/o Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Niobrara Activity		2035 With All Great Plains Trade Corridor Improvements		2035 With All Great Plains Trade Corridor Improvements and Niobrara Activity	
	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks
VMT												
Nebraska (total)	3,298,567	1,025,407	3,936,995	1,103,455	3,959,163	1,107,058	4,247,697	1,136,545	4,218,846	1,191,762	4,526,441	1,224,521
New (total)	na	na	na	na	na	na	289,062	29,573	260,036	84,761	546,208	114,039
Diverted (total)	na	na	na	na	22,168	3,603	21,640	3,517	21,815	3,546	43,239	7,028
Existing (total)	3,298,567	1,025,407	3,936,995	1,103,455	3,936,995	1,103,455	3,936,995	1,103,455	3,936,995	1,103,455	3,936,995	1,103,455
US 385												
New	na	na	na	na	na	na	19,445	1,385	23,285	1,747	42,535	3,117
Diverted	na	na	na	na	15,005	3,576	14,648	3,491	14,766	3,519	29,267	6,976
Existing	239,825	26,922	375,668	41,326	375,668	41,326	375,668	41,326	375,668	41,326	375,668	41,326
US 26												
New	na	na	na	na	na	na	61,646	2,208	56,338	2,040	117,368	4,226
Diverted	na	na	na	na	5,594	917	5,461	895	5,505	902	10,912	1,789
Existing	205,240	14,874	266,561	13,116	266,561	13,116	266,561	13,116	266,561	13,116	266,561	13,116
NE 71												
New	na	na	na	na	na	na	40,316	5,932	51,502	12,514	91,415	18,387
Diverted	na	na	na	na	11,259	2,213	10,991	2,160	11,080	2,178	21,960	4,317
Existing	147,691	15,497	170,213	16,237	170,213	16,237	170,213	16,237	170,213	16,237	170,213	16,237
NE 71 Bypass												
New	na	na	na	na	na	na	457	133	564	222	1,017	353
Diverted	na	na	na	na	151	36	147	35	148	35	294	69
Existing	1,297	132	2,366	310	2,366	310	2,366	310	2,366	310	2,366	310
L62A												
New	na	na	na	na	na	na	12,910	950	16,332	1,208	29,113	2,148
Diverted	na	na	na	na	1,205	79	1,176	77	1,185	78	2,350	154
Existing	106,315	9,982	106,327	8,871	106,327	8,871	106,327	8,871	106,327	8,871	106,327	8,871
Wyoming	700,368	67,407	921,135	79,860	954,349	86,681	1,088,333	97,127	1,101,842	104,302	1,267,367	121,396
New	na	na	na	na	na	na	134,775	10,608	148,021	17,730	281,448	28,231
Diverted	na	na	na	na	33,213	6,821	32,423	6,659	32,685	6,712	64,783	13,304
Existing	700,368	67,407	921,135	79,860	921,135	79,860	921,135	79,860	921,135	79,860	921,135	79,860

Location	2010 Existing Traffic		2035 w/o Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Niobrara Activity		2035 With All Great Plains Trade Corridor Improvements		2035 With All Great Plains Trade Corridor Improvements and Niobrara Activity	
	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks
South Dakota	2,689,199	593,965	4,291,722	879,806	4,273,525	878,111	4,429,627	905,006	4,066,213	851,864	4,221,881	878,719
New	na	na	na	na	na	na	155,668	26,855	0	0	155,668	26,855
Diverted	na	na	na	na	0	0	0	0	0	0	0	0
Existing	2,689,199	593,965	4,291,722	879,806	4,273,525	878,111	4,273,959	878,152	4,066,213	851,864	4,066,213	851,864
Colorado	1,426,738	165,926	2,600,640	277,162	2,602,803	277,296	2,609,785	277,747	2,703,385	283,440	2,712,016	283,993
New	na	na	na	na	na	na	7,033	454	100,616	6,145	107,146	6,568
Diverted	na	na	na	na	2,164	134	2,112	131	2,129	132	4,231	263
Existing	1,426,738	165,926	2,600,640	277,162	2,600,640	277,162	2,600,640	277,162	2,600,640	277,162	2,600,640	277,162
4-State Total	10,215,872	1,245,059	22,283,356	2,453,853	22,280,064	2,452,087	23,585,926	2,589,016	22,458,268	2,470,769	23,763,160	2,607,562
New	na	na	na	na	na	na	1,305,784	136,887	178,204	18,681	1,483,097	155,475
Diverted	na	na	na	na	0	0	0	0	0	0	0	0
Existing	10,215,872	1,245,059	22,283,356	2,453,853	22,280,064	2,452,087	22,280,142	2,452,129	22,280,064	2,452,087	22,280,064	2,452,087
VHT												
Nebraska (total)	17,630,376	3,030,357	33,112,712	4,714,275	33,115,555	4,714,553	34,873,034	4,908,314	33,446,711	4,797,834	35,223,498	4,994,796
New (total)	na	na	na	na	na	na	1,757,547	193,768	538,856	109,588	2,292,118	302,937
Diverted (new)	na	na	na	na	24,332	3,737	23,752	3,649	23,944	3,678	47,470	7,291
Existing (total)	17,630,376	3,030,357	33,112,712	4,714,275	33,091,224	4,710,815	33,091,735	4,710,897	32,883,911	4,684,568	32,883,911	4,684,568
US 385												
New	52,139	17,005	62,897	18,484	62,095	18,148	66,971	18,744	66,445	19,616	72,119	20,400
Diverted	na	na	na	na	na	na	4,558	488	4,096	1,395	8,740	1,902
Existing	na	na	na	na	342	59	335	58	337	58	680	118
US 26	52,139	17,005	62,897	18,484	61,753	18,089	62,078	18,199	62,012	18,162	62,699	18,381
New	0	0	0	0	0	0	0	0	0	0	0	0
Diverted	na	na	na	na	na	na	300	23	359	29	666	52
Existing	na	na	na	na	230	58	226	57	228	58	459	116
NE 71	3,725	445	5,914	690	5,771	675	5,805	679	5,794	678	5,863	686
New	0	0	0	0	0	0	0	0	0	0	0	0
Diverted	na	na	na	na	na	na	969	37	884	34	1,872	72
Existing	na	na	na	na	87	15	86	15	86	15	174	30
NE 71 Bypass	3,234	250	4,252	223	4,165	218	4,191	220	4,182	219	4,232	222
New	0	0	0	0	0	0	0	0	0	0	0	0
Diverted	na	na	na	na	na	na	611	95	779	201	1,403	299
Existing	na	na	na	na	170	35	166	35	168	35	337	70

Location	2010 Existing Traffic		2035 w/o Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Niobrara Activity		2035 With All Great Plains Trade Corridor Improvements		2035 With All Great Plains Trade Corridor Improvements and Niobrara Activity	
	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks	All Veh.	Trucks
L62A	2,248	251	2,623	265	2,563	260	2,579	261	2,574	261	2,604	264
New	0	0	0	0	0	0	0	0	0	0	0	0
Diverted	na	na	na	na	na	na	8	2	9	4	17	6
Existing	na	na	na	na	3	1	2	1	2	1	5	1
Wyoming	22	2	41	6	39	6	40	6	40	6	40	6
New	0	0	0	0	0	0	0	0	0	0	0	0
Diverted	na	na	na	na	na	na	203	16	257	20	465	37
Existing	na	na	na	na	19	1	19	1	19	1	38	3
South Dakota	1,681	168	1,703	151	1,664	148	1,674	149	1,671	148	1,691	150
New	10,910	1,117	14,533	1,335	14,711	1,418	16,879	1,597	17,050	1,710	19,867	2,015
Diverted	na	na	na	na	na	na	2,091	174	2,288	288	4,423	466
Existing	na	na	na	na	509	111	500	109	503	110	1,012	221
Colorado	10,910	1,117	14,533	1,335	14,203	1,307	14,288	1,315	14,260	1,312	14,431	1,328
New	41,877	9,780	67,630	14,634	66,150	14,296	68,971	14,822	63,208	13,924	66,023	14,450
Diverted	na	na	na	na	na	na	2,413	443	0	0	2,423	445
Existing	na	na	na	na	0	0	0	0	0	0	0	0
4-State Total	41,877	9,780	67,630	14,634	66,150	14,296	66,558	14,379	63,208	13,924	63,600	14,005
New	25,853	3,293	47,550	5,556	47,523	5,546	47,984	5,583	49,611	5,692	50,293	5,770
Diverted	na	na	na	na	na	na	109	7	1,557	101	1,668	109
Existing	na	na	na	na	33	2	33	2	33	2	66	4

COST, PRIORITIZATION, AND IMPLEMENTATION SCHEDULE

Cost Estimates

The study team, working with NDOR, developed a list of potential improvement projects to improve the safety, increase capacity of the corridor and to ultimately meet the overall goal of a four lane divided roadway. The improvements considered included intersection improvements, roadway widening for a Super-2 facility, widening for a four-lane roadway, safety improvements, and ITS improvements. The following projects were considered:

NE 71:

- Widen NE 71 to a Super-2 facility from Colorado/Nebraska border to I-80
- Intersection Improvement at Clean Harbors (South of Kimball)
- Extend NE 71 Bypass to NE 71 south of Kimball
- I-80 Interchange Improvements
- Truck Parking/Visitor Center I-80 & NE 71 interchange.
- Widen NE 71 to four lanes from Colorado/Nebraska border to I-80

US 26:

- Pedestrian Overpass Scottsbluff at 5th Avenue
- L79E and US 26 Intersection Improvement
- Widen US 26 to four lanes from Wyoming/Nebraska border to Morrill
- Safety and Traffic Operation Improvements/Relief Route in Morrill
- Safety and Traffic Operation Improvements in Mitchell
- Widen US 26 to four lanes from Minatare to L62A/US 26 intersection
- Safety and Traffic Operation Improvements in Minatare
- US 26 and NE 71 Interchange
- US 26 Relief Route Mitchell

L62A:

- Widen L62A to four lanes from L62A/US 26 intersection to US 385

US385:

- Widen US 385 to four lanes from L62A intersection to Alliance
- Construct Passing Lanes (Super-2) on US 385 from Alliance to Chadron
- US 385 and US 20 Intersection Improvement
- Widen US 385 from Chadron to South Dakota/Nebraska state border
- Widen US 385 to four lanes from Alliance to L7E (Hemingford)
- US 385 bridge widening over NE 2
- US 385 to four lanes from L7E to Chadron
- Relief Route for Chadron
- Truck Parking/Visitor Center for Chadron

Planning level costs, in 2012 dollars, were developed based on recent information from NDOR improvement projects in the area. The following costs were general costs used in the estimation process. Independent costs were completed for some individual projects that do not meet the following criteria.

The Super-2 section includes two 12-foot lanes and ten-foot shoulders and construction of a 12-foot passing lane. The passing lanes were estimated to be one mile in length with appropriate taper lengths.

“Four-lane” improvements include construction of two new lanes with ten-foot shoulders and the existing two lanes would remain in place.

- Construction of two new lanes of a four-lane roadway. Assumption that the existing two lanes would remain in place - \$3,000,000/mile
- Construction of four lanes of relief route. Assumption that four new lanes are constructed. - \$5,000,000/mile
- Construction of “Super-2” improvements - \$1,000,000/mile

Costs for the project development, engineering, construction engineering, utilities, and right-of-ways were developed based upon a percentage of the construction costs. The estimated percentages are listed below. These percentages were based on historical NDOR data.

- Project Development, Engineering, and Construction Engineering were estimated to be 16 percent of the construction costs.
- Utility Costs were estimated to be three percent of the construction costs.
- Right-of-Way Costs were estimated to be three percent of the construction costs.

Prioritization

With such a large investment required to upgrade the Heartland Expressway Corridor, located within the State of Nebraska, to the envisioned capacity and functionality, it is important to understand the priority of the improvement projects from the standpoint of the overall system need. The prioritization process used criteria for ranking the improvement projects relative to one another.

The weighting criteria used in this study are similar to the prioritization process used in the Ports to Plains Corridor Development and Management Plan. The following criteria were used for ranking both expansion sections and relief routes.

Truck Average Annual Daily Traffic (AADT): The PTP Alliance Corridor is designated as a high priority corridor with the importance of improving the trade corridor to promote the flow of goods both regionally and internationally. Using truck AADT allows priority to be given to improvement projects that are expected to have a higher number of trucks.

Accident Rate: Existing crash rates were used to compare improvement projects with each other to identify safety enhancements.

Existing Pavement Condition: The existing pavement conditions were provided by NDOR. Improvement projects with known deteriorating pavement received a higher priority over projects with good pavement.

Intermodal Connection: Intermodal facilities are at the forefront of increasing efficiency in the transfer and transport of goods. Roadway expansion projects that support existing intermodal facilities should be considered in prioritizing improvements to the system. Improving the efficiency of transporting freight and goods to the intermodal facilities provides an additional benefit.

System Connectivity: As discussed in Section 2.1.2, the system connectivity provides the ability to connect the Heartland Expressway improvements to the planned improvements along the PTP Alliance Corridor. The measure provides priority to projects that connect planned improvements to improved corridors outside of Nebraska.

Total Vehicle AADT: While a primary focus of the Heartland Expressway is to promote trade growth along the PTP Alliance Corridor, the general motorist will also benefit from improvements. This measure accounts for all motorists, not just commercial vehicles. The data includes existing and forecasted AADT.

Travel Time Savings Rate: This criterion allows existing and (forecasted) future delay along the Corridor to be accounted for in prioritization. Improvements that cause greater travel time savings per mile of improvement have a higher priority for implementation.

Cost per Vehicle Mile Traveled: This measure allows cost to play a role in prioritizing improvements. The lower the cost per vehicle mile traveled, the greater the cost-effectiveness of the improvement.

Volume to Capacity Ratio: The volume to capacity ratio is a measure that allows areas with higher congestion to gain priority over areas where congestion is less of a problem. Congested roadways cause costly delays in the movement of goods and people.

The following matrix presents the details of the evaluation process, including values and weights for each criterion. The factors and their weights were discussed and verified by the Project Steering Committee. The weights were established based upon the significance of the criteria in meeting the function of the Corridor.

**Heartland Expressway
Project Priority Groupings**

Travel Demand Priority	Highway Segment	Improvement	Type	Completion Year	Pavement Type	Pavement Condition	Crash Rate (Seg -)		RP Start	RP End	Distance	No. of Passing Lane		Unit Price	Price	New Maintenance & Operations for Project Program		Existing AADT	Existing AADT Trucks	2035 Forecast	2035 Forecast	2035 Forecast	2035 Forecast	Existing V/C	
							Crashes/MEV	Crashes/HMVM				Locations	No of Items			Background AADT	Background Truck AADT			AADT with GPTC Improvements	Truck AADT with GPTC Improvements				
Group 1 (2015 to 2020)																									
	US 385	Intersection with NE 20 (East)	Intersection Improvements	2017			0.795						1.00	\$ 800,000.00	\$ 800,000.00		3,300	480	4,820	720	7,860	1,080	0.19		
4	US 385	L62A to Alliance	4-Lane Roadway	2019	Asphalt	Good	74.6	85.00	107.00	22.00	0.00		1.00	\$ 3,000,000.00	\$ 66,000,000.00	\$ 4,809,728.00	3,400	480	4,160	500	4,990	600	0.40		
5	US 385	Alliance to Chadron	Super 2 Facility - Add Passing Lanes	2020	Asphalt	Very Good	108.4	110.00	168.00	58.00	3.00		1.00	\$ 750,000.00	\$ 2,250,000.00	\$ 955,536.00	2,330	270	2,450	280	4,000	550	0.27		
	US 26	In Scottsbluff @ 5th Avenue	Pedestrian Overpass	2020			1.5						1.00	\$ 1,000,000.00	\$ 1,000,000.00		7,340	350	13,710	630	13,740	630	0.24		
7	US 385	Chadron to SD	4-Lane	2022	Asphalt	Good	74.8	170.00	186.00	16.00			1.00	\$ 3,000,000.00	\$ 48,000,000.00	\$ 3,048,320.00	1,650	240	2,410	360	3,930	540	0.19		
	US 26	L79E Intersection (Minatare)	Intersection Improvements	2017			0.962						1.00	\$ 150,000.00	\$ 150,000.00		6,600	540	6,930	950	8,780	1,200	0.60		
	NE 71	I-80	Extend Bypass to NE 71 to the south	2022			44.2			3.00			1.00	\$ 6,000,000.00	\$ 18,000,000.00	\$ 1,143,120.00	1,420	300	1,500	310	2,660	910	0.17		
6	NE 71	Colorado Border to I-80	Super 2 Facility (4-Lane Design Criteria)	2021	Asphalt	Very Good	44.2	0.00	15.00	15.00			1.00	\$ 1,000,000.00	\$ 15,000,000.00	\$ 2,998,320.00	1,420	300	1,500	310	2,660	910	0.17		
	NE 71	Clean Harbors (South of Kimball)	Intersection Improvement	2020									1.00	\$ 250,000.00	\$ 250,000.00		1,420	300	1,500	310	2,660	910	0.17		
	NE 71	I-80 (MP 22) Interchange	Rest Area/Visitor Center	2022			44.2						1.00	\$ 5,000,000.00	\$ 5,000,000.00	\$ 1,650,000.00	9,240	4,650	9,660	4,890	9,890	4,970	0.12		
ITS Improvements														\$ 2,820,000.00	\$ 423,000.00										
														\$ 156,450,000.00	\$ 15,028,024.00										
Group 2 (2020 to 2025)																									
3	L62A	US26 to US 385	4-Lane Roadway	2022	Concrete	Good	62.1	0.00	8.00	8.00	0.00		1.00	\$ 5,000,000.00	\$ 40,000,000.00	\$ 3,048,320.00	2,470	435	2,590	540	4,010	730	0.29		
5	US 385	Alliance to L7E (Hemingford)	4-Lane	2027	Asphalt	Very Good	51.8	110.00	126.00	16.00			1.00	\$ 3,000,000.00	\$ 48,000,000.00	\$ 1,898,880.00	2,590	210	2,720	220	4,200	410	0.30		
	US 385	Alliance to L7E (Hemingford)	Bridge Widening of Existing	2027			51.8						1.00	\$ 3,000,000.00	\$ 3,000,000.00		2,590	210	2,720	220	4,200	410	0.30		
1	US 26	Wyoming State Line to Morrill	4-Lane Roadway	2024	Concrete	Very Good	85.0	0.00	7.00	7.00	0.00		1.00	\$ 3,000,000.00	\$ 21,000,000.00	\$ 1,202,488.00	4,320	390	9,340	480	9,690	530	0.51		
1	US 26	Mitchell	Safety and Traffic Operation Improvements	2026						1.00			1.00	\$ 1,000,000.00	\$ 1,000,000.00	\$ -	6,480	390	14,010	480	14,250	520	0.22		
1	US 26	Morrill Relief Route	Safety and Traffic Operation Improvements	2027						4.00			1.00	\$ 5,000,000.00	\$ 20,000,000.00	\$ 949,440.00	8,870	730	14,120	530	14,470	580	0.52		
ITS Improvements														\$ 850,000.00	\$ 127,500.00										
														\$ 133,000,000.00	\$ 7,226,628.00										
Group 3 (2025 to 2030)																									
5	US 385	L7E (Hemingford) to Chadron St P.4-Lane	4-Lane	2032	Asphalt	Very Good	71.9	132.00	154.00	22.00			1.00	\$ 3,000,000.00	\$ 66,000,000.00	\$ 1,580,480.00	1,960	310	2,060	320	3,700	620	0.23		
2	US 26	Minatare to L62A intersection	4-Lane Roadway	2027	Asphalt w/Con. Base	Good	87.1	33.00	42.00	9.00	0.00		1.00	\$ 5,000,000.00	\$ 45,000,000.00	\$ 2,136,240.00	5,080	415	5,330	730	6,750	920	0.60		
2	US 26	Minatare	Safety and Traffic Operation Improvements	2028						1.00			1.00	\$ 1,000,000.00	\$ 1,000,000.00		5,080	415	5,330	730	6,750	920	0.60		
5	US 385	Chadron to S Edge of Chadron St P.4-Lane	4-Lane	2032	Asphalt	Good	188.3	154.00	168.00	14.00			1.00	\$ 3,000,000.00	\$ 42,000,000.00	\$ 1,005,760.00	3,410	250	3,580	260	4,880	550	0.40		
														\$ 154,000,000.00	\$ 3,716,720.00										
Group 4 (2030 to 2035)																									
7	US 385	Chadron	Relief Routes	2033			188.3			4.00			1.00	\$ 5,000,000.00	\$ 20,000,000.00	\$ 299,776.00	3,410	250	3,580	260	4,880	550	0.40		
	US 26	Intersection with NE 71	Interchange	2035			0.271						1.00	\$ 5,000,000.00	\$ 5,000,000.00		8,600	1,190	13,240	790	13,700	890	0.57		
	US 385	Chadron	Rest Area/Visitor Center	2034			74.8						1.00	\$ 5,000,000.00	\$ 5,000,000.00	\$ 330,000.00	3,980	510	4,860	640	7,930	1,090	0.47		
1	US 26	Mitchell	Relief Routes	2037			62.1			4.00			1.00	\$ 5,000,000.00	\$ 20,000,000.00		8,910	730	14,180	530	14,540	580	0.52		
6	NE 71	Colorado Border to I-80	4-Lane	2037	Asphalt	Very Good	44.2	0.00	15.00	15.00			1.00	\$ 3,000,000.00	\$ 45,000,000.00	\$ -	1,420	300	1,500	310	2,660	910	0.17		
														\$ 95,000,000.00	\$ 629,776.00										
														20 Year Plan (2015 to 2035) = \$ 538,450,000.00											
														New Maintenance & Operation Costs for Project Program= \$ 26,601,148.00											
Group 5 (2040+)																									
5	US 385	L62A to Alliance	Reconstruct NB Lanes		Asphalt	Good		85.00	107.00	22.00	0.00		1.00	\$ 3,000,000.00	\$ 66,000,000.00		3,400	480	4,160	500	4,990	600	0.40		
5	US 385	Alliance to L7E (Hemingford)	Reconstruct NB Lanes		Asphalt	Good	51.8	110.00	126.00	16.00			1.00	\$ 3,000,000.00	\$ 48,000,000.00		2,590	210	2,720	220	4,200	410	0.30		
5	US 385	L7E (Hemingford) to Chadron St P.	Reconstruct NB Lanes		Asphalt	Very Good	71.9	132.00	154.00	22.00			1.00	\$ 3,000,000.00	\$ 66,000,000.00		1,960	310	2,060	320	3,700	620	0.23		
5	US 385	Chadron to S Edge of Chadron St F.	Reconstruct NB Lanes		Asphalt	Very Good	188.3	154.00	168.00	14.00			1.00	\$ 3,000,000.00	\$ 42,000,000.00		3,410	250	3,580	260	4,880	550	0.40		

(#) Projects included in NDOR's Current STP Program

Total Project Summary = \$ 760,450,000.00

Travel Demand Priority	Highway	Segment	Improvement	Type	Completion Year	Pavement Type	Project Ranking Scores									Overall Project Group Score			
							Relative Weights								Total Forecast AADT		Travel Time Savings	Cost Per Vehicle Mile	V/C
							18 Truck AADT	16 Accidents	16 Existing Pavement Condition	12 Multi-Modal Connectivity	10 System Connectivity	8	7	7					
Group 1 (2015 to 2020)																			
	US 385	Intersection with NE 20 (East)	Intersection Improvements	Safety	2017		0.25	0.27	0.35	0.15	0.03	0.14	0.12	0.05	0.06	38			
4	US 385	L62A to Alliance	4-Lane Roadway	Roadway	2019	Asphalt	3.03	1.94	2.23	0.61	0.25	0.93	0.70	0.29	0.89				
5	US 385	Alliance to Chadron	Super 2 Facility - Add Passing Lanes	Roadway	2020	Asphalt	1.48	1.68	1.29	0.18	0.05	0.65	0.11	0.55	0.53				
	US 26	In Scottsbluff @ 5th Avenue	Pedestrian Overpass	Safety	2020		0.21	0.39	0.20	0.15	0.12	0.10	0.08	0.08	0.08				
7	US 385	Chadron to SD	4-Lane	Roadway	2022	Asphalt	1.10	0.68	1.62	0.44	0.14	0.54	0.36	0.59	0.31				
	US 26	L79E Intersection (Minatare)	Intersection Improvements	Safety	2017		0.29	0.66	0.35	0.24	0.15	0.16	0.14	0.12	0.17				
6	NE 71	I-80	Extend Bypass to NE 71 to the south		2022		0.27	0.30	0.39	0.90	1.17	0.06	0.05	0.24	0.06				
	NE 71	Colorado Border to I-80	Super 2 Facility (4-Lane Design Criteria)	Roadway	2021	Asphalt	0.43	0.11	0.33	0.24	0.72	0.11	0.09	0.68	0.08				
	NE 71	Clean Harbors (South of Kimball)	Intersection Improvement	Safety	2020		0.16	0.00	0.24	0.25	0.42	0.05	0.04	0.34	0.05				
	NE 71	I-80 (MP 22) Interchange	Rest Area/Visitor Center	Truck Parking	2022		1.86	2.13	1.18	1.08	1.40	0.97	0.85	0.31	0.18				
ITS Improvements																			

Group 2 (2020 to 2025)																
3	L62A	US26 to US 385	4-Lane Roadway	Roadway	2022	Concrete	1.00	0.43	0.81	5.81	3.42	0.93	0.95	0.24	0.23	32
5	US 385	Alliance to L7E (Hemingford)	4-Lane	Roadway	2027	Asphalt	0.65	0.50	0.73	0.51	0.11	0.38	0.29	0.25	0.33	
5	US 385	Alliance to L7E (Hemingford)	Bridge Widening of Existing Grade Separation (NE 2)	Roadway	2027		2.16	1.92	1.92	1.44	1.20	0.96	0.84	0.84	0.72	
1	US 26	Wyoming State Line to Morrill	4-Lane Roadway	Roadway	2024	Concrete	0.78	0.89	0.47	0.66	0.50	0.58	1.51	0.22	0.36	
1	US 26	Mitchell	Safety and Traffic Operation Improvements		2026		0.23	0.00	0.20	0.15	0.12	0.10	0.09	0.09	0.07	
1	US 26	Morrill Relief Route	Safety and Traffic Operation Improvements		2027		0.67	0.00	0.39	0.00	0.00	0.33	0.29	0.05	0.17	
ITS Improvements																

Group 3 (2025 to 2030)																
5	US 385	L7E (Hemingford) to Chadron St Park	4-Lane	Roadway	2032	Asphalt	1.31	0.72	1.00	0.33	0.09	0.46	0.23	0.33	0.34	16
2	US 26	Minatare to L62A intersection	4-Lane Roadway	Roadway	2027	Asphalt w/ Con. Base	1.07	1.38	0.91	0.72	0.76	0.52	1.56	0.11	0.54	
2	US 26	Minatare	Safety and Traffic Operation Improvements		2028		0.38	0.00	0.39	0.00	0.00	0.15	0.13	0.41	0.20	
5	US 385	Chadron to S Edge of Chadron St Park	4-Lane	Roadway	2032	Asphalt	0.67	2.09	0.95	0.32	0.08	0.39	0.18	0.19	0.38	

