North Dakota Public Service Commission Annual Rail Safety and Stakeholder Meeting May 11, 2022

North Dakota State Freight and Rail Plan Status Update

NORTH Dakota | Transportation
Be Legendary.

STATE FREIGHT & RAIL PLAN
TRANSPORTATION CONNECTION

PROJECT SCHEDULE

NORTH Dakota | Transportation
Be Legendary.

STATE FREIGHT & RAIL PLAN
TRANSPORTATION CONNECTION

DELIVERABLES TO DATE

- Data Analysis & Management
- Initial “Wave” of Stakeholder Management
- Chapter 1: Vision, Purpose, and Goals
- Chapter 2: ND Multimodal Freight System

Nearing completion:

- Chapter 3, Economic analysis & Commodity flows
- Chapter 4, Existing Assets, Conditions, and Performance
- Chapter 5, Issues and Needs

Table 4. Tons (M) by Flow Type and Domestic Mode (2017)

Domestic Mode	Int'l Gateway	ND to ND	ND to Other State	Other State to ND	Other Est. Through	Grand Total
Pipeline	126.7	29.2	102.4	17.5		275.7
Truck	8.7	77.0	16.4	22.0	17.5	141.6
Rail	45.5	7.7	27.4	3.8	31.9	116.3
Unknown	0.1	49.4				49.5
Multiple Modes		0.2	7.3	1.8		9.3
Air						0.0
Grand Total	**181.0**	**163.5**	**153.5**	**45.2**	**49.4**	**592.4**

Source: Analysis of USDOT Freight Analysis Framework 5.2

Table 5. Share of Tons (M) by Flow Type and Domestic Mode (2017)

Domestic Mode	Int'l Gateway	ND to ND	ND to Other State	Other State to ND	Other Est. Through	Grand Total
Pipeline	21.4%	4.9%	17.3%	2.9%		46.5%
Truck	1.5%	13.0%	2.8%	3.7%	3.0%	23.9%
Rail	7.7%	1.3%	4.6%	0.6%	5.4%	19.6%
Unknown	0.0%	8.3%	0.0%			8.4%
Multiple Modes	0.0%	0.0%	1.2%	0.3%		1.6%
Air	0.0%	0.0%	0.0%	0.0%		0.0%
Grand Total	**30.5%**	**27.6%**	**25.9%**	**7.6%**	**8.3%**	**100.0%**

Source: Analysis of USDOT Freight Analysis Framework 5.2. Note that row or column totals may not sum precisely due to rounding.

Figure 61. Rail Tons (M) (2017)

Summaries by Flow Type

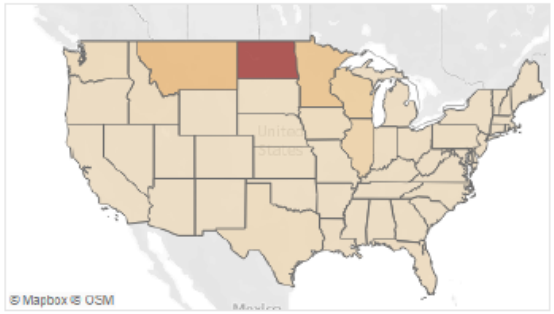
Trade	Int'l Gateway	ND to ND	ND to Other State	Other Est. Through	Other State to ND	Grand Total
Domestic		5.7	26.2	24.8	3.7	60.4
Import	30.5	1.1		1.9	0.2	33.6
Export	15.0	0.9	1.2	5.2		22.3
Grand Total	45.5	7.7	27.4	31.9	3.8	116.3

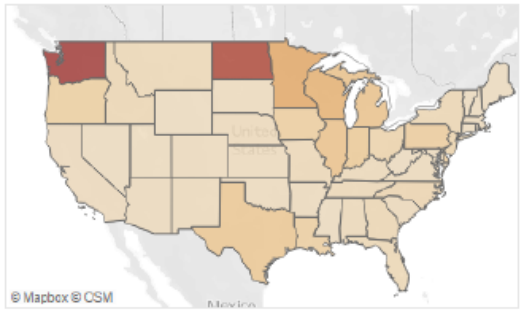
Domestic Mode	Int'l Gateway	ND to ND	ND to Other State	Other Est. Through	Other State to ND	Grand Total
Pipeline	126.7	29.2	102.4		17.5	275.7
Truck	8.7	77.0	16.4	17.5	22.0	141.6
Rail	45.5	7.7	27.4	31.9	3.8	116.3
Unknown	0.1	49.4	0.0			49.5
Multiple Modes	0.0	0.2	7.3		1.8	9.3
Air	0.0	0.0	0.0		0.0	0.0
Grand Total	181.0	163.5	153.5	49.4	45.2	592.4

Commodity Group (SCTG2)	Int'l Gateway	Other Est. Through	ND to Other State	ND to ND	Other State to ND	Grand Total
Cereal Grains (inclu..	2.6	9.8	6.8	3.8	0.8	23.8
Crude Petroleum	2.6		11.3	0.1		14.0
Coal	0.3	11.7	0.0	0.8	1.0	13.8
Agricultural Product..	0.3	4.1	7.0	0.6	0.0	12.1
Fertilizers	9.7	0.1	0.0	0.4	0.2	10.3

Domestic Origin State	
ND	65.6
MT	14.7
MN	11.3
WI	7.3
IL	4.9

Domestic Destination State	
WA	29.0
ND	26.5
MN	9.4
WI	7.6
IL	4.7





Commodities by Trade Type and Domestic Mode

Commodity Group (SCTG2)	Domestic	Import	Export	Grand Total
Cereal Grains (includes seed)	20.4	2.6	0.8	23.8
Crude Petroleum	11.3	2.7	0.0	14.0
Coal	13.3	0.5	0.1	13.8
Agricultural Products (ex Feed, Gr..	8.1	0.5	3.5	12.1
Fertilizers	0.2	8.6	1.5	10.3

Commodity Group (SCTG2)	Rail	Grand Total
Cereal Grains (includes seed)	23.8	23.8
Crude Petroleum	14.0	14.0
Coal	13.8	13.8
Agricultural Products (ex Feed, Gr..	12.1	12.1
Fertilizers	10.3	10.3

Trading Partners and International Modes

Foreign Origin for Imports	Rail	Water	Grand Total
Canada	32.83	0.02	32.85
Eastern Asia		0.51	0.51
SE Asia and Oceania		0.10	0.10
Europe		0.08	0.08
Rest of Americas		0.05	0.05

Foreign Destination for Exports	Rail	Water	Grand Total
Canada	17.0	0.0	17.0
Eastern Asia		3.9	3.9
Mexico	0.8	0.0	0.8
South, Central, Western A..		0.3	0.3
SE Asia and Oceania		0.2	0.2

Figure 62. Rail Value ($B) (2017)

Summaries by Flow Type

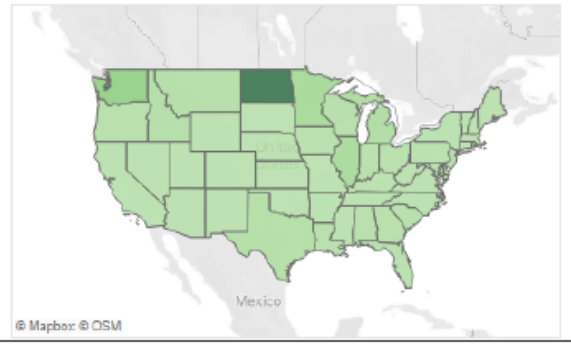
Trade	Int'l Gateway	ND to ND	ND to Other State	Other Est. Through	Other State to ND	Grand Total
Import	13.06	0.30		5.26	0.16	18.78
Domestic		1.44	7.97	3.51	0.72	13.64
Export	5.52	0.29	0.36	3.30		9.47
Grand Total	18.58	2.03	8.33	12.07	0.88	41.89

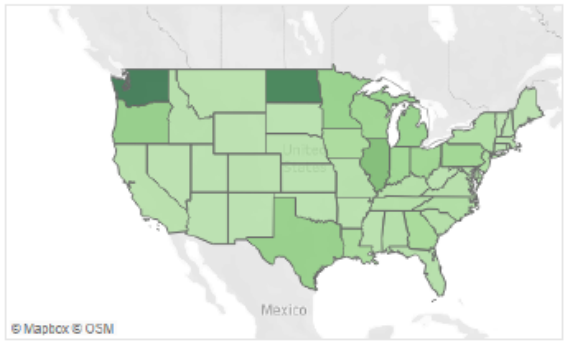
Domestic Mode	Int'l Gateway	ND to ND	ND to Other State	Other Est. Through	Other State to ND	Grand Total
Truck	24.3	25.3	14.1	76.0	20.5	160.3
Pipeline	40.2	7.3	28.6		2.3	78.4
Rail	18.6	2.0	8.3	12.1	0.9	41.9
Multiple Modes	0.0	0.8	7.2		5.8	13.8
Unknown	0.0	0.8	0.2			1.0
Air	0.1	0.0	0.2		0.5	0.8
Grand Total	83.1	36.2	58.7	88.1	30.1	296.2

Commodity Group (SCTG2)	Int'l Gateway	ND to ND	ND to Other State	Other Est. Through	Other State to ND	Grand Total
Cereal Grains (inclu..	0.56	0.93	1.34	1.60	0.20	4.63
Crude Petroleum	0.83	0.05	3.56			4.44
Agricultural Product..	0.12	0.25	2.50	1.52	0.02	4.41
Plastics and Rubber	3.05	0.00	0.00	0.56	0.05	3.66
Wood Products	2.67	0.00	0.00	0.80	0.02	3.49

Domestic Origin State	
ND	23.42
WA	4.57
MN	2.19
IL	2.04
MI	1.24

Domestic Destination State	
WA	8.93
ND	8.43
IL	3.44
OR	1.94
TX	1.87





Commodities by Trade and Domestic Mode

Commodity Group (SCTG2)	Import	Domestic	Export	Grand Total
Cereal Grains (includes seed)	0.58	3.91	0.14	4.63
Crude Petroleum	0.87	3.56	0.00	4.44
Agricultural Products (ex Feed, G..	0.25	2.89	1.28	4.41
Plastics and Rubber	2.59	0.22	0.85	3.66
Wood Products	2.81	0.47	0.21	3.49

Commodity Group (SCTG2)	Rail	Grand Total
Cereal Grains (includes seed)	4.63	4.63
Crude Petroleum	4.44	4.44
Agricultural Products (ex Feed, G..	4.41	4.41
Plastics and Rubber	3.66	3.66
Wood Products	3.49	3.49

Trading Partners and International Modes

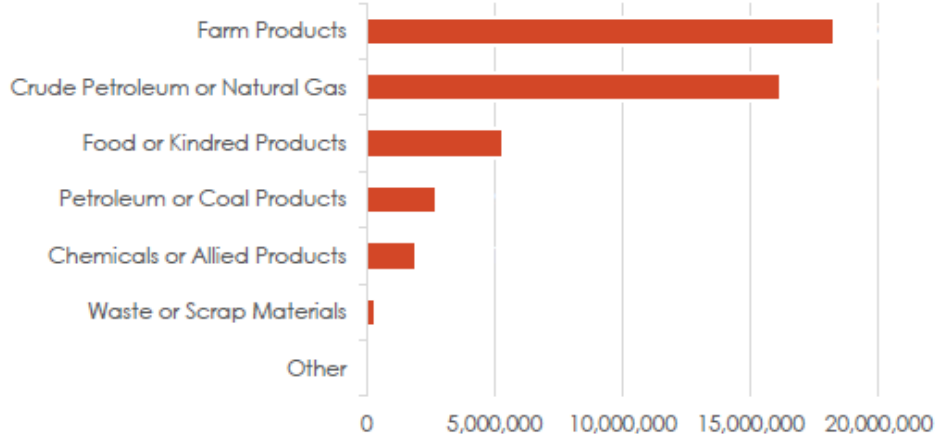
Foreign Origin for Imports	Rail	Water	Grand Total
Canada	14.28	0.01	14.29
Eastern Asia		3.22	3.22
SE Asia and Oceania		0.65	0.65
Europe		0.43	0.43
South, Central, Western A..		0.09	0.09
Rest of Americas		0.07	0.07

Foreign Destination for Exports	Rail	Water	Grand Total
Canada	6.217	0.002	6.219
Eastern Asia		2.410	2.410
Europe		0.226	0.226
SE Asia and Oceania		0.203	0.203
Mexico	0.169	0.004	0.173
South, Central, Western A..		0.130	0.130

FREIGHT RAIL TRAFFIC BY COMMODITY

By far the largest commodity types shipped from North Dakota were farm products and petroleum products (Figure 29). Farm products consisted primarily of corn, soybean and wheat shipments. Petroleum products could include crude oil as well as other petroleum products like natural gas liquids.

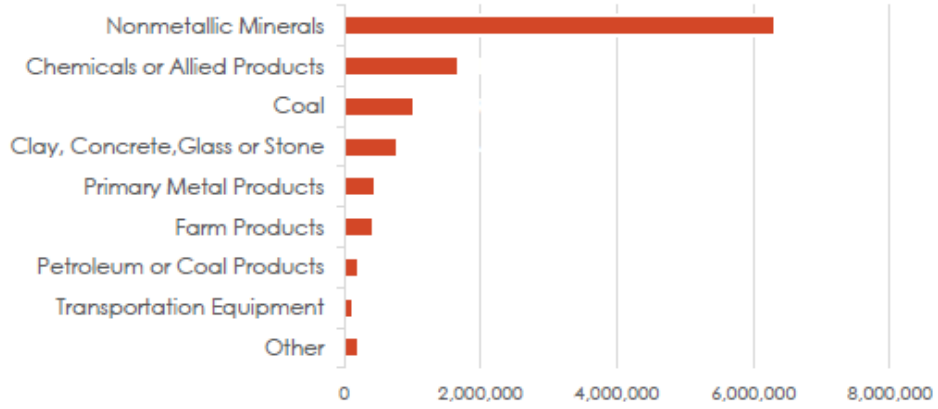
Figure 29: North Dakota Freight Rail Outbound Tonnage by Commodity (2019)



Source: STB Waybill Sample processed by IHS Markit

As shown in Figure 30, the largest tonnage commodities shipped to North Dakota were nonmetallic minerals. The majority of these were used in energy exploration.

Figure 30: North Dakota Freight Rail Inbound Tonnage by Commodity (2019)



Source: STB Waybill Sample processed by IHS Markit

Figure 75. Transearch Rail O-D Tonnage, All Commodities, Inbound Only (2019)

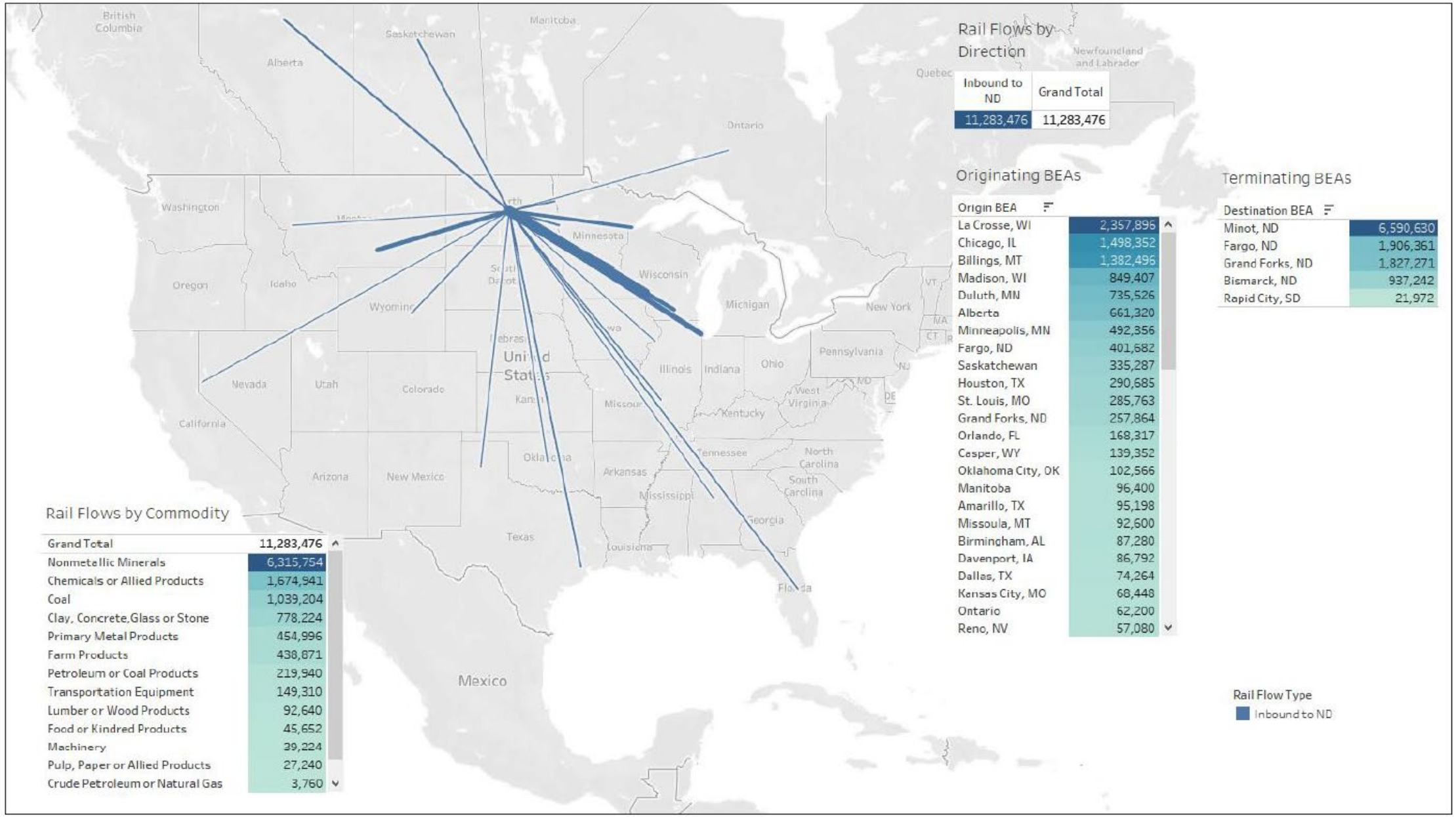
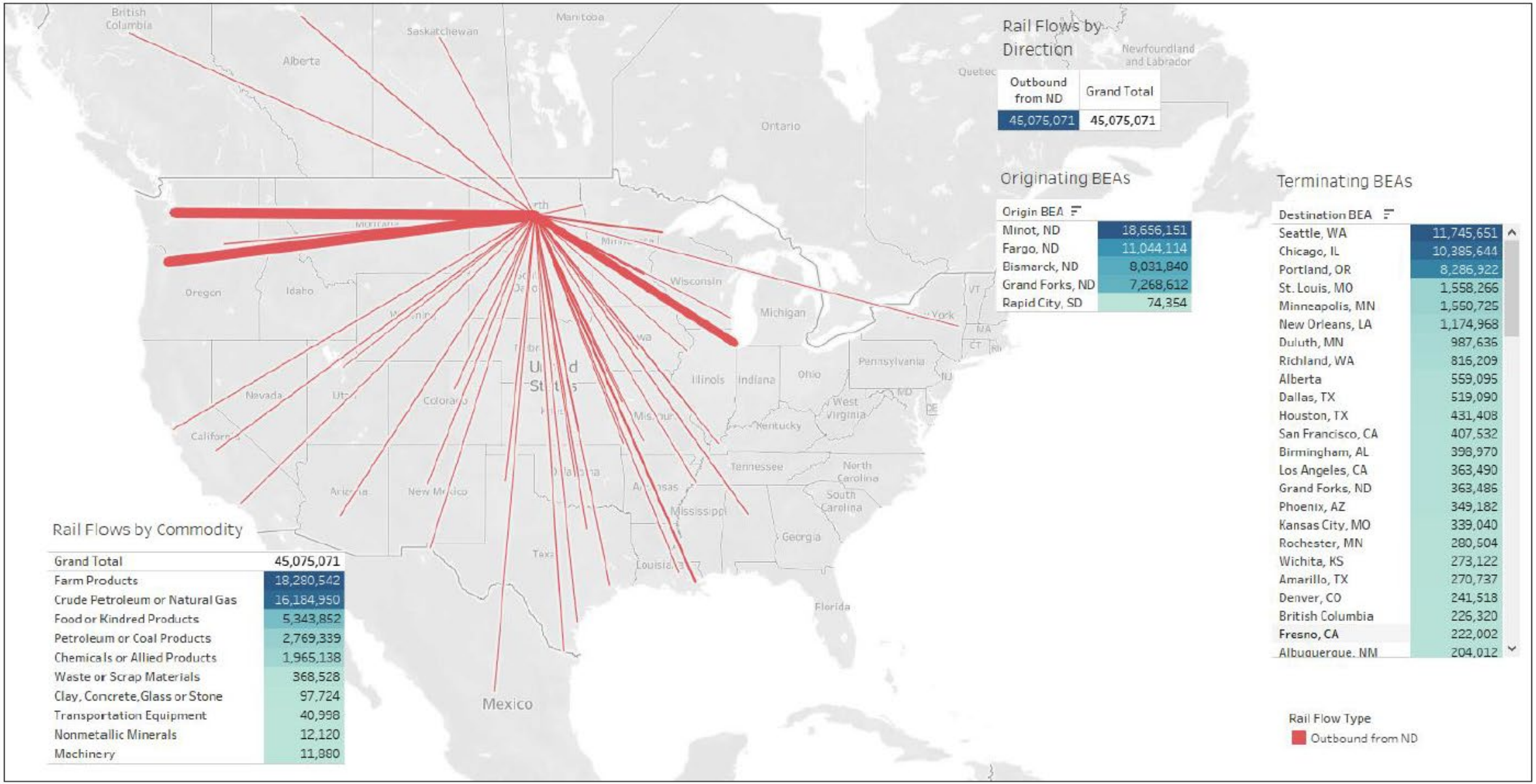


Figure 76. Transearch Rail O-D Tonnage, All Commodities, Outbound Only (2019)



FREIGHT RAIL CONSTRAINTS

Standard maximum freight car gross weight – 286,000 pounds

10% greater capacity than previous standard at 263,000 pounds

45% of local railroad mileage cannot accommodate the 286k standard

Use lower capacity cars or less than fully loaded cars

Impacts shippers through higher unit shipping costs

Railroad	Owned/Leased in North Dakota-Miles	Less Than 286K Pound Compatible Track-Miles	Percent
BNSF	1,552	0	0%
CP Rail	502	0	0%
Total Class I Mileage	**2,054**	**0**	**0%**
DMVW	522	239	46%
DN	50	2	4%
NP	304	177	58%
RRVW	428	163	38%
Total Local Railroad Mileage	**1,304**	**581**	**45%**

NUMBER OF RAIL-RELATED CROSSING CRASHES (2011-2020)

23 USC § 407 Documents
NDDOT Reserves All Objections

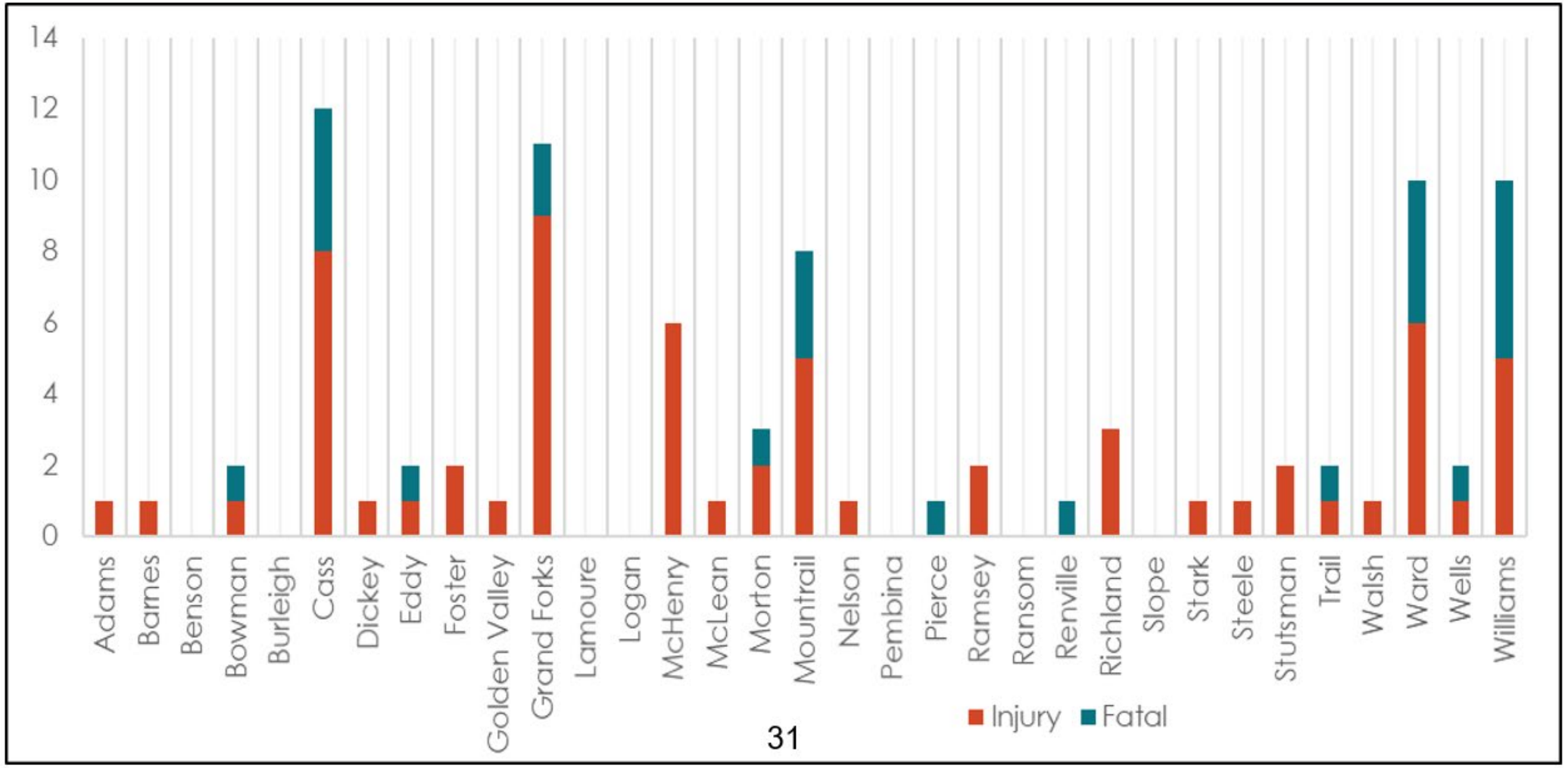
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Fatal Crashes	0	4	3	4	2	1	5	3	2	1	25
Injury Crashes	8	15	11	4	6	6	2	5	4	2	63
Property Damage Only Crashes	12	10	14	20	8	8	12	8	9	7	108
Total Crashes	**20**	**27**	**27**	**28**	**15**	**15**	**19**	**16**	**15**	**10**	**196**

FATALITIES & INJURIES BY TYPE (2011-2020)

Year	Train Struck Vehicle		Vehicle Struck Train		Total # of Crashes	
	Fatality (# of crashes)	Injury (# of crashes)	Fatality (# of crashes)	Injury (# of crashes)	Fatality	Injury
2011	—	5	—	3	—	8
2012	4	11	—	4	4	15
2013	3	8	—	3	3	11
2014	4	1	—	3	4	4
2015	2	5	—	1	2	6
2016	1	5	—	1	1	6
2017	5	2	—		5	2
2018	3	4	—	1	3	5
2019	2	3	—	1	2	4
2020	1	2	—		1	2
Average	2.78	4.60	—	2.13	2.78	6.30

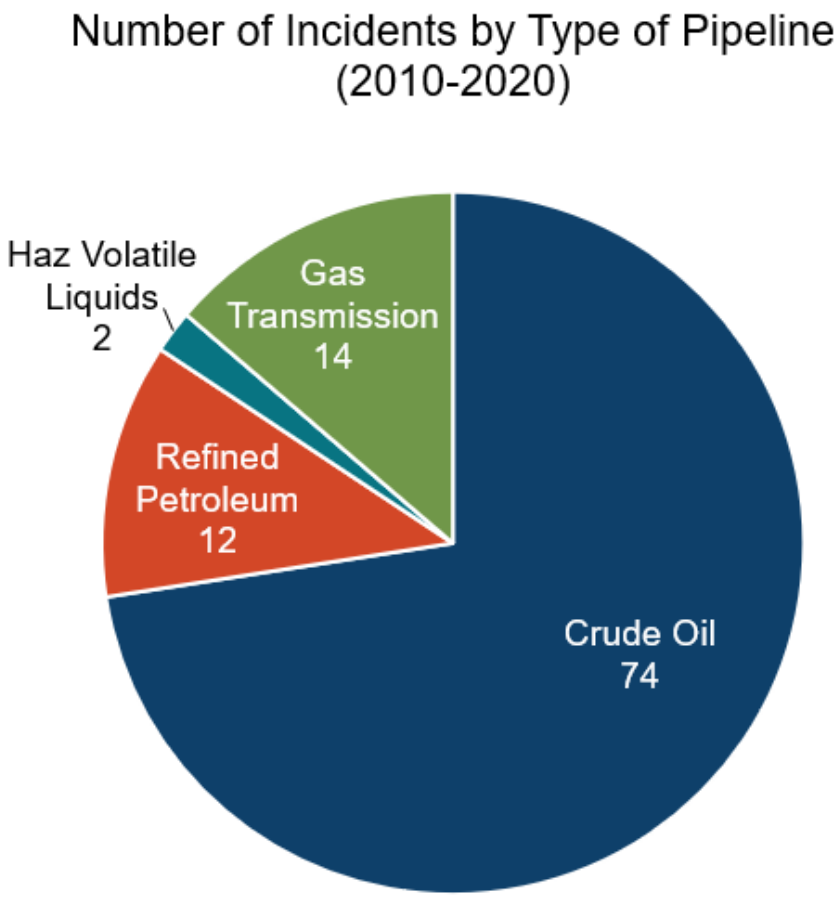
RAIL-RELATED CRASHES BY COUNTY (2011-2020)

23 USC § 407 Documents
NDDOT Reserves All Objections



PIPELINE – INCIDENTS IN NORTH DAKOTA

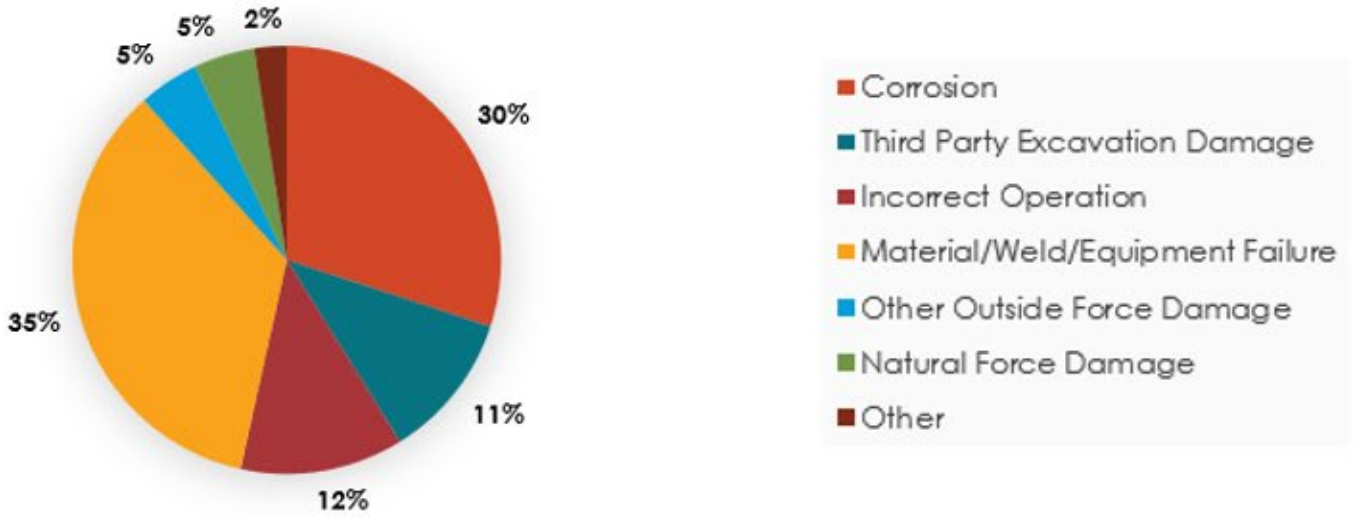
Year	Number of Incidents	Fatalities	Injuries	Total Cost
2010	8	1		$4,754,615
2011	8			$1,774,922
2012	5			$2,757,318
2013	15			$20,578,078
2014	12			$4,339,591
2015	5			$673,939
2016	11			$13,411,156
2017	11			$1,568,794
2018	18			$2,157,394
2019	6			$39,591,984
2020	6			$1,076,581



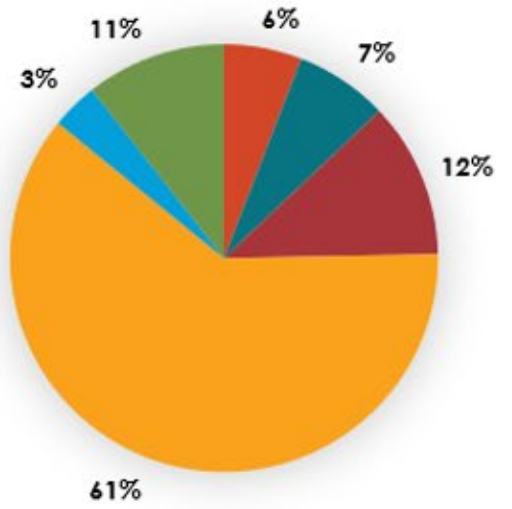
PIPELINE INCIDENT CAUSES

North Dakota has a different profile of causes of incidents than the overall national profile.

National Crude Oil and Refined Petroleum Products Causes of Incidents



North Dakota Crude Oil and Refined Petroleum Products Causes of Incidents



SWOT ANALYSIS – Rail and Pipeline

- **Strengths**
  - Rail System is efficient, safe, and in good condition. Sufficient for ND industries
  - Pipeline system is efficient and safe
- **Weaknesses**
  - Train frequency and lengths occasionally delay roadway traffic
  - Nearly half of track on local railroads cannot accommodate 286k railcar weights
  - Less than 20% of rail at-grade crossings have active warning (over 80% are passive)
  - Over past 7 years (2015 to present) rail-related crossing crashes have not diminished - plateaued

SWOT ANALYSIS – Rail and Pipeline

- **Opportunities**
  - Transformation from fossil fuels to renewable energy and electrification – trucking and rail industry
  - Reducing rail at-grade crossings in urban areas
  - Improve resiliency of multimodal freight system
  - Analyze Canadian Pacific's acquisition of Kansas City Southern for lower cost transportation to Mexico
  - Support Local Railroads in addressing 286k weight limitations
- **Threats**
  - Labor availability to sustain transportation industries (trucking and rail)
  - Energy transition may reduce tax base causing reduction in infrastructure