

6 SYSTEM CONDITION AND PERFORMANCE



This section provides an overview of the conditions and performance of the state's freight transportation system. A detailed analysis of the conditions and performance of the state's infrastructure can be found in the [Conditions and Performance Technical Report](#). In addition, when freight performance measures are established by FHWA, MDOT will incorporate those measures into its planning process.

2035 MI TRANSPORTATION PLAN PERFORMANCE MEASURES

MDOT has actively implemented performance-based program development and asset management since 1997, when the State Transportation Commission (STC) established state trunkline pavement and bridge goals. MDOT's long history with performance measures has enabled the department to develop robust measurement capabilities. Performance measures for Michigan's transportation infrastructure were selected using system-wide goals and objectives. The [Goals, Objectives, and Performance Measures Report](#) presents the four system-wide goals, their associated objectives as they relate to MDOT's mission - Integration, Economic Benefit, and Quality of Life - and the selection criteria used to develop the performance measures. Each of the four goal areas and associated objectives from the 2035 MITP are summarized as follows:

Goal Area 1: Stewardship

Preserve transportation system investments, protect the environment, and utilize public resources in a responsible manner.

The Stewardship Goal focuses on MDOT's role and responsibilities associated with being good stewards of Michigan's resources. This is based on a holistic view of resources, including funding transportation assets (e.g., highways, rail lines, airports, etc.), the physical human environment, and the Michigan economy.

Goal Area 2: Safety and Security

Continue to improve transportation safety and ensure the security of the transportation system.

The Safety and Security Goal continues MDOT's long-standing commitment to build, maintain, and operate the safest transportation system possible. The objectives under the Safety and Security Goal emphasize traditional safety initiatives aimed at reducing fatalities, injuries, and crashes/incidents, as well as efforts to address transportation system security needs.

Goal Area 3: System Improvement

Modernize and enhance the transportation system to improve mobility and accessibility.

The System Improvement Goal emphasizes the various areas where MDOT can make direct investments or encourage investments by other entities to improve the efficiency and effectiveness of Michigan's transportation system. The objectives focus on improvements to modernize, expand, and connect the system to support economic growth and better facilitate the movement of goods, people, and services.

Goal Area 4: Efficient and Effective Operations

Improve the efficiency and effectiveness of the transportation system and transportation services, and expand MDOT's coordination and collaboration with partners.

The Efficient and Effective Operations Goal reflects MDOT's desire to achieve the greatest possible performance from Michigan's existing transportation assets and future system improvements. This goal also addresses the importance of operating a transportation system and providing services to ensure citizens and stakeholders have modal choices. The objectives associated with this goal area focus on the application of technology, stronger coordination and collaboration with public and private stakeholders, and improved intermodal transfers.

TRACKING THE PERFORMANCE OF MICHIGAN'S INFRASTRUCTURE

To achieve the goals that have been established, it is necessary to monitor the performance of the system. MDOT formalized its approach to improving, measuring, and reporting the condition of its transportation networks with the STC's 1997 adoption of the pavement condition goals. Since then, MDOT has developed performance measures to reflect a broader range of the transportation system.

Asset Management

MDOT follows an [asset management](#) approach to maintain Michigan's transportation system. Asset management provides a solid foundation that allows transportation professionals to monitor the transportation system and optimize the preservation, improvement, and timely replacement of assets through cost-effective management, programming, and resource allocation decisions.

Transportation System Condition Report

MDOT uses the [Transportation System Condition Report](#), which is updated twice a year, to provide a quick snapshot of whether or not the department is achieving the state long-range plan goals laid out above. The measures are organized around the four major goal areas of the 2035 MITP - Stewardship, Safety and Security, System Improvement, and Efficient and Effective Operations. While the individual measures reported may change over time, the close connection to the 2035 MITP goals ensures that the focus and importance of the reporting remains constant. The measures included in the report are only a representative sample of the countless measurements and data collections monitored by MDOT in the course of overseeing the building, maintenance, and operation of the state's transportation system. It is viewed as a work in progress. The selection of measures may change as the report is refined, as experience dictates, and as new federal requirements for performance measurement are put into place.

Michigan Dashboard

Gov. Snyder implemented the Michigan Dashboard ([Mi Dashboard](#)), which provides a quick assessment of the state's performance in key areas, including economic strength, health and education, value-for-money government, quality of life, and public safety. Mi Dashboard includes an infrastructure dashboard, which provides a way for the public to track the progress of many key infrastructure elements important to them. This includes those related to freight movements, and draws upon many of the measures MDOT already was using in its investment and programming decisions.

More information about MDOT's performance can be found on the MDOT Web site at www.michigan.gov/mdot.

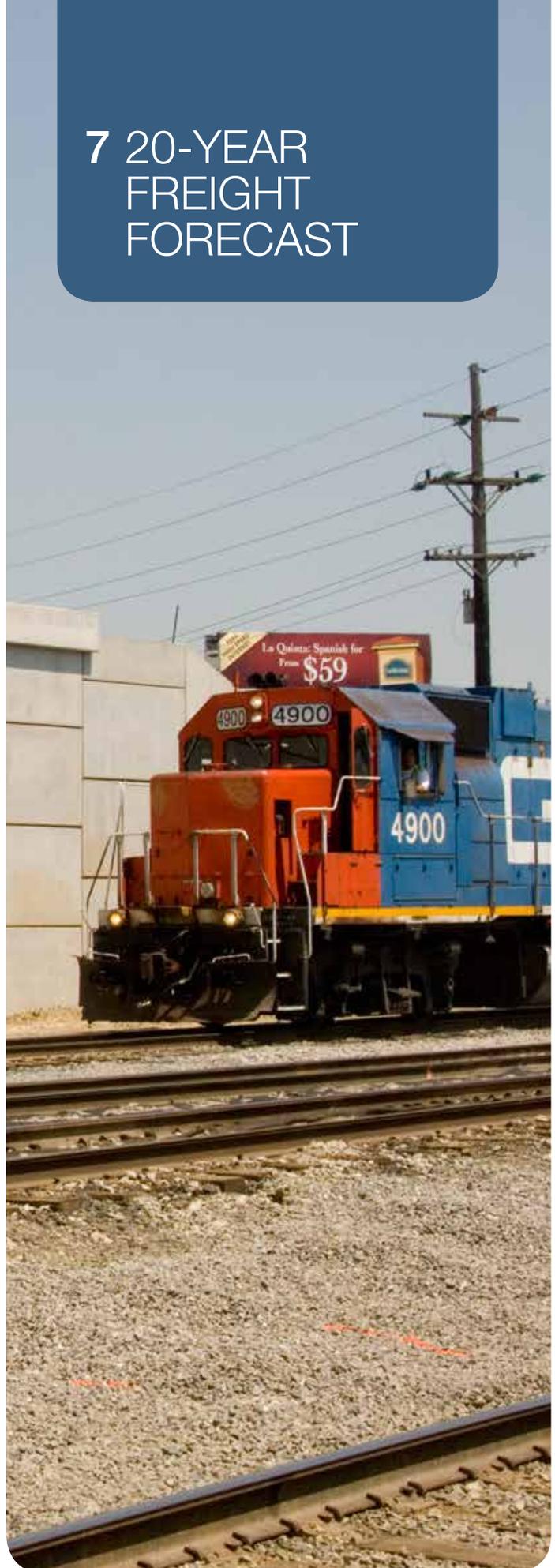


7 20-YEAR FREIGHT FORECAST

This section provides a 20-year forecast of freight transportation demands, broken down by mode of transportation and Standard Transportation Commodity Code (STCC), including the projected demands for intrastate, inbound, outbound, and through-interstate transportation of freight. The estimated projections are based on 2009 data from IHS Global Insight.

HIGHWAY FREIGHT FORECAST

Overall truck freight movements are projected to increase by 55.5 percent by 2030, from 290 million tons in 2009 to 451 million tons in 2030 (Table 6). Intrastate truck freight movements are projected to increase by slightly less at 48.2 percent by 2030, from 112 million tons in 2009 to 167 million tons in 2030 (Table 7). Outbound truck freight movements are projected to increase 59.3 percent by 2030, from 68 million tons in 2009 to 108 million tons in 2030 (Table 8). Inbound truck freight movements are projected to increase 43.5 percent by 2030, from 81 million tons in 2009 to 117 million tons in 2030 (Table 9). Through-truck freight movements, those not stopping in Michigan, are projected to increase 112.3 percent by 2030, from 27 million tons in 2009 to 58 million tons in 2030 (Table 10).



7 20-YEAR FREIGHT FORECAST

Table 6 – Michigan Truck Freight Movements (2009-2030): Overall (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	37,168,126	38,366,391	40,250,656	41,113,371	41,764,850	12.4%
Primary Forest Materials	8	40,941	56,151	56,769	55,951	56,141	37.1%
Fresh Fish	9	58,461	69,617	79,109	89,567	101,182	73.1%
Metallic Ores	10	345,146	481,854	422,860	378,313	359,570	4.2%
Coal	11	270,740	299,372	288,058	283,434	282,744	4.4%
Crude Petroleum and Natural Gas	13	6,519,056	8,221,417	9,071,113	9,913,644	10,865,650	66.7%
Nonmetallic Ores and Minerals	14	48,490,181	59,073,359	62,928,065	65,604,860	69,153,323	42.6%
Ordnance	19	50,352	65,971	76,163	83,473	97,062	92.8%
Food Products	20	33,565,166	38,565,192	42,555,693	46,448,057	50,515,068	50.5%
Tobacco Products	21	88,344	63,936	52,751	42,651	33,111	-62.5%
Textiles and Apparel	23	885,484	998,983	999,693	1,056,761	1,167,881	31.9%
Lumber and Wood Products	24	16,965,409	30,565,901	34,043,763	34,667,242	35,450,704	109.0%
Furniture and Fixtures	25	1,554,507	1,981,964	2,456,752	3,043,776	3,853,139	147.9%
Paper and Pulp Products	26	7,151,654	8,829,814	9,781,328	10,544,512	11,400,219	59.4%
Printed Matter	27	3,116,664	2,995,083	3,023,652	3,111,304	3,344,046	7.3%
Chemical Products	28	19,833,861	23,342,506	25,455,418	26,628,812	28,123,472	41.8%
Petroleum or Coal Products	29	19,058,116	18,772,605	18,472,638	18,606,847	19,125,387	0.4%
Rubber and Plastics	30	4,906,676	6,067,477	6,736,038	7,334,548	8,084,819	64.8%
Clay, Cement, Glass, Stone Products	32	13,011,465	16,278,247	17,392,066	18,342,807	19,766,621	51.9%
Primary Metal Products	33	12,805,054	17,179,117	18,610,334	19,427,008	20,715,688	61.8%
Fabricated Metal Products	34	5,751,248	7,108,725	7,194,662	7,219,264	7,432,223	29.2%
Machinery	35	3,675,269	5,295,180	6,065,511	6,834,659	7,893,734	114.8%
Electrical Equipment	36	2,571,981	3,457,220	4,217,800	5,110,198	6,244,940	142.8%
Transportation Equipment	37	8,196,777	12,843,502	12,763,243	13,283,362	14,167,056	72.8%
Technical Instruments and Equipment	38	541,435	686,687	852,766	1,052,837	1,310,649	142.1%
Misc. Manufacturing Products	39	788,792	1,007,640	1,184,148	1,364,095	1,603,562	103.3%
Waste or Scrap Material	40	4,709,126	6,582,927	7,549,561	8,697,219	10,228,954	117.2%
Misc. Freight Shipments	41	1,356,932	1,893,654	2,434,855	3,089,007	3,901,040	187.5%
Mail	43	1,441,708	1,399,322	1,370,689	1,349,511	1,331,276	-7.7%
Secondary Traffic	50	35,417,193	48,079,042	56,111,673	64,089,867	73,142,073	106.5%
Total		290,335,865	360,628,856	392,497,828	418,866,958	451,516,185	55.5%

Table 7 – Michigan Truck Freight Movements (2009-2030): Michigan to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	17,636,205	18,135,917	18,879,610	19,064,780	19,051,455	8.0%
Primary Forest Materials	8	1,500	6,397	5,355	3,142	1,435	-4.3%
Fresh Fish	9	468	478	526	572	619	32.3%
Metallic Ores	10	23,336	30,775	26,003	22,358	20,754	-11.1%
Coal	11	187,234	182,000	165,498	155,236	148,836	-20.5%
Nonmetallic Ores and Minerals	14	34,509,447	41,887,259	44,610,705	46,364,233	48,698,097	41.1%
Ordnance	19	25	28	27	21	17	-32.9%
Food Products	20	5,605,864	6,277,030	6,834,891	7,336,680	7,822,032	39.5%
Tobacco Products	21	375	271	226	182	142	-62.0%
Textiles and Apparel	23	7,562	8,274	7,334	6,751	6,521	-13.8%
Lumber and Wood Products	24	11,847,791	23,206,654	26,352,662	26,956,545	27,575,605	132.7%
Furniture and Fixtures	25	8,428	9,269	9,429	9,191	9,081	7.8%
Paper and Pulp Products	26	514,736	656,164	716,187	747,157	783,255	52.2%
Printed Matter	27	292,369	266,526	266,431	271,360	291,243	-0.4%
Chemical Products	28	3,240,503	3,481,662	3,402,140	3,035,973	2,643,888	-18.4%
Petroleum or Coal Products	29	10,773,673	10,285,309	9,992,578	9,961,915	10,169,845	-5.6%
Rubber and Plastics	30	68,358	81,365	84,991	85,667	87,452	27.9%
Clay, Cement, Glass, Stone Products	32	7,644,788	9,562,512	10,040,171	10,359,247	10,907,801	42.7%
Primary Metal Products	33	707,816	913,771	923,933	897,555	906,447	28.1%
Fabricated Metal Products	34	246,690	305,829	294,594	281,787	278,615	12.9%
Machinery	35	6,654	9,970	10,063	9,790	10,144	52.5%
Electrical Equipment	36	3,560	4,396	4,710	4,873	5,207	46.3%
Transportation Equipment	37	66,051	116,341	109,007	108,190	112,620	70.5%
Technical Instruments and Equipment	38	815	1,003	1,245	1,514	1,863	128.6%
Misc. Manufacturing Products	39	2,307	2,807	3,239	3,602	4,105	77.9%
Waste or Scrap Material	40	1,592,220	1,897,247	1,970,431	2,040,138	2,159,176	35.6%
Misc. Freight Shipments	41	96,158	124,078	148,829	170,267	192,794	100.5%
Mail	43	799,693	763,482	741,566	721,063	704,780	-11.9%
Secondary Traffic	50	17,076,980	23,200,456	26,920,553	30,591,007	34,804,067	103.8%
Total		112,961,605	141,417,271	152,522,935	159,210,797	167,397,895	48.2%

7 20-YEAR FREIGHT FORECAST

Table 8 – Michigan Truck Freight Movements (2009-2030): Michigan to Other (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	5,404,059	5,611,556	5,888,133	6,101,291	6,277,017	16.2%
Primary Forest Materials	8	8,385	11,037	11,604	12,167	12,806	52.7%
Fresh Fish	9	5,096	5,403	6,036	6,723	7,521	47.6%
Metallic Ores	10	1,700	2,585	2,820	3,056	3,329	95.8%
Coal	11	15,099	20,409	20,876	21,354	21,822	44.5%
Crude Petroleum and Natural Gas	13	3,778,586	4,766,024	5,272,832	5,774,256	6,340,777	67.8%
Nonmetallic Ores and Minerals	14	4,970,955	6,363,693	6,865,695	7,350,809	7,998,717	60.9%
Ordnance	19	15,016	20,687	24,749	26,601	30,158	100.8%
Food Products	20	11,904,776	13,634,904	14,854,185	16,041,211	17,281,822	45.2%
Tobacco Products	21	356	268	220	179	142	-60.2%
Textiles and Apparel	23	143,109	154,977	147,338	149,287	157,880	10.3%
Lumber and Wood Products	24	3,470,899	4,761,794	4,726,278	4,553,822	4,508,266	29.9%
Furniture and Fixtures	25	545,776	632,170	701,607	743,010	796,371	45.9%
Paper and Pulp Products	26	2,309,671	2,785,500	3,039,302	3,210,408	3,390,096	46.8%
Printed Matter	27	1,126,526	1,082,107	1,094,337	1,133,790	1,224,899	8.7%
Chemical Products	28	6,480,737	7,636,002	8,400,141	8,829,440	9,247,458	42.7%
Petroleum or Coal Products	29	2,882,709	3,131,248	3,202,987	3,292,629	3,399,620	17.9%
Rubber and Plastics	30	1,959,092	2,365,743	2,612,732	2,791,195	2,997,292	53.0%
Clay, Cement, Glass, Stone Products	32	1,270,449	1,557,873	1,739,909	1,927,525	2,166,559	70.5%
Primary Metal Products	33	4,090,410	5,545,113	6,013,390	6,249,147	6,582,411	60.9%
Fabricated Metal Products	34	2,292,298	2,772,893	2,774,416	2,740,743	2,747,713	19.9%
Machinery	35	1,375,135	1,993,638	2,219,524	2,399,695	2,653,687	93.0%
Electrical Equipment	36	749,608	928,573	1,071,353	1,200,387	1,354,290	80.7%
Transportation Equipment	37	3,459,036	5,735,320	5,725,748	6,059,772	6,545,058	89.2%
Technical Instruments and Equipment	38	213,014	267,032	332,478	410,436	508,832	138.9%
Misc. Manufacturing Products	39	245,984	304,247	346,794	382,146	428,638	74.3%
Waste or Scrap Material	40	1,980,537	3,199,167	3,982,944	4,944,271	6,219,514	214.0%
Misc. Freight Shipments	41	153,836	205,889	251,359	297,933	351,192	128.3%
Mail	43	550,839	549,109	545,311	547,430	547,678	-0.6%
Secondary Traffic	50	6,951,486	9,411,247	11,209,798	13,066,313	15,083,640	117.0%
Total		68,355,180	85,456,205	93,084,897	100,267,026	108,885,206	59.3%

Table 9 – Michigan Truck Freight Movements (2009-2030): Other to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	11,649,245	11,584,893	11,959,634	11,885,851	11,740,156	0.8%
Primary Forest Materials	8	24,298	29,670	29,469	28,875	28,470	17.2%
Fresh Fish	9	30,229	36,004	41,346	47,200	53,762	77.8%
Metallic Ores	10	312,310	436,398	380,244	337,372	317,970	1.8%
Coal	11	42,669	63,005	66,985	71,430	75,953	78.0%
Crude Petroleum and Natural Gas	13	83,511	103,154	104,261	106,039	108,020	29.3%
Nonmetallic Ores and Minerals	14	7,959,627	9,630,627	10,188,691	10,554,844	11,040,110	38.7%
Ordnance	19	22,231	26,867	28,429	28,435	31,658	42.4%
Food Products	20	11,978,477	13,618,388	14,994,938	16,256,581	17,496,862	46.1%
Tobacco Products	21	87,145	62,944	51,897	41,920	32,492	-62.7%
Textiles and Apparel	23	556,656	609,754	586,313	604,892	662,868	19.1%
Lumber and Wood Products	24	1,144,379	1,949,824	2,237,567	2,343,087	2,455,235	114.5%
Furniture and Fixtures	25	527,937	689,582	859,068	1,083,807	1,407,474	166.6%
Paper and Pulp Products	26	2,352,619	2,969,594	3,257,472	3,431,231	3,619,140	53.8%
Printed Matter	27	1,531,186	1,437,050	1,434,205	1,457,014	1,555,665	1.6%
Chemical Products	28	6,819,644	7,569,211	7,780,117	7,414,380	7,010,996	2.8%
Petroleum or Coal Products	29	4,874,839	4,695,210	4,549,078	4,545,832	4,655,846	-4.5%
Rubber and Plastics	30	1,968,917	2,405,505	2,558,228	2,655,403	2,810,648	42.8%
Clay, Cement, Glass, Stone Products	32	3,393,726	4,197,851	4,384,349	4,506,579	4,732,594	39.5%
Primary Metal Products	33	4,973,010	6,665,518	6,908,888	6,738,989	6,760,491	35.9%
Fabricated Metal Products	34	2,606,319	3,276,275	3,244,710	3,173,031	3,210,786	23.2%
Machinery	35	1,342,851	2,019,236	2,226,489	2,413,106	2,701,979	101.2%
Electrical Equipment	36	1,219,427	1,697,065	2,083,640	2,566,232	3,179,757	160.8%
Transportation Equipment	37	3,189,738	5,152,244	4,901,972	4,881,251	5,036,125	57.9%
Technical Instruments and Equipment	38	252,708	310,329	378,674	460,968	569,591	125.4%
Misc. Manufacturing Products	39	410,247	516,139	600,185	685,707	802,879	95.7%
Waste or Scrap Material	40	530,627	671,470	702,198	733,843	773,887	45.8%
Misc. Freight Shipments	41	334,694	478,816	621,649	806,718	1,033,264	208.7%
Mail	43	91,171	86,726	83,807	81,014	78,815	-13.6%
Secondary Traffic	50	11,387,389	15,465,601	17,979,232	20,430,098	23,251,548	104.2%
Total		81,697,825	98,454,949	105,223,735	110,371,731	117,235,041	43.5%

7 20-YEAR FREIGHT FORECAST

Table 10 – Michigan Truck Freight Movements (2009-2030): Through (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	2,478,617	3,034,025	3,523,279	4,061,449	4,696,221	89.5%
Primary Forest Materials	8	6,757	9,047	10,341	11,768	13,431	98.8%
Fresh Fish	9	22,669	27,733	31,202	35,072	39,281	73.3%
Metallic Ores	10	7,799	12,096	13,793	15,527	17,517	124.6%
Coal	11	25,738	33,959	34,699	35,414	36,133	40.4%
Crude Petroleum and Natural Gas	13	2,656,959	3,352,239	3,694,020	4,033,349	4,416,853	66.2%
Nonmetallic Ores and Minerals	14	1,050,152	1,191,780	1,262,974	1,334,974	1,416,399	34.9%
Ordnance	19	13,081	18,389	22,958	28,415	35,230	169.3%
Food Products	20	4,076,048	5,034,870	5,871,679	6,813,584	7,914,352	94.2%
Tobacco Products	21	469	452	409	369	334	-28.8%
Textiles and Apparel	23	178,157	225,978	258,707	295,831	340,612	91.2%
Lumber and Wood Products	24	502,339	647,629	727,256	813,787	911,598	81.5%
Furniture and Fixtures	25	472,367	650,943	886,648	1,207,768	1,640,213	247.2%
Paper and Pulp Products	26	1,974,628	2,418,556	2,768,367	3,155,717	3,607,727	82.7%
Printed Matter	27	166,583	209,401	228,679	249,139	272,239	63.4%
Chemical Products	28	3,292,977	4,655,631	5,873,020	7,349,019	9,221,130	180.0%
Petroleum or Coal Products	29	526,895	660,839	727,994	806,471	900,076	70.8%
Rubber and Plastics	30	910,308	1,214,865	1,480,087	1,802,282	2,189,427	140.5%
Clay, Cement, Glass, Stone Products	32	702,503	960,011	1,227,637	1,549,456	1,959,667	179.0%
Primary Metal Products	33	3,033,819	4,054,715	4,764,124	5,541,317	6,466,340	113.1%
Fabricated Metal Products	34	605,941	753,728	880,942	1,023,704	1,195,109	97.2%
Machinery	35	950,629	1,272,336	1,609,435	2,012,068	2,527,923	165.9%
Electrical Equipment	36	599,386	827,187	1,058,097	1,338,706	1,705,686	184.6%
Transportation Equipment	37	1,481,953	1,839,597	2,026,515	2,234,148	2,473,252	66.9%
Technical Instruments and Equipment	38	74,899	108,323	140,369	179,920	230,362	207.6%
Misc. Manufacturing Products	39	130,253	184,447	233,930	292,639	367,941	182.5%
Waste or Scrap Material	40	605,742	815,042	893,987	978,966	1,076,378	77.7%
Misc. Freight Shipments	41	772,243	1,084,871	1,413,018	1,814,089	2,323,789	200.9%
Mail	43	5	4	4	4	4	-13.7%
Secondary Traffic	50	1,338	1,738	2,090	2,449	2,819	110.7%
Total		27,321,255	35,300,430	41,666,261	49,017,403	57,998,043	112.3%

WATERBORNE FREIGHT FORECAST

Overall waterborne freight movements are projected to increase 38.5 percent by 2030, from 74 million tons in 2009 to 102 million tons in 2030 (Table 11). Intrastate waterborne freight movements, those moving from one Michigan port to another, are projected to increase by slightly less at 22.3 percent by 2030, from 11 million tons in 2009 to 14 million tons in 2030 (Table 12). Outbound waterborne freight movements are projected to increase roughly 58.6 percent by 2030, from 34 million tons in 2009 to 54 million tons in 2030 (Table 13). Inbound waterborne freight movements are projected to increase 20.7 percent by 2030, from 28 million tons in 2009 to 34 million tons in 2030 (Table 14).

Table 11 – Michigan Marine Freight Movements (2009-2030): Overall (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	123,547	139,108	149,515	158,621	169,880	37.5%
Fresh Fish	9	50	63	70	78	86	71.7%
Metallic Ores	10	17,402,758	30,866,095	33,124,716	32,417,458	31,763,899	82.5%
Coal	11	23,196,106	27,900,644	26,788,444	25,789,356	25,282,754	9.0%
Crude Petroleum and Natural Gas	13	69,009	85,783	94,684	102,278	105,702	53.2%
Nonmetallic Ores and Minerals	14	26,122,361	31,061,151	32,308,755	33,168,274	34,065,340	30.4%
Food Products	20	18,097	22,465	25,146	27,564	30,211	66.9%
Textiles and Apparel	23	25	29	28	30	32	25.5%
Lumber and Wood Products	24	10,658	17,225	20,414	23,085	25,600	140.2%
Furniture and Fixtures	25	75	92	123	161	212	184.0%
Paper and Pulp Products	26	850	1,011	1,237	1,481	1,783	109.7%
Printed Matter	27	24	30	32	36	39	59.6%
Chemical Products	28	318,313	349,404	356,315	355,678	357,201	12.2%
Petroleum or Coal Products	29	2,117,476	2,365,853	2,420,060	2,507,951	2,607,616	23.1%
Rubber and Plastics	30	323	386	453	523	607	88.2%
Clay, Cement, Glass, Stone Products	32	4,038,682	5,178,228	5,872,868	6,408,736	6,985,328	73.0%
Primary Metal Products	33	619,342	771,142	860,595	954,952	1,058,061	70.8%
Fabricated Metal Products	34	17,338	23,014	22,479	21,211	20,413	17.7%
Machinery	35	1,233	1,653	1,983	2,381	2,893	134.6%
Electrical Equipment	36	332	426	491	576	701	111.2%
Transportation Equipment	37	8,096	10,447	11,220	12,095	13,121	62.1%
Technical Instruments and Equipment	38	47	61	78	99	126	169.6%
Misc. Manufacturing Products	39	26,012	32,586	36,990	41,176	46,250	77.8%
Waste or Scrap Material	40	144,374	215,499	235,005	254,875	277,376	92.1%
Misc. Freight Shipments	41	36,908	44,212	49,274	55,092	62,227	68.6%
Total		74,272,036	99,086,605	102,380,976	102,303,765	102,877,460	38.5%

7 20-YEAR FREIGHT FORECAST

Table 12 – Michigan Marine Freight Movements (2009-2030): Michigan to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Metallic Ores	10	2,294,635	3,695,199	3,969,257	3,842,833	3,722,312	62.2%
Coal	11	500,166	592,223	578,952	572,315	564,149	12.8%
Nonmetallic Ores and Minerals	14	7,538,217	8,343,973	8,473,014	8,488,487	8,576,024	13.8%
Textiles	23	4	2	0	0	0	-100.0%
Lumber and Wood Products	24	1,866	4,602	5,757	6,758	7,874	322.1%
Chemical Products	28	49,786	53,378	50,695	45,358	39,705	-20.2%
Petroleum or Coal Products	29	413,640	391,604	381,152	382,089	384,549	-7.0%
Rubber and Plastics	30	9	10	10	11	11	25.0%
Clay, Cement, Glass, Stone Products	32	686,435	803,618	813,279	786,316	768,677	12.0%
Primary Metal Products	33	19,924	31,488	32,166	31,636	30,642	53.8%
Fabricated Metal Products	34	8,578	11,447	10,919	9,956	9,182	7.0%
Machinery	35	259	335	330	333	358	38.4%
Electrical Equipment	36	210	265	292	338	412	95.8%
Transportation Equipment	37	293	421	327	300	299	2.2%
Technical Instruments and Equipment	38	7	9	11	15	20	194.0%
Misc. Manufacturing Products	39	10,751	13,712	15,672	17,699	19,985	85.9%
Waste or Scrap Material	40	4,919	6,971	7,404	7,851	8,355	69.8%
Misc. Freight Shipments	41	13,134	15,297	16,621	18,378	20,724	57.8%
Total		11,542,833	13,964,553	14,355,860	14,210,672	14,153,278	22.6%

Table 13 – Michigan Marine Freight Movements (2009-2030): Michigan to Other (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	123,547	139,108	149,515	158,621	169,880	37.5%
Fresh Fish	9	50	63	70	78	86	71.7%
Metallic Ores	10	8,572,376	16,626,603	17,830,226	17,608,423	17,417,871	103.2%
Coal	11	6,513,528	9,183,682	9,276,780	9,327,575	9,381,026	44.0%
Crude Petroleum and Natural Gas	13	69,009	85,783	94,684	102,278	105,702	53.2%
Nonmetallic Ores and Minerals	14	14,870,030	18,273,607	19,295,874	20,036,743	20,709,139	39.3%
Food Products	20	17,628	21,887	24,425	26,673	29,119	65.2%
Textiles and Apparel	23	21	26	28	30	32	49.8%
Lumber and Wood Products	24	8,792	12,623	14,657	16,327	17,726	101.6%
Furniture and Fixtures	25	65	80	107	138	182	178.4%
Paper and Pulp Products	26	848	1,009	1,235	1,478	1,781	109.8%
Chemical Products	28	233,694	258,673	265,324	266,749	270,249	15.6%
Petroleum or Coal Products	29	998,680	1,265,666	1,333,533	1,403,581	1,477,349	47.9%
Rubber and Plastics	30	297	354	416	481	558	88.0%
Clay, Cement, Glass, Stone Products	32	2,760,340	3,582,841	4,039,246	4,316,420	4,549,913	64.8%
Primary Metal Products	33	12,433	18,250	22,169	26,365	31,541	153.7%
Fabricated Metal Products	34	2,125	2,692	3,094	3,556	4,156	95.6%
Machinery	35	490	647	799	967	1,180	140.9%
Electrical Equipment	36	121	161	198	238	289	137.9%
Transportation Equipment	37	7,022	9,024	9,777	10,557	11,451	63.1%
Technical Instruments and Equipment	38	40	52	66	83	106	165.5%
Misc. Manufacturing Products	39	15,233	18,837	21,274	23,424	26,203	72.0%
Waste or Scrap Material	40	68,827	110,055	123,905	138,089	154,340	124.2%
Misc. Freight Shipments	41	13,695	17,042	19,244	21,159	23,061	68.4%
Total		34,288,893	49,628,765	52,526,647	53,490,035	54,382,937	58.6%

7 20-YEAR FREIGHT FORECAST

Table 14 – Michigan Marine Freight Movements (2009-2030): Other to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Metallic Ores	10	6,535,747	10,544,293	11,325,232	10,966,202	10,623,716	62.5%
Coal	11	16,182,413	18,124,739	16,932,713	15,889,467	15,337,580	-5.2%
Nonmetallic Ores and Minerals	14	3,714,113	4,443,570	4,539,867	4,643,044	4,780,177	28.7%
Food Products	20	468	578	721	891	1,093	133.3%
Furniture and Fixtures	25	9	12	16	22	30	222.7%
Paper and Pulp Products	26	2	2	2	3	3	63.1%
Printed Matter	27	24	30	32	36	39	59.6%
Chemical Products	28	34,833	37,353	40,296	43,572	47,248	35.6%
Petroleum or Coal Products	29	705,156	708,583	705,375	722,282	745,718	5.8%
Rubber and Plastics	30	17	22	26	32	38	125.0%
Clay, Cement, Glass, Stone Products	32	591,907	791,769	1,020,343	1,306,000	1,666,738	181.6%
Primary Metal Products	33	586,984	721,404	806,260	896,951	995,879	69.7%
Fabricated Metal Products	34	6,635	8,875	8,466	7,699	7,074	6.6%
Machinery	35	485	671	853	1,081	1,355	179.5%
Transportation Equipment	37	781	1,002	1,115	1,237	1,370	75.4%
Misc. Manufacturing Products	39	29	38	44	52	62	115.8%
Waste or Scrap Material	40	70,628	98,474	103,695	108,935	114,682	62.4%
Misc. Freight Shipments	41	10,079	11,873	13,410	15,555	18,442	83.0%
Total		28,440,310	35,493,286	35,498,469	34,603,059	34,341,244	20.7%

RAIL FREIGHT FORECAST

Overall rail freight movements are projected to increase by 58.1 percent by 2030, from 83 million tons in 2009 to 132 million tons in 2030 (Table 15). Intrastate rail freight movements are projected to increase by 174.5 percent by 2030, from 9.5 million tons in 2009 to 26 million tons in 2030 (Table 16). Outbound rail freight movements are projected to increase 37.6 percent by 2030, from 15.5 million tons in 2009 to 21 million tons in 2030 (Table 17). Inbound rail freight movements are projected to increase 2.7 percent by 2030, from 30.9 million tons in 2009 to 31.8 million tons in 2030 (Table 18). Through-rail freight movements, those not stopping in Michigan, are projected to increase 91.5 percent by 2030, from 27 million tons in 2009 to 53 million tons in 2030 (Table 19).

Table 15 – Michigan Rail Freight Movements (2009-2030): Overall (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	3,968,383	4,126,177	4,249,975	4,253,302	4,223,524	6.4%
Fresh Fish	9	2,720	3,327	3,706	4,099	4,544	67.1%
Metallic Ores	10	9,954,685	18,328,311	22,564,579	25,523,482	27,860,272	179.9%
Coal	11	19,765,846	18,356,080	17,749,871	16,798,868	15,739,409	-20.4%
Crude Petroleum and Natural Gas	13	363,844	442,919	463,685	484,360	505,670	39.0%
Nonmetallic Ores and Minerals	14	1,971,732	2,210,322	2,195,322	2,182,578	2,195,815	11.4%
Ordnance	19	1,960	2,190	2,905	2,637	2,116	7.9%
Food Products	20	4,119,492	4,799,384	5,307,620	5,840,703	6,434,960	56.2%
Textiles and Apparel	23	5,680	7,183	8,151	9,268	10,549	85.7%
Lumber and Wood Products	24	2,946,180	4,186,731	4,548,198	4,803,535	5,103,724	73.2%
Furniture and Fixtures	25	16,240	22,231	30,010	40,230	54,055	232.8%
Paper and Pulp Products	26	4,228,360	5,251,919	5,589,096	5,823,328	6,125,475	44.9%
Printed Matter	27	680	1,013	1,411	1,953	2,654	290.3%
Chemical Products	28	11,087,278	14,216,221	16,396,573	18,751,957	21,632,998	95.1%
Petroleum or Coal Products	29	4,448,833	5,075,702	5,206,305	5,337,703	5,497,340	23.6%
Rubber and Plastics	30	92,640	124,926	152,489	185,788	225,412	143.3%
Clay, Cement, Glass, Stone Products	32	3,261,800	4,292,195	5,097,544	6,030,872	7,257,419	122.5%
Primary Metal Products	33	4,737,281	6,200,109	6,766,559	7,207,763	7,824,501	65.2%
Fabricated Metal Products	34	41,200	53,696	64,821	78,307	94,791	130.1%
Machinery	35	28,200	38,361	46,747	56,269	69,058	144.9%
Electrical Equipment	36	56,160	74,160	90,987	108,547	131,284	133.8%
Transportation Equipment	37	5,608,256	8,425,664	8,253,216	8,532,351	9,000,374	60.5%
Technical Instruments/ Equipment	38	920	1,346	1,700	2,108	2,640	187.0%
Misc. Manufacturing Products	39	16,400	22,304	28,636	36,428	46,375	182.8%
Waste or Scrap Material	40	2,407,524	3,150,184	3,346,650	3,544,778	3,764,321	56.4%
Misc. Freight Shipments	41	170,335	214,732	256,103	295,307	337,147	97.9%
Shipping Containers	42	214,004	269,825	298,312	323,164	356,024	66.4%
Freight Forwarder Traffic	44	18,680	23,011	25,657	28,476	32,108	71.9%
Shipper Association Traffic	45	6,960	8,347	9,087	9,856	10,850	55.9%
Misc. Mixed Shipments	46	4,109,520	5,197,722	5,945,403	6,765,669	7,757,636	88.8%
Hazardous Waste	48	158,516	189,931	201,028	205,700	211,177	33.2%
Total		83,810,309	105,316,222	114,902,346	123,269,383	132,514,219	58.1%

7 20-YEAR FREIGHT FORECAST

Table 16 – Michigan Rail Freight Movements (2009-2030): Michigan to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	32,112	31,030	31,214	30,140	29,043	-9.6%
Metallic Ores	10	8,334,341	15,810,409	19,841,871	22,602,232	24,722,228	196.6%
Nonmetallic Ores/Minerals	14	562,240	530,091	467,294	432,721	415,277	-26.1%
Food Products	20	12,200	13,412	14,259	15,156	16,117	32.1%
Lumber or Wood Products	24	269,520	532,905	604,988	615,179	625,543	132.1%
Paper and Pulp Products	26	58,800	101,237	105,232	96,977	87,379	48.6%
Chemical Products	28	61,360	62,657	62,661	57,386	51,067	-16.8%
Petroleum or Coal Products	29	66,708	65,042	62,255	60,248	59,699	-10.5%
Primary Metal Products	33	9,752	12,496	12,148	10,773	9,889	1.4%
Transportation Equipment	37	132,200	226,855	196,770	181,175	176,342	33.4%
Waste or Scrap Material	40	4,080	6,008	6,616	7,258	8,003	96.1%
Misc. Freight Shipments	41	5,080	6,238	7,172	7,861	8,491	67.1%
Shipping Containers	42	504	573	596	598	603	19.6%
Total		9,548,897	17,398,953	21,413,075	24,117,702	26,209,680	174.5%

Table 17 – Michigan Rail Freight Movements (2009-2030): Michigan to Other (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	2,395,983	2,401,574	2,429,175	2,365,203	2,264,180	-5.5%
Metallic Ores	10	1,460,308	2,269,764	2,444,379	2,612,025	2,793,444	91.3%
Crude Petroleum and Natural Gas	13	3,240	3,774	4,045	4,272	4,529	39.8%
Nonmetallic Ores and Minerals	14	981,952	1,161,153	1,184,238	1,189,154	1,204,350	22.6%
Ordnance	19	1,800	2,004	2,725	2,499	2,009	11.6%
Food Products	20	652,684	762,463	831,113	897,329	963,700	47.7%
Lumber and Wood Products	24	624,360	773,420	732,663	687,242	654,898	4.9%
Furniture and Fixtures	25	320	424	563	729	959	199.6%
Paper and Pulp Products	26	1,048,440	1,339,014	1,342,050	1,273,477	1,221,488	16.5%
Chemical Products	28	972,280	1,062,894	1,059,604	999,630	937,224	-3.6%
Petroleum or Coal Products	29	865,894	935,581	934,867	920,187	907,473	4.8%
Rubber and Plastics	30	120	153	191	232	286	138.0%
Clay, Cement, Glass, Stone Products	32	561,960	673,329	740,928	812,484	901,140	60.4%
Primary Metal Products	33	480,236	671,430	686,025	634,039	583,948	21.6%
Machinery	35	160	195	204	204	203	27.1%
Electrical Equipment	36	1,640	2,155	2,654	3,242	3,982	142.8%
Transportation Equipment	37	3,113,088	4,952,621	4,678,780	4,747,959	4,942,729	58.8%
Waste or Scrap Material	40	1,350,160	1,860,865	1,984,000	2,107,931	2,245,144	66.3%
Misc. Freight Shipments	41	74,640	94,745	114,225	131,816	149,781	100.7%
Shipping Containers	42	85,620	107,595	112,997	115,183	120,536	40.8%
Freight Forwarder Traffic	44	5,560	6,643	7,184	7,679	8,284	49.0%
Misc. Mixed Shipments	46	889,760	1,117,039	1,246,320	1,364,829	1,506,681	69.3%
Hazardous Waste	48	9,560	11,134	11,935	12,605	13,365	39.8%
Total		15,579,765	20,209,970	20,550,865	20,889,950	21,430,335	37.6%

7 20-YEAR FREIGHT FORECAST

Table 18 – Michigan Rail Freight Movements (2009-2030): Other to Michigan (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	121,844	121,663	125,051	122,153	118,336	-2.9%
Fresh Fish	9	400	462	524	596	679	69.7%
Metallic Ores	10	11,960	20,437	20,186	20,003	19,831	65.8%
Coal	11	19,742,506	18,326,453	17,720,051	16,768,966	15,709,435	-20.4%
Nonmetallic Ores and Minerals	14	186,484	227,498	239,348	245,080	246,971	32.4%
Food Products	20	527,928	579,420	625,950	669,071	713,910	35.2%
Lumber and Wood Products	24	869,760	1,278,964	1,433,844	1,548,657	1,675,165	92.6%
Paper and Pulp Products	26	439,840	532,952	593,697	639,205	683,554	55.4%
Chemical Products	28	1,740,528	1,942,974	1,994,295	1,890,546	1,766,068	1.5%
Petroleum or Coal Products	29	1,195,675	1,211,667	1,193,591	1,181,526	1,184,502	-0.9%
Clay, Cement, Glass, Stone Products	32	804,640	1,064,933	1,154,804	1,245,861	1,398,400	73.8%
Primary Metal Products	33	2,074,765	2,706,824	2,835,316	2,861,790	2,991,619	44.2%
Machinery	35	5,000	7,321	7,518	7,365	7,722	54.4%
Electrical Equipment	36	10,000	13,599	16,007	18,799	22,656	126.6%
Transportation Equipment	37	1,151,740	1,696,684	1,675,339	1,739,609	1,844,323	60.1%
Waste or Scrap Material	40	530,420	592,831	614,712	637,048	661,828	24.8%
Misc. Freight Shipments	41	78,055	95,942	111,548	125,736	140,579	80.1%
Shipping Containers	42	113,600	141,680	157,334	170,265	185,084	62.9%
Freight Forwarder Traffic	44	11,440	13,866	14,988	15,974	17,267	50.9%
Shipper Association Traffic	45	6,960	8,347	9,087	9,856	10,850	55.9%
Misc. Mixed Shipments	46	1,331,040	1,653,549	1,871,749	2,110,263	2,401,088	80.4%
Hazardous Waste	48	42,076	47,793	49,802	49,046	48,475	15.2%
Total		30,996,661	32,285,857	32,464,742	32,077,417	31,848,341	2.7%

Table 19 – Michigan Rail Freight Movements (2009-2030): Through (Tons)

Commodity	STCC	2009	2015	2020	2025	2030	Growth % 2009-2030
Agriculture	1	1,418,444	1,571,910	1,664,535	1,735,806	1,811,965	27.7%
Fresh Fish	9	2,320	2,865	3,182	3,503	3,866	66.6%
Metallic Ores	10	148,076	227,701	258,143	289,221	324,768	119.3%
Coal	11	23,340	29,628	29,820	29,902	29,974	28.4%
Crude Petroleum and Natural Gas	13	360,604	439,145	459,640	480,088	501,140	39.0%
Nonmetallic Ores and Minerals	14	241,056	291,580	304,442	315,622	329,217	36.6%
Ordnance	19	160	185	180	138	107	-33.4%
Food Products	20	2,926,680	3,444,089	3,836,298	4,259,147	4,741,232	62.0%
Textiles and Apparel	23	5,680	7,183	8,151	9,268	10,549	85.7%
Lumber and Wood Products	24	1,182,540	1,601,442	1,776,702	1,952,457	2,148,118	81.7%
Furniture and Fixtures	25	15,920	21,807	29,447	39,501	53,096	233.5%
Paper and Pulp Products	26	2,681,280	3,278,717	3,548,117	3,813,670	4,133,055	54.1%
Printed Matter	27	680	1,013	1,411	1,953	2,654	290.3%
Chemical Products	28	8,313,110	11,147,696	13,280,014	15,804,395	18,878,638	127.1%
Petroleum or Coal Products	29	2,320,556	2,863,412	3,015,592	3,175,743	3,345,666	44.2%
Rubber and Plastics	30	92,520	124,773	152,298	185,555	225,126	143.3%
Clay, Cement, Glass, Stone Products	32	1,895,200	2,553,933	3,201,812	3,972,526	4,957,879	161.6%
Primary Metal Products	33	2,172,528	2,809,358	3,233,069	3,701,160	4,239,045	95.1%
Fabricated Metal Products	34	41,200	53,696	64,821	78,307	94,791	130.1%
Machinery	35	23,040	30,845	39,025	48,700	61,133	165.3%
Electrical Equipment	36	44,520	58,406	72,326	86,506	104,646	135.1%
Transportation Equipment	37	1,211,228	1,549,503	1,702,327	1,863,608	2,036,980	68.2%
Technical Instruments and Equipment	38	920	1,346	1,700	2,108	2,640	187.0%
Misc. Manufacturing Products	39	16,400	22,304	28,636	36,428	46,375	182.8%
Waste or Scrap Material	40	522,864	690,480	741,322	792,542	849,346	62.4%
Misc. Freight Shipments	41	12,560	17,807	23,158	29,895	38,296	204.9%
Shipping Containers	42	14,280	19,977	27,385	37,118	49,801	248.7%
Freight Forwarder Traffic	44	1,680	2,502	3,485	4,824	6,557	290.3%
Misc. Mixed Shipments	46	1,888,720	2,427,134	2,827,334	3,290,578	3,849,867	103.8%
Hazardous Waste	48	106,880	131,004	139,291	144,049	149,338	39.7%
Total		27,684,986	35,421,442	40,473,664	46,184,314	53,025,864	91.5%

AIR FREIGHT FORECAST

Statistics necessary to support accurate 20-year air freight forecasts for Michigan are insufficient at this time. Airmail volumes are expected to decrease as electronic correspondence for both personal and business purposes continues to grow. The air cargo industry is heavily impacted by the cost of fuel. Boeing, in its most recent World Air Cargo Forecast 2012-2013, predicts an average 5.2 percent annual growth rate for world air cargo traffic, and an increase by more than 80 percent in the air freighter fleet in the next 20 years.¹⁰

¹⁰ Boeing, World Air Cargo Forecast 2012-2013, <http://www.boeing.com/assets/pdf/commercial/cargo/wacf.pdf>