
Memorandum

The City of Traverse City
Engineering Department



TO: Jered Ottenwess, City Manager
FROM: Timothy J. Lodge, City Engineer 
DATE: May 28, 2014
SUBJECT: TC Technical Committee Memorandum
East-West Transportation Options

Attached is the Memorandum from the TC-TALUS Technical Committee to the TC-TALUS Board of Directors which reviews East-West Transportation Options. The TC-TALUS Board asked the Technical Committee to examine east-west transportation options within the TC-TALUS study area. The TC-TALUS Technical Committee is a collaboration of regional governmental representatives focused on Regional Transportation and Land Use. This work was recently completed and is scheduled for discussion this month (May 2014) for use in the development of a Regional Long Range Transportation Plan.

The Technical Committee used the tools developed during the Grand Vision Land Use and Transportation Study (2007 to 2010) to model future traffic patterns on several transportation alternatives. Two "Road Diets" on City streets were included as alternatives. These were located on 8th Street from Boardman Avenue to Woodmere Avenue and on Garfield Avenue from the City Limits near the Airport to 8th Street. The Memorandum includes a summary table showing the favorable (Lowered V/C ratio) and unfavorable (Raised V/C ratio) outcomes of the modeling as it relates to Regional traffic patterns.

The next steps are to complete the discussion with the TC-TALUS Board of Directors and choose alternatives to include in a final model run showing the cumulative impacts of the selected alternatives. This final analysis will likely influence the Regional Long Range Transportation Plan.

For more information about The Grand Vision Land use and Transportation Study (2007-2010) we encourage reviewing the attached Transportation Reports Roadmap and available through the Northwest Michigan Council of Governments website: www.nwm.org. Task 3.4 Travel Demand Model Methodology, Task 3.6 (combined with Task 4.2) Transportation Gap Analysis and Refined Corridor/Intersection Analysis, and Task 5.1 Develop Recommended Transportation Strategies are importantly related to the development of transportation alternatives for the Grand Traverse Region.



Transportation Reports Roadmap

There are 17 Grand Vision reports, each information-rich with general topics, specific analysis, and graphic data.

This roadmap is designed to give readers a cross-referencing system to quickly locate topics within the many documents of the Grand Vision reports. Each report has a task number assigned to it, as an identifier for the consultants who prepared the reports.

There are three ways to locate information:

- By Task Number
- By Report Name
- By Report Description

To access the online version of this roadmap, with links directly to the reports, visit:
www.nwm.org/gvreports.asp

The Grand Vision Document

This cornerstone document explains the Grand Vision guiding principles, project timeline, partners and calls to action. It includes an illustrative map that demonstrates a regional growth concept that is a reflection of community decisions made about transportation and land use preferences, as well as the preferences for economic growth, housing, agriculture, and the natural environment expressed at scenario planning workshops and through the Vision Decision community process.

Task 1 Report - Past/Existing Transportation and Land Use Trends

This report analyzes past and existing local and regional plans, and other studies relevant to the land use and transportation system of the area.

Task 2 Report - Public Awareness, Education and Engagement

The public involvement phase of the study and the results are documented in four reports:

TCAPS - Grand Vision Student Assembly Summary is a synopsis of the workshops held at the Traverse City Central and West high schools.

Visual Preference Survey: Summary of Results presents a visual preference survey, completed by Fregonese and Associates, that shapes the workshop maps and chips to local conditions.

Grand Traverse Futures, Input Session on Regional Growth/Planning documents the Advanced Strategy Lab conducted by Harris Interactive on June 3, 2008. The results of this document were used to help shape the values research (the following report).

Grand Traverse Land Use Study: Values Research details the values research conducted by Harris Interactive for the Grand Vision Study.

The tabulated results of the Grand Vision Decision process were reported in an electronic spreadsheet that is available upon request.

Task 3 Report - Transportation, Socio-Economic and Land Use Data Development

In this study, we present the analysis of the technical data we collected, which is documented within eight reports.

Task 3.1 - Traffic Crash Analysis is the core study in this report, and includes a number of other deliverables. Geographic Information Systems maps (workshop maps) are available upon request.

Task 3.2 - Socio-Economic Report presents projected trends of population, demographic and economic driver information.

Task 3.3 - Gap Analysis studies the gaps that exist between current trends and the Regional Values and Vision established through the public involvement process.

Task 3.4 - Travel Demand Model Methodology documents a computerized travel demand model for the core study area.

Task 3.5 includes two reports:

Socioeconomic Impact Report analyzes the changes in land use, risks/opportunities, impacts and costs of the four possible future growth scenarios established as a part of the public involvement process.

Land Use Scenario Environmental Report inventories the existing conditions found along the 11 Corridors of Significance approved by the TC-TALUS Board of Directors. Consultant input and the review and

recommendation of the TC-TALUS Technical Advisory Committee created this inventory.

Task 3.6 (combined with Task 4.2) - Transportation Gap Analysis and Refined Corridor/Intersection Analysis compares current capacity to projected future demand on the roadways and intersections along the Corridors of Significance. The consultant also makes recommendations to address areas of concern. Included in these reports is The Grand Vision Scorecard. It doesn't individually address deliverables of the study, but presents the public involvement process and results in a readable format. It addresses a number of work tasks and is intended to augment numerous other reports.

Task 4 Report - Transportation Data Analysis

This task provides analysis of the complete set of transportation data consultants gathered.

Task 4.1 - National Functional Classification System Changes recommends the potential changes to this system to help implement the Grand Vision.

Task 4.2 (combined with Task 3.6) - Transportation Gap Analysis and Refined Corridor/Intersection Analysis compares current capacity to projected future demand on the roadways and intersections along the Corridors of Significance.

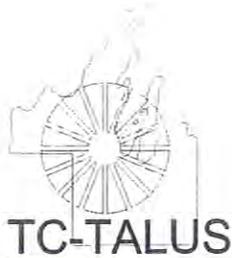
Task 4.3 - Multi-Modal Transportation Systems Plan Final Report analyzes various modes of transportation and the applicability to the transportation system of the area.

Task 5 Report - Final Recommendations and Resources

This report consists of recommended strategies to help us achieve the vision of the project.

Task 5.1 - Develop Recommended Transportation Strategies sets forth the consultants' recommendations for transportation investment for the near future, as well as decision-making for the next 50 years.

Task 5.2 - The Grand Vision Community Resources Guide and Toolbox, which includes associated resources compact disc, provides references to examples that can assist in the implementation of seven identified issue areas.



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www.nwm.org/tctalus.asp

Date: May 1, 2014
 To: TC-TALUS Board of Directors
 From: TC-TALUS Technical Committee
 Subject: East-West Transportation options

The TC-TALUS Board of Directors has tasked the Technical Committee to examine east-west transportation options within the TC-TALUS study area. As the evaluation of modeled projects is coming to a conclusion, the Technical Committee needs to provide the Board with the information we have developed.

As described in more detail below, the Travel Demand Model used socio-economic data developed during the Grand Vision process to predict travel demand. The Technical Committee analyzed the model outputs and is providing the following staff analysis of the east-west transportation issues. The Boardman River runs north/south through the TC-TALUS area and the limited number of crossings/lanes is the main constraint facing east-west mobility through the TC-TALUS area. East – West transportation routes in the TC-TALUS area include the following:

Road/Crossing Name	Regional Function lanes	Local Function lanes	2007 V/C As is	2035 V/C No build
US-31, M-37, M-72 (Grandview Parkway)	4		1.15	1.48
Front Street / State Street		2	0.99	1.30
Eighth Street	4	4	0.90	1.19
South Airport Road	4		1.15	1.58
Cass Road		1 (2 proposed)	0.51	1.14
Beitner Road	2		1.16	1.74
Total	14	7 (8 proposed)		

Although not east-west in orientation, Cass Street and Union Street both cross the Boardman River in a north-south direction as the river meanders to an east-west orientation for a short distance through the City of Traverse City. These roadways could be seen as adding to the limited number of river crossings and therefore providing some level of east-west roadway capacity.

In the following discussion the Volume to Capacity ratio or V/C is used as an indication of traffic congestion. The V/C ratio is defined as the ratio of directional design hour traffic volume to the directional design hour capacity. The ratio is used as an indicator of how the roadway links (NOT intersections) are expected to function. The ratio is expressed as a decimal percentage (i.e. a V/C ratio of 0.50 indicates that the roadway link is operating at 50% of design capacity, V/C of 1.0 indicates the roadway link is operating at 100% of design capacity, and a V/C of 1.50 indicates the roadway link is operating at 50% above design capacity). The V/C is indicative of intersection capacity that relates to congestion and delay factors which impact the quality of life. As with all travel demand modeling, the results are best used as comparisons between scenarios rather than as absolute quantitative measurements of future conditions. While every effort was made to ensure the forecasts were as accurate as possible, it is of course impossible to predict the future with 100% accuracy.

US-31, M-37, M-72 is an MDOT jurisdiction state trunkline serving the TC-TALUS area in both north-south and east-west directions. The Travel Demand Model (TDM) calculated the V/C ratio on the east-west portion as between 1.07 and 1.15 for the base year (2007) and 1.37 to 1.49 for the future year (2035). Potential to increase capacity of the roadway is very restricted due to limited right-of-way and the feasibility of acquiring additional right-of-way for construction. Minor capacity increases could be realized by small scale intersection widening and /or traffic signal improvements. However, these improvements will likely not balance current or future capacity deficiencies.

Front Street / State Street are City of Traverse jurisdiction major surface streets (State Street included as the one way pair of Front Street in downtown Traverse City). Front Street / State Street are east-west roadways located in the downtown Traverse City area. The function and operations of these streets preclude them from serving to move major volumes of traffic now and in the future due to limited right-of-way and serving as “main street” to downtown Traverse City.

Eighth Street is a City of Traverse City jurisdiction major surface street and serves basically the east-west movement of traffic. Although Eighth Street is not continuous in the east-west direction, it serves predominately east-west traffic movement through connection to Cass, Union and Fourteenth Streets. The Travel Demand Model (TDM) calculated the Volume to Capacity (V/C) ratio on Eighth Street as between 0.82 and 1.04 for the base year (2007) and 1.04 to 1.39 for the future year (2035). Options for increasing the capacity of Eighth Street are limited due to right-of-way constraints and the roadway has been discussed as a potential “road diet” opportunity to reduce it to 2 travel lanes plus a center turn lane from its current 4 lane configuration. The potential road diet would provide additional east-west capacity for bicycles and possibly pedestrians if implemented. Parallel bicycle and pedestrian facilities are provided on Webster Street and Boardman Lake Trail in the vicinity of 8th Street.

South Airport Road is a County Primary road under the jurisdiction of the Grand Traverse County Road Commission. It currently serves high volumes of east-west traffic as well as local land uses including commercial, industrial and residential land uses. The TDM currently calculates the 2007 V/C. of South Airport Road between 0.68 (east end) and 1.15 (west end), and the 2035 V/C 0.81 (east end) and 1.58 (west end). The potential to increase capacity along the corridor varies, although likely to be somewhat more feasible on the east end than the west end. Although the east end is not anticipated to justify capacity increases, the US-31 to Garfield road segment is projected to be 58% over capacity in the year 2035. The west end (east of US-31) of South Airport Road is predominately commercial land uses and increasing capacity by road widening would be extremely expensive due to right-of-way acquisition costs. Minor widening, traffic signal improvements and transit enhancements could provide minimal relief to the expected capacity deficiencies.

Cass Road is a continuation of Cass Street in Traverse City and is a County Primary road under the jurisdiction of the Grand Traverse County Road Commission. Its current Boardman River crossing is a structurally deficient one lane bridge. The Travel Demand Model (TDM) calculated the Volume to Capacity (V/C) ratio on the Cass Road as between 0.51 for the base year (2007) and 1.14 for the future year (2035). As Cass Street, Cass Road is essentially a north-south roadway, however because of its river crossing does serve east-west traffic. Discussions are currently underway to replace the current bridge with a two lane structure that would obviously increase capacity over the current one-lane bridge. However, due to its location on a north-south roadway, the capacity increase realized by the bridge replacement will have little effect to relieve east-west capacity issues now and in the future.

Beitner Road is a County Primary road under the jurisdiction of the Grand Traverse County Road Commission. Beitner Road is the east leg of the “Chum’s Corners” intersection which is where US-31 and M-37 merge/split with US-31 going west and north and M-37 south north and south. The intersection is approximately 3-4 miles south of South Airport road and approximately 1-2 miles south of the Cass Road bridge crossing. Beitner road terminates at the Keystone road which is a north-south road, however, it does connect to Three Mile road via Hammond road. The Travel Demand Model (TDM) calculated the Volume to Capacity (V/C) ratio of Beitner/ Keystone roads as between 1.16 and 1.48 for the base year (2007) and 1.38 to 1.99 for the future year (2035). The potential to increase capacity on Beitner road is limited due to limited right-of-way and terrain concerns. To rebuild Beitner road to current standards a great deal of earthmoving and/or an elevated bridges over the Boardman River and railroad tracks would be necessary. It should be noted that Beitner Road is predicted to be over capacity in every model scenario except where it is widened to four lanes.

The following projects were tested on the Travel Demand Model using both 2007 base year socio economic data and forecasted 2035 socio economic data. The 2035 data was developed during the Grand Vision process and represents the “Village” growth scenario. More information on the projections can be found in the Grand Vision Task 3.2 Socio-Economic report and 3.4 Travel Demand Model report. One final model run will be completed, including all projects recommended for inclusion in the TC-TALUS Long Range Plan.

- Extension of South Airport to the east to 4 or 5 mile road (2 lanes) (East Bay Twp).
- Garfield Ave, road diet 4 to 3 lanes (Traverse City)
- Hartman-Hammond connection with and without connection to Cass Road (4 lanes) (Garfield Twp)
- Hartman-Hammond connection with connection to Cass Road and continuation to Silver Lake Road (4 lanes) (Garfield Twp)
- Eighth Street, road diet 4 to 3 lanes, Boardman Ave to Woodmere (Traverse City)
- Beitner/Keystone Roads, widen to 4 lanes, US-31/M-37 to Hammond Road (TC Chamber)

- Extend Cass Road (2 lanes) along the west side of the Boardman River to Beitner Road. (GT County)
- Widen South Airport Road including boulevard between Garfield and LaFrainer and Garfield and Cass (Garfield Twp)

The spreadsheet below illustrates the results of the projects modeled had on various road segments in the area.

TC-TALUS Volume to Capacity Comparison

Corridor				2035 Project Run VC Ratios										
				S. Airport		S. Airport		Hart--Hamm	Hart-Hamm	Hart-Hamm	Eighth	Garfield	Beitner	S. Airport
ID*	Name	From	To	2007 VC	2035 VC	3 to 4 mile	3 to 5 mile	US-31 to Keystone with no connection to Cass	US-31 to Keystone w/connection to Cass	US-31 to Silver Lake rd	4 to 2 lane road diet Boardman to Woodmere	4 to 2 lane road diet Boon to Eighth	widen to 4 lanes 31 to Hammond	Boulevard Garfield to Cass
1.09	Grandview	Hall	Union	1.07	1.37	1.38	1.38	1.27	1.27	1.29	1.35	1.37	1.24	1.37
2.02	South Airport	US-31	Garfield	1.15	1.58	1.61	1.62	1.45	1.44	1.38	1.64	1.57	1.46	1.61
4.04	Beitner	US-31	River	1.16	1.74	1.72	1.70	1.60	1.61	1.62	1.76	1.74	0.80	1.72
9.08	8th	Lake	Woodmere	0.90	1.19	1.20	1.21	1.06	1.06	1.06	1.35	1.20	1.26	1.19
11.01	Cass	South Airport	Keystone	0.51	1.14	1.16	1.17	0.35	0.39	0.63	1.16	1.14	1.10	1.14
41.03	Front	Division	Union	0.99	1.30	1.30	1.31	1.22	1.22	1.23	1.25	1.30	1.41	1.30
3.08	Division	Front	14th	0.97	1.08	1.09	1.09	1.07	1.07	1.07	1.08	1.10	1.07	1.09
3.09	Division	Grandview	Front	0.76	0.89	0.90	0.89	0.83	0.83	0.82	0.85	0.90	0.86	0.89
4.05	Keystone	Cass	River	1.24	1.38	1.46	1.51	1.15	1.17	1.17	1.40	1.37	0.79	1.36
5.04	Garfield	South Airport	Hammond	0.31	0.37	0.38	0.40	0.54	0.54	0.60	0.42	0.35	0.75	0.40
6.04	Hammond	3 Mile	4 Mile	0.80	1.25	1.03	1.09	1.30	1.30	1.30	1.24	1.24	0.64	1.26
7.03	3 Mile	US-31	South Airport	1.15	0.83	0.56	0.58	0.82	0.82	0.82	0.82	0.83	1.49	1.21
8.01	West Bay Shore	Cherry Bend	M-72	1.08	1.47	1.47	1.47	1.48	1.47	1.48	1.47	1.47	0.85	1.48
9.04	Silver Lake	Barnes	Division	0.54	0.80	0.81	0.81	0.77	0.77	0.75	0.78	0.81	1.46	0.80
9.05	14th	Division	Cass	1.21	1.66	1.67	1.67	1.54	1.54	1.56	1.65	1.65	1.10	1.66
9.12	Cass	Grandview	8th	0.75	0.96	0.95	0.95	0.89	0.88	0.92	0.92	0.97	0.63	0.97
11.02	Cass	14th	South Airport	0.91	1.14	1.14	1.14	1.11	1.12	1.13	1.16	1.19	0.85	1.15
18.01	Birmley	Keystone	Garfield	0.57	0.48	0.48	0.46	0.60	0.61	0.59	0.48	0.48	0.24	0.47
19.01	Hartman	US-31	Cass	0.14	0.30	0.30	0.30	0.42	0.42	0.42	0.32	0.30	0.68	0.30
29.00	Hastings	Parsons	Garfield	0.19	0.35	0.35	0.35	0.35	0.35	0.35	0.36	1.03	0.35	0.35
34.02	La Franier	South Airport	Hammond	0.52	0.44	0.44	0.44	0.34	0.32	0.41	0.29	0.44	0.09	0.46
36.00	Veterans	South Airport	14th	0.80	2.12	2.13	2.08	1.88	1.91	2.28	2.26	2.34	0.55	2.20
38.01	Union	8th	14th	0.61	0.86	0.86	0.87	0.81	0.81	0.79	0.81	0.88	1.10	0.86
38.02	Union	Grandview	8th	0.82	1.31	1.28	1.32	1.22	1.22	1.31	1.41	1.46	1.34	1.36
54.00	South Airport	3 Mile	4 Mile/ 5 Mile	0.00	0.00	1.12	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.00	Hammond	Cass	Keystone	0.00	0.00	0.00	0.00	0.97	0.95	1.00	0.00	0.00	0.00	0.00

New Roads
East-West Roads
Lowered V/C ratio (better)
Raised V/C ratio (worse)

* Corridor ID assigned by MDOT Modeler for analysis purpose only.

The following Evaluation Criteria information was developed and completed by the TC-TALUS Technical Committee to give general information on the expected impacts of the projects tested using the TC-TALUS Travel Demand Model. Before any of these projects are advanced to construction a National Environmental Policy Act (NEPA) review must be conducted to determine if there are social, economic or environmental impacts. The Evaluation Criteria serve as an indication of relative level of impacts in the given areas.

The maps the follow each projects Evaluation Criteria review are outputs from the Travel Demand Model and depict the year 2035 results of the project evaluated on the left side versus the 2035 road network with no improvements on the right side.

TC-TALUS Evaluation Criteria category definitions

Public Influence – The amount of public support or nonsupport for the project

Alternative Travel Modes – The impact the project may have on alternative modes of travel (non vehicular)

Low income / Minority populations – The impact the project may have on low income and/or minority populations

Adjacent land use – The impact the project may have on adjacent land uses

Regional Mobility – The impact the project may have on trips beginning and/or ending outside of the TC-TALUS area

Local Mobility – The impact the project may have on trips beginning and ending inside of the TC-TALUS area

Future capacity to meet future demand – The impact the project may have on the future (2035) transportation demand

Funding availability – The impact the project may have on expected future revenue

Safety – The impact the project may have on roadway safety

Natural systems – The impact the project may have on environmental factors such as wetlands, endangered species, public open spaces and parks etc.

Historic Properties – The impact the project may have on properties eligible for or listed on the Historic Registry

Water Quality – The impact the project may have on both surface and ground water resources

Noise – The impact the project may have on noise levels in the project area

Access to Employment – The impact the project may have on accessibility to employment areas in the project area

Economic Development – The impact the project may have on economic development in the project area

Relocation of people or businesses – The impact the project may have on relocating people and/or businesses

Additional right-of-way required – The impact the project will have on existing public right-of-way

Accommodates all users – The impact the project may have on all users of the public right-of-way

Promotes transportation mode choice – The impact the project may have on promoting alternative mode of travel

Freight/Trucking – The impact the project may have on the movement of freight to/from the project area and region

Air – The impact the project may have on air transportation facilities in the project area and region

Water – The impact the project may have on water transportation facilities in the project area and region

Transit – The impact the project may have on public transportation in the project area and region

TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14

Rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

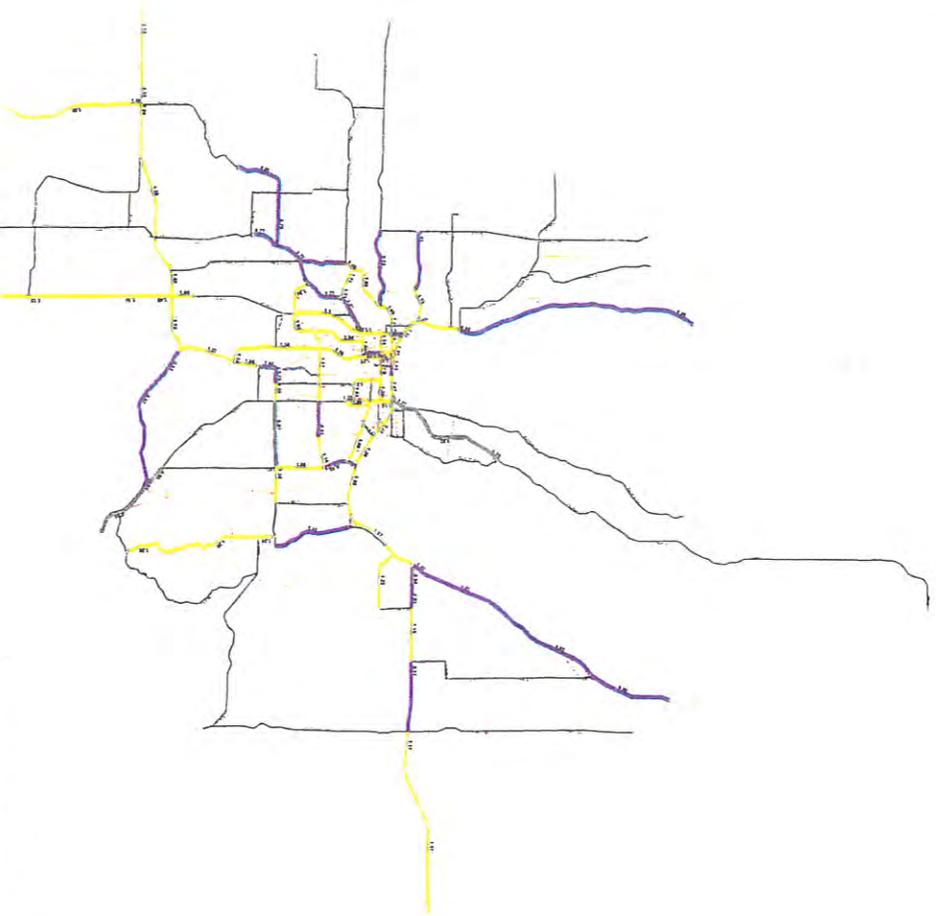
Project Name: **Garfield Avenue Road diet 4 to 2 travel lanes w/ center turn lane from Boon to 8th**

Category	Expected Impacts	Expected Impacts		Comments (Evaluated by TC-TALUS Technical Committee 4/10/14)
		No Impact	Major Impact	
Social	Public Influence		X	
	Alternate Travel Modes		X	
	Low Income /minority populations		X	
Model	Adjacent Land Use		X	
	Regional Mobility		X	
	Local Mobility		X	
Financial	Future capacity to meet future demand		X	
	Funding availability	X		
Safety	Safety		X	
	Natural systems	X		
Environmental	Historic Properties	X		
	Water Quality	X		
	Air Quality		X	
	Noise		X	
	Access to employment		X	
Economic	Economic Development		X	
	Relocation of People or Businesses	X		
Complete Streets	Additional Right of Way required	X		
	Accommodates all users		X	
Other Modes	Promotes Transportation Mode Choice		X	
	Freight/Trucking		X	
	Air	X		
	Water	X		
	Transit		X	

TC-TALUS Travel Demand Model Result Comparison

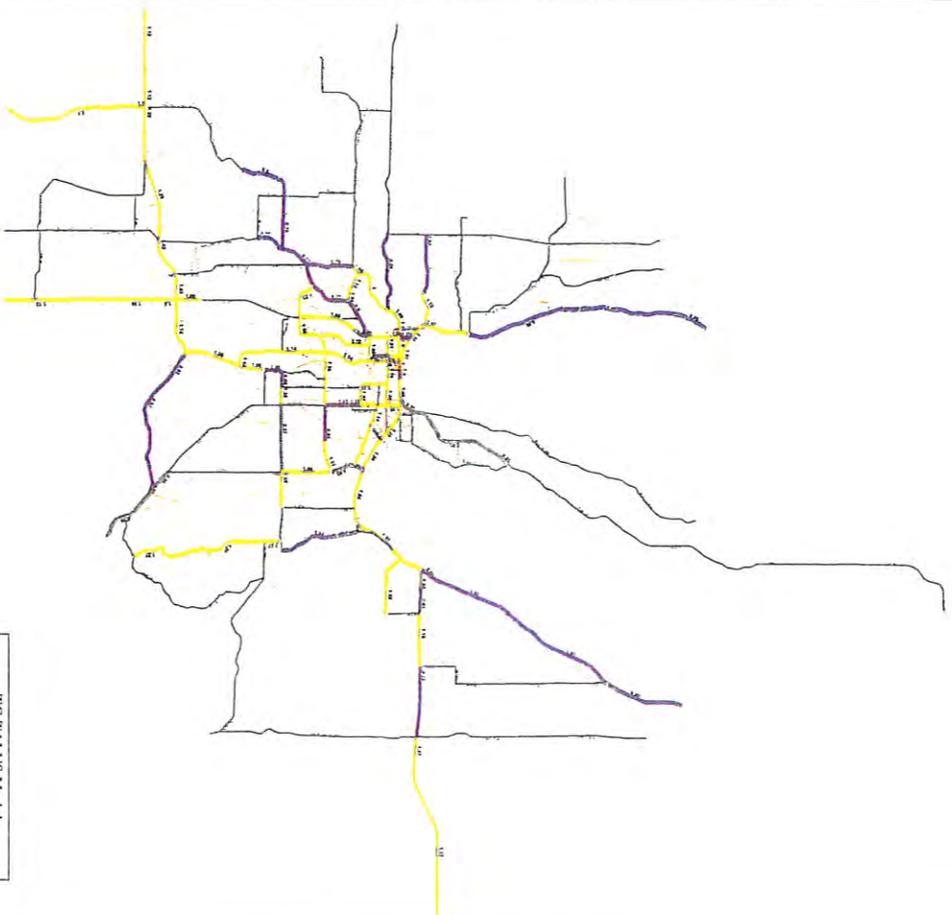
2035 Socio-Economic Data with Project 4 Network

Project 4: Garfield Road (4 to 3 lanes) from Boon St. to Eighth St.



TC-TALUS Model
General Comments:
Volume to Capacity (VC) Ratio
 — VC Ratio Under 0.75
 — 0.75 to 0.90 VC Ratio
 — 0.90 to 1.00 VC Ratio
 — VC Ratio over 1.00

2035 Socio-Economic Data with E+C Network

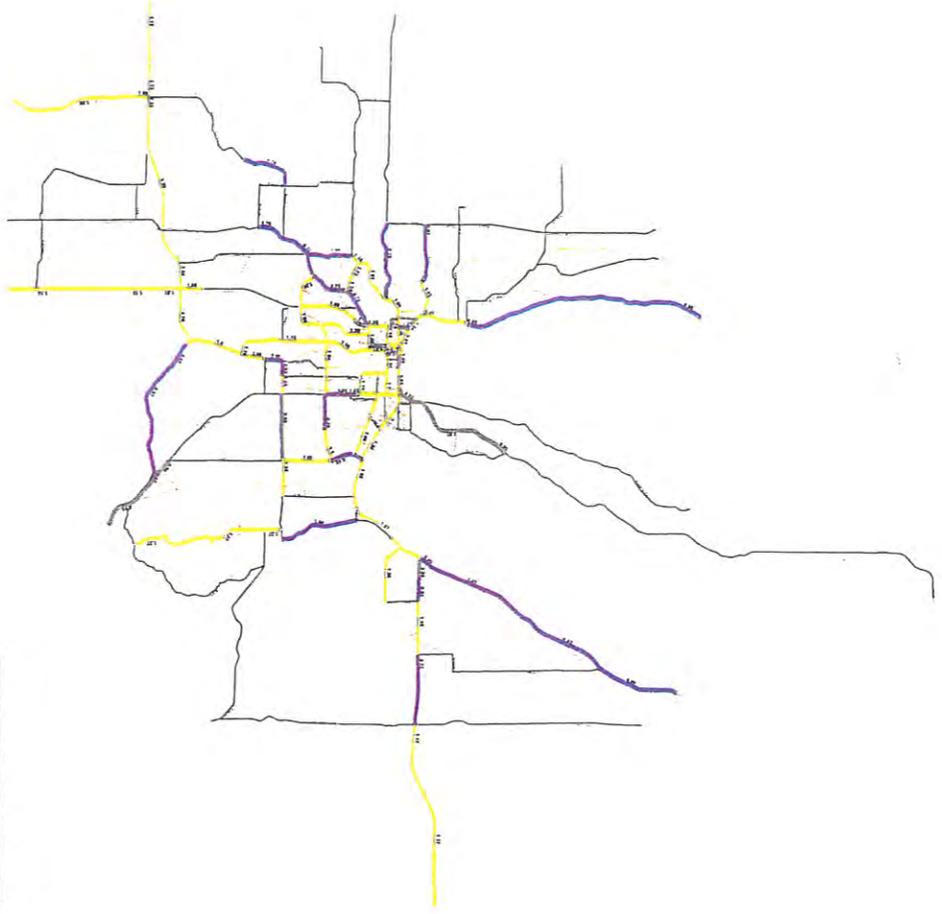


TC-TALUS Model
General Comments:
Volume to Capacity (VC) Ratio
 — VC Ratio Under 0.75
 — 0.75 to 0.90 VC Ratio
 — 0.90 to 1.00 VC Ratio
 — VC Ratio Over 1.00

TC-TALUS Travel Demand Model Result Comparison

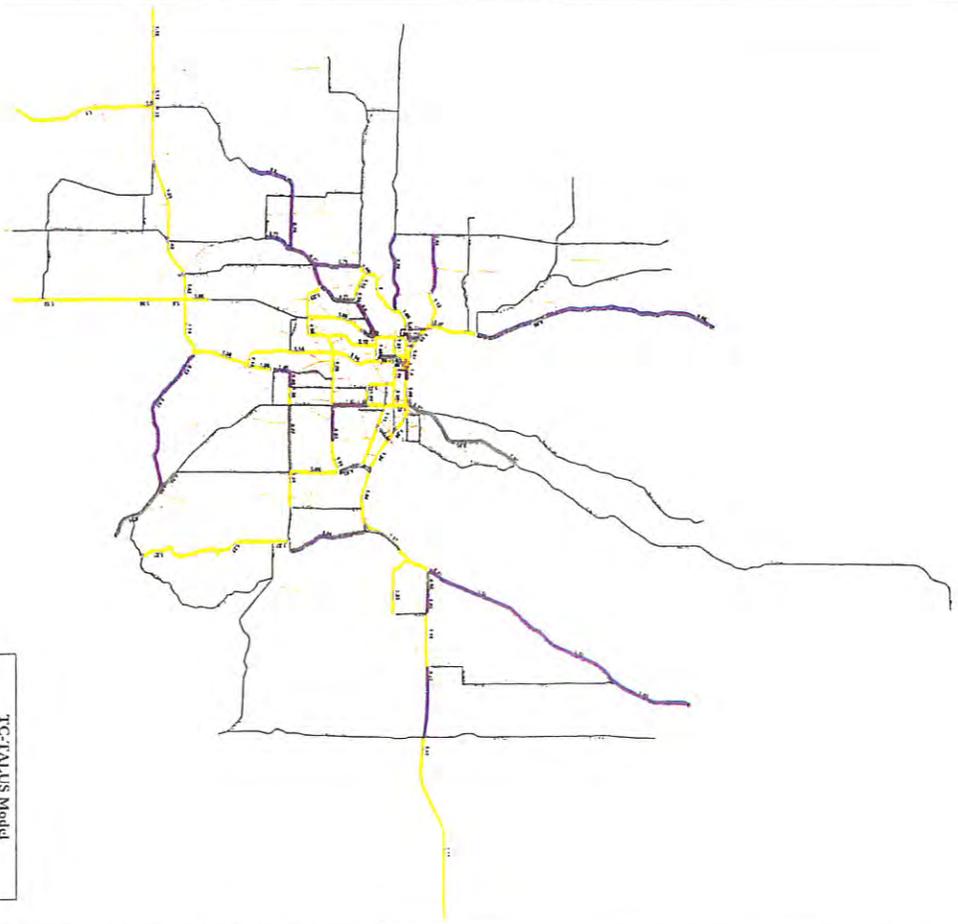
2035 Socio-Economic Data with Project 9 Network

Project 9: Eighth Street Road Diet (4 to 3 lanes) between Boardman Avenue and Woodmere Avenue.



TC-TALUS Model
 Central Connections
 Volume to Capacity (V/C) Ratio
 - 0.75 to 0.99 V/C Ratio
 - 1.00 to 1.49 V/C Ratio
 - V/C Ratio over 1.50

2035 Socio-Economic Data with E+C Network



TC-TALUS Model
 Central Connections
 Volume to Capacity (V/C) Ratio
 - 0.75 to 0.99 V/C Ratio
 - 1.00 to 1.49 V/C Ratio
 - V/C Ratio Over 1.50

TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14
 rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

Project Name: **5. Airport extension 2 lanes 3mile to 4 mile**

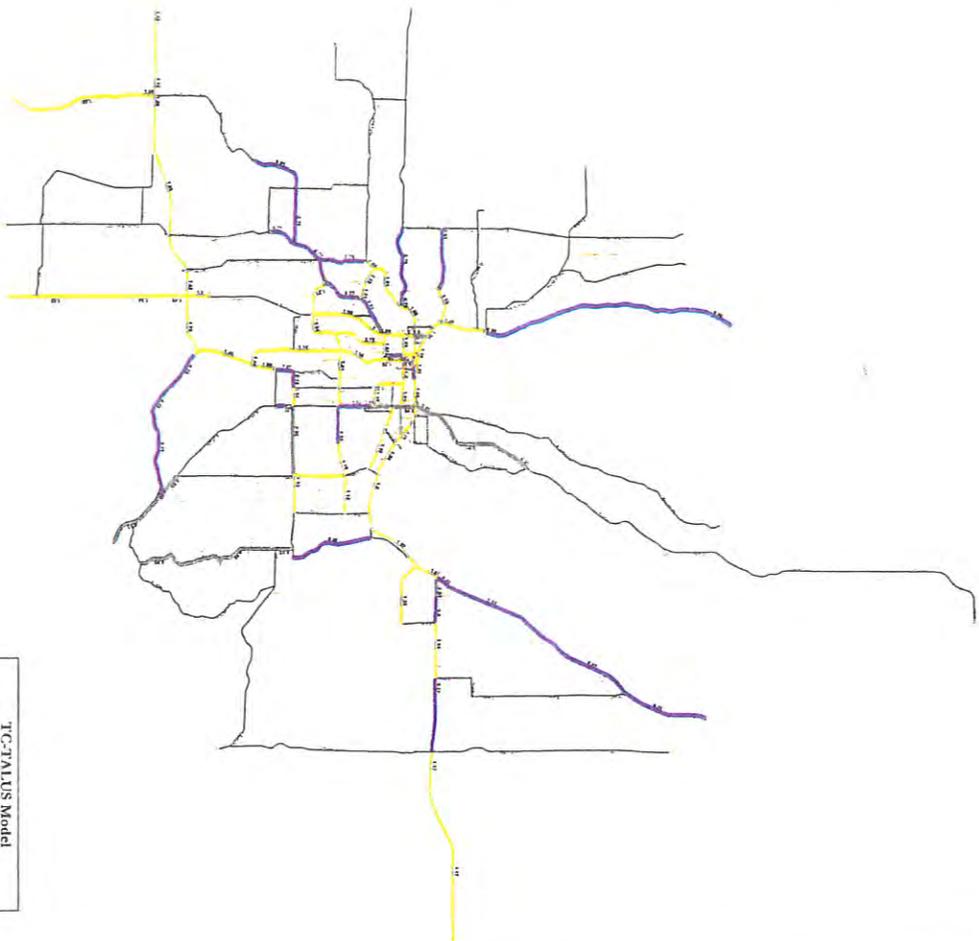
Category	Expected Impacts	Expected Impacts			Comments
		No Impact	Minimal Impact	Major Impact	
Social	Public Influence			X	
	Alternate Travel Modes			X	
	Low income /minority populations Adjacent Land Use		X	X	some existing development disturbed
Model	Regional Mobility		X	X	no drastic impact to REGIONAL mobility
	Local Mobility			X	
	Future capacity to meet future demand			X	
Financial	Funding availability			X	
Safety	Safety		X		
Environmental	Natural systems			X	
	Historic Properties		X	X	
	Water Quality		X	X	
	Air Quality		X	X	
	Noise			X	
Economic	Access to employment		X		
	Economic Development		X		
	Relocation of People or Businesses		X	X	
Complete Streets	Additional Right of Way required			X	
	Accommodates all users			X	
	Promotes Transportation Mode Choice			X	
Other Modes	Freight/Trucking			X	
	Air		X		
	Water	X			
	Transit		X		

no drastic changes to current/future routes

TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 2 Network

Project 2: Two lane South Airport Road Extension from Three Mile Road to Four Mile Road



2035 Socio-Economic Data with E+C Network



TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14
 rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

Project Name:

5. Airport extension 2 lanes 3mile to Smith

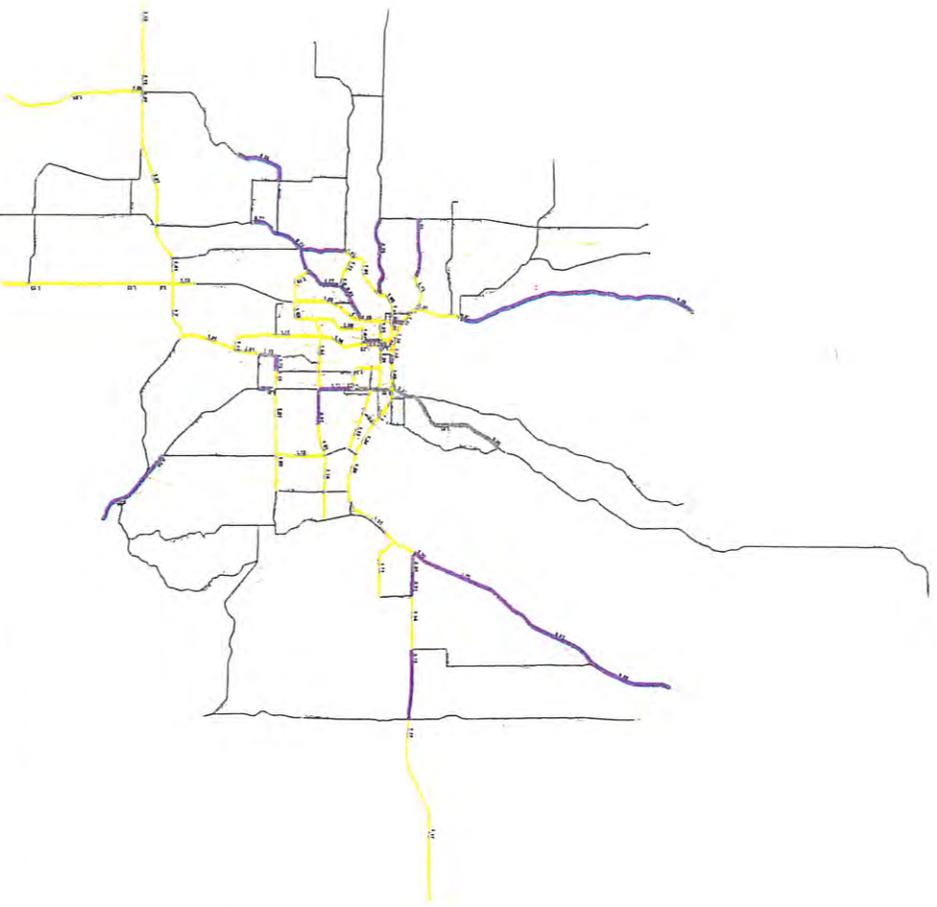
Category	Expected Impacts	Expected Impacts			Comments
		No Impact	Minimal Impact	Major Impact	
Social	Public Influence			X	
	Alternate Travel Modes			X	
	Low income /minority populations adjacent Land Use		X	X	
Model	Regional Mobility		X	X	no drastic change to REGIONAL mobility
	Local Mobility				
	Future capacity to meet future demand			X	
Financial	Funding availability			X	
	Safety			X	
Environmental	Natural systems			X	
	Historic Properties		X	X	
	Water Quality			X	
	Air Quality		X	X	
	Noise			X	
Economic	Access to employment		X	X	
	Economic Development			X	
Complete Streets	Relocation of People or Businesses		X	X	
	Additional Right of Way required			X	
	Accommodates all users Promotes Transportation Mode Choice			X	
Other Modes	Freight/Trucking			X	
	Air		X		
	Water	X			
	Transit		X		

no drastic changes to current/future routes

TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 3 Network

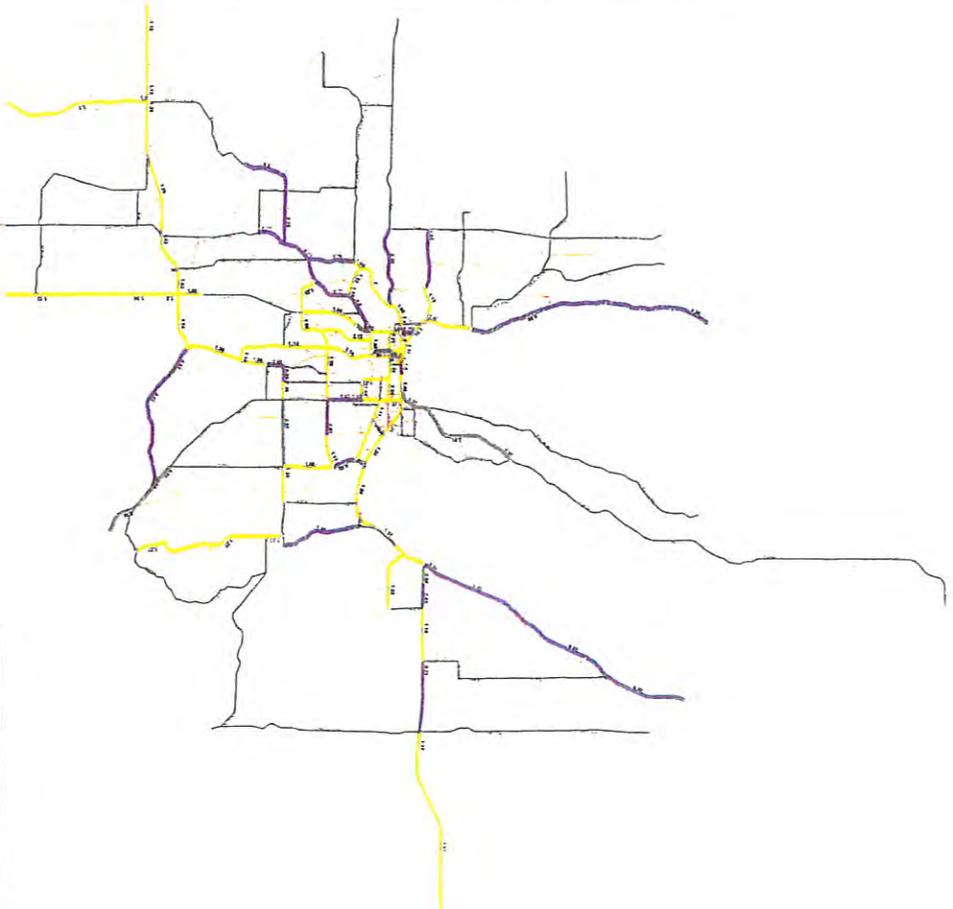
Project 3: Two lane South Airport Road Extension from Three Mile Road to Five Mile Road



TC-TALUS Model
Central Corridor
Volume to Capacity (VC) Ratios
— VC Ratio Under 0.75
— VC Ratio 0.75 to 0.90 VC Ratio
— VC Ratio 0.90 to 1.00 VC Ratio
— VC Ratio over 1.00

Prepared for TC-TALUS Technical Committee by J. Osborne, AFDOT
Date: August 1, 2013

2035 Socio-Economic Data with E+C Network



TC-TALUS Model
Central Corridor
Volume to Capacity (VC) Ratio
— VC Ratio Under 0.75
— VC Ratio 0.75 to 0.90 VC Ratio
— VC Ratio 0.90 to 1.00 VC Ratio
— VC Ratio Over 1.00

For Discussion Purposes Only

Note: E+C = Existing + Commuter - Projects completed since 2007
Capacity is Planning Capacity ILS D (not Design Capacity)

TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14
 rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

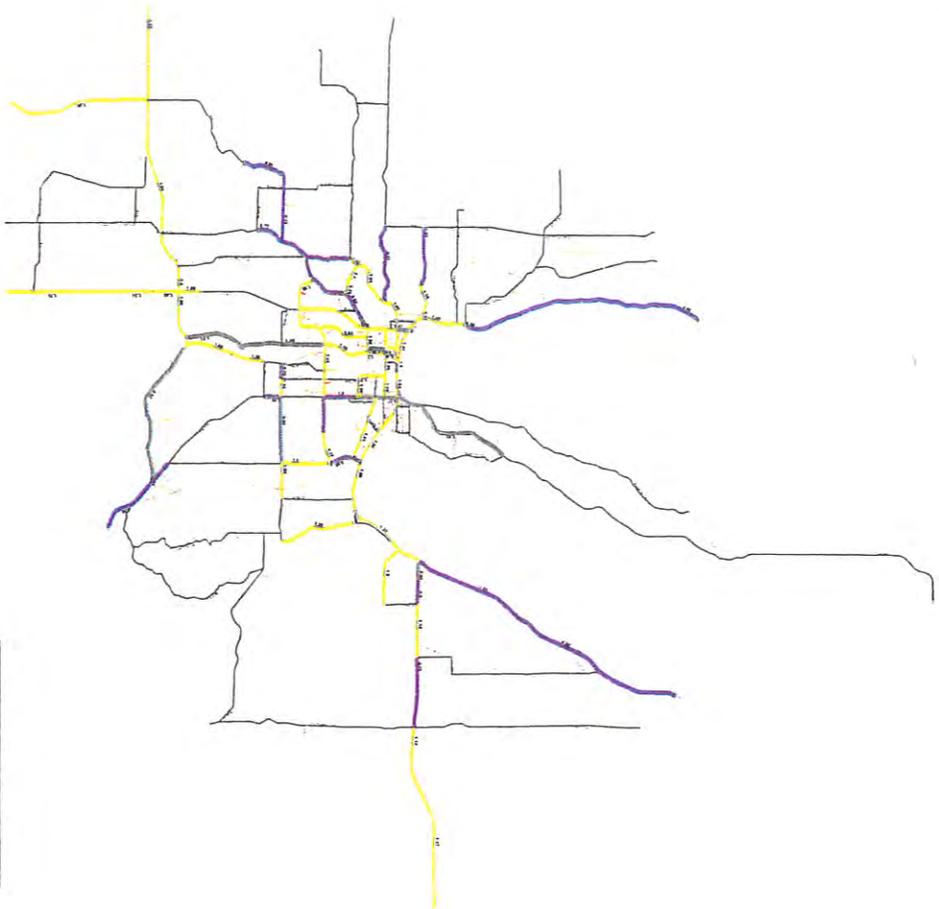
Project Name: **Cass road new 2 lane road from the bridge/dam to Beltner**

Category	Expected Impacts			Comments
	No Impact	Minimal Impact	Major Impact	
Social				
Public Influence			X	
Alternate Travel Modes			X	
Low income /minority populations	X			
Adjacent Land Use			X	
Model				
Regional Mobility		X		Duplicates Keystone and US-31 function
Local Mobility		X		
Future capacity to meet future demand		X		
Financial				
Funding availability			X	
Safety				
Safety			X	Intersection with Beltner road is a problem
Environmental				
Natural systems			X	location in valley may cause problems
Historic Properties		X		
Water Quality			X	
Air Quality			X	
Noise			X	
Economic				
Access to employment		X		
Economic Development		X		
Relocation of People or Businesses		X		
Additional Right of Way required			X	
Complete Streets				
Accommodates all users			X	
Promotes Transportation Mode Choice			X	
Other Modes				
Freight/Trucking		X		
Air	X			
Water	X			
Transit		X		

TC-TALUS Travel Demand Model Result Comparison

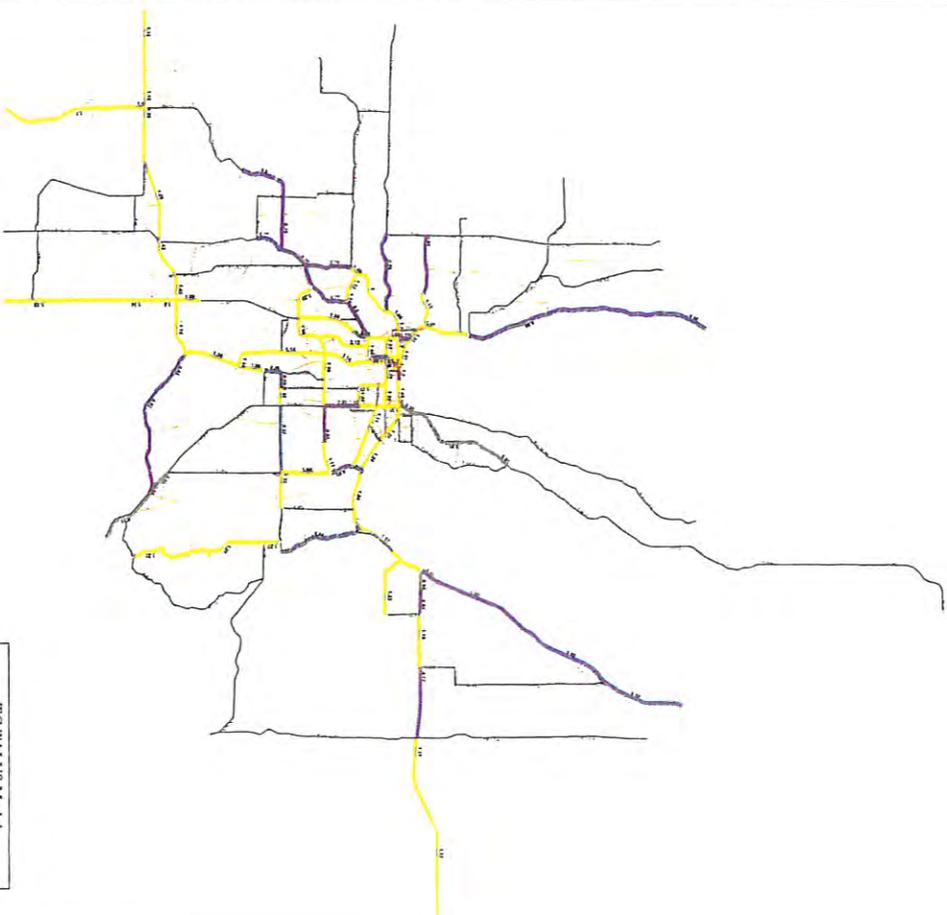
2035 Socio-Economic Data with Project 12 Network

Project 12: New two lane road along Boardman River from Betiner Road to Cass Road.



TC-TALUS Model
Generalized Commuter
Volume to Capacity (VC) Ratio
 — VC Ratio under 0.75
 — 0.75 to 0.99 VC Ratio
 — 0.99 to 1.00 VC Ratio
 — VC Ratio over 1.0

2035 Socio-Economic Data with E+C Network



TC-TALUS Model
Generalized Commuter
Volume to Capacity (VC) Ratio
 — VC Ratio under 0.75
 — 0.75 to 0.99 VC Ratio
 — 0.99 to 1.00 VC Ratio
 — VC Ratio Over 1.0

TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14

rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

Project Name: Hartman-Hammond connection to Silver Lake Road - no connection to Cass Rd.

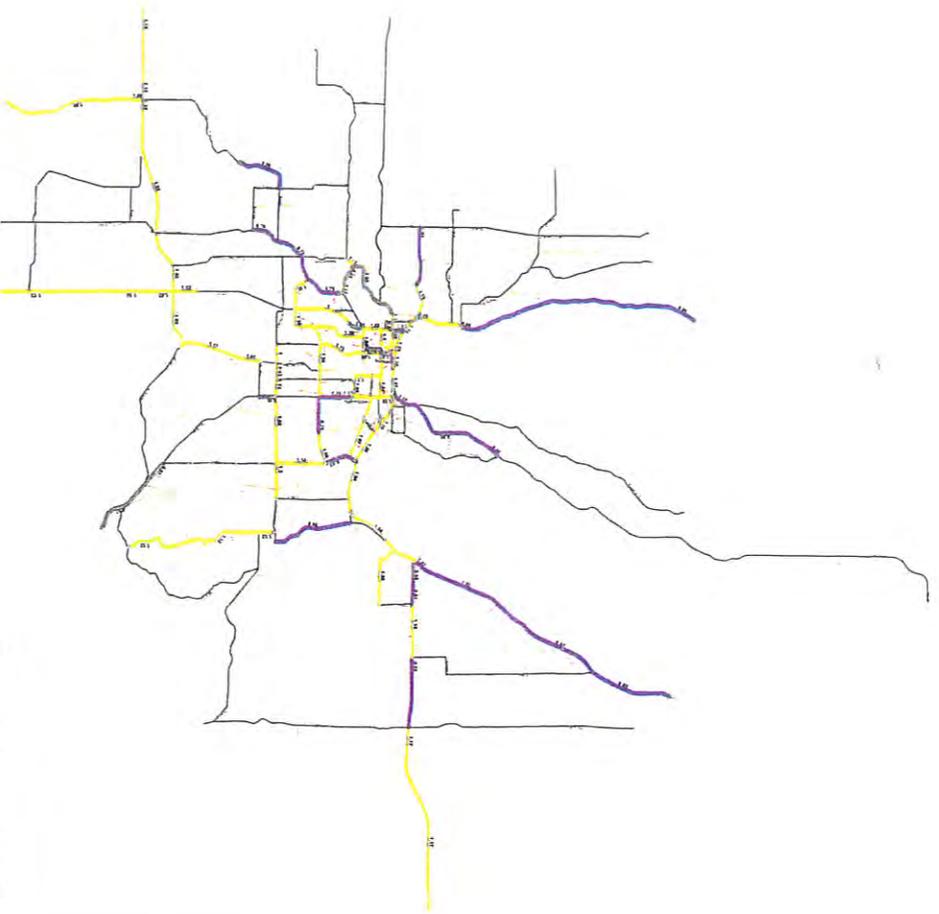
Category	Expected Impacts			Comments
	No Impact	Minimal Impact	Major Impact	
Social	Public Influence		X	
	Alternate Travel Modes		X	
	Low Income /minority populations	X		
	Adjacent Land Use		X	
Model	Regional Mobility		X	
	Local Mobility		X	
	Future capacity to meet future demand		X	
Financial	Funding availability		X	
Safety	Safety		X	
Environmental	Natural systems		X	
	Historic Properties		X	
	Water Quality		X	
	Air Quality	X		
	Noise		X	
Economic	Access to employment		X	
	Economic Development		X	
	Relocation of People or Businesses		X	
	Additional Right of Way required		X	
Complete Streets	Accommodates all users		X	
	Promotes Transportation Mode Choice		X	
Other Modes	Freight/Trucking		X	
	Air	X		
	Water	X		
	Transit	X		

depending on design

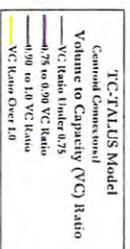
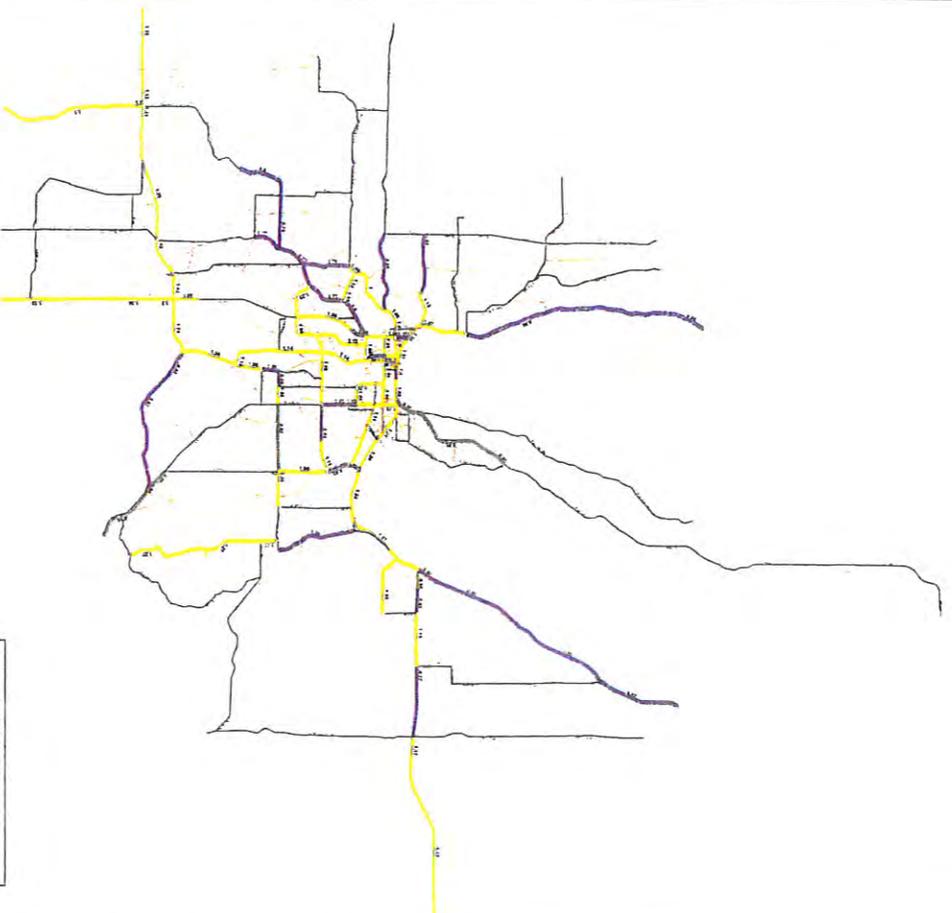
TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 8 Network

Project 8: Hartman-Hammond Road connection - extend two lanes from US-31 to Silver Lake Road



2035 Socio-Economic Data with E+C Network



TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14
 rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

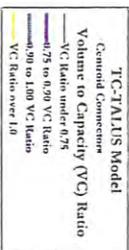
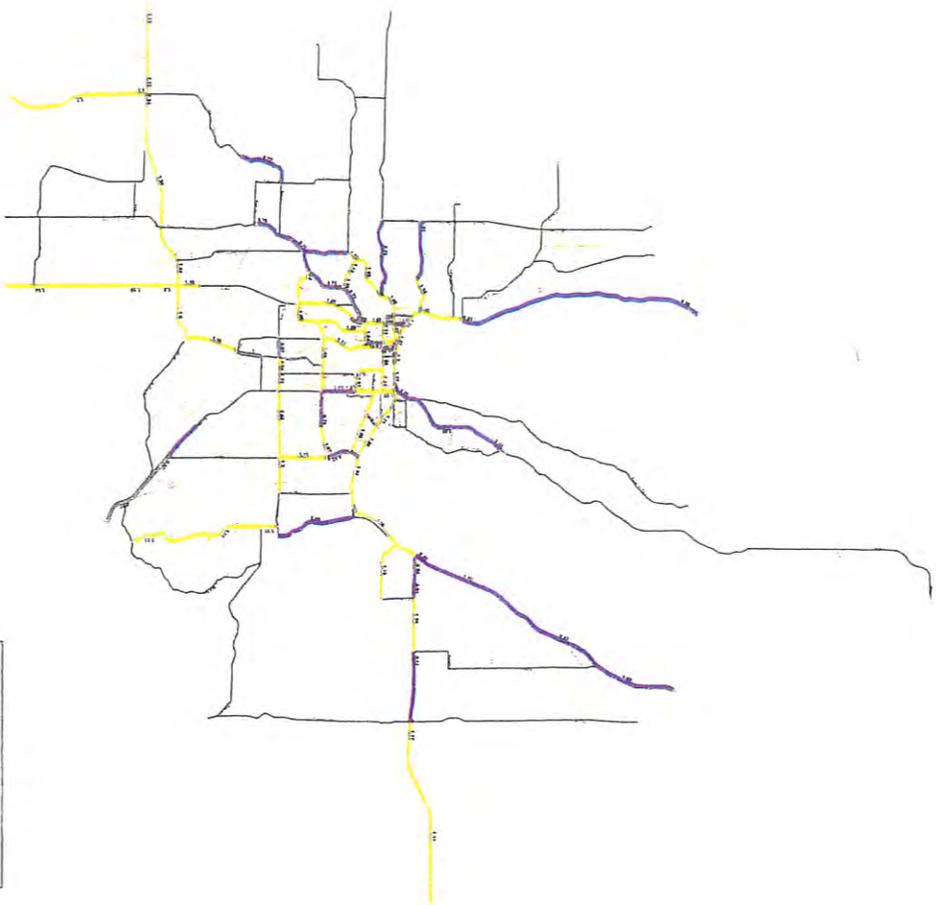
Project Name: Hartman-Hammond connection to Keystone Rd no connection to Cass rd.

Category	Expected Impacts	Expected Impacts		Comments
		No Impact	Major Impact	
Social	Public Influence		X	
	Alternate Travel Modes		X	
	Low Income /minority populations		X	
	Adjacent Land Use	X		
Model	Regional Mobility		X	
	Local Mobility		X	
	Future capacity to meet future demand		X	
Financial	Funding availability		X	
	Safety		X	
Environmental	Natural systems		X	
	Historic Properties	X		
	Water Quality		X	
	Air Quality Noise	X		
Economic	Access to employment		X	
	Economic Development		X	
	Relocation of People or Businesses	X		
	Additional Right of Way required		X	
Complete Streets	Accommodates all users		X	
	Promotes Transportation Mode Choice		X	
Other Modes	Freight/Trucking		X	
	Air	X		
	Water		X	
	Transit	X		

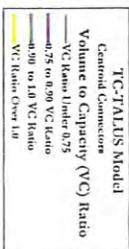
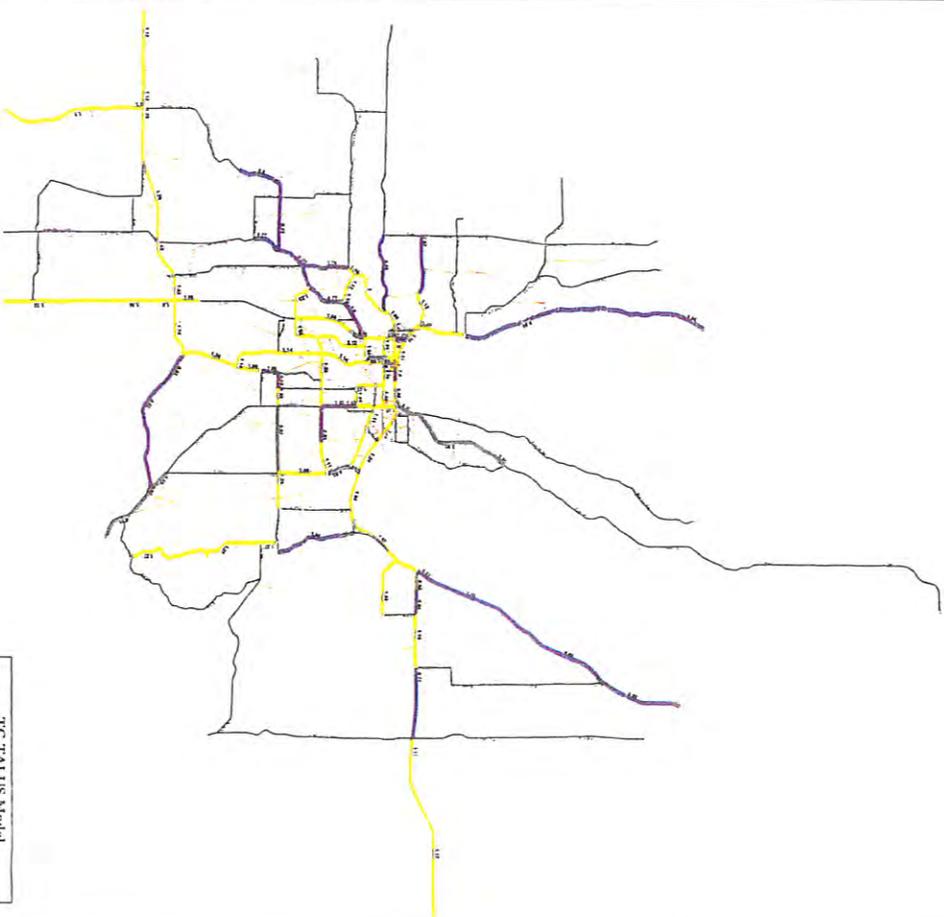
TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 6 Network

Project 6: Hartman-Hammond Road connection - Four lanes from US-31 South and Keystone Road
 Remove Cass Road connection to Keystone Road



2035 Socio-Economic Data with E+C Network



TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/20/14

rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

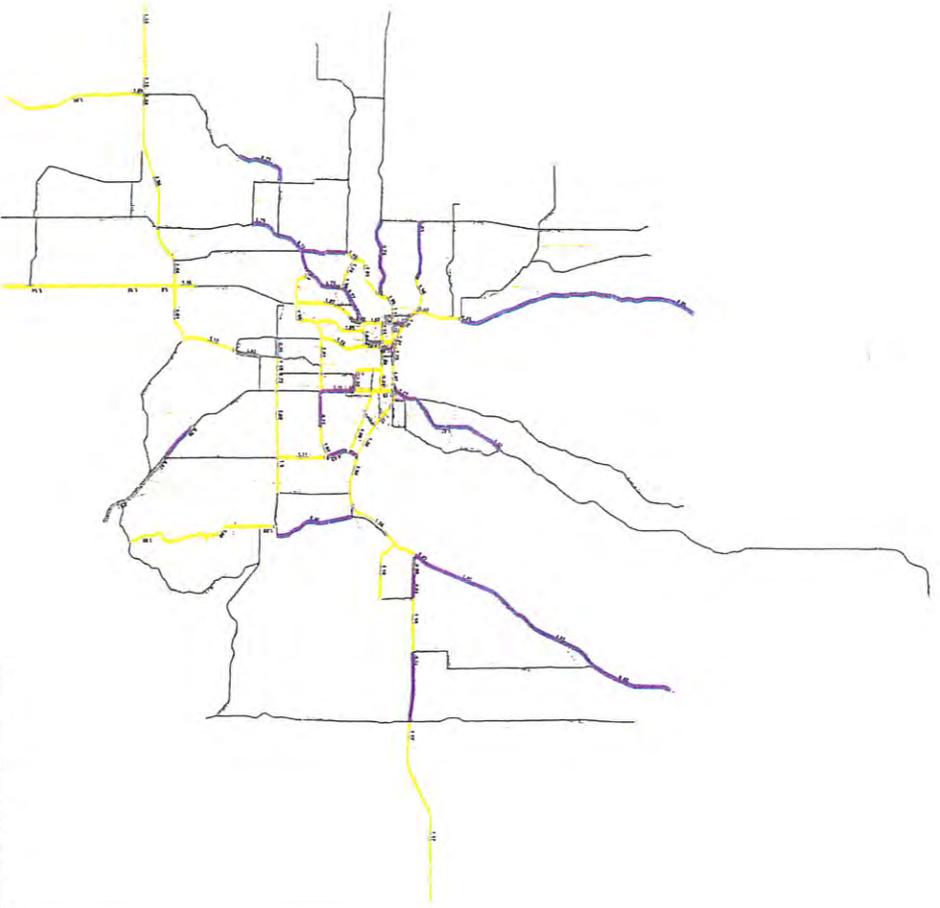
Project Name: Hartman-Hammond connection to Keystone with connection to Cass rd.

Category	Expected Impacts			Comments
	No Impact	Minimal Impact	Major Impact	
Social	Public Influence		X	
	Alternate Travel Modes		X	
	Low income /minority populations	X		
	Adjacent Land Use		X	
Model	Regional Mobility		X	
	Local Mobility		X	
	Future capacity to meet future demand		X	
	Funding availability		X	
Financial				
Safety			X	
Environmental	Natural systems		X	
	Historic Properties	X		
	Water Quality		X	
	Air Quality	X		
Economic	Noise		X	
	Access to employment		X	
	Economic Development		X	
	Relocation of People or Businesses	X		
Complete Streets	Additional Right of Way required		X	
	Accommodates all users		X	
	Promotes Transportation Mode Choice		X	
Other Modes	Freight/Trucking		X	
	Air	X		
	Water			
	Transit	X		

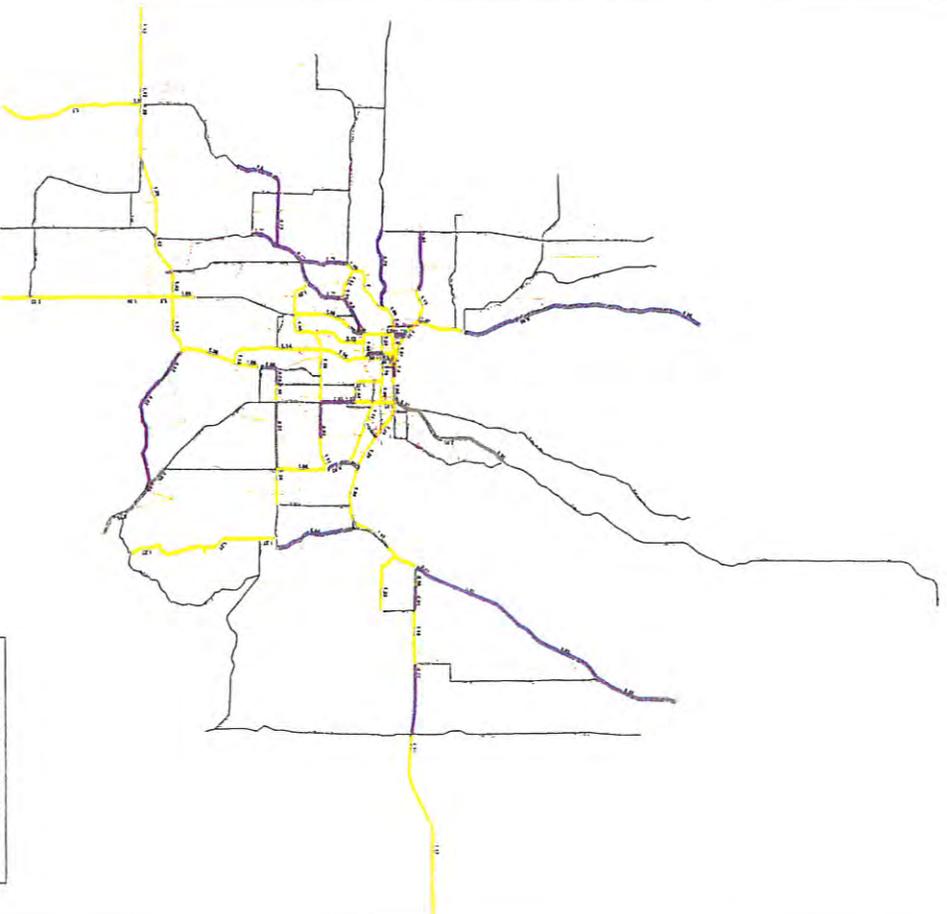
TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 7 Network

Project 7: Hartman-Hammond Road connection - Four lanes from US-31 South and Keystone Road



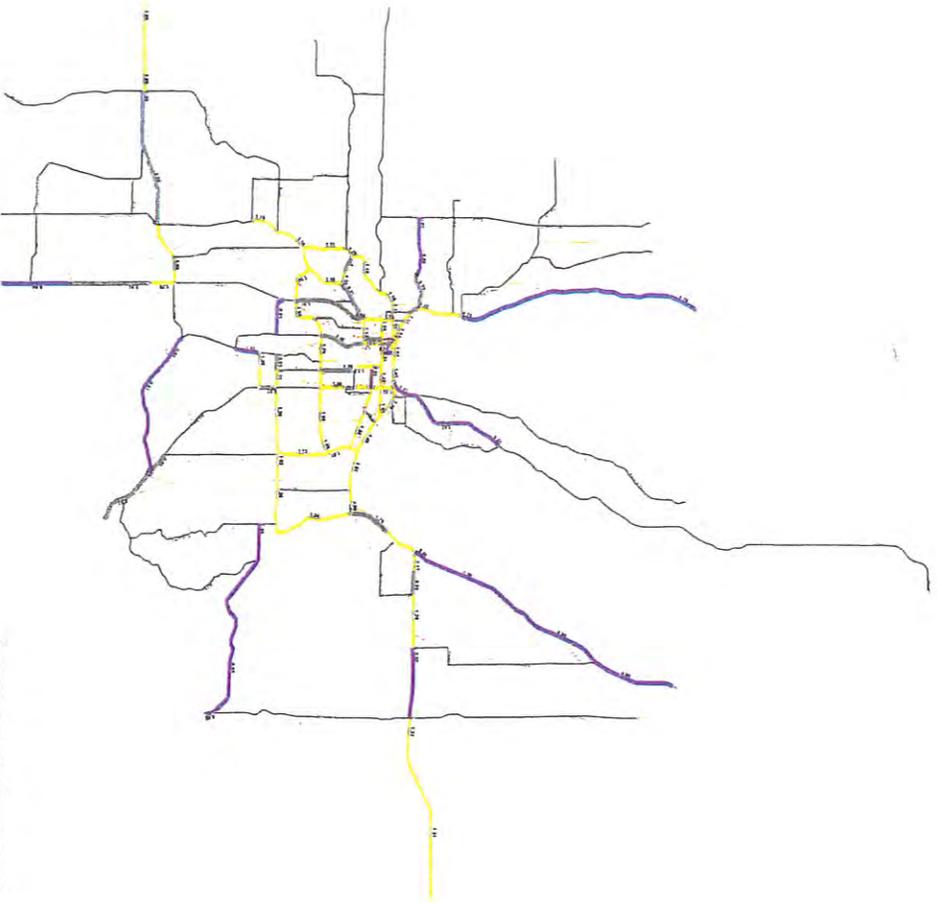
2035 Socio-Economic Data with E+C Network



TC-TALUS Travel Demand Model Result Comparison

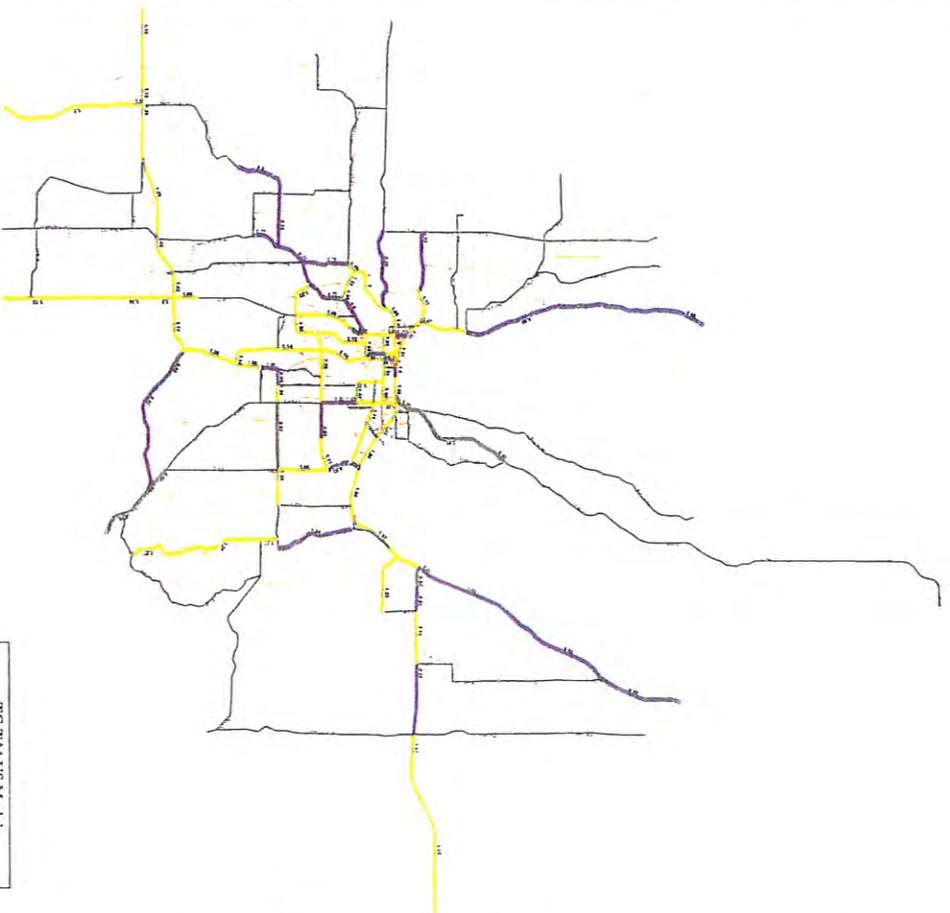
2035 Socio-Economic Data with Project II Network

Project II: Widen Beiter/Keystone Roads to 4 lanes between US-31 and Hammond Road.



TC-TALUS Model
General Connection
Volume to Capacity (V/C) Ratio
 V/C Ratio under 0.75
 0.75 to 0.99 V/C Ratio
 1.00 to 1.49 V/C Ratio
 V/C Ratio over 1.5

2035 Socio-Economic Data with E+C Network



TC-TALUS Model
General Connection
Volume to Capacity (V/C) Ratio
 V/C Ratio under 0.75
 0.75 to 0.99 V/C Ratio
 1.00 to 1.49 V/C Ratio
 V/C Ratio Over 1.5

TC-TALUS Project Evaluation Criteria

TC-TALUS Technical Committee rankings approved 4/10/14
 rankings are intended to be relative measures of EXPECTED impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.

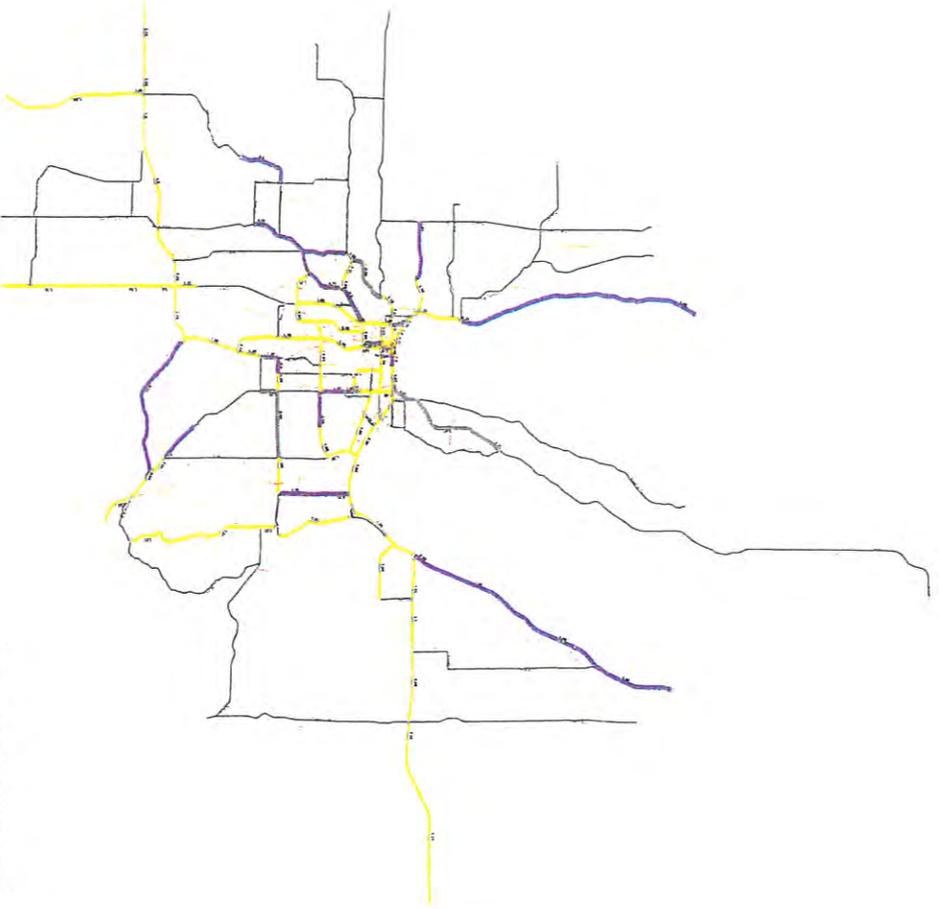
Project Name: South Airport Road boulevard Garfield to LaFrazier

Category	Expected Impacts	Expected Impacts		Comments
		No Impact	Minimal Impact	
Social	Public Influence		X	
	Alternate Travel Modes			X
	Low Income /minority populations		X	
	Adjacent Land Use		X	
Model	Regional Mobility		X	
	Local Mobility			X
	Future capacity to meet future demand		X	
	Funding availability			X
Financial				
Safety	Safety			X crosswalks and left turns
Environmental	Natural systems		X	
	Historic Properties	X		
	Water Quality	X		
	Air Quality		X	
	Noise		X	
Economic	Access to employment		X	
	Economic Development		X	
	Relocation of People or Businesses			X
Complete Streets	Additional Right of Way required			X assume lane extension beyond current curb
	Accommodates all users		X	
	Promotes Transportation Mode Choice			X
Other Modes	Freight/Trucking			X
	Air		X	
	Water	X		
	Transit			X

TC-TALUS Travel Demand Model Result Comparison

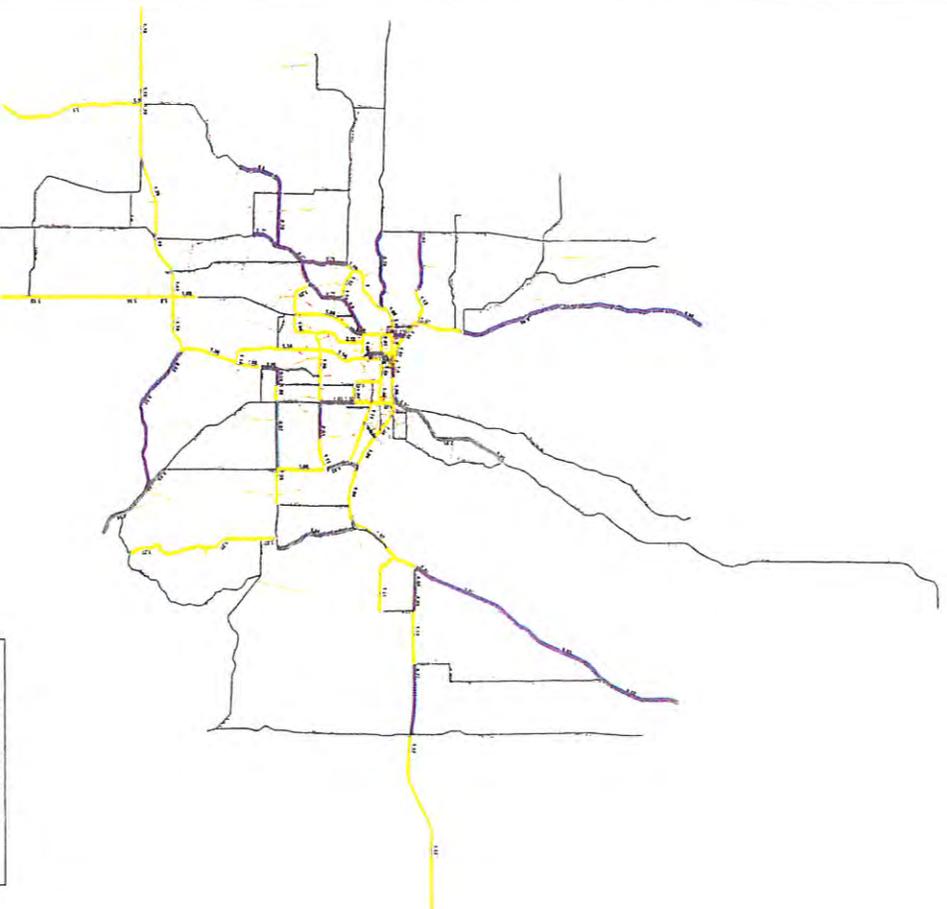
2035 Socio-Economic Data with Project 13 Network

Project 13: Changing S. Airport Rd. to a Boulevard from Garfield to LaFrenier



TC-TALUS Model
General Comment:
Volume to Capacity (VC) Ratio
— VC Ratio under 0.75
— VC Ratio 0.75 to 0.90
— VC Ratio 0.90 to 1.00
— VC Ratio over 1.00

2035 Socio-Economic Data with E+C Network



TC-TALUS Model
General Comment:
Volume to Capacity (VC) Ratio
— VC Ratio under 0.75
— VC Ratio 0.75 to 0.90
— VC Ratio 0.90 to 1.00
— VC Ratio Over 1.00

TC-TALUS Project Evaluation Criteria					
Category	Expected Impacts	Expected Impacts			Comments
		No Impact	Minimal Impact	Major Impact	
Social	Public Influence			X	
	Alternate Travel Modes			X	
	Low Income /minority populations		X		
	Adjacent Land Use			X	
Model	Regional Mobility			X	
	Local Mobility			X	
	future capacity to meet future demand			X	
Financial	Funding availability			X	
Safety	Safety			X	
Environmental	Natural systems		X		
	Historic Properties			X	
	Water Quality			X	
	Air Quality		X		
	Noise			X	
Economic	Access to employment			X	
	Economic Development			X	
	Relocation of People or Businesses			X	
	Additional Right of Way required			X	
	Accommodates all users			X	
Complete Streets	Promotes Transportation Mode Choice			X	
Other Modes	Freight/Trucking			X	
	Air	X			
	Water				
	Transit			X	

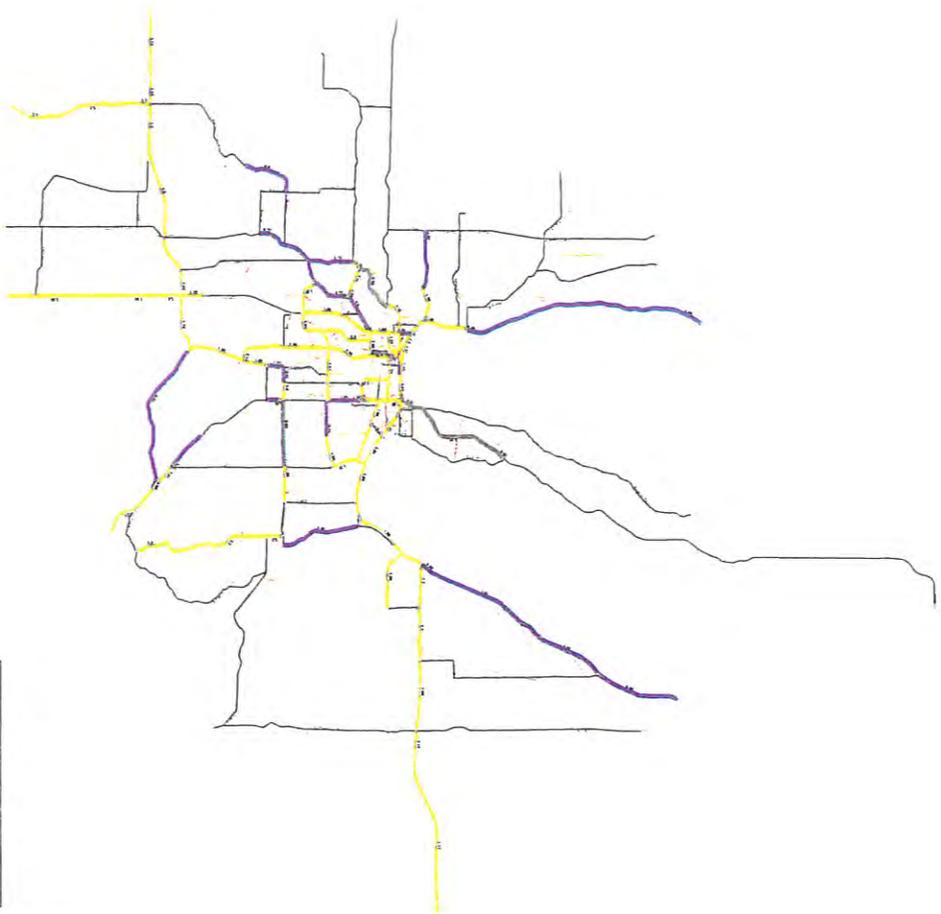
TC-TALUS Technical Committee rankings approved 4/10/14
 Rankings are intended to be relative measures of EXPECTED Impacts of each project - further investigation of detailed impacts will be the responsibility of the implementing agency.
 Project Name: S. Airport Road boulevard from Garfield to Cass

assume lane extension beyond current curb

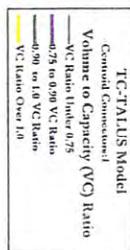
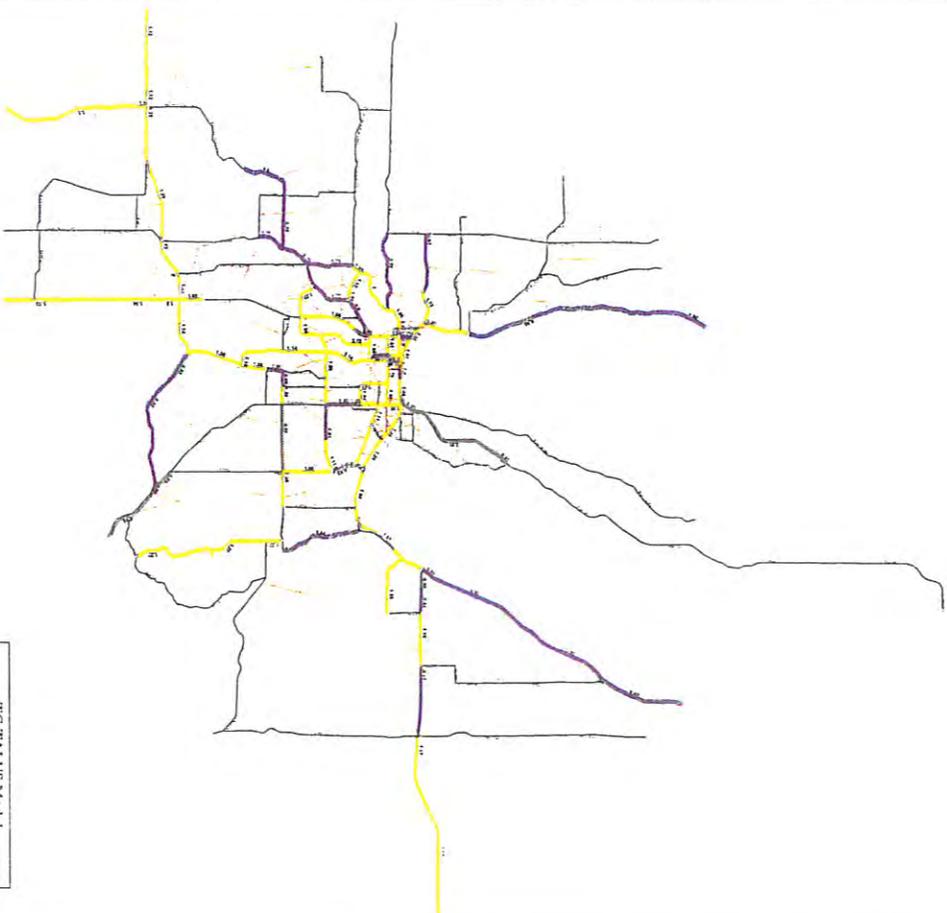
TC-TALUS Travel Demand Model Result Comparison

2035 Socio-Economic Data with Project 14 Network

Project 14: Changing S. Airport Rd. to a Boulevard from Garfield to Cass



2035 Socio-Economic Data with E+C Network



The following is a complete set of data output from the Travel Demand Model that was summarized in the information provided above.

TC-TALUS Volume to Capacity Comparison

Corridor	ID*	Name	From	To	2035 Project Run VC Ratios													
					2007 VC	2035 VC	Project 2	Project 3	Project 4	Project 6	Project 7	Project 8	Project 9	Project 11	Project 12	Project 13	Project 14	
	1.02	Traverse/M-72	Green	Benzonia State	0.51	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.82
	1.03	Traverse/M-72	Benzonia State	W of Bay	0.66	1.13	1.13	1.13	1.13	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.14
	1.04	Traverse/M-72	W of Bay	Grandview	0.61	0.93	0.93	0.94	0.94	0.92	0.91	0.90	0.94	0.94	0.93	0.95	0.94	0.93
	1.05	Grandview SE	Traverse/M-72	Division	1.15	1.35	1.34	1.35	1.34	1.35	1.34	1.35	1.34	1.35	1.35	1.35	1.35	1.35
	1.06	Grandview NW	Division	Traverse/M-72	1.15	1.36	1.37	1.36	1.37	1.37	1.37	1.37	1.37	1.37	1.36	1.37	1.37	1.37
	1.07	Grandview SE	Division	Hall	1.15	1.45	1.45	1.46	1.46	1.37	1.36	1.39	1.43	1.43	1.45	1.49	1.45	1.45
	1.08	Grandview NW	Hall	Division	1.15	1.49	1.51	1.51	1.51	1.39	1.39	1.39	1.47	1.47	1.49	1.55	1.50	1.50
	1.09	Grandview	Hall	Union	1.07	1.37	1.38	1.38	1.37	1.27	1.27	1.29	1.35	1.35	1.37	1.37	1.37	1.37
	1.10	Grandview SE	Union	Front	1.15	1.44	1.45	1.46	1.44	1.31	1.31	1.31	1.49	1.49	1.44	1.50	1.44	1.44
	1.11	Grandview NW	Front	Union	1.15	1.40	1.42	1.42	1.42	1.30	1.29	1.28	1.49	1.28	1.40	1.47	1.40	1.41
	1.12	Front	Grandview	Garfield	1.15	1.48	1.48	1.49	1.47	1.37	1.37	1.37	1.63	1.63	1.48	1.48	1.53	1.47
	1.13	Front/Munson	Garfield	Airport Access	0.99	1.28	1.29	1.30	1.28	1.29	1.28	1.28	1.32	1.32	1.28	1.28	1.27	1.25
	1.14	US-31	Airport Access	3 Mile	0.98	1.24	1.24	1.24	1.25	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.23	1.24
	1.15	US-31	3 Mile	4 Mile	1.19	1.54	1.30	1.28	1.55	1.54	1.54	1.54	1.53	1.53	1.54	1.54	1.54	1.54
	1.16	US-31	4 Mile	M-72	1.18	1.57	1.57	1.51	1.57	1.58	1.58	1.58	1.57	1.57	1.57	1.57	1.55	1.56
	1.17	M-72	US-31	Hilltop	1.02	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	1.09	1.10
	1.18	M-72	Hilltop	Lautner	1.02	0.81	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.80	1.09	1.10
	1.19	M-72	Lautner	Bates	1.02	1.15	1.14	1.14	1.15	1.14	1.14	1.14	1.16	1.15	1.15	1.14	1.14	1.10
	1.20	M-72	Bates	Elk Lake	1.02	0.77	0.77	0.76	0.77	0.77	0.77	0.78	0.78	0.77	0.77	0.76	1.05	1.05
	1.21	M-72	Elk Lake	Richardson	0.84	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
	2.01	South Airport	Silver Lake	US-31	0.99	1.23	1.21	1.19	1.24	1.30	1.30	1.32	1.28	1.28	1.23	1.18	1.25	1.25
	2.02	South Airport	US-31	Garfield	1.15	1.58	1.61	1.62	1.57	1.45	1.44	1.38	1.64	1.64	1.58	1.65	1.61	1.61
	2.03	South Airport	Garfield	Townline	0.68	0.81	0.86	0.87	0.82	0.76	0.76	0.78	0.79	0.79	0.81	0.85	0.76	0.76
	2.04	South Airport	Townline	3 Mile	0.93	1.11	1.19	1.21	1.14	1.07	1.07	1.08	1.10	1.10	1.11	1.17	1.05	1.05
	3.01	M-37	Norton	Hamlin	0.98	1.13	1.13	1.13	1.13	1.14	1.14	1.13	1.14	1.14	1.13	1.13	1.13	1.14
	3.02	M-37	Sweetwater	Norton	0.98	1.14	1.14	1.13	1.14	1.15	1.15	1.14	1.14	1.15	1.14	1.14	1.14	1.14
	3.03	M-37	Beltner	Sweetwater	0.98	1.50	1.49	1.50	1.49	1.50	1.50	1.47	1.51	1.51	1.50	1.45	1.50	1.50
	3.04	US-31	Foster	Beltner	0.80	1.09	1.10	1.13	1.08	1.16	1.16	1.12	1.09	1.09	1.09	1.06	1.12	1.12
	3.05	US-31	South Airport	Foster	0.37	0.54	0.55	0.57	0.54	0.60	0.59	0.53	0.54	0.54	0.51	0.55	0.55	0.55
	3.06	US-31	South Airport	Fitzhugh	0.83	1.08	1.08	1.08	1.10	1.07	1.07	1.00	1.09	1.09	1.08	1.10	1.09	1.09
	3.07	US-31	14th	Fitzhugh	0.83	0.99	1.00	1.00	1.01	0.98	0.98	0.91	1.00	0.99	0.99	1.04	1.01	1.01
	3.08	Division	Front	14th	1.43	1.08	1.09	1.09	1.10	1.07	1.07	1.07	1.07	1.08	1.08	1.10	1.09	1.09
	3.09	Division	Grandview	Front	1.13	0.89	0.90	0.89	0.90	0.83	0.83	0.82	0.85	0.85	0.89	0.91	0.89	0.89
	4.01	US-31	Blackford	M-137	0.93	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
	4.02	US-31	M-137	West Silver Lake	1.11	1.29	1.28	1.27	1.28	1.34	1.34	1.32	1.33	1.33	1.29	1.28	1.30	1.30
	4.03	US-31	West Silver Lake	M-37	1.15	1.42	1.42	1.41	1.42	1.44	1.44	1.42	1.42	1.44	1.42	1.40	1.42	1.42
	4.04	Beltner	US-31	River	1.16	1.74	1.72	1.70	1.74	1.60	1.61	1.62	1.76	1.76	1.74	1.96	1.72	1.72
	4.05	Keystone	Cass	River	1.24	1.38	1.46	1.51	1.37	1.15	1.17	1.17	1.40	1.40	1.38	1.66	1.36	1.36
	4.06	Keystone	Birtley	Cass	1.48	1.99	1.99	2.01	1.98	1.00	0.93	1.01	2.06	2.06	1.99	1.39	1.97	1.98
	4.07	Keystone	Hammond	Birtley	0.25	0.85	0.87	0.92	0.84	0.55	0.51	0.50	0.88	0.88	0.85	0.60	0.86	0.87
	4.08	Keystone	South Airport	Hammond	0.29	0.35	0.33	0.32	0.38	0.20	0.24	0.26	0.37	0.37	0.35	0.72	0.40	0.40
	5.01	Garfield	Rusch	3 Mile	0.48	0.70	0.66	0.61	0.68	0.75	0.75	0.66	0.66	0.66	0.70	0.50	0.77	0.77
	5.02	Garfield	Birtley	Rusch	0.32	0.49	0.46	0.43	0.48	0.51	0.51	0.50	0.46	0.46	0.49	0.34	0.53	0.53
	5.03	Garfield	Hammond	Birtley	0.86	0.74	0.77	0.81	0.71	0.72	0.72	0.78	0.73	0.73	0.74	0.79	0.77	0.76
	5.04	Garfield	South Airport	Hammond	0.31	0.37	0.38	0.40	0.35	0.54	0.54	0.60	0.42	0.42	0.37	0.44	0.41	0.40
	5.05	Garfield	Boon	South Airport	0.65	0.83	0.82	0.83	0.83	0.73	0.88	0.88	0.89	0.86	0.83	0.80	0.85	0.85
	5.06	Garfield	Carver	Boon	0.75	0.82	0.81	0.82	0.82	1.22	0.87	0.86	0.87	0.85	0.82	0.79	0.86	0.86

TC-TALUS Volume to Capacity Comparison

Corridor ID*	Name	From	To	2035 Project Run VC Ratios														
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5.07	Garfield	Front	Carver	0.84	1.01	0.99	0.99	1.35	1.13	1.13	1.13	1.13	1.13	1.13	1.01	0.97	1.06	1.06
5.08	Garfield	3 Mile	River	0.52	0.99	0.93	0.86	0.99	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.89	1.02	1.01
5.11	Garfield	Peninsula	Front	0.37	0.43	0.41	0.40	0.34	0.70	0.70	0.70	0.70	0.70	0.47	0.43	0.29	0.43	0.43
6.01	Hammond	Keystone	LaFrenier	0.00	0.78	0.78	0.79	0.79	1.14	1.15	1.13	1.13	0.83	0.78	0.78	0.80	0.81	0.81
6.02	Hammond	La Franer	Garfield	0.42	1.35	1.34	1.36	1.36	1.72	1.72	1.73	1.73	1.29	1.35	1.32	1.39	1.40	1.40
6.03	Hammond	Garfield	3 Mile	0.62	0.97	0.98	1.01	0.97	1.08	1.09	1.08	1.08	0.98	0.97	0.98	0.98	0.99	0.99
6.04	Hammond	3 Mile	4 Mile	0.80	1.25	1.03	1.09	1.24	1.30	1.30	1.30	1.30	1.24	1.25	1.26	1.26	1.26	1.26
6.05	Hammond	4 Mile	5 Mile	0.39	0.66	0.68	0.43	0.66	0.66	0.66	0.66	0.66	0.65	0.65	0.67	0.65	0.65	0.65
7.01	3 Mile	Hammond	Garfield	0.19	0.27	0.26	0.24	0.29	0.30	0.30	0.30	0.30	0.29	0.27	0.21	0.19	0.19	0.19
7.02	3 Mile	South Airport	Hammond	0.65	1.06	1.12	1.15	1.08	1.11	1.11	1.14	1.14	1.09	1.06	1.10	0.68	0.68	0.68
7.03	3 Mile	US-31	South Airport	1.15	0.83	0.56	0.58	0.83	0.82	0.82	0.82	0.82	0.82	0.83	0.83	0.85	1.22	1.21
8.01	West Bay Shore	Cherry Bend	M-72	1.08	1.47	1.47	1.47	1.47	1.48	1.48	1.48	1.48	1.47	1.47	1.47	1.48	1.48	1.48
8.02	West Bay Shore	Shady	Cherry Bend	0.62	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
9.01	West Silver Lake	Village	US-31	0.06	0.28	0.28	0.27	0.28	0.26	0.26	0.26	0.26	0.28	0.28	0.28	0.28	0.28	0.28
9.02	West Silver Lake	Boone	Village	0.31	0.60	0.61	0.60	0.60	0.59	0.59	0.71	0.71	0.60	0.60	0.60	0.60	0.60	0.60
9.03	West Silver Lake	Barnes	Boone	0.59	0.77	0.77	0.77	0.77	0.76	0.76	0.78	0.78	0.76	0.77	0.77	0.77	0.77	0.77
9.04	Silver Lake	Barnes	Division	0.54	0.80	0.81	0.81	0.81	0.77	0.77	0.75	0.75	0.78	0.78	0.80	0.82	0.80	0.80
9.05	Silver Lake	Division	Cass	1.21	1.66	1.67	1.67	1.65	1.54	1.54	1.56	1.56	1.65	1.66	1.69	1.66	1.66	1.66
9.06	Cass	8th	14th	0.94	1.23	1.25	1.25	1.25	1.11	1.11	1.09	1.09	1.16	1.23	1.30	1.23	1.23	1.23
9.07	8th	Cass	Lake	0.82	1.04	1.05	1.06	1.05	0.94	0.94	0.95	0.94	0.91	1.04	1.09	1.04	1.04	1.04
9.08	8th	Lake	Woodmere	0.90	1.19	1.20	1.21	1.20	1.06	1.06	1.06	1.06	1.35	1.19	1.25	1.19	1.19	1.19
9.09	8th	Woodmere	Garfield	1.04	1.39	1.41	1.42	1.38	1.24	1.24	1.24	1.24	1.10	1.39	1.48	1.40	1.41	1.41
9.10	8th	Garfield	Munson	0.10	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18
9.11	8th	Division	Cass	1.03	1.23	1.23	1.23	1.23	1.11	1.11	1.11	1.10	1.16	1.23	1.27	1.22	1.21	1.21
9.12	Cass	Grandview	8th	0.75	0.96	0.95	0.95	0.97	0.89	0.88	0.92	0.92	0.92	0.96	0.98	0.97	0.97	0.97
10.01	North Long Lake	Richardson	Zimmerman	0.44	0.62	0.62	0.62	0.63	0.61	0.61	0.64	0.64	0.62	0.62	0.61	0.62	0.62	0.62
10.02	North Long Lake	Zimmerman	Barnes	0.99	1.44	1.44	1.42	1.46	1.42	1.42	1.42	1.42	1.44	1.44	1.42	1.54	1.54	1.54
10.03	Barnes	North Long Lake	Barcliff	0.54	1.12	1.12	1.11	1.13	1.15	1.15	1.15	0.95	1.13	1.12	1.12	1.12	1.12	1.12
10.04	Barnes	Barcliff	Silver Lake	0.73	1.32	1.31	1.30	1.31	1.36	1.36	1.36	1.19	1.34	1.32	1.29	1.31	1.32	1.32
11.01	Cass	South Airport	Keystone	0.51	1.14	1.16	1.17	1.14	0.35	0.39	0.63	0.63	1.16	1.14	0.95	1.15	1.14	1.14
11.02	Cass	14th	South Airport	0.91	1.14	1.14	1.14	1.19	1.11	1.12	1.13	1.13	1.16	1.14	1.16	1.15	1.15	1.15
12.00	US-31	M-72	Baysshore	0.53	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.85	0.85	0.85
13.00	Bates	US-31	M-72	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.01	Elk Lake	Hanel	M-72	0.14	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.02	Williamsburg	M-72	Supply	0.22	0.60	0.61	0.61	0.60	0.61	0.61	0.58	0.58	0.60	0.60	0.61	0.66	0.66	0.66
15.10	Supply	High Lake	S. of Williamsburg	0.35	0.65	0.65	0.61	0.66	0.64	0.64	0.64	0.63	0.65	0.65	0.65	0.66	0.66	0.66
16.01	Hobbs	Garfield	Supply	0.07	0.33	0.31	0.26	0.33	0.30	0.30	0.30	0.30	0.34	0.33	0.35	0.34	0.33	0.33
17.01	High Lake	Hammond	Hobbs	0.39	1.27	0.95	0.59	1.26	1.11	1.11	1.09	1.12	1.37	1.27	0.66	1.31	1.30	1.30
18.01	Birmley	Keystone	Garfield	0.57	0.48	0.48	0.46	0.48	0.60	0.61	0.59	0.48	0.48	0.48	0.35	0.48	0.48	0.47
19.01	Hartman	US-31	Cass	0.14	0.30	0.30	0.30	0.30	0.42	0.42	0.42	0.42	0.32	0.30	0.23	0.30	0.30	0.30
20.01	Sleights	Keystone	Garfield	0.21	0.82	0.75	0.69	0.81	0.66	0.66	0.66	0.66	0.87	0.82	0.92	0.84	0.84	0.84
21.01	Lautner	M-72	Bunker Hill	0.05	0.39	0.39	0.35	0.39	0.38	0.38	0.36	0.40	0.39	0.39	0.38	0.47	0.47	0.47
21.02	Bunker Hill	US-31	Lautner	0.12	1.23	1.23	1.11	1.23	1.19	1.19	1.15	1.26	1.26	1.23	1.20	1.56	1.38	1.38
22.01	4 Mile	US-31	Hammond	0.29	0.33	0.54	0.54	0.33	0.42	0.42	0.41	0.46	0.35	0.33	0.42	0.75	0.50	0.50
23.01	5 Mile	Holiday	Hammond	0.63	0.84	0.85	0.72	0.83	0.85	0.85	0.85	0.85	0.84	0.84	1.22	1.31	0.86	0.86
23.02	Holiday/5 Mile	US-31	US-31	0.34	0.70	0.71	0.66	0.71	0.72	0.72	0.72	0.72	0.71	0.70	0.71	0.71	0.70	0.70
24.01	M-137	Benzie	Youker	0.48	1.10	1.09	1.09	1.09	1.10	1.10	1.09	1.09	1.09	1.10	1.09	1.09	1.09	1.10

TC-TALUS Volume to Capacity Comparison

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24.02	South Long Lake	Foxwood	US-31	0.29	0.39	0.39	0.39	0.39	0.37	0.37	0.37	0.37	0.37	0.39	0.39	0.38	0.38
24.03	South Long Lake	Bass Lake	Foxwood	0.60	0.80	0.81	0.82	0.81	0.77	0.77	0.79	0.79	0.78	0.80	0.80	0.80	0.80
24.05	Secor	East Long Lake	West Silver Lake	0.60	0.75	0.75	0.74	0.76	0.73	0.73	0.71	0.74	0.74	0.75	0.75	0.75	0.75
25.01	Center	Mission	Mapleton	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
25.02	Center	Mapleton	East Shore	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
25.03	Center	East Shore	Front	0.82	0.91	0.91	0.91	0.92	0.86	0.87	0.86	0.93	0.91	0.91	0.93	0.91	0.91
26.01	Peninsula	Devils Dive	Mckien	0.06	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
26.02	Peninsula	Mckien	Center	0.31	0.42	0.43	0.43	0.42	0.43	0.42	0.42	0.43	0.43	0.42	0.43	0.43	0.43
27.01	East Shore	Eastern	Center	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05
27.02	Eastern	Peninsula	East Bay	0.28	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
28.01	Parsons	Garfield	3 Mile	0.78	1.11	1.12	1.12	1.09	1.08	1.08	1.07	1.08	1.08	1.11	1.11	1.06	1.05
28.02	Hannah	Woodmere	Garfield	0.38	0.59	0.59	0.60	0.55	0.54	0.54	0.54	0.47	0.59	0.59	0.62	0.57	0.57
29.00	Hastings/Boon	Parsons	Garfield	0.19	0.35	0.35	0.35	1.03	0.35	0.35	0.35	0.36	0.35	0.35	0.35	0.35	0.34
30.01	Carver	Barlow	Garfield	0.43	1.44	1.46	1.50	1.63	1.01	0.99	1.06	1.13	1.44	1.39	1.22	1.21	1.21
30.02	Woodmere/Carver	Barlow	Barlow	0.92	1.23	1.23	1.24	1.30	1.09	1.09	1.10	1.00	1.23	1.27	1.24	1.24	1.23
31.00	Airport Access	US-31	Parsons	0.08	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.05
32.01	Milliken	Eastern	Front	0.30	0.38	0.39	0.39	0.39	0.39	0.39	0.40	0.40	0.38	0.39	0.38	0.38	0.38
33.00	Front/East Bay	Eastern	Munson	0.15	0.19	0.19	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.17	0.17
34.01	Barlow	Carver	South Airport	0.63	0.70	0.70	0.70	0.75	0.71	0.70	0.72	0.64	0.70	0.72	0.74	0.74	0.74
34.02	La Franier	South Airport	Hammond	0.52	0.44	0.44	0.44	0.44	0.34	0.32	0.41	0.29	0.44	0.48	0.46	0.46	0.46
35.00	Frankie	Silver Lake	US-31	0.01	0.10	0.10	0.09	0.10	0.10	0.11	0.10	0.10	0.10	0.07	0.10	0.10	0.10
36.00	Veterans	South Airport	14th	0.80	2.12	2.13	2.08	2.34	1.88	1.91	2.28	2.26	2.12	2.03	2.19	2.20	2.20
37.00	Boardman	Front	8th	0.41	0.61	0.61	0.61	0.62	0.55	0.55	0.56	0.55	0.61	0.63	0.61	0.61	0.61
38.00	Pine/State	Front	Union	1.00	1.39	1.40	1.41	1.40	1.41	1.23	1.24	1.26	1.39	1.47	1.39	1.39	1.39
38.01	Union	8th	14th	0.61	0.86	0.86	0.87	0.88	0.81	0.81	0.79	0.81	0.86	0.89	0.86	0.86	0.86
38.02	Union	Grandview	8th	0.82	1.31	1.28	1.32	1.46	1.22	1.22	1.31	1.41	1.31	1.38	1.37	1.36	1.36
39.00	Bay	M-72	Division	0.26	1.34	1.34	1.33	1.33	1.34	1.35	1.38	1.32	1.34	1.37	1.35	1.35	1.35
40.01	Elmwood	Bay	6th	0.16	0.37	0.37	0.38	0.38	0.38	0.38	0.34	0.38	0.37	0.37	0.36	0.36	0.36
40.02	6th	Elmwood	Division	0.20	0.69	0.70	0.73	0.73	0.82	0.82	0.81	0.76	0.69	0.69	0.70	0.70	0.69
41.01	Front	Boardman	Grandview	0.62	0.80	0.80	0.80	0.80	0.71	0.72	0.72	0.91	0.80	0.84	0.79	0.79	0.79
41.02	Front	Union	Boardman	0.71	1.00	0.99	1.00	0.99	0.99	0.87	0.88	0.93	1.00	1.04	0.99	0.99	0.99
41.03	Front	Division	Union	0.99	1.30	1.30	1.31	1.30	1.30	1.22	1.23	1.25	1.30	1.35	1.30	1.30	1.30
41.04	Front	Madison	Division	1.03	1.45	1.44	1.43	1.43	1.39	1.39	1.37	1.42	1.45	1.45	1.43	1.43	1.43
41.05	Front	Cedar Run	Madison	0.80	1.05	1.06	1.06	1.06	1.02	1.02	0.98	1.04	1.05	1.07	1.12	1.12	1.12
41.06	North Long Lake	Barnes	Cedar Run	0.62	1.00	1.01	1.01	1.02	1.03	1.03	0.98	1.01	1.00	1.01	0.98	0.98	0.98
42.01	Hoxie/Grandview	W of Spring Lake	West Bay Shore	0.14	0.32	0.32	0.32	0.32	0.32	0.32	0.31	0.32	0.32	0.32	0.32	0.32	0.32
43.01	Fouch	W of Spring Lake	Center	0.15	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
44.01	Cherry Bend	Fouch/Center	West Bay Shore	0.30	0.33	0.33	0.33	0.33	0.33	0.33	0.34	0.33	0.33	0.33	0.33	0.33	0.33
44.02	Center	Bingham	Fouch	0.07	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
45.01	Lake Leelanau	Lakeview	Fouch	0.18	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
45.02	Bugal	Fouch	Hoxie	0.10	0.15	0.15	0.16	0.15	0.15	0.15	0.14	0.15	0.15	0.15	0.15	0.15	0.15
45.03	Gray/Bugal	Hoxie	Cedar Run	0.20	0.36	0.36	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.37	0.37	0.37	0.37
46.01	Cedar Run	Gray	Cedar Run	0.45	0.76	0.76	0.76	0.75	0.76	0.76	0.75	0.75	0.76	0.77	0.75	0.75	0.75
46.02	Cedar Run	Cedar Valley	Gray	0.29	0.52	0.52	0.52	0.51	0.52	0.52	0.50	0.51	0.52	0.52	0.52	0.52	0.52
47.01	Church	Cedar Run	West Long Lake	0.17	0.34	0.34	0.33	0.34	0.34	0.34	0.34	0.34	0.35	0.34	0.34	0.34	0.34
48.01	Bass Lake/East Long Lake	North Long Lake	Boone	0.19	0.33	0.34	0.33	0.35	0.33	0.32	0.32	0.40	0.33	0.33	0.34	0.33	0.33
48.02	Boone	Bass Lake	West Silver Lake	0.04	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Prepared for TC-TALUS Technical Committee
by J. Osborne, MDOT

For Discussion Purposes Only

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TC-TALUS Volume to Capacity Comparison

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49.01	Zimmerman	North Long Lake	Silver Lake	0.55	0.76	0.76	0.77	0.77	0.76	0.76	0.73	0.77	0.76	0.75	0.77	0.76			
49.02	East Silver Lake	Silver Lake	Beltner	0.13	0.17	0.18	0.22	0.17	0.17	0.17	0.15	0.18	0.17	0.17	0.16	0.17			
50.01	County Road 633	US-31	Hilltop	0.33	0.50	0.50	0.51	0.50	0.49	0.49	0.50	0.49	0.50	0.50	0.50	0.50			
51.01	Fall	East Duck Lake	County Road 633	0.19	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45			
52.01	East Duck Lake	US-31	Fall	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
52.02	East Duck Lake	Fall	County Road 633	0.06	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18			
53.00	Hilltop	County Road 633	M-37	0.07	0.15	0.14	0.14	0.15	0.16	0.16	0.14	0.15	0.15	0.15	0.15	0.15			
54.00	South Airport	3 Mile	4 Mile/5 Mile	0.00	0.00	1.12	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
55.00	Hammond	Cass	Keystone	0.00	0.00	0.00	0.00	0.00	0.97	0.95	1.00	0.00	0.00	0.00	0.00	0.00			
56.00	Hartman	US-31	East Silver Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00			

New Roads
 * Corridor ID assigned by MDOT Modeler for analysis purpose only.