Memorandum

The City of Traverse City
Engineering Department

TO: Jered Ottenwess, City Manager

FROM: Timothy J. Lodge, City Engineer

DATE: May 20, 2014

SUBJECT: Eighth Street Evolution

Attached for your consideration is a summary document titled Eighth Street Evolution. This document was prepared with the intent of adding value to the current conversations related to changes to the configuration and function of Eighth Street between Union Street and Woodmere Avenue.

Historically, this portion of Eighth Street has performed as an arterial and collector street. It represents nearly 30% of the regions east-west travel lanes that cross the Boardman River. Implementing a "Road Diet" which reduces the number of travel lanes is a concern validated by various traffic studies that indicate undesirable consequences including traffic migration into the adjacent Boardman Neighborhood. In general, the upper traffic volume threshold for successful "Road Diets" is well below the current traffic volumes of Eighth Street.

Other concerns with a "Road Diet" trial include the intersection traffic flow at Woodmere Avenue with the two left turn lanes onto Eighth Street, intersection capacity at the Boardman intersection, and the possible confusion with pavement markings not matching the concrete pavement joints.

Therefore, we recommend that if a "Road Diet" is implemented on a trial basis for this portion of Eighth Street a process similar to the one outlined in ***"GUIDELINES FOR THE CONVERSION OF URBAN FOUR-LANE UNDIVIDED ROADWAYS TO THREE-LANE TWO-WAY LEFT-TURN LANE FACILITIES, Knapp, 2001"*** be followed. This will ensure that the appropriate level of public involvement, traffic monitoring and evaluation and reporting of results be performed for this trial. We estimate that this will require hiring a consultant to perform the work with a budgeted cost of $35,000 to $55,000.

Eighth St Evolution

The Comprehensive City Plan

1942

"In the development of a comprehensive street plan, it is good practice to concentrate traffic on thoroughfares particularly adapted for this purpose." The proposed Eighth St between the Boardman River and Garfield Ave is four through lanes and two parking lanes in a width of 56 feet, in a right-of-way of 80 feet.

Eighth St Bridge Replacement and Engineering Report

1973-1974

The Eighth St Bridge, originally constructed around 1927, was a 34' wide, earth filled spandrel concrete arch bridge and was reconstructed in 1974 as a pre-stressed twin-span concrete box beam bridge with a pedestrian walkway underneath. Right-of-way acquisition was required to accommodate the wider width of the roadway and sidewalks. The bridge was replaced because it was not wide enough to accommodate the volume of traffic, which flows equally in both directions. The horizontal and vertical alignment was poor and the sidewalks and railings along the bridge were seriously deteriorated.

East-West Arterial Highway

1980

As a follow up to the 1977 City Plan, which encouraged a hierarchy of streets by designating certain streets as arterials, collector streets, and local streets, the City Commissioned an Engineering Study of a primary arterial route from Airport Access Rd and Munson Ave to Fourteenth and Division St along the railroad corridor. The concept was largely abandoned in the 1980's and 1990's with the remnant Boardman Lake Ave emerging in 1994. Several refinements of the 1994 Boardman Lake Avenue have occurred in the past few years.

Parking Removed on E Eighth St

1980

Parking along E Eighth St from Boardman Ave to Woodmere Ave is removed to open up another travel lane on E Eighth St. The decision to remove the parking was finalized by the City Commission with Traffic Control Order #179 on September 16, 1980.

The Traverse City, City Plan

1999 - 2006

The Plan calls out for making use of existing streets and for the most basic changes to make more efficient use of the road system. East-west traffic through the city is extremely limited given the severe land constraints of our historic, developed community. Coordinating traffic signals with computers and reducing the number of driveways by coordinating driveways are measures that will increase the carrying capacity of existing arterials and collectors, such as Eighth St.

Request to Have Eighth St Converted to Three Lanes

1999

The Traffic Calming Committee Requests that Eighth St be converted from 4 to 3 lanes between Lake Ave and Woodmere Ave. URS's Traffic Modeling showed that converting this portion of Eighth St would cause some of the intersections to fail during peak travel hours due to increased traffic backups. The City Engineer, Duane Brege suggests trying a 4 to 3 lane conversion on Eighth St between Garfield Ave and Munson Ave instead.

Eighth St and Woodmere Ave Intersection Reconstructed

2004

A proposed roundabout at the intersection fails to gain public support and Woodmere Ave changes from one left turn lane onto Eighth St to two left turn lanes due to traffic backups. This improves traffic operations significantly.

Eighth St Re-striping Pilot Program

2009

Communication sent from the City Engineer, Tim Lodge, to the City Manager, Ben Bifoss, recommending that the Center for Transportation Research and Education "Guidelines for the Conversion of 4-lane undivided Roadways to 3-lane 2-way Left-turn lane Facilities" be followed with respect to the Eighth St corridor from Lake St to Munson Ave. According to the Guidelines and previous traffic studies and models, the section of Eighth St from Garfield Ave to Munson Ave should operate smoothly as a 3-lane section. However a more extensive evaluation of Eighth St from Woodmere to Lake St is recommended, due to the higher traffic volumes and previous studies showing that this section of Eighth St would operate at failure levels if converted to a 3-lane section. The City Commission approved the one-year Eighth St Re-striping Pilot Program to res-tripe Eighth St between Garfield Ave and Munson Ave on April 20, 2009

The Grand Vision Land use and Transportation Study

2007-2010

This community based Land Use and Transportation Study is summarized on 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 options for Eighth St.

Boardman Lake Ave Traffic Study

2011

URS and City volunteers collect traffic modeling data for the proposed Boardman Lake Ave. The collected data is used for an Origin/Destination study to determine how much traffic would use Boardman Lake Ave and how traffic would change on existing roads. The intersections of Eighth and Lake Ave, Cass St, and Boardman Ave are studied. The intersection of Eighth and Cass St is found to have a LOS of C for both the AM and PM peak hour.

Corridors Master Plan

2012

Eighth St is "generally characterized as the most utilized street in the City". Traffic cutting through residential areas to access/exit Eight St is highlighted as a major concern. Also, the large number of curb cuts is cited as contributing to traffic issues and poor pedestrian and cyclist circulation. Bike lanes are proposed to provide a safer environment for cyclists and create a wider buffer for pedestrians on the sidewalk. A roundabout at the intersection of Boardman Ave and Eighth St is proposed as an alternative to the existing signalized intersection, but additional right-of-way would be required. After several revisions to the Corridor Master Plan, the proposed cross-section of Eighth St from Lake Ave to Boardman Ave is shown with a modified 4-lane street, parking, and bike lanes from Lake Ave to Boardman Ave and requires additional right-of-way. The cross section from Boardman Ave to Garfield shows a 3-lane section with bike lanes.

TC-TALUS Technical Committee

2012-Current

A collaboration of regional governmental representatives developed a tool to model future traffic patterns for use in the development of a Regional Long Range Transportation Plan. The TC-TALUS Board asked the technical committee to examine east-west transportation options within the TC-TALUS study area. This work was recently completed and is scheduled for discussion this month (May 2014).

Level of Service Determination

2013

The City Engineering Department used the Highway Capacity Manual 2010 and LOS+ (a hybrid traffic analysis method based on the Highway Capacity Manual 2010 and NCHRP Project 3-70) to determine the level of service of Eighth St for the existing configuration and three proposed configurations, using traffic volume information gathered in 2011 by URS. The existing Eighth St configuration has two lanes each way and no center turn lane or bicycle facilities. The first proposed configuration is Eighth St with one through and one shared westbound lane, a median, and a shared eastbound lane. The second proposed configuration requires additional right of way and has two westbound lanes with a westbound bike lane, center turn lane, and one eastbound shared lane. The last configuration of Eighth St is a traditional 4 to 3 lane conversion design with one eastbound and one westbound lane, a center turn lane, and bike lanes.

Tim Lodge/City Engineering/GTC

04/13/2009 03:24 PM

To Ben Bifoss/GTC

cc Robert Cole/City DPS/GTC@GTC, Makayla Vitous/City Manager/GTC@GTC

bcc

Subject 8th Street Information

Ben:

Traffic counts on the easterly portion between Garfield and Munson Avenue are 9,000 to 10,000 vehicles per day.

Traffic counts on the portion between Woodmere and Lake Street are 24,000 to 29,000 vehicles per day. This portion of street is concrete pavement with joint lines at the lanes lines for the existing four lane section. Restriping this section is problematic because as the pavement markings fade, it would be easy for vehicles using the route to expect to follow the concrete joint lines.

According to the Center for Transportation Research and Education (CTRE) **"Guidelines for the Conversion of 4-lane Undivided Roadways to 3-lane 2-way Left-turn Lane Facilities"** the level of daily traffic volume should be below 17,500 vehicles per day for the feasibility for a successful conversion. With the current traffic volumes, a more extensive evaluation should be conducted prior to trying a conversion for the portion between Woodmere and Lake Street. Several studies have included converting streets with 20,000 vehicles per day with success. I am fortunate to have met the individual who wrote the aforementioned "Guidelines..." and have placed a call into him to see if he would weigh in on 8th Street or Division Street "Road Diets".

Previous studies and modeling of the portion of 8th Street between Woodmere and Lake Street show that it would operate at failure levels if converted to a three lane section and could cause traffic to migrate into the adjacent neighborhoods instead of using 8th Street.

Timothy J. Lodge, P.E.
City Engineer
City of Traverse City
400 Boardman Avenue
Traverse City, MI 49684
231.922.4455

Guidelines for the Conversion of Urban Four-Lane Undivided Roadways to Three-Lane Two-Way Left-Turn Lane Facilities

Final Report

Sponsored by the Office of Traffic and Safety
of the Iowa Department of Transportation
CTRE Management Project 99-54

April 2001

CTRE
Center for Transportation Research and Education

Iowa State University

Iowa Department of Transportation

Table ES.1 Feasibility Determination Factor Characteristics and Sample Evaluative Questions

Factor	Characteristics	Sample Evaluative Questions
Roadway Function and Environment	• Actual, Expected, and Desired Primary Function (Access, Mobility, or a Combination of the Two) • Community Objectives/Goals for the Roadway • Available Right-of-Way • Current and Expected Adjacent Land Use	• What is the primary current, expected, and desired function of the roadway? • Is the roadway primarily a collector or minor arterial roadway? • Does the current roadway primarily operate as a "defacto" three-lane cross section? • Is the goal for the roadway improvement increased safety with somewhat lower mobility? • Is the right-of-way limited? • Will the adjacent land use remain relatively stable throughout the design period? • Will the proposed cross section match the desired function of the roadway? • Will the answers to the above questions remain the same throughout the design period of the project?
Overall Traffic Volume and Level of Service	• Total Daily Volume • Peak-Hour Volume (Morning/Noon/Evening) • Directional Split • Intersection and Arterial Level of Service • Side Street and Driveway Vehicle Delay • Volume of Frequent-Stop and/or Slow-Moving Vehicles • Signal Timing/Phasing • Arterial Travel Speeds and Vehicle Delays • Existence of Turn Lanes	• What is an acceptable increase in minor street or signal-related delay due to the conversion? • Is a decrease in arterial travel speed of 5 miles per hour or less acceptable? • What is an acceptable reduction in intersection level of service? • What level of daily traffic volume exists (for Iowa roadways and assuming a 50/50 split and 10 percent of daily volume occurs during peak-hour): $\leq$ 15,000 vpd (feasibility probable) 15,000 to 17,500 vpd (exercise caution) $\geq$ 17,500 vpd (feasibility less likely) • Does the signal timing/phasing need to be changed? • Does the current roadway primarily operate as a "defacto" three-lane cross section?

Table ES.1 Continued

Turning Volumes and Patterns	• Number and Location of Turn Volumes and Access Points • Peak time period of Turn Volumes • Existence of Left-Turn and Right-Turn Lanes • Design of Access Points and Intersections • Turn Volume of Frequent-Stop and/or Slow-Moving Vehicles • Minor Street and Access Point Vehicle Delay • Signal Timing/Phasing	• Does the signal timing/phasing need to changes/optimized? • How important is it that right-turn vehicles quickly enter/exit the roadway? • Do the access point and intersections need to be redesigned (e.g., radii, approach slopes, location)? • Are right-turn lanes needed at particular locations? • Does the proposed marking allow the design vehicle (e.g., tractor-trailer) to turn properly? • What is an acceptable increase in minor street and/or left-turn vehicle delay? • Does the current roadway primarily operate as a "defacto" three-lane cross section?
Frequent-Stop and/or Slow-Moving Vehicles (e.g., agricultural vehicles, mail carriers, school buses, tractor-trailers, and buggies)	• Volume, Location, and Time of Frequent-Stop and/or Slow-Moving Vehicles • Type, Design (Length, Width, Turning Radius, etc.) and Speed of Vehicles • Arterial Travel Speeds and Vehicle Delays • Level of Enforcement for Proper TWLTL Use (i.e., No Passing Allowed)	• What is acceptable delay with respect to frequent-stop or slow-moving vehicles? • Can these vehicles turn properly at the access points and intersections? • Can no passing of these vehicles be enforced? • Are there locations for pull-outs for these vehicles? • Can some or all of the stop locations for the frequent-stop vehicles be combined?

Table ES.1 Continued

Weaving, Speed, and Queues	• Signal Timing/Phasing • Number of Existing Lane Changes • Turn Volume and Location • Arterial Travel Speeds and Vehicle Delays • Level of Enforcement for Proper TWLTL Use (i.e., No Passing Allowed) • Number and Location of Turn Volumes and Access Points • Peak Time Period of Turn Volumes • Existence of Left-Turn and Right-Turn Lanes • Design of Access Points and Intersections • Turn Volume of Frequent-Stop and/or Slow-Moving Vehicles • Minor Street and Access Point Vehicle Delay • Queue Length • Number of Speeders (i.e., greater than 5 mph over the posted speed limit)	• Does the signal timing/phasing need to changes/optimized? • How important is it that right-turn vehicles quickly enter/exit the roadway? • Do the access point and intersections need to be redesigned (e.g., radii, approach slopes, location)? • Are right-turn lanes needed at particular locations? • What is an acceptable increase in minor street and/or left-turn vehicle delay? • Is a decrease in arterial travel speed of 5 miles per hour or less acceptable? • What is an acceptable change in queues? • Are there safety concerns related to weaving? • Can no passing be enforced? • Can drivers be educated about proper use of TWLTL? • Is a reduction in speeders and speed variability preferred? • Can all the old markings be completely removed? • Does the current roadway primarily operate as a "defacto" three-lane cross section?
Crash Types and Patterns	• Type of Crashes • Location of Crashes • Number and Location of Pedestrians and Bicyclists • Parallel Parking Need	• Can the crashes that are occurring be reduced with a conversion? • Will a reduction in speed and speed variability increase safety? • Are there safety concerns related to parallel parking maneuvers? • Do pedestrians and bicyclists have safety concerns?
Pedestrian and Bike Activity	• Number and Location of Pedestrians • Number and Location of Bicyclist Use • Characteristics of Pedestrians and Bicyclists (e.g., Age) • Bike and Pedestrian Friendliness of Roadway • Cross Section Width • Parallel Parking Need	• What is the pedestrian and bicyclist friendliness of the roadway? • Do pedestrians and bicyclists have safety concerns? • Will the addition of a TWLTL assist pedestrians and bicyclists? • How will pedestrians and bicyclists interact with parallel parking? • Can a bike lane be added after the conversion?

Table ES.1 Continued

Right-of-Way Availability, Cost, and Acquisition Impacts	• Available Right-of-Way • Cost of Right-of-Way • Existence of Left-Turn and Right-Turn Lanes • Design of Access Points and Intersections • Number of Properties Needed and Environmental Impacts (e.g., Tree Removal) • Cross Section Width • Parallel Parking Need	• Is the right-of-way limited? • Will the cost of right-of-way acquisition be significant? • Do the access point and intersections need to be redesigned (e.g., radii, approach slopes, location)? • Are right-turn lanes needed at particular locations? • What is necessary in the cross section (e.g., bike lane, parallel parking)?
General Characteristics		
Parallel Roadways	• Roadway Network Layout • Volume and Characteristics of Through Vehicles Diverted • Impact of Diversion on Parallel Roadways	• Is a decrease in arterial travel speed of 5 miles per hour or less acceptable? • Does the signal timing/phasing need to changes/optimized? • Will conversion divert through vehicles to parallel roadways? • Is it possible to avoid or reroute the diverted traffic? • What is the impact on the parallel roadway environment?
Offset Minor Street Intersections	• Volume and Time of Left Turns • Queue Lengths • Distance between Minor Street Approaches	• Do left turns occur into both minor street/access point approaches at a similar time? • Are the left-turn volumes significant? • Will the left-turn volumes produce queues in the through lanes of a three-lane roadway?
Parallel Parking	• Parallel Parking Need • Number of Parking Maneuvers • Operational and Safety Impacts of Parallel Parking • Design of Existing/Proposed Parallel Parking	• Does parallel parking exist? • How many parking maneuvers occur during peak travel times? • What are the safety and delay concerns related to parallel parking maneuvers? • Is it possible to design these spaces for easy enter/exit (i.e., to minimize delay)? • Will it be necessary to reduce the number of parking spaces? • Does parallel parking reduce the ability of vehicles to turn in and out of minor streets and access points?

Table ES.1 Continued

Corner Radii	• Design of Access Points and Intersections • Number and Location of Turn Volumes and Access Points • Peak time period of Turn Volumes • Existence of Left-Turn and Right-Turn Lanes • Turn Volume of Frequent-Stop and/or Slow-Moving Vehicles • Minor Street and Access Point Vehicle Delay	• How important is it that right-turn vehicles quickly enter/exit the roadway? • Do the access point and intersections need to be redesigned (e.g., radii, approach slopes, location)? • Are right-turn lanes needed at particular locations? • Does the proposed marking allow the design vehicle (e.g., tractor-trailer) to turn properly? • Do parallel parking spaces need to be removed to allow proper turning?
At-Grade Railroad Crossing	• Volume, Location, and Time of Train Crossing • Length of Crossing Train • Delay Impacts of Train Crossing • Queue Impacts of Train Crossing • Total Daily Vehicle Volume • Peak-Hour Vehicle Volume (Morning/Noon/Evening) • Directional Split of Vehicles	• Do trains cross during peak travel periods? What is the typical delay from train crossing? • Is double the current queue length (with four-lane undivided cross section) at a railroad at-grade crossing acceptable? • Would the delay impacts of double the current queue be acceptable?

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 and 10 Activity Centers 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.

Northwest Michigan Council of Governments

TC-TALUS