Gourdie/Fraser & Associates, Inc.

Municipal
Development
Transportation
Consultants

124 W. State St. • P.O. Box 927
Traverse City, MI 49684-0927
t: 231-946-5874 • f: 231-946-3703
www.gourdiefraser.com

November 17, 2000

Mr. Richard Lewis
City Manager
City of Traverse City
400 Boardman Avenue
Traverse City, Michigan 49684

Re: Boardman Lake Avenue
8th Street to Cass Road
City of Traverse City
GFA Project No. 001405

Dear Richard:

Enclosed please find a copy of the draft report for the above referenced project. Please review this information and offer your comments. Also, please provide cost information regarding right of way acquisition as noted on page 14 of the report. Upon receiving your input we will prepare the final report for the project. If you would prefer, we will meet with you at your convenience to review the report and your comments.

As always, if you have any questions or comments, please don't hesitate to contact us at (231) 946-5874.

Sincerely,

GOURDIE/FRASER & ASSOCIATES, INC.

Craig W. Seger
Project Manager

Troy E. Molby
Project Engineer

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Enclosure
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ENGINEERING STUDY
FOR
BOARDMAN LAKE AVENUE

Prepared for
City of Traverse City
By
Gourdie/Fraser & Associates
Draft
November 17, 2000

City of
Traverse City

Gourdie/Fraser &
Associates, Inc.

SUMMARY

As requested by the City of Traverse City, Gourdie/Fraser & Associates is providing the following preliminary study and recommendations for the proposed Boardman Lake Avenue. This study follows two other studies conducted for the City of Traverse City by Gourdie/Fraser & Associates. The new roadway concept was first introduced in 1994 and then updated in 1998.

The route for this proposed new roadway would intersect Eighth Street between Lake Avenue and the Boardman River, proceed southerly along the west side of Boardman Lake and ultimately intersect Cass Road at the south city limit of Traverse City. The conceptual route proposed in this study maintains the current railway configuration, and is primarily located along the east side of the existing railway.

FOREWORD

Various sources provided information for this study. Mapping, property ownership, and engineering input were provided by the City of Traverse City. The MDOT Railroad Safety Section provided information for the railway crossings. On-site investigation has provided additional insight in preparation of this study.

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I. INTRODUCTION

The City of Traverse City has realized the need to relieve traffic congestion along the Cass and Union Street corridors. It has been a vision to return these roads to typical neighborhood roadways, thereby eliminating the negative impact the current traffic loads have on the surrounding area. There has also historically been an increasing need to provide good north/south access to the downtown area. Boardman Lake Avenue has been proposed to accomplish the above goals. It should be noted that this is not a design, but rather, a preliminary study. Also, public input was not incorporated into this study.

This study reviews and incorporates the following items:

- Impacts due to the proposed Boardman Banks project between Fifteenth and Sixteenth Streets.
- Evaluation of the proposed Boardman Lake Avenue alignment and type, without relocating the existing railroad tracks.
- Investigation of phasing the project (two phases, see below).
- Verification of proposed traffic diverter at Cass Road and Fourteenth Street.
- Evaluation for future expansion of the proposed roadway.
- Evaluation of proposed sidewalk and landscaping so that no revisions would be required as a result of future expansion.
- Revised cost estimates.

This report will be presented in the following two phases:

- Phase one is for Boardman Lake Avenue from Eighth Street south to Fourteenth Street (see Figure 1).
- Phase two is for Boardman Lake Avenue from Fourteenth Street south to Cass Road at the south city limit, including the Seventeenth Street connection (see Figure 2).

Figure 1

Figure 2

II. RECOMMENDATIONS AND IMPACTS

The following recommendations and impacts are based on findings of this preliminary study:

1. Roadway alignment and cross-section.

   The recommended route for the proposed roadway starts at Eighth Street and extends south to the south city limit line at Cass Road. The recommended alignment follows the east side of the existing railroad tracks (see Figure 1).

   The recommended cross section is a boulevard with single traffic lanes in each direction, and turn lanes at 8th, 14th and 17th Streets (see Figure 2). The proposed roadway would be projected to initially carry 18,000 vehicles per day (1998 study). A two-lane boulevard section could adequately handle this level of traffic. The roadway cross-section should accommodate easy expansion to a four-lane boulevard (two lanes in each direction). As demand for a better level of service and traffic flows increase, expansion may be desired.

2. Speed Limit

   The roadway should be posted at 25 MPH, based on recommendations from the City of Traverse City.

3. Phase One – Eighth Street to Fourteenth Street

   Phase One would begin at Eighth Street and proceed south to Fourteenth Street (see Photo 1, and Figure 1). This could relieve traffic flows on Cass Road and Union Street north of Fourteenth Street.

Photo 1: Looking Northerly along railway from proposed location of Fourteenth Street connection, Phase One.

The connection with Eighth Street could be configured as a major intersection. The intersection may require a traffic signal with turn lanes and pavement markings to facilitate turning movements.

The connection with Fourteenth Street could be configured as a major intersection. The intersection may require a traffic signal with turn lanes and pavement markings to facilitate turning movements. This intersection may require purchase of additional right-of-way located north and south of the existing Fourteenth Street right-of-way. A service drive entrance could be located east of the intersection with Fourteenth Street to access properties adjacent to Boardman Lake.

4. Traffic diverter at Fourteenth and Cass

There is a concern that traffic may short circuit the proposed Boardman Lake Avenue by using Cass Road north of Fourteenth Street. Placement of a traffic diverter at the Cass Road and Griffin Street intersection (see Figure 1) could eliminate this concern. With the traffic diverter at this location, access would be provided to the Cone Drive commercial business, the east-west flow of traffic along Fourteenth Street could be maintained, and the use of Cass Road by through traffic could be discouraged.

5. Phase Two – Fourteenth Street to Cass Road

Phase Two would continue the route from Fourteenth Street south to intersect with Cass Road at the south city limit. This phase would include an intersection and traffic diverter at Seventeenth Street (see Photo 2, and Figure 1).

Photo 2: Looking Southerly along railway from proposed location of Fourteenth Street connection, Phase Two.

Access from Boardman Lake Avenue to Seventeenth Street could allow a direct route to existing businesses in this area. However, there is a concern that traffic may short circuit the proposed Boardman Lake Avenue by using Cass Road north of Seventeenth Street. Placement of a traffic diverter at the Cass Road and Seventeenth Street intersection could provide direct access to the businesses, and discourage the use of Cass Road by through traffic.

Under this conceptual route with maintaining the existing location of the railroad tracks, Boardman Lake Avenue would encroach into Boardman Lake between Sixteenth and Seventeenth Streets. Environmental impact studies, which can be costly and time consuming, may be required by applicable regulatory agencies. Construction of a relatively large retaining wall may also be necessary.

6. Impacts of Boardman Banks Project

Boardman Banks is a proposed residential and commercial development located between Twelfth and Sixteenth Streets, east of the proposed Boardman Lake Avenue. Acquisition of a 0.82-acre parcel from the Boardman Banks developers may be required by the City of Traverse City, because the parcel is located along the conceptual route between Fifteenth and Sixteenth Streets.

7. Railway Crossings

Boardman Lake Avenue, as proposed with road connections, would create four crossings of the existing railway: two on Boardman Lake Avenue, one on Fourteenth Street, and one on Seventeenth Street. Based on information obtained from MDOT, no net gain in railway-road grade crossings is allowed statewide. The net gain in grade crossings for this project would be three, if the Sixteenth Street crossing were to be abandoned in Phase Two. Under requirements set by MDOT, Traverse City would have to abandon three other crossings.

Railway-road grade crossings can introduce vehicular and pedestrian safety issues. MDOT recommends at-grade crossings be designed at an angle of 90 degrees. The two Boardman Lake Avenue grade crossings would be skewed and long, which may violate MDOT safety criteria.

The separation required between the proposed road and rails, as mandated by MDOT, will vary dependant upon final profiles and physical constraints. For this study we have maintained a minimum separation of 25 feet between roadway edge of shoulder and track centerline.

The estimated costs for grade crossings, as indicated by MDOT, range from approximately $200,000 to $300,000 for each crossing, depending on length and design. Estimated costs for grade crossing signals and gates are approximately $200,000 for each crossing.

8. Future Roadway Expansions

The roadway should be configured so that expansion to a four-lane boulevard would require minimal revisions to the initial two-lane boulevard. The proposed roadway cross-section for a two-lane boulevard, and a conceptual future cross-section for a four-lane boulevard are shown in Figure 2. These cross-sections could allow for the future expansion of the roadway from two to four lanes, with minimal revisions to the initial two-lane boulevard.

The potential development at areas east of the proposed route (next to Boardman Lake) should be considered. Additional intersections to provide access to properties east of the proposed route may be necessary dependent upon future planning for that area.

The existing right-of-way along the railroad corridor is 200 feet. The proposed roadway configuration would require 192 feet of right-of-way, a difference of 8 feet.

9. Sidewalk and landscaping

The sidewalks and landscaping should be configured so that if the roadway were expanded in the future, these would not have to be moved or replaced.

IV. COST ESTIMATES

We have prepared cost estimates for each type of cross section. Each of the cross-sections reviewed have a lineal footage cost. The various intersection costs will remain constant since they will be configured for a full range of turning movements in all cases.

We have assembled a table showing lineal footage cost of several roadway cross-section alternatives (Table IV-1).

The lineal foot costs provided are used for inserting into the overall cost estimate as a unit price for that typical section. Additional costs such as rail crossings, retaining walls, intersections, signalization, landscaping, stormwater management, lighting, etc. are then included in the overall cost estimate as additional items.

TABLE IV-1
LINEAL FOOT
UPDATED COST ESTIMATES FOR
VARIOUS ROADWAY CROSS-SECTIONS

I)	Two Lane Road w/Paved Shoulder and Open Ditches	$ 80.00/Ft.
II)	Two Lane Boulevard w/Paved Shoulder and Open Ditches (one lane each direction)	$ 98.00/Ft. (Preferred Alternative)
III)	Four Lane Roadway w/Paved Shoulder and Open Ditches	$135.00/Ft.
IV)	Four Lane Roadway w/o Shoulders and with Curb & Gutter & Storm Sewer	$170.00/Ft.
V)	Four Lane Boulevard w/Paved Shoulder and Open Ditches	$145.00/Ft.

Notes (Table IV-1):

1) These costs include roadway sub-base cost.

2) These costs assume minimal earthwork cost of $15.00/Ft.

3) Curb, gutter & storm sewer add approximate $65.00/Ft. to integral section and approximately $90.00/Ft. to a boulevard section.

4) Right-of-way cost is not included in these lineal foot costs.

5) Rail crossing cost not included in these lineal foot costs.

6) Bike path, sidewalk or street scaping not included in these lineal foot costs.

7) Stormwater management measures are included in these lineal foot costs.

8) Future construction costs not included.

TABLE IV-2

UPDATED COST ESTIMATE FOR BOARDMAN LAKE AVENUE

Preferred Alternative
(Two Lane Boulevard, Open Ditches)

Note - This Cost Estimate is broken down into various segments I thru V starting at Eighth Street and progressing south.

I. Intersection with Eight Street and Boardman Lake Avenue (Phase One)

DESCRIPTION	EST QUANTITY	UNIT PRICE	TOTAL PRICE
a) Demolition	1 LS	21,600.00	21,600.00
b) Traffic Maint.	1 LS	3,600.00	3,600.00
c) Right of Way	1 LS	16,200.00	16,200.00
d) Earthwork	1 LS	16,500.00	16,500.00
e) Curb & Gutter	1500 LF	14.00	21,000.00
f) Storm Sewer	1000 LF	33.00	33,000.00
g) Catch Basin	10 EA	1300.00	13,000.00
h) Adjust Utilities	1 LS	5500.00	5,500.00
i) Sub-Base	2000 CY	6.50	13,000.00
j) Aggregate	750 CY	20.00	15,000.00
k) Bituminous Surfacing	1000 TON	44.00	44,000.00
l) Sidewalks	10000 SF	4.00	40,000.00
m) Signalization	1 LS	16,200.00	16,200.00
n) Pavement Marking	1 LS	2,700.00	2,700.00
o) Restoration	1 LS	6,000.00	6,000.00
	Subtotal Eighth Street Intersection		267,300.00

II. Eighth St to 14th St (Phase One)

DESCRIPTION	EST QUANTITY		TOTAL PRICE
a) Two Lane Blvd. w/Open Ditches	2800 LF	98.00	274,400.00
b) Stormwater Mgt. Practices	1 LS	18,500.00	18,500.00
c) Rail Crossing	1 EA	450,000.00	450,000.00
d) Demolition & Cleanup	1 LS	37,000.00	37,000.00
e) Pedestrian Crossing	80 LF	1,550.00	124,000.00
f) Pedestrian Pathway	2800 LF	13.00	36,400.00
	Subtotal Main Corridor Eighth St to 14TH St		940,300.00

III. 14th St. Intersection (Phase One)

DESCRIPTION	EST QUANTITY		TOTAL PRICE
a) Demolition	1 LS	13,000.00	13,000.00
b) Traffic Maint.	1 LS	2,500.00	2,500.00
c) Earthwork	1 LS	13,000.00	13,000.00
d) Curb & Gutter	2000 LF	14.00	28,000.00
e) Storm Sewer	1700 LF	33.00	56,100.00
f) Catch Basin	8 EA	1,300.00	10,400.00
g) Adjust Utilities	1 LS	8,600.00	8,600.00
h) Rail Crossing	1 EA	450,000.00	450,000.00
i) Sub-Base	2800 CY	6.50	18,200.00
j) Aggregate	900 CY	20.00	18,000.00
k) Bituminous Surfacing	1300 TON	44.00	57,200.00
l) Sidewalks	7000 SF	4.00	28,000.00
m) Signalization	1 LS	16,200.00	16,200.00
n) Traffic Diverter Island	1 LS	5,500.00	5,500.00
o) Pavement Marking	1 LS	2,700.00	2,700.00
p) Restoration	1 LS	8,600.00	8,600.00
	Subtotal 14TH St Intersection		$ 736,000.00

IV. Boardman Lake Avenue 14th St. to South Connection (Phase Two)

DESCRIPTION	EST QUANTITY		TOTAL PRICE
a) Two Lane Blvd. w/Open Ditches	3100 LF	98.00	303,800.00
b) Stormwater Mgt. Practices	1 LS	25,000.00	25,000.00
c) Pedestrian Pathway	3100 LF	13.00	40,300.00
d) Demolition & Cleanup	1 LS	13,000.00	13,000.00
e) Rail Crossing	2 EA	450,000.00	900,000.00
f) Construct retaining wall	40,000 SF	16.00	640,000.00
	Subtotal Boardman Lake Ave from 14TH to S. Connection		1,922,100.00

V. 17th Street Connection and Cass Street South End Termination (Phase Two)

DESCRIPTION	EST QUANTITY		TOTAL PRICE
a) Curb & Gutter	300 LF	14.00	4,200.00
b) Bituminous Surfacing	1000 TON	44.00	44,000.00
c) Aggregate	500 CY	20.00	10,000.00
d) Sub-Base	1500 CY	6.50	9,750.00
e) Traffic Diverter Island	1 LS	5,500.00	5,500.00
f) Storm Sewer	800 LF	33.00	26,400.00
g) Catch Basins	6 EA	1,300.00	7,800.00
	Subtotal Boardman Lake Ave. 17th St. Connection and Cass St. South End Termination		107,650.00

I. Summary of Cost

Construction Cost Estimated Subtotal for entire Route & Section with Rail Crossings	Phase One	$ 1,943,600.00
	Phase Two	$ 2,029,750.00
10% Contingencies		$ 400,000.00
Design engineering		$ 400,000.00
Construction Engineering, Surveying & Testing		$ 600,000.00
MDOT Right of Way Acquisition Cost *		$
Fourteenth Street Right of Way Acquisition Cost *		$
TOTAL ESTIMATED PROJECT COST W/ RAIL CROSSINGS		$
	Use	$

* As provided by the City of Traverse City

VI. CONCLUSIONS

The information presented in this report is based on preliminary study. No design work was completed for this study, and costs are based on estimates only. The Boardman Lake Avenue project could be completed in phases, which would reduce the initial capital required for the project. The recommended phases would be as follows:

- Phase One, Eighth to Fourteenth Street
- Phase Two, Fourteenth to Cass Road

The City of Traverse City would need to acquire property from Boardman Banks between Fifteenth and Sixteenth Streets for completion of the Phase Two portion of the project. Without the Phase Two portion of the roadway, Phase One would have limited impact on the reduction of traffic congestion. Therefore, both phases would need to be completed for this project to be successful.

The scope of this study was to evaluate the alignment and type of roadway so as not to relocate the railroad tracks. However, by comparing information presented in this study with previous studies, it appears that a configuration relocating the railway to the east side of Boardman Lake Avenue would be beneficial in the following ways:

- Reduces overall cost of the project.
- Reduces number of grade crossings from four to one (east of Fourteenth Street intersection), and reduces the necessity for abandoning other grade crossings.
- Increases safety of the roadway.
- May provide more available space along the east edge of the existing ROW.
- May be possible to reconstruct the railway in the phases described above (this has not been studied at this time).