F6

City of Hiawatha

Engineering Department

101 Emmons St., Hiawatha Iowa, 52233-1697
PHONE (319) 393-1515 ext. 511 FAX (319) 393-1516

To: **Mayor and City Council** **Date:** **June 30, 2016**

From: John C Bender PE, City Engineer

Re: **Professional Services Work Order with Hall and Hall Engineers**

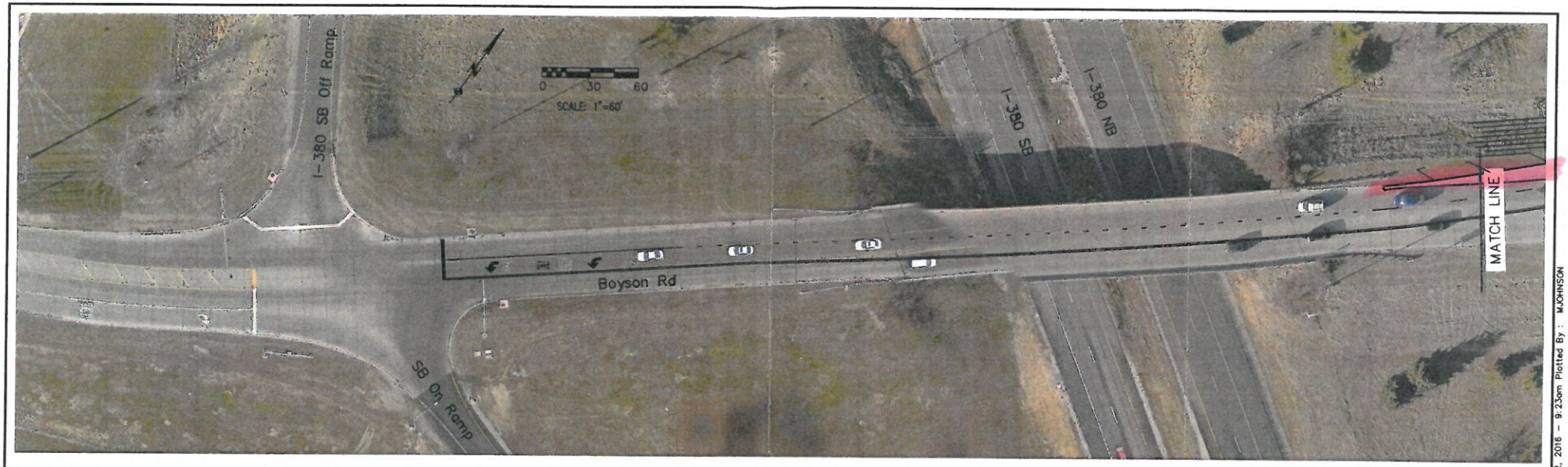
Description: **Work Order No 6-Boyson Road/North Center Point Road Intersection Study**

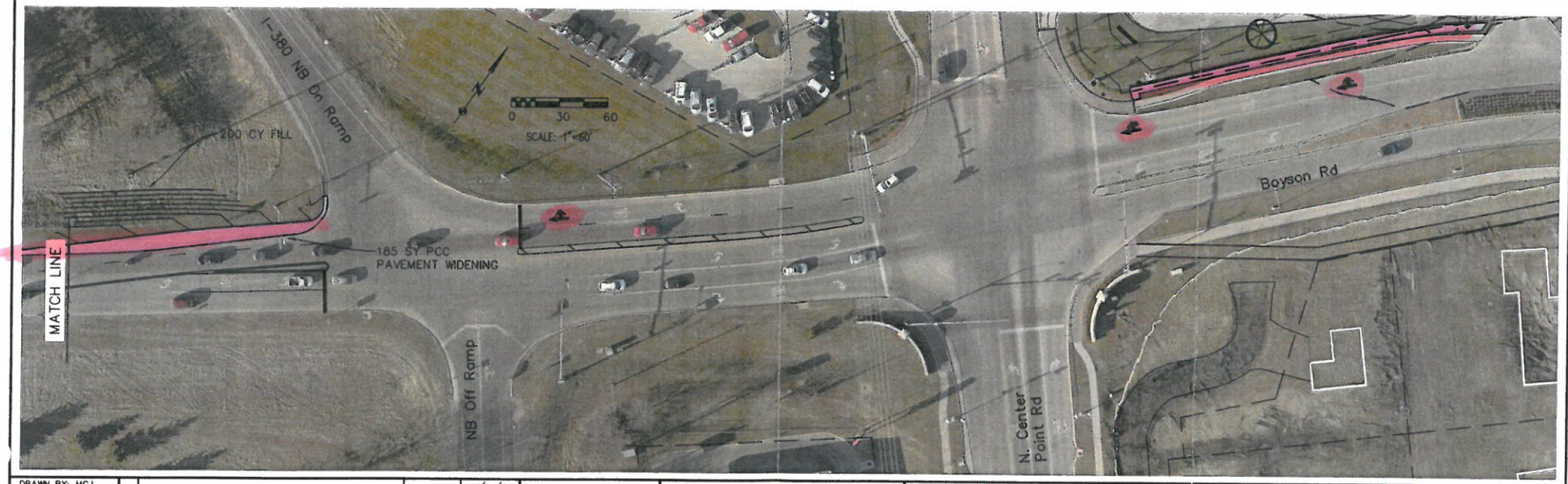
Report: The City Council approved a professional engineering amendment with Hall and Hall Engineers to develop a concept study for interim improvements to the Boyson Road/North Center Point Road intersection. This study was completed in April of this year. The proposal chosen by Council was option #2 that upgraded the traffic signals and added a small area of pavement widening to allow changing the traffic lane configurations.

The Council approved a budget item in the newly adopted CIP for $200,000 to prepare a project that could be an interim improvement project to the Boyson Road/North Center Point Road/ I-380 on-ramp. The DOT is revising the scope of the Interchange Justification Report (IJR) for the Tower Terrace Interchange study to review the proposed design at the Boyson Road interchange. This study is projected to require an additional year to perform. Because of this delay, we feel an interim improvement project should be considered to help the traffic in the area.

We have reviewed option #2 with the DOT and they are in concurrence. The attached work order is from Hall and Hall Engineers to develop plans and specifications to construct option #2 this summer.

Engineering recommends approval of the Work Order No 6.





DRAWN BY: MGJ				/ /
CHECKED BY: MGJ				/ /
APPROVED BY: MGJ				/ /
DATE: 02/11/16				/ /
FIELD BOOK: XXX	NO.	REVISION DESCRIPTION	APPROVED	DATE

Hiawatha!

HALL & HALL ENGINEERS, INC.
Leaders in Land Development Since 1959
1860 BOYSON ROAD, HIAWATHA, IOWA 52233
PHONE: (319) 362-9548 FAX: (319) 362-7595
CIVIL ENGINEERING • LANDSCAPE ARCHITECTURE
LAND SURVEYING • LAND DEVELOPMENT PLANNING
www.halleng.com

BOYSON ROAD & N. CENTER POINT ROAD
CONCEPT PLAN

OPTION 2
DUAL WESTBOUND LANES

SCALE: 1"=60'
PROJECT NO: 4089-16-1

SHEET 1 OF 2

CAD File: I:\projects\4000\4089-16-01 Boyson & NCPR Concept\DWG\Boyson Concept M.dwg Date Plotted : Feb 12, 2016 - 9:23am Plotted By : MJOHNSON

PROFESSIONAL ENGINEERING SERVICES
WORK ORDER #6
Boyson Road Capacity Improvements

I. General

A. The City of Hiawatha ("Owner") and Hall and Hall Engineers, Inc. ("Engineer") entered into an agreement for Professional Services dated January 8, 2014, and approved by City Council resolution 14-003. That agreement, together with previously approved amendments to it, is herein referred to as the "Master Agreement".

B. This work order describes work to be completed for a special project in accordance with paragraph 7.02 of the Master Agreement. All terms and conditions of the Master Agreement apply to this work order.

C. The intent of this work is to provide the Owner with a design plan of for interim traffic capacity improvement at the intersections of Boyson Road with North Center Point Road, I-380 Northbound Ramps, and I-380 Southbound Ramps, that is generally in accordance with Option 2 of the previously prepared traffic analysis.

II. Scope of Services

A. Project Administration – Engineer will provide general project administration for project scope, schedules, and budgets. This task will include up to two meetings with City Staff and attendance at one City Council meeting. This will also include coordination with the Iowa DOT and preparation of a Work in Right-of-Way permit. It is assumed that no other permits (including NPDES) will be required for this project.

B. Base Mapping – Engineer will perform topographic surveys at critical locations as required for the development of the project. A base map will be developed using this survey and available GIS data and aerial photography. No boundary survey will be done with this project.

C. Plan of Improvements – Engineer will prepare one set of improvement plans with sufficient detail for contractor bidding and construction. It is anticipated that the plan set will include the following:

1. Title Sheet
2. Grading Plan (for Embankment Widening West of the NB On Ramp)
3. Paving Plan (for Pavement Widening West of the NB On Ramp)
4. Pavement Marking Plan
5. Storm Sewer Plans (Relocation of Intake)
6. Traffic Control Plan
7. Traffic Signal Modification Plan

The plans shall have sufficient detail for Iowa DOT review and approval, but will not be prepared in the typical DOT standard plan format. Two plan submittals are anticipated with this project. The first submittal will be for review by the City and DOT and the second submittal will be the final bidding documents after incorporating changes based on review comments received.

D. Project Manual– Engineer will prepare a project manual to include all required bidding documents and any necessary special provisions, including special provisions for traffic signal modifications.

E. Engineer's Estimate of Cost – Engineer shall provide an estimate of cost for the proposed construction.

III. Basis of Payment

A. The Owner shall compensate the Engineer for services in accordance with paragraph 7.01 of the Master Agreement with the following exceptions:

1. The total value of work completed under this work order shall not exceed $19,650.

IV. Schedule

A. The work shall be completed in accordance with the following schedule:

Authorization to Proceed	July 7, 2016
Submit Preliminary Plans for Review	July 22, 2016
Receive all Review Comments	August 5, 2016
Submit Final Plans for Filing with City Clerk	August 17, 2016
Bid Opening	September 1, 2016
Award Contract	September 7, 2016
Begin Construction	September 26, 2016
Complete Construction	October 28, 2016

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, the Effective Date of which is the last date signed by the parties.

OWNER:

By: Bill Bennett

Title: Mayor

Date Signed:

Address for giving notices:

Hiawatha City Hall

101 Emmons Street

Hiawatha, Iowa 52233

319-393-1515

ENGINEER:

By: Matt Johnson, P.E.

Title: Project Manager

Date Signed: 7/1/16

Engineer License or Firm's Certificate Number: 421308857

State of: Iowa

Address for giving notices:

Hall and Hall Engineers, Inc.

1860 Boyson Road

Hiawatha, Iowa 52233

319-362-9548

Base model. As the table shows, significant improvements are expected simply through improving the signal timing. It should be noted that this optimization includes using "lagging" left turns for some phases. This means that the left turn phase comes up after the through traffic phase. While this timing is becoming more common in the Cedar Rapids area it is still less expected by drivers and can cause some confusion. Since a vast majority of the traffic along Boyson Road is commuter traffic, I believe they will quickly adjust to this timing plan and this should not be concerning.

In order to fully optimize and coordinate the signals, it is believed that the existing controllers will need to be upgraded. Depending on the extent of the equipment that needs to be replaced, the cost for this could range from $25,000 - $70,000. We are assuming that all three intersections would need new controllers and the NB Ramp intersection would need a full new cabinet. Our rough order of magnitude cost estimate for that work is $40,000.

2. <u>Add an Eastbound Left Turn Lane at N. Center Point Road (Option 1)</u>
One of the biggest concerns identified was a lack of storage for EB left turn vehicles between N. Center Point Road and the NB I-380 Ramps. In order to improve this, we evaluated an option for installing a second left turn lane. This option is illustrated on the attached Sheet 1. This would require minimal pavement widening due to additional pavement width currently present in this area. In addition to this widening, we would recommend removing the curb bump out just to the north along N. Center Point Road to allow two through lanes at least to Dina Road. The analysis results from this improvement (including signal timing optimization) are summarized in Table 1 as Option 1. This shows very little improvement over the base condition and we expect that operations during non-peak hours may even be worse than the base scenario. This is due to the fact that the dual lefts require this movement to operate as protected only operation (i.e. – no permitted left turns on the green ball). Additionally, the outside left turn lane is not expected to be fully utilized due to the fact that drivers understand they will need to merge left to continue going straight along N. Center Point Road north of Dina Road.

The rough order of magnitude construction cost estimate for these improvements, including traffic signal upgrades, restriping, and some minor pavement widening is $95,000.

3. <u>Add Westbound Through Traffic Lanes (Option 2)</u>
Another significant operational concern identified was the westbound movement. This is especially problematic in the short section between the I-380 NB Ramp intersection and the N. Center Point Road intersection. Option 2 was developed to

increase the vehicle storage area for this movement by modifying the right turn only lane into a shared through-right turn lane and widening the pavement west of the NB Ramp intersection to support two through lanes of traffic. The widening area is limited by the existing bridge and guardrail. Therefore, we would utilize the existing painted median as a dedicated WB left turn lane at the approach to the I-380 SB Ramp intersection. Since the traffic is reasonably split between WB through movements and WB left turn movements at that intersection, there is no real concern with optimal lane utilization from this lane configuration. It is noted that the WB right turn movement at the I-380 NB Ramp represents about 13% of the westbound traffic at that intersection during the PM peak hour.

To further improve WB traffic flow, it is further recommended that the WB right turn lane at the N. Center Point Road intersection also be repurposed as a shared through-right turn lane. This will allow more vehicles to queue up on that side of the intersection and, therefore, get through the intersection quicker during the green phase.

The rough order of magnitude construction cost estimate for these improvements, including traffic signal upgrades, restriping, embankment construction, and some minor pavement widening is $115,000.

It is noted that any of these improvements would require coordination with and permission from the Iowa DOT, since they maintain jurisdiction of the I-380 ramps. We have not yet initiated any discussion with them to gauge their acceptance of any of the proposed improvements.

Table 1: Comparison of Overall Intersection Operations by Alternative

Intersection	Peak Hour	Existing		Base		Option 1		Option 2	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Boyson Rd & N. Center Point Rd	AM	55.5	E	36.6	D	34.5	C	29.9	C
	PM	39.8	D	29.5	C	34	C	26.3	C
Boyson Rd & NB Ramps	AM	46.1	D	20.2	C	19.7	B	11	B
	PM	40.6	D	19.1	B	19.7	B	19.3	B
Boyson Rd & SB Ramps	AM	24.8	C	18.6	B	17.3	B	14.6	B
	PM	23	C	18.5	B	18.3	B	18.8	B

DRAFT

RESOLUTION NO. 16-
City Council

RESOLUTION APPROVING WORK ORDER #6 TO THE PROFESSIONAL SERVICES AGREEMENT BETWEEN THE CITY OF HIAWATHA AND HALL AND HALL ENGINEERS, INC. IN CONNECTION WITH THE BOYSON ROAD/NORTH CENTER POINT ROAD INTERSECTION IMPROVEMENT PROJECT

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HIAWATHA, IOWA, that the Mayor is hereby authorized to sign Work Order #6 to the Professional Services Agreement between the City of Hiawatha and Hall and Hall Engineers, Inc. for the following purposes and under the following terms:

for the purpose of providing project administration, base mapping, plan of improvements, project manual and Engineer's Estimate of Cost for the Boyson Road/North Center Point Road Intersection Improvement Project consisting of new signal upgrades, new timing and phasing concepts, and a new traffic lane configuration, at a total cost of work not to exceed $19,650.00, as shown in the attached Exhibit 'A'. The Professional Services Agreement with Hall and Hall Engineers, Inc. was approved by City Council Resolution #14-003 on January 8, 2014.

AYES:
NAYS:
ABSENT:

PASSED AND APPROVED this 6th day of July, 2016.

_____
Bill Bennett, Mayor

ATTEST:

_____
Kelly Kornegor, City Clerk