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FEASIBILITY REPORT

for

**KNOLLWOOD DRIVE and
1st AVENUE SOUTHWEST
SANITARY SEWER EXTENSION**

March 17, 2016

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

A handwritten signature in cursive script that reads "Larye J. Mick".

Larye J. Mick, P.E.

March 17, 2016

Minnesota Registration Number 15542

INTRODUCTION

The purpose of this report is to determine the feasibility of improving Knollwood Drive from Woodland Court to 1st Avenue SW and 1st Avenue SW from Knollwood Drive to 266 feet east of Knollwood Drive by extension of the municipal wastewater collection system. The terms "wastewater collection system" and "sanitary sewer" will be used interchangeably in this report.

Although the improvement has been petitioned for, the property represented on the petition does not abut on 35% of the frontage of the petitioned improvement. The recommended project should be considered as Council initiated in all proceedings. This report has been prepared pursuant to a Council resolution of February 22, 2016.

PROJECT NEED

Refer to the attached MAP 1. The City has received a petition for an extension of the wastewater collection system from the owners of a parcel of land located on the south side of 1st Avenue SW. They are proposing to develop the westerly area of a roughly triangular tract for multiple family housing consisting of condominiums.

The triangular parcel extends from Knollwood Drive eastward to the railroad property. It is bordered on the west by a single family home and acreage. Railroad property is adjacent on the south and east. An existing single family home with frontage on the south side of 1st Avenue SW is located on a 0.89 acre tract adjacent on three sides to the triangular tract.

None of the parcels of land located south of 1st Avenue SW are currently within the city limits. A petition has been received from the owners of the triangular tract for annexation into the city limits.

None of these parcels are currently served by city sanitary sewer or water distribution. The existing homes rely on septic systems and well water.

PROJECT DESIGN

Refer to the attached MAP 2. The wastewater collection system that is available to serve the proposed housing development currently ends at the intersection of Knollwood Drive and Woodland Court. A manhole is in place here with an 8" stub out to the south. The existing 8" sanitary sewer on Knollwood Drive should be extended south to the 1st Avenue SW intersection, and then eastward along 1st Avenue SW to the entrance road area of the proposed housing development.

The segment on Knollwood Drive should be installed at minimum grade to provide for future extensions to the south and west of the Knollwood/1st Avenue SW intersection. The length of these future extensions will be limited to the area near this intersection due to the rapidly decreasing ground elevations encountered in the westerly direction.

Segments installed east of the Knollwood/1st Avenue SW intersection should be 8" in size and installed at minimum grade and depth as needed to serve the proposed housing development, the existing single family home located somewhat within the development area, and any future housing that may occur in the easterly portion of the triangular tract. The railroad property and adjacent Highway 60 serve as an end to the service district. Further extension to the south and east is not possible.

The sanitary sewer segments installed on Knollwood Drive and on 1st Avenue SW should be considered as a public improvement. They have the potential to service more than just the proposed housing development. In accordance with City policy these segments are needed to bring sanitary sewer service to the site of development. The costs and financing sections of this report are based upon installing these two segments as a recommended public improvement.

In order to provide an adequate depth for the sanitary sewer to properly function as a gravity flow system for the service area this project will involve relatively deep excavations. Pipe will generally be installed at a depth of 18 to 22 feet. The work will be similar in scope to the 2008 sanitary sewer construction on Knollwood Drive north of Woodland Court. Unfortunately, this will result in removal of the pavement surface and related through traffic closure of Knollwood Drive and 1st Avenue SW during construction. Although access from one direction can be maintained for all properties involved, consideration should be given to requiring that the contractor perform the work during the

summer Prairie Elementary school break due to the volume of traffic approaching the school from the west and northwest.

Further extension (beyond the entrance to the proposed housing development) of the sanitary sewer eastward along 1st Avenue SW is not recommended as a public improvement. The north side of 1st Avenue SW (Prairie Elementary) is already served by sanitary sewer. The existing house on the south side of 1st Avenue SW could be served but the sanitary sewer would extend along 1st Avenue SW, at a cost to the City, without any other connections or use until reaching the east area of the potential future housing development. Additional sanitary sewers would still need to be provided by the developer within the proposed housing area. In order to prevent the duplication of installing parallel sanitary sewer segments it is recommended that the sanitary sewer be installed through the housing development instead.

The north-south sanitary sewer segment within the proposed housing development could potentially serve more than one property with future extensions. Therefore, it should be constructed by the developer but dedicated as a public sewer along with the corresponding easement to the city for access and maintenance.

The east-west sanitary sewer segment extending from the proposed development towards the east end of the triangular tract could be constructed in the future. This would also service the existing house tract. It could potentially serve more than one property. Because of this, it would need to be a public sewer located within an easement to the city for access and maintenance. This east-west segment could be constructed by the developer and dedicated to the city, or it could be constructed as a future city improvement project.

The different segments are indicated on the attached MAP 2.

ADDITIONAL WASTEWATER FLOW RELATIONSHIP TO AVAILABLE CAPACITY

The sanitary sewer extension presented in this report relies on the available downstream sanitary trunk main capacity. The Knollwood Drive sanitary sewer and its proposed extension discharge to the 12" sanitary sewer trunk line on South Shore Drive. The South Shore Drive trunk extends from Knollwood Drive to the lift station located near the intersection of South Shore Drive and 1st Avenue SW.

Sewer pipe sizing calculations performed by the City Engineer's Office show that the trunk line is near capacity. Although the sizing calculations indicate that the housing project being currently proposed would not cause the trunk line capacity to be exceeded, continued development south of 1st Avenue SW, within the Prairie Elementary School site or elsewhere within the sewer district, would result in a projection of the capacity of the trunk line being exceeded.

It is important to recognize that such pipe sizing calculations are not precise and that variations in factors used will result in a change in the determination as to current and/or projected capacity adequacy or deficiency. With or without additional development the sizing calculations indicate that consideration needs to be given to increasing the capacity of the South Shore Drive trunk. The first priority for increasing capacity would be the most downstream portion, specifically from the lift station to Flower Lane.

OTHER PUBLIC IMPROVEMENTS

Other common public improvements such as street, water distribution, and storm water management are either already in place to serve the proposed development or will need to be constructed by the developers at their cost.

The proposed housing development is served by 1st Avenue SW for street access. Driveways and roadways internal to the housing development will be constructed, maintained and owned by the developers.

A water main is in place along 1st Avenue SW to serve the housing development. It is anticipated that the developers will construct a private water main through the housing development to serve the individual units. Since this water main extension will only serve the proposed development area it will not be a public improvement. The existing single family homes on the south side of 1st Avenue SW can be served with individual water service lines from the 1st Avenue SW water main when the need occurs.

The housing development as proposed will require on-site storm water management per state and city requirements. This will be a system internal to the housing development. It will not involve additional properties and the need for a public storm water improvement.

COSTS AND FINANCING

The total estimated improvement project cost, including engineering and contingencies, is \$235,100. Of the total cost for a sanitary sewer project, that portion which would be incurred in constructing a sewer main of the size and depth adequate for only providing service to abutting properties is to be considered lateral sewer costs. Such lateral costs are based on the installation of an 8 inch main at up to 10 feet in depth. The remaining costs would be defined as trunk costs or those additional costs associated with providing service to an area larger than that which abuts on the project. These costs for the proposed improvement are estimated as follows:

Lateral Costs: \$146,400

Trunk Costs: \$88,700

Total Project: \$235,100

The cost differential for constructing up to 22 feet deep rather than 10 feet deep would typically be greater than estimated for this project. The reduced differential is a result of limited work area and proximity of adjacent utilities which increases the lateral cost. In other words, the lateral costs are greater than they might be in a less constricted alignment.

Special assessments for wastewater collection projects are levied in two components, trunk assessments and lateral assessments.

Lateral Assessments

Lateral assessments are based on the lateral costs as previously defined and the rate determining frontage or Residential Equivalent Connections (RECs) applicable to the project. The lateral costs divided by the rate determining units establishes the assessment rate. The amount of assessments is equal to the assessment rate multiplied by assessable units. Assessable units may be less than rate determining units when a portion or portions of the project abut property that is not benefitted by the project.

The property on the west side of Knollwood Drive is not found to be benefitted nor proposed to be assessed because the property is fully served by the Woodland Court sewer. The property in the northeast quadrant of 1st Avenue SW and Knollwood Drive has only been assessed for frontage from its northerly boundary to the southerly limits of the 2008 sanitary sewer extension. The remaining frontage of this property should be assessed lateral benefit as shown on MAP 1. Only that portion of the triangular tract on the south side of 1st Avenue SW as shown on MAP 1 is proposed to be assessed lateral benefit at this time.

The property abutting the triangular tract on the west may be subject to additional lateral assessment in the future if annexed and developed.

The selection of REC or frontage units tends to be based on the status of the abutting property. Frontage is generally used when assessments are to be levied to undeveloped property or properties that may be subdivided or rearranged. The use of frontage units yields a uniformly distributed rate which is beneficial in equitably reapportioning assessments at the time development or a change in property lines occurs. REC units are typically used where the number of individual connections or lots is able to be identified at the time the project is undertaken. In the case of this project the property could potentially be subdivided. It is therefore proposed to utilize frontage units.

The lateral assessment rate would be calculated as the \$146,400 in lateral costs divided by the 845.6 feet of rate determining frontage or \$173.13/ foot. Due to the unusually high assessments that would result from strict use of the City's Assessment Ordinance, it is believed that these assessments would exceed the benefit derived from the project as defined by the intent of Minnesota Statutes. It is therefore recommended that the lateral assessment be based on the current value of the previous

calculated sewer lateral assessment rates used in similar situations, which is estimated to be \$59.63 per foot at the time the project is undertaken. Final lateral assessments will be determined at the time of project financing or on calculated rates, whichever is less.

Trunk Assessments

Trunk assessments are levied on the basis of area benefitted by a sanitary sewer extension and the current trunk assessment rate which is independent of a particular project's cost. The trunk rate is defined by ordinance and originates from a July 1975 determination of estimated costs for all trunk improvements needed at that time and the total area to be served by those improvements. An adjustment using a construction cost index maintains current value of the trunk rate. A trunk fund receives all trunk assessments and is utilized to retire those debt costs attributable to trunk project costs. The trunk fund may receive more or less assessments than trunk costs for each project undertaken. Only the area shown on MAP 1 is subject to trunk sanitary sewer assessments as a result of the proposed improvement. All other properties within the city limits abutting on the proposed improvement have been assessed trunk benefit in full.

The property abutting the triangular tract on the west may be subject to additional trunk assessment in the future if annexed and developed.

Estimated Assessments

Estimated assessments, trunk fund obligations, and "City Share" costs of the project are as follows:

	<u>LATERAL</u>	<u>TRUNK</u>	<u>TOTAL</u>
Assessments	\$18,294.48	\$10,953.75	\$29,248.23 (12.44%)
Trunk Fund from		\$77,746.25	\$77,746.25
City Share	<u>\$128,105.52</u>	<u>0.00</u>	<u>\$128,105.52</u>
TOTAL	\$146,400.00	\$88,700.00	\$235,100.00

Provided that this project is combined with other assessable improvement projects as a single improvement project having more than 20% of its costs assessed, initial financing of the project costs should be through issuance of a PIR general obligation bond with possible use of 401 construction fund reserves until such a bond is issued. The bond debt would be recovered by special assessments and by special tax levy for the remaining costs not to be assessed.

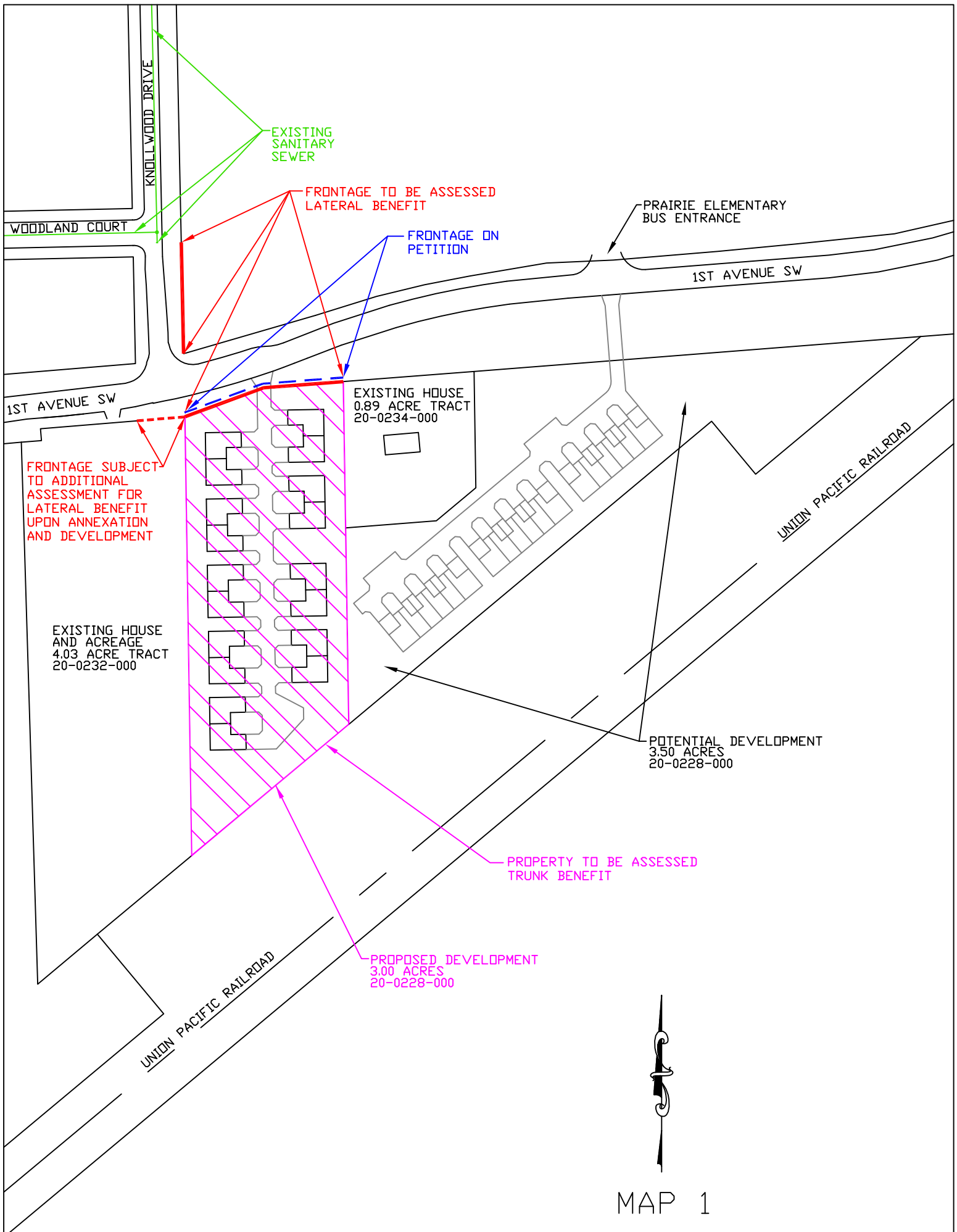
Should no other assessable improvements be ordered that result in 20% of the costs of a combined improvement project being assessed, it will be necessary for the city share of the lateral costs of the improvement to be permanently funded from 401 Construction Fund reserves. The assessable lateral costs would be initially financed from the 401 Construction Fund and ultimately financed by the lateral special assessments received. The Trunk sanitary fund will be used to finance the trunk costs of the improvement. The Trunk Fund will receive all trunk assessments for the project.

COMBINATION WITH OTHER PROJECTS

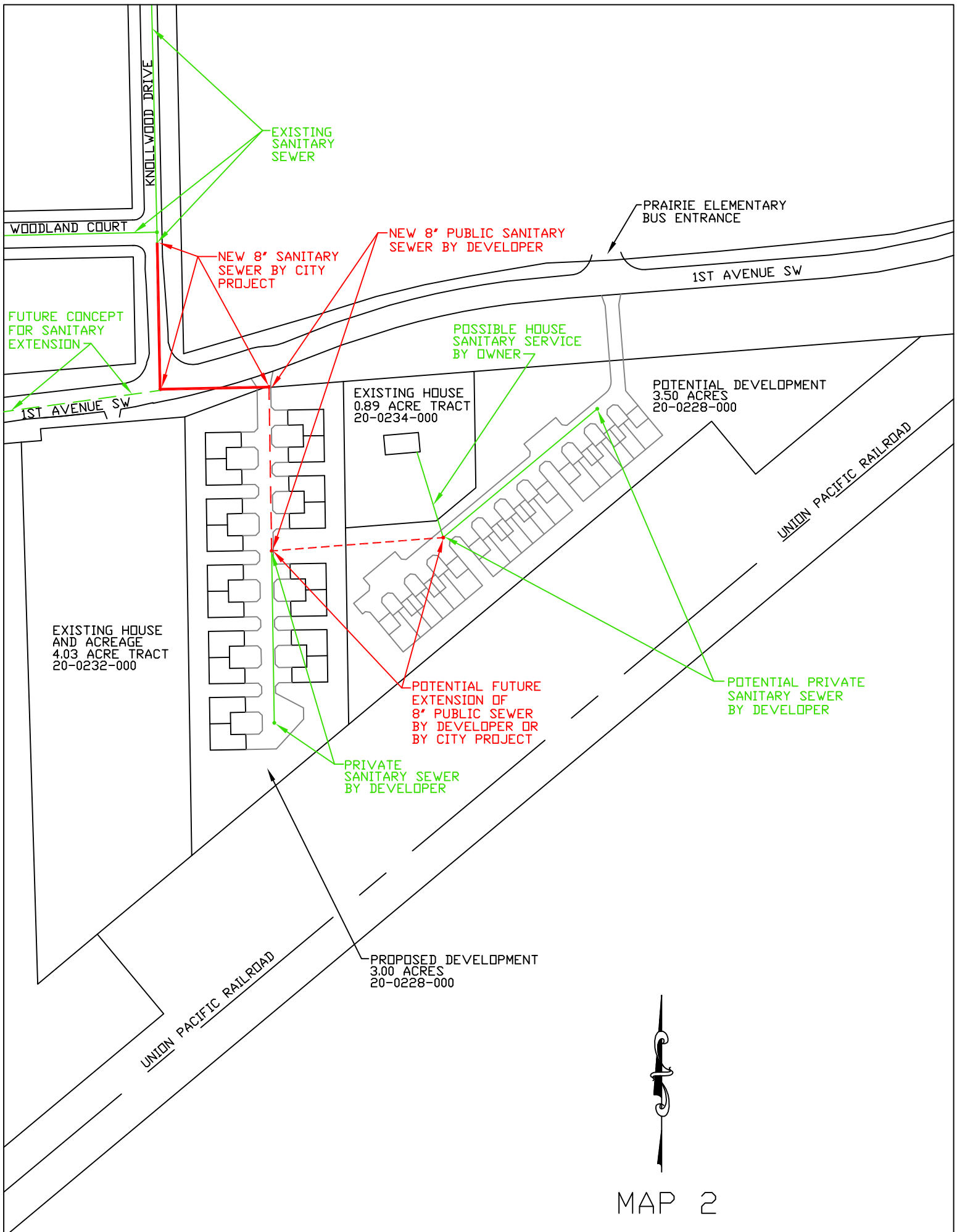
The proposed improvement could be combined with any sanitary sewer, storm sewer or water main extension projects ordered to be completed in 2016. Due to the necessary street closures consideration should be given to requiring that this portion of any combined project be accomplished during the summer school break.

CONCLUSION

The public improvements project as proposed in this report, combined with the developer installed improvements, is a feasible and cost effective manner in which to provide wastewater collection service to Knollwood Drive from Woodland Court to 1st Avenue SW and 1st Avenue SW from Knollwood Drive to 266 feet east of Knollwood Drive.



MAP 1



MAP 2