BOLTON & MENK

Real People. Real Solutions.

City of Ramsey

Future Business Park

March 2017 Update

Analysis and Report

Submitted by:
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EXECUTIVE SUMMARY

The City of Ramsey identified the need to prepare for the development of a new business park within the City. A large area of privately owned green-field space located on the north side of Trunk Highway 10, west of Armstrong Boulevard, was identified for a future Ramsey Business Park. A report was prepared in late 2015 and early 2016 which reviewed traffic impacts and outlined infrastructure needs related to business park area.

Development pressures have resulted in proposed land use changes for a portion of the study area. Phasing of the development activities in this area is also different than previously anticipated. As a result, the City requested an update to the previous analysis.

This update primarily includes a study of traffic impacts resulting from the revised anticipated land uses in the business park.

The updated analysis indicates the required improvements within the study area can be implemented based on the phasing plan currently proposed. Each series of improvements for Bunker Lake Boulevard and Puma Street can be implemented as the properties immediately adjacent to the roadways are developed.

Future improvements required to serve the area include:

- Expansion of Bunker Lake Boulevard (west of Armstrong Boulevard) to a four lane section,
- Expansion of the west end of Bunker Lake Boulevard and Puma Street to three lane sections,
- Construction of right turn lanes at entrances,
- Extension of an 18-inch sanitary sewer line along Bunker Lake Boulevard and Puma Street,
- North of the Puma Street/Bunker Lake Boulevard intersection, construction of a lift station,
- North of the lift station, extension of a 12-inch sanitary sewer gravity main,
- Extension of a 16-inch water main along Bunker Lake Boulevard and Puma Street,
- Use of regional rate control basins to maintaining existing flow rates into the COR,
- Installation of street lighting, trails/sidewalks, and landscaping consistent with City Policy, and
- Obtaining of ROW required for improvements during the platting process.

Total costs for all public improvements are approximately $6,819,000, assuming the project is constructed according to the phases described in this report. The costs are considered project costs and include 30% contingencies and project development costs (administrative, engineering, and fiscal).

Costs related to trunk sanitary sewer and trunk watermain were assumed to be paid from City utility funds. The City will need to develop a funding strategy for the remaining $5,419,000 in public improvement costs.

The information presented in this report is intended to allow for discussions with property owners and developers, as well as allow the City to begin considering funding options.

I. INTRODUCTION

The Ramsey City Council and Ramsey Economic Development Authority (EDA) identified the need to prepare for the development of a new business park within the City. The City identified a large area of privately owned green-field space located on the north side of Trunk Highway 10, west of Armstrong Boulevard, for a future Ramsey Business Park. A report was prepared in late 2015 and early 2016 which reviewed traffic impacts and outlined infrastructure needs related to the business park area. That report is incorporated by reference to this update.

Development pressures have resulted in proposed land use changes for a portion of the study area. Phasing of the development activities in this area is also different than previously anticipated. As a result, the City requested an update to the previous analysis.

The previous report provided a comprehensive analysis of the study area. This update focuses primarily on areas located adjacent to Puma Street, with a more cursory review of the remaining study area. Infrastructure needed and potential cost allocations related to the required improvements are included in this review.

The overall study area boundary remains unchanged from the previous study (see Figure 1).

II. LAND USE UPDATES

The primary land use changes relate to the area west of Puma Street and north of Bunker Lake Boulevard. The area west of Puma Street was previously a combination of Business Park and Medium Density Residential, and will now be all Medium Density Residential. The area north of Bunker Lake Boulevard had been Public, and will now be Business Park (see Figure 2 for updated land uses).

III. PRELIMINARY CONSIDERATIONS

The previous study described the roadway and public utility improvements required to serve the study area.

Public utility improvements are based on information contained in the City's Comprehensive Plans for sanitary sewer and water. The proposed updates in land use for this specific area are not anticipated to change the strategies contained in those Comprehensive Plans. The sanitary sewer and water system improvements, as outlined in the previous study, are still considered as base requirements for developments occurring in this area.

Roadway improvements require additional analysis based on the new land uses. Both the Average Annual Daily Traffic (AADT) and the Peak Hour turning movements are expected to change due to the updated land uses. The required roadway geometrics (number of through lanes, turns lanes, etc.) will be reviewed and compared to those described in the previous study.

Traffic patterns are expected to change as a result of the changes in land use. For example:

- For Business Park uses, traffic would be expected to enter the area in the morning (AM Peak Hour) and leave in the evening (PM Peak Hour).
- For Residential uses, traffic would be expected to leave the area during the AM Peak Hour and return during the PM Peak Hour.
- For Public, or School, uses, traffic would be expected to enter the area during the AM Peak Hour, leave during an early PM Peak Hour, and not impact the traditional PM Peak Hour. Also,

special events at School properties typically occur at off-peak times, creating congestion outside of the typical peak hours.

The updated land uses include Business Park areas being converted to residential, and also Public areas being converted to Business Park.

IV. DISCUSSION OF PHASES/IMPROVEMENTS

The previous analysis considered a phasing plan beginning a quarter of a mile west of Armstrong Boulevard and then systematically extending to the west along Bunker Lake Boulevard and then north along Puma Street. New development pressures create a revised phasing strategy for implementation of infrastructure improvements.

A Preliminary Plat is anticipated for the 87.8 acre property immediately west of Puma Street and extending from the Union Pacific Railroad tracks to Alpine Avenue. This area is anticipated to ultimately contain 351 lots and be phased from south to north.

The current phasing strategy is depicted on Figure 3. A discussion of the phasing, along with required infrastructure improvements is described below:

A. Phase 1A

The phase 1A improvements are as depicted on Figure 4. The developments will include both Residential and Business Park uses.

The public utility improvements will consist of extending the sanitary sewer and water mains to Puma Street. The utilities will need to be extended beyond the future roadway improvements to avoid the need to impact those facilities when future phases occur.

The roadway improvements will include construction of Bunker Lake Boulevard from the previously constructed west access to the former school property to Puma Street.

B. Phase 1B

See Figure 5 for the anticipated Phase 1B development area. The improvements will include both Residential and Business Park uses, extending north from the Phase 1A development area. The Phase 1B development area is anticipated to extend to the low area along Puma Street.

The public utility improvements will consist of extending the sanitary sewer and water mains north along Puma Street. The utilities will need to be extended beyond the future roadway improvements to avoid the need to impact those facilities when future phases occur.

The roadway improvements will include construction of Puma Street from Bunker Lake Boulevard to the low area along Puma Street.

C. Phase 2

See Figure 6 for the anticipated Phase 2 development area. The improvements are anticipated to consist entirely of residential uses, extending from the low area along Puma Street to Alpine Drive.

The public utility improvements will consist of extending the sanitary sewer and water mains north along Puma Street. The utilities will need to be extended to Alpine Drive, with consideration given to future extensions along Alpine Drive.

The roadway improvements will include construction of Puma Street from the low area

along Puma Street to Alpine Drive.

D. Future Phase

The future phase of development is depicted on figure 7, and includes an area east of the Phase 1A, Phase 1B and Phase 2 improvements.

The area includes Business Park uses. The north half of Bunker Lake Boulevard, along with sanitary sewer and water mains have been constructed through this area. Roadway improvements will include construction of the south half of Bunker Lake Boulevard.

E. Area of Additional Consideration

This area is depicted on Figure 8 and is comprised of the areas along the first ¼ mile of Bunker Lake Boulevard west of Armstrong Boulevard which may access Bunker Lake Boulevard in the future. There is the potential for this area to be developed as a commercial/retail center, which would be a significant traffic generator. There is also the potential for the property located south of Bunker Lake Boulevard to access Armstrong Boulevard at 147th Avenue, which would relieve stress on the Bunker Lake Boulevard and Armstrong Avenue intersection.

V. ASSUMPTIONS CARRIED FORWARD

The primary focus of this analysis is related to providing infrastructure to serve development along Puma Street in the near future. In the previous study, assumptions were made that should be considered by the City as developments are brought forward. The following is a summary of those items:

Right-of-Way Requirements

We have assumed that most of the required improvements will be development driven and Right of Way will be secured through the platting process. The City will need to review the right of way required and secure needed easements during the Preliminary Platting process.

Phased Improvements

A general understanding of the improvements required to ultimately serve the area along with an anticipated sequencing of the improvements is described above. Changes in the sequencing of the improvements could impact the facilities needed for each phase and the costs associated with those improvements.

Jurisdictional Authority/Approvals/Permits

As the project moves from the planning stages to design and construction, permits will be required from various agencies. The following agencies will be permitting entities for considered improvements:

- Minnesota Department of Transportation State Aid: Bunker Lake Boulevard and Puma Street are State Aid routes,
- Minnesota Pollution Control Agency: NPDES Storm Water Permit,
- Minnesota Pollution Control Agency: Sanitary Sewer Extension Permit,
- Minnesota Department of Health (MDH): Watermain Extension and Dewatering,
- Anoka County: Work in Right of Way, and
- Lower Rum River Watershed Management Organization: Storm Water.

Both MnDOT and Anoka County were engaged during the previous study process. Comments from both agencies are reflected in the improvements considered in this report.

Previous Improvements

Significant consideration and planning was completed prior to completion of the improvements constructed in 2011. Those improvements included street, trail, sanitary sewer and water distribution. Additionally, consideration was given to storm water management strategies and a potential 30-inch raw watermain from a future intake on the Mississippi River to the proposed site of the water treatment plant, just south of Fire Station No. 1. All previous analyses and reports are considered as a part of this analysis.

VI. ADDITIONAL ANALYSIS

In the previous analysis, we completed traffic and storm water studies and reviewed City Comprehensive Plans for sanitary sewer and water main needs for the study area. Based on the changes in proposed land use, the traffic study requires revisions. The storm water requirements, along with the sanitary sewer and water main needs, are unchanged as a result of the revised land uses. The following paragraphs relate key findings of the traffic analysis. The complete analysis is included in Appendix B of this report.

a. Traffic Analysis Update

The traffic analysis was completed to determine required lane geometry for Bunker Lake Boulevard and Puma Street, along with turn lane requirements at four intersections in the study area.

The revised land uses result in an increase of 18,100 trips per day into and out of the area at full build. This is at the low end of the range previously calculated for the area (18,500 to 23,300).

Note: Short term improvements are intended to mitigate current safety or operations problems, along with full development of the Study Area. Mid-term improvements are anticipated safety related improvements that may be required within the study area. Long-term improvements are anticipated safety improvements required as a result of growth in the region.

b. Short Term Improvements

- Armstrong Boulevard & Bunker Lake Boulevard:
    - Bunker Lake Boulevard is proposed to be reconstructed in the near future by Anoka County to a four lane divided road between Ramsey Boulevard and Armstrong Boulevard. The dual southbound left turn lanes at this intersection will be striped when Bunker Lake Boulevard is reconstructed. A southbound double left turn lane will help reduce queues entering the COR development.
    - Plan for eastbound dual-right turn lanes, two eastbound through lanes, and a 300 ft. left turn lane.
- Bunker Lake Boulevard (west of Armstrong Boulevard):
    - Expand to a four lane section for development to the first full access to the west of Armstrong Boulevard. This will be between 540 ft. to 775 ft., depending on access from the COR to Bunker Lake Boulevard.

- The eastbound approach should include a left turn lane, two through lanes, and one right turn lane.

- Bunker Lake Boulevard (west of commercial section to Puma Street):
  - Expand to a three lane section for development.
  - Right turn lanes (locations and lengths) will be determined based on development type. Right turn lanes will typically be required where development related trips are anticipated to be more than 100 per day.

- Puma Street:
  - Expand to a three lane section for development (two through lanes and one center left turn lane). Depending on what type of developments occur on the east side of Puma Street, and where those accesses are located, Puma Street could potentially remain as a two lane roadway.
  - Right turn lanes (locations and lengths) will be determined based on development type.

- Bunker Lake Boulevard & Puma Street Intersection:
  - An all-way stop or single lane roundabout will operate adequately at this intersection for the 2040 Full-Build conditions. A southbound left turn lane and westbound right turn lane are recommended for an all way stop.

c. Mid-Term Improvements

- See attached Traffic Memorandum in Appendix B.

d. Long-Term Improvements

- See attached Traffic Memorandum in Appendix B.

e. Discussion of Findings

- The required improvements within the study area can be implemented based on the phasing plan described above. Each series of improvements for Bunker Lake Boulevard and Puma Street can be implemented as the properties immediately adjacent to the roadways are developed.
- Puma Street could potentially be developed as a two lane section with right and left turn lanes at key access points. This will depend on access point locations, type of development on the east side of Puma Street, and location of accesses along the corridor. We recommend proceeding with the three lane section at this time due to the uncertainties of development in the area.
- For Phase 1A, right turn lanes will most likely be required both eastbound and westbound along Bunker Lake Boulevard and southbound along Puma Street at proposed access locations. Temporary paving will be required to transition back to the existing Bunker Lake Boulevard and the existing Puma Street.
- For Phase 1B, right turn lanes will most likely be required both northbound and southbound along Puma Street at proposed development access locations. Temporary paving will be required to transition back to the existing Puma Street.
- For Phase 2, right turn lanes will most likely be required both northbound and southbound along Puma Street at proposed development access locations.

- For the Future Phase, right turn lanes will most likely be required along Bunker Lake Boulevard in both the eastbound and westbound directions. Temporary paving will be required to transition back to the existing Bunker Lake Boulevard.
- Our analysis indicates that, while nearing capacity, the intersection of Bunker Lake Boulevard and Armstrong Boulevard will not require improvements until the Area of Additional Consideration is developed.

VII. ADDITIONAL IMPROVEMENT CONSIDERATIONS

For more detailed information of each of the following items, please reference the previous study report.

Street Lighting

The costs included for street lighting were derived from recent projects within the City of Ramsey.

Trails/Sidewalks

Project costs shown in this report include trails along the south side of Bunker Lake Boulevard and the east side of Puma Street.

Phase Transitions

Bunker Lake Boulevard and Puma Street will be constructed to wider sections than currently exist. Because the roadways will be constructed in phases, they will need to taper to meet the existing, narrower roadway widths. These taper sections will then be removed as the next phase of improvements is completed. Costs were included in each phase for these tapering roadway sections.

Right Turn Lane Additions

Right turn lanes will be required at each access off of Bunker Lake Boulevard and Puma Street. The actual access locations will be dependent upon the type of land use and internal site characteristics. We included allowances for the right turn lanes in each phase for budgeting purposes.

Landscaping

The improvements considered with this report include a very utilitarian landscaping approach to the area. Bituminous trails and lighting were included, but other features, such as trees, shrubs, decorative features and monuments are not included in the estimated project costs.

Right of Way and Easements

We assumed that required rights of way would be dedicated as a portion of the development process and no costs are included in the project costs for acquisitions.

VIII. COST CONSIDERATIONS

Costs were developed based upon phased implementation. The phasing is as depicted on the figures in Appendix A. All costs presented in the following pages are 2017 costs, with no allowance for inflation.

Phases 1A, 1B and 2

Improvement Type	Phase 1A	Phase 1B	Phase 2
Roadway	$ 795,000	$ 940,000	$ 675,000
Roadway Transitions	$ 66,000	$ 78,000	$ 56,000
Right Turn Lanes	$ 132,000	$ 156,000	$ 112,000
Trails/Sidewalks	$ 106,000	$ 125,000	$ 90,000
Storm Water Management	$ 0	$ 48,000	$ 16,000
Street Lighting	$ 76,000	$ 90,000	$ 65,000
Trunk Water	$ 154,000	$ 182,000	$ 131,000
Trunk Sanitary Sewer	$ 179,000	$ 545,000	$ 179,000
Total Costs/Phase	**$ 1,508,000**	**$ 2,164,000**	**$ 1,324,000**
Total Costs less Public Utilities	**$ 1,175,000**	**$ 1,437,000**	**$ 1,014,000**

Future Phases

Improvement Type	Future East	Additional Area
Roadway	$ 628,000	$ 580,000
Roadway Transitions	$ 62,000	$ 58,000
Right Turn Lanes	$ 52,000	$ 48,000
Trails/Sidewalks	$ 115,000	$ 106,000
Storm Water Management	$ 0	$ 0
Street Lighting	$ 75,000	$ 69,000
Trunk Water	$ 19,000	$ 0
Trunk Sanitary Sewer	$ 11,000	$ 0
Total Costs/Phase	**$ 962,000**	**$ 861,000**
Total Costs less Public Utilities	**$ 932,000**	**$ 861,000**

Total Cost all Phases	**$ 6,819,000**
Total Cost all Phases less Public Utilities	**$ 5,419,000**

The above costs are considered project costs and include 30% contingencies and project development costs. Project development costs include administrative, engineering, and fiscal related costs.

The roadway transition costs are allotments for phase transitions associated with tapering pavements sections to match in-place sections where required, and subsequent removals of the transition areas.

The right turn lane costs depicted in the tables include a 150 ft turn lane with 1:10 taper sections.

Street lighting costs are based upon recent installations within the City of Ramsey.

For storm water management, costs were included for manholes, catch basins, and pipe within the street sections and included in the roadway costs. For Phases 1B and 2, ponding costs were included for excavation related activities. We assumed a ponding area would be acquired through the platting process, and ponding within a development site would be expanded to include volume for roadway drainage.

The Phase 1A limits are based upon the area that can be served by a gravity sanitary sewer system. The Phase 1B sanitary sewer costs include a lift station and forcemain.

IX. COST ALLOCATION ALTERNATIVES

The costs, or a portion of the costs, of the improvements are typically allocated back to adjacent properties through the use of assessments, fees and other methods. The costs are typically allocated in a way that is equitable to the properties benefitting from the improvements. Public improvements that will become City owned and maintained are typically constructed through a public process, while secondary improvements are constructed by the developer. For our analysis, we assumed the following items would be constructed through the public process:

- Bunker Lake Boulevard and Puma Street, including storm water conveyance systems,
- Trunk Water Facilities,
- Trunk Sanitary Sewer Facilities,
- Trails, and
- Street Lighting.

While the street lights will most likely be installed by a private utility and the trails could potentially be constructed by the property owner, we have included these items as public improvements.

Other improvements were considered secondary and are typically the property owner's responsibility to install:

- Sanitary Sewer Service Extensions,
- Water Service Extensions,
- Natural Gas Lines to Buildings,
- Telephone Service to Buildings,
- Electric Service to Buildings,
- Site Grading,
- Site Landscaping,
- Site Storm Water Conveyance,
- Storm Water Ponding, and
- Easement Dedication.

These types of improvements are typically inspected by the City for conformity with applicable codes and standards, but are constructed by the property owner.

Figure 9 depicts the parcels considered for this report and also provides additional information related to each parcel. Similar information is presented in the following table:

Identification Number	Zoning Classification	Gross Area less NWI Area (Acres)	Adjusted Frontage (Ft)
Phase 1A			
1	B-2 Business District	20.307	1,358
2	B-2 Business District	10.843	1,002
4	R-2 Medium Density Residential	9.231	120
5	R-2 Medium Density Residential	19.691	399
Phase 1A Totals		**60.072**	**2,879**
Phase 1B			
6	B-2 Business District	27.116	1,141
7	R-2 Medium Density Residential	16.022	928
Phase 1B Totals		**43.138**	**2,069**
Phase 2			
8	R-1 Low Density Residential	28.338	683
9	R-1 Low Density Residential	4.107	419
10	R-2 Medium Density Residential	35.285	1,289
Phase 2 Totals		**67.730**	**2,391**
Future			
11	B-2 Business District	24.801	1,343
12	B-2 Business District	23.324	1,345
13	B-2 Business District	11.529	0
Future Phase Totals		**59.654**	**2,688**
Additional Area			
14	COR	7.507	1,263
15	R-1 MUSA	7.878	1,261
Additional Area Totals		**15.385**	**2,524**
Totals all Phases		**245.979**	**12,551**

Note: The table above includes a column for Gross Area – NWI Area. This represents the total area of the parcel based on GIS mapping, less the wetland area per the National Wetland Inventory (NWI) GIS mapping.

The zoning classifications listed in the table above are based on anticipated future zoning for the study area. Gross areas and frontages are based on GIS information and will most likely be refined during subsequent phases of project development.

A portion of the improvements will be paid by the City either through utility funds or other means. A list of assumptions is as follows:

- All trunk water and sanitary sewer system costs will be paid for through the City utility funds,
- Storm water management costs are related to ponding and are considered integral to roadway construction,
- Assessments will be made to benefitting properties as each phase is constructed,
- Two standard methods of assessments were analyzed including: Frontage and Area.
- The City's existing assessment policy very closely matches the Frontage method, and
- Gross acreage (less NWI Wetland acreage) was used in lieu of net developable acreage in the calculations below.
- Lot 3 was not considered in the assessments as the lot is zoned residential. The resultant assessment amounts are considered negligible related to the entire Business Park area.
- Lots 14 and 15 abut Armstrong Boulevard, a County roadway, and will access off of Bunker Lake Boulevard. Lots 1 and 4 abut a portion of the Puma Street right of way that is anticipated to be vacated. Lots 8, 9 and 10 abut Alpine Drive, but access will be limited to Puma Street.

The table below depicts a distribution based on all costs being assessed to the benefitting properties. We have assumed for this analysis the costs would be assessed to properties benefitting from each phase of construction. For instance, properties directly benefitting from Phase 1 improvements would be assessed for Phase 1 costs at the time of Phase 1 improvements.

Calculations were based on the areas and front footages, along with the costs per phase as developed earlier within this report. Trunk sanitary sewer and trunk watermain were considered City costs and were not included in the calculations. While this study focuses primarily on Phases 1 – 3, the future phase and the area of additional consideration were included for comparison. A summary of the unit costs used in the calculations is presented below:

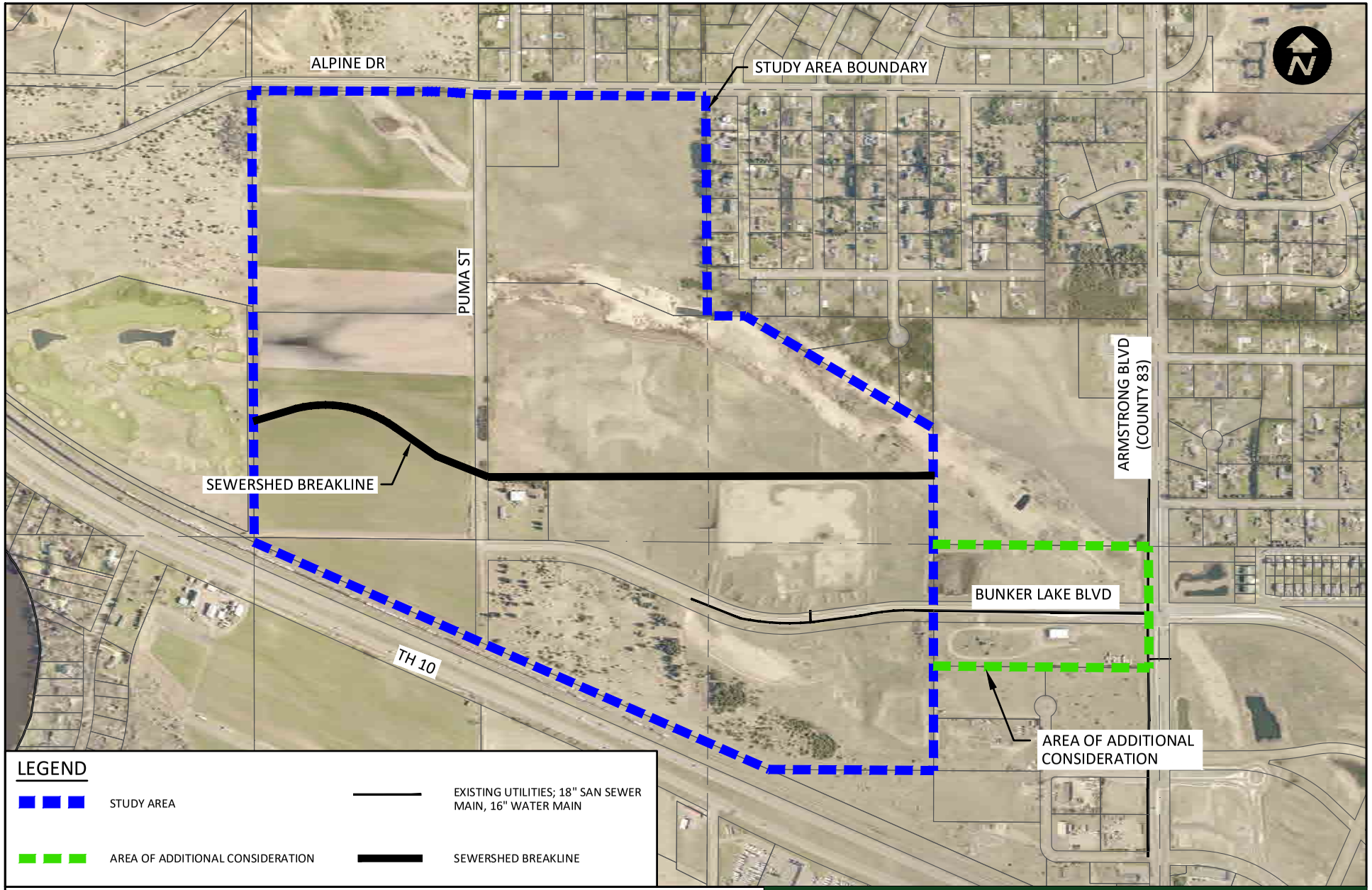
Phase	Frontage Method (Cost/FF)	Area Method (Cost/Acre)
1A	$ 408.13	$ 19,559.86
1B	$ 694.54	$ 33,311.70
2	$ 424.09	$ 14,971.21
Future	$ 346.73	$ 15,623.43
Additional Area	$ 341.13	$ 55,963.60

Based on the above cost distribution, the potential assessments per lot per phase is depicted below:

Identification Number	Frontage Method	Area Method
Phase 1A		
1	$ 554,200	$ 397,200
2	$ 409,000	$ 212,100
4	$ 49,000	$ 180,500
5	$ 162,800	$ 385,200
Phase 1A Totals	**$ 1,175,000**	**$ 1,175,000**
Phase 1B		
6	$ 792,500	$ 903,300
7	$ 644,500	$ 533,700
Phase 1B Totals	**$ 1,437,000**	**$ 1,437,000**
Phase 2		
8	$ 289,700	$ 424,300
9	$ 177,700	$ 61,500
10	$ 546,700	$ 528,300
Phase 2 Totals	**$ 1,014,000**	**$ 1,014,000**
Future Phase		
11	$ 465,700	$ 387,500
12	$ 466,400	$ 364,400
13	$ 0	$ 180,100
Future Phase Totals	**$ 932,000**	**$ 932,000**
Additional Area		
14	$ 430,800	$ 420,100
15	$ 430,200	$ 440,900
Additional Area Totals	**$ 861,000**	**$ 861,000**
Total all Phases	**$ 5,419,000**	**$ 5,419,000**

The information presented in this section of the report is intended to allow for discussions with property owners and developers to be initiated. Refinement of the amounts presented is anticipated based on those discussions.

Appendix A: Figures



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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
LOCATION & EXISTING CONDITIONS

FIGURE 1

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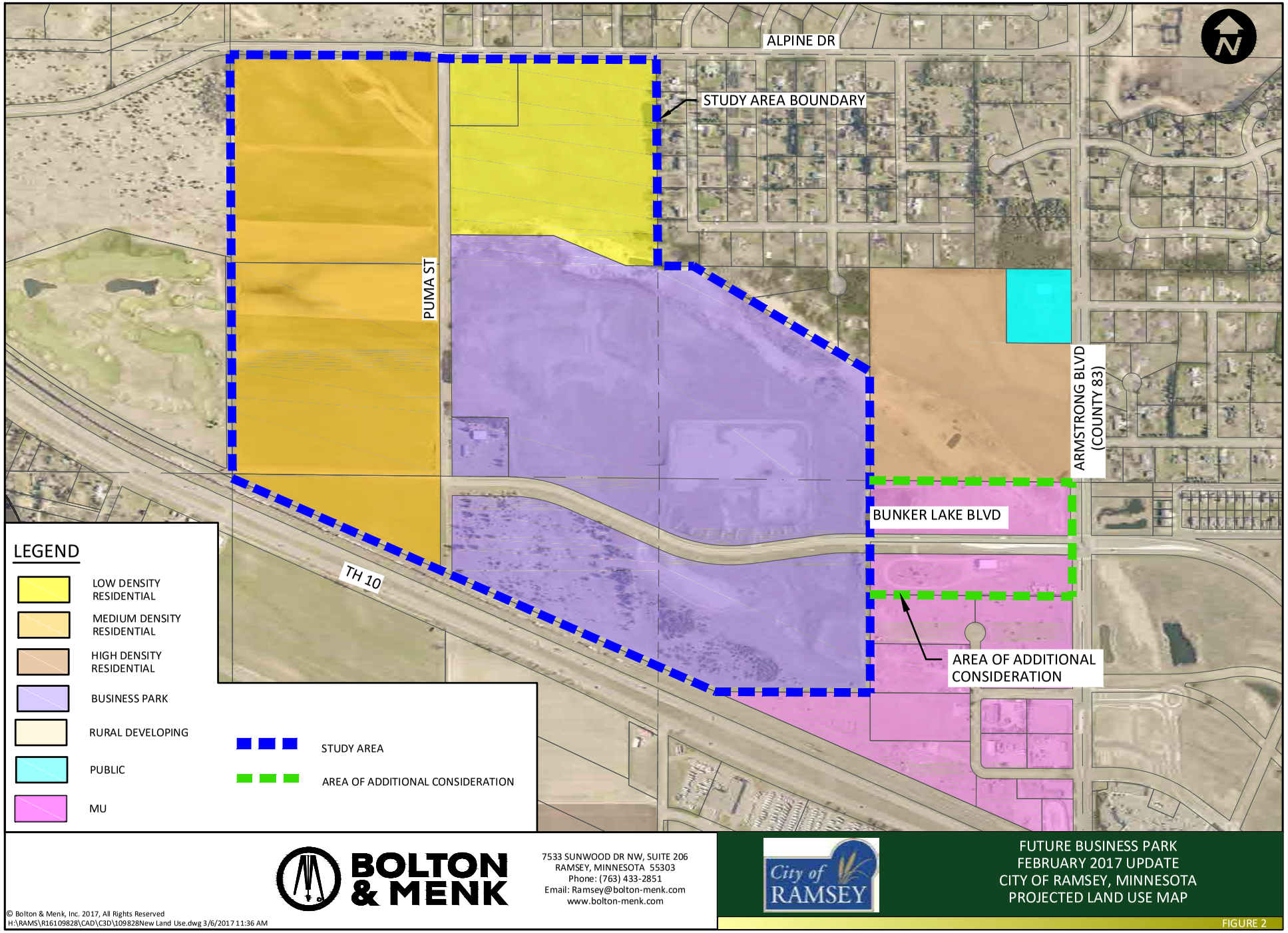

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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
PROJECTED LAND USE MAP

FIGURE 2

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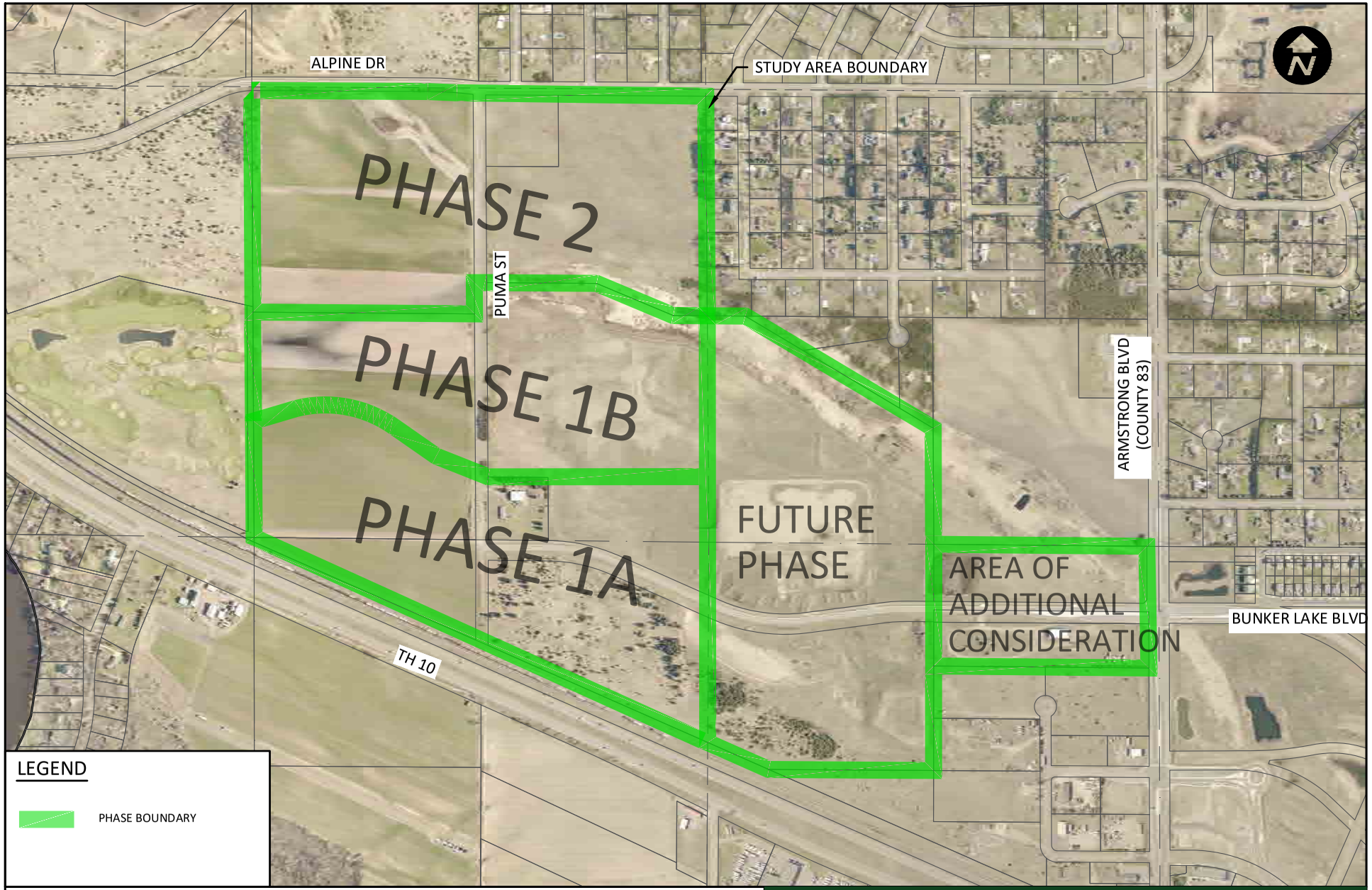

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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
PHASING MAP

FIGURE 3

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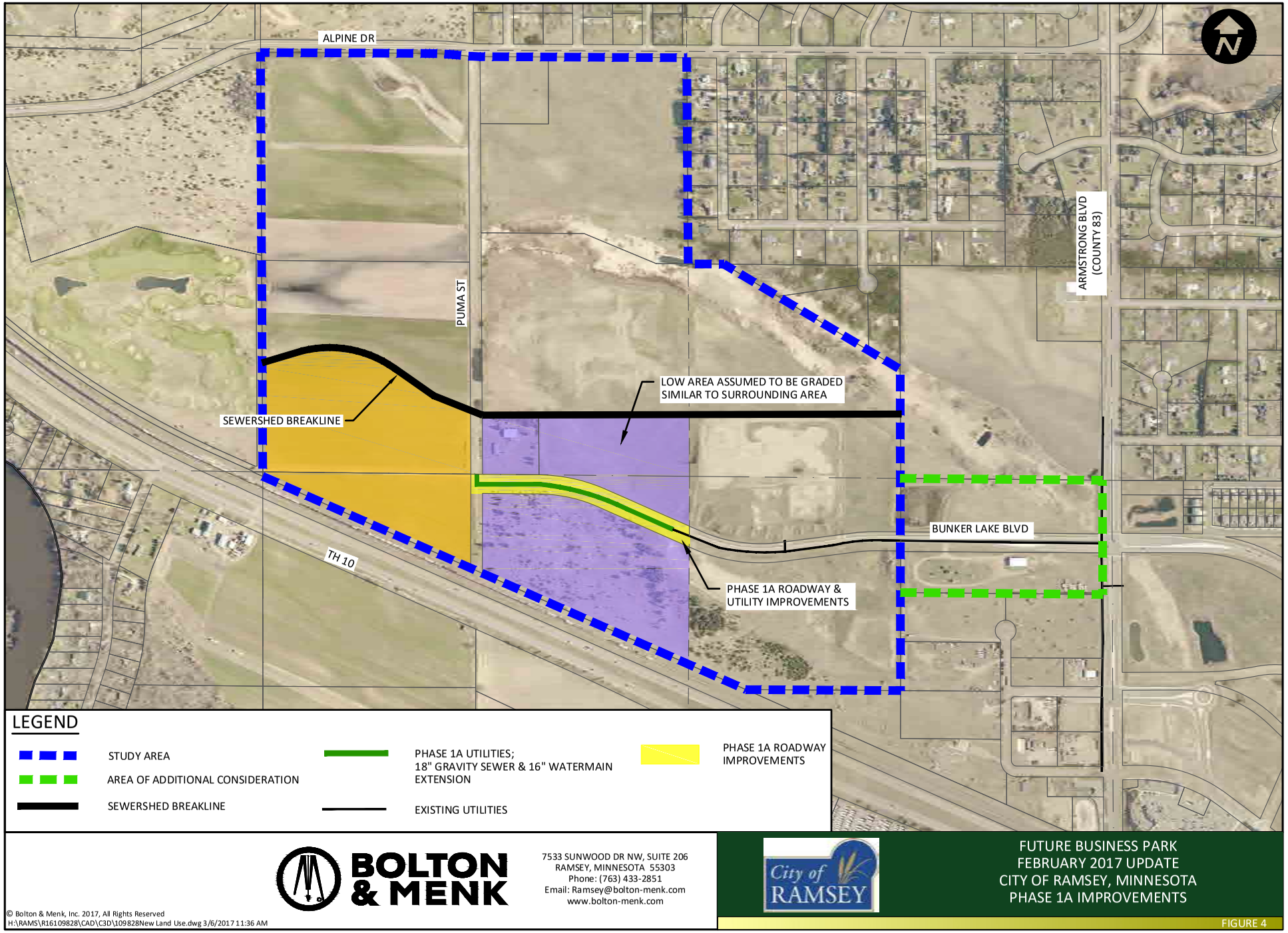

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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
PHASE 1A IMPROVEMENTS

FIGURE 4

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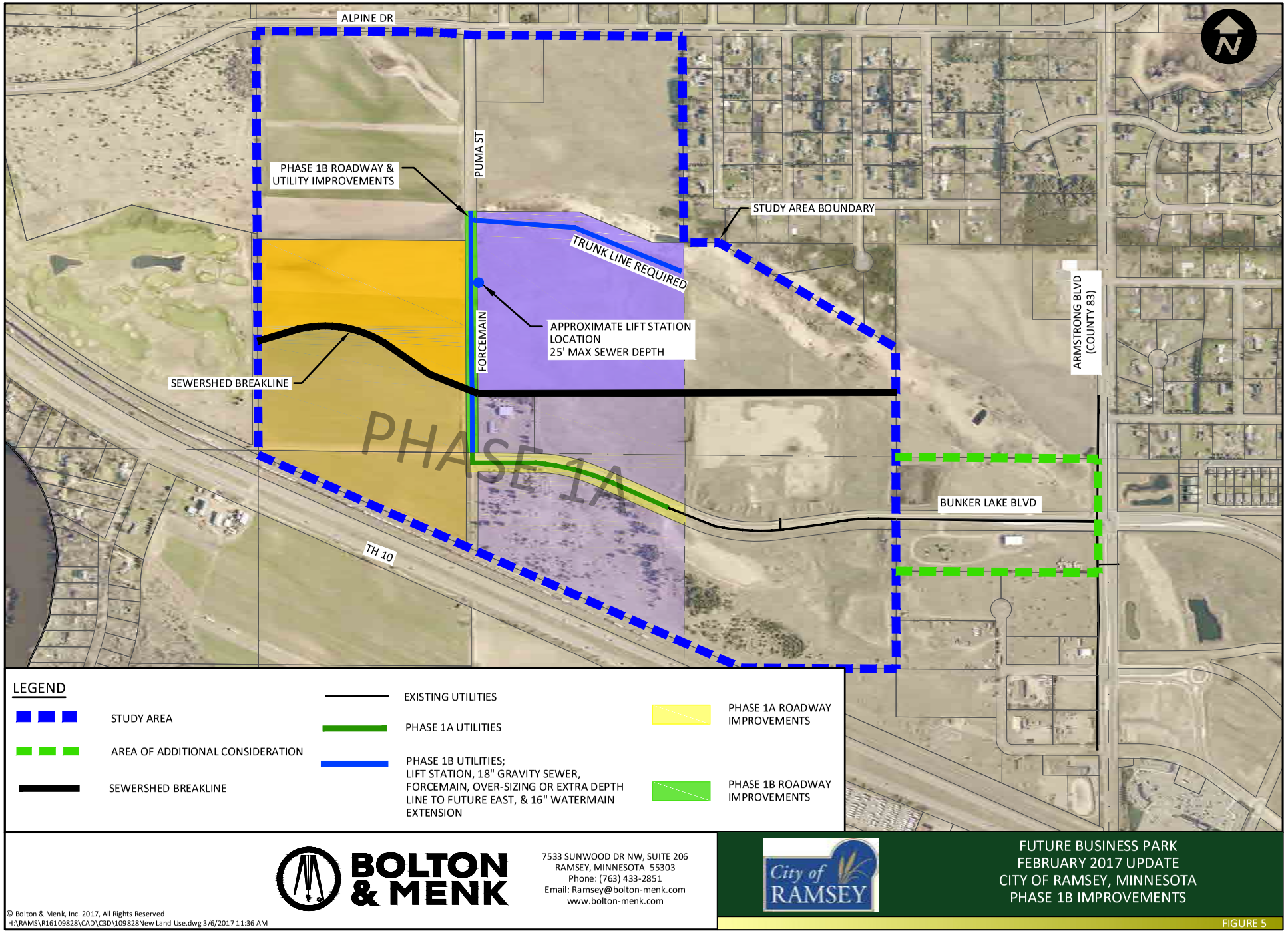

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FUTURE BUSINESS PARK
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CITY OF RAMSEY, MINNESOTA
PHASE 1B IMPROVEMENTS

FIGURE 5

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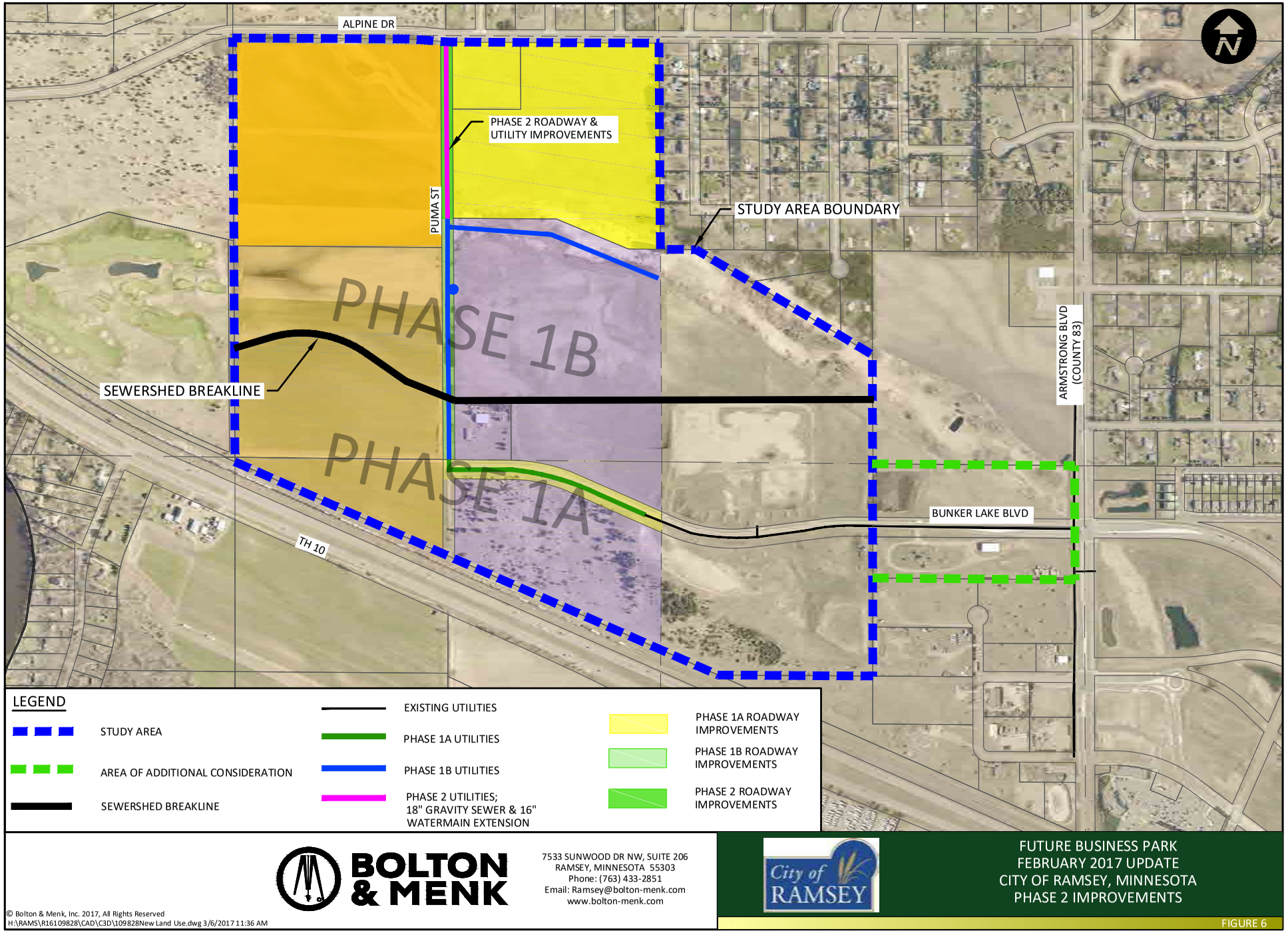

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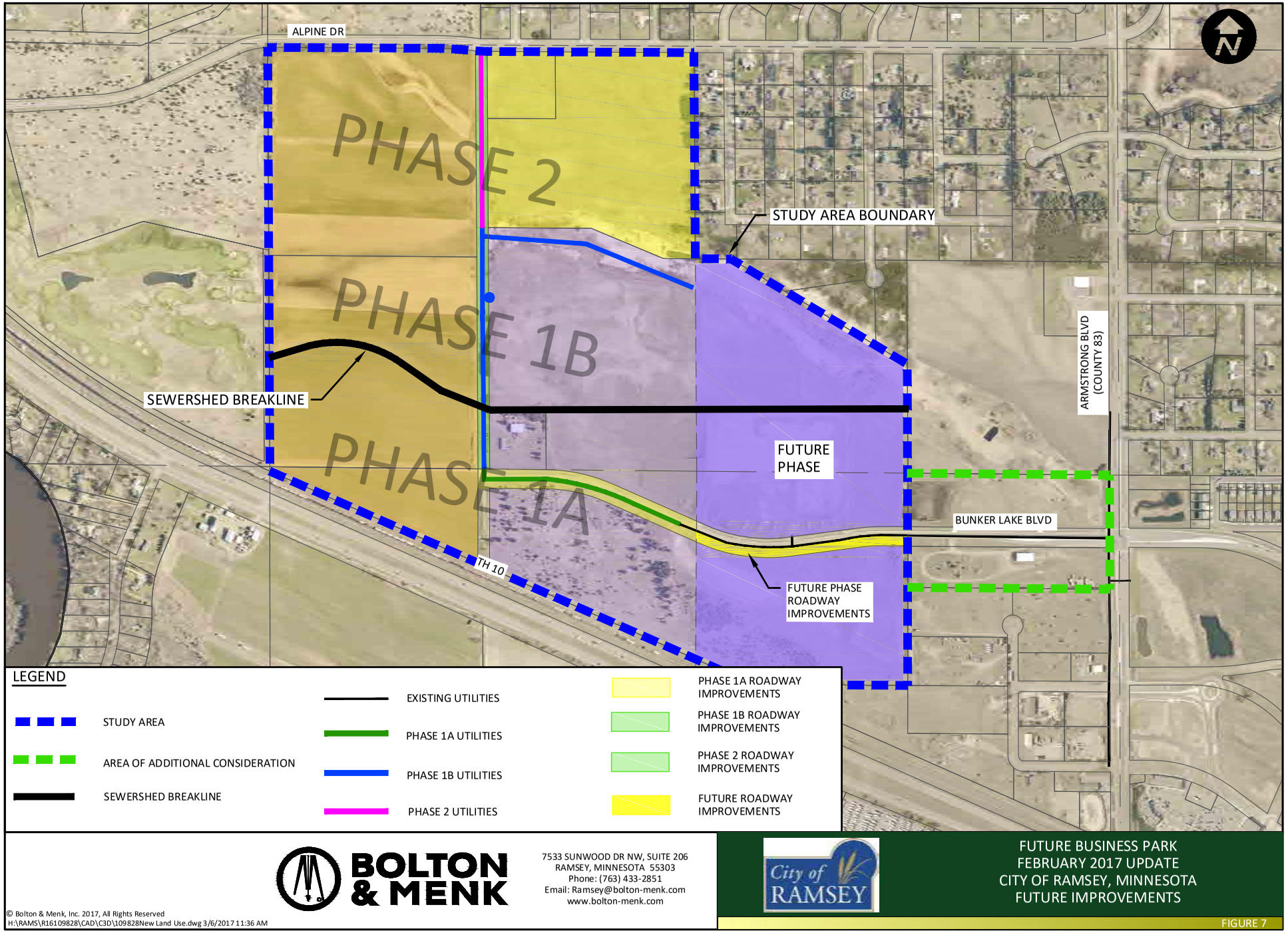
City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
PHASE 2 IMPROVEMENTS

FIGURE 6

H:\RAMS\R16109828\CAD\C3D\109828New Land Use.dwg 3/6/2017 11:36 AM



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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
FUTURE IMPROVEMENTS

FIGURE 7

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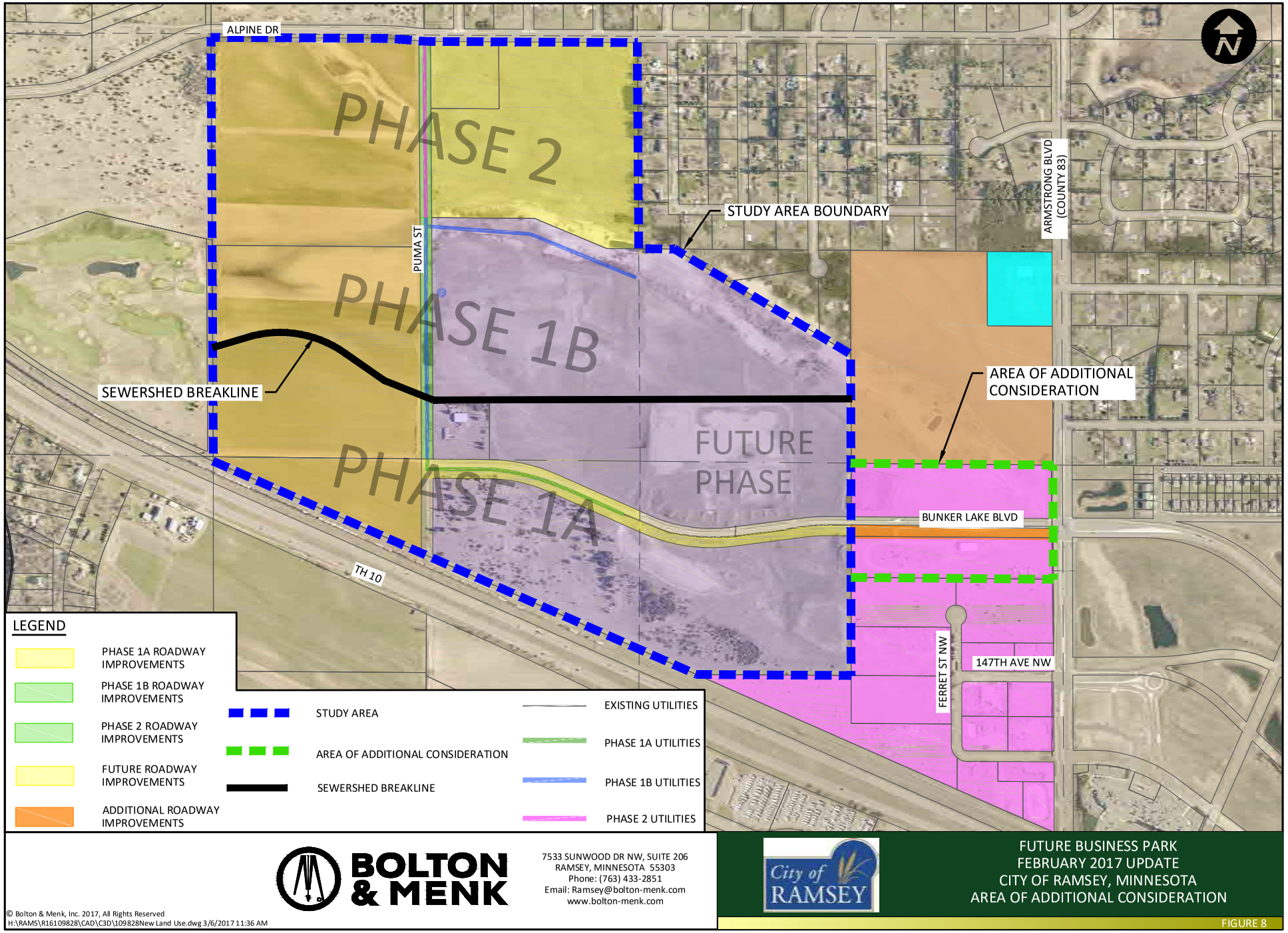

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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
AREA OF ADDITIONAL CONSIDERATION

FIGURE 8

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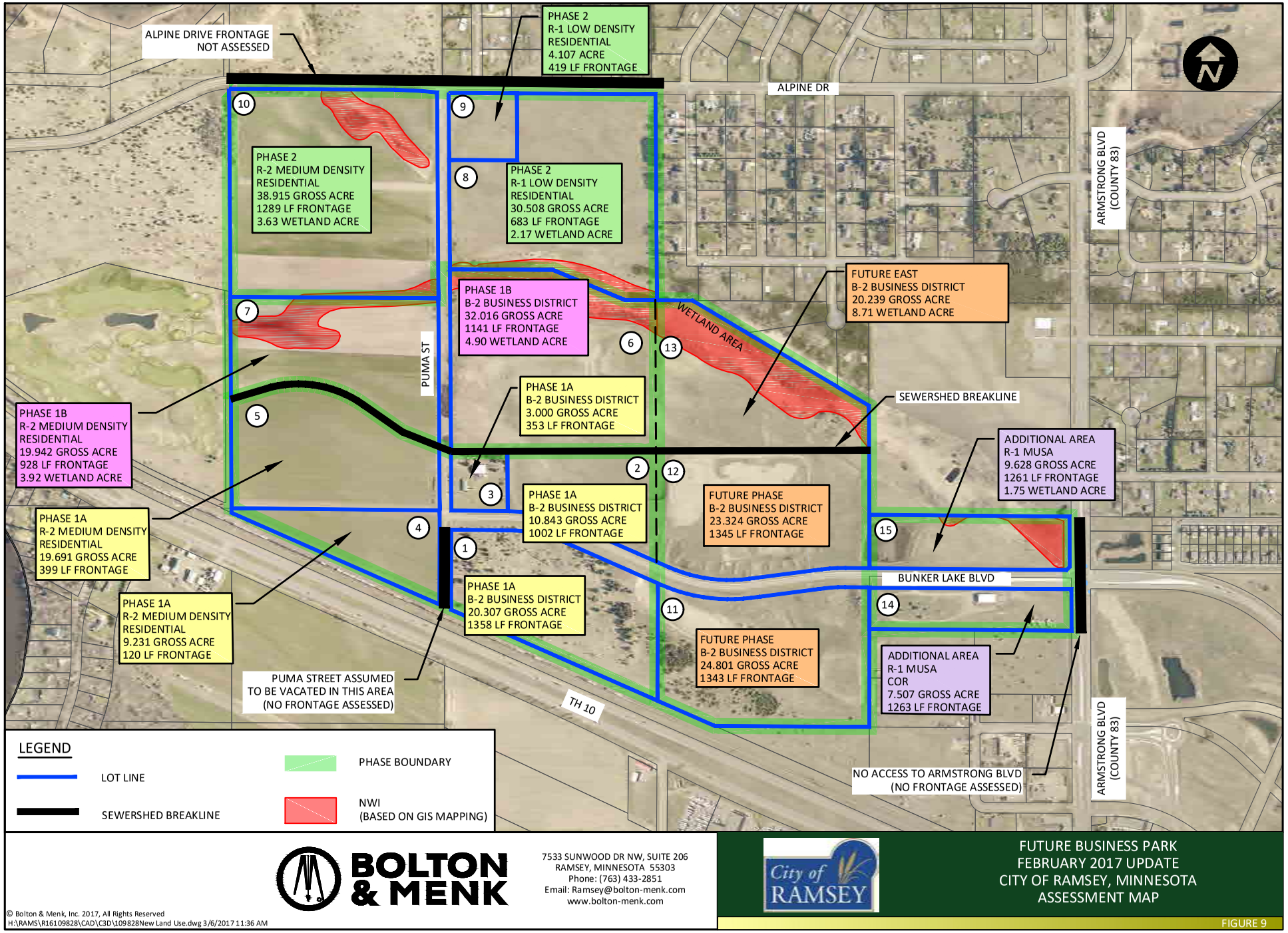

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City of RAMSEY

FUTURE BUSINESS PARK
FEBRUARY 2017 UPDATE
CITY OF RAMSEY, MINNESOTA
ASSESSMENT MAP

FIGURE 9

Appendix B: Traffic Study

BOLTON & MENK
Real People. Real Solutions.

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TRAFFIC MEMORANDUM

Date: January 27, 2017

To: City of Ramsey

From: Bryan Nemeth, P.E., PTOE

Subject: Supplemental Traffic Memorandum
Traffic Impact Study for Future Business Park: October 21, 2015
City of Ramsey, MN
Project No.: R16.109828

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.

By: _____
Bryan T. Nemeth, P.E., PTOE
License No. 43354

Date: January 27, 2017

I. Introduction

This traffic memorandum provides an update to the Traffic Impact Study for Future Business Park, October 21, 2015, in Ramsey, MN. The update includes analysis of a revised Proposed Future Land Use plan for the area.

The revised analysis results in an increase of approximately 18,100 trips per day into and out of the area at 2040 Full Build. This is an overall reduction in trips compared to the previous land use alternatives proposed.

The analysis evaluates the mitigation needs Bunker Lake Blvd west of Armstrong Boulevard (CSAH 83) and Puma Street south of Alpine Drive. This includes the intersection of Armstrong Blvd (CSAH 83) at Bunker Lake Blvd (CSAH 116).

II. Recommendations

A. Intersection and roadway improvements along Bunker Lake Blvd (west of Armstrong Blvd) and Puma St. (south of Alpine Dr.) are revised as follows.

1. Short Term

a) Armstrong Blvd & Bunker Lake Blvd: Stripe the southbound left with dual left turn lanes. No other roadway improvements needed in the short term. Signal timing updates recommended.

(1) Plan for eastbound dual right turn lanes or free-right turn lane and two eastbound thru lanes in the future (See Long Term Recommendations).

b) Bunker Lake Blvd (west of Armstrong Blvd)

(1) COR area:

(a) With COR access to Bunker Lake Blvd: 4-lane divided roadway to full access intersection. Full access 775 ft. from Armstrong Blvd. Right-in/right-out access at least 475 ft. from Armstrong Blvd. Continuous median to full access.

(b) Without COR access to Bunker Lake Blvd: 4-lane Divided to full access intersection. Full access 540 ft. from Armstrong Blvd. Right-in/right-out access at least 475 ft. from Armstrong Blvd. Continuous median to full access.

(2) COR to Llama St. Alignment: 3-lane undivided roadway, right turn lanes into development roadways. Primary intersection spacing of 1/8 mile.

(3) Llama St. Alignment to Puma St.: 3-lane undivided roadway, right turn lanes into development roadways where development trips anticipated to be over 100 per day. Primary intersection spacing of 1/8 mile.

c) Puma St.: Potentially remain a 2-lane undivided roadway. Left turn lanes into Business Park accesses. Right turn lanes provided where development trips anticipated to be over 100 per day.

d) Bunker Lake Blvd & Puma St.: Single lane roundabout or all-way stop

control. Southbound left turn lane and westbound right turn lane recommended with all-way stop control.

2. Mid-Term

a) Armstrong Blvd & Alpine Dr.: Single lane roundabout. Intersection control evaluation study should be completed to verify.

b) Alpine Dr. & Puma St.: Add eastbound right turn lane. Add a northbound turn lane to separate left and right turns. Add a westbound left turn lane when needed. This need to be based on delay and crash experience, especially if there is trip redistribution due to congestion on Armstrong Blvd.

3. Long-Term

a) Armstrong Blvd & Bunker Lake Blvd: Dual eastbound right turn lanes or free right turn lane. Dual right turn lanes are recommended over the free right due to pedestrian accessibility crossing a heavy free-right and the bridge design of Armstrong Blvd.

b) Plan for two eastbound thru lanes in the future. The two eastbound thru lanes are not necessarily due to traffic volumes but are recommended to give more green time to conflicting movements, specifically the westbound left. Additionally, the high eastbound right turn volumes may result in trip reassignment to use Bunker Lake Blvd and access Highway 10 at Ramsey Blvd instead of Armstrong Blvd. This may also result in more trips using Alpine Dr. to access Highway 10 for trips to and from the west.

III. Analysis

The traffic analysis updates consider a change in land uses within the Future Business Park area as shown on the attached Armstrong West: Proposed Future Land Uses map.

A. Forecasts

The background trip forecasts are consistent with the previous analysis. The trip forecasts to and from each area are included at the end of this memorandum. Forecasts were developed using trip rates from the ITE Trip Generation Manual, consistent with the previous analysis. The additional trips due to the development result in the forecasted trips as shown on the attached map.

B. Traffic Analysis Results

1. 2040 Full Build with Existing Lanes

Table 1: Design Year (2040) with Existing Lanes

Traffic Control Scenario	Peak Hour	Intersection Delay*- LOS		Maximum Delay-LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft) ****
Design Year 2040 Alternative 2									
TH 10/169 South Ramp & CSAH 83 (Armstrong Blvd)	AM	13	B	24	C	EBL	EBL	105	174
Signal	PM	12	B	22	C	EBL	EBL	98	148
TH 10/169 North Ramp & CSAH 83 (Armstrong Blvd)	AM	63	E	143	F	WBR	WBT/R	468	1152
Signal	PM	71	E	124	F	WBR	WBT/R	595	1560
CSAH 83 (Armstrong Blvd & 147th Avenue	AM	55	D	131	F	NBL	NBT	759	1327
Signal	PM	52	D	87	F	NBL	NBT	660	1252
CSAH 83 (Armstrong Blvd) & CSAH 116 (Bunker Lake Blvd)	AM	69	E	184	F	NBL	NBT	784	1086
Signal (assumed double SBL & double WBL were stripped)	PM	100	F	227	F	NBL	NBT	733	1109
CSAH 83 (Armstrong Blvd) & Alpine Drive NW	AM	5	A	20	C	EBT	EBL/T	45	114
TWSC	PM	9	A	46	E	EBL	NBL/T	68	167
Alpine Drive NW & Puma Street NW	AM	2	A	7	A	NBL	NBL/R	31	54
TWSC	PM	3	A	9	A	NBL	NBL/T	51	86
Puma Street NW & Bunker Lake Blvd	AM	3	A	9	A	NBT	SBL/T/R	50	75
Option 1: AWSC	PM	4	A	7	A	WBR	WBT/R	56	86
Puma Street NW & Bunker Lake Blvd	AM	0	A	3	A	EBR	EB L/R	4	18
Option 2: 3 Legged intersection (with curve)	PM	0	A	2	A	EBL	EBL/R	7	24
Puma Street NW & Bunker Lake Blvd	AM	2	A	5	A	NBT	SBL/T/R	16	51
Option 3: Roundabout	PM	2	A	4	A	SBT	SBL/T/R	4	23

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

***Limiting Movement is the highest delay movement.

****Max Queue refers to the 95% Queue (Passenger car stored length = 25 ft, Heavy vehicle stored length = 45 ft)

Analysis indicates that it there are anticipated to be capacity concerns along Armstrong Blvd from Highway 10 to Bunker Lake Blvd. Mitigation is necessary at the intersection of Armstrong Blvd at Bunker Lake Blvd.

2. 2040 Full Build with Mitigation

Table 2: Design Year (2040) with Mitigation

Traffic Control Scenario	Peak Hour	Intersection Delay*- LOS		Maximum Delay-LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft) ****
Design Year 2040 Alternative 2									
TH 10/169 South Ramp & CSAH 83 (Armstrong Blvd)	AM	11	B	22	C	EBL	EBL	95	147
Signal	PM	12	B	23	C	EBL	SBR	47	171
TH 10/169 North Ramp & CSAH 83 (Armstrong Blvd)	AM	21	C	53	D	SBT	SBT	382	727
Signal	PM	49	D	141	F	SBT	SBT	809	1272
CSAH 83 (Armstrong Blvd & 147th Avenue	AM	12	B	33	C	SBL	NBT	199	376
Signal	PM	56	E	111	F	SBT	SBT	664	1232
CSAH 83 (Armstrong Blvd) & CSAH 116 (Bunker Lake Blvd)	AM	38	D	84	F	NBL	NBT	353	868
Signal (Added double EB thru, free right)	PM	50	D	139	F	WBL	WBT	401	915
CSAH 83 (Armstrong Blvd) & Alpine Drive NW	AM	5	A	26	D	WBL	EBR	61	110
TWSC (Added EB/WB RT lane)	PM	10	B	88	F	EBT	NBL/T	77	171
Alpine Drive NW & Puma Street NW	AM	2	A	6	A	WBL	NBL/R	33	56
TWSC	PM	3	A	9	A	NBL	NBL/T	48	80
Puma Street NW & Bunker Lake Blvd	AM	3	A	9	A	WBL	SBL/T/R	50	78
Option 1: AWSC	PM	4	A	8	A	WBL	WBL/T/R	57	83
Puma Street NW & Bunker Lake Blvd	AM	0	A	3	A	EBL	EBL/R	4	18
Option 2: 3 Legged intersection (with curve)	PM	0	A	5	A	EBL	EBL/R	6	24
Puma Street NW & Bunker Lake Blvd	AM	2	A	5	A	NBT	SBL/T/R	11	37
Option 3: Roundabout	PM	2	A	4	A	EBT	SBL/T/R	3	21

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

***Limiting Movement is the highest delay movement.

****Max Queue refers to the 95% Queue (Passenger car stored length = 25 ft, Heavy vehicle stored length = 45 ft)

Analysis indicates

Mitigation includes the lanes and traffic control indicated in the recommendations but also includes a third southbound lane along Armstrong Blvd from Bunker Lake Blvd to the Highway 10 North Ramp terminal. Additional review of the bridge design indicates that a third lane would not be feasible without substantial revisions to the bridge structure over the railroad. Based on this, two eastbound through lanes are recommended at the intersection of Armstrong Blvd and Bunker Lake Blvd to provide an alternative route if needed. The analysis below also considers an eastbound free right into the third lane. This is recommended to be a dual right turn when or if needed based on traffic redistribution in the area.

The resulting queues are shown below for each movement at the intersection of Armstrong Blvd and Bunker Lake Blvd. Dual eastbound right turn lanes would be anticipated to have similar average queues and shorter max queues. The max queues are anticipated to be less if there is traffic redistribution based on congestion.

Table 3: Design Year (2040) Armstrong Blvd & Bunker Lake with Proposed Lanes

Traffic Control Scenario	Peak Hour	Delay-LOS**		Max Approach Queue	
				Average Queue (ft)	Max Queue (ft) ****
CSAH 83 (Armstrong Blvd) & CSAH 116 (Bunker Lake Blvd)					
EBL	AM	41	D	64	122
	PM	37	D	106	191
EBR	AM	3	A		
	PM	47	D	390	916
WBL	AM	45	D	134	215
	PM	131	F	401	915
NBL	AM	84	F	305	412
	PM	52	D	207	307
SBL	AM	31	C	95	145
	PM	46	D	81	128

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

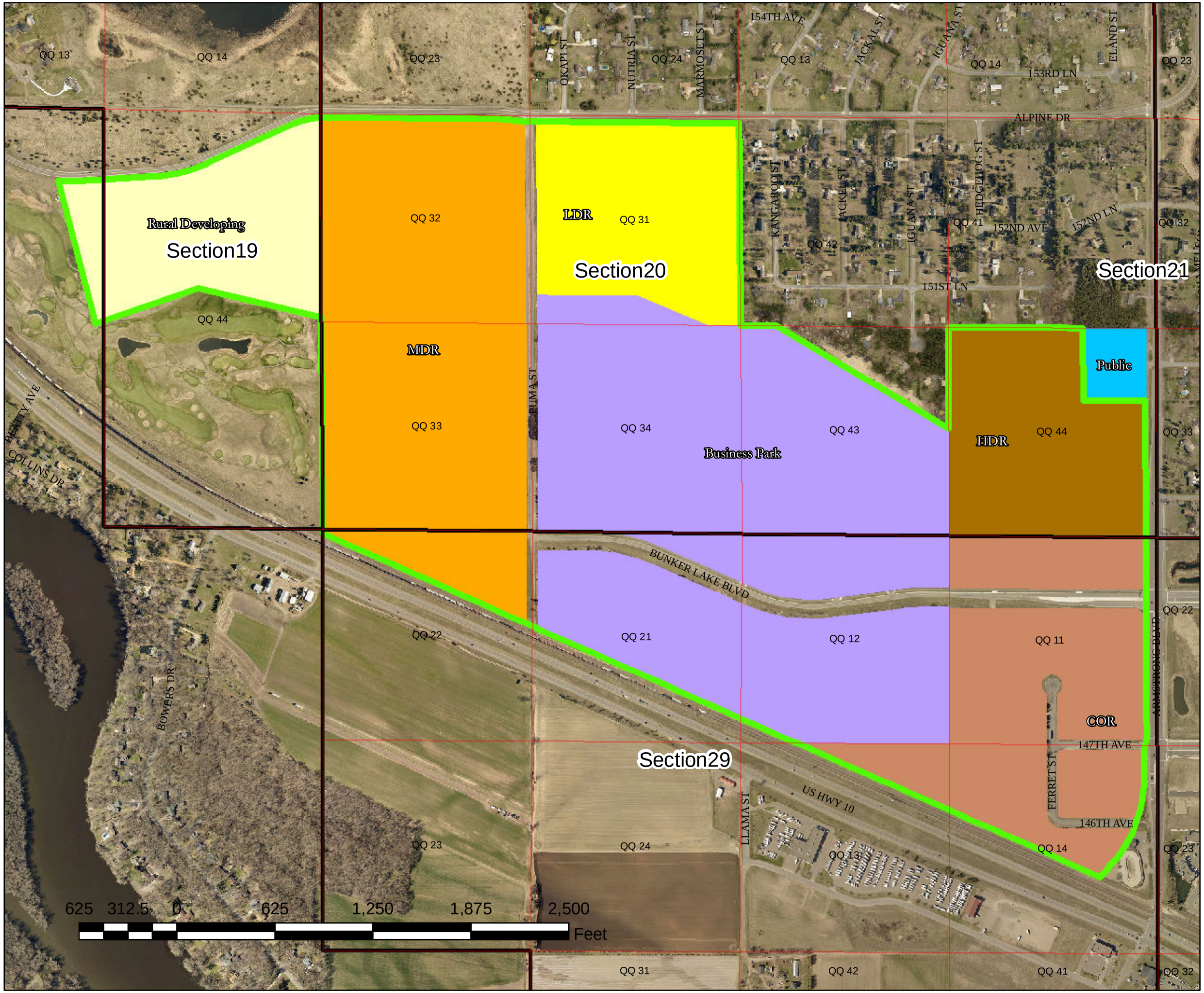
***Limiting Movement is the highest delay movement.

****Max Queue refers to the 95% Queue (Passenger car stored length = 25 ft, Heavy vehicle stored length = 45 ft)

C. Special Considerations

1. The trips from specific developments to Puma and Bunker Lake Blvd have not been analyzed. Trips to and from specific developments should be assigned to appropriate roadways based on the development roadway design. This is especially important for trip assignment at the intersection of Bunker Lake Blvd and Puma St.

2. Mitigation for intersections outside of the area due to development in the area have not been completed.



City of RAMSEY

Armstrong West
Proposed Future Land Uses

Section QQ

Section Only

AUAR Boundary

Future Land Use

- Business Park
- COR
- High Density Residential
- Low Density Residential
- Medium Density Residential
- Public/Quasi-Public
- Rural Developing

N

This is not an approved land use plan. This is a working document only, based on current feedback and concepts (both public and privately developed concepts).

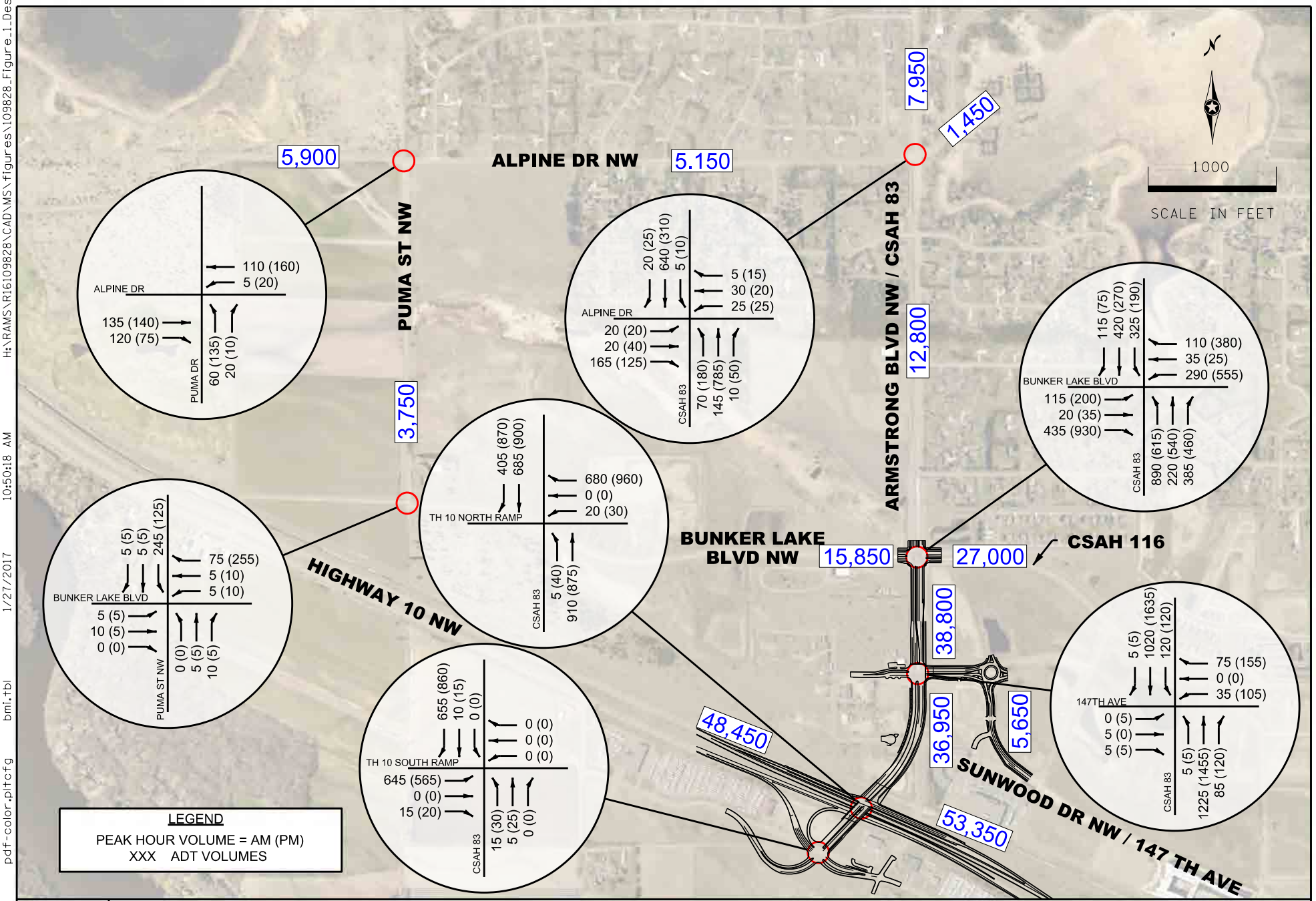


FIGURE 1: DESIGN YEAR (2040) TRAFFIC VOLUMES

FUTURE BUSINESS PARK TRAFFIC STUDY
RAMSEY, MN.

Ramsey EDA Traffic Assumptions

Alternative 2: Business Park (January 2017 Update)

B-2 **Business Park** — 134.54 Acres — ITE Code 130 — Internal-to-Internal Reduction

Based on Acres

	Average Rate	#	% enter	% exit	entering	exiting		entering	exiting		Pass-by entering	Pass-by exiting	New Trips entering	New Trips exiting
AM	8.55	1151	83	17	955	196	10%	860	177	0%	0	0	860	177
Afternoon	4.42	595	50	50	298	298	10%	268	268	0%	0	0	268	268
PM	8.84	1190	21	79	250	940	10%	225	847	0%	0	0	225	847
Weekday	63.11	8491	50	50	4246	4246	15%	3609	3609	0%	0	0	3609	3609

B-2 **Retail/Commercial** — 74.4 K ft^2 — ITE Code X — Internal-to-Internal Reduction

Based on Square Feet — 7.43 Acres

	Average Rate	#	% enter	% exit	entering	exiting		entering	exiting		Pass-by entering	Pass-by exiting	New Trips entering	New Trips exiting
AM	7.41	552	53	47	293	259	20%	235	208	46%	109	96	126	112
Afternoon	5.46	407	50	50	204	204	20%	163	163	40%	66	66	97	97
PM	10.91	813	51	49	415	398	20%	332	319	39%	130	125	202	194
Weekday	124.59	9275	50	50	4638	4638	30%	3247	3247	39%	1267	1267	1980	1980

R-1 **Single Family Detached Housing** — 104 units — ITE Code 210 — 34.62 Acres

Based on Dwelling Units — 3 Units per Acre

	rate	#	% enter	% exit	entering	exiting	New Trips entering	New Trips exiting
AM	0.75	83	25	75	21	62	21	62
Afternoon	0.51	53	31	69	16	37	16	37
PM	1.01	109	63	37	69	40	69	40
Weekday	9.57	1078	50	50	539	539	539	539

R-2 **Residential Townhouse** — 527 units — ITE Code 230 — 87.79 Acres

Based on Dwelling Units — 3 to 7 Units per Acre

	Average Rate	#	% enter	% exit	entering	exiting	Assume 6 Units per Acre	New Trips entering	New Trips exiting
AM	0.44	196	17	83	33	163		33	163
Afternoon	0.26	138	31	69	43	95		43	95
PM	0.52	235	67	33	157	78		157	78
Weekday	5.81	2732	50	50	1366	1366		1366	1366

R-3 **Low Rise Apartment** — 525 units — ITE Code 221 — 43.74 Acres

Based on Dwelling Units — 7 to 15 Units per Acre

	Average Rate	#	% enter	% exit	entering	exiting	Assume 12 Units per Acre	New Trips entering	New Trips exiting
AM	0.46	215	21	79	45	170		45	170
Afternoon	0.29	153	31	69	47	106		47	106
PM	0.58	291	65	35	189	102		189	102
Weekday	6.59	3076	50	50	1538	1538		1538	1538

Rural Developing — ITE Code x

Assumed trips

	entering	exiting
AM	5	20
Afternoon		
PM	20	5
Weekday		

Total

	Pass-by entering	Pass-by exiting	New Trips entering	New Trips exiting
AM	109	96	1090	704
Afternoon	66	66	472	602
PM	130	125	862	1266
Weekday	1267	1267	9032	9032

West of Commercial Area

	Pass-by entering	Pass-by exiting	New Trips entering	New Trips exiting
AM			919	422
Afternoon			327	400
PM			471	970
Weekday			5514	5514