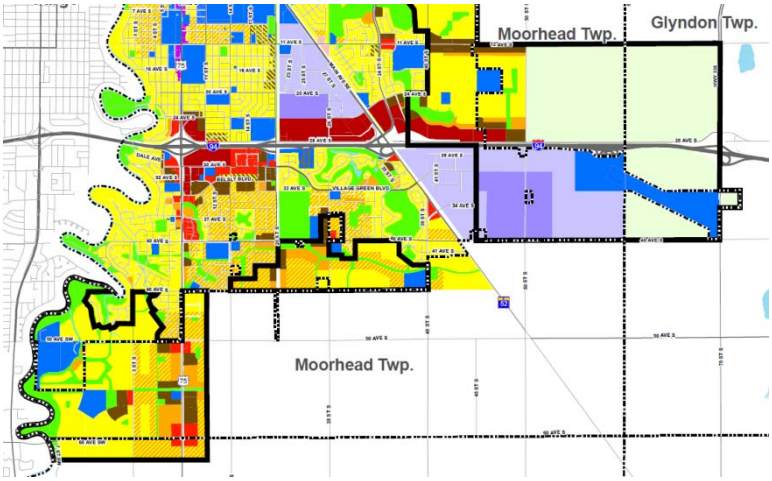
# City of Moorhead, Minnesota
# Growth Area for South and East Moorhead

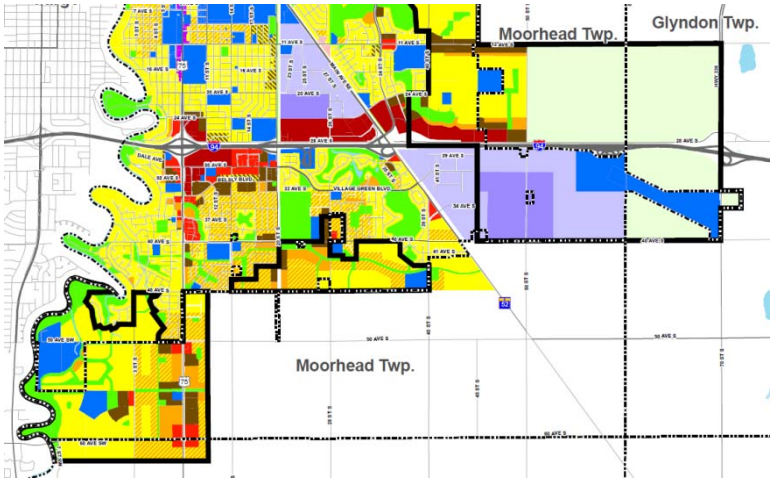
## Alternative Urban Areawide Review (AUAR) Update

October 28, 2013



## Growth Area for South and East Moorhead

# Alternative Urban Areawide Review (AUAR) Update
# Technical Memorandum




*DATE*: October 28, 2013

*TO*: Moorhead City Council

*FROM*: Phil Carlson, AICP, Stantec Consulting Services

*RE*: Growth Area for South and East Moorhead AUAR Update

**Introduction**

This technical memorandum serves as the update for the *Growth Area for South and East Moorhead Alternative Urban Areawide Review (AUAR)* initially adopted by the City of Moorhead on March 21, 2005. This update is prepared under the provisions of Minnesota Rule 441.3610 Subpart 7, which requires an update every five years until full development of the AUAR area is complete.

**AUAR Items**

The information in this memorandum for updates or modifications to the AUAR follows the outline in the original AUAR, numbered as items 1 through 31, plus a section at the end on Mitigation Initiatives. Information and analysis in the 2005 AUAR is presumed to still apply, unless new information or analysis is included in this update.

Where maps convey the same information as maps in the 2005 AUAR, the same figure numbers are used. Where a new map has been created the figure numbering starts where the 2005 AUAR figure numbers left off.

1. **Title**. No change

2. **Proposer**. No change.

3. **RGU**. No change.

4. **Reason for EAW Preparation**. No change.

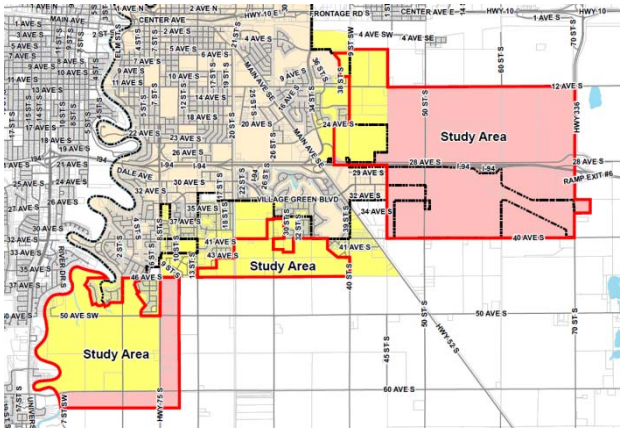
5. **Location and Maps**. The AUAR project area boundaries have changed, reflecting changes to the growth areas outside of the City of Moorhead. The revised project area includes the following townships and sections, all in Clay County, Minnesota:

   - T 138, R 48 W: Sections 5, 6
   - T 139, R 48 W: Sections 10, 11, 13, 1, 15, 21, 22, 23, 24, 27, 28, 29, 30, 31, 32
   - T 139, R 49 W: Sections 25, 36
   - T 139, R 47 W: Sections 18, 19, 20

   The revised AUAR project area boundary is illustrated on the attached maps:

   - Figure 5-1: *Project Location*
   - Figure 5-2: *AUAR Boundary*
   - Figure 5-3: *USGS Map*
   - Figure 6-1: *Land Use Plan* (instead of the *Growth Area Plan (GAP)* )

   Figure 5-2 shows both the original 2005 oundaries in yellow and the current AUAR project area boundaries in salmon.




6. **Description**. The description of the development scenario is modified as follows:

   In the 2005 AUAR Figure 6-1 illustrates the Growth Area Plan (GAP). This has been updated with a new Figure 6.1, *Future Land Use* Map. Figures 5-2 and 6.1 show that the AUAR project area consists of three sub-areas:

   - The area furthest southwest, called the South District, is expanded slightly from the 2005 boundary to extend east across Highway 75 and south across 60th Avenue SW.
   - The areas called the South Central and Southeast Districts are combined into one South Central District now. This area is reduced in size somewhat from the 2005 boundary on its north edge due to development that has occurred in that part of Moorhead since the 2005 AUAR, and also to not include any area east of 40th Street South out to Highway 52. It also excludes the developed neighborhood in the southwest quadrant of 40th Avenue South and 40th Street South.

- The East District is reduced on its west side and northwest corner due to development in Moorhead in that area since 2005. The area is significantly expanded from its 2005 boundary to extend east to Highway 336 and south across I-94 to 40th Avenue South. A large portion of this increased area in the East District is guided Agriculture and is not expected to develop within the 2035 time frame.

Traffic counts from 2010 are included on Figure 6-2 attached.

In addition, four maps from Moorhead's 2009 *Comprehensive Plan Addendum* refine the Growth Area Plan for most of the AUAR project area:

- Figure 6-3, *Growth Area Plan Update Location Map*
- Figure 6-4, *East Growth Area Plan*
- Figure 6-5, *Southeast Growth Area Plan*
- Figure 6-6, *South Central Growth Area Plan*
- Figure 6-7, *South Growth Area Plan*

7. **Project Magnitude Data.** The text for item 7 is modified to read:

The project area encompasses approximately 5,651 acres in south and east Moorhead. At total build-out it is anticipated that there will be a total of 17,810 residential units – 8,460 unattached and 9,360 attached. Full build-out (anticipated to be 50 or more years) would also include about 5.2 million square feet of institutional uses. Building heights are anticipated to range from 1 to 4 stories which is compatible to adjacent land uses. Revised Table 7.1 below summarizes the anticipated types and intensity/density of land uses through the AUAR area.

**Table 7.1 Moorhead GAP AUAR Project Magnitude Data – Revised 7-15-2013**

| Land Use | Acres | Maximum | Future Project | Existing Project | Total Project |
|---|---|---|---|---|---|
| Agricultural | 1,637.89 | | | | |
| Community Commercial | 56.86 | 0.25 FAR | 619,200 sq ft | 840,400 sq ft | 1,459,600 sq ft |
| Regional Commercial | 81.79 | 0.25 FAR | 890,700 sq ft | | 890,700 sq ft |
| Heavy Industrial | 306.00 | 0.40 FAR | 5,331,800 sq ft | 5,500 sq ft | 5,337,300 sq ft |
| Light Industrial | 448.27 | 0.30 FAR | 5,858,000 sq ft | | 5,858,000 sq ft |
| High Density Residential | 250.02 | 30 units/acre | 7,500 units | 130 units | 7,630 units |
| Medium Density Residential | 205.51 | 12 units/acre | 2,470 units | | 2,470 units |
| Medium Density Mixed Residential | 490.27 | 5 units/acre | 2,450 units | | 2,450 units |
| Low Density Residential | 1,241.72 | 4 units/acre | 4,970 units | 290 units | 5,260 units |
| Public/Institutional | 515.94 | 0.15 FAR | 3,371,200 sq ft | 1,813,800 sq ft | 5,185,000 sq ft |
| Parks/Open Space | 416.97 | | | | |
| TOTAL | 5,651.27 | Commercial/ | 16,070,900 sq ft | 2,659,700 sq ft | 18,730,600 sq ft |
| | | Housing Units | 17,390 units | 420 units | 17,810 units |
| | | (Attached - MF) | 9,230 units | 130 units | 9,360 units |
| | | (Detached - SF) | 8,170 units | 290 units | 8,460 units |

The assumptions about the proportion of detached and attached residential units in Table 7.2 in the original AUAR are unchanged in the data above.

8. **Permits and Approvals Required.** The permits, review and approvals required in the previous Table 8.1 still apply, although in some cases the regulations applicable to that permit, review or approval have been amended. Any project proposer within the AUAR project area will need to be aware of current regulations.

9. **Land Use.** Existing land use in the AUAR project area is illustrated on Table 9.1, *Existing Land Use,* and summarized in Table 9.1.

**Table 9.1 Existing Land Use in the AUAR Project Area**

| Land Use | Acres |
|---|---|
| Agricultural | 5,077.72 |
| Commercial | 77.18 |
| Industrial | 0.31 |
| High Density Residential | 6.26 |
| Low Density Residential | 72.58 |
| Parks/Open Space | 52.63 |
| Public/Institutional | 277.59 |
| Vacant | 67.05 |
| Vacant-Res Platted | 19.93 |
| TOTAL | 5,651.26 |

Development activity in the project area since 2005 is summarized in the attached table, *Building Permits and Projects 2006-2012*. 1,563 units of housing have been built, of which 1,051 units were single family and 512 multi-family. As noted in the table, a number of commercial and institutional uses have been built, with some significant new ones expected soon.

The City adopted the *Comprehensive Plan Addendum* in 2009 which covers the area including the AUAR project area. See question 6 for discussion of land use map and growth area plans attached to this AUAR update. One change to the land use plan involved property owned by Park Christian School on the north side of 40th Avenue South near 30th Street South. The attached *Mayor and Council Communication* from May 29, 2012 discusses the issues associated with this land use change.

10. **Cover Type.** This information was based on a 2002 aerial photo visual comparison to the 1990 MnDNR Land Use/Land Cover dataset, which is still assumed valid as the basis for land cover in the AUAR project area. Figure 10-1, *Land Cover*, illustrates current land cover within the expanded AUAR project area.

The attached Natural Heritage letter, dated April 7, 2010, and Index Report from the DNR note a small area of wet prairie just outside the AUAR project area. This same area was shown in the 2005 AUAR on Figure 10-2.

11. **Fish, Wildlife and Ecologically Sensitive Resources**. The attached Natural Heritage letter, dated April 7, 2010, and Index Report from the DNR note the sensitive resources in or near the AUAR project area. One, the wet prairie, is outside the project area. An endangered owl species was observed in 2007; a threatened butterfly species was observed in 1968 but not since.

12. **Physical Impacts on Water Resources**.

    The City of Moorhead prepared an updated stormwater management plan (SWMP), the *Moorhead Storm Water Management Master Plans* in September 2010. Attached are excerpts from that plan showing stormwater improvements planned for the growth areas in and near the AUAR project area. In addition, a TMDL (total maximum daily load) study for the Red River is ongoing and not yet complete as this AUAR update is being prepared, the results of which may impact development activities in the AUAR project area.

13. **Water Use**.

    The municipally-owned utility Moorhead Public Service (MPS) anticipates improvements to the water supply system in the AUAR project area. Depending on the rate and type of growth, there will be a need for a water transmission line to be extended from 28th Street near US Highway 10 east to 45th Street, then south across I-94 to Highway 52. A future water tower is also planned in the southwest quadrant of 40th Avenue South and 28th Street South. A map of these features is attached, Figure 13-1, *Water System Improvements*. MPS is also currently working with regional partners to identify the potential water sources needed after 2015.

14. **Water-Related Land Use Management Districts**. The attached report, *City of Moorhead Flood Mitigation Status* (11-27-12), summarizes the various projects related to flooding on the Red River since the 2009 flood. These include:

    - property acquisition
    - flood gates and lift stations
    - levee and floodwall projects
    - proposed projects
    - need for sandbags; and
    - cost of temporary measures

The attached map, Figure 14-1, *Adopted Floodplain Map,* illustrates the adopted 100-year and 500-year floodplain lines in Moorhead.

The Army Corps of Engineer's Fargo Moorhead Diversion project plans a large diversion channel on the west side of Fargo to handle significant flood levels on the Red River. This is shown on attached Figure 14-3, *FM Area Diversion.* An embankment, or tie-back levee, is proposed on the Minnesota side of the Red River about 6 miles south of the AUAR project area.

15. **Water Surface Use**. No change.

16. **Erosion and Sedimentation**. No change. Attached Figure 16-1, *Clay County Soil Survey*, illustrates soils in the region, including the AUAR project area.

17. **Water Quality – Stormwater Runoff**. The attached maps of storm ponds in growth Areas, labeled as *2013 AUAR Update Storm Ponds* (labeled East, South and Southwest, respectively) show existing stormwater ponds constructed since 2005 highlighted in blue. Also illustrated are two ditches – the 50th Avenue South system in the southwest area, and the 40th Avenue South system in the south area. These show the major drainage improvements that have been constructed since 2005 and how they conform or have been modified from the 2005 Growth Area Plan. See also question 12 and the attached excerpts from the 2010 *Moorhead Storm Water Management Plan.*

18. **Water Quality – Wastewater**. The attached report, *AUAR Item 18 – Water Quality:* Wastewater, details the sanitary system improvements in the AUAR project area that have been built since 2005 and that are anticipated to handle future development. Figures 18-1, 18-2, and 18-3 in that report illustrate the existing and proposed sanitary sewer system in the area. The following summarizes the conclusions of that report.

    *South Area*
    The portion of the South growth area west of Hwy 75, between 46 Avenue S and 50th Avenue S was evaluated during the 2004 study. At that time, this area was expected to develop 800 units. At this time, it is projected that the same area will develop approximately 930 units. The planned capacity for Lift Station No. 35 was 800 gpm. It is recommended that this area be monitored closely as this area approaches saturation to determine whether the design capacity of the lift station will be exceeded.

*East Area*

A portion of the East growth area was evaluated during the 2004 study. A cursory review of the projected flows based on the revised future land uses was completed. Comparing the projected flows to the previously proposed flows for the portion of the growth area evaluated earlier suggests that the previously proposed infrastructure will be adequate for that area.

*South Central Area*

The South Central growth area was not formally addressed in this study. However, given the proposed future land use in the South Central Area, the anticipated flows for remaining developable land were compared to the difference between the 2004 design flows and the 2009 average day flow. This comparison suggests that – even though the trunk sanitary system is expected to reach its full capacity under the proposed land uses – changes to the planned trunk sanitary system in this area are not necessary. However, there are some indications that more recent developments have come in with higher than anticipated flows.

19. **Geologic Hazards and Soil Conditions**. No change.

20. **Solid Wastes; Hazardous Wastes; Storage Tanks**. Solid waste generation for future anticipated development in the AUAR project area is estimated in Table 20.1 below for residential uses and Table 20.2 for non-residential uses. These numbers are based on the same waste generation rates and assumptions as in the 2005 AUAR.

**Table 20.1 Future Residential Waste Generation**

| Land Use | Future Units | Existing Units | Total Units | Tons MSW/ HH/ Year | Estimated Total Tons MSW/ Year | Tons Recig/ HH/ Year | Estimated Total Tons Recig/ Year |
|---|---|---|---|---|---|---|---|
| High Density Residential | 6,680 | 130 | 6,810 | 0.914 | 6,224 | 0.445 | 3,030 |
| Medium Density Residential | 2,370 | | 2,370 | 0.914 | 2,166 | 0.445 | 1,055 |
| Medium Density Mixed Residential | 2,340 | | 2,340 | 0.914 | 2,139 | 0.445 | 1,041 |
| Low Density Residential | 4,930 | 290 | 5,220 | 0.914 | 4,771 | 0.445 | 2,323 |
| Total Residential Units | 16,320 | 420 | 16,740 | | 15,300 | | 7,449 |

**Table 20.2 Future Non-Residential Waste Generation**

| Land Use | Existing Acres | Future Acres | Total Acres | Empl/ Acre | Empl | Tons MSW/ Empl/ Year | Estimated Total Tons MSW/ Year | Tons Recycling/ Empl/ Year | Estimated Total Tons Recycling/ Year |
|---|---|---|---|---|---|---|---|---|---|
| Community Commercial | 77 | 52 | 129 | 11 | 1,417 | 0.529 | 750 | 0.257 | 364 |
| Regional Commercial | 0 | 64 | 64 | 11 | 700 | 0.529 | 370 | 0.257 | 180 |
| Heavy Industrial | 0 | 302 | 302 | 5 | 1,510 | 0.529 | 799 | 0.257 | 388 |
| Light Industrial | 0 | 436 | 436 | 5 | 2,180 | 0.529 | 1,153 | 0.257 | 560 |
| Public/Institutional | 278 | 252 | 530 | 5 | 2,650 | 0.529 | 1,402 | 0.257 | 681 |
| Parks/Open Space | 53 | 340 | 393 | 0 | 0 | | | | |
| TOTAL | 408 | 3,567 | 3,974 | | 8,458 | | 4,474 | | 2,174 |

21. **Traffic**. The transportation system in the Fargo-Moorhead area is modeled by the Fargo-Metro COG. The model has been updated since 2005 taking into account system modifications and improvements as well as anticipated projects out to the year 2035. The following summary discusses the various components of the transportation system that have been analyzed. Existing traffic counts from 2010 are shown on Figure 6-2 attached.

    The attached Figure 21-6 and Figure 21-7 show the model runs for the 2035 socio-data (on 2035 network) and the full-build socio-data (on 2035 network). The 2035 network includes all of the revisions that were identified and addressed during the model re-validation process. The maps also show the level-of-service (LOS) breakdown – volume/capacity relationship. An updated ADT traffic map with counts as of 2010 is also attached.

    The table, *Transportation Improvements - Model & Programming Applicability (revised 3-19-2013),* attached as Figure 21-8, expands and revises the improvements as listed in the previous 2005 AUAR. All the improvement shown in the first grouping are projects that were incorporated into the modeled network (unless 'local' functional classification) and are within and/or somewhat associated with the AUAR sub-areas. The second grouping of improvements consists of adjustments that were previously identified to help mitigate some of the issues present in the "old" full-build model run, but are not part of this "new" 2035 network. Following is a discussion of various transportation improvements:

    - *Transportation Improvement (TI) #2* – Extension of 20th St S: The City of Moorhead expects to update the 5-year CIP and advance the construction of 20th St from 34th to 41st Ave S to 2014 or 2015. The extension from 41st to 50th will probably stay in the CIP as an undetermined long range project. The extension from 50th to 60th Ave S will not be in the 5-year CIP, but will remain on the LRTP.

- *TI #6* – the roundabout at 50th Ave S and 8th St (TH 75) was cancelled by the City Council in 2012, dropping it out of the CIP. Since it is the recommended improvement for this intersection from the corridor study, it will remain on the LRTP as an illustrative project.
- *TI #7* – the roundabout at 60th Ave S and 8th St (TH 75) was completed and opened to traffic in the fall of 2011.
- *TI #8* – TH 75 from 24th to 60th Ave S – the description talks about additional capacity of 8 lanes, but per the corridor study, TH 75 should be expanded to 6 lanes between 24th and 40th Ave S, and 4 lanes from 40th to 50th Ave S. The existing 2 lane section from 50th to 60th should be adequate as long as it includes turn lanes at intersections.
- *TI #10* – TH 75 / I-94 interchange improvements. These are acceptable as is. MnDOT is designing the interchange (early 2013), and the final design is as yet undetermined.
- *TI #11* – SE Main Ave / I-94 ramps – this project has been completed.
- *TI #12* – extension of 28th St – this project will be development driven and will only happen if the adjoining properties are platted. Therefore, it should be considered a long range project.
- *TI #13* – extension of Westmoor Drive – like 28th St above, this will be development driven and should be considered long range.
- *TI #15* – 24th Ave S has been constructed to 42nd Ave S. The future extension from 42nd to 46th will probably stay in the 5-year CIP as a "future" project that will be driven when the abutting property is developed.
- *TI #16* – Ridgewood Boulevard has been constructed between 34th and 40th St S. It will not be constructed any further than that as a collector street, since a subdivision has already been platted and developed on the east side of 40th St S.
- *TI #18* – 28th Ave S has been constructed between 34th St and 36th St. The extension from 36th St/28th Ave S to 24th Ave S will likely stay in the CIP as a "future" project driven by development.
- *TI #20* – 28th Ave S from 20th St to 26th St is currently under contract. The road has been completed, and the only contract work that will carry over into 2013 is the installation of the traffic signal at 20th St. For purposes of the AUAR, this entire project should be considered to be complete.
- *TI #21* – this will likely be moved up to 2014 or 2015 when the CIP is revised (same as TI #2).
- *TI #26* – the roundabout at 28th Ave S / 36th St S / 40th St S has been completed.
- *TI #27* – warrants are currently being evaluated. If this intersection meets warrants, the signal would likely be installed in 2014 or 2015 concurrent with TI #2.

*Traffic Model.* Metro COG's regional traffic model is based on adopted future land use plans within each jurisdiction, proposed land uses (densities, use type) within transportation analysis zones (TAZ) and growth predictions (i.e. applied build-out percentages relative to demographic projections under each planning horizon). Metro COG initially spent time reviewing growth area

plans and Comprehensive Plan land use designations to determine the degree of consistency between adopted plans and household/job distribution within the regional model per defined planning horizons (2015, 2035 and full build). Subsequently, 2035 and full build model runs were completed with the intent to document capacity issues, identify mitigation measures and define network revisions, as necessary. Model runs are further detailed below.

*2015.* The 2009 Long Range Transportation Plan (LRTP) includes the 2015 traffic (AADT) forecast for the metropolitan area. Upon review of the updated growth area plans Metro COG determined projections within the regional model continued to accurately represent household and job distribution within applicable south/east growth area TAZ's.

*2035.* Due in part to changing land development patterns within certain TAZ's Metro COG in cooperation with the City of Moorhead re-allocated and/or modified applied build-out percentages for households and jobs respective to the 2035 scenario. This included 3,460 households and 1,297 jobs. This socio-economic data was incorporated into the regional model and a model run was completed for the 2035 TAZ on the 2035 network.

Based on this output Metro COG and the City of Moorhead did not incorporate any network changes as volume/capacity data did not suggest any major impact to the transportation network.

*Full Build.* Based on the adopted future land use plan Metro COG formulated full build input data for households and jobs within the defined growth areas. Full build TAZ socio-economic data was incorporated into the model and run on the 2035 network (no network revisions). Metro COG and the City of Moorhead reviewed the output data and identified a number of proposed revisions/network modifications in an attempt to more appropriately represent growth areas and anticipated components of the transportation network. These revisions are incorporated into the regional model, and are attached as Figure 21-8.

*Traffic Volume & Roadway Capacity.* Metro COG's adopted 2009 LRTP sets forth a translation table that equates volume/capacity ratios for arterials/collectors to a level of service (LOS) measurement. Model runs and output data follow this volume/capacity relationship. This information can be referenced in the LRTP.

22. **Vehicle-Related Air Emissions**. No change.

23. **Stationary Source Air Emissions**. No change.

24. **Dust, Odors, Noise**. No change.

25. **Sensitive Resources**. Two documents are attached, *Historic/Architectural Inventory* (9-7-2012) and *Archeological Site Locations* (9-7-2012). These lists update the inventories in the 2005 AUAR. Also attached is Figure 25-2, *Parks, Trails and Points of Interest*.

26. **Adverse Visual Impacts**. No change.

27. **Compatibility with Plans**. The City of Moorhead adopted a Comprehensive Plan Addendum in November 2009 that included revised plans for the growth areas covered by this AUAR. The information in this AUAR Update is compatible with that duly adopted plan.

    The AUAR and GAP plans are compatible with orderly annexation plans in the East Growth Area. Specifically, portions of the East Growth Area are comprised of areas covered by the Joint Resolution for Orderly Annexation with Moorhead Township dated July 28, 2008, and the Joint Resolution for Orderly Annexation with Glyndon Township, dated September 2, 2008. The *Annexation Boundary Map* is attached as Figure 27-1.

28. **Impact on Infrastructure and Public Services**.

    *Water*. The municipally-owned utility Moorhead Public Service (MPS) anticipates improvements to the water supply system in the AUAR project area. Depending on the rate and type of growth, there will be a need for a water transmission line to be extended from 28th Street near US Highway 10 east to 45th Street, then south across I-94 to Highway 52. A future water tower is also planned in the southwest quadrant of 40th Avenue South and 28th Street South. A map of these features is attached, Figure 13-1, *Water System Improvements*. MPS is also currently working with regional partners to identify the potential water sources needed after 2015.

    *Sewer.* See question 18.

    *Electricity.* Improvements to electric infrastructure in the area include the new Opportunity Substation and 115 kV transmission line, now under construction. The substation is located near 34th Avenue South and 42nd Street South. The transmission line runs along Highway 52 from 24th Avenue South to 50th Avenue South, then west along 50th to 20th Street South. See attached Figure 28-1, *115kV Transmission Line Proposed Route Options.* Contracts were awarded spring of 2012, construction was started summer of 2012, with anticipated substantial completion in 2013.

    *Stormwater Management*. See question 17.

*Transportation*. See question 21 for information on traffic modeling. The *2009 Long Range Transportation Plan* details the entire roadway system in the Fargo-Moorhead area, including the AUAR project area, and is available online: http://www.fmmetrocog.org/new/assets/documents/LRTP/FINAL%20document%20from%20PRINTER.pdf

*Bicycles & Pedestrians.* The existing FM Metro Area Bikeways Map is attached. The Metro COG has also prepared a *Bicycle and Pedestrian Plan* in October 2011 which analyzes and provides detailed recommendations for bicycle and pedestrian facilities, including within the AUAR project area. Excerpts from the *Plan* are attached. The plan shows recommended improvements in the AUAR project area, including a segment of the Fargo-Moorhead Trans-Metropolitan Area Bikeways Network which would enter the South District on 50th Avenue SW, then connect to 15th Street South. The entire report is available online: http://www.fmmetrocog.org/new/assets/documents/bike%20plan/January_2012_body.pdf

*Transit.* The *2012-2016 Transit Development Plan* (TDP) details transit service plans in the Metro area including the AUAR project area and is available online: http://www.fmmetrocog.org/new/index.php?id=382

*Community Facilities.* There are several planned or potential expansions to pubic and quasi-public uses in the AUAR project area:

- There is a potential public-private partnership to develop a YMCA on the south side.
- Trollwood Performing Arts School, at 50th Avenue South on the Red River, may add facilities in the future.
- Park Christian School is planning a school on 40th Avenue South near 31st Street South.
- The Moorhead Public School District is starting its long-range planning, which will identify potential locations for future school facilities in the growth areas.

29. **Cumulative Impacts**. No response required.

30. **Other Potential Environmental Impacts**. The revised development scenario in this AUAR update will not generate environmental impacts beyond those described in this AUAR update.

31. **Summary of Issues**. The summary of issues in the Executive Summary of the 2005 AUAR still applies to this update.

**Mitigation Initiatives**. The Mitigation Initiatives discussed in the 2005 AUAR apply to this update.

**Comments**. Five comment letters, attached, were received in 2010, from the following:

- Buffalo Red River Watershed District, February 2, 2010
- City of Fargo, February 8, 2010
- Minnesota DNR, February 19, 2010
- Minnesota Pollution Control Agency, February 22, 2010
- River Keepers (email), February 17, 2010

Additional comments were received in 2013 from the following

- City of Dilworth (email), September 27, 2013
- Minnesota Pollution Control Agency, September 25, 2013

# Mayor and Council Communication

**January 25, 2010**



**SUBJECT: *Resolution Ordering an Update to the Alternative Urban Areawide Review (AUAR) for the South and East Growth Areas of Moorhead**

**RECOMMENDATION:** It is respectfully requested that the Mayor and Council authorize staff to prepare and submit an Alternative Area Urban Review (environmental review) for that portion of land covered by the Growth Area Plan for South and East Moorhead.

**BACKGROUND:** An AUAR is authorized under Minnesota Rules Chapter 4410.3610 as an alternative form of environmental review for anticipated residential, commercial, and light industrial development and associated infrastructure. To proceed with an AUAR, an adopted Comprehensive Plan is required. FM Metro COG entered into a contract with Bonestroo for the 2009 Update to the Comprehensive Plan and AUAR and has provided contract administration during the process.

In 2005, the City completed the South and East Growth Area Plan as a result of increased development activity. An AUAR was also completed in 2005 for that portion of land covered by the Growth Area Plan. On November 9, 2009, the City Council adopted the 2009 Update to the 2004 City of Moorhead Comprehensive Plan, which included new and revised Growth Area Plans for South and East Moorhead. The 2009 Update to the Comprehensive Plan updated the Growth Area Plan concepts to reflect land use changes that have occurred, incorporate master plans that developers have prepared as well as newly developed land use patterns based on the vision statement.

**KEY ISSUES:** An AUAR is intended to review cumulative impacts that may result from development projects as opposed to singular Environmental Assessment Worksheets or Environmental Impact Statements which look at the impact of a single project. Upon completion of an AUAR, residential, commercial and light industrial development projects and associated infrastructure within the designated areas that are consistent with development assumptions and that comply with the plan for mitigation are exempt from additional review.

A Comprehensive Plan along with an approved AUAR assists in the continued growth and development of the City and assists the development community by providing advanced environmental planning. The AUAR also assists the City Engineering Department, Moorhead Public Service and other utility companies by providing an analysis on infrastructure expansion and impact on infrastructure.

**POLICY CONSIDERATIONS:** An AUAR does not commit the City of Moorhead to expand infrastructure or utilities. The AUAR will satisfy requirements in Minnesota Rules and will ensure that environmental impacts of development are accounted for and managed and assist the development community by providing advanced environmental planning.

**FINANCIAL CONSIDERATIONS:** FM Metro COG entered into a contract with Bonestroo for the 2009 Update to the Comprehensive Plan and AUAR and has provided contract administration during the process. The total cost of the AUAR is $16,000, with $14,200 being funded by the FM Metro COG Community Planning Grants Program. The local share of $1,800 is included within the 2010 Planning and Zoning Professional Services Budget.

**LEGAL CONSIDERATIONS:** The activities described herein are within the scope and authority of the Mayor and City Council to conduct.

Respectfully Submitted:

Michael J. Redlinger
City Manager

**Department/Response Person: Community Services / Kristie Leshovsky**

**Attachments: Draft Resolution**

# REQUEST FOR COUNCIL ACTION

| AGENDA SECTION: Community Services Department | ORIGINATING DEPT. Community Services | MEETING DATE: 1/25/2010 |
|---|---|---|
| ITEM NO. 12. | ITEM DESCRIPTION: *Resolution Ordering an Update to the Alternative Urban Areawide Review (AUAR) for the South and East Growth Areas of Moorhead | PREPARED BY: Leshovsky |

## DRAFT RESOLUTION

WHEREAS, an Alternative Urban Areawide Review (AUAR) is a substitute form of environmental review that replaces an Environmental Assessment Worksheet (EAW) or Environmental Impact Statement (EIS) as provided for in Minnesota Rules Chapter 4410.3600 and is a more appropriate form of environmental review that evaluates cumulative impacts over a larger area; and,

WHEREAS, the City of Moorhead completed an Alternative Urban Areawide Review (AUAR) for the south and east growth areas of Moorhead in March 2005; and.

WHEREAS, Minnesota Rules Chapter 4410.3600 Subp. 7 identifies the circumstances that require an AUAR to be updated, which include five years passing since the AUAR was adopted and amending the comprehensive plan to allow an increase in development levels; and

WHEREAS, the City of Moorhead adopted a Comprehensive Plan Addendum in November 2009 which identified future growth to the south and east; and

WHEREAS, the City of Moorhead is the Responsible Government Unit (RGU) assigned the responsibility of conducing the AUAR; and,

WHEREAS, Minnesota Rule 4410.3610 (AUAR Process) Subpart 3 requires an “order for review” to define the review area boundaries and the “anticipated nature, location, and intensity” of projected future development; and,

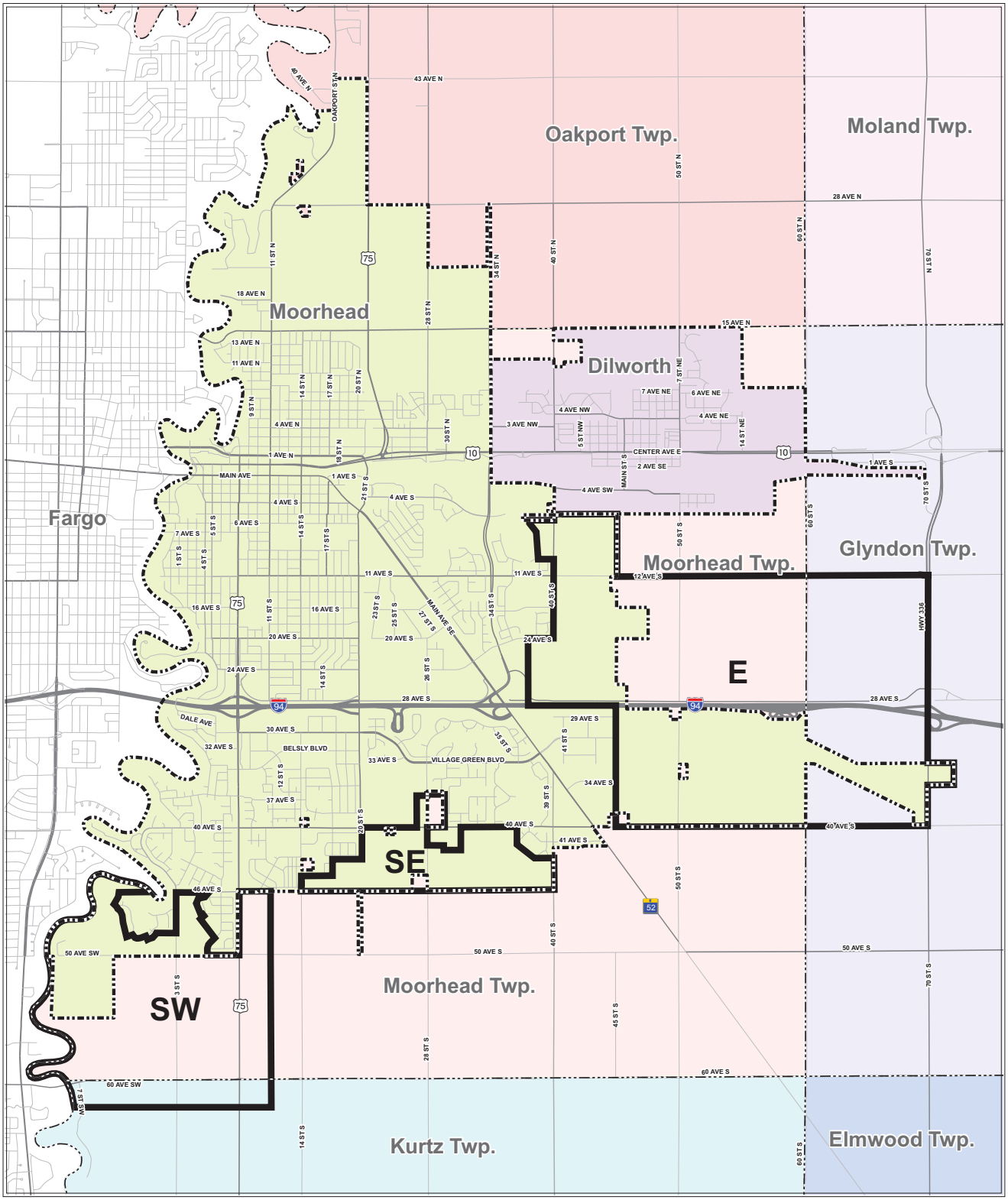
WHEREAS, the AUAR area is further identified on the project area map attached as Exhibit A; and,

WHEREAS, the AUAR will explore the impacts of growth in accordance to the Comprehensive Plan and Growth Area Plan; and,

WHEREAS, the Comprehensive Plan and Growth Area Plan land use designations for the project area include a combination of residential, commercial, public, institutional, light industrial, park and open space.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Moorhead hereby adopts this Order for Review for the South and East Moorhead Growth Area AUAR Update.

PASSED by the City Council of the City of Moorhead this 25th day of January, 2010.




## Regional Location

Figure 5-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

March 19, 2010

Stantec

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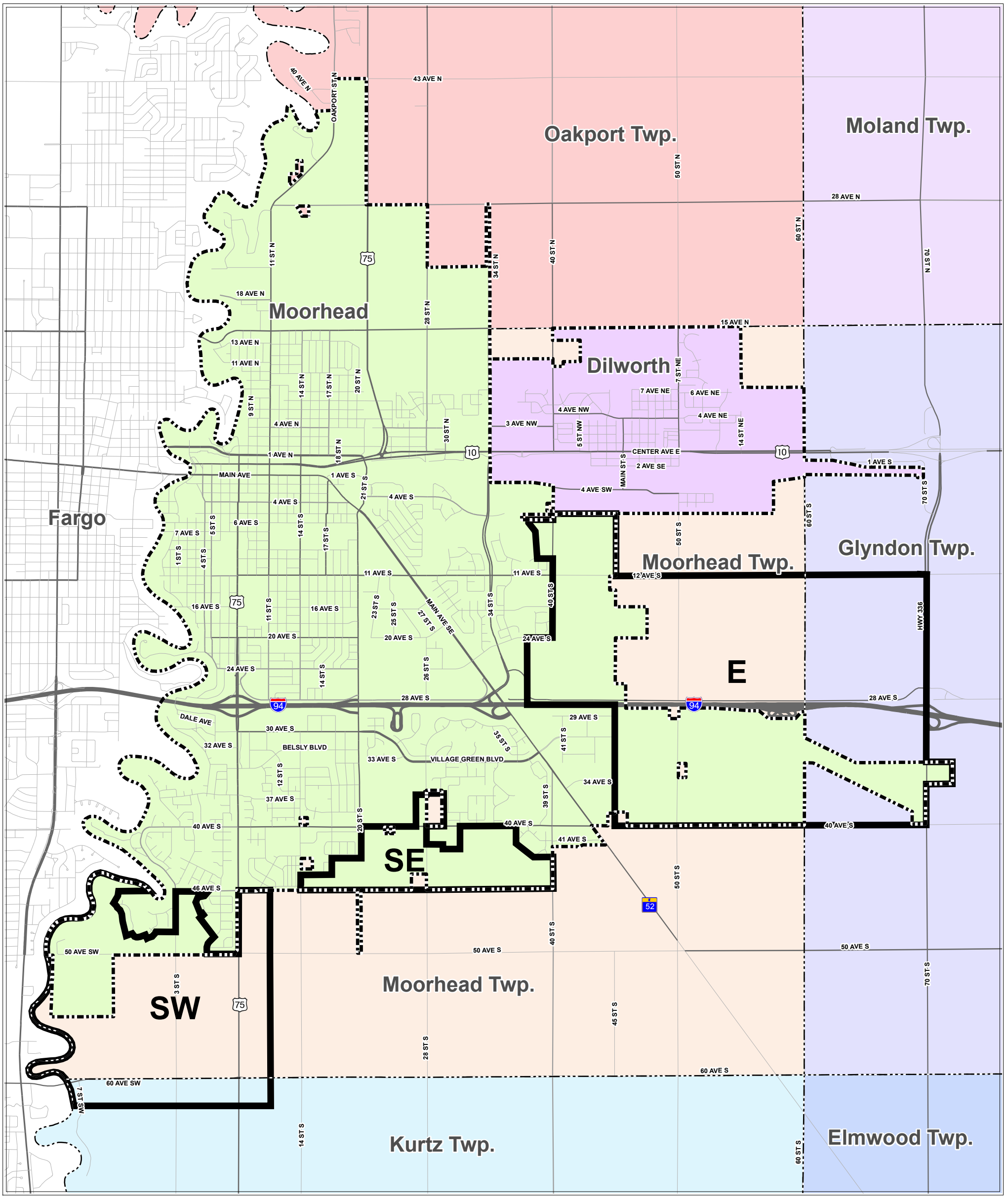


# Regional Location

Figure 5-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

AUAR Boundary

City Boundary

Township Boundary

N

2,000 0 2,000 4,000 Feet

March 19, 2010

Stantec

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# South and East Growth Area Plan Boundaries

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

AUAR Area Boundary

2005 Growth Area

Additional Study Area

Note: The original growth area plan (2005) is shaded in yellow and the boundaries for the current planning effort are outlined in red. The additional areas being studied in this planning effort are shaded in pink. It should be noted that although the pink areas were studied, the majority of areas east of 50th Street South are not anticipated to develop within the current 2035 planning horizon due to infrastructure constraints.

N

2,000 0 2,000 4,000 Feet

March 21, 2013

Stantec

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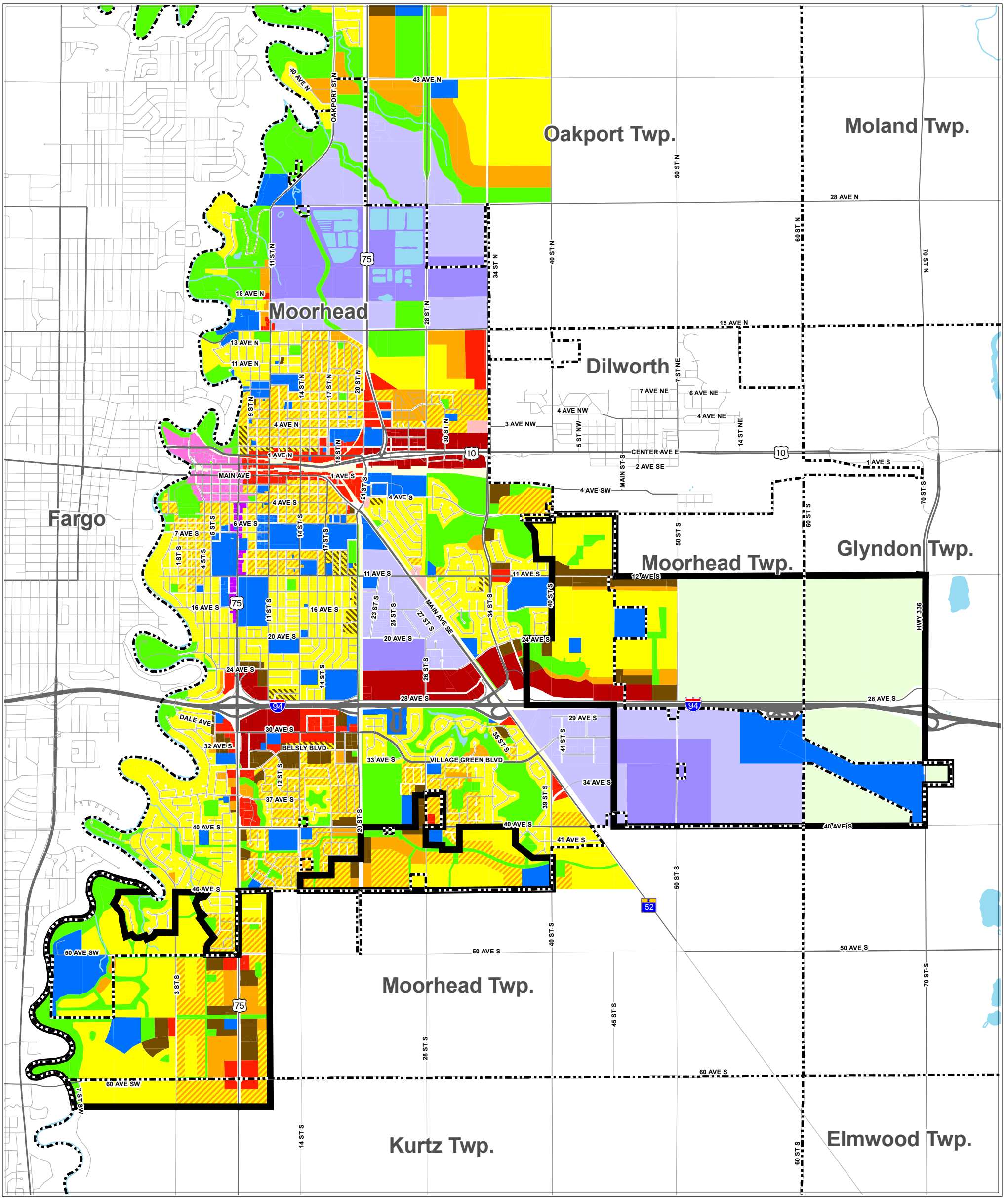



# Future Land Use Map

Figure 6-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

- Municipal Boundary
- AUAR Boundary
- Agricultural
- Railroad
- Rural Residential
- Low Density Residential
- Medium Density Residential
- Medium Density Mixed Residential
- High Density Residential
- High Density Mixed Residential
- Neighborhood Commercial
- Community Commercial
- Regional Commercial
- Downtown
- Mixed Use
- Light Industrial
- Heavy Industrial
- Public/Institutional
- Parks/Open Space
- Open Water

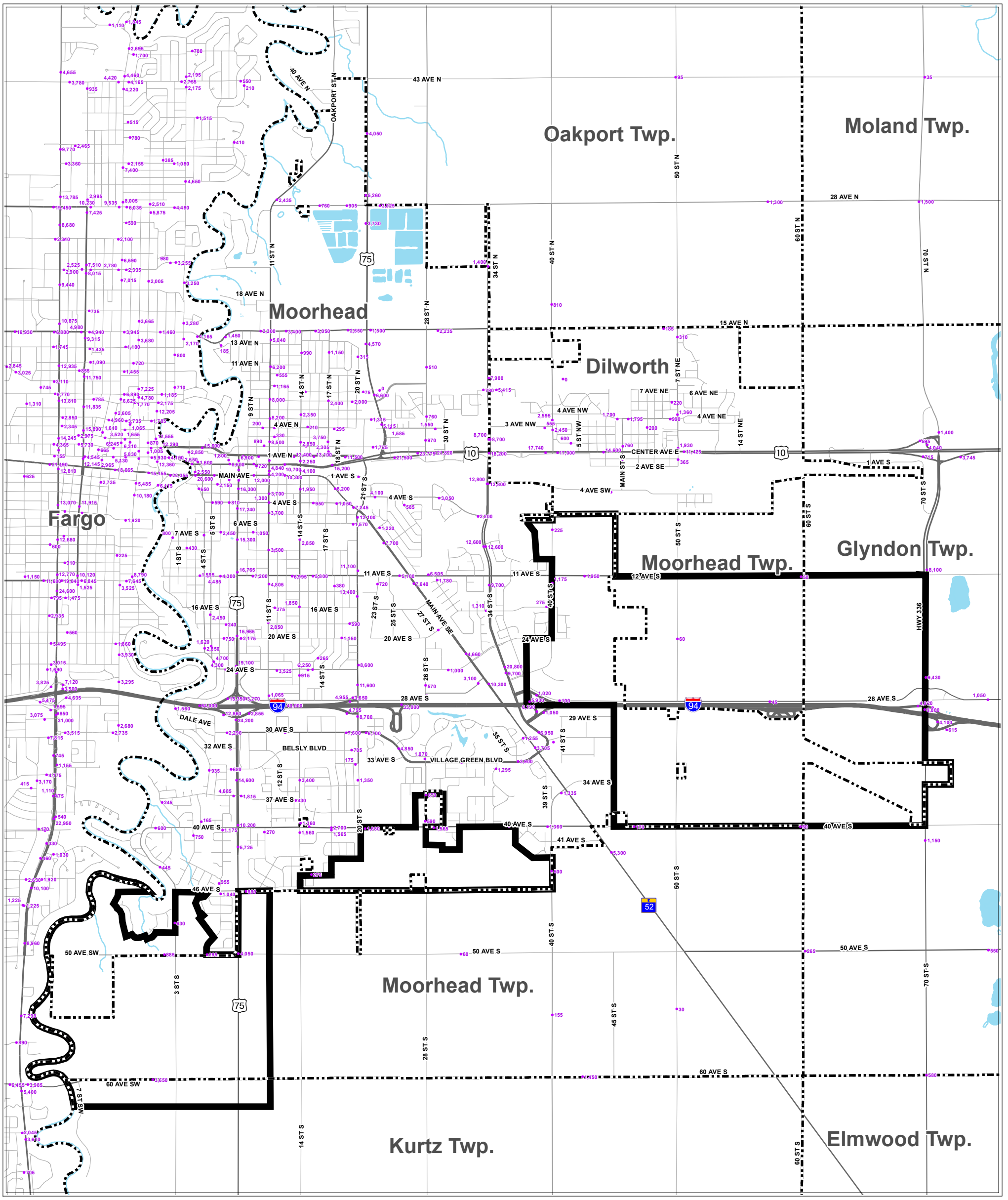
N

2,000 0 2,000 4,000 Feet

March 19, 2010

Bonestroo

K:/2261/2261090030/GIS/Projects/flu.mxd




# 2010 Average Annual Daily Traffic Volumes

Figure 6-2

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

12,345 2010 Average Annual Daily Traffic Volume

Municipal Boundary

AUAR Boundary

Open Water

N

2,000 0 2,000 4,000 Feet

September 11, 2012

Stantec

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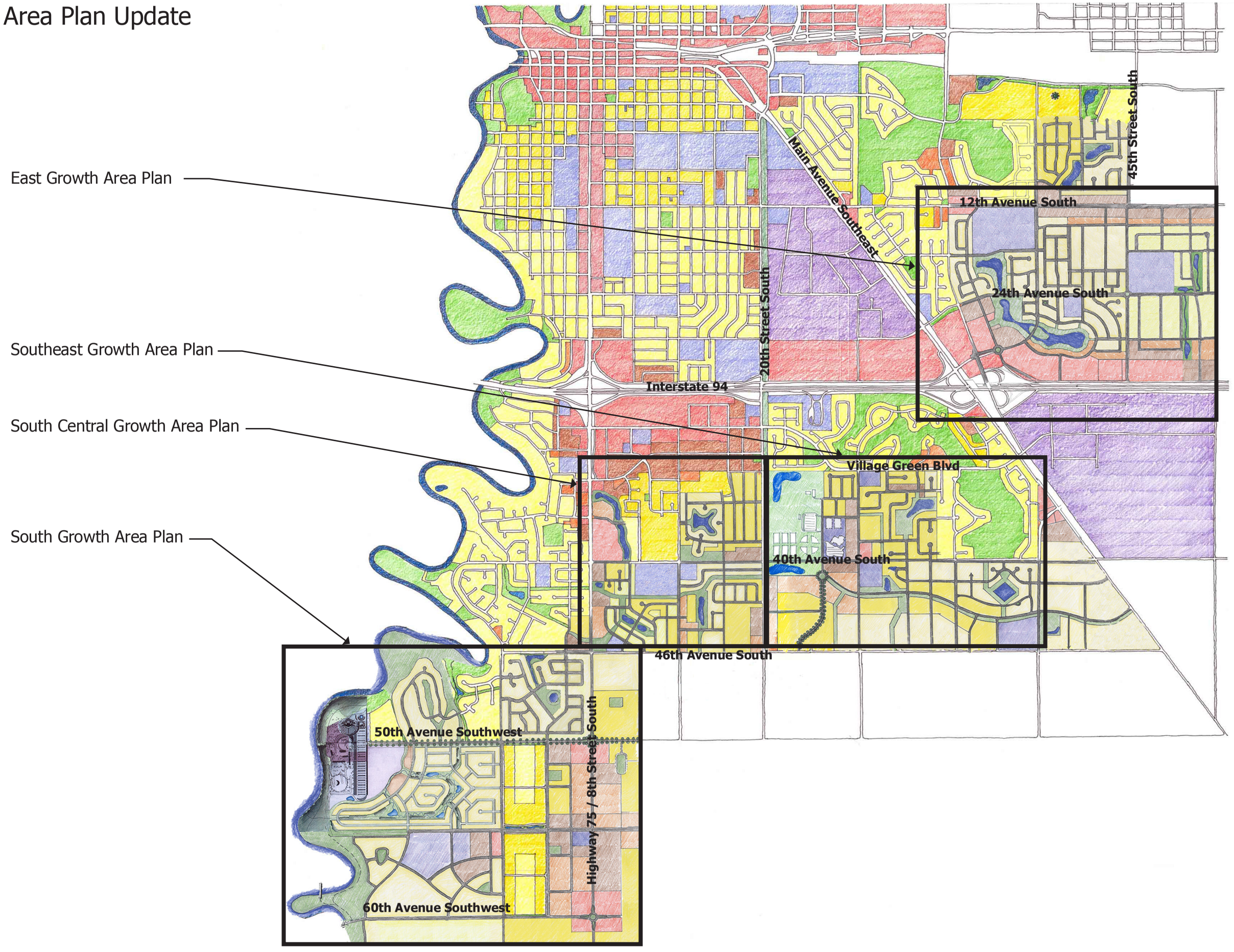
# Figure 12: Growth Area Plan Update Location Map

AUAR Update
Figure 6-3

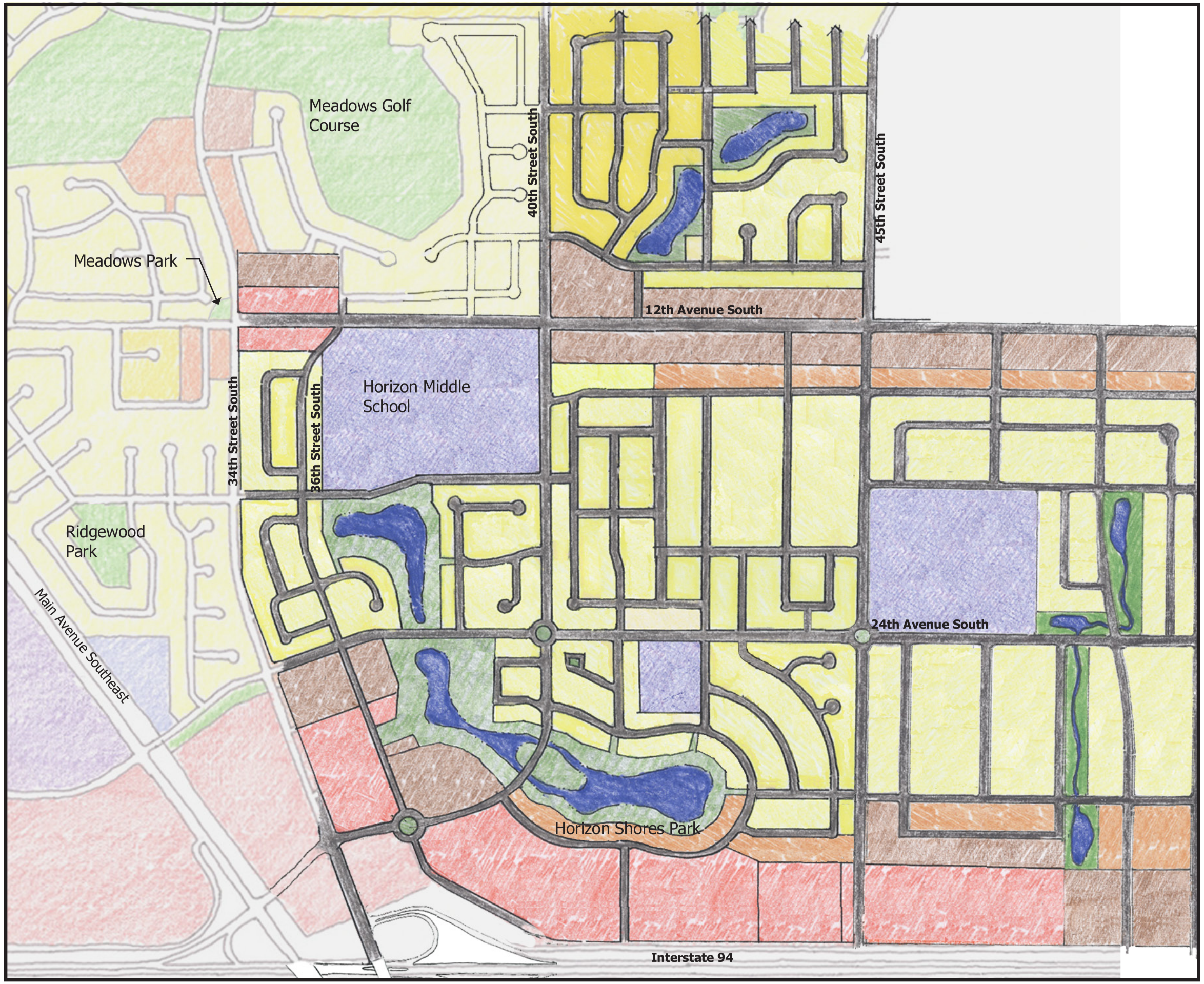


# Figure 13: East Growth Area Plan

AUAR Update
Figure 6-4

Legend

- Park and Open Space
- Public Land
- 0-4 Dwelling Units per Acre
- 3-5 Dwelling Units per Acre
- 6-12 Dwelling Units per Acre
- 12+ Dwelling Units per Acre
- Commercial
- Industrial
- Storm Ponds

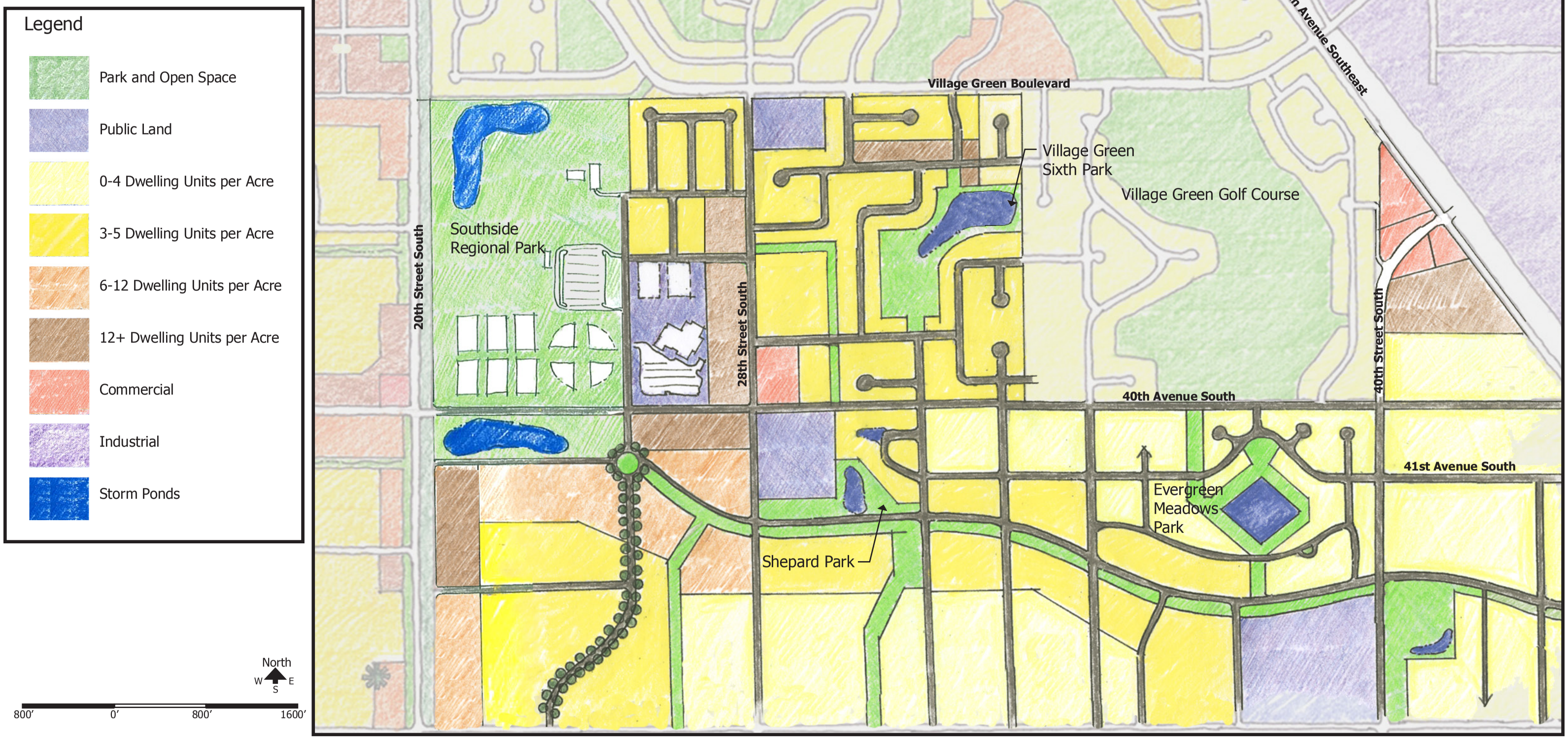



800′ 0′ 800′ 1600′

North
W E
S

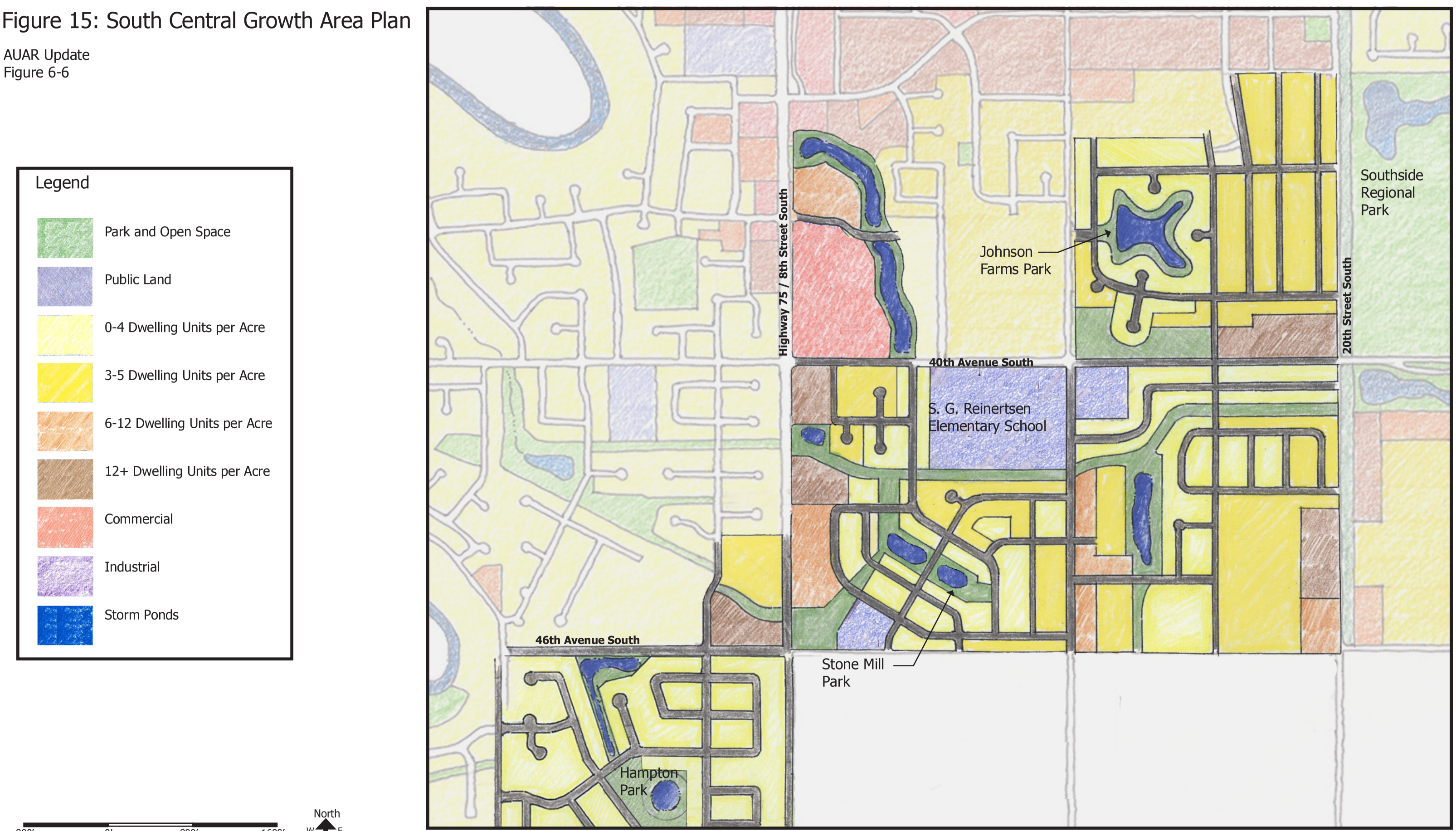
# Figure 14:Southeast Growth Area Plan

AUAR Update
Figure 6-5



# Figure 15: South Central Growth Area Plan

AUAR Update
Figure 6-6

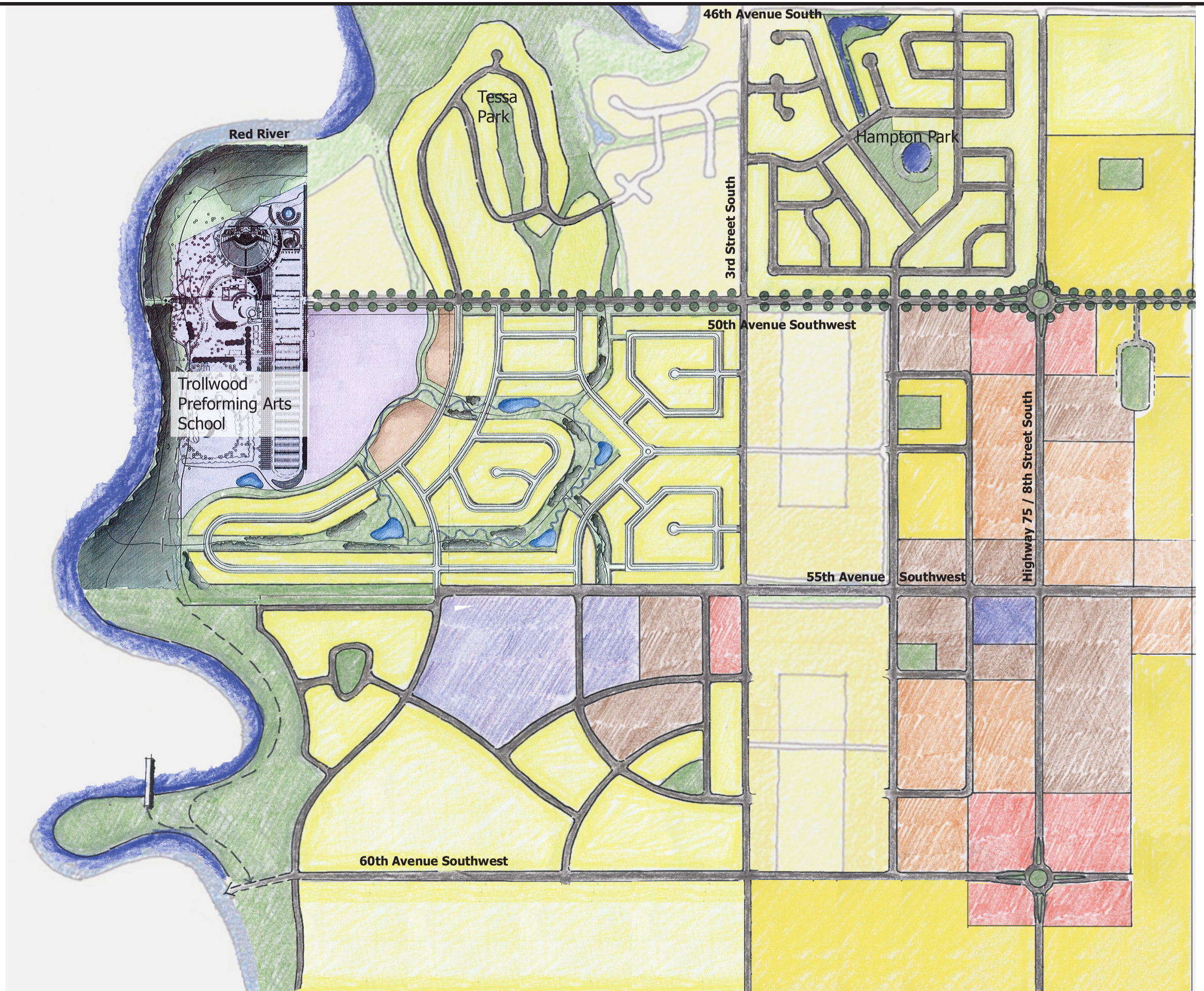


# Figure 16: South Growth Area Plan

AUAR Update
Figure 6-7

Legend

- Park and Open Space
- Public Land
- 0-4 Dwelling Units per Acre
- 3-5 Dwelling Units per Acre
- 6-12 Dwelling Units per Acre
- 12+ Dwelling Units per Acre
- Commercial
- Industrial
- Storm Ponds




North
W E
S

900′ 0′ 900′ 1800′

# Mayor and Council Communication

**May 29, 2012**



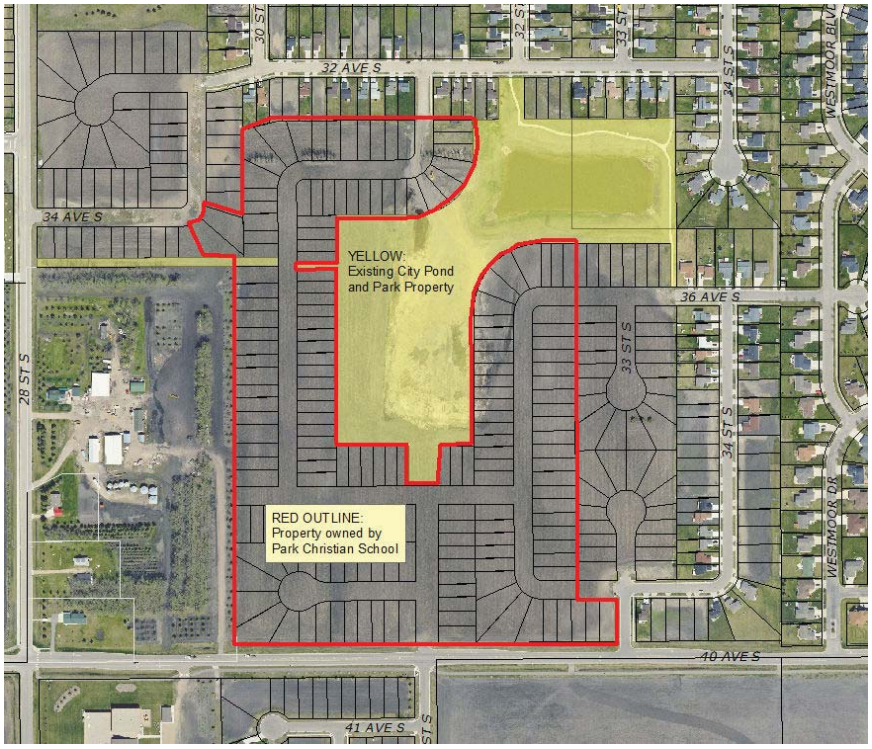
**SUBJECT: Resolution to Approve Land Lease with Park Christian Schools**

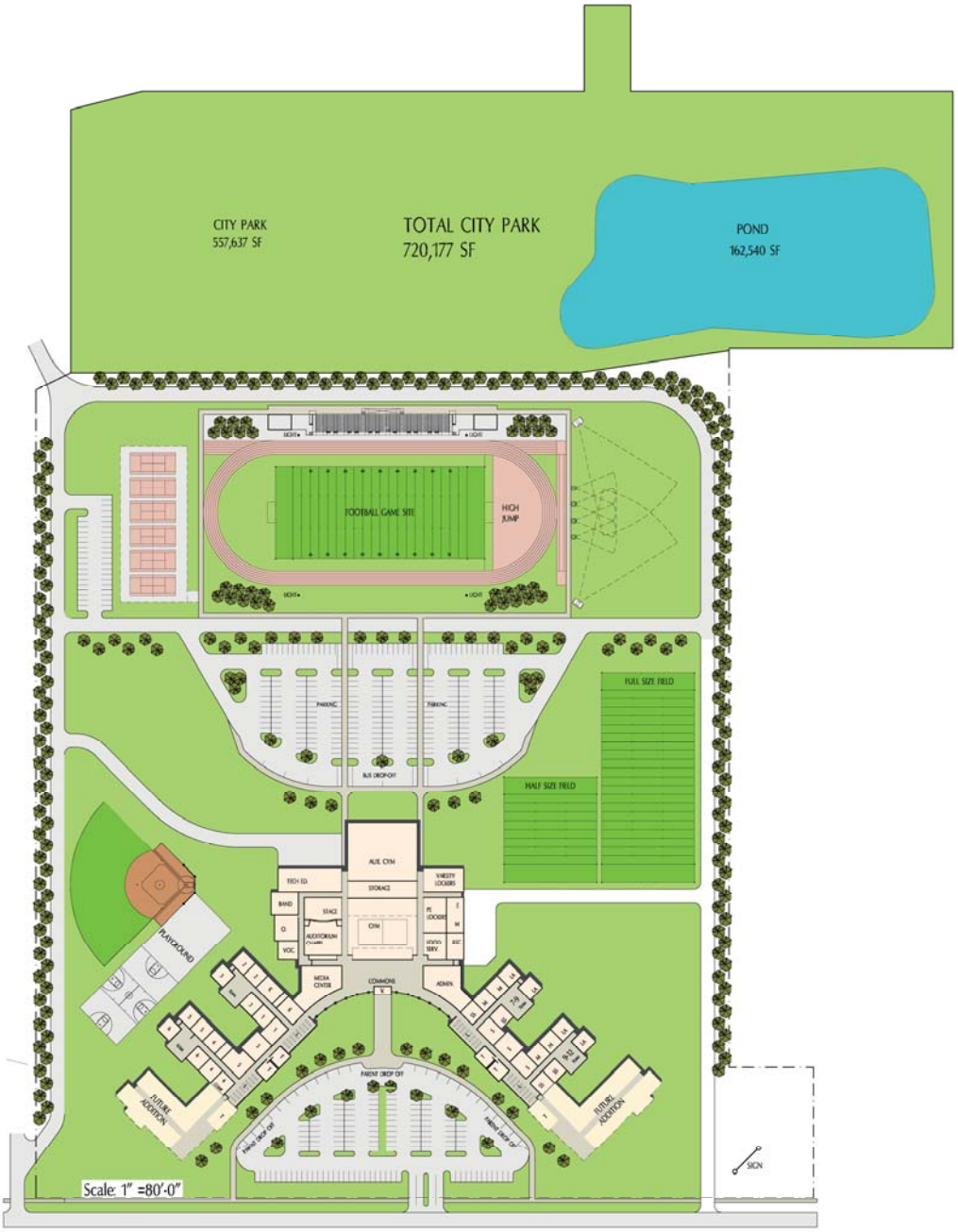
**RECOMMENDATION:** The Mayor and City Council are asked to consider a resolution to approve a temporary land lease agreement with Park Christian School for the placement of park equipment on land currently owned by the School.

**BACKGROUND / KEY POINTS:** Park Christian School recently acquired a tract of land in Village Green Sixth Addition in south Moorhead. The School intends to replat the acquired tract which will include a lot for a new school and a lot which will be dedicated to the City for parkland dedication required during the platting of Village Green Sixth Addition. The City Parks and Recreation Division currently has park equipment that has been purchased and is ready to be placed on the parkland site. The improvements planned for 2012 include installation of a play structure with wood chip surfacing. It is anticipated that it would be installed by early July. The Parks Advisory Board unanimously recommended execution of the proposed land lease.

The attached resolution and draft temporary land lease will allow for the placement of parkland equipment on land that is currently owned by the School and transfer said land to the City upon platting. The School has reviewed the draft lease and agreed with the proposed terms.

The existing pond and parkland area is shown in yellow below. The pond and park area, following future platting, is shown on the following page.






PCS PARK CHRISTIAN SCHOOL

N

60 ACRE SITE

PARK CHRISTIAN SCHOOL
LAND USE STUDY
MOORHEAD, MINNESOTA

ZERR BERG ARCHITECTS

gehrtz

**Agenda Item No. 11.**

**FINANCIAL CONSIDERATIONS:** The park equipment has been purchased. There is no cost associated with the proposed land lease.

**VOTING REQUIREMENTS:** Majority of Quorum

*Disclaimer: Voting requirements may be subject to changes in the law, parliamentary procedural matters, or other unforeseen issues. The City Attorney provides opinion on questions of voting requirements in accordance with the Moorhead City Code, Minnesota State Statues, and parliamentary procedure.*

Respectfully Submitted:

Michael J. Redlinger
City Manager

**Department:** Community Services
**Prepared by:** Kristie Leshovsky, City Planner and Zoning Administrator

**Attachments:** Draft Resolution
Draft Temporary Land Lease

# Request for Council Action

| AGENDA SECTION: Community Services Department | ORIGINATING DEPARTMENT: Planning | MEETING DATE: May 29, 2012 |
|---|---|---|
| ITEM NO. 11. | ITEM DESCRIPTION: Resolution to Approve Land Lease with Park Christian Schools | PREPARED BY: Leshovsky |

**DRAFT RESOLUTION**

WHEREAS, Park Christian School owns a tract of land and intends to replat said tract which will include a City park; and

WHEREAS, the City wishes to install park equipment within the tract of land currently owned by the School; and

WHEREAS, the property upon which the park is proposed to be located is legally described as Lots 34-49, Block 4, inclusive and Lots 74-93, Block 5, inclusive, Village Green Sixth Addition.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Moorhead, Minnesota that the Mayor and City Manager are hereby authorized to enter into a Temporary Land Lease Agreement with Park Christian School for the placement of parkland equipment and improvement of an area of open space for the purpose of a park on property currently owned by Park Christian School.

PASSED: May 29, 2012 by the City Council of the City of Moorhead.

**TEMPORARY LAND LEASE AGREEMENT**

THIS LAND LEASE, made and entered into as of the ___ day of _____, 2012, (the "Lease"), by and between the City of Moorhead, a duly organized political subdivision of the State of Minnesota, whose address is 500 center Avenue, Moorhead, MN 56561 (hereinafter the "City") and Park Christian School, whose address is 300 17th Street North, Moorhead, MN, 56560 (hereinafter the "School")

WHEREAS, the School owns a tract of land legally described as:

Lots 12 and 13, and Lots 34 through 49, inclusive, and Lots 51 through 66, inclusive, Block 4; Lots 25 through 48, inclusive, and Lots 50 through 93, inclusive, Block 5; Lots 1 through 35, inclusive, Block 6; Lots 1 through 24, inclusive, Block 7; and Lots 37 through 56, inclusive, Block 8, all in Village Green Sixth Addition to the City of Moorhead, Clay County, Minnesota.

WHEREAS, the School intends to re-plat said tract which will include a park; and

WHEREAS, the School and the City acknowledge that, upon re-platting, the School will transfer to the City by Warranty Deed a tract of land designated as a public park and public storm water pond, as more fully described herein, which will satisfy the park land dedication requirements outlined in the Village Green Sixth Addition Developer's Agreement, evidenced by recorder's document 625011; and

WHEREAS, the City wishes to construct a park and install park equipment within the tract of land currently owned by the School; and

WHEREAS, the property upon which the park is proposed to be located is legally described as:
Lots 34-49, Block 4, inclusive; and Lots 74-93, Block 5, inclusive,
Village Green Sixth Addition
(Hereinafter referred to as the "land"); and

WHEREAS, the City desires to permanently place parkland equipment and to improve an area of open space for the purpose of a park; and

WHEREAS, School is agreeable to such use of property under the conditions set out below.

NOW, THEREFORE, in consideration of the promises and mutual covenants hereafter contained, the parties hereby formally covenant, agree and bind themselves as follows:

1. Schools hereby leases to the City for the sum of one dollar ($1.00) and other good and valuable consideration, the receipt and the sufficiency of which are hereby acknowledged, the Land, together with improvements thereon, whether now or existing or hereafter constructed, for a term commencing on the effective date of this agreement and ending when the City of Moorhead takes ownership of the property.

2. The City and School shall work together to re-plat the larger parcel and to formally transfer and convey the land to the City.

3. Subject to the other provisions of this Lease, this lease shall terminate upon the recording of a warranty deed transferring the ownership of the property to the City.

4. During the term of the Lease, the City agrees to use the land solely for the purpose of a park and as such shall install park equipment and park related amenities.

5. The City shall responsible for providing insurance coverage for the use of the Land as a park with playground equipment. The City's insurance policy shall name the school as an additional insured.

6. The City shall indemnify and hold the School harmless from any third party claims arising out of or related to the use of the property as a park.

7. School agrees that upon the termination of this Lease, it will surrender the land to the free and clear of all liens and encumbrances.

8. The City shall not assign or otherwise dispose of or encumber this Lease without written consent School.

9. City shall take possession of the Land and accept the Land in its existing condition, and by taking possession is representing to the School that there is nothing further required of the School to make the premises suitable for the purposes and uses set forth above.

10. This Agreement shall be controlled by the laws of the State of Minnesota, and any action brought as a result of any claim, demand or cause of action arising under the terms of this Agreement shall be brought in an appropriate venue in the State of Minnesota.

11. This Agreement contains the entire understanding of the parties. It may not be changed orally, but only upon an agreement in writing approved by the City Council and signed by the Mayor and City Manager. It may be modified as to terms and conditions from time to time upon the mutual consent of the parties; however, such modification shall be reduced to writing, signed by the parties, and the document appended to and made a part of this Agreement.

12. The Lessee agrees to indemnify and save harmless the Lessor from and against all liability, damages, penalties, judgments, or claims of whatever nature arising from injury to person or property sustained by anyone arising out of Lessee's use and occupancy of the Leased Premises

and shall at Lessee's own cost and expense defend any and all suits or actions (just or unjust) which may be brought against the Lessor or in which the Lessor may be impleaded with others upon any such above-mentioned matter, claim or claims. This indemnification in no way limits Lessee's obligation to maintain a blanket or other general liability insurance policy for the benefit of the Lessor. This indemnity and hold harmless agreement shall include indemnity against all costs, expenses, and liabilities incurred in or in connection with any such claims or proceedings brought thereon and the defense thereof.

13. Lessee shall, at Lessee's sole cost and expense, provide and maintain during the term of this Agreement a blanket or general liability insurance policy against claims for personal injury, death, or property damage occurring in connection with the use and occupancy of the Leased Premises by the Lessee, said policy shall have limits of not less than $1,000,000.00 combined single limit.

14. Lessee shall, at Lessee's sole cost and expense, provide and maintain property insurance during the term of this Agreement in an amount sufficient to cover all items of property owned, maintained, or controlled by the Lessee on the Leased Premises.

15. All insurance policies (or riders) required by this Agreement shall be (i) taken out by Lessee and maintained with responsible insurance companies organized under the laws of one of the states of the United States and qualified to do business in the State of Minnesota, (ii) shall contain a provision that the insurer shall not cancel or revise coverage thereunder without giving written notice to Lessee as an insured party and to Lessor as an additional insured at least thirty (30) days before cancellation or revision becomes effective, (iii) shall name Lessee as an insured party and Lessor as an additional insured, (iv) shall be in accordance with specifications approved by the insurance advisor for Lessor, and (v) shall be evidenced by a Certificate of Insurance listing Lessor as an additional insured which shall be filed with the Lessor.

16. Lessor and Lessee agree that intoxicating beverages shall neither be served on or about the Leased Premises nor shall intoxicating beverages be served on or about the City facility under the terms of this Agreement without the written consent of the Lessor. Lessor and Lessee further agree that if Lessor does consent to the serving of intoxicating beverages on the Leased Premises, said serving of intoxicating beverages shall only be allowed if served in accordance with Chapter 340A of the Minnesota Statutes and any regulations there under as well as any and all applicable City ordinances as such statutes, regulations and ordinances may be from time to time amended, supplemented, or replaced. Lessor and Lessee further agree that the serving of intoxicating beverages will be subject to such terms, conditions, and limitations as may be required by Lessor's insurance carriers, said terms, conditions, and limitations to be prescribed by Lessor's insurance advisor.

17. Each provision, section, sentence, clause, phrase, and word of this Agreement is intended to be severable. If any provision, section, sentence, clause, phrase, and word hereof is held by a court with jurisdiction to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of this Agreement.

IN WITNESS WHEREOF, the City of Moorhead and Park Christian School have caused this Lease to be executed in their respective names and attested by duly authorized officers all as of the date first above written.

Dated: _____

**Park Christian School**

_____
Kent Hannestad, President

The foregoing instrument was acknowledged before me this _____ day of _____, 2012, by Kent Hannestad, known to me to be the President of Park Christian School.

_____
Notary Public, Clay County, Minnesota

(NOTARIAL SEAL or STAMP)

Dated:_____

**CITY OF MOORHEAD:**

_____
MARK VOXLAND, Mayor

_____
MICHAEL REDLINGER, City Manager

ATTEST:

_____
JILL WENGER, City Clerk

The foregoing instrument was acknowledged before me this _____ day of _____, 2012, by Mark Voxland, Michael Redlinger, and Jill Wenger, known to me to be the Mayor, City Manager, and City Clerk, respectively, of the City of Moorhead.

_____
Notary Public, Clay County, Minnesota

(NOTARIAL SEAL or STAMP)

## Building Permits and Projects 2006 - 2012

**South District:**

- Single family attached and detached: 113
- Multi family units: None
- Commercial: None
- Parks: Trollwood Performing Arts School/Regional Park
- Institutional: None

**South Central District:**

- Single family attached and detached: 642
- Multi family units: 236 units
    - 1501 Belsly Blvd (58.226.0020) – 88 units
    - 802 37th Ave S (58.426.0010) – 55 units
    - 852 37th Ave S (58.426.0100) – 39 units
    - 800 41st Ave S (58.608.0060) – 54 units
- Commercial: Essential Health Clinic, two commercial complexes
- Parks: Stonemill Neighborhood Park; Johnson Farms Neighborhood Park
- Institutional: Expansion of religious institution
- Future: 126 multifamily units under construction

**South East District**

- Single family attached and detached: 162
- Multi family units: None
- Commercial: None
- Parks: Southside Regional Park; Village Green Neighborhood Park; Evergreen Meadows Neighborhood Park
- Institutional: Farmstead Estates Senior Housing; Lilac Homes (memory care facility); 2 religious institutions
- Future: Park Christian School

**East District:**

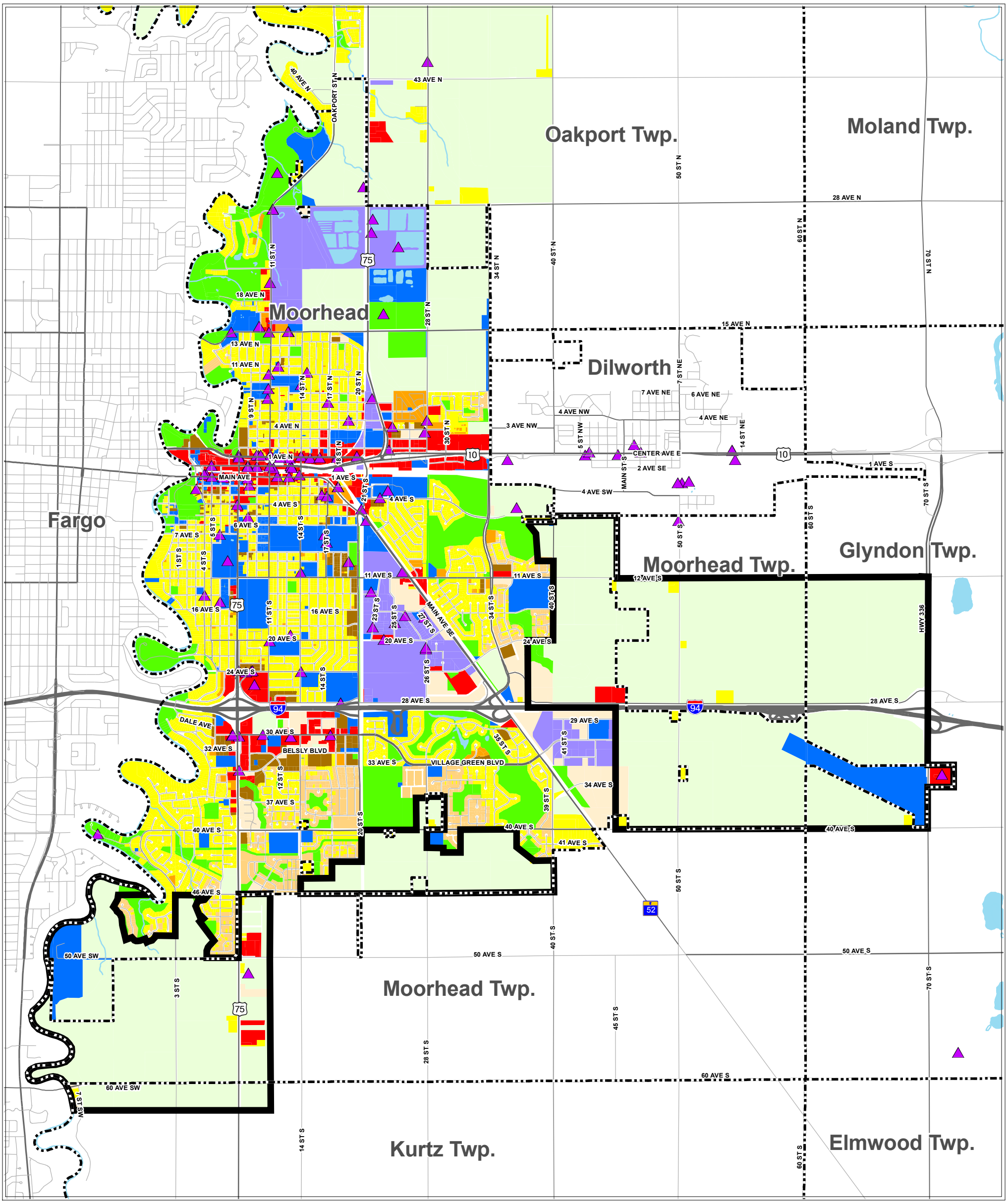
- Single family attached and detached: 134
- Multi family units: 276 units
    - 2421 36th St S (58.339.0010) – 90 units
    - 2720 36th St S (58.343.0020) – 90 units
    - 3500 8th Ave S (58.372.0150) – 96 units
- Commercial: Holiday Gas Station; Commercial/Office Complex
- Parks: Horizon Shores Regional Park
- Institutional: None
- Future: 2012-2013
    - Sanford Medical Clinic (currently under construction – anticipated completion July 2014)
    - Sam's Club (anticipated construction start spring of 2013)
    - Casey's General/Convenience Store (anticipated construction start spring/summer 2013)

# Existing Land Use Map

Figure 9-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota




| | |
|---|---|
| Sites of Environmental Concern | Commercial |
| Municipal Boundary | Industrial |
| AUAR Boundary | Parks/Open Space |
| Agricultural | Public/Semi-Public/Institutional |
| Low Density Residential | Vacant Platted Residential |
| Med Density Residential | Vacant |
| High Density Residential | Open Water |

N

2,000 0 2,000 4,000 Feet

March 19, 2010

Bonestroo

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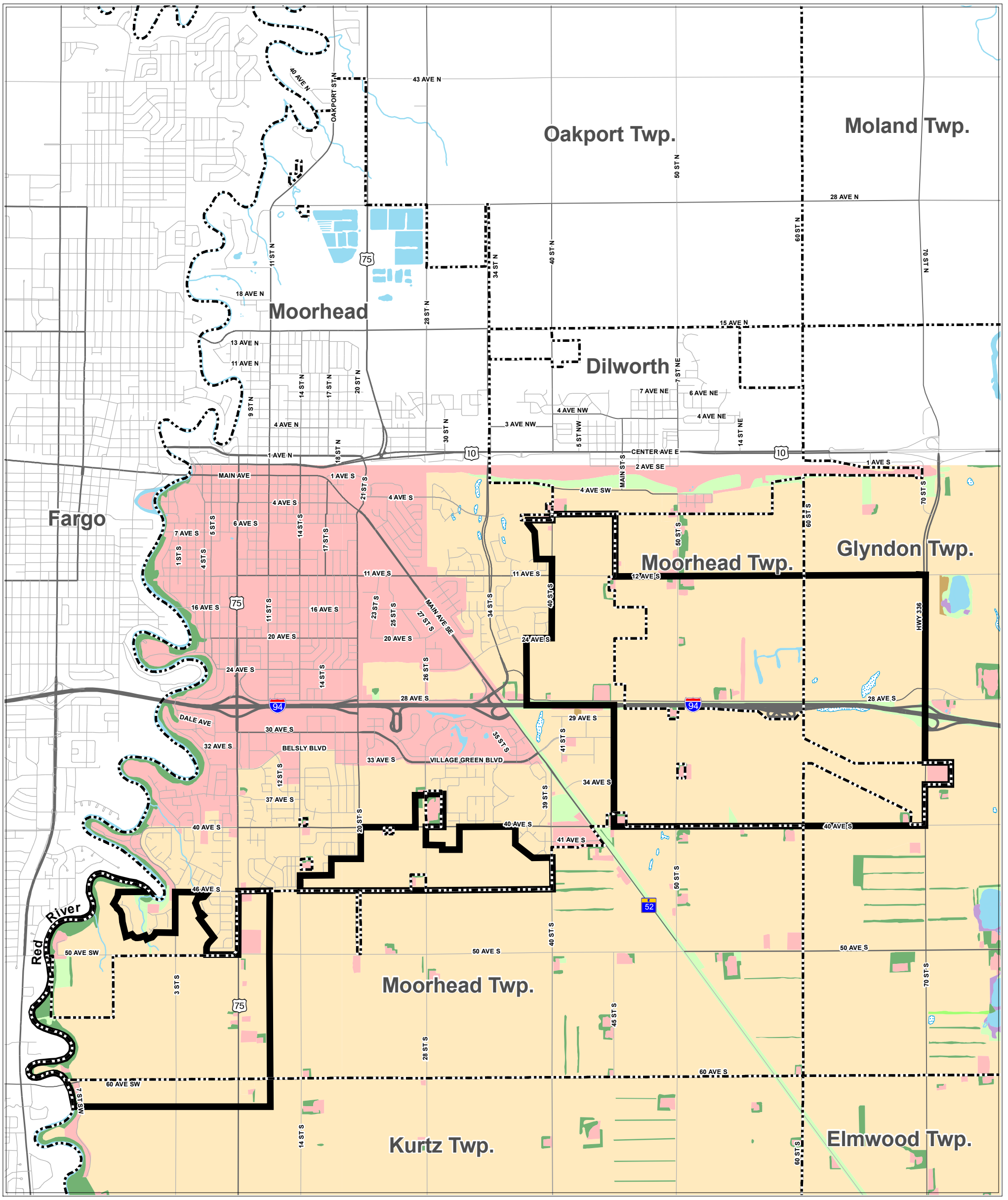


# Land Cover

Figure 10-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

- Municipal Boundary
- AUAR Boundary
- Deciduous Forest
- Grassland-Shrub-Tree (deciduous)
- Grassland
- Exposed Soil, Sandbars, and Sand Dunes
- Cultivated Land
- Developments
- Gravel Pits and Open Mines
- Open Water
- Wetlands

N

2,000 0 2,000 4,000 Feet

March 19, 2010

Bonestroo

K:/2261/2261090030/GIS/Projects/land cover.mxd

# Minnesota Department of Natural Resources

Division of Ecological Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5109 Fax: (651) 296-1811 E-mail: lisa.joyal@state.mn.us


April 7, 2010 **Correspondence # ERDB 20050542-0003**

Ms. Lisa Fay
Bonestroo
2335 West Highway 36
St. Paul, MN 55113

RE: Natural Heritage information in the vicinity of the Growth Area for South and East Moorhead, Clay County

| Township (N) | Range (W) | Section(s) |
|---|---|---|
| 138 | 48 | 5, 6 |
| 139 | 48 | 10,11,13-15,21-24,27-32 |
| 139 | 49 | 36 |
| 139 | 47 | 18-20 |

Dear Ms. Fay,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the AUAR Boundary. Based on this query, rare features have been documented within the search area. For details, please see the enclosed database reports.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Department of Natural Resources, Division of Ecological Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area.

The enclosed results include an Index Report and a Detailed Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location information, which might result in the destruction of a rare feature, both reports are copyrighted.

The Index Report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index report for any other purpose, please contact me to request written permission. **The Detailed Report is for your personal use only as it may include specific location information that is considered nonpublic data under *Minnesota Statutes*, section 84.0872, subd. 2. If you wish to reprint or publish the Detailed Report for any purpose, please contact me to request written permission.**

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

Lisa Joyal

Lisa Joyal
Natural Heritage Review Coordinator

enc.

Printed March 2010
Data valid for one year

**Minnesota Natural Heritage Information System**
**Index Report of records within 1 mile radius of:**
ERDB #20050542-0003 - Growth Area For South and East Moorhead
Multiple TRS
Clay County

## Rare Features Database:

| Element Name and Occurrence Number | Federal Status | MN Status | State Rank | Global Rank | Last Observed Date | EO ID # |
|---|---|---|---|---|---|---|
| **Vertebrate Animal** | | | | | | |
| Speotyto cunicularia (Burrowing Owl) #42<br>T139N R48W S28 ; Clay County | | END | S1B,SNRM | G4 | 2007-08-23 | 34452 |
| **Invertebrate Animal** | | | | | | |
| Oarisma garita (Garita Skipper) #5<br>T139N R48W S15, T139N R48W S14, T139N R48W S13, T139N R48W S12, T [...] ; Clay County | | THR | S2 | G5 | 1968-06-19 | 24753 |
| **Terrestrial Community - Other Classification** | | | | | | |
| Wet Prairie (Northern) Type #189 (NPC Code: WPn53c)<br>T139N R48W S26, T139N R48W S23 ; Clay County | | N/A | S3 | GNR | 1994-07-29 | 21842 |

**Records Printed** = 3

Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. For plants, taking includes digging or destroying. For animals, taking includes pursuing, capturing, or killing.

N

US HWY 10

FUTURE RAW WATER
TRANSMISSION MAIN

12TH AVE S

SCHOOL

I 94

FUTURE RAW WATER
TRANSMISSION MAIN

PARK

40TH AVE S

SCHOOL

FUTURE ELEVATED
STORAGE SITE

45TH ST S

50TH AVE S

60TH AVE S

MN TH 75

14TH ST S

BNSFRR

28TH ST S

40TH ST S

60TH ST S

# 2013 AUAR Update
# Figure 13-1
# Water System Improvements

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|---|---|---|
| DWG#: | W0161 | |
| DESIGN BY: | JDH | |
| DRAWING BY: | RBS | |
| DATE: | 03/27/10 | |
| LAYOUT: | D1 | |
| MPS PROJECT | | |

MOORHEAD PUBLIC SERVICE

CITY of MOORHEAD

SOUTH and EAST AUAR UPDATE

SCALE

0' 3500'

SHEET

1 OF 1

**ARTICLE B. FLOODWAY (FW) AND FLOOD FRINGE (FF) OVERLAY DISTRICTS**

10-17B-1: STATUTORY AUTHORIZATION AND PURPOSE:
A. Statutory Authorization: The legislature of the state of Minnesota has, in Minnesota statutes chapters 103F and 462 delegated the responsibility to local government units to adopt regulations designed to minimize flood losses.

B. Purpose: The special flood hazard areas of the city of Moorhead are subject to periodic inundation which results in potential loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare. It is the purpose of this article to promote the public health, safety, and general welfare and to minimize those losses described above by provisions contained herein.

This article is adopted to comply with the rules and regulations of the national flood insurance program codified as 44 code of federal regulations parts 59 - 78, as amended, so as to maintain the community's eligibility in the national flood insurance program. (Ord. 2012-1, 2-27-2012)

10-17B-2: FW AND FF GENERAL PROVISIONS:
A. Study And Map Adopted By Reference: The flood insurance study for Clay County, Minnesota and incorporated areas, the flood insurance rate maps therein numbered 27027C0308E, 27027C0309E, 27027C0316E, 27027C0317E, 27027C0318E, 27027C0319E, 27027C0328E, 27027C0338E, 27027C0340E, 27027C0456E, 27027C0457E, 27027C0458E, 27027C0459E, 27027C0470E, 27027C0480E, 27027C0481E, 27027C0484E and the flood insurance rate map index numbered 27027CIND2A and 27027CIND1A, all dated April 17, 2012, and prepared by the federal emergency management agency, are hereby adopted by reference and are hereby declared to be a part of this title. The maps covering the city boundaries of the city of Moorhead and any maps of property annexed into the city of Moorhead are declared to be part of the official zoning map. The floodway district shall comprise those areas shown as floodway on the flood insurance rate map. The flood fringe shall comprise those areas within the 100-year floodplain (i.e., zone AE) shown on the flood insurance rate map located outside of the floodway.

B. Boundaries: The boundaries of the floodway and flood fringe (the floodplain) shall be determined by use of the 100-year flood profile, the ground elevations that existed on the date of the first national flood insurance program map showing the area in the floodplain (dated July 1, 1974) and other supporting technical data in the flood insurance study and by scaling distances off the official zoning map. Where interpretation is needed as to the exact location of the boundaries of the district as shown on the official zoning map or other appropriate maps, as for example, where there appears to be a conflict between a mapped boundary and actual field conditions, the city shall make the necessary interpretation based on the criteria stated above. Persons contesting the location of the district boundaries shall be given a reasonable opportunity to present their case to the board of adjustment and to submit technical evidence.

C. Warning And Disclaimer Of Liability: This title does not imply that areas outside the floodplain districts or land uses permitted within such districts will be free from flooding or flood damages. This title will not create liability on the part of the city of Moorhead or any officer or employee thereof for any flood damages that result from reliance on this title or any administrative decision lawfully made thereunder.

D. Abrogation And Greater Restrictions: It is not intended by this article to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this article imposes greater restrictions, the provisions of this article shall prevail. All other regulations in this title inconsistent with this article are hereby repealed to the extent of the inconsistency only.

E. Severability: If any section, clause, provision, or portion of this article is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this article shall not be affected thereby.

F. Flood Insurance Rate Map Panels: The flood insurance rate map panels adopted by reference into subsection A of this section may include floodplain areas that lie outside of the corporate boundaries of the city of Moorhead at the time of adoption of this article. If any of these floodplain land areas are annexed into the city of Moorhead after the date of

adoption of this article, the newly annexed floodplain lands shall be subject to the provisions of this article immediately upon the date of annexation into the city of Moorhead. (Ord. 2012-1, 2-27-2012)

10-17B-3: ESTABLISHMENT OF FLOODWAY AND FLOOD FRINGE ZONING OVERLAY DISTRICTS:
A. The use districts lying within the floodplain areas under the jurisdiction of this title are hereby divided into two (2) additional districts: floodway district (FW) and flood fringe district (FF) as follows:

Floodway District: The floodway district shall include those areas designated as floodway on the flood insurance rate map adopted in subsection 10-17B-2A of this article.

Flood Fringe District: The flood fringe district shall include those areas designated as floodway fringe. The flood fringe district shall include those areas shown on the flood insurance rate map as adopted in subsection 10-17B-2A of this article as being within zone AE but being located outside of the floodway.

B. The boundaries of these districts shall be shown on the official zoning map. Within these districts, all uses not allowed as permitted uses or as conditional uses shall be prohibited. No new structure or land shall hereafter be used and no structure shall be constructed, located, extended, converted, or structurally altered without full compliance with the terms of this title and other applicable regulations which apply to uses within the jurisdiction of this title.

C. Removal of lands from the designated floodplain shall require the following: an amendment to the official zoning map as outlined in chapter 3 of this title; adoption of the approved FEMA case number within this article; and shall be in compliance with Minnesota rules 6120.5800 subpart 2. (Ord. 2012-1, 2-27-2012)

10-17B-4: FW FLOODWAY OVERLAY DISTRICT:
10-17B-4-1: FW PERMITTED USES:
The following uses must have a low flood damage potential, must be permissible in the underlying zoning district if one exists, must not obstruct flood flows or increase flood elevations, and must not involve structures, fill, obstructions, excavation, or storage of materials or equipment.

General farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, sod farming, and wild crop harvesting.

Private and public recreational uses such as golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, fishing areas, bicycle and pedestrian trails.

Residential, commercial and industrial lawns, gardens, plant nurseries, parking and loading areas and play areas. (Ord. 2012-1, 2-27-2012)

10-17B-4-2: FW CONDITIONAL USES:
Structures accessory to those uses listed in section 10-17B-4-1 of this article and the uses listed below:

Circuses, carnivals and similar transient amusement enterprises.

Drive-in theaters, new and used car lots, roadside stands, signs and billboards.

Extraction of sand, gravel, dirt or other materials provided such materials are not piled and/or stored in the floodway.

Fences that obstruct flood flows.

Kennels.

Marinas, boat rentals, docks, piers, wharves and water control structures.

Placement of fill.

Railroads, streets, bridges, utility transmission lines, utility boxes, and pipelines.

Recreational vehicles either on individual lots of record or in existing or new subdivisions or commercial or condominium type campgrounds, subject to the exemptions and provisions of subsection 10-17B-6C of this article.

Storage yards for equipment, machinery or materials.

Structural works for flood control such as dams, diversion channels, levees and floodwalls constructed to any height where the intent is to protect individual structures and levees and dikes where the intent is to protect agricultural crops.

Uses or structures accessory to passive or active open space areas. (Ord. 2012-1, 2-27-2012)

10-17B-4-3: FW STANDARDS FOR CONDITIONAL USES:
All such uses require a conditional use permit based upon the procedures set forth in and regulated by chapter 4 and section 10-18-2 of this title.

A. Fill: Any fill proposed to be deposited in the floodway must be shown to have some beneficial purpose and the amount thereof must not exceed that necessary to achieve the intended purpose, as demonstrated by a plan submitted by the owner showing the uses to which the filled land will be put and final dimensions of the proposed fill or other materials. Such fill shall not increase the designated 100-year flood elevation by more than 0.00 feet and shall be protected from erosion by vegetative cover, mulching, riprap, or other acceptable method.

B. Accessory Structures (Temporary Or Permanent):

1. Structures shall not be designated for human habitation.
2. Structures shall have a low flood damage potential.
3. The structure or structures, if permitted, shall be constructed and placed on the building site so as to offer the minimum obstruction to the flow of floodwaters.
a. Whenever possible, structures shall be constructed with the longitudinal axis parallel to the direction of flood flow, and
b. So far as practicable, structures shall be placed approximately on the same flood flow lines as those of adjoining structures.
4. Structures shall be adequately anchored to prevent flotation which may result in damage to other structures and/or restriction of bridge openings and other narrow sections of the stream or river.
5. Utilities and facilities such as gas, electrical, sewer and water systems to be located in the floodway shall be floodproofed in accordance with the Minnesota state building code or elevated to above the regulatory flood protection elevation.
6. Structures shall be elevated on fill or floodproofed to the FP-1 or FP-2 floodproofing classifications as defined by the Minnesota state building code. As an alternative, an accessory structure may be floodproofed to the FP-3 or FP-4 floodproofing classification in the Minnesota state building code provided the accessory structure constitutes a minimal investment, does not exceed five hundred seventy six (576) square feet in size at its largest projection, and for a detached garage, the detached garage must be used solely for parking of vehicles and limited storage. All floodproofed accessory structures must meet the following additional standards:
a. The structure must be adequately anchored to prevent flotation, collapse or lateral movement of the structure and shall be designed to equalize hydrostatic flood forces on exterior walls;
b. Utilities and facilities such as gas, electrical, sewer and water systems to be located in the floodway shall be floodproofed in accordance with the Minnesota state building code or elevated to above the regulatory flood protection elevation; and
c. To allow for the equalization of hydrostatic pressure, there must be a minimum of two (2) "automatic" openings in the outside walls of the structure having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding. There must be openings on at least two (2) sides of the structure and the bottom of all openings must be no higher than one foot (1') above the lowest adjacent grade to the structure. Using human intervention to open a garage door prior to flooding will not satisfy this requirement for automatic openings.

C. Storage Of Material And Equipment:

1. The storage or processing of materials that are, in time of flooding, buoyant, flammable, explosive or could be injurious to human, animal or plant life is prohibited.
2. Storage of other material or equipment may be allowed if not subject to major damage by floods and firmly anchored to prevent flotation or readily removable from the area within the time available after flood warning.

D. Garbage And Solid Waste Disposal: No conditional use permits for garbage and waste disposal sites shall be issued for floodway areas.

E. Permanent Structural Works For Flood Control:

1. Structural works for flood control that will change the course, current or cross section of protected wetlands or public waters shall be subject to the provisions of Minnesota statutes, chapter 103G.
2. Communitywide structural works for flood control intended to remove areas from the regulatory floodplain shall not be allowed in the floodway.
3. Structural works for flood control constructed in the floodway shall not cause an increase to the 100-year or regional flood unless the federal emergency management agency has issued a conditional and final letter of map revision pursuant to 44 code of federal regulations 65.12 authorizing the stage increase to the 100-year flood elevation in the floodway. The technical analysis must assume equal conveyance or storage loss on both sides of a stream.
4. Levees constructed to protect agricultural crops shall cause no stage increase to the 100-year flood for any portion of the levee in the floodway. (Ord. 2012-1, 2-27-2012)

10-17B-5: FF FLOOD FRINGE OVERLAY DISTRICT:

10-17B-5-1: FF PERMITTED USES:

Any conditional use or permitted use in the floodway overlay district unless otherwise identified in section 10-17B-5-2 of this article.

All structures, including accessory structures, constructed on fill so that the lowest floor is at or above the regulatory flood protection elevation. The finished fill elevation shall be no lower than the base flood elevation for the particular area and shall extend to such elevation at least fifteen feet (15') beyond the limits of any structure or building erected thereon. As an alternative to elevation on fill, accessory structures that constitute a minimal investment and that do not exceed five hundred seventy six (576) square feet at its largest projection may be internally floodproofed in accordance with subsection 10-17B-4-3B6 of this article.

The storage of any materials or equipment elevated on fill to the regulatory flood protection elevation.

Lots and subdivisions or otherwise legally described areas that have an approved letter of map revision - based on fill (LOMR-F) as described in and officially adopted by section 10-17B-8 of this article, which have been filled to an elevation at or above the regulatory flood protection elevation per Minnesota rules 6120.5800, subpart 2, and are contiguous to other lands lying outside the flood fringe district and which are in compliance with the following standards are herein permitted:

A. Residential basements may be constructed below the regulatory flood protection elevation if in compliance with the FP-1 floodproofing classification (i.e., a W1 space) of the Minnesota state building code and in accordance with the following minimum requirements, consistent with 44 code of federal regulation 60.6(c) and the city of Moorhead "basement" exception from the federal emergency management agency, or the federal emergency management agency technical bulletin 10-01, as amended:

1. Flood Depth: Flood depths shall not be more than five feet (5') for developable lots that are contiguous to land above the base flood elevation (100-year flood) or three feet (3') for other lots.
2. Flood Velocity: Flood velocity shall be limited to five feet (5') per second.
3. Flood Warning Time: Flood warning time shall be at least twelve (12) hours. Flood warning times of two (2) hours or greater may be approved if the community demonstrates that it has a flood warning system and an emergency plan in operation that is adequate to ensure safe evacuation of affected residents.

4. Basement Structural Requirements:
a. Basements shall be designed and constructed so that any basement area, utilities and sanitary facilities below the floodproofed level are floodproofed in accordance with the FP-1 floodproofing classification (e.g., watertight with walls impermeable to the passage of water without human intervention).
b. Basement walls shall be built with the capacity to resist the hydrostatic and hydrodynamic loads as well as the effects of buoyancy resulting from flooding to the floodproofed design level, and shall be designed so that minimal damage will occur from floods exceeding that level.
c. Floodproofing design level shall be an elevation no lower than the regulatory flood protection elevation where the difference between the 100-year flood and the 500-year flood levels is three feet (3') or less and two feet (2') above the 100-year flood level where the difference between the 100-year flood and 500-year flood levels is greater than three feet (3').
5. Basement Floor: The top of basement floor shall be no lower than five feet (5') below the 100-year flood level.
6. Fill:
a. The area surrounding the structure must be filled to an elevation no lower than the base flood elevation for the particular area and shall extend to such elevation at least fifteen feet (15') beyond the limits of any structure or building erected thereon;
b. Fill must be compacted to at least ninety five percent (95%) of standard laboratory maximum dry density (standard proctor), according to the American Society For Testing And Materials (ASTM) standard D-698, or as otherwise directed by the city. Fill soils must be fine grained soils of low permeability, such as those classified as CH, CL, SC, or ML according to the ASTM standard D-2487, "Classification Of Soils For Engineering Purposes"; and
c. Slopes must be protected by a vegetative cover.
7. Develop/Review Of Structural Design Of Building: A registered professional engineer or architect shall develop or review the building's structural design, specifications, and plans, including consideration of depth, velocity, and duration of flooding and type and permeability of soils at the building site, and inspect and certify that the basement design, as constructed, is in accordance with accepted standards of practice for meeting the provisions of this paragraph; and
8. Inspection Of Structure: The community building official is authorized to inspect the structure to verify that it meets the provisions of this section. (Ord. 2012-1, 2-27-2012)

10-17B-5-2: FF PROVISIONAL USES:
The following uses require a provisional use permit based upon procedures and regulated by chapter 6 of this title. The city planner and zoning administrator, or designee, will provide a copy of the provisional use permit to the commissioner of natural resources within ten (10) days of its issuance.

A. Lots and subdivisions or otherwise legally described areas that have an approved letter of map revision - based on fill (LOMR-F) as described in section 10-17B-8 of this article and which are in compliance with the following:
1. Residential basements may be constructed below the regulatory flood protection elevation if in compliance with the FP-1 floodproofing classification (i.e., a W1 space) of the Minnesota state building code and in accordance with the requirements in subsection 10-17B-5-1A of this article, consistent with 44 code of federal regulations 60.6(c) and the city of Moorhead "basement" exemption from the federal emergency management agency, or the federal emergency management agency technical bulletin 10-01 as amended, and only upon compliance with this article and the provisions of chapter 6 of this title. (Ord. 2012-1, 2-27-2012)

10-17B-5-3: FF CONDITIONAL USES:
Requires a conditional use permit based upon procedures and regulated by chapter 4 of this title. The following uses may be allowed in the FF flood fringe overlay district only upon compliance with this article and section 10-17B-7-3 of this article and the provisions of chapter 4 and section 10-18-2 of this title:

A. Residential Basements: Residential basements may be constructed below the regulatory flood protection elevation if in compliance with the FP-1 floodproofing classification (i.e., a W1 space) of the Minnesota state building code and in accordance with the requirements in subsection 10-17B-5-1A of this article, consistent with 44 code of federal regulations 60.6(c) and the city of Moorhead "basement" exemption from the federal emergency management agency, or the federal emergency management agency technical bulletin 10-01 as amended.

B. Storage Of Materials And Equipment:

1. The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

2. Storage of other materials or equipment may be allowed if readily removable from the area within the time available after a flood warning and in accordance with a plan approved by the city.

C. Nonresidential Structures: All areas of nonresidential structures, including basements to be placed below the regulatory flood protection elevation, shall be floodproofed in accordance with the structurally dry floodproofing classifications in the Minnesota state building code. Structurally dry floodproofing must meet the FP-1 or FP-2 floodproofing classification in the Minnesota state building code and this shall require making the structure watertight with the walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. Structures floodproofed to the FP-3 or FP-4 classification shall not be permitted.

D. Alternative Elevation Methods:

1. Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the regulatory flood protection elevation. These alternative methods may include the use of stilts, pilings, parallel walls, etc., or above grade, enclosed areas. The base or floor of an enclosed area shall be considered above grade and not a structure's basement or lowest floor if: a) the enclosed area is above grade on at least one side of the structure; b) it is designed to internally flood and is constructed with flood resistant materials; and c) it is used solely for parking of vehicles, building access or storage. The above noted alternative elevation methods are subject to the following additional standards:

a. Design And Certification: The structure's design and as built condition must be certified by a registered professional engineer or architect as being in compliance with the general design standards of the Minnesota state building code and, specifically, that all electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the regulatory flood protection elevation or be designed to prevent floodwater from entering or accumulating within these components during times of flooding.

b. Specific Standards For Above Grade, Enclosed Areas: Above grade, fully enclosed areas must be designed to internally flood and the design plans must stipulate:

(1) A minimum area of openings in the walls where internal flooding is to be used as a floodproofing technique. There shall be a minimum of two (2) openings on at least two (2) sides of the structure and the bottom of all openings shall be no higher than one foot (1') above grade. The automatic openings shall have a minimum net area of not less than one square inch for every square foot of enclosed area subject to flooding unless a registered professional engineer or architect certifies that a smaller net area would suffice. The automatic openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters without any form of human intervention; and

(2) That the enclosed area will be designed of flood resistant materials in accordance with the FP-3 or FP-4 classifications in the Minnesota state building code and shall be used solely for building access, parking of vehicles or storage. (Ord. 2012-1, 2-27-2012)

10-17B-5-4: STANDARDS FOR ALL FLOOD FRINGE USES:

A. Commercial uses: Accessory land uses, such as yards, railroad tracks, and parking lots may be at elevations lower than the regulatory flood protection elevation. However, a floodplain development permit for such facilities to be used by the employees or the general public shall not be granted in the absence of a flood warning system that provides adequate time for evacuation if the area would be inundated to a depth and velocity such that when multiplying the depth (in feet) times velocity (in feet per second) the product number exceeds four (4) upon occurrence of the 100-year flood.

B. Manufacturing and industrial uses: Measures shall be taken to minimize interference with normal plant operations especially along streams having protracted flood durations. Certain accessory land uses such as yards and parking lots may be at lower elevations subject to requirements set out in subsection A of this section. In considering permit applications, due consideration shall be given to needs of an industry whose business requires that it be located in floodplain areas.

C. Fill shall be properly compacted and the slopes shall be properly protected by the use of riprap, vegetative cover or other acceptable method.

D. The federal emergency management agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the 100-year flood elevation - FEMA's requirements may incorporate specific fill compaction and side slope protection standards for multi-structure or multi-lot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

E. All manufactured homes must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over the top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

F. Standards for recreational vehicles are contained in subsection 10-17B-6C of this article. (Ord. 2012-1, 2-27-2012)

10-17B-6: ADDITIONAL STANDARDS FOR ALL FLOOD FRINGE AND FLOODWAY USES:

A. Floodplain Developments: Floodplain developments shall not adversely affect the hydraulic capacity of the channel and adjoining floodplain of any tributary watercourse or drainage system where a floodway or other encroachment limit has not been specified on the official zoning map. No use shall affect the capacity of the channels or floodways of any tributary to the main stream, drainage ditch or any other drainage facility or stream.

B. Public Utilities, Railroads And Bridges:

1. Public Utilities: All public utilities and facilities such as gas, electrical, sewer and water supply systems to be located in the floodplain shall be designed to prevent floodwater from entering or accumulating within during times of flooding or floodproofed in accordance with the Minnesota state building code or elevated to above the regulatory flood protection elevation.

2. Public Transportation Facilities: Railroad tracks, roads, and bridges shall comply with this article and the zoning title. Elevation to the regulatory flood protection elevation shall be provided where failure and interruption of these transportation facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary railroad tracks, roads or bridges may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety and as long as such construction is in accordance with the rules and regulations of the department of natural resources, state of Minnesota, and the federal emergency management agency.

C. Manufactured Homes And Manufactured Home Parks And Placement Of Recreational Vehicles:

1. New manufactured home parks and expansions to existing manufactured home parks shall be subject to the provisions placed on subdivisions by section 11-7-3 of this code.

2. The placement of new or replacement manufactured homes in existing manufactured home parks or on individual lots of record that are located in floodplain districts will be treated as a new structure and may be placed only if elevated in compliance with section 10-17B-5 of this article. If vehicular road access for preexisting manufactured home parks is not provided in accordance with section 10-17B-5-2 of this article, then replacement manufactured homes will not be allowed until the property owner(s) develops a flood warning emergency plan acceptable to the city.

a. All manufactured homes must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over the top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

3. Recreational vehicles that do not meet the exemption criteria specified in subsection C3a of this section shall be subject to the provisions of this title and as specifically spelled out in subsections C3c and C3d of this section.

a. Exemption: Recreational vehicles are exempt from the provisions of this article if they are placed in any of the areas listed in subsection C3b of this section and further they meet the following criteria:

(1) Have current licenses required for highway use.

(2) Are highway ready meaning on wheels or the internal jacking system, are attached to the site only by quick disconnect type utilities commonly used in campgrounds and recreational vehicle parks and the recreational vehicle has no permanent structural type additions attached to it.
(3) The recreational vehicle and associated use must be permissible in any preexisting, underlying zoning use district.
b. Areas Exempted For Placement Of Recreational Vehicles:
(1) Individual lots or parcels of record.
(2) Existing commercial recreational vehicle parks or campgrounds.
(3) Existing condominium type associations.
c. Loss Of Exemption: Recreational vehicles exempted in subsection C3a of this section lose this exemption when development occurs on the parcel exceeding five hundred dollars ($500.00) for a structural addition to the recreational vehicle or exceeding five hundred dollars ($500.00) for an accessory structure such as a garage or storage building. The recreational vehicle and all additions and accessory structures will then be treated as a new structure and shall be subject to the elevation requirements and the use of land restrictions specified in this article. There shall be no development or improvement on the parcel or attachment to the recreational vehicle that hinders the removal of the recreational vehicle to a flood free location should flooding occur.
d. New Commercial Recreational Vehicle Parks Or Campgrounds: New commercial recreational vehicle parks or campgrounds and new residential type subdivisions and condominium associations and the expansion of any existing similar use exceeding five (5) units or dwelling sites shall be subject to the following:
(1) Any new or replacement recreational vehicle will be allowed in the floodway or flood fringe districts provided said recreational vehicle and its contents are placed on fill above the regulatory flood protection elevation and proper elevated road access to the site exists in accordance with section 10-17B-5-1 of this article. No fill placed in the floodway to meet the requirements of this section shall increase flood stages of the 100-year or regional flood.
(2) All new or replacement recreational vehicles not meeting the criteria of subsection C3d(1) of this section may, as an alternative, be allowed as a conditional use if in accordance with the following provisions and the provisions of chapter 4 of this title. The applicant must submit an emergency plan for the safe evacuation of all vehicles and people during the 100-year flood. Said plan shall be prepared by a registered engineer or other qualified individual, shall demonstrate that adequate time and personnel exist to carry out the evacuation, and shall demonstrate the provisions of subsections C3a(1) and C3a(2) of this section will be met. All attendant sewage and water facilities for new or replacement recreational vehicles must be protected or constructed so as to not be impaired or contaminated during times of flooding. (Ord. 2012-1, 2-27-2012)

10-17B-7: ADMINISTRATION OF FLOODWAY AND FLOOD FRINGE OVERLAY DISTRICTS:
10-17B-7-1: PERMITS:

A. Application For Building Permits And Floodplain Development Permits: Application for a building permit and floodplain development permit shall be made in accordance with city regulations and the Minnesota state building code. Additional information for properties located in the floodway district or flood fringe overlay district shall include plans drawn to scale; elevations of the lot; existing or proposed structures, fill or storage of materials; and the location of the foregoing in relation to the channel.

B. Construction And Use To Be As Provided In Applications, Plans And Permits: Additional requirements beyond those provided elsewhere in this title for properties in the floodway or flood fringe overlay district include the requirement to submit certification by a registered professional engineer, architect or land surveyor as appropriate, that the finished fill and building floor elevations, floodproofing or other flood protection measures were designed and constructed in compliance with the provisions of this title.

C. State And Federal Permits: Prior to granting a building permit, floodplain development permit, conditional use permit or variance it shall be determined that the applicant has obtained all necessary state and federal permits, if required.

D. Permits Required: Permits, when required, shall be secured prior to the erection, addition, modification, rehabilitation (including normal maintenance and repair), or alteration of any building, structure or portion thereof in the floodway and flood fringe overlay districts; prior to the use or change of use of a building, structure or land; prior to the construction of

a dam, fence, or on site septic system; prior to the change or extension of a nonconforming use; prior to the repair of a structure that has been damaged by flood, fire, tornado, or any other source; and prior to the placement of fill or excavation of materials within the floodway and/or flood fringe overlay districts.

E. Record Of First Floor Elevation: The city shall maintain a record of the elevation of the first floor and basement floor (if applicable) of all new structures or alterations or additions to existing structures in the floodway and flood fringe district. The city shall also maintain a record of the elevation to which structures, alterations, or additions to structures are floodproofed.

F. Notifications For Watercourse Alterations: The zoning administrator, or designee, shall notify, in riverine situations, adjacent communities and the commissioner of the department of natural resources prior to the community authorizing any alteration or relocation of a watercourse. If the applicant has applied for a permit to work in the beds of public waters pursuant to Minnesota statutes, chapter 103G, this shall suffice as adequate notice to the commissioner of natural resources. A copy of said notification shall also be submitted to the Chicago regional office of the federal emergency management agency (FEMA).

G. Notification To FEMA When Physical Changes Increase Or Decrease The 100-Year Flood Elevation: As soon as is practicable, but not later than six (6) months after the date such supporting information becomes available, the zoning administrator, or designee, shall notify the Chicago regional office of FEMA of the changes by submitting a copy of said technical or scientific data. (Ord. 2012-1, 2-27-2012)

10-17B-7-2: VARIANCES, BOARD OF ADJUSTMENT AND APPEALS ACTION:
A. Procedures: All variance requests are subject to the procedures set forth in and regulated by chapter 5 of this title.

B. Variances: No variance shall have the effect of allowing any district uses prohibited therein, permit a lesser degree of flood protection than the regulatory flood protection elevation for the particular area, or permit standards lower than those required by state law.

C. Hearings: For properties within the floodway or flood fringe overlay district, the board shall submit to the commissioner of natural resources a copy of the application for proposed variances sufficiently in advance so that the commissioner will receive at least ten (10) days' notice of the hearing.

D. Decisions: A copy of all decisions granting variances for properties in the floodway or flood fringe shall be forwarded to the commissioner of natural resources within ten (10) days of such action.

E. Additional Criteria: The following additional variance criteria of the federal emergency management agency must be satisfied:

1. Variances shall not be issued by a community within any designated regulatory floodway if any increase by more than 0.00 feet in flood levels during the base flood discharge would result.
2. Variances shall only be issued by a community upon: a) a showing of good and sufficient cause, b) a determination that failure to grant the variance would result in exceptional hardship and practical difficulties to the applicant, and c) a determination that the granting of a variance will not result in increased flood heights by more than 0.00 feet, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
3. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

F. Flood Insurance Notice And Recordkeeping: The zoning administrator, or designee, shall notify the applicant for a variance that:

1. The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as twenty five dollars ($25.00) for one hundred dollars ($100.00) of insurance coverage, and
2. Such construction below the 100-year or regional flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions. A community shall maintain a record of all

variance actions, including justification for their issuance, and report such variances issued in its annual or biennial report submitted to the administrator of the national flood insurance program. (Ord. 2012-1, 2-27-2012)

10-17B-7-3: CONDITIONAL USE PERMITS; PLANNING COMMISSION AND COUNCIL ACTION:

A. Permit Requests: All conditional use permit requests are subject to the procedures set forth in and regulated by chapter 4 and section 10-18-2 of this title.

B. Application Requirements: Upon receiving an application for a conditional use permit in the floodway or flood fringe district, the planning commission, in formulating its recommendation to the council, may prior to rendering its recommendation thereon:

1. Require the applicant to furnish the following information if deemed necessary by the planning commission to determine the suitability of the particular site for the proposed use:

a. Plans in triplicate drawn to scale showing the nature, location, dimensions and elevation of the lot, existing or proposed structures, fill, storage of materials, floodproofing measures and the relationship of the above to the location of the channel.

b. A typical valley cross section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross sectional areas to be occupied by the proposed development and high water information.

c. Plan (surface view) showing elevations or contours of the ground, pertinent structure, fill or storage elevations; size, location and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream; and soil types.

d. Profile showing the slope of the water surface of the stream.

e. Specifications for building construction and materials, floodproofing, filling, dredging, grading, channel improvement, storage of materials, water supply and sanitary facilities.

f. Additional information as requested.

2. Transmit one copy of the information described in subsection B1 of this section to a designated engineer or other expert person or agency selected by the planning commission for technical assistance, where necessary, to evaluate the proposed project in relation to flood heights and velocities, potential flood damage to the use, the adequacy of the plans for protection and other technical matters. The fees of such expert shall be paid by the applicant.

3. Based upon the technical evaluation of the designated engineer or expert, the planning commission shall determine the specific flood hazard at the site and evaluate the suitability of the proposed use in relation to the flood hazard.

C. Hearings: For properties within the floodway or flood fringe overlay district, the planning commission shall submit to the commissioner of natural resources a copy of the application for proposed conditional use permits sufficiently in advance so that the commissioner will receive at least ten (10) days' notice of the hearing.

D. Decisions: A copy of all decisions granting conditional use permits for properties in the floodway and flood fringe shall be forwarded to the commissioner of natural resources within ten (10) days of such action.

E. Factors Upon Which Decisions To Issue Conditional Use Permit Shall Be Based: In passing upon conditional use permits, the following shall be considered in addition to other applicable factors that may be required to be considered elsewhere in this title (including chapter 4 of this title):

1. The danger to life and property due to increased flood heights or velocities caused by encroachments.

2. The danger that materials may be swept onto other lands or downstream to the injury of others or that may block bridges, culverts, or other hydraulic structures.

3. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.

4. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

5. The importance of the services provided by the proposed facility to the community.

6. The requirements of the facility for a waterfront location.

7. The availability of the alternative locations not subject to flooding for the proposed uses.

8. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
9. The relationship of the proposed use to the comprehensive plan and floodplain management program of the area.
10. The safety of access to the property in times of flood for ordinary and emergency vehicles.
11. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters expected at the site.
12. Such other factors which are relevant to the purposes of this title.

F. Conditions Attached To Conditional Use Permits: Upon consideration of the factors listed above and the purposes of this title, the following conditions may be attached to the granting of conditional use permits or variances within the floodway or flood fringe overlay districts to fulfill the purposes of this title. Such conditions may include, but are not limited to, the following:

1. Modification of waste disposal and water supply facilities.
2. Limitations on period of use and operation.
3. Imposition of operational controls, sureties and deed restructures.
4. Requirements for construction of channel modifications, compensatory storage, dikes, levees and other protective measures.
5. The applicant shall submit a plan or document certified by a registered professional engineer or architect that the floodproofing measures are consistent with the regulatory flood protection elevation and associated flood factors for the particular area as well as floodproofing measures, in accordance with the Minnesota state building code and this title. (Ord. 2012-1, 2-27-2012)

10-17B-7-4: AMENDMENTS:

The floodplain designation on zoning maps shall not be removed from floodplain areas unless it can be shown that the designation is in error or that the area has been filled to an elevation at or above the regulatory flood protection elevation and is contiguous to other lands lying outside the floodplain district. Special exceptions to this rule may be permitted by the commissioner of natural resources if it is determined that, through other measures, lands are protected adequately for the intended uses. All amendments, including amendments to the floodway or flood fringe districts on the official zoning map, must be submitted to and approved by the commissioner of natural resources prior to adoption. Changes in the official zoning map must meet the federal emergency management agency's (FEMA) technical conditions and criteria and must receive prior FEMA approval before adoption. The commissioner of natural resources must be given ten (10) days' written notice of all hearings to consider an amendment to this article, flood related definitions in section 10-2-2 of this title, and any floodway or flood fringe related sections of this title and said notice shall include a draft of the amendment or technical study under consideration. (Ord. 2012-1, 2-27-2012)

10-17B-8: PROPERTIES WITH AN APPROVED LETTER OF MAP REVISION - BASED ON FILL (LOMR-F):

The city zoning administrator, or designee, shall maintain a master list of letters of map revision - based on fill (LOMR-F) approved by the federal emergency management agency. That master list, consisting only of approved LOMR-Fs, is hereby adopted by this article. (Ord. 2012-1, 2-27-2012)

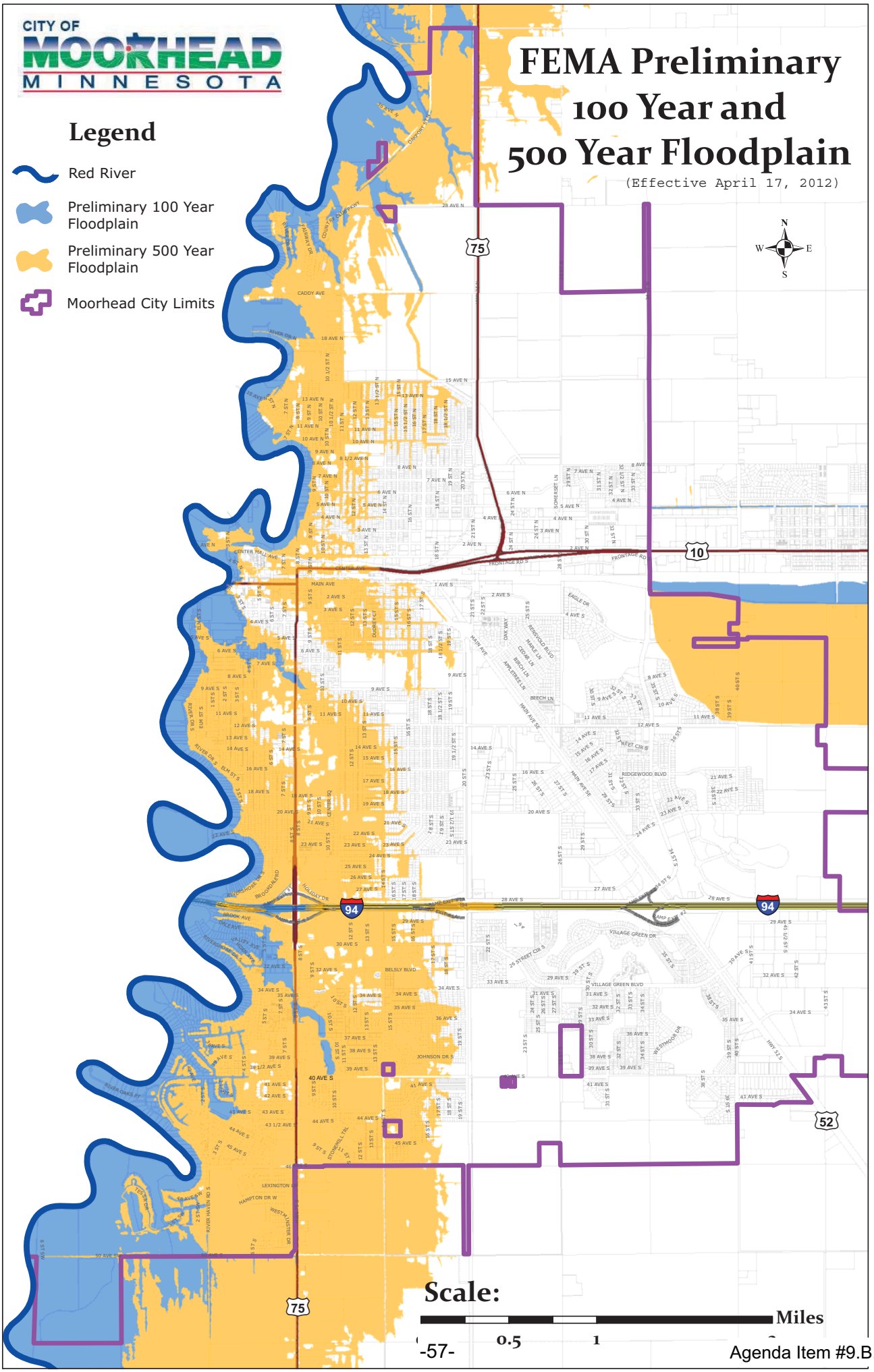
CITY OF MOORHEAD MINNESOTA

# FEMA Preliminary 100 Year and 500 Year Floodplain

(Effective April 17, 2012)

## Legend

- Red River
- Preliminary 100 Year Floodplain
- Preliminary 500 Year Floodplain
- Moorhead City Limits



# City of Moorhead
# Flood Mitigation Status

## PROGRAM GOALS

- ✓ Reduce emergency flood protection measures and flood risk to a river stage of 42.5 feet
- ✓ Reduce emergency response time through acquisition of at-risk properties and construction of permanent infrastructure
- ✓ Keep the community in business during major flood events
- ✓ Send a positive message to new and/or expanding businesses and homeowners
- ✓ Avoid continued burden and risk to State finances

## BUDGET STATUS

### REVENUE

| | Secured | Future | Total | Percent |
|---|---|---|---|---|
| DNR Flood Damage Reduction Grant[1] | $57,000,000 | $10,798,331 | $67,798,331 | 68.5% |
| FEMA Hazard Mitigation Grant | $213,598 | $0 | $213,598 | 0.2% |
| City[2] | $29,458,306 | $1,532,400 | $30,990,706 | 31.3% |
| **Total** | **$86,671,904** | **$12,330,731** | **$99,002,635** | 100.0% |

### EXPENDITURES

| | Completed | Pending/Proposed | Total |
|---|---|---|---|
| Acquisitions | $47,439,350 | $18,169,810 | $65,609,160 |
| Infrastructure complete or under contract | $28,299,627 | $10,436,308 | $38,735,935 |
| Assumed Non-Acquisition & Related Infrastructure | $0 | ($5,342,460) | ($5,342,460) |
| Total | **$75,738,977** | **$23,263,658** | **$99,002,635** |

[1]All State funds allocated to date have been expended or committed.

[2]The required City match is $12,416,444. To expedite project completion, the City will expend an additional $18.5M in excess of the required local match.

Notes:

A. The City has exceeded the required grant match by more than $18.5M.

B. In 2012, an internal stormwater drainage analysis was initiated to evaluate stormwater system capacities needed during flood events when stormwater gates are closed due to high river stages. This analysis is necessary to ensure that adequate permanent pumping capacity is available for precipitation events during a flood event or that adequate temporary pumping capacity can be provided. This analysis may identify additional improvements that are currently not included in the project budget.

C. In accordance with an orderly annexation agreement, Tract 2 of the Town of Oakport will be annexed into the City in 2015.

**Attachment A:** This map provides a summary of flood mitigation acquisitions completed (206) and declined (63).

**Attachment B:** This map provides a summary of stormwater gates and lift station improvements completed.

**Attachment C:** This map provides an overview of levee and floodwall projects. In addition to projects that are completed or are under contract for construction, the map indicates pending and proposed projects.

- Pending projects: Easements are required. Acquisition of entire parcels is not required.
- Proposed projects: Acquisition of entire parcels is necessary for a complete, continuous project. In all but one case, portions of the project can be completed without additional acquisition.

**Attachment D:** This map highlights proposed projects. The Woodlawn Park area presents significant challenges for both emergency and permanent flood mitigation measures.

**Attachment E:** These graphs summarize the need for sandbags and clay contingency levees for a 42.5 foot flood crest under 2009 conditions, 2011 conditions, and current conditions. For 2009 conditions, the sandbag count is an estimate. The success of a flood fight effort of this magnitude is highly questionable; if not logistically and/or physically infeasible. Current conditions sandbag and clay levee needs associated with pending and proposed projects represent reductions that can be achieved with complete, continuous projects.

**Attachment F:** These graphs summarize estimated costs for the temporary emergency measures shown in Attachment E.

CITY OF MOORHEAD MINNESOTA

# Rejected Flood Acquisitions as of August 15th 2012

## Legend

Rejected Flood Acquisition Purchase Offers

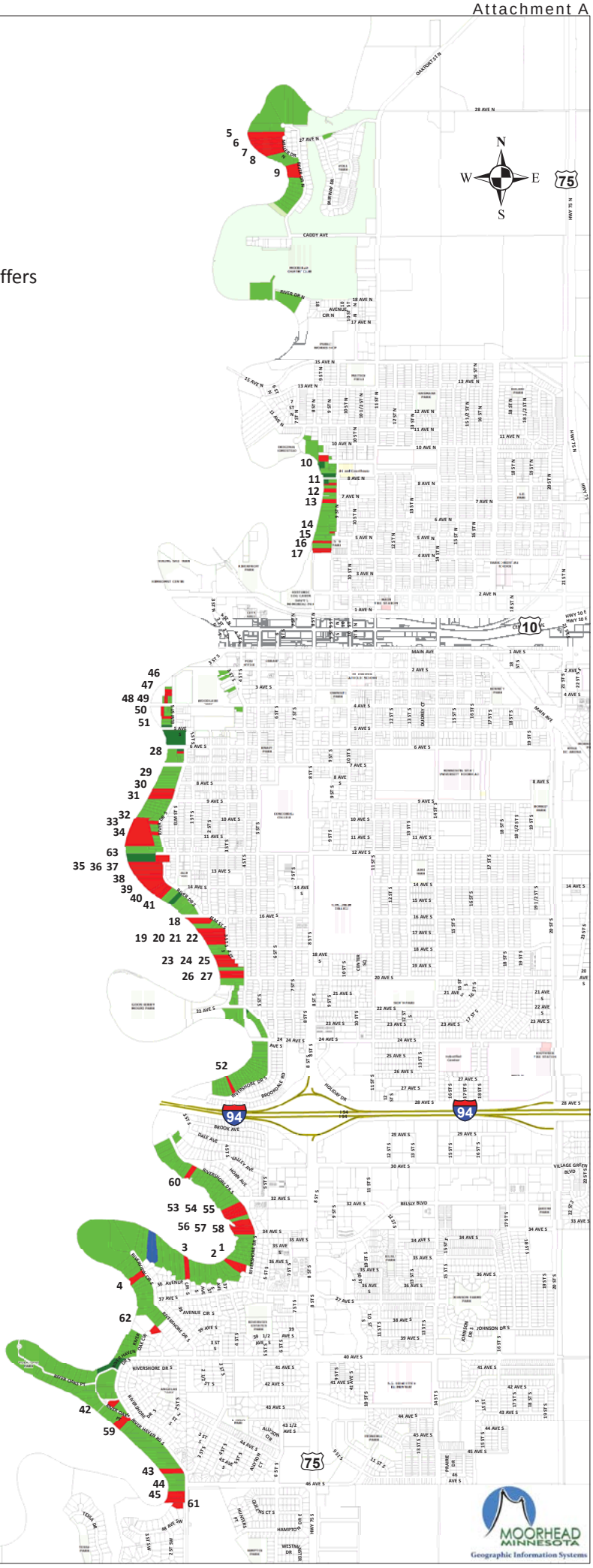
### Properties Not Necessary to Acquire

Completed Flood Acquisitions

Relevant City Owned Properties

Private Property Protected by City Project

| Map ID | Owner | Land Address |
|---|---|---|
| 1 | CHRISTIAN & GLENDA D'AGOSTINO | 3607 RIVERSHORE DR S |
| 2 | WAYNE & ELIZABETH CHRISTIANSON | 3611 RIVERSHORE DR S |
| 3 | SUSAN E TRUST ROGERS | 104 36TH AVENUE CIR S |
| 4 | JEAN L MCMERTY | 3517 RIVERVIEW CIR S |
| 5 | DAVID R & VONNIE J THORDAL | 2701 MILLER DR N |
| 6 | ELDON WOLLMAN | 2623 MILLER DR N |
| 7 | MARK M & ALYSON M BJORNSTAD | 2619 MILLER DR N |
| 8 | DAVID P & SUZANNE JOHNSON | 2615 MILLER DR N |
| 9 | CREEK & ERICKA KUSER | 2525 RIVER DR N |
| 10 | BILL RAKOWSKI | 810 9TH AVE N |
| 11 | SCOTT HALUPTZOK | 717 9TH ST N |
| 12 | DAVID & SHARON WEBER | 707 9TH ST N |
| 13 | DENNIS M & MARIE P KVANVIG | 633 9TH ST N |
| 14 | ZACH ZEIS | 505 9TH ST N |
| 15 | MARIE MITCHELL | 417 9TH ST N |
| 16 | TRAVIS & TIFFANY NAGEL | 409 9TH ST N |
| 17 | RANDY R & CYNTHIA CARRILLO | 405 9TH ST N |
| 18 | MARC & LADONNA HOLLAND | 1603 ELM ST S |
| 19 | RBT & JEAN STRANDNESS OCONNOR | 1625 3RD ST S |
| 20 | HUGH DUFNER | 1701 3RD ST S |
| 21 | CARL-MARTIN & MARTHA NELSON | 1709 3RD ST S |
| 22 | ZENAS BAER | 1715 3RD ST S |
| 23 | WILLIAM & BARBARA MCCAULEY | 1813 3RD ST S |
| 24 | JOHN & AMY O'CONNOR | 1817 3RD ST S |
| 25 | AUGUST HAKK | 1903 4TH ST S |
| 26 | DAVID B & HEIDI L K MANNING | 1915 4TH ST S |
| 27 | STEPHEN & DARLINE A SWEEN | 1919 4TH ST S |
| 28 | JAMES R ROTHLISBERGER | 605 ELM ST S |
| 29 | HARLOW A & SONJA IVERSON | 811 ELM ST S |
| 30 | LINDA M GRANT | 819 ELM ST S |
| 31 | ANITA LEISETH | 823 ELM ST S |
| 32 | MASON R & KAILA B WILNER | 1001 RIVER DR S |
| 33 | MASON R & KAILA B WILNER | 1003 RIVER DR S |
| 34 | RODNEY J ROTHLISBERGER | 1021 RIVER DR S |
| 35 | IAN REVIE | 1217 RIVER DR S |
| 36 | DUANE J TALGE | 1223 RIVER DR S |
| 37 | TIMOTHY & VALERIE RITLAND | 1303 RIVER DR S |
| 38 | MIKE & PATRICIA CODY SKOGEN | 1309 RIVER DR S |
| 39 | GEORGE T MALLICK | 1313 RIVER DR S |
| 40 | TIMOTHY K & WENDY S OLSON | 1323 RIVER DR S |
| 41 | JOHN A GJEVRE | 1325 RIVER DR S |
| 42 | LEAH SORBY | 18 RIVER OAKS PT |
| 43 | BERT & TERESA MCDONOUGH | 4503 RIVER HAVEN RD S |
| 44 | STEVEN G & LEANN D WRIGHT | 4605 RIVER HAVEN RD S |
| 45 | CLIFFORD L MCLAIN | 4609 RIVER HAVEN RD S |
| 46 | CINDY SVOBODNY | 307 ELM ST S |
| 47 | DORIS & BRUCE HILDE OLICH | 311 ELM ST S |
| 48 | BRUCE HILDE | 46 4TH AVE S |
| 49 | BRUCE HILDE | 40 4TH AVE S |
| 50 | LEONARD F & JILL M DANIELSON | 51 4TH AVE S |
| 51 | D & L FAULKNER FITZGERALD | 419 ELM ST S |
| 52 | CHAD A & CYNTHIA SOFTING | 2819 RIVERSHORE DR S |
| 53 | CORY R & SARA L KLOSTRIECH | 3203 RIVERSHORE DR S |
| 54 | RALPH & KAREN MEHNERT-MELAND | 3207 RIVERSHORE DR S |
| 55 | BARBARA SCHRAMM | 3211 RIVERSHORE DR S |
| 56 | LUCINDA F SWENSON | 3303 RIVERSHORE DR S |
| 57 | WILLIAM D KRANZLER | 3309 RIVERSHORE DR S |
| 58 | KRISTINE VALAN | 3315 RIVERSHORE DR S |
| 59 | DAVID JR & GAIL DEMUTH | 7 RIVER OAKS PT |
| 60 | LLOYD PAULSON | 3107 RIVERSHORE DR S |
| 61 | MICHAEL L & LINDA M SAND | 4709 RIVER HAVEN RD S |
| 62 | LOREN & VALENTINA GARRISON | 3904 RIVER OAK CIR |
| 63 | KAREN VOSBURG | 1201 RIVER DR S |

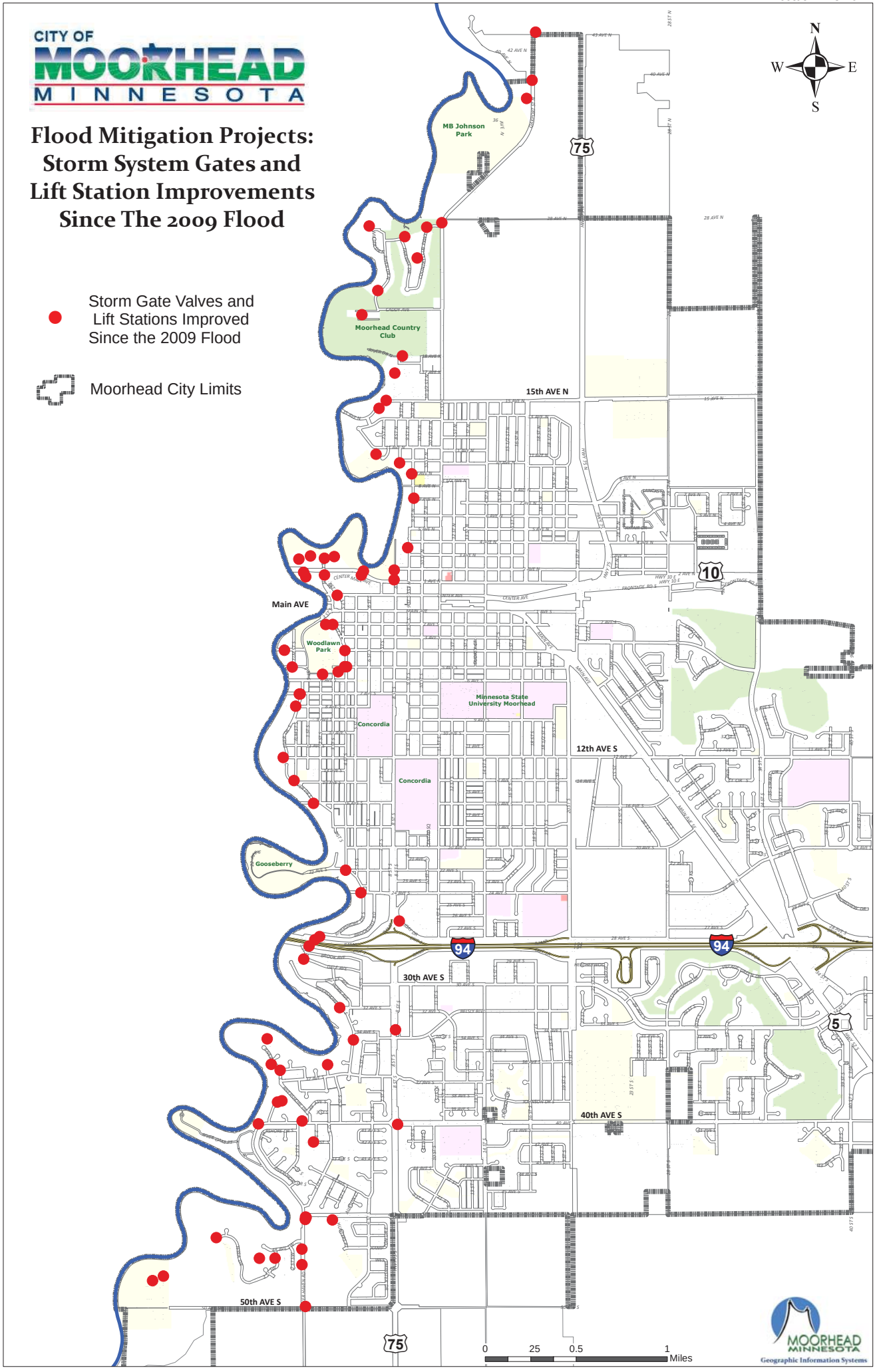


CITY OF MOORHEAD MINNESOTA

# Flood Mitigation Projects: Storm System Gates and Lift Station Improvements Since The 2009 Flood

Storm Gate Valves and Lift Stations Improved Since the 2009 Flood

Moorhead City Limits



CITY OF MOORHEAD MINNESOTA

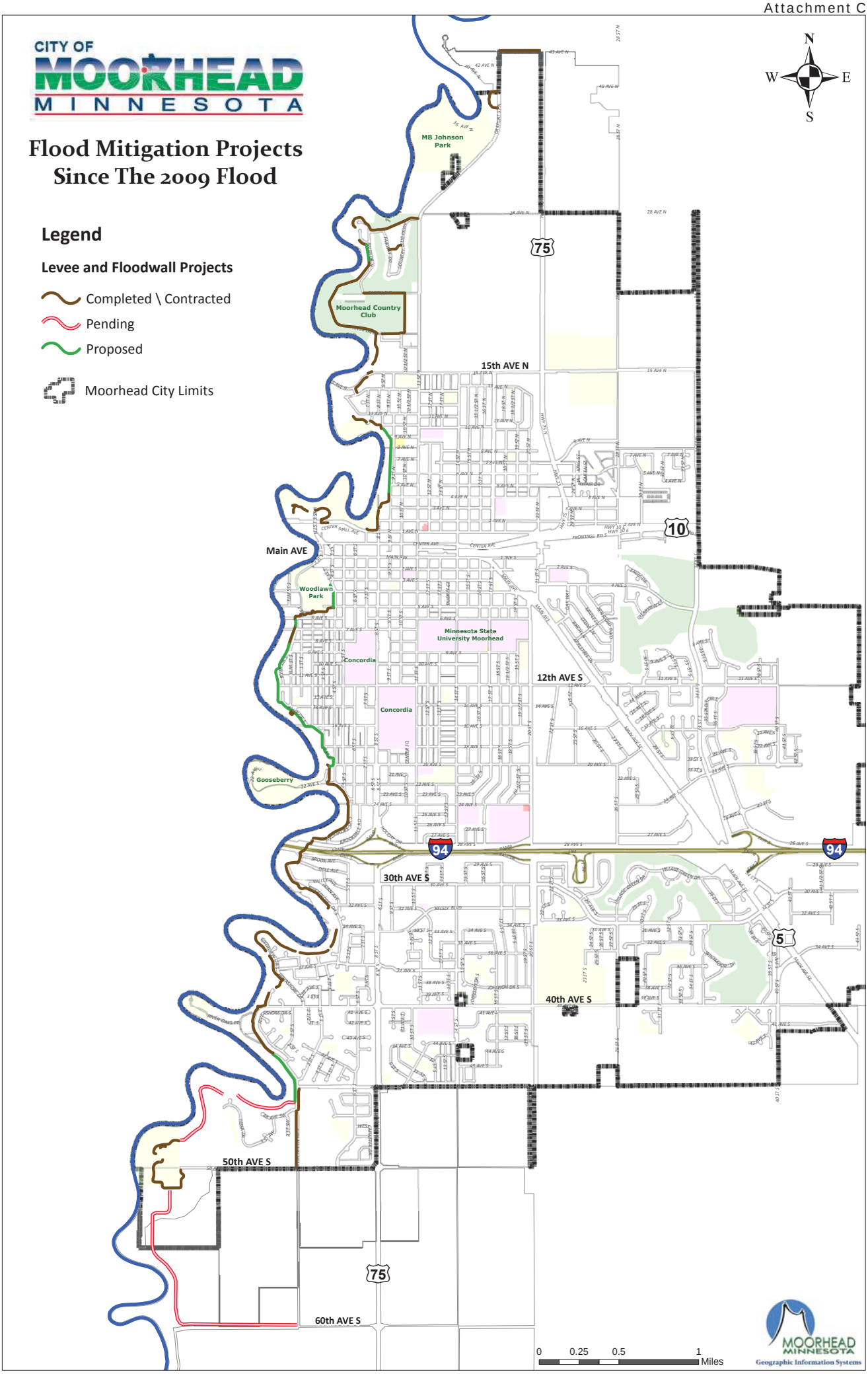
# Flood Mitigation Projects Since The 2009 Flood

## Legend

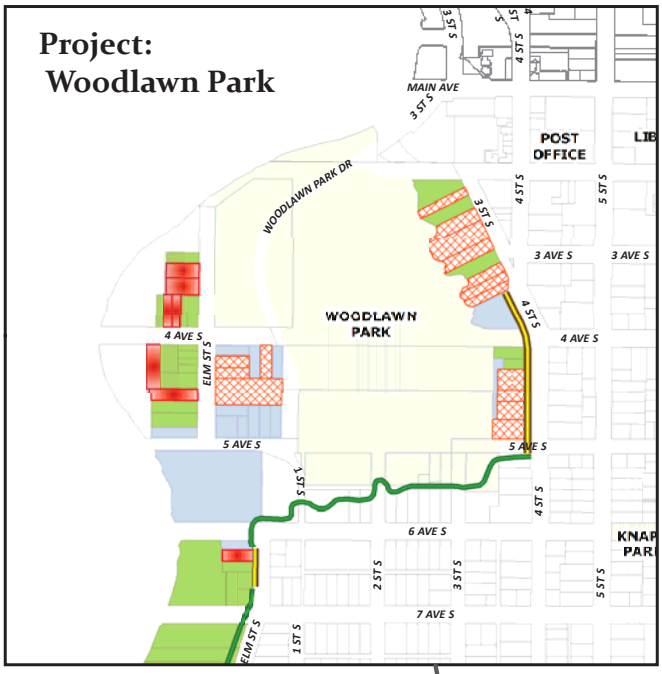
**Levee and Floodwall Projects**

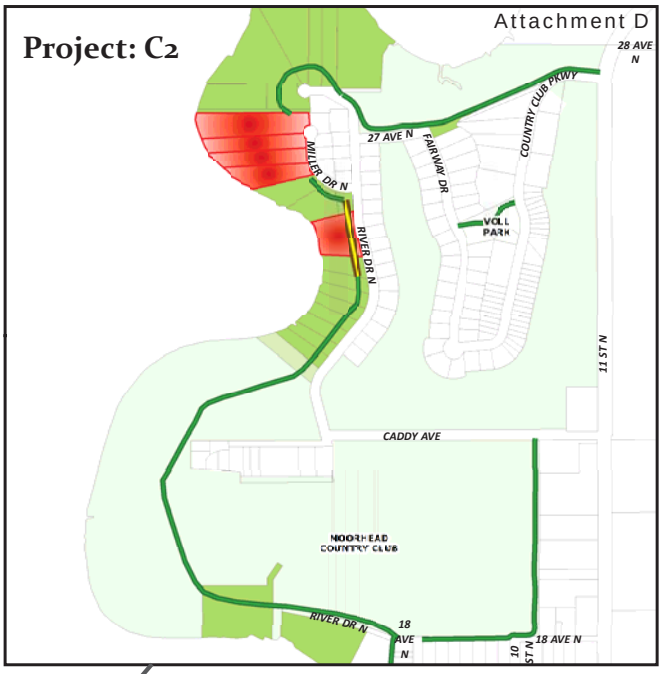
- Completed \ Contracted
- Pending
- Proposed

Moorhead City Limits



Attachment D




CITY OF MOORHEAD MINNESOTA

## Flood Mitigation Projects and Property Acquisitions

### Legend

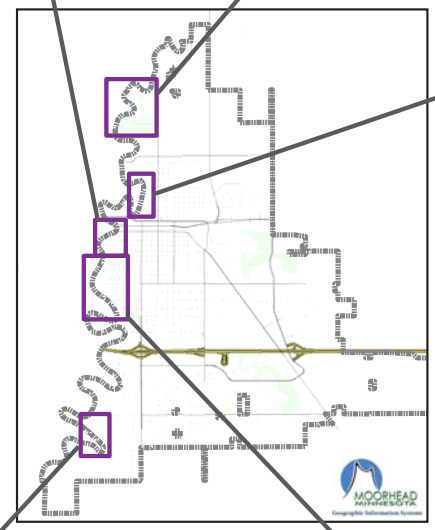
- Rejected Flood Acquisition Purchase Offers
- No Previous Acquisition Offer

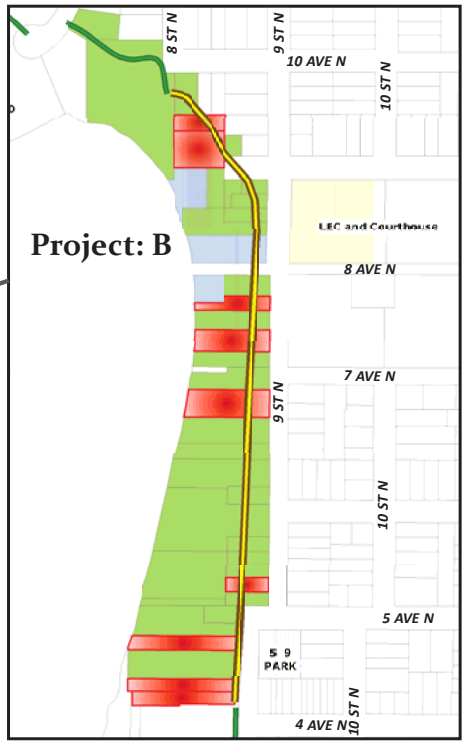
**Properties Not Necessary to Acquire**

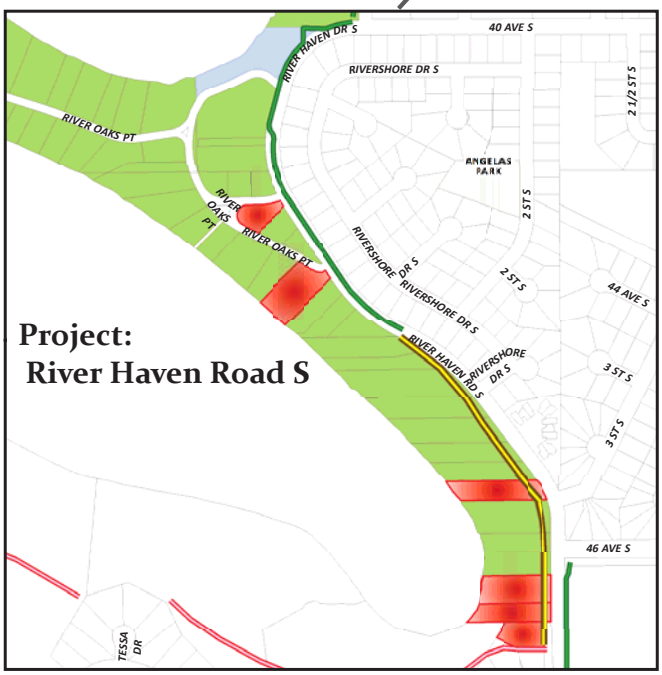
- Completed Flood Acquisitions
- Relevant City Owned Properties

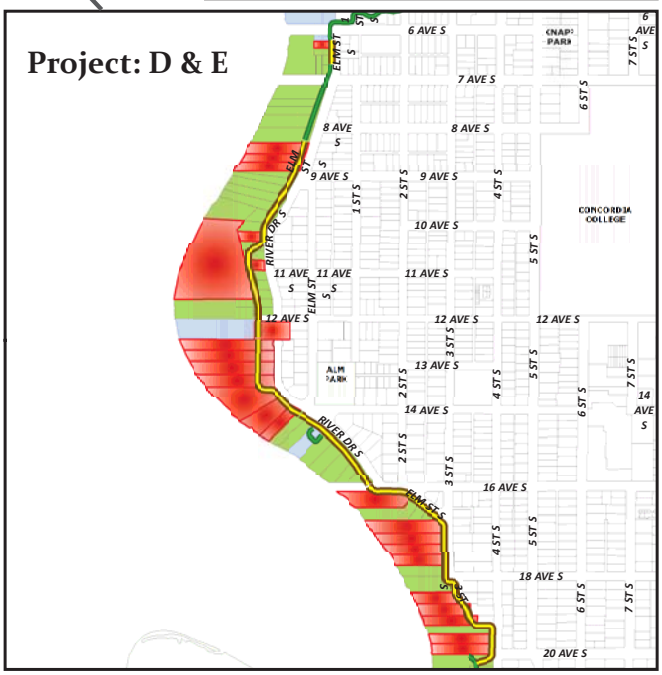
**Levee and Floodwall Projects**

- Completed \ Contracted
- Pending
- Proposed

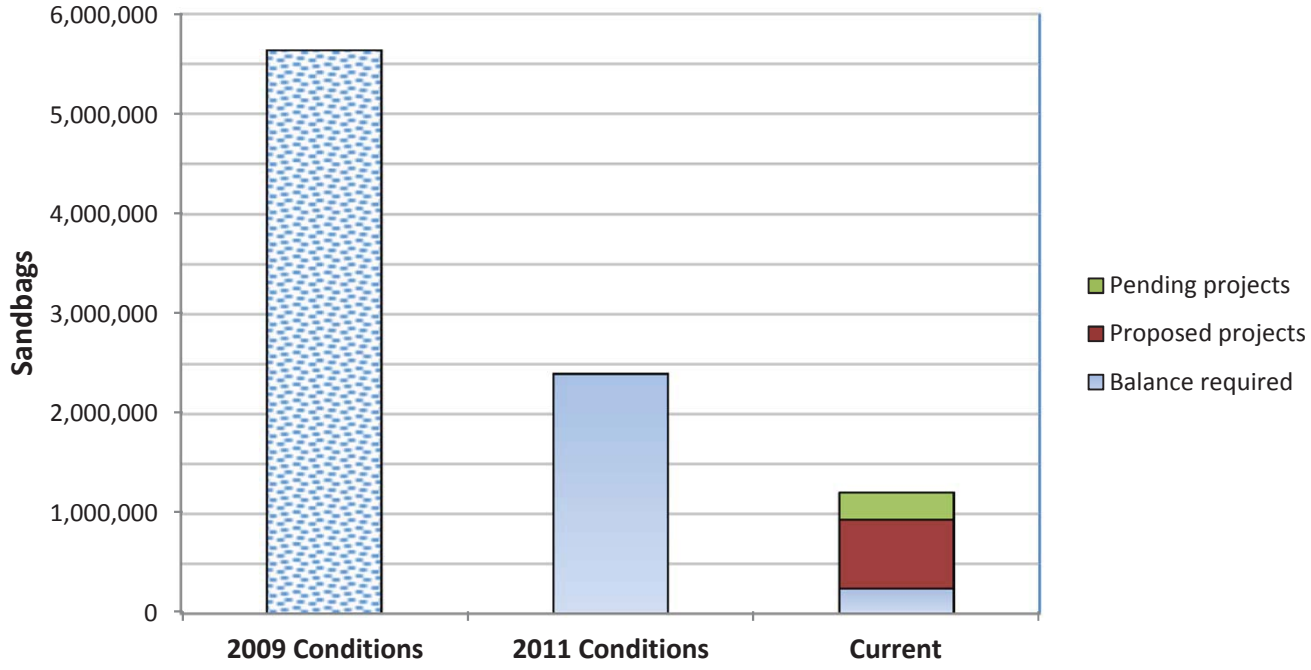


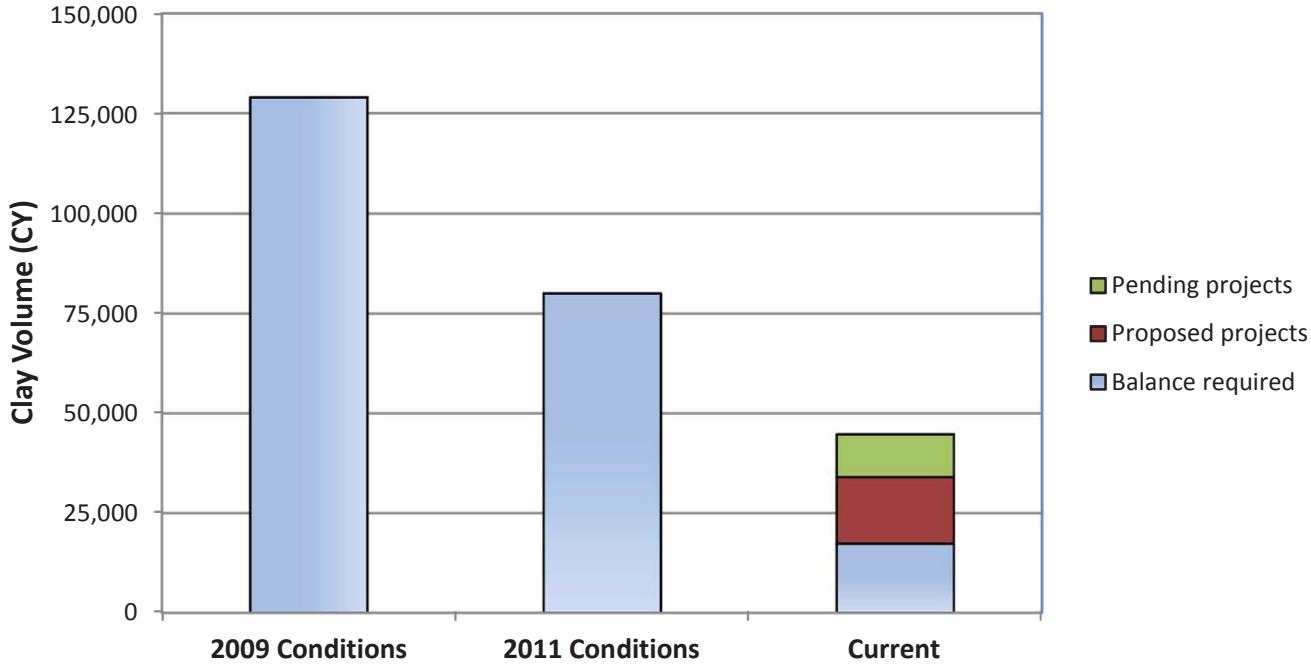



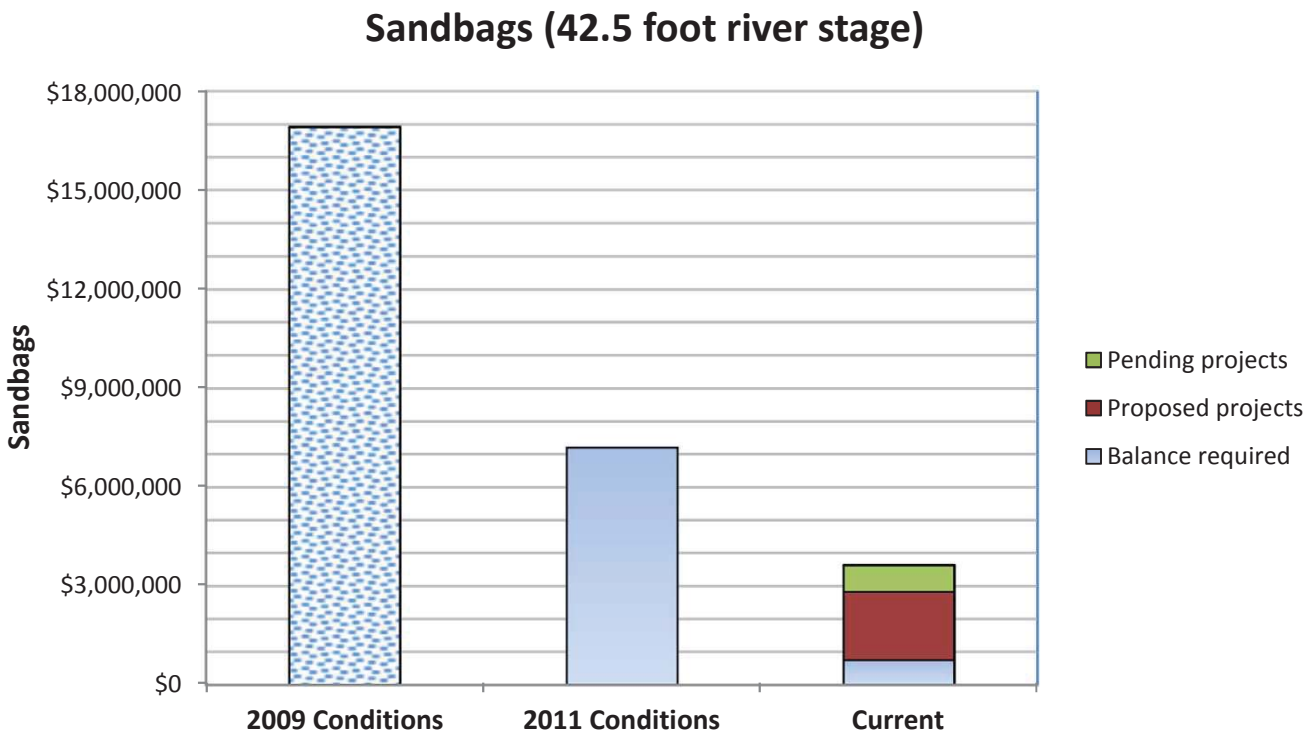



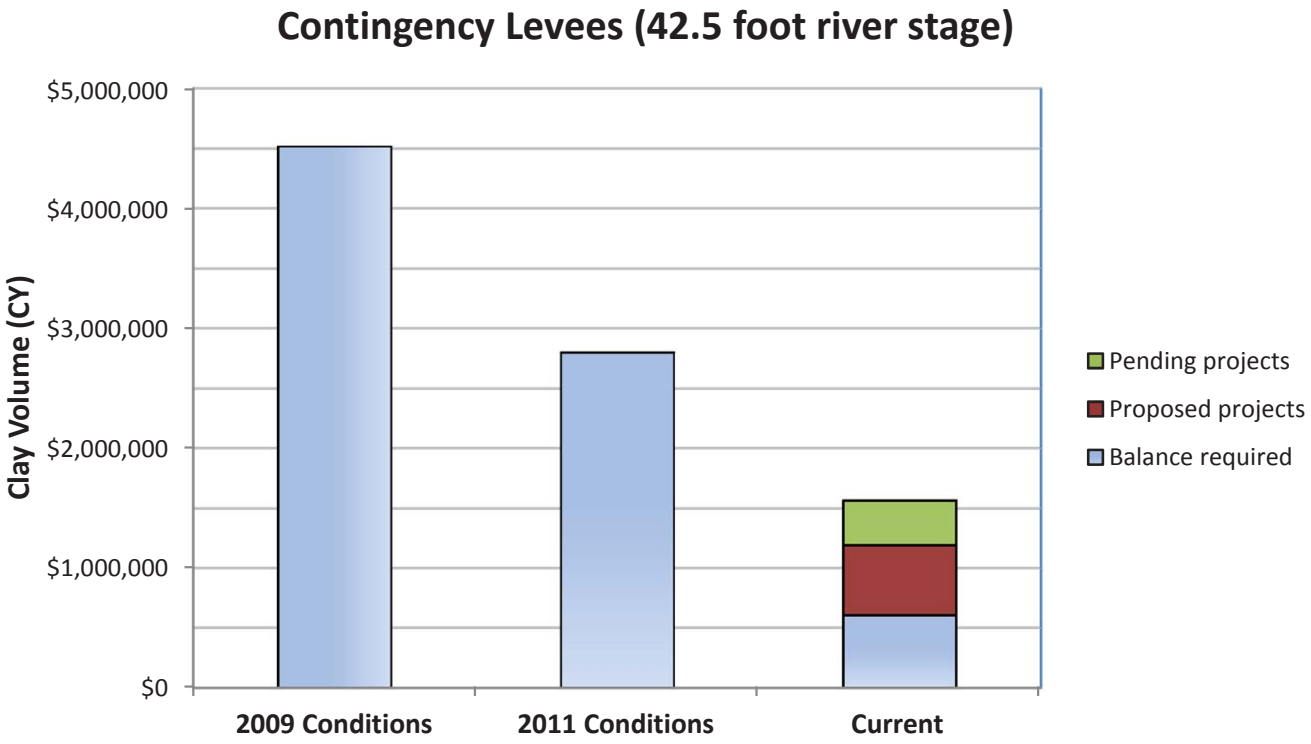
## Sandbags (42.5 foot river stage)

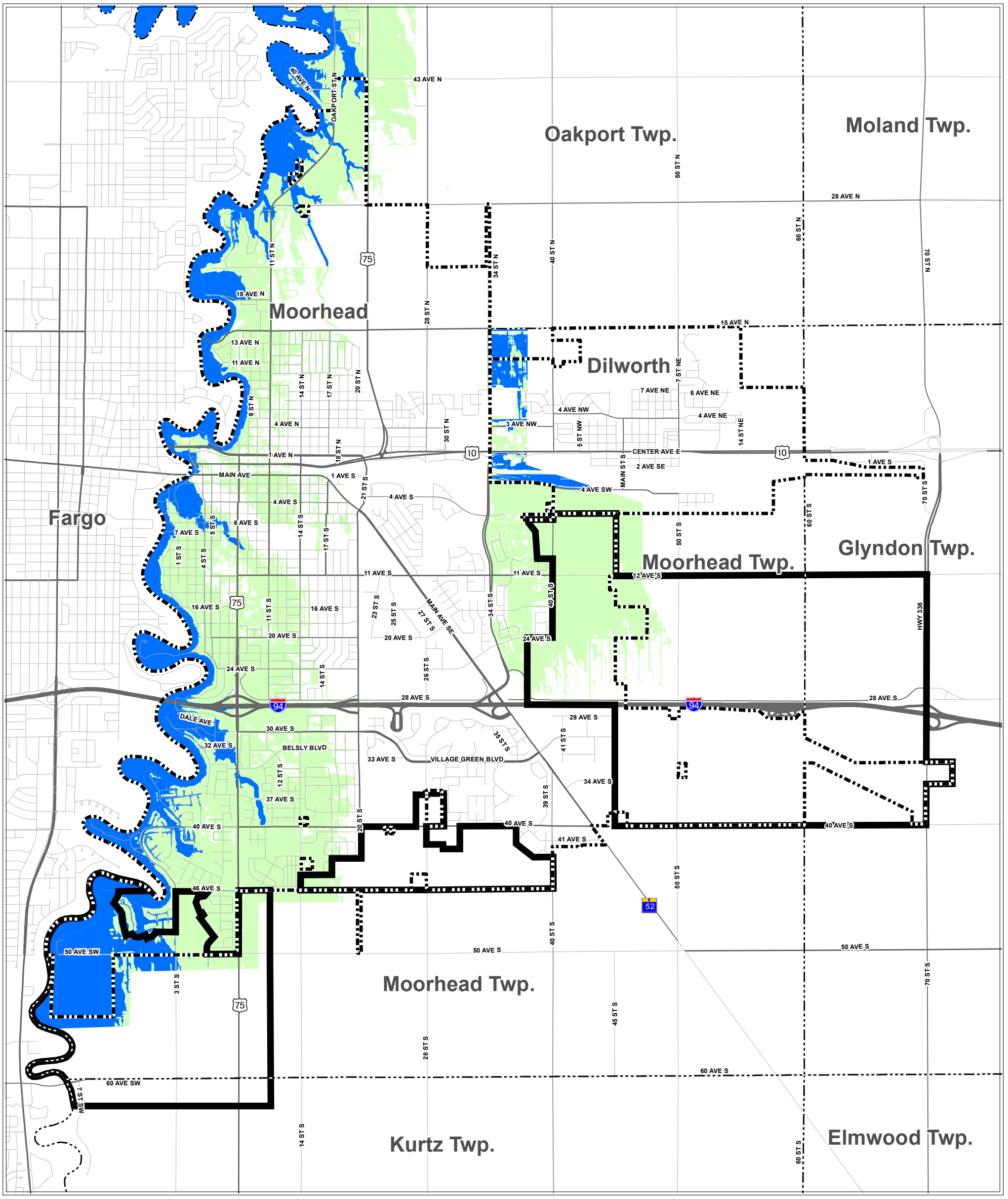



## Contingency Levees (42.5 foot river stage)




Sandbags (42.5 foot river stage)
$18,000,000
$15,000,000
$12,000,000
$9,000,000
$6,000,000
$3,000,000
$0
Sandbags
2009 Conditions
2011 Conditions
Current
Pending projects
Proposed projects
Balance required


Contingency Levees (42.5 foot river stage)
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$0
Clay Volume (CY)
2009 Conditions
2011 Conditions
Current
Pending projects
Proposed projects
Balance required




# Adopted Floodplain Map

Figure 14-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

City Boundary

Township Boundary

AUAR Boundary

100-Year Floodplain

500-Year Floodplain

N

2,000 0 2,000 4,000 Feet

July 8, 2013

Stantec

K:/2261/2261090030/GIS/Projects/floodplain.mxd

Diversion Outlet
Rush River Inlet
Lower Rush River Inlet
Maple River Spillway & Aqueduct
Drain 14 Inlet
Sheyenne River Spillway & Aqueduct
Wild Rice River Control Structure
Red River Control Structure
Tieback Embankment
Diversion Gated Inlet Structure
Staging Area
Overflow Embankment
Georgetown
Argusville
Harwood
North River
Reiles Acres
Mapleton
Fargo
West Fargo
Dilworth
Glyndon
Moorhead
Prairie Rose
Frontier
Briarwood
Sabin
Horace
Davenport
Oxbow
Comstock
Kindred
Cass
Richland
Clay
Wilkin
Rush River
Lower Branch Rush River
Maple River
Sheyenne River
Sheyenne River Tributary
Sheyenne Diversion
Rose Coulee, Drain #27
Wild Rice River
Wild Rice River Tributary
Buffalo River
Red River
Deerhorn Creek
Stony Creek
Wolverton Creek
bing
© Harris Corp, Earthstar Geographics LLC © 2013 Microsoft Corporation

- Aqueduct
- Control Structure
- Fish Passage
- Gated Inlet Structure
- Inlet
- Diversion Outlet
- Spillway
- Overflow Embankment
- Tieback Embankment
- Channel Reaches
- Diversion Channel
- Staging Area
- Sheyenne Diversion
- Water
- Rail
- Municipal Area
- County Boundary

# FM Area Diversion

## Project Features Overview

As Of: 2/20/2013

0 0.5 1 2 3 Miles

AUAR 2013 Figure 14-3

FLOOD DIVERSION AUTHORITY

*By CLM, Imagery: Bing Maps Aerial Data Courtesy of: USACE*
*Coordinate System: NAD 1983 StatePlane ND S FIPS 3302 Ft*
*Projection: Lambert Conformal Conic Datum: North American 1983*

# Clay County Soil Survey

Figure 16-1

South and East Moorhead Growth Area AUAR

City of Moorhead, Minnesota

Municipal Boundary

AUAR Boundary

Open Water

N

2,000 0 2,000 4,000 Feet

March 19, 2010

Bonestroo

K:/2261/2261090030/GIS/Projects/soils.mxd

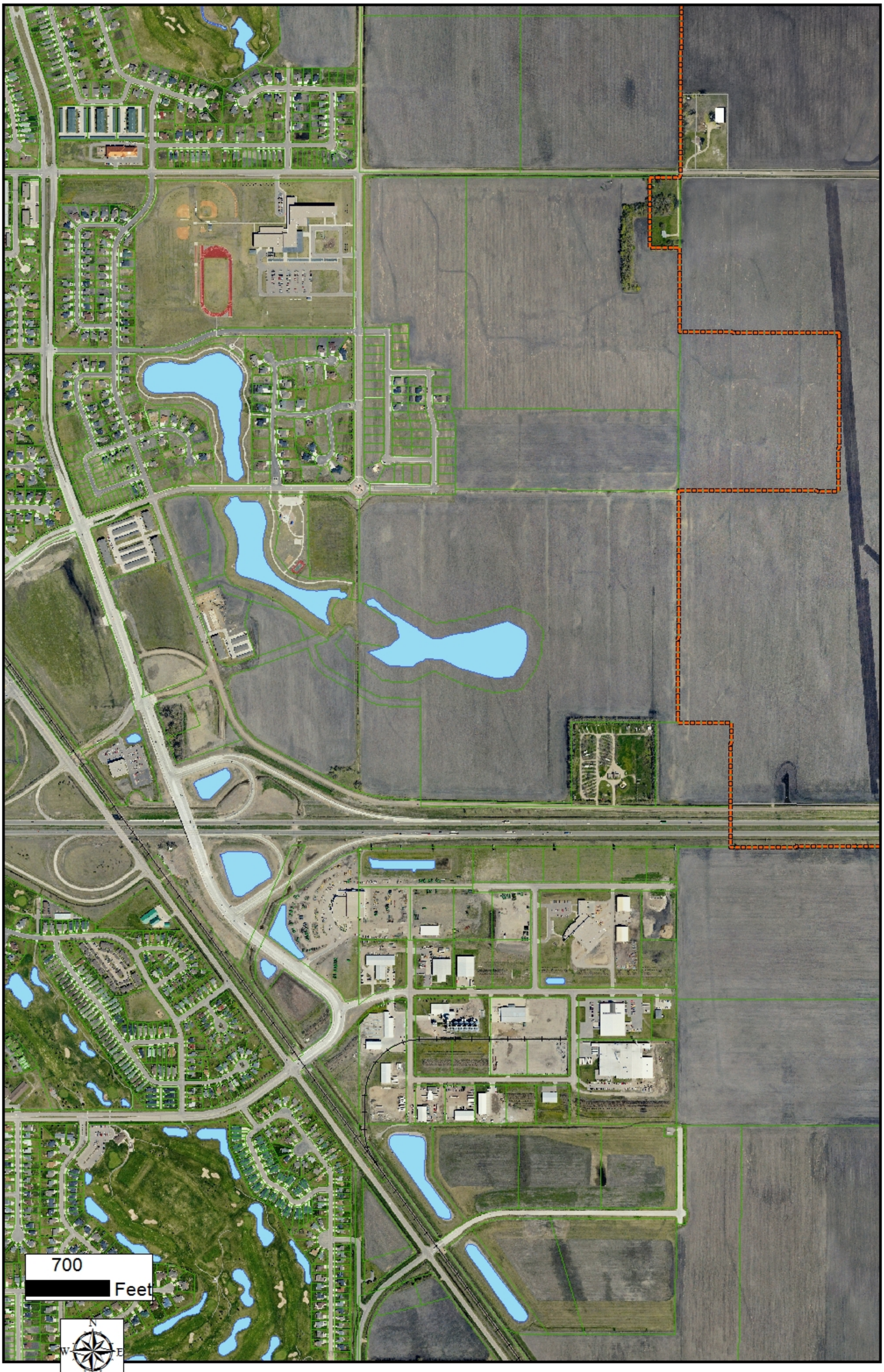



Figure 17-1  2013 AUAR Update  East Side Storm Ponds

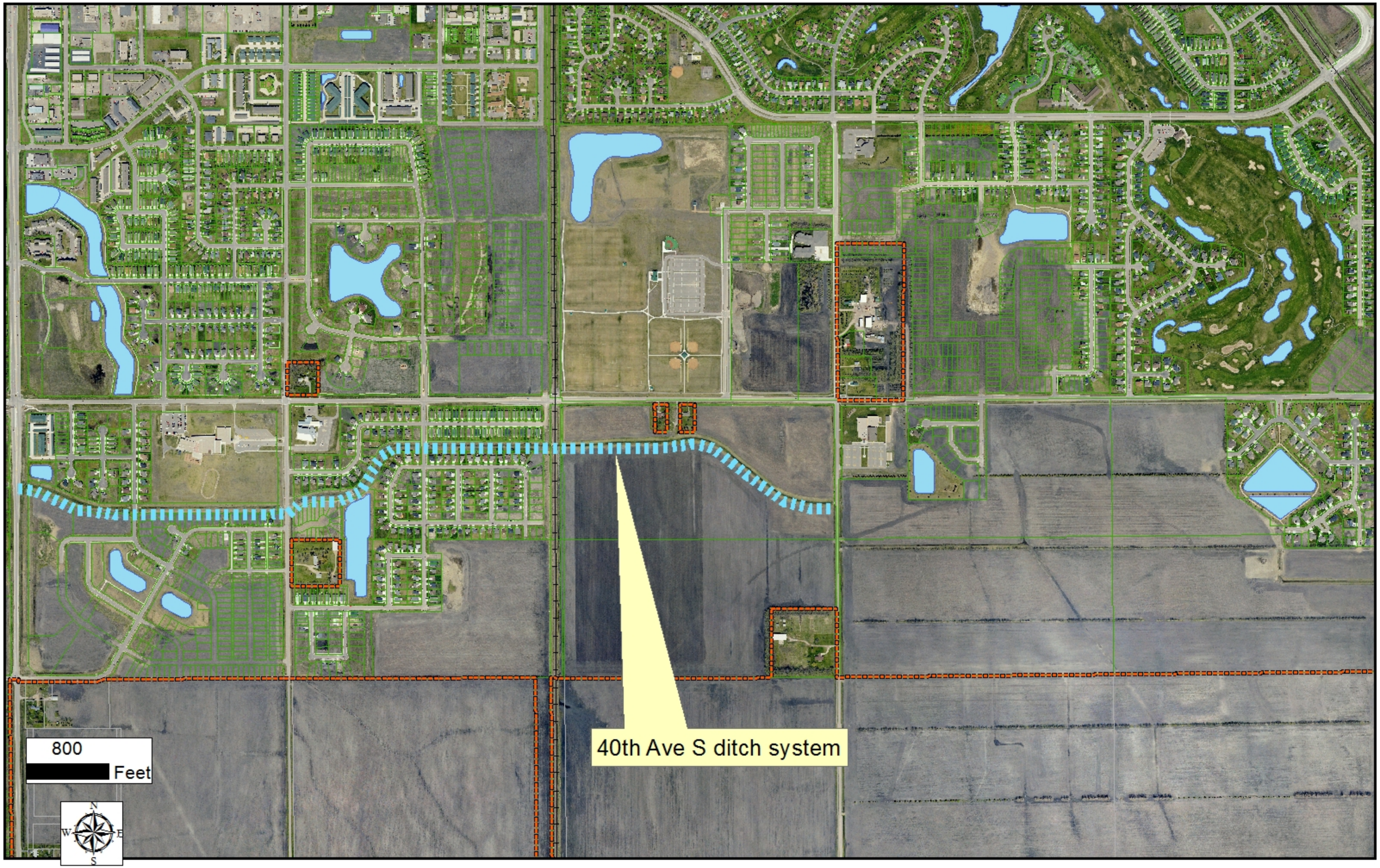



Figure 17-2 2013 AUAR Update South Side Growth Area Ponds


Figure 17-3 2013 AUAR Update Southwest Area Storm Ponds

# AUAR ITEM 18.
# WATER QUALITY: WASTEWATER

## A. SANITARY SEWER INTRODUCTION

### 1. General Information

All trunk sanitary sewer construction in Moorhead between 1991 and 2000 was guided by the report entitled "Evaluation Report – Sanitary Sewer Collection System - 1991". This original report was reviewed and updated in 2002 ("East Side and South Side Sanitary Sewer Collection System, 2002"). It was subsequently reviewed and updated in 2004 ("Appendix E – 2004 Sanitary Sewer System Evaluation Upgrade") for incorporation in the 2002 report.

In 2005, the City completed the South and East Growth Area Plan Alternative Urban Areawide Review (AUAR) report with the goal of comprehensively planning for development projects in the south and east areas of Moorhead. Statutory requirements call for 5-year updates to AUAR areas that have not fully developed. This sanitary planning study is being conducted in conjunction with the 2010 South and East Growth Area Plan AUAR Update (2010 SE AUAR) report. As such, it will expand on the 2004 evaluation and will be included in the 2010 SE AUAR.

The purpose of this report is to evaluate future service areas outside the those areas currently covered by previous evaluations, and to develop a model of the system that will serve as a guide for the expansion of Moorhead's trunk sanitary sewer system to serve the anticipated full-development population of this area. This service area is separate from the 2004 service area because all of the sanitary system within the 2004 system will be at capacity following planned future development.

There are three distinct growth areas addressed in the 2010 SE AUAR, as shown in the Future Land Use Map shown in Figure 6-1: the South Area, South Central area, and East Area. This study is concerned primarily with the portions of the South Area and East Area that were not evaluated in the 2004 study.

The South Area being evaluated for this report is generally located east of the Red River, south of 50$^{th}$ Avenue SW, west of Hwy 75, and north of 60$^{th}$ Avenue S. The E1 area is generally located north of I-94 and south of 12th Avenue S, from 50th Street S west a half mile. The E2 area is approximately one square mile bounded by I-94 (north), 40th Avenue S (south), 50th Street S (west), and 60th Street S (east). These areas can be seen on Figures 2 and 3.

The region was best evaluated by breaking it into two phases. The phases were established by considering anticipated areas of construction from recent developer requests, the expected natural progression of growth, and the capacity restrictions imposed by existing sanitary

infrastructure. To be cost-effective, the phasing must proceed sequentially. To this end, the South Area was broken into two sub-areas: S1 and S2. In Phase 1, it is expected that Areas S1 and E1 will fully develop. In Phase 2, development is expected to occur in Area S2 and/or Area E2.

The local elements of conveyance include sewer services, laterals, trunk sewers, manholes, lift stations, forcemains, and all related appurtenances associated with the collection and transportation of wastewater. The sewer laterals and service lines are governed to a large extent by platting as the land is developed. Therefore, those facilities cannot be accurately determined at this level of analysis and must be excluded from an overall study of this type. However, trunk sewers are largely dependent on topography, soil conditions, physical features, and man-made barriers. This study is concerned with relevant portions of the trunk system, which include the lift stations, forcemains, and gravity links between the lift stations and the Wastewater Treatment Facility. Since the trunk sewer design determines the ultimate service availability for the system, it is essential that an overall trunk sewer plan be available as a guide for future development. The City will need to perform periodic reviews to compare planned versus actual development and to reevaluate costs. This report can be modified and updated to respond to changes in development plans.

A generalized layout of the portion of the sanitary sewer system currently serving the south and east areas of Moorhead and those systems that have been added since 2005 is presented in Figure 18-1. More detailed information, including all relevant data, is presented in figures and tables in this report. Preliminary cost estimates have also been prepared to establish a basis for updating the Capital Improvement Program and assessment policy as needed.

Figures 18-2 and 18-3 also depict major district boundaries, proposed trunk sanitary sewers, lift stations, and forcemains. Existing district boundaries and numbers are shown along with future growth areas. Design flow and pipe capacities for each segment are presented in the Data Summary section for each phase. Capacities for all proposed lift stations can also be found in the Data Summary section for each phase.

One of the basic objectives of this study was to estimate the cost of completing the trunk sanitary sewer system for the South and East Moorhead Expansion Area. The trunk assessments that fund the system cost are intended to ensure future sewer fund solvency. Treatment and disposal of wastewater generated by the City is accomplished at the Wastewater Treatment Facility located in the northeastern portion of the current city limits. This report deals only with the trunk conveyance facilities required to transport wastewater from the growth areas. The Wastewater Treatment Facility's capacity to accommodate the increased flows from the growth area is outside the scope of this study. Any expansion of the Wastewater Treatment Facility must be covered in a separate analysis.

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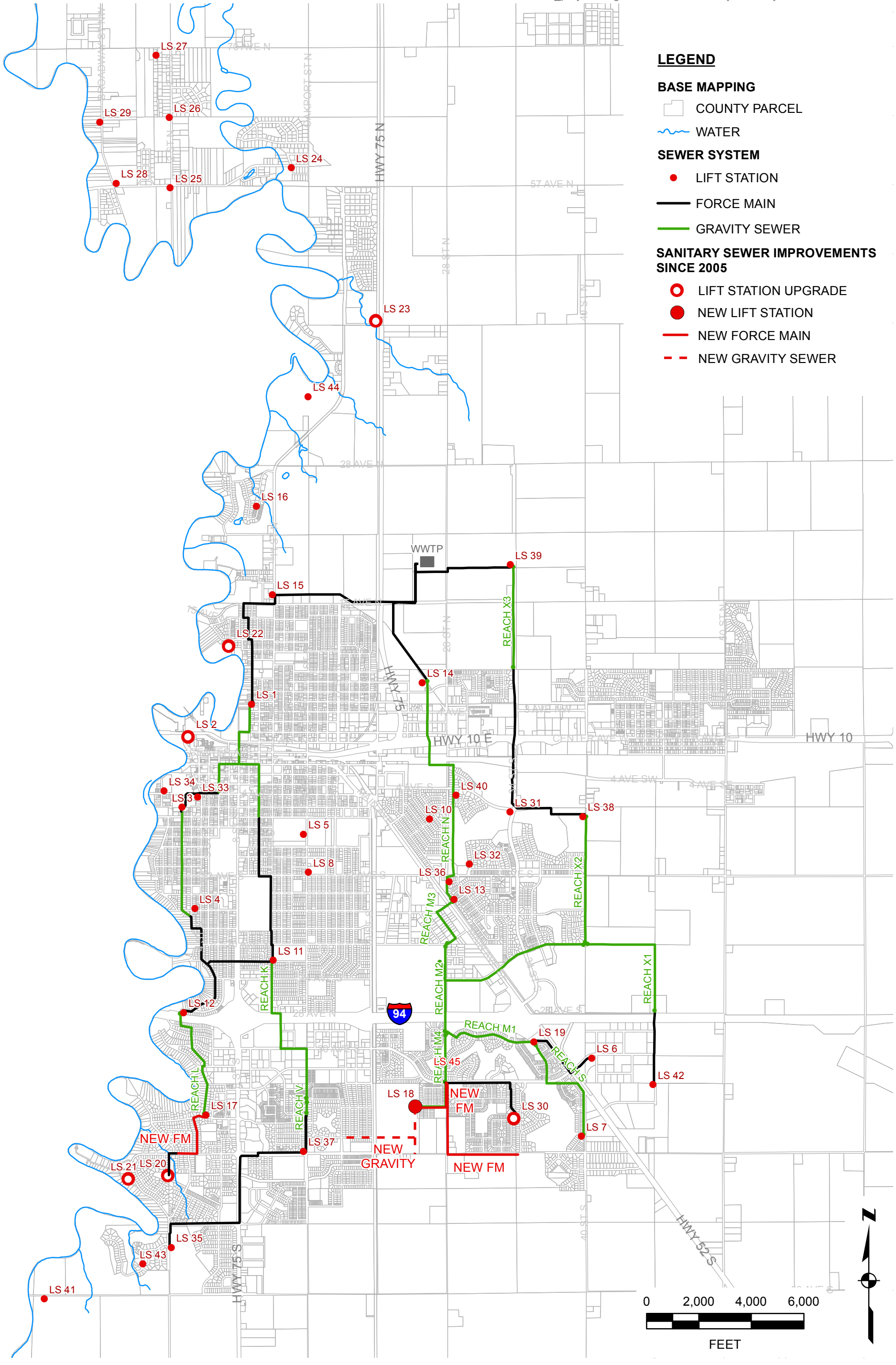


## LEGEND

**BASE MAPPING**

- COUNTY PARCEL
- WATER

**SEWER SYSTEM**

- LIFT STATION
- FORCE MAIN
- GRAVITY SEWER

**SANITARY SEWER IMPROVEMENTS SINCE 2005**

- LIFT STATION UPGRADE
- NEW LIFT STATION
- NEW FORCE MAIN
- NEW GRAVITY SEWER

FIGURE 18-1 - SANITARY SEWER IMPROVEMENTS SINCE 2005

CITY OF MOORHEAD, MINNESOTA
SANITARY SEWER SYSTEM - SOUTH AND EAST AREA EXPANSION EVALUATION

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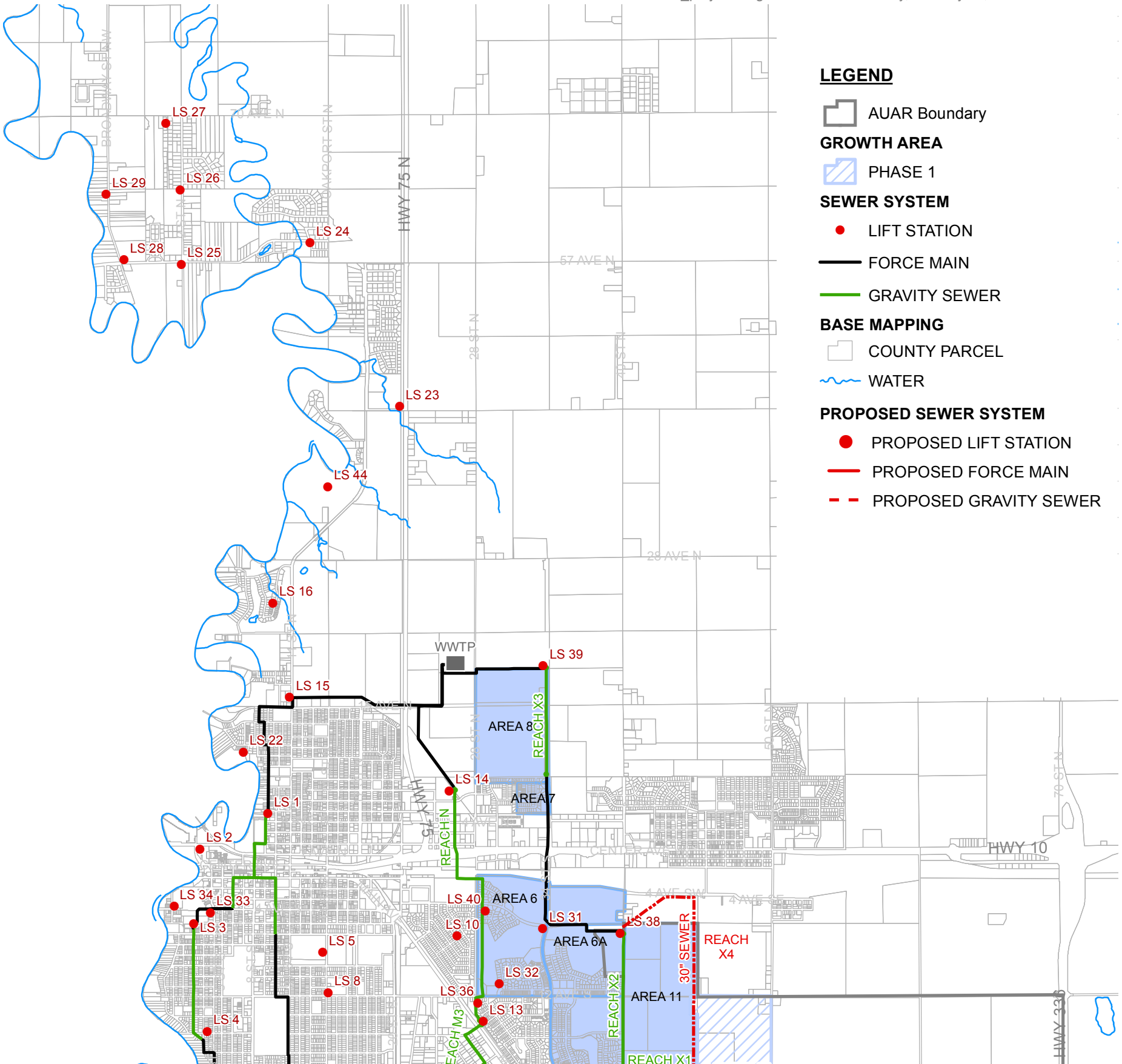


FIGURE 18-2 - FUTURE GROWTH AREA - PHASE 1

CITY OF MOORHEAD, MINNESOTA
SANITARY SEWER SYSTEM - SOUTH AND EAST AREA EXPANSION EVALUATION

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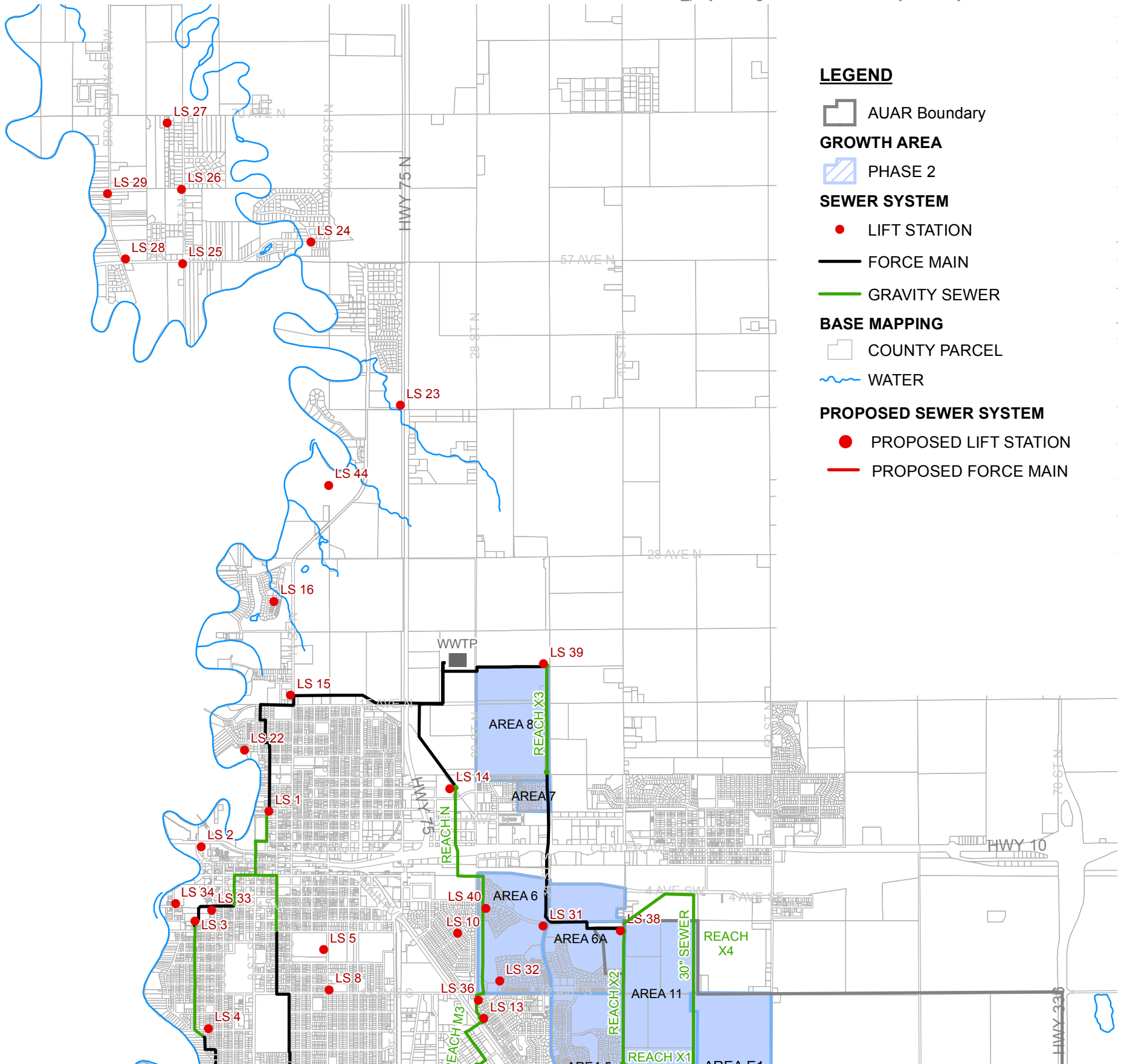


FIGURE 18-3 - FUTURE GROWTH AREA - PHASE 2

CITY OF MOORHEAD, MINNESOTA
SANITARY SEWER SYSTEM - SOUTH AND EAST AREA EXPANSION EVALUATION

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The cost estimates presented in this report are based on 2013 construction costs and can be related to the Engineering News Record (ENR) cost index of 9437 (January 2013). Future changes in this index are expected to reasonably reflect changes in construction costs for the trunk sanitary sewer system.

A summary of the estimated system construction costs per district and phase appears later in this report. These costs include trunk sanitary sewers, lift stations and forcemains. A 25% contingency incorporates estimated costs for land acquisition and easements. The construction and land/easement cost estimates are also increased by 21% for legal, engineering, administrative, and short term financing.

## 2. General Regional Sanitary Facility Description

The entire study area will flow to four specific regional lift stations that will discharge directly into the Wastewater Treatment Facility (WWTF). Flow to the regional lift stations will be by gravity trunk sewers, or regional sewers, or sub-regional lift stations or in combinations. Therefore, the four regional lift stations serve entirely separate systems that do not rely on each other.

## 3. General Sanitary Sewer Conveyance System Description

The proposed alignments of the trunk sanitary sewers are preliminary and should be reviewed at the time of final design to ensure conformance with existing and proposed development. In most cases, the alignment closely follows natural drainage ways and anticipated utility easements. Major changes in alignment are not recommended because these could lead to excessive pipe depths and thus increased construction costs.

Sizing of the trunk sanitary sewers was computed based on the assumed land uses within the future service area. Trunk sanitary sewers were extended as far as economically viable where the depth to continue would be too costly.

# B. GENERAL SANITARY DESIGN CRITERIA

## 1. Land Use

Land use is the driving factor in determining future sanitary flows for the areas to be served. Land use designations utilized in this study were established in the Comprehensive Plan Addendum created by Stantec in 2009 for the City of Moorhead.

## 2. Wastewater Flows

Unit wastewater flows were assigned to each different type of land use designated in the Comprehensive Plan Addendum. The average flow for each sewer district was calculated by multiplying the land use area or number of units being served by the corresponding unit flows. The following table below provides the unit flows designated for each land use type.

| Land Use | Flow Allocation | Units/Acre |
|---|---|---|
| Low Density Residential | 350 gallons per day per unit | 4 |
| Medium Density Residential | 300 gallons per day per unit | 5 |
| Medium Density Mixed Residential | 250 gallons per day per unit | 12 |
| High Density Residential | 150 gallons per day per unit | 30 |
| Industrial | 2,000 gallons per day per acre | |
| Commercial | 1,500 gallons per day per acre | |
| Agricultural | 0 gallons per day per acre | |
| Public/ Institutional | 1,000 gallons per day per acre | |
| Parks/ Open Space | 50 gallons per day per acre | |

Unit flow allocations for residential use were lowered from the City's standard residential land use unit flows to account for the maximum development densities in computing capacity requirements and for the reduction in land use for ponding areas.

## 3. Infiltration / Inflow

The design flows used in this report incorporate an allowance for an average of 15 gallons per capita per day of extraneous water entering the sanitary sewer system through inflow and infiltration (I/I). Current design specifications limit infiltration to 100 gallons per day per inch of diameter per mile of pipe.

The City has taken steps to minimize I/I. These steps include stringent testing of all new sanitary sewer lines, use of manholes with concealed pick holes, proper maintenance of the existing system through an extensive sewer rehabilitation program, and a regular program of

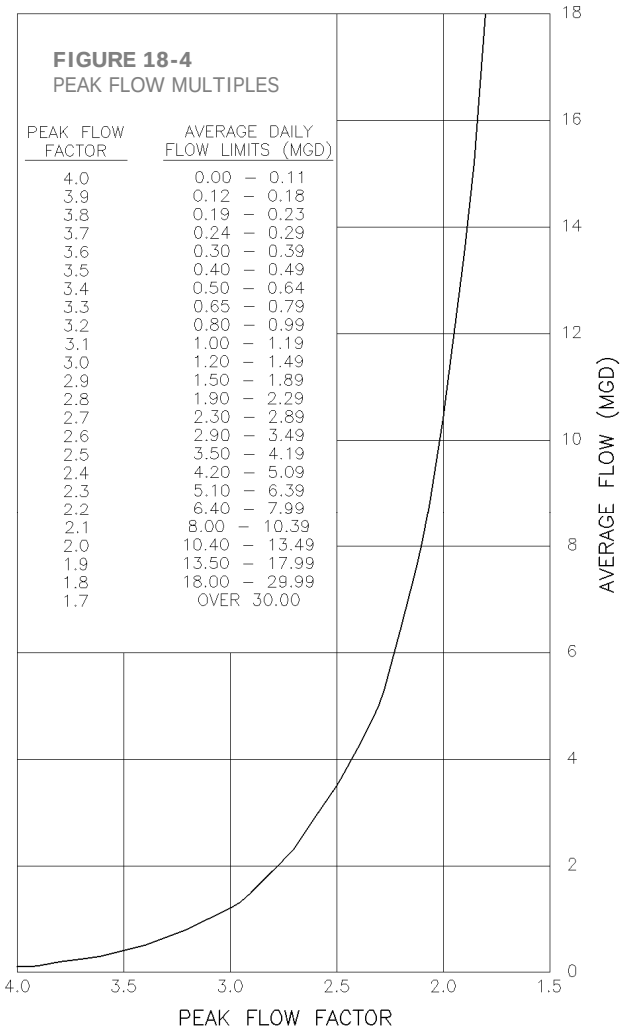
manhole rehabilitation. The City also prohibits the connection of roof and foundation drains to the sanitary sewer system and has conducted a citywide sump pump inspection program.

## 4. System Design

The trunk sanitary sewer system must be capable of handling not only the average flows, but also the maximum anticipated flows. These peak flow rates can be expressed as a variable ratio applied to the average flow rates. A number of curves that describe this ratio have been developed, all of which indicate a decreasing ratio of peak flow to average flow with increasing tributary population or average flow. The values applied herein are shown in Figure 18-4 and presented in both tabular and graphical form. These values are generally conservative and are widely used for planning in municipalities the size of Moorhead. For the remainder of this report, all references to flow shall mean the average flow multiplied by the appropriate peak flow factor unless otherwise indicated.

**FIGURE 18-4**
PEAK FLOW MULTIPLES

| PEAK FLOW FACTOR | AVERAGE DAILY FLOW LIMITS (MGD) |
|---|---|
| 4.0 | 0.00 – 0.11 |
| 3.9 | 0.12 – 0.18 |
| 3.8 | 0.19 – 0.23 |
| 3.7 | 0.24 – 0.29 |
| 3.6 | 0.30 – 0.39 |
| 3.5 | 0.40 – 0.49 |
| 3.4 | 0.50 – 0.64 |
| 3.3 | 0.65 – 0.79 |
| 3.2 | 0.80 – 0.99 |
| 3.1 | 1.00 – 1.19 |
| 3.0 | 1.20 – 1.49 |
| 2.9 | 1.50 – 1.89 |
| 2.8 | 1.90 – 2.29 |
| 2.7 | 2.30 – 2.89 |
| 2.6 | 2.90 – 3.49 |
| 2.5 | 3.50 – 4.19 |
| 2.4 | 4.20 – 5.09 |
| 2.3 | 5.10 – 6.39 |
| 2.2 | 6.40 – 7.99 |
| 2.1 | 8.00 – 10.39 |
| 2.0 | 10.40 – 13.49 |
| 1.9 | 13.50 – 17.99 |
| 1.8 | 18.00 – 29.99 |
| 1.7 | OVER 30.00 |



# C. DESIGN REPORT

## 1. Comparison to Previous Study

### a. South Area

The portion of the South growth area west of Hwy 75, between 46 Avenue S and 50 Avenue S was evaluated during the 2004 study. At that time, this area was expected to develop 800 units. At this time, it is projected that the same area will develop approximately 930 units. The planned capacity for Lift Station No. 35 was 800 gpm. It is recommended that this area be monitored closely as this area approaches saturation to determine whether the design capacity of the lift station will be exceeded.

### b. East Area

A portion of the East growth area was evaluated during the 2004 study. A cursory review of the projected flows based on the revised future land uses was completed. Comparing the projected flows to the previously proposed flows for the portion of the growth area evaluated earlier suggests that the previously proposed infrastructure will be adequate for that area.

### c. South Central Area

The South Central growth area was not formally addressed in this study. However, given the proposed future land use in the South Central Area, the anticipated flows for remaining developable land were compared to the difference between the 2004 design flows and the 2009 average day flow. This comparison suggests that--although the trunk sanitary system is expected to reach its full capacity under the proposed land uses--changes to the planned trunk sanitary system in this area are not necessary. However, there are some indications that more recent developments have come in with higher than anticipated flows.

## 2. Phase 1

### a. General Description

The Phase 1 service area generally includes Area E1 and the 50th to 55th Street portion of the South Area (referred to as Area S1) where development is most likely to occur first. This Phase is shown in Figure 18-2.

### b. Proposed Sanitary Facilities – Overview

New sanitary facilities will be required to facilitate the growth associated with Phase 1. The proposed facilities for this phase include a new regional lift station (LS 46) and dual force mains to facilitate saturated development of Area S1, as well as a new sanitary trunk to serve Area E1. The following paragraphs discuss the facilities required for each district. Please note that downstream facilities must be constructed in conjunction with, or prior to, all pertinent upstream facilities.

#### i. Area S1

In Area S1, a triplex submersible lift station with a capacity of 2,220 gpm will be required to serve the entire area in Phase 1. Dual 16-inch forcemains from this lift station will deliver flow to Lift Station No. 38 via reach X4. The forcemains are sized to accommodate a flow of 3,020 gpm. This is the projected flow if Area S2 were to develop until the capacity of Reach X3 is maximized.

#### ii. Area E1

To serve Area E1, a new reach of trunk sewer line will be needed. The proposed reach, labeled X4 in Figure 18-2, is a 30-inch line stretching from Manhole 38.78 to Lift Station No. 38. Due to limited capacity in Reach X2, Reach X4 is sized to accommodate flows from a portion of Area 9 as well as all of Area S1 and Area E1.

#### iii. Lift Station No. 39

In order to serve area S1 and E1, the peak flow to Sanitary Lift Station No. 39 will be 8,750 gpm. This flow is greater than the existing capacity of 6,600 gpm. Therefore, Lift Station No. 39 will need to be expanded to accommodate this peak flow. In order to provide the least amount of overall costs, Lift Station No. 39 upgrade should be expanded to a total of 9,500 gpm in a single upgrade to accommodate the future flows generated by Phase 2 as mentioned below.

## 3. Phase 2

### a. General Description

The Phase 2 service area includes Areas S2 and E2. The core elements of Phase 1 must be completed before this phase can be constructed. Figure 18-3 depicts Phase 2.

It is anticipated that only a portion of the Phase 2 service area will be able to develop due to the limits of existing sanitary infrastructure. The limiting factor in how much development can occur

in Phase 2 is the size of the downstream gravity sewer, Reach X3 which feeds Lift Station No. 39. Reach X3 is a 42" RCP line that has a capacity of 9,500 gpm.

Given the flows projected at the build-out of Phase 1, it is expected that Reach X3 will be able to accommodate no more than 325 gpm of additional average flow. This equates to a maximum of 1,340 new low density units without exceeding the capacity of Reach X3. This is approximately 30 to 40 percent of the maximum proposed residential density for Areas S2 and E2.

Once the Phase 1 service area is fully developed, the average flows should be determined and the remaining capacity of Reach X3 re-evaluated. This remaining capacity can come from either Area S2 or E2, or a combination of the two areas.

### b. Proposed Sanitary Facilities – Overview

The sanitary facilities required for Phase 2 are dependent on how the development occurs in Areas S2 and/or E2. For development in Area S2, Lift Station No. 46 in Area S1 may be upgraded to handle the flow from S2. Development in E2 will require construction of Lift Station No. 47 with its forcemain discharging into Reach X4. The exact location and capacity of this lift station will depend on the amount and location of development in Area E2. Lift Station No. 39 will need to be expanded to provide a firm capacity of 9,500 gpm.

## 4. Data Summary

The facilities designed and sized for expansion of the south and east sanitary service areas are shown in Table 18-1. As mentioned earlier in this report, the average flows were computed by multiplying the land use area/number of units to be served by the corresponding unit flows. From this total average flow, the design flow was determined by multiplying the average flow by the corresponding peak flow factor as shown in Figure 18-4.

**TABLE 18-1.**
**LIFT STATION AND FORCEMAIN SIZING**

| Lift Station Designation | Area of Service | Service Area (AC) | Average Design Flow (GPM) | Peak Flow Factor (Figure 4) | Lift Station Design Flow (GPM) | Forcemain Size (in.) | Forcemain Cap. (gpm) | Description of Lift Station |
|---|---|---|---|---|---|---|---|---|
| SOUTH REGION | | | | | | | | |
| LS 46 | S1 | 620 | 715 | 3.1 | 2,220 | dual 16 | 3,600 | Triplex Submersible Lift Station |
| LS 46 | S1 & S2 | 955 * | 1,041 | 2.9 | 3,020 | dual 16 | 3,600 | Phase 2 upgrade of LS 46 |
| EAST REGION | | | | | | | | |
| LS 47 | E2 | 335 * | 326 | 3.5 | 1,150 | 12 | 1,400 | Duplex Submersible Lift Station |

**INTERCEPTOR SIZING**

| Interceptor Designation | Area of Service | Service Area (AC) | Average Design Flow (GPM) | Peak Flow Factor (Figure 4) | Interceptor Design Flow (GPM) | Interceptor Size (in.) | Interceptor Cap. (gpm) | Notes |
|---|---|---|---|---|---|---|---|---|
| EAST REGION | | | | | | | | |
| X4 | E1, S1, S2 & E2 | 1270 * | 1,441 | 2.8 | 4,040 | 30 | 4,430 | May be used to share capacity with X1/X2 |

* Maximum developable acreage based on a total of 335 acres developed in Phase 2.

## 5. Opinion of Probable Cost

Due to the uncertainty of determining exactly where development will begin, the areas being served were considered individually in terms of costs. To avoid a complex table of probable costs that could be constructed by evaluating all possible development scenarios, the process was simplified. Cost estimates were established on an individual area basis so that the costs could be determined in the event that a developer wanted to develop an area that did not fit in with the logical extension of facilities.

As shown in Table 18-2 on the following page, the estimated minimum cost of all facilities, if development proceeds in a logical order, is $14,430,000 in Phase 1 and $6,135,000 in Phase 2. The value of proceeding in a logical progression cannot be overemphasized. If all the areas develop in an orderly progression, the cost per acre would be around $16,200 per acre.

**TABLE 18-2**

**Moorhead - Minnesota**
**South and East Growth Area Expansion Evaluation**
**Project No. 000258-07128-0**

**PHASE 1**

**Area E1**

| Description | Acres | LS Size | LS Cost | Gravity Sewer Size (in.) | Length (feet) | Unit Cost | Gravity Sewer Cost | McCarras Lift Station 03-A6-1 Deferred Assessment | Interceptor 02-A6-9 Deferred Assessment | Final Construction Cost | 25% Contingencies | 21% Legal, Eng. & Administrative | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 315 acres north of I-94 | 315 | | | 30 inch | 12,000 | $150 | **$1,800,000** | | | **$1,800,000** | **$450,000** | **$472,500** | **$2,722,500** |
| Upgrade LS 39 | | 9,500 gpm | **$1,050,000** | | | | | | | **$1,050,000** | **$262,500** | **$275,625** | **$1,588,125** |
| Total Acres | 315 | | | | | | | | **Total Cost** | **$2,850,000** | **$712,500** | **$748,125** | **$4,310,625** |
| | | | | | | | | | **Total Cost per Acre** | **$9,048** | | | **$13,684.52** |

**Area S1**

| Description | Acres | LS Size | LS Cost | Forcemain Size (in.) | Length (feet) | Unit Cost | Forcemain Cost | McCarras Lift Station 03-A6-1 Deferred Assessment | Interceptor 02-A6-9 Deferred Assessment | Final Construction Cost | 25% Contingencies | 21% Legal, Eng. & Administrative | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The area west of Hwy | 620 | 2,220 gpm | **$1,480,000** | | | | | | | **$1,480,000** | **$370,000** | **$388,500** | **$2,238,500** |
| 75 between 50th and | | | | Dual 16 inch | 31,800 | $130 | **$4,134,000** | | | | | | |
| 55th, plus 160 acres | | | | (w/ I-94 jacking) | Defer 50% to Phase 2 | | **$2,067,000** | | | **$2,067,000** | **$516,750** | **$542,588** | **$3,126,338** |
| east of 75 between 46th | | | | | | | | | **$1,337,138** | **$1,337,138** | **$334,285** | **$350,999** | **$2,022,421** |
| and 55th (LS 47) | | | | | | | | | | | | | |
| Upgrade McCarras LS | | | **$320,000** | | | | | **$172,000** | | **$492,000** | **$123,000** | **$129,150** | **$744,150** |
| Upgrade LS 38 | | 8,475 gpm | **$1,050,000** | | | | | | | **$1,050,000** | **$262,500** | **$275,625** | **$1,588,125** |
| Ditch Improvement along | | | | | | | **$530,000** | | | | | | |
| Forcemain Route | | | | | Defer 50% to Phase 2 | | **$265,000** | | | **$265,000** | **$66,250** | **$69,563** | **$400,813** |
| Total Acres | 620 | | | | | | | | **Total Cost** | **$6,691,138** | **$1,672,785** | **$1,756,424** | **$10,120,346** |
| | | | | | | | | | **Total Cost per Acre** | **$10,792** | | | **$16,323.14** |

**PHASE 2**

**Area E2**

| Description | Acres | LS Size | LS Cost | Forcemain Size (in.) | Length (feet) | Unit Cost | Forcemain Cost | Final Construction Cost | 25% Contingencies | 21% Legal, Eng. & Administrative | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Up to 335 acres in E2 | 335 | | | 12 inch | 5,300 | $80 | **$424,000** | **$424,000** | **$106,000** | **$111,300** | **$641,300** |
| LS 47 | | 1,150 gpm | **$600,000** | | | | | **$600,000** | **$150,000** | **$157,500** | **$907,500** |
| Total Acres | 335 | | | | | | **Total Cost** | **$1,024,000** | **$256,000** | **$268,800** | **$1,548,800** |
| | | | | | | | **Total Cost per Acre** | **$3,057** | | | **$4,623.28** |

**Area S2**

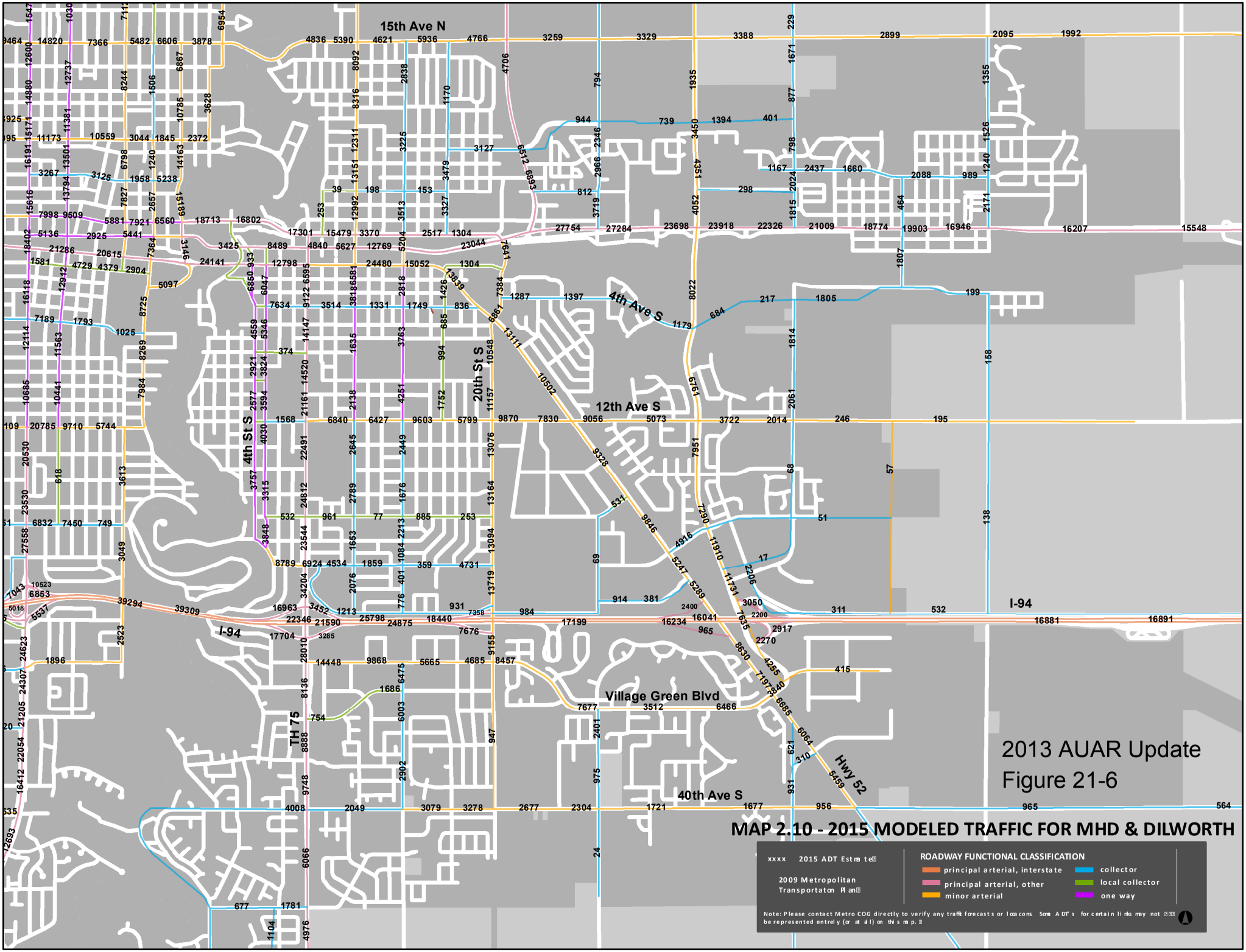
| Description | Acres | LS Size | LS Cost | Forcemain Size (in.) | Length (feet) | Unit Cost | Forcemain Cost | Final Construction Cost | 25% Contingencies | 21% Legal, Eng. & Administrative | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Up to 335 acres in S2, | 335 (total for all of Phase 2) | | | | | | | | | | |
| Upgrade LS 46 (from 2220 to 3020 gpm) | | | **$700,000** | | | | | **$700,000** | **$175,000** | **$183,750** | **$1,058,750** |
| | | | | Pay remainder of deferred FM cost | | | **$2,067,000** | **$2,067,000** | **$516,750** | **$542,588** | **$3,126,338** |
| | | | | Pay remainder of deferred ditch cost | | | **$265,000** | **$265,000** | **$66,250** | **$69,563** | **$400,813** |
| Total Acres | 335 | | | | | | **Total Cost** | **$3,032,000** | **$758,000** | **$795,900** | **$4,585,900** |
| | | | | | | | **Total Cost per Acre** | **$9,051** | | | **$13,689.25** |

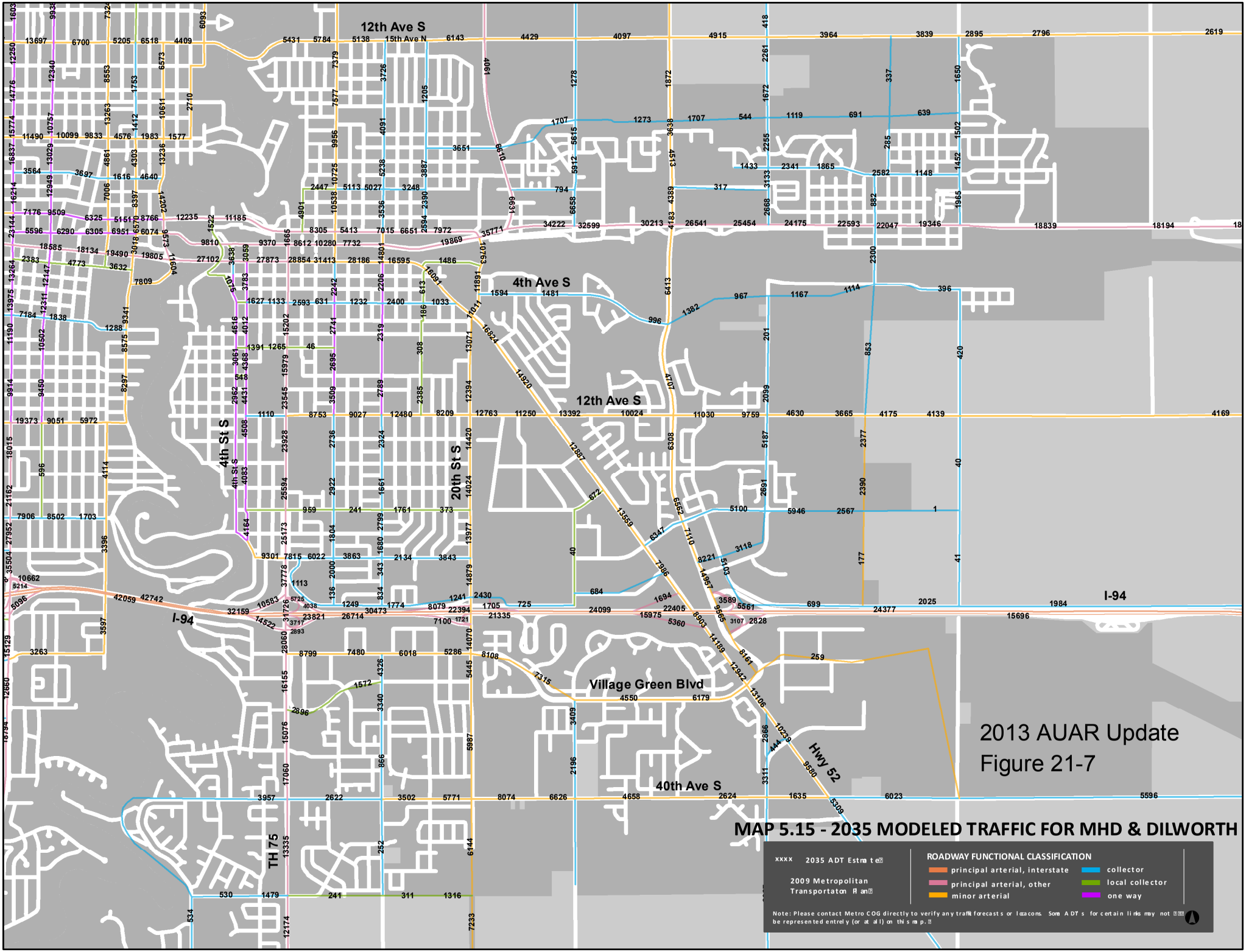
# Figure 21-8

Revised 3-19-2013

| Transportation Improvements _ Model & Programming Applicability | | | |
|---|---|---|---|
| | Project | Model Applicability | LRTP / TIP / CIP |
| 1 | Extention of 50th Ave S (east of TH 75) to 20th St S | modeled as 2 lane collector from TH 75 to CSAH 52 | LRTP (illustrative) |
| 2 | Extension of 20th St S from 34th Ave to 41st Ave S | modeled with 20th St extended from 34th to 60th Ave as minor arterial | LRTP 34th to 41st (short range) 41st to 60th (illustrative); TIP 2014 34th to 41st ; CIP (future, to 50th Ave S) |
| 3 | 20th St / I94 Interchange - Add WB off-ramp and EB on-ramp | 2035 and full-build modeled with interchange re-configuration | LRTP (long range); CIP (future) |
| 4 | Extension of 3rd St S from 50th Ave S to 60th Ave S | modeled as 2 lane collector | |
| 5 | Construction of 55th Ave S from Red River to TH 75 | modeled as 2 lane collector | |
| 6 | Intersection Control (Roundabout) at 50th Ave S & TH 75 | included | LRTP (long range) |
| 7 | Intersection Control (Roundabout) at 60th Ave S & TH 75 | included | Completed |
| 8 | TH 75 from 24th Ave S to 60th Ave S | additional capacity (8 lanes) | LRTP 20th to 60th (illustrative) |
| 9 | Re-construct 60th Ave S from Red River to TH 75 | modeled as 4 lane minor arterial | LRTP (long range) |
| 10 | TH 75 / I94 Interchange and Ramp Revisions | modeled w/ added EB off-ramp and NB 8th St to WB I-94 on-ramp | LRTP (mid range); 2016 TIP; CIP 2016 |
| 11 | Construct SE Main Ave / I94 Ramps (serves traffic to/from west) | included | Completed |
| 12 | Extension of 28th St S | modeled as extension to approximately 46th Ave S (collector) | LRTP (long range) |
| 13 | Extension of Westmoor Blvd | | |
| 14 | Construct 4th Ave S from 34th St to 40th St | modeled as 2 lane collector | LRTP (short range); CIP (future) |
| 15 | Construct 24th Ave S from 34th St to 46th St (complete between 34th and 42nd) | modeled as 3 lane facility to 46th St and 2 lane collector to CR 78 | LRTP (long range); CIP (future) |
| 16 | Construct Ridgewood Blvd from 34th St to 40th St (complete) | roadway not modeled | Completed |
| 17 | Construct 46th St from 4th Ave S to 34th St S | modeled as 2 lane collector | |
| 18 | Construct 40th St from 24th Ave to 34th St S – existing between 34th and 36th | modeled as 2 lane collector | LRTP (short range); CIP (future) |
| 19 | Construct 40th St from 12th Ave to 4th Ave S | modeled as 2 lane collector | LRTP (mid range); CIP (future) |
| 20 | Construct 28th Ave S from 20th St to 26th St S | modeled as 2 lane w/ signal at 28th Ave and 20th St intersection and roundabout at WB I94 on-ramp; project completed 2012 except signal to be finished 2013 | Completed |
| 21 | Intersection Control (add signal) at 30th Ave S / 20th St intersection | signal included | LRTP (short range); TIP 2016; CIP 2016 (2014?) |
| 22 | Intersection Control (add signal) at 46th Ave S / TH 75 | signal included | LRTP (illustrative) |
| 23 | Intersection Control (add signal) at 3rd St S / 60th Ave S | signal included | |
| 24 | Intersection Control (add signal) at 4th Ave S / 34th St S | signal included | LRTP (short range); CIP (future) |
| 25 | Intersection Control (add signal) at 12th Ave S / 40th St S | signal included | LRTP (mid range); CIP (future) |
| 26 | Intersection Control (add roundabout) at 28th Ave S / 36th St S/ 40th Street | roundabout included | Completed |
| 27 | Intersection Control (add signal) at 40th Ave S / 20th St S | signal not included | Probably in 2014, if warranted |

| Possible Full-Build Improvements _ Non-Modeled | | | |
|---|---|---|---|
| | Project | Model Applicability | LRTP / TIP / CIP |
| 1 | Intersection Control (add signal) at 40th Ave S / 14th St S | signal not included | |
| 2 | Intersection Control (add signal) at 28th St S / 40th Ave S | signal not included | |
| 3 | Intersection Control (add signal) at 30th Ave S / 28th St S | signal not included | |
| 4 | Intersection Control (add signal) at CSAH 7 / CSAH 52 | signal not included | |
| 5 | Intersection Control (add signal) at CSAH 52 / 40th Ave S | signal not included | |


15th Ave N
4th Ave S
12th Ave S
40th Ave S
20th St S
4th St S
TH 75
I-94
Village Green Blvd
Hwy 52
2013 AUAR Update
Figure 21-6
MAP 2.10 - 2015 MODELED TRAFFIC FOR MHD & DILWORTH
xxxx 2015 ADT Estimate
2009 Metropolitan Transportation Plan
ROADWAY FUNCTIONAL CLASSIFICATION
principal arterial, interstate
principal arterial, other
minor arterial
collector
local collector
one way
Note: Please contact Metro COG directly to verify any traffic forecasts or locations. Some ADT's for certain links may not be represented entirely (or at all) on this map.


12th Ave S
15th Ave N
4th Ave S
12th Ave S
4th St S
20th St S
I-94
I-94
Village Green Blvd
40th Ave S
Hwy 52
TH 75
2013 AUAR Update
Figure 21-7
MAP 5.15 - 2035 MODELED TRAFFIC FOR MHD & DILWORTH
xxxx 2035 ADT Estimate
2009 Metropolitan Transportation Plan
ROADWAY FUNCTIONAL CLASSIFICATION
principal arterial, interstate
principal arterial, other
minor arterial
collector
local collector
one way
Note: Please contact Metro COG directly to verify any traffic forecasts or locations. Some ADTs for certain links may not be represented entirely (or at all) on this map.

# Archaeological Site Locations

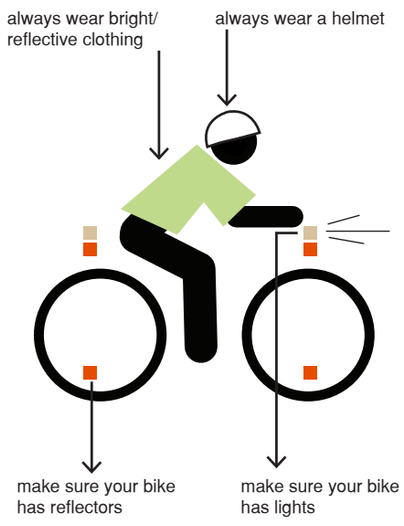
| Site Number | Site Name | Twp. | Range | Sec. | Quarter Sections | Acres | Phase | Site Description | Tradition | Context | Reports | NR | CEF | DOE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **County:** | **Clay** | | | | | | | | | | | | | |
| 21CYr | Red River Trail | 138 | 48 | 5 | SE | 0 | 0 | TR | | | | | | |
| | Red River Trail | 138 | 48 | 5 | NW | 0 | 0 | TR | | | | | | |
| | Red River Trail | 139 | 48 | 29 | W-W | 0 | 0 | TR | | | | | | |
| | Red River Trail | 139 | 48 | 32 | W-W | 0 | 0 | TR | | | | | | |

# History/Architecture Inventory

| PROPERTY NAME | ADDRESS | Twp | Range | Sec | Quarters | USGS | Report | NRHP | CEF | DOE | Inventory Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **COUNTY Clay** | | | | | | | | | | | |
| **CITY/TOWNSHIP: Dilworth** | | | | | | | | | | | |
| Northern Pacific Buildings | 3rd St. NE & 2nd Ave. SE | 139 | 48 | 11 | SE-NE-NE | Sabin | CY-79-1H | | | | CY-DWC-003 |
| **CITY/TOWNSHIP: Glyndon Twp.** | | | | | | | | | | | |
| Arlan Mueller Farmstead | 6844 40th St. | 139 | 47 | 19 | SW-SE-SE | Sabin | CY-2009-1H | | | | CY-GYT-005 |
| **CITY/TOWNSHIP: Moorhead** | | | | | | | | | | | |
| South Dam | Across the Red River at mile 458.1 | 139 | 48 | 30 | NW-NE-NW | Fargo South | | | Y | | CY-MHC-091 |
| unnamed ditch | | 139 | 48 | 13 | | | | | | | CY-MHC-096 |
| unnamed ditch | | 139 | 48 | 24 | | | | | | | CY-MHC-096 |

## Bike Safety:

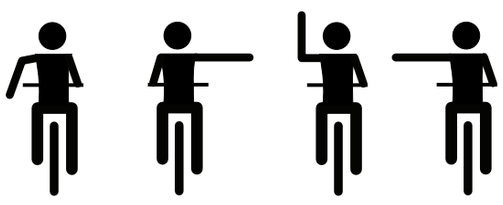
**Bicyclists share the same privileges and responsibilities as drivers of motor vehicles, and must obey all traffic control signs and signals.**




* You can never have too many reflectors or lights on your bike. The more you have the more safe you are as a bicyclist

## On-road bicycling:

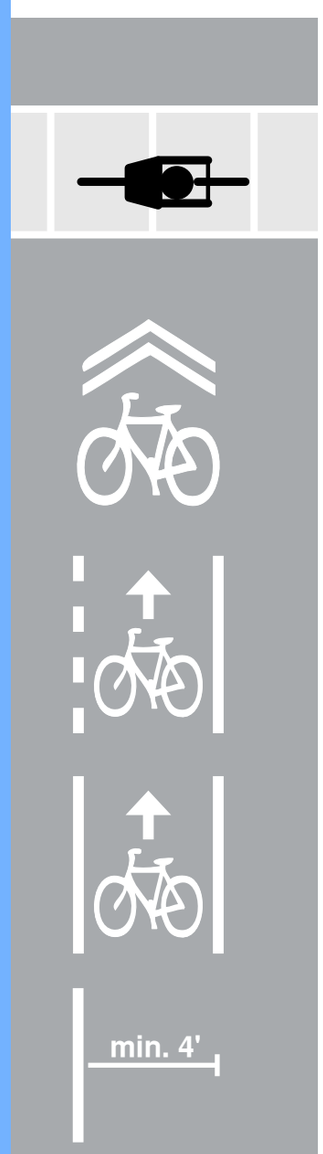
must know biking symbols:




**For more bike safety information:**
+ www.bikeed.org
+ www.sharetheroadmn.org/

## FM Signs:

In the FM Area, there are signs to be aware of as a bicyclist and as a driver to ensure a safe experience for everyone.




### Sidewalks:

Use extra caution when riding on sidewalks, especially at crossings/ intersections and around pedestrians

### Sharrow:

share the road with vehicles

### Bike lane at an intersection:

cars yield to bicycles when merging over dashed line

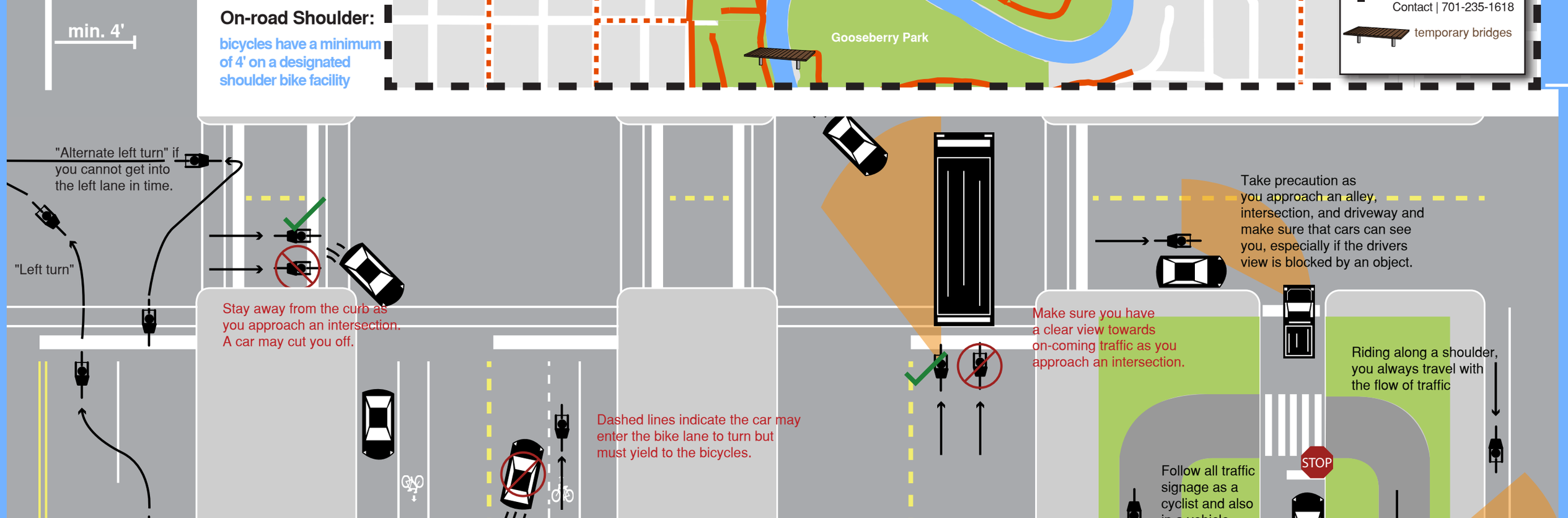
### Bike lane:

bicycles only, cars keep out

### On-road Shoulder:

bicycles have a minimum of 4' on a designated shoulder bike facility

## Downtown Inset:


Inspired by: City of Minneapolis Bicycle Map

FM Metro Area

# Bikeways Map

Fargo | West Fargo | Moorhead | Dilworth

# FM area bikeways 2012 (current as of Dec. 2011)

## Points of interest (refer to quadrants)

| | |
|---|---|
| E-13 | West Acres Mall |
| I-11 | Moorhead Center Mall |
| I-11 | Main Avenue Bridge |
| I-11 | Hjemkomst Center |
| H-16 | Bluestem (Trollwood) |
| K15 | 100 Acre Park (Mhd) |
| A-11/12 | Fairgrounds (WF) |
| E-14 | Red River Valley Zoo |
| H-12 | Island Park |
| I-13 | Lindenwood Park (Far) |
| I-13 | Gooseberry Park (Mhd) |
| I-12 | Woodlawn Park |
| I-11 | Oak Grove Park (Far) |
| I-11 | Memorial Park (Mhd) |
| H-11 | GTC (MATBUS Station) |
| D-14 | Softball Grounds (S.Far) |
| H-11 | Fargo City Hall |
| I-11 | Moorhead City Hall |
| C-12 | West Fargo City Hall |
| M-11 | Dilworth City Hall |
| H-12 | Cass County Courthouse |
| J-10 | Clay County Courhouse |
| I-11 | Sanford (downtown) |
| H-13 | Essentia/Sanford (S.Univ) |
| F-15 | Essentia (Innovis) (S.Far) |
| F/G-15 | Sanford Health (S.Far) |
| G-9/10 | NDSU (Main Campus) |
| H-11 | NDSU (downtown) |
| J/K-12 | MSUM (Campus) |
| I/J-12/13 | Concordia University |
| G-16/17 | Rose Creek Country Club |
| B/C-16 | Osgood Golf Course |
| F-13 | Prairiewood Golf Course |
| H/I-14 | Fargo Country Club |
| L-12 | Meadows Golf Course |
| L-14 | Village Green Golf Course |
| I/J-9 | Moorhead Country Club |
| K-13 | MN State |

## Schools

| | |
|---|---|
| M-11 | Dilworth Elementary School |
| F-14 | Park Christian School North Campus |
| K-11 | Moorhead High School |
| L-12 | Horizon Middle School |
| J-13 | Ellen Hopkins Elementary |
| J-10 | Robert Asp Elementary |
| J-15 | S.G. Reinersten Elementary |
| B-11 | Clayton A. Lodoen Kindergarten Center |
| C-16 | Osgood Kindergarten Center |
| A-15 | Aurora Elementary |
| C-12 | Eastwood Elementary |
| B-12 | South Elementary |
| C-11 | L.E. Berger Elementary |
| A-12 | Westside Elementary |
| C-13 | Cheney Middle School |
| B-11 | Stem Center Middle School |
| C-16 | Sheyenne Ninth Grade Center |
| C-12 | West Fargo High School |
| B-11 | West Fargo Community High |
| G-13 | Lewis & Clark Elementary |
| J-10 | Madison Elementary |
| I-10 | Horace Mann Elementary |
| H-12 | Grace Lutheran School |
| H-13 | Clara Barton Elementary |
| I-8 | Longfellow Elementary |
| I-10 | Oak Grove Lutheran High School |
| H-9 | Ben Franklin Middle School |
| G-16 | Discovery Middle School |
| H-12 | Hawthorne Elementary |
| F-12 | Dakota Montessori School Inc. |
| G-18 | Bennett Elementary |
| G-13 | Fargo South High School |
| G-12 | Carl Ben Eielson Middle School |
| H-9 | Washington Elementary |
| H-9 | Fargo North High School |
| H-10 | Roosevelt Elementary |
| G-11 | Jefferson Elementary |
| F-17 | Kennedy Elementary |
| H-14 | Lincoln Elementary |
| H-8 | Mckinley Elementary |
| H-9 | Holy Spirit Elementary |
| H-13 | Nativity Elementary |
| C-16 | Sullivan Middle School |
| C-16 | Shanley High School |
| F-15 | Oak Grove Lutheran Elementary |
| C-14 | Freedom Elementary |
| B-21 | Horace Elementary School |


**Prepared by:**
FM Metropolitan Council of Governments
Case Plaza, Suite 232
One North 2nd Street, Fargo, ND 58102
www.fmmetrocog.org | 701.232.3242


Hector International Airport

19TH AVE
12TH AVE
MAIN AVE
13TH AVE
17TH AVE
32ND AVE
40TH AVE
52ND AVE

45TH ST
42ND ST
25TH ST
10TH ST N
UNIVERSITY DR
8TH ST

31
10
75
94
29
52
78
17

Maple River
Red River

## Legend

- PRIMARY/SECONDARY SCHOOL
- COLLEGE/UNIVERSITY
- PARK/GOLF COURSE
- BUS TRANSFER POINTS
- OFF ROAD BIKE FACILITY (shared use path)
- ON ROAD BIKE FACILITY (shoulders, sharrows, bike lanes)
- DOWNTOWN INSET (ON BACK)

# 2011 Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan

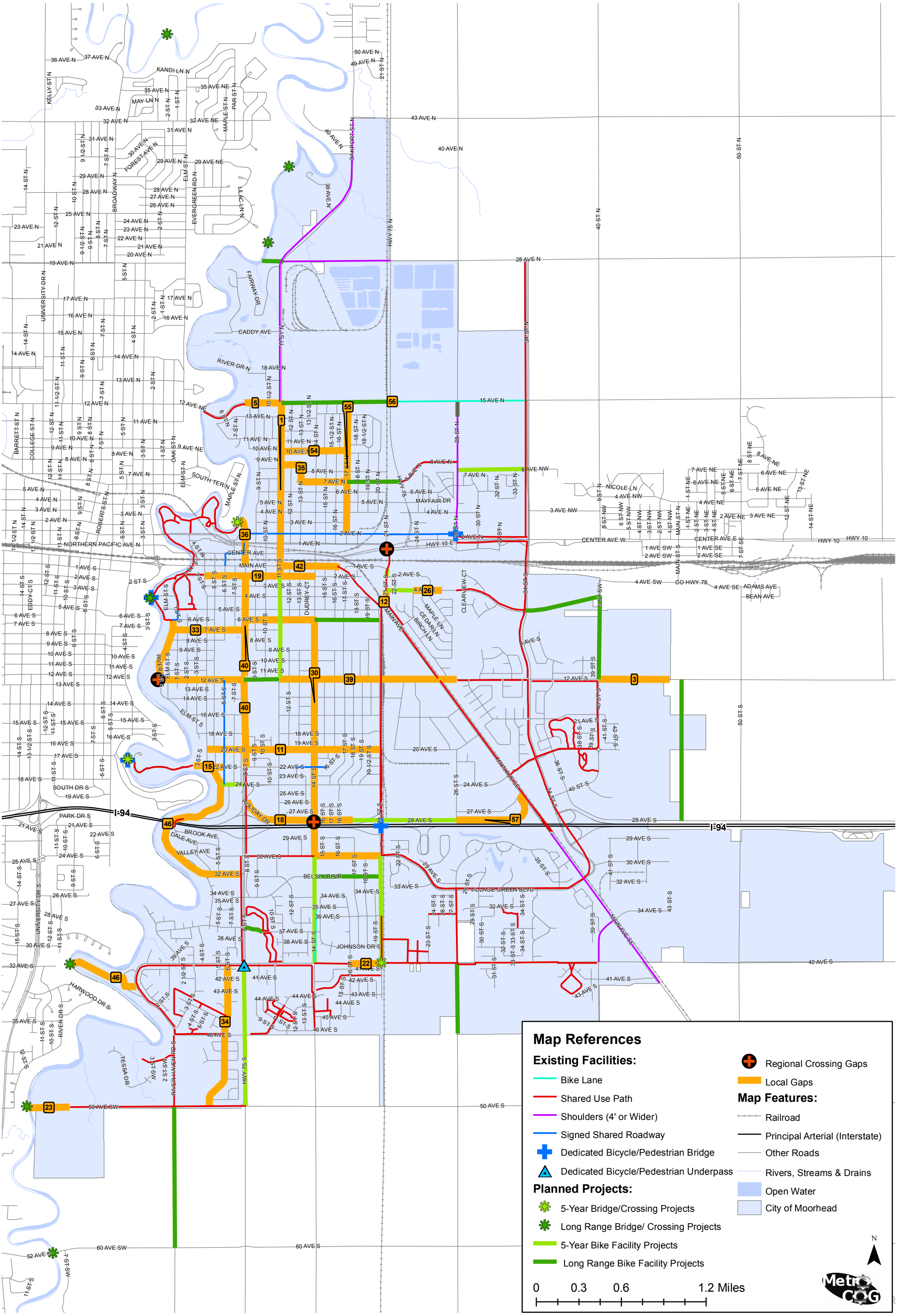
Excerpts for Moorhead
2013 AUAR Update

Adopted October 20, 2011

Prepared by the Fargo-Moorhead Metropolitan Council of Governments (Metro COG)

# City of Moorhead Facilities, Projects & Gaps

**Figure 4.2**



# Chapter 6: RECOMMENDATIONS

The following recommendations are based on both the issues identified and the goals and objectives of this plan. Some of the recommendations serve as guidance while others are specific work program items which will assist in the mitigation of an identified issue.

## 6.1 Bicycle and Pedestrian Network Gaps

### Creation of Locally and Federally Funded Project Lists

Metro COG reviewed the 2009 Long Range Transportation Plan and met with member local units of government to confirm which projects should be moved into the 2011 Plan Update and which projects should not. Metro COG met with member local units of government to discuss which locally funded projects (from capital improvement projects list for each unit of government) should be included in the 2011 Plan Update. Both the federally and locally funded projects were moved into one of three categories of projects: short-range locally funded, short-range federally funded and long-term projects. The short term or 5-year project lists are located in Table 6.1. The long range planned project lists can be found in Appendix G. Metro COG recommends that local jurisdictions continue to construct the projects listed within the short-term project lists over the next 5-years and re-evaluate the projects with the update of the next plan.

### Major Barriers

Metro COG created a list of five regionally significant bicycle/pedestrian gaps based on public input and feedback from associated agencies and stakeholders. The list of regionally significant gaps was reviewed by the consulting team and a prioritized list of five regionally significant gaps was created. The five prioritized projects were selected based on system connectivity of bicycle and pedestrian trip generators, level of priority by member local units of government, and level of project feasibility based on right of way available to construct the project. Description sheets were created for each project including project description, regional context and associated proposed improvements needed for the project and can be found in Appendix A. They are also listed in prioritized order below

1. Crossing over Red River from 40th Ave S (Fargo) to Bluestem Center for the Arts
2. Crossing of I-94 at 14th St S (28th Ave S to 30th Ave S) (Moorhead)
3. Crossing of I-29 at 28th Ave S (Fargo)
4. Crossing over Red River at 13th Ave S (Fargo) to 12th Ave S (Moorhead)

Regionally significant gaps are long-range projects that will need thorough analysis and support from the public. Regionally significant gaps should be pursued in order of prioritization after the Lindenwood/Gooseberry and Oak Grove/Memorial bicycle/pedestrian bridges are replaced.

**Table 6.1**
**5 Year Bicycle/Pedestrian Projects (All Jurisdictions)**

| Jurisdiction | Project Location | Project Description |
|---|---|---|
| Cass County | CR 31 from CR 20 to CR 22 | Overlay |
| Cass County | CR 20 from CR 17 to Highway 81 | Roadway Reconstruction |
| Cass County | CR17 from 12th Avenue North to CR 20 | Roadway Reconstruction |
| Cass County | CR 15 from 48th Street SE to 36th Street SE | Overlay and add paved shoulders |
| Cass County | CR 15 from CR 16 to CR 10 | Overlay roadway surface and add paved 6 foot shoulders. |
| Cass County | CR 16 from CR 15 to CR 17 | Concrete Repair/Overlay and add paved 6 foot shoulders. |
| Clay County | CR 11 from Sabin to TH 336 | Roadway Reconstruction |
| Clay County | CSAH 8 from Red River to TH 75 | Paved 6 foot shoulder as part of roadway reconstruction |
| Clay County | CSAH 1 from CSAH 22 to CR 93 | Paved 6 foot shoulder as part of roadway reconstruction |
| Clay County | CSAH 19 from TH 10 to CSAH 18 | Paved 6 foot shoulder as part of roadway reconstruction |
| Clay County | CSAH 18 (CSAH 3 to TH 75) | Roadway Reconstruction |
| Clay County | Hwy 52 from CR 7 to I-94 | Shared Use Path |
| Fargo | 7th Avenue North (35th St to 45th St) | Construct most appropriate on-road or off-road bicycle facility (as part of a larger roadway reconstruction effort). |
| Fargo | Lindenwood/Gooseberry Bridge | Construct a bike-ped bridge. |
| Fargo | Oak Grove / Memorial Bridge | Construct a bike-ped bridge. |
| Fargo | 12th Avenue North (45th St to I-29) | Construct most appropriate on-road or off-road bicycle facility. |
| Fargo | Drain 53 Bicycle-Pedestrian Bridge | Construct a bike-ped bridge over Drain 53 at approximately 58th Avenue South (in the Silver Leaf Addition) |
| Fargo | 12th Avenue North (9th St N to trail along Red River) | Construct most appropriate on-road or off-road bicycle facility (as part of a larger roadway reconstruction effort). |
| Fargo | 25th Street South (58th - 64th) | Construct most appropriate on-road or off-road bicycle facility Project as part of a larger roadway reconstruction effort. |
| Fargo | 25th Street South (64th-73rd) | Construct most appropriate on-road or off-road bicycle facility Project as part of a larger roadway reconstruction effort. |
| Fargo | 62nd Avenue South (18th St to 25th St) | Construct most appropriate on-road or off-road bicycle facility. |

| | | |
|---|---|---|
| Fargo | 64th Avenue South (University Dr to 25th St) | Construct most appropriate on-road or off-road bicycle facility as part of a larger roadway reconstruction effort. |
| Fargo | Roberts St (NP Ave to 6th St N) | Shared lane markings and signage – Level 3 |
| Fargo | 7th St N (6th Ave N to 17th Ave N) | Bike boulevard – Level 2 |
| Fargo | 8th St N (NP Ave to 2nd Ave N) | Bike boulevard – Level 1 |
| Fargo | 11th St N (6th Ave N to 17th Ave N) | Bike boulevard – Level 2 |
| Fargo | College St (8th Ave N to 12th Ave N) | Bike boulevard – Level 1 |
| Fargo | 14th St N (8th Ave N to 12th Ave N) | Bike boulevard – Level 1 |
| Fargo | Barrett St (8th Ave N to 12th Ave N) | Bike boulevard – Level 2 |
| Fargo | 16th St N (Dakota Dr to 12th Ave N) | Bike boulevard – Level 1 |
| Fargo | 18th St N (Dakota Dr to 12th Ave N) | Bike boulevard – Level 1 |
| Fargo | 2nd Ave N (University Dr to Roberts St) | Shared lane markings and signage – Level 3 |
| Fargo | 6th Ave N (11th St N to Broadway) | Bike boulevard – Level 1 |
| Fargo | 8th Ave N (14th St N to Broadway) | Bike lanes and signage |
| Fargo | Dakota Dr (12th Ave N to 14th St N) | Bike lanes and signage |
| Fargo | 11th Ave N (18th St N to Broadway) | Bike boulevard – Level 2 |
| Fargo | 12th Ave N (Dakota Dr to 9th St N) | Wide outside lane and bike route signage |
| Fargo | 12th Ave N (9th St N to 1st St N) | Bike lanes and signage |
| Fargo | 14th Ave N (University Dr to Broadway) | Bike lanes and signage |
| Fargo | 14th Ave N (University Dr to Broadway) | Bike boulevard – Level 1 |
| Fargo | 10th St N (NP Ave to 17th Ave N) | One way bike lane northbound in western curb Lane |
| Fargo | University Dr (NP Ave to 17th Ave N) | One way bike lane in southbound eastern curb lane |
| Fargo | NP Ave N (University Dr to 4th St N) | Bike lanes and signage |
| Fargo | Broadway (9th Ave N to 35th Ave N) | Construct a bicycle lane. |
| Fargo | Drain 53 Bikeway | Construct shared use path from Timberline Addition to 52nd Ave S. |
| Fargo | Elm Street | Provide on-road bicycle facility from 15th Ave N to Golf course Avenue North (Edgewood Golf Course) |
| Fargo | 1st Avenue South | Construct appropriate on- or off-road bicycle facility along 1st Ave S from 18th St S to Broadway, along 18th St S from 1st Ave S to |

| | | |
|---|---|---|
| | | 2nd Ave S and along 2nd Ave S from 18th St to 25th St |
| Fargo | University Drive (32nd Ave N to CR 20) | Construct most appropriate on-road or off-road bicycle facility as part of a Road Project. |
| Fargo | Broadway (9th Ave N to 35th Ave N) | Construct a bicycle lane. |
| Fargo | Drain 53 Bikeway | Construct shared use path from Timberline Addition to 52nd Ave S. |
| Fargo | Elm Street | Provide on-road bicycle facility from 15th Ave N to Golf course Avenue North (Edgewood Golf Course) |
| Fargo | 1st Avenue South | Construct appropriate on- or off-road bicycle facility along 1st Ave S from 18th St S to Broadway, along 18th St S from 1st Ave S to 2nd Ave S and along 2nd Ave S from 18th St to 25th St |
| Fargo | University Drive (32nd Ave N to CR 20) | Construct most appropriate on-road or off-road bicycle facility as part of a Road Project. |
| Fargo | 5th Street (13th Ave S to 24th Ave S) | New two-lane road section with Sharrows. |
| Fargo | 24th Ave S (5th St to 9th St) | New two-lane road section with Sharrows. |
| Fargo | 9th Street (24th Ave S to 26th Ave S) | New two-land road section with Sharrows. |
| Fargo | 26th Ave S (9th St to 11th St) | New two-lane road section with Sharrows. |
| Fargo | 11th Ave S (26th Ave S to 30th Ave S) | New two-lane road section with Sharrows. |
| Fargo | 30th Ave S (11th St to University Dr) | New two-lane road section with Sharrows. |
| Fargo | 7th Ave N (38/39th St to 45th St) | New three-lane section with Wide Outside Lane. |
| Fargo | 9th Ave S (42nd St to 38th St) | Mill and overlay project; parking on north side will be removed to stripe 5’ on-street bike lanes. |
| Fargo | 5th Ave S (25th St to 21st St) | Two-lane road section with Sharrows. |
| Fargo | 21st St (1st Ave S to 5th Ave S) | Two-lane road section with Sharrows. |
| Fargo | 1st Ave S (4th St to University Dr) | Two-lane road section with Sharrows. |
| Fargo | 32nd Ave N (9.5 St to Peterson Pkwy) | Remove parking from one side of street; stripe two on-street bike lanes. |
| Fargo | 4th St (NP Ave to 9th Ave N) | Three-lane section with 5’ bike lanes on each side. |
| West Fargo | Main Avenue (5th St East to 45th Street) | Construct most appropriate on- or off-road bicycle facility. |
| West Fargo | Main Avenue (Morrison Street to I-94) | Construct most appropriate on- or off-road bicycle facility. |
| West Fargo | 12th Avenue North (CR19 to 45th Street) | Construct most appropriate on- or off-road bicycle facility. |
| West Fargo | 8th Street West (Main Avenue to 2nd Ave West) | Construct most appropriate on- or off-road bicycle facility. |

| | | |
|---|---|---|
| Moorhead | 4th Avenue South (21st St to 24th St) | Construct appropriate on- or off-road bicycle facility (as part of a larger roadway reconstruction project). |
| Moorhead | 11th St South, Main to 12th Ave South | Construct appropriate on- or off-road bicycle facility (as part of a larger roadway reconstruction project). |
| Moorhead | 21st Street South (Main Ave SE to 2nd Ave S) | Construct appropriate on- or off-road bicycle facility (as part of a larger roadway reconstruction project). |
| Moorhead | Lindenwood/<br>Gooseberry Bridge | Construct a bike-ped bridge over Red River. |
| Moorhead | Main Avenue (2nd Ave S to 20th St) | Construct appropriate on- or off-road bicycle facility (as part of a larger roadway reconstruction project). |
| Moorhead | Oak Grove / Memorial Bridge | Construct a bike-ped bridge over Red River. |
| Moorhead | Pedestrian Underpass at 40th Ave S and 20th St S | Construct an underpass |
| Moorhead | 8th Street South (40th Ave S to 46th Ave S) | Construct appropriate on- or off-road bicycle facility. |
| Moorhead | 8th Street South (46th Ave S to 50th Ave S) | Construct appropriate on- or off-road bicycle facility. |
| Moorhead | 20th Street South (30th Ave S to 34th Ave S) | Construct appropriate on- or off-road bicycle facility. |
| Moorhead | 20th Street South (34th Avenue S to 40th Avenue S) | Construct appropriate on- or off-road bicycle facility. |
| Moorhead | 8th Avenue North (28th to 34th St) | Construct appropriate on- or off-road bicycle facility. |
| Moorhead | 14th Street South (30th Ave S to 40th Ave S) | Construct appropriate on- or off-road bicycle facility as part of a larger roadway reconstruction project. |
| Moorhead | 24th Avenue South (River Shore Dr to 8th St S) | Construct appropriate on- or off-road bicycle facility. |
| Dilworth | 7th Street NE (4th Ave. N to 15th Ave. N) | Bicycle Route Signage |
| Dilworth | 7th Street NE (TH 10 to 15th Ave N) | Construct a concrete shared use path. Costs are designated separate from a larger roadway reconstruction project. |

**Local Network Gaps**

The consulting team took existing bikeways, future bikeways and overlaid these two GIS files to create a localized gap map that demonstrated where there are gaps in the bikeway network. These maps are shown in Chapter 4 of this document. Metro COG recommends that these projects be completed as funds become available. This could be done with local funds, in conjunction with roadway projects, or bundled for a federal grant application. In order to determine which projects should be completed first, the list of local network gaps was prioritized based on safety, connectivity between trip generators, regional significance, and connections over major barriers. A technical memorandum including the project prioritization methodology and a list of prioritized local network gaps can be found in Appendix F. The type of facility should be determined at the time of implementation. The Facility Selection Criteria document (Appendix B) can provide guidance on the type of facility to be used.

**Trans-Metropolitan Area Bicycle Routes**

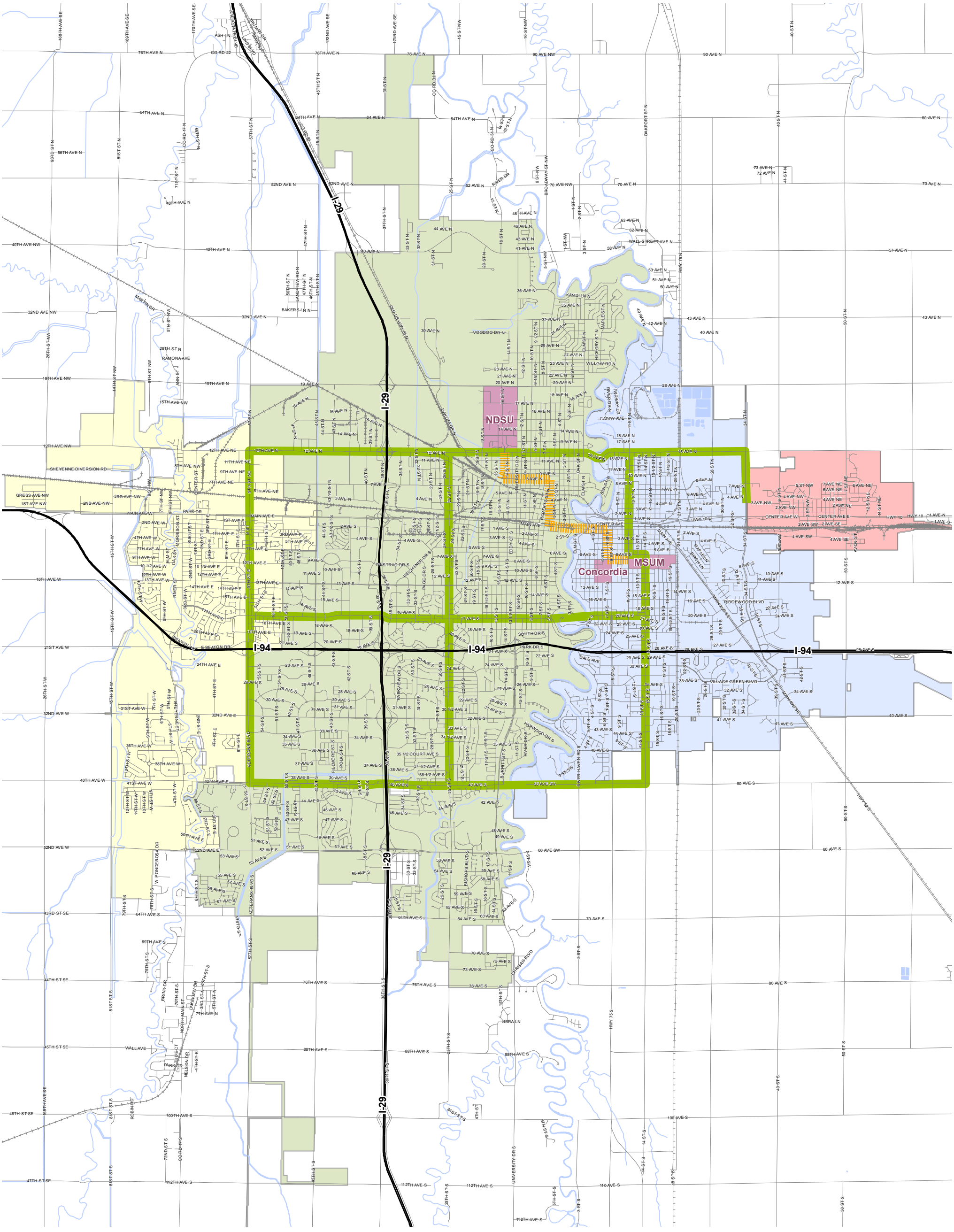
The development of Trans-Metropolitan Bicycle Routes was completed through a coordinated effort between Metro COG and the consulting team and can be viewed in Figure 6.1. This conceptual route shown in Figure 6.1 intends to provide efficient movement by bicycle across all or most of the Metropolitan Area in a north/south or east/west direction. Analysis of routes focused on using lower volume roadways where possible as well as neighborhood connections (on and off-road bikeways) to create as fluid a trip as possible. These routes do not lead to specific sites but are intended to allow a bicyclist to enter a sub-area of the Metropolitan Area for commuting, doing errands or recreational purposes. The intent is that these routes would be accessible to bicyclists of all skill and comfort levels. It is recommended that gaps in these routes be filled as opportunities present themselves and that the project selection criteria have additional points for projects which would make improvements to the Trans-Metropolitan Bicycle Route. It is also recommended that once the route is completed that it be signed (MUTCD guidelines) with major destination plaques attached and directional arrows provided.

**College Connector Bicycle Route**

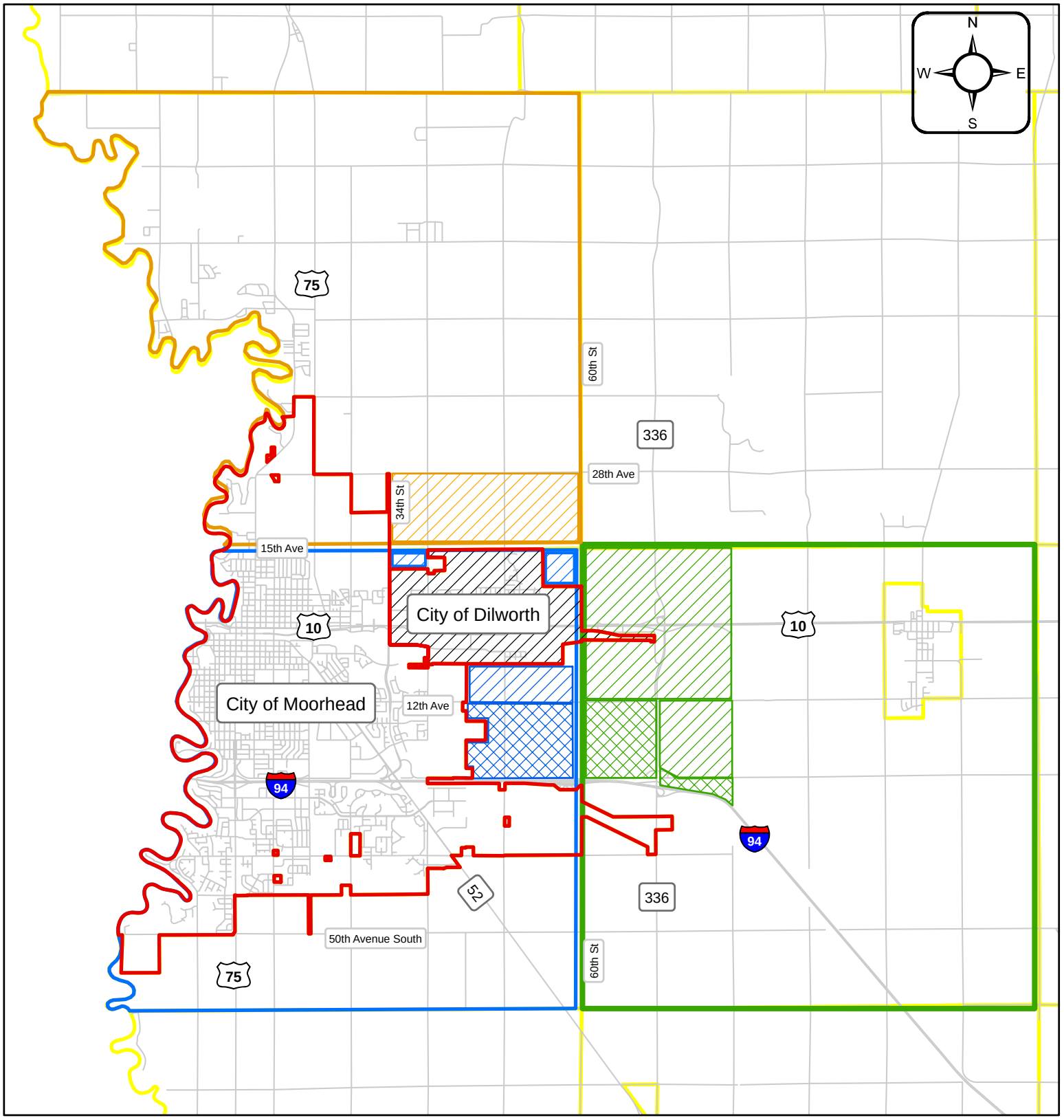
The consulting team developed a conceptual bicycle route connecting North Dakota State University, Minnesota State University at Moorhead and Concordia College. The route was developed using existing bicycle routes (on and off-road) and linking them to low volume roadways where possible. Figure 6.2 illustrates this proposed route. It benefits from a year-round river crossing at Main Avenue. Additionally, the College Connector route would be an ideal use for route signage such as the trails logo identified in 4.12. Since all facilities currently exist, the route could be signed in the near future.

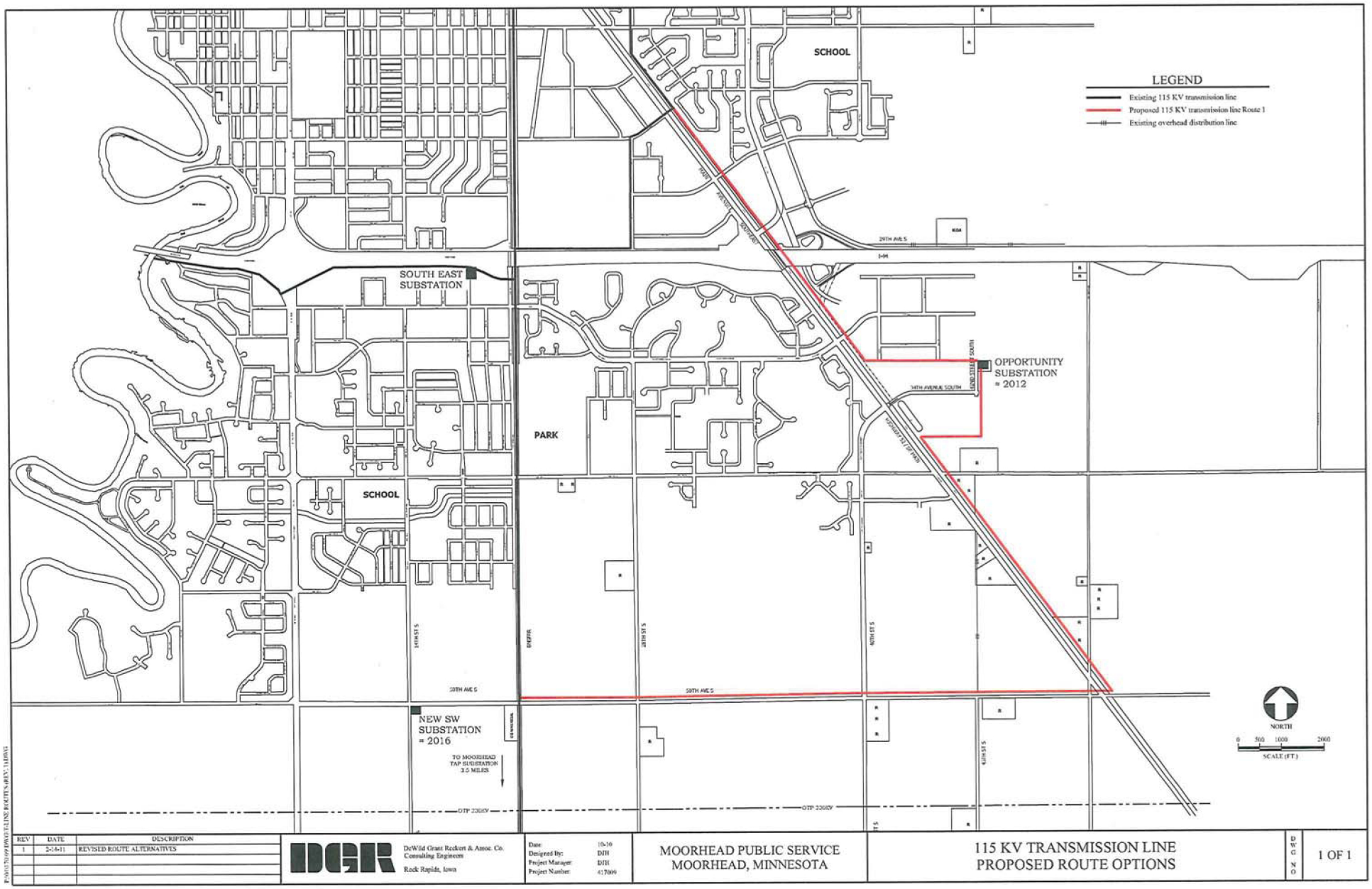
# Trans-Metropolitan Area Bikeways Network

**Figure 6.1**



AUAR Figure 27-1 Annexation Boundaries






AUAR Update Figure 28-1

# *BUFFALO - RED RIVER WATERSHED DISTRICT*

BARNESVILLE, MINNESOTA 56514

123 FRONT STREET SOUTH — P.O. BOX 341 PHONE 218 354-7710


February 2, 2010

Ciara Schlichting, AICP
Bonestroo
2335 HWY 36W
St. Paul, MN 55113

RE: South and East Moorhead Growth Area AUAR Update

Dear Ms. Schlichting:

In response to your 1/19/10 letter regarding the above, the Buffalo-Red River Watershed District (BRRWD) would like to offer some comments. As you know, the proposed Growth Area is located within our boundaries. Some concerns that we would note include:

- A corridor needs to be maintained along the Red River of the North for both floodplain management and slippage issues.
- For all areas, strict floodplain regulation, management, and enforcement need to be applied.
- Recognition, preservation, and maintenance for Clay County Ditch No. 9, located on the south side of 60th AVE S.
- The need to maintain a drainage corridor along 50th AVE S.
- Recognizing the existence of Project No. 57, City of Moorhead I-94 Flood Control, located along the north and west lines of Section 24, Moorhead Township.
- Recognition, preservation, and maintenance of Clay County Ditch No. 41 along the east lines of Sections 13 and 18, Moorhead Township.
- Depending on the aquifer maps, part of the Growth Area may be located over the Buffalo Aquifer, especially along Trunk Highway (T.H.) No. 336.

If you should have questions or comments concerning the above, please feel free to contact this office.

Sincerely,

BUFFALO-RED RIVER WATERSHED DISTRICT

Bruce E. Albright

Bruce E. Albright
Office Administrator

BEA/jj

## Schlichting, Ciara J.

**From:** James Hinderaker [JHinderaker@cityoffargo.com]
**Sent:** Monday, February 08, 2010 10:38 AM
**To:** Schlichting, Ciara J.
**Subject:** 2009 AUAR Update

Ms. Schlichting,

Thank you for the opportunity to comment on the City of Moorhead's update of the Alternative Urban Areawide Review (AUAR).

The City of Fargo is primarily concerned with the south growth area that borders North Dakota. The city recommends that future development consider the challenges of development near the Red River and that adequate measures are put in place to ensure against flooding and river bank slumping. Further the city recommends that as setbacks from the Red River are increased that these areas be preserved for public recreational opportunities like passive riparian areas and trails. Final, the city recommends that future roads and trails connect to the extent possible between Fargo and Moorhead.

Thanks again for the opportunity to comment.

Sincerely,

Jim Hinderaker
Senior Planner, City of Fargo
701-241-1473

Minnesota Department of Natural Resources
500 Lafayette Road • St. Paul, MN • 55155-40

February 19, 2010

Ciara Schlichting, AICP
c/o Bonestroo
2335 Highway 36 W
St. Paul, MN 55113

Re: South and East Moorhead Growth Area AUAR Update (Early Coordinaton)

Dear Ms. Schlichting:

The Minnesota Department of Natural Resources (MDNR) has reviewed the update materials for the Alternative Urban Areawide Review (AUAR) for the South and East Moorhead Growth Area AUAR Update, Moorhead, Minnesota. The MDNR offers the following comments for your consideration.

Stormwater Management Features

The Growth Area Plan (Figure 6.1) in the 2005 Final AUAR depicts several permanent storm water management features. Many of these features appear to have been omitted (e.g. area south of 55th Avenue) from the updated South Growth Area Plan as exhibited in Figure 16 of the Comprehensive Plan.

A description of the storm water management system and design standards should be included in the updated AUAR. The MDNR encourages the City of Moorhead to continue to consider alternative/innovative approaches to stormwater management. Examples of this would include rainwater gardens and constructed wetlands as part of an overall stormwater "treatment train".

Green Space/Open Space Enhancements to the Project Area

The updated South Growth Area Plan appears to maintain green space along the shore of the Red River, drainage ways (the two coulees), and the proposed storm water features. Having this green space provides a variety of important functions, such as nutrients and contaminant removal, safe travel corridors and shelter for wildlife, storm water infiltration, and aesthetics to accent surrounding developed areas. The use of native vegetation in these areas is also encouraged. The width of these green corridors should be maximized as much as possible to increase the functions they provide.

MDNR Comment Letter – Oakport Township Draft AUAR

Also, please consider remarks provided in the MDNR comment letter on the Oakport Township Draft AUAR, particularly those discussing mitigation options and planning for the future. The pdf version of the Oakport letter will be sent with the electronic version of this comment letter.

Thank you for the opportunity to review the materials for the proposed update on the South and East Moorhead Growth Area AUAR and for your consideration. Please feel free to contact me with any questions or comments.

Sincerely,

Ronald Wieland, Planner (651) 259-5157
Environmental Review Unit
Division of Ecological Resources

Attachment (electronic copy only) - MDNR Comment Letter on Oakport Township Draft AUAR

ERDB# 20050542-0002 D:\DNR_Comments\South_Moorhead_Growth_Area_AUAR_EC.doc

**Minnesota Department of Natural Resources**
500 Lafayette Road • St. Paul, Minnesota • 55155-4025

December 16, 2008

Scott Hutchins
Director of Community Services
500 Center Avenue, Box 799
Moorhead, MN 56561
scott.hutchins@ci.moorhead.mn.us

Re: North Moorhead / Oakport Township Alternative Urban Areawide Review (AUAR)

Dear Mr. Hutchins:

The Department of Natural Resources (DNR) has reviewed the Draft Alternative Urban Areawide Review (AUAR) for the North Moorhead / Oakport Township project, Moorhead, Minnesota. The DNR offers the following comments for your consideration.

The DNR would like to thank the City of Moorhead for initiating this long-term planning process to accommodate the urban growth needs of the City. Based on our experience with some well-done AUAR projects, the DNR would like to emphasize its importance and value to the City in meeting its goals of improving living standards of the citizens while protecting and enhancing the natural resources of the area. Approximately two miles of Oakport Coulee and more than 6 miles of the Red River are within the planning area. The DNR promotes the development of open space for a growing community, and is supportive of parkland, reestablishment of natural areas, and the development of trails in a scheme that protects water quality of the Red River and Oakport Coulee. The DNR considers this an opportunity to increase the City government's efficiency in the development process but also to enhance livability in the neighborhoods and business districts.

The DNR considers the AUAR process to be a planning forum to be used for developing partnerships that enable funding, retention/enhancement of natural resources and development of recreational features and uses as is reasonable and desirable for City residents. Preferably, the DNR should be active in the process early on in development of the draft AUAR. Nevertheless, a review of the draft AUAR provides an opportunity for collaboration between the City and DNR. The DNR would like the City to maintain a dialogue with the DNR in the future for weighing potential opportunities for providing better enhancement/development/retention of its natural resources. Mr. Dave Friedl, Cleanwater Legacy Regional Representative at Fergus Falls (218-739-7576x264), and Jim Wolters, Area Fisheries Supervisor at Detroit Lakes (218-846-8340), are delegated representatives of the DNR to serve as departmental liaisons for addressing on-going resource planning issues with the City.

The DNR is committed to offering additional DNR staff time to work with the City on development of the Final AUAR. The DNR would like to highlight important policy issues early in the process such as consideration of future partnerships with the DNR and others for assistance with planning and for seeking funding for grant and program financial assistance, i.e. Clean Water Legacy Grants for buffers to protect water quality, considering the Red River is presently impaired due to excessive sedimentation. Other opportunities may exist for, trails, ecosystem restoration, and other natural resource protection or enhancement efforts. The DNR would like to bring to your attention two quality examples of recently completed AUARs and final mitigation plans by the Cities of Lino Lakes and Winona (see links below). The examples include partnerships with the DNR in several implementation efforts:

http://www.linolakes.govoffice2.com/index.asp?Type=B_BASIC&SEC={73EB3D9E-AC06-49F6-9E1E-E20204C921B1}

http://www.cityofwinona-mn.com/se3bin/clientgenie.cgi

Item No. 8. Permits and Approvals Required

The report discusses permitting reviews in Table 8.1. Under DNR it discusses Utility Crossings Permits, Natural Heritage Program Coordination and Wetland Permits. There are no public water wetlands in this area; therefore DNR (Division of Waters) would not have regulatory authority over these wetlands and no permits from DNR would be required for wetland activity. A local authority would be responsible for wetland mitigation. However, the Red River and the Oakport Coulee are both public waters and any activity below their ordinary high water level may require a DNR-Waters public waters work permit (if not included within the Utility Crossing Permits).

Item No. 9 & 10. Land Use and Land Cover

Although the City is only responsible for providing a map of land use/land cover types that presently exist and for each development scenario, the complexity of the cover types as diagrammed in each scenario's land use map behooves the City to include a table listing pre- and estimated post-project land use/land cover type acreages. General ranges of impervious surface percentage for each development category, i.e., low-density residential, medium-density residential, industrial, etc, can be applied.[1] Using the impervious percentage estimates for each of the development categories, it would be beneficial to estimate acreage of impervious surface for each land use and for the project area under each scenario, or as determined through modeling the City's stormwater management plan. Also, the cover type and impervious surface change estimates could be sequenced over the fifty-year period, possibly based on 5-year, or at least 15-year intervals.

Item No. 12 & 14. Physical Impacts on Water Resources & Water-related Land Use Management Districts

There is a lack of discussion in the draft AUAR on the flood mitigation projects planned or underway in/near the project area. The AUAR should include discussions on the relationship and developmental effects on the project area of three flood control projects or studies as follows: 1) The Oakport Township Flood mitigation project has been finalized with construction expected to start soon. The project includes phased construction of 6 miles of earthen dike, a stormwater collection system and a stormwater treatment system. 2) The Fargo Southside Flood control project is another flood mitigation project proposed for the region. 3) Additional flood risk information is available from the US Corps of Engineers' Fargo-Moorhead Metropolitan Flood Risk Management Study.

The City states that there are no shoreland areas in the in the AUAR project area. It is true, there are no shoreland zones around lakes in the area, however, shoreland regulations also apply to the public waters of the Red River and Oakport Coulee.

A minor correction is noted for the number listed for the DNR General permit for construction dewatering. The permit number is 1997-0005 not 97-005.

Item No. 13. Water Use

The DNR found discussions on water use issues to be accurate and complete. The DNR appreciates the inclusion of information on useful wells, source aquifers, pollution sensitivity, the river water treatment

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[1] Dougherty, M., L.D. Randel, J.G. Scott, A.J. Claire, and G. Normand. 2004. Evaluation of impervious surface estimates in a rapidly urbanizing watershed. Photogrammetric Engineering and Remote Sensing 70:1275-1284.
Giannotti, L., and S. Prisloe, 1999, Do it yourself! Impervious surfaces buildout analysis, NEMO Technical Paper #4, University of Connecticut, Haddam Cooperative Extension Center.

plant, future studies, and ground water supply expansion needs. As noted by the City, it is reasonable to expect additional infrastructure and water resources will be required in the future. Does the City anticipate the need for Red River Valley Water Supply project water, which is proposed through interbasin transfer from the Missouri River basin?

Mitigation Opportunities and Planning for the Future

The DNR recommends that the City establish a commitment to open space (green space) acreage goals in the mitigation plan and employs conservation developments with adequate natural areas. DNR encourages the City to reserve and allocate ample permanent open space for stormwater management and retention, restoration of wetlands, buffering water systems, trail corridors for connecting with trails and natural features to the east, and for the creation of a river-connected park, perhaps similar to the Greenway in Grand Forks. Potential areas could be drafted into the plan and the range of acreage of land dedicated to such purposes or multiple uses could be estimated, with a firm commitment to minimum acceptable acreage allotments.

Lanes for walking and biking need to be set as a development layer to insure reservations for these uses and a timeframe are established early on in the planning process. There is interest in extending the Heartland State Trail to Moorhead and the possibility exists of extending the Central Lakes State Trail towards the City.

The City should include several areas along the Red River in its open space plan to provide access and facilities for shore-based angling. This would fit within scenario two, which proposes that most of the area along the Red River be used for parks and open space. Shore-based angling developments can be as simple as adding large, flat rocks to serve as platforms for anglers, to more complex projects, such as constructing permanent fishing platforms above a specified elevation. Fishing platforms are usually constructed to be Americans with Disabilities Act (ADA) compliant. As mentioned in the AUAR, the Red River supports a variety of fish species and serves as a very unique fishery for this area. Improved stormwater management would improve/maintain the water quality of the Red River and would contribute to efforts to prevent summer fish kills, which occur if the water quality is not maintained, especially in stagnant areas where fish may get trapped during summer months.

Moorhead is at the heart of the northern tallgrass prairie ecosystem, where million acres of native prairie once stretched beyond the horizon across portions of Minnesota and neighboring states and Canadian provinces. With the loss of prairie vegetation, prairie dependant mammals, birds, and insects have also declined. Only about 15,000 acres of high or medium quality native prairie remain in Clay County, most of which remains in two concentrations, Felton Prairie and Bluestem Prairie.

The City of Moorhead and associated neighbors are encouraged to use this AUAR process to critically evaluate opportunities for establishing and management of areas dedicated as open space, which could partially serve as a surrogate for the loss of native prairie. A stormwater management system could be designed to mimic wet prairie habitats that once flourished in this area of the valley.

Benefits of planting diverse native prairie plantings on ecologically appropriate sites are:

- Plants are adapted to local environment and soil;
- Deep roots improve water infiltration and reduces runoff;
- Restores natural heritage;
- Reduced need for chemical inputs and removes potentially harmful nutrients from runoff;
- 70% of biomass is below soil surface improving soil quality & sequestering carbon
- Biologically diverse;
- Competes well with noxious weeds;

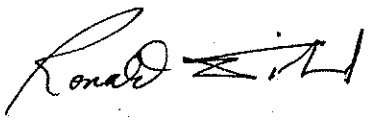
unique demonstration project that, with replication, could prove to dramatically impact the conservation and development of Minnesota's natural resources. The goal of this effort should be to produce clean, and sustainable alternative energy for our homes, businesses, and transportation while providing a wide range of natural resource benefits.

An example of an open space district of 1,000 acres of biomass production would potentially yield 2,000 to 6,000 tons of biomass annually, one-half of that if harvested on a biennial schedule, and less by proportion of lawns and landscaping, trails, etc., in the open space district. Other green spaces already established or planned in other parts of the City could be incorporated into the management scheme. Native prairies without any agronomic help are producing about 2- to 2.5-ton per acre harvest yields. In stormwater management areas with greater moisture, nutrient influx, and the potential to actually select plant material for higher yields (perhaps cordgrass), 5 tons per acre is a reasonable yield. This would not be a sufficient volume to generate all the fuel for a big industrial facility like a sugar mill. It would however not be a trivial supply (~2,000 to 3,000 ton @15 million btu per ton), especially if it were being done to augment the use of beet pulp. However, other smaller commercial/industrial users could probably better match this volume. For example, the University of Minnesota Morris facility will need 6-9 thousand tons of biomass per year. Biomass harvesting would not unduly conflict with outdoor usage of the area because the harvest could occur in the fall after spring-summer recreation season and prior to the winter sports season, and management could be revised to avoid other conflicts as needed and with consideration for wildlife needs. A high stubble height is recommended to insure some wildlife habitat value remains after harvest. Estimates of the value of the biomass production could be leveraged against the initial upfront commitment to green space set-aside. If requested, additional specifics of such a plan could be provided by the DNR and bioenergy consultants would be readily available to assist the City.

Establishing/maintaining "prairie vegetation" in the open spaces would pose some problems. Native prairie that is disturbed by the addition of stormwater runoff could have a tendency to become infested with reed canary and other exotics—smooth brome and quackgrass and canada thistle. Switchgrass monocultures, or limited polycultures involving switch, big bluestem, and prairie cordgrass, might work. The exotic species take advantage of nutrient pulses much more strongly than the native prairie species, which have evolved for life in a tightly competitive system where nutrients are largely tied up in the biomass.

The DNR appreciates the opportunity to provide comments on the draft AUAR and for your consideration. Please feel free to contact me with any questions or comments.

Sincerely yours,



Ronald Wieland, Senior Planner (651) 259-5157
Environmental Review Unit
Division of Ecological Resources

cc: Paul Stolen, Peter Buesseler, David Friedl, Jim Wolters, Helen Cozzetto, Michele Puchalski, Steve Colvin, Randall Doneen, Mark Lindquist, Jason Garms, Robert Dana, Will Haapala (PCA) (william.haapala@pca.state.mn.us)

ERDB# 20090250-0001
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Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 800-675-3843 | 651-282-5332 TTY | www.pca.state.mn.us

February 22, 2010

Ms. Ciara Schlichting
Bonestroo
2335 Highway 36 West
St. Paul, MN 55113

Re: South and East Moorhead Growth Area AUAR Update

Dear Ms. Schlichting:

The Minnesota Pollution Control Agency (MPCA) Environmental Review Unit has reviewed the information in your letter dated January 19, 2010, regarding the forthcoming update of the Alternative Urban Areawide Review (AUAR) for the Moorhead South and East Growth Areas located in Moorhead, Minnesota. Based on the information provided in the letter, and with regards to matters for which the MPCA has regulatory responsibility and other interests, MPCA staff has the following comments for your consideration.

- If the total project will disturb one acre or more of land, a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit is required from the MPCA. Information regarding the MPCA's Construction Stormwater Program can be found on the MPCA's Web site at: http://www.pca.state.mn.us/water/stormwater/stormwater-c.html. Questions regarding Construction Stormwater permit requirements should be directed to Larry Zdon at 651-757-2839.

- Please be aware that the Red River is listed on the MPCA Draft 2010 303(d) Total Maximum Daily Load (TMDL) list of impaired waters. We recommend you check with our current listing of impaired waters at our MPCA Web site at http://www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html. The Red River is listed as impaired for turbidity, fecal coliform, mercury, and polychlorinated biphenyls. The impairment will dictate additional increased stormwater treatment both during construction and require additional increased permanent treatment post construction. These requirements will be included in the NPDES/SDS Construction Stormwater Permit. The responsible government unit should identify that compliance with these increased stormwater water quality treatments can be achieved on the project site or elsewhere. Questions regarding Construction Stormwater permit requirements should be directed to Larry Zdon at 651-757-2839. Information regarding the MPCA's Construction Stormwater Program can be found on the MPCA's Web site at: http://www.pca.state.mn.us/water/stormwater/stormwater-c.html.

  In addition, any project that will result in over 50 acres of disturbed area and has a discharge point within one mile of an impaired water is required to submit their Stormwater Pollution Prevention Plan (SWPPP) to the MPCA for a review at least 30 days prior to the commencement of land disturbing activities. If the SWPPP is found to be out of compliance with the terms and conditions of the General Permit, further delay may occur. The MPCA encourages the project proposer to meet with staff at preliminary points to avoid this situation. Questions regarding SWPPPs should be directed to Todd Smith at 651-757-2732.

- The MPCA advocates the use of Low Impact Design (LID) practices to aid in the minimization of storm water impacts. LID is a storm water management approach and site-design technique that emphasizes water infiltration, values water as a resource, and promotes the use of natural systems to treat water runoff. Examples include:

- Special ditches, arranged in a series, that soak up more water;
- Vegetated filter strips at the edges of paved surfaces;
- Trees or swales between rows of cars;
- Residential or commercial rain gardens designed to capture and soak in storm water;
- Porous pavers, concrete and asphalt for sidewalks and parking lots;
- Narrower Streets;
- Rain barrels and cisterns; and
- Green roofs.

LID concepts may be found in the State of Minnesota Stormwater Manual, dated November 2005, located on the MPCA Web site at: http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html.

In addition, the MPCA LID Web page provides a description and examples of LID features such as permeable pavement, rain gardens, and green roofs. Links to other resources on LID are available as well. The Web site is located at:
http://www.pca.state.mn.us/water/stormwater/stormwater-lid.html.

We appreciate the opportunity to review this project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this project, please contact me at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Planner Principal
Environmental Review and Feedlot Section
Regional Division

KK:mbo

cc: Craig Affeldt, MPCA, St. Paul
Larry Zdon, MPCA, St. Paul
Todd Smith, MPCA, St. Paul
Will Haapala, Detroit Lakes

## Schlichting, Ciara J.

**From:** Bob Backman [bob@riverkeepers.org]
**Sent:** Wednesday, February 17, 2010 8:04 AM
**To:** Schlichting, Ciara J.
**Subject:** Moorhead AUAR update
**Follow Up Flag:** Follow up
**Flag Status:** Red

River Keepers is a non profit that works with the Red River of the North.
The South and East Moorhead Growth Area AUAR appears to include over a mile of Red River riverfront. Our organization continues to be frustrated by the lack of easements in growth areas dedicated to bike and pedestrian trails. We strongly encourage Moorhead to include easements on the banks of the river so that in the future trails can be constructed. Local and national surveys continue to indicate that the citizens want trails. We all know the difficulty of adding these facilities after an area is developed so lets plan for them know.
Thank you

Robert Backman
River Keepers
325 7th St South #201A
Fargo, ND 58103
701-235-2895
fax 701-235-7394
bob@riverkeepers.org
www.riverkeepers.org

## Carlson, Phil

**From:** Stan & Una Mae Thurlow <sthurlow@loretel.net>
**Sent:** Friday, September 27, 2013 8:47 AM
**To:** Carlson, Phil; Ken Parke
**Subject:** Mhd-AUAR

Phil-

Thanks for the opportunity to review the AUAR for Moorhead East/South growth area. I did not see references to the joint powers agreement between Moorhead and Dilworth regarding the development of 12th Ave S or the joint resolutions regarding orderly annexation for Moorhead and Glyndon townships. This agreement and resolutions speak to land development within your AURA area. On page three, there is discussion regarding "guided" Agriculture. I am not sure what that means.

We appreciate this effort by the City of Moorhead and this document examines future development and its associated impact to review the cumulative (rather than the incremental) effect of those developments and impacts. The growth area examined within this document needs to be coordinated with Dilworth development as they will be adjacent development. Perhaps a discussion and/or illustration of this issue could have been included (i.e. under 27. Compatibility with Plans).

Thanks for the opportunity to review.

Stan Thurlow
Dilworth City Planner

Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

September 25, 2013

Ms. Kristie Leshovsky
Moorhead City Hall
500 Center Avenue
Moorhead, MN 56561

Re: South and East Moorhead Growth Area Alternative Urban Areawide Review Update

Dear Ms. Leshovsky:

Thank you for the opportunity to review and comment on the Alternative Urban Areawide Review (AUAR) Update for the South and East Moorhead Growth Area project (Project) located in the city of Moorhead, Minnesota. The Project consists of mixed use development in the Moorhead area. Minnesota Pollution Control Agency (MPCA) staff has reviewed the AUAR Update and have no comments at this time.

We appreciate the opportunity to review this project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this AUAR Update, please contact me at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Planner Principal
Environmental Review Unit
Resource Management and Assistance Division

KK:bt

cc: Craig Affeldt, MPCA, St. Paul
Jim Ziegler, MPCA, St. Paul