

HIA

HEALTH IMPACT ASSESSMENT

Divine

Mercy

Development

Health

Impact

Assessment



Divine Mercy Development
Faribault, Minnesota

Minnesota Climate and Health Program
Minnesota Department of Health
Environmental Impacts Analysis Unit



November 2011

Divine Mercy Development Health Impact Assessment

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+ Executive Summary

MDNH undertook a desktop HIA to inform recommendations on incorporating health and climate change indicators into the EAW process. A desktop HIA uses the same process as a full HIA but generally relies on existing data and literature to analyze selected indicators and does not have a community engagement component. MDH performed a desktop HIA because of limited time and resources. The HIA is intended to be a pilot for how an HIA or health indicators might be incorporated or combined with the EAW. Therefore, the actual public health impacts of the Divine Mercy Development determined through the analysis were not considered as important as the findings that could be generalized to mixed-use projects overall and to the EAW. Determining the health impacts that are currently missing from the EAW process was the primary objective. Thus, this HIA process was slightly different than a normal HIA process and should not be assumed to align with community preferences.

The desktop HIA on the Divine Mercy Development included five of the the six standard steps in HIAs: Screening, Scoping, Assessment, Recommendations, and Reporting. The Screening step determines several things: 1) whether the project could benefit from an HIA (projects that could benefit from an HIA are those projects that potentially have a large impact on public health or the health of vulnerable populations); 2) the feasibility of the HIA (available data and resources); and 3) whether the HIA could affect a decision that would mitigate negative health effects and/or improve beneficial health effects. Because this was a pilot study, part of a larger effort to incorporate public health and climate change into the EAW, affecting change to the actual project was not of primary concern.

In the scoping step, a group of internal MDH staff with knowledge of HIAs and experience completing environmental reviews selected the indicators based on research-based measures on the built environment and land use that relate to public health and climate change mitigation and adaptation. MDH chose indicators based

on the following criteria: 1) whether the indicator was directly related to public health, 2) whether the indicator addressed climate change or public health impacts from climate change, and 3) whether the EQB would have the authority to include the measure in the EAW (e.g., not a municipal ordinance or regional system). Generally an indicator had to meet at least two of the three criteria to be included.

In the assessment step, MDH analyzed the project based on the chosen indicators, including a baseline assessment of the community. MDH provided a summary of measures in the baseline assessment that included the following characteristics: population, age, race and ethnicity, household size, housing tenure, income and poverty, educational attainment, employment, asthma rates, chronic obstructive pulmonary disorder (COPD) rates, obesity rates and physical activity statistics.

“The desktop HIA on the Divine Mercy Development included the five of the six standard steps in HIAs: Screening, Scoping, Assessment, Recommendations, and Reporting.”

The recommendation step provides recommended actions, including no-build or mitigation strategies, in order to reduce or eliminate the health impacts of the project determined in the assessment. The health and climate change recommendations for the Divine Mercy Development can be found embedded within the assessment and findings for each individual indicator. In a separate report, MDH will prepare general recommendations for the EQB on how to incorporate public health and climate change indicators into the EAW process.

The reporting step disseminates the assessment and recommendations to the public, stakeholders, and relevant decision makers. For the Divine Mercy Development HIA, reporting is two-fold: MDH will provide the report to Divine Mercy to inform them of possible mitigation actions for future phases of development; and MDH will provide the EQB with a second report that includes findings from the HIA and recommendations regarding incorporating health and climate change indicators into the EAW.

The last HIA step evaluates the quality and process of the HIA, evaluates the impact of the HIA on decisions made in response to the HIA, and monitors the implementation of the HIA recommendations and the health impacts of implementation. Since this was a pilot project intended to inform the EAW, MDH will not be monitoring the impact of the HIA on the Divine Mercy Development. MDH will monitor the final recommendations to the EQB regarding incorporating health and climate change indicators into the EAW.

MDH acknowledges that examining only one type of project does not provide sufficient information to discover all of the climate change and public health impacts of the different types of EAW projects. The pilot project provides an example of how multiple projects in one category could benefit from implementing an HIA. It also demonstrates the health impacts associated with one mixed-use project that completed an EAW.

Using results from the HIA, other examples of states' incorporation of HIAs into the environmental review process, and a literature review, MDH will present its findings to the EQB for changing the EAW and/or the EAW guidance document to include climate change and public health indicators. Incorporating health and climate change indicators into the EAW is a policy change that will encourage consideration of climate change and the public's health in future projects that complete the EAW.

+ Introduction

In 2010, the Minnesota Department of Health (MDH) received a grant from the Centers for Disease Control and Prevention (CDC) to conduct a Health Impact Assessment (HIA) on the Minnesota Environmental Assessment Worksheet (EAW). This report explores the process of conducting a desktop HIA on one EAW for a mixed-use project. The HIA will be used to inform recommendations to the Minnesota Environmental Quality Board (EQB) on how to incorporate climate change and health impacts into the EAW.

There is a strong rationale for conducting an HIA on projects that go through the EAW process. The environmental review process – both at the federal level through the National Environmental Protection Act (NEPA) and locally through the Minnesota Environmental Protection Act – was developed to consider the environmental and human health impacts of government actions related to large land use projects. NEPA statute specifically states that one of the purposes of the Act is “to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.” Historically, public health has not been a primary component of the environmental review process. Public health has either not been addressed or only addressed as it relates to direct environmental exposure to toxins. (Bhatia & Wernham, 2008) However, in every case when NEPA has been challenged in the courts to include health impacts, the courts have upheld the principle that health impacts need to be assessed explicitly in the NEPA

process. (M Radner, personal communication, October 20, 2011) Because the EAW does not currently include many questions regarding health impacts of projects, the HIA on an EAW project was determined to add value by introducing important health impacts into the environmental review process.

There is precedent in Minnesota to perform HIAs on projects that go through the EAW process. In 2008, instigated by a petition from neighbors, the Carver County Board ordered the proposed LG Everist Transfer Station to prepare an EAW. Carver County Public Health utilized an HIA checklist to review the LG Everist Transfer Station project and submitted a summary of findings to the County Board. (S Just, personal communication, October 28, 2011) LG Everist subsequently decided not to pursue the EAW and eventually cancelled the project. Carver County Public Health also included language in their 2010 annual public health report that recommended conducting future HIAs and integrating HIAs into the EAW process. (CCPH, 2009)

As part of defining this project, MDH tabulated the types of EAW projects submitted to the EQB for fiscal years 2008-2010. With help from a report by the Minnesota Pollution Control Agency (MPCA, 2009), MDH found a total of 241 projects completed an EAW. MDH determined that it would not be possible to perform an HIA on all 241 EAW projects because the projects vary dramatically and have different climate change and public health impacts. Projects ranged from solid waste incinerators to shipyards, and highways to wetland restoration. Additionally, staff agreed that it would be too difficult to determine which types of projects had the most impact on climate change and public health given the variety of projects and the lack of research on potential health impacts on some types of projects.

MDH decided to conduct a pilot project, performing one HIA on an EAW project, to begin to understand how HIAs can be used to incorporate climate change and health indicators into the environmental review process. The pilot project began by performing the first step in an HIA (i.e., the screening step). MDH staff reviewed all of

<i>Table 1</i>
EAW of Mixed-Use Projects: FY2008 - 2010
Afton Center
Centerville Downtown Redevelopment
Cold Spring Granite Mixed Use Development
Divine Mercy Catholic Church Development
Highland Preserve
Hustad Mixed Use Development
Wayzata Bay Center Redevelopment

the projects within the last three fiscal years within one EAW category (e.g., mixed-use, commercial, land use, etc.) and then chose one specific project for an HIA. (A list of EAW categories can be found in Appendix A.) MDH decided to review the mixed-use projects because of available expertise in this area. MDH staff used Design for Health's screening tool (DFH, 2007a) and found that two projects indicated the need for an HIA and five were borderline for performing an HIA. See Table 1 for the list of mixed-use projects from 2008-2010.

Not all large land use projects go through the EAW process; specific categories of projects with known environmental impacts may proceed directly to the Environmental Impact Statement (EIS). It is likely that all projects that go through the EIS would screen positive for an HIA. From the initial screening of three years of mixed-use projects, it appears that most projects that go through the EAW could benefit from an HIA. MDH decided to perform a desktop HIA on the Divine Mercy Catholic Church Development (Divine Mercy Development) mixed-use project.

The following sections go into more detail on the five steps of this desktop HIA. The next section reviews the screening process using the Design for Health screening tool, followed by the scoping process where the health and climate change indicators were selected. Following scoping, the section on assessment and recommendations provides baseline data for the community and assesses the health impacts of the Divine Mercy Development, and finally the reporting process that outlines how the report will be disseminated.

+ HIA Step 1: Screening

The first step in the HIA, the screening step, was performed on all the projects within the EAW mixed-use category from the last three fiscal years. Mixed-use projects were selected because they include more than one type of land use and a broader range of potential health impacts would be evaluated.

Seven projects (see Table 1) were screened using the Design for Health's screening tool which evaluates whether an HIA may or may not be necessary for a project. (DFH, 2007a) There are a total of seven questions in Part 1 of the tool related to the size and scope of the project including the geographic area, whether significant land use changes are proposed, whether the project would affect vulnerable populations, and whether there is sufficient institutional capacity to address potential issues. Each question receives a score of yes (2 points), no (0 points) or uncertain (1 point). If a project receives more than seven points in Part 1 an HIA is potentially needed, and if a project receives more than 11 points an HIA is recommended. If a project receives more than seven points the screener continues to Part 2 of the checklist. See the completed checklist in Appendix B.

There are a total of nine questions in Part 2 of the tool related to whether or not the proposed project meets specified thresholds for a healthy community including available sewer and water infrastructure, proximity to supermarkets, and potential air quality issues. Each question receives a score of no (2 points), yes (0 points) or uncertain (1 point). If a project receives more than eight points in Part 2 an HIA is potentially needed, and if a project receives more than 13 points an HIA is recommended.

The results of the screening indicated that all mixed-use projects with an EAW published in fiscal years 2008-2010 could benefit from an HIA. For two of the seven projects (i.e., Hustad Mixed Use Development and Divine Mercy Development) an HIA was recommended, and an HIA was potentially needed for each of the remaining five projects. The Divine Mercy Development was selected

“The results of the screening indicated that all mixed use projects with an EAW published in fiscal years 2008, 2009, and 2010 would benefit from an HIA.”

because the completed EAW contained more information and a higher level of analysis than the Hustad Mixed Use Development.

+ HIA Step 2: Scoping

Scoping involved the review and selection of health and climate change indicators. MDH reviewed health and climate change indicators from five different sources including: the San Francisco Healthy Development Measurement Tool, Design for Health Comprehensive Plan Review Checklist, Minnesota GreenStep Cities Best Practices, Sustainable Sites Initiative Guidelines and Performance Benchmarks, and the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) Project Checklist. The original list included hundreds of indicators. Over the course of several meetings, MDH staff narrowed the list down to 26 indicators. See Appendix C for a final list of indicators.

The criteria for inclusion/exclusion included the following: whether the indicator was directly related to public health, whether the indicator addressed climate change or public health impacts from climate change, and whether the EQB would have the authority to include the measure in the EAW (e.g., not a municipal ordinance or regional system).

Indicator themes that directly related to public health included the following:

- » minimizing exposure to hazardous sites and sources of emissions;
- » providing access to parks and trails for physical activity;
- » providing affordable and diverse housing options to improve community stability and foster social networks and community; and
- » providing access to healthy food retailers and emergency services.

Indicator themes that addressed climate change or public health impacts from climate change included the following:

- » proximity and provision of public transit, bicycle lanes, and trails;
- » provision of mixed-use buildings; and
- » permitted clustered or high-density development.

Indicator themes that were eliminated because EQB would not have the authority to include the measure in the EAW included the following:

- » synchronizing traffic signals so as to minimize car idling at intersections and replace traffic lights with LEDs;
- » planning to create transit-oriented development (TOD) districts;
- » incorporating green building concepts like green roofs, sustainable building materials, and renewable energy; and
- » other measures that were related to municipal zoning codes, building codes or ordinances.

There were some indicators included in the HIA that are already incorporated into the EAW. For example,

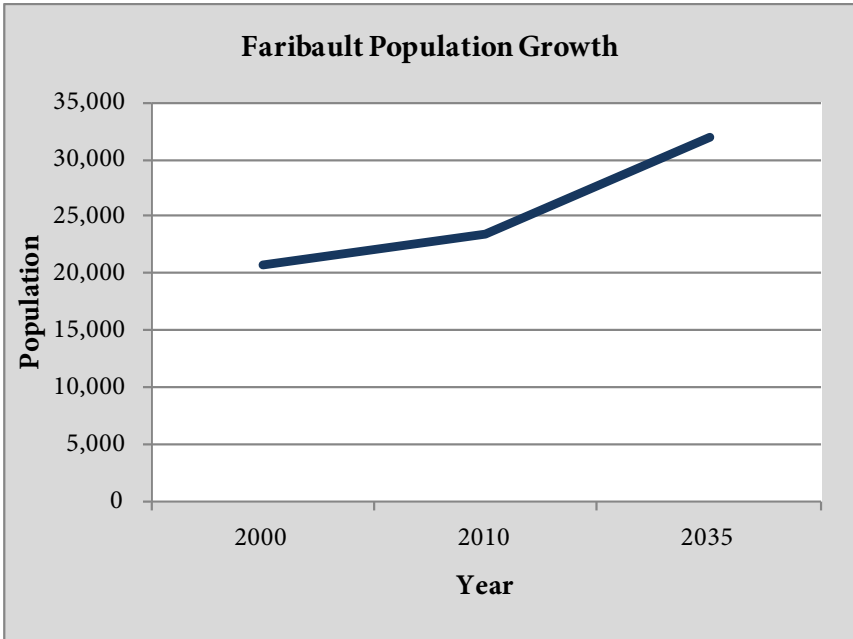
floodplain avoidance and public wells are heavily regulated and reviewed by the EAW. MDH included indicators related to these areas: 1) to stress their importance to ensure that they remain part of the EAW, and 2) to transition the indicators away from an environment-only perspective to also consider the impacts on public health.

+ HIA Steps 3 & 4: Assessment and Recommendations

The assessment includes two pieces: 1) the baseline assessment of population, housing, economic and health measures, and 2) the indicator assessment of the climate change and public health impacts of the Divine Mercy Development. The indicator assessment and recommendations are divided up into 10 health categories: 1) Air Quality, 2) Land Development, 3) Parks, 4) Trees and Vegetation, 5) Transportation, 6) Housing, 7) Food, 8) Water, 9) Noise, and 10) Safety. The assessments begin with a public health objective and a description of their importance to public health. Health indicators address how public health and/or climate change is impacted by a specific action, discuss findings from the EAW (whether the Divine Mercy Development impacts public health as a result), and provide recommendations for how to mitigate the impact on public health. The assessment and recommendations steps were combined to directly connect the public health and climate change effects of the development with specific strategies to mitigate the negative effects. In some cases a negative health impact was not found and no recommendations were provided.

Baseline Assessment

The following baseline assessment provides information about the population, households, employment and education, and health characteristics in the area surrounding the Divine Mercy Development. The Divine Mercy Development is located in the southern portion of the City of Faribault, Rice County, Minnesota. The baseline assessment was performed for the entire city of Faribault, not specifically for the community that currently lives or will live in the Divine Mercy Development in the future, because most data are unavailable at the small geography



of the development. Additionally, not all the data was available at the municipal level; health statistics were only available at the county or state level.

Population¹--

Faribault is a growing city, located approximately 30 minutes south of the Twin Cities seven-county metro area. In 2000, the population was 20,818. By 2010, the population had grown to 23,352, a 12% increase in the 10-year period. In 2010, thirteen percent (13%) of the population was 65 years old or older and 25% of the population was less than 18 years old. Nearly 50% of the population was between the ages of 25 and 60 years old. The largest five-year age groups were 25 to 29 (7.9%), 15 to 19 (7.3%), and 30 to 34 (7.2%). In 2010, Faribault's population was 82.6% white, 7.6% black/African American, 2.1% Asian, 1.0% American Indian, Native Hawaiian or Pacific Islander, 4.4% other race, and 2.3% two or more races. Overall, the population was 13.0% Hispanic. In 2010, Faribault was slightly more diverse than Minnesota state-wide, which was 85.3% white, 5.3% black/African American, and only 4.7% Hispanic.

The State Demographic Center projects that by 2025 Faribault's population will increase nearly 37% to 31,990 persons. The Center's projections for age groups show a

1 -- 2000 and 2010 population data is compiled from the 2000 or 2010 Decennial Censuses or projected by the State Demographic Center for 2035.

state-wide trend in the growth of the population 65 years old or older. In Rice County the population 65 years old and older is projected to increase 137% from 2005 to 2035. Assuming that Faribault's elderly population grows at the same rate, Faribault's elderly population will grow from 3,065 to nearly 5,000.

Table 2 and Figures 1 and 2 show the growth in the elderly population, as well as growth and/or changes in all age groups in Rice County. Table 2 also demonstrates over 30% growth in the youth population (5 years old to 14 years old). Figures 1 and 2 show a continued strong presence of the early- to mid-twenties population and the middle-aged population, by gender. Overall, Rice County is only projected to grow 27% as compared to Faribault's 37%. Therefore, while the city and the county share similarly dominant population age groups, it is assumed that Faribault will experience higher growth trends in some of the age groups.

Figure 1: 2010 Population Pyramid

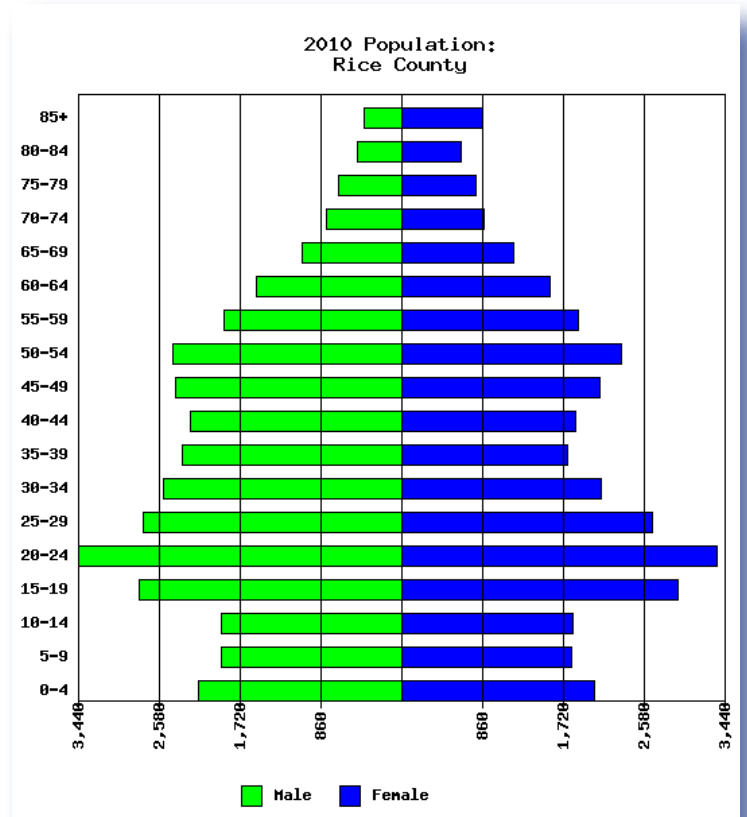
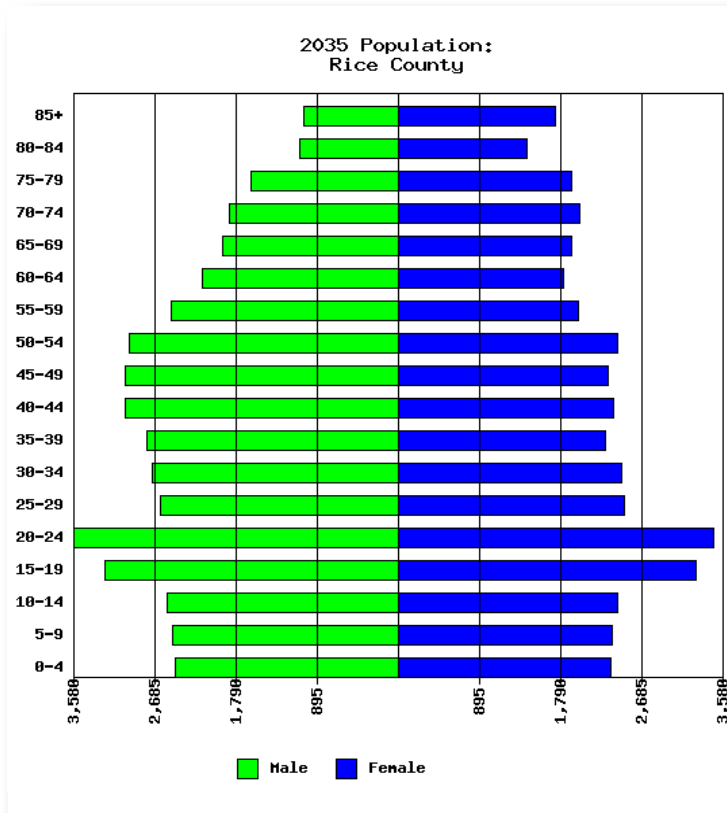


Figure 2: 2035 Population Pyramid



Households²

In 2010, Faribault had a total of 8,946 households. The majority of households (67.7%) were owner-occupied; and 32.3% were renter-occupied. The average household size was 2.61 persons. Housing tenure in Faribault was slightly below the state average of 73.0% owner-occupied households. The average household size in Faribault was also just slightly larger than the state average of 2.54 persons per household.

Employment & Education³

Faribault’s average estimated household median income from 2005 through 2009 was \$49,511. Over the same time span, Minnesota’s state-wide household median income was \$57,007, nearly \$7,500 more than Faribault. The 2005-2009 average estimated poverty rate was 13.6%, versus 10.0% state-wide. Nearly half (49.0%) of Faribault’s population that is 25 years old or older has

Table 2: Rice County Population 2010 - 2035

Age Group	2010	2035	% Change 2010 - 2035
0-4	4,220	4,810	14.0
5-9	3,730	4,850	30.0
10-14	3,750	4,980	32.8
15-19	5,730	6,520	13.8
20-24	6,800	7,060	3.8
25-29	5,420	5,120	-5.5
30-34	4,660	5,180	11.2
35-39	4,100	5,060	23.4
40-44	4,090	5,380	31.5
45-49	4,520	5,320	17.7
50-54	4,770	5,380	12.8
55-59	3,760	4,490	19.4
60-64	3,130	3,980	27.2
65-69	2,240	3,850	71.9
70-74	1,680	3,860	129.8
75-79	1,460	3,530	141.8
80-84	1,100	2,500	127.3
85+	1,260	2,780	120.6
Total	66,420	84,650	27.4

earned more than a high school diploma (or equivalent). Compared to the state average, educational attainment in Faribault is lower; statewide 63.1% have more than high school diploma or equivalent. The 2009 five-year average unemployment rate in Faribault was 5.7%, 0.1% lower than state-wide unemployment (5.8%). As of August 2011, the Minnesota Department of Employment and Economic Development’s (DEED) seasonally adjusted unemployment rate was 7.2% for the entire state. However, DEED’s seasonally adjusted unemployment rate for Faribault was 7.7%. Both the state and Faribault have increased in unemployment, but Faribault has demonstrated a more intense incline in its unemployment rate.

Health Characteristics

Populations vulnerable to certain climate change-related health impacts include the poor, the elderly, young children, and people with pre-existing conditions. The percentages of people who are poor, elderly and/or

2 All household data is compiled from the 2010 Census.

3 All income, poverty, employment and education data are compiled from the 2009 American Community Survey 5-year Estimates unless otherwise noted.

children have been described previously. Pre-existing conditions that could be exacerbated by increased air particulates, pollution, and extreme heat events will be covered in this section. Pre-existing conditions include asthma, COPD, and obesity.

Unlike Census data, health data is often not available at geographies smaller than the county-level. The following health statistics will include a combination of county-level data and state-level data. Given the dearth of data at the local level, MDH assumed that health statistics for Faribault mirror county- and state-level health data. This may not be accurate given that Faribault’s population differs from the state’s population, and certain indicators of health, such as poverty, are greater for Faribault than for the state.

MDH’s Environmental Health Tracking Program provides county-level data on asthma and COPD. Table 3 shows the asthma hospitalization rate for Rice County versus all of Minnesota.⁴ The Rice County rate of asthma hospitalizations from 2006 to 2008 was lower than the rate of asthma hospitalizations for the whole state.

Table 4 shows the COPD hospitalization rate for Minnesota in 2008 based on age.⁵ The rate of COPD

Table 3: 2006-2008 Asthma Hospitalizations

	Count	Total Population	Rate (per 10,000)	95% confidence interval
Rice County	126	186,060	6.77	(5.6 - 8.0)
Minnesota	12,871	15,570,119	8.27	(8.1 - 8.4)

hospitalization starts to increase as early as 35-44 years old. The highest rate of COPD hospitalization is for the elderly ages 75-84 (102.75 per 10,000), and is 65 times greater than the rate for ages 35-44 (1.58 per 10,000). This table clearly demonstrates that the elderly, particularly those aged 75 years old or older, are significantly more likely to be hospitalized for COPD than the young. The age variability in COPD rates is significant because the Divine Mercy Development is planning for 40 units of senior housing.

The County Health Rankings⁶ provides health statistics at the country level. The 2011 County Health Rankings

Health Tracking Program, Minnesota Department of Health, Web: <https://apps.health.state.mn.us/mndata/>

4 Minnesota Public Health Data Access, Minnesota Environmental Public Health Tracking Program, Minnesota Department of Health, Web: <https://apps.health.state.mn.us/mndata/>

6 The County Health Rankings is a partnership between the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. Data is available online here: <http://www.countyhealthrankings.org/>

5 Minnesota Public Health Data Access, Minnesota Environmental Public

Table 4: 2008 Minnesota COPD Hospitalizations

Age Group	Count	Total Population	Rate (per 10,000)	95% Confidence Interval
0-24 Years	61	1,789,652	0.34	(0.26 - 0.44)
25-34 Years	20	686,499	0.29	(0.18 - 0.45)
35-44 Years	113	713,885	1.58	(1.29 - 1.87)
45-54 Years	627	805,990	7.78	(7.17 - 8.39)
55-64 Years	1,177	577,055	20.4	(19.23 - 21.56)
65-74 Years	2,066	333,765	61.9	(59.23 - 64.57)
75-84 Years	2,256	219,571	102.75	(98.51 - 106.99)
85+ Years	968	104,150	92.94	(87.09 - 98.80)
All ages 45+ combined	7,227	3,440,915	21	(20.52 - 21.49)

ranks Rice County 18 out of 85 counties in Minnesota for overall health. The percent of adults that are obese (i.e., Body Mass Index greater than or equal to 30) is 26% as compared to 25% in the U.S. and 26% in Minnesota.

The 2009 Behavioral Risk Factor Surveillance Survey asked whether adults participated in 30+ minutes of moderate physical activity five or more days per week or vigorous physical activity for 20+ minutes three or more days per week. Nationwide 49.4% said 'Yes', and 50.6% responded 'No'; whereas in Minnesota 47.3% said 'Yes', and 52.7% responded 'No'. MDH assumed that Rice County residents and Faribault residents would respond similarly and would have lower levels of physical activity, similar to state levels.

In summary, Faribault has a growing population, especially the elderly population and to some extent the youth population. Households in the city are more likely to rent than households across the state, while household size is slightly larger than average. Faribault has shown a slightly lower household median income and higher poverty rate than Rice County, as well as slightly lower educational attainment and a higher unemployment rate. Due to minimal socio-economic disadvantages, Faribault's health measures may be slightly worse than Rice County overall.

Indicator Assessment

The following section assesses 26 health and climate change indicators from 10 health categories. Each health category includes an objective for public health and a discussion on how public health is impacted in general. The health indicator assessments include a description of potential health impacts, health impact findings specific to the Divine Mercy Development, and recommendations for mitigating any negative health impacts of the development.

Image 1: Air Pollution



Air Quality

Objective:

Reduce impacts of pollution on air quality by preventing generation of pollutants or siting sensitive uses away from pollution sources.

Discussion:

Air pollution is primarily created by the combustion of fossil-fuels, whether from a mobile source (e.g., motor vehicle) or stationary source (e.g., factory or power plant). Common air pollutants from mobile and stationary sources include carbon dioxide (CO₂), carbon monoxide (CO), volatile organic compounds (VOCs), sulfur oxides (SO_x), nitrogen oxides (NO_x), particulate matter (PM), and air toxins. Air pollution impairs the health of the environment as well as humans. Through atmospheric deposition, air pollutants can contaminate public drinking water sources. (Swackhamer et al, 2004) Inhalation of air pollutants can cause respiratory problems and sometimes cancer. Certain air pollutants known as greenhouse gases (GHG) (e.g., carbon dioxide and methane) trap the sun's heat. Increased emission of GHG results in overall temperature increases and climactic weather pattern changes. (IPCC, 2007)

Ground-level ozone pollution, a reaction of NO_x, VOCs, and sunlight, is a major concern in urban areas with concentrations of polluting sources from traffic congestion, heavy-industrial areas, and power plants. Ground-level ozone pollution can cause a range of respiratory ailments including: exacerbating existing lung conditions such as asthma, breathing difficulties in both healthy individuals and sensitive populations, and even premature death. (Union of Concerned Scientists, 2011; Katsouyanni, 2003) Sensitive populations, including children, pregnant women, the elderly, and those with existing respiratory problems such as COPD, are more susceptible to poor health as a result of higher concentrations of ground-level ozone.

Diesel PM, released from diesel trucks and power plants, is suspected to be a significant health risk, and may pose the greatest risk for cancer among air pollutants. (EPA, 2009) Diesel PM contributes approximately 3% to the national average respiratory hazard. (EPA, 2009) Short-term exposure to fine PM can cause adverse health effects, including increased hospital and emergency room (ER) admissions, heart-attacks, premature deaths, and altered lung function especially for sensitive populations. (Katsouyanni, 2003)

Health Indicator 1:

Are all sensitive uses (e.g., residential areas, schools, day care facilities, playgrounds and sports fields) at least 200 meters (m) (656 feet (ft)) from a major road, and at least 150m (492 ft) from a truck route? If not, does the project reduce population contact to air pollution?

Description:

While air pollutants from mobile sources disperse when released from a tailpipe, concentrations of pollutants are still found near emissions sources like major roads and highways. Populations that are heavily exposed to emissions and sensitive populations experience the worst health effects. As a highly susceptible population, babies are three times as likely to be born with serious heart defects if exposed to high ambient levels of emissions in utero. (Jackson, 2003)

In addition to pollutants like CO₂ and VOCs, motor vehicles emit “air toxins” including benzene, formaldehyde, diesel PM and others. These mobile source air toxins are responsible for 30% of the overall average cancer risk. (EPA, 2009) Nyberg (2000) found a 50% increase in lung cancer risk for populations heavily exposed to traffic-related air pollution.

Air pollution from automobile emissions costs the nation’s health “roughly 50-70 million days with restricted levels of activity, 20,000 to 46,000 cases of chronic respiratory illness, and 40,000 premature deaths.” (EPA, 2001) “A comprehensive study of air pollution from motor vehicles estimated annual costs of \$28.7 to \$531 billion in health damage, \$2.5 to \$4.6 billion in crop damage, and \$6.0 to \$43.54 billion in damage to visibility.” (EPA, 2001)

Image 2: Traffic



Image 3: Smokestack



Findings:

The closest major road (i.e., interstate or trunk highway) is Interstate 35W, which is located 0.65 miles (3,432 ft) from the proposed sensitive uses (e.g., senior housing, schools, and residences with children or persons with preexisting conditions) on the project site. The project is not within the critical area of 656 ft from a major road. [See Map 1: Major Roads.] Because sensitive uses are not within 656 ft of a major road, it is expected that there will not be increased risk of health conditions such as asthma, COPD hospitalizations, cancer, birth defects, or premature death.

Recommendations:

No recommendations.

Health Indicator 2:

Does the project avoid locating sensitive uses in close proximity to a major industrial stationary source of air pollution?

Description:

Stationary sources generate air pollution through the combustion of fossil fuels, similar to mobile sources. Exposures to air pollutants can be a result of pollution-emitting industries moving into existing neighborhoods or, more recently, residential developments at the urban fringe building near incompatible uses such as hog farms and industrial zones. Siting developments away from pollution-emitting industries can be just as effective at improving health outcomes as reducing emissions from stationary sources.

Findings:

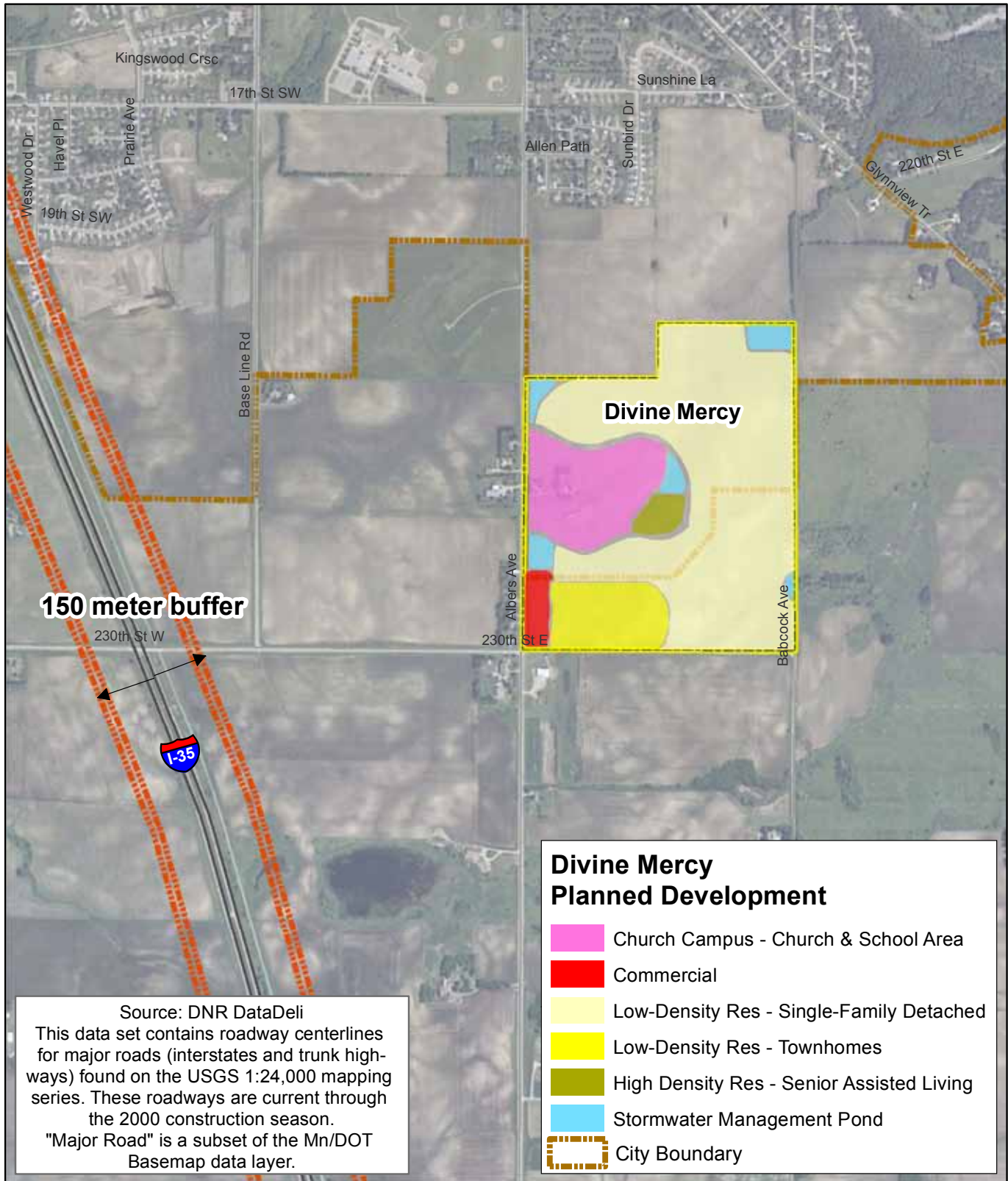
The southwest corner of the Divine Mercy Development abuts a feedlot. Air quality issues related to feedlots include odor, dust, flies, smoke, and chemical drift, but the planned commercial use at that corner of the project site may act as a sufficient buffer to the residential areas and other sensitive uses. It is unknown if the feedlot will cause any air quality issues. The only other potential sources of air pollution (i.e., MPCA identified sites) are construction storm water permits, which do not pose air pollution threats. [Source: MPCA; see Map 2: Stationary Sources.] Because there is a commercial area that provides a buffer to the feedlot, it is possible that there will not be any negative health outcomes.

Recommendations:

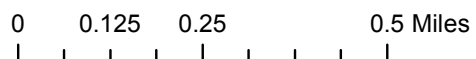
The Divine Mercy Development should be aware of the feedlot near the site and consider coordinating with the feedlot owner to implement any nuisance mitigation efforts as deemed necessary.

Map 1

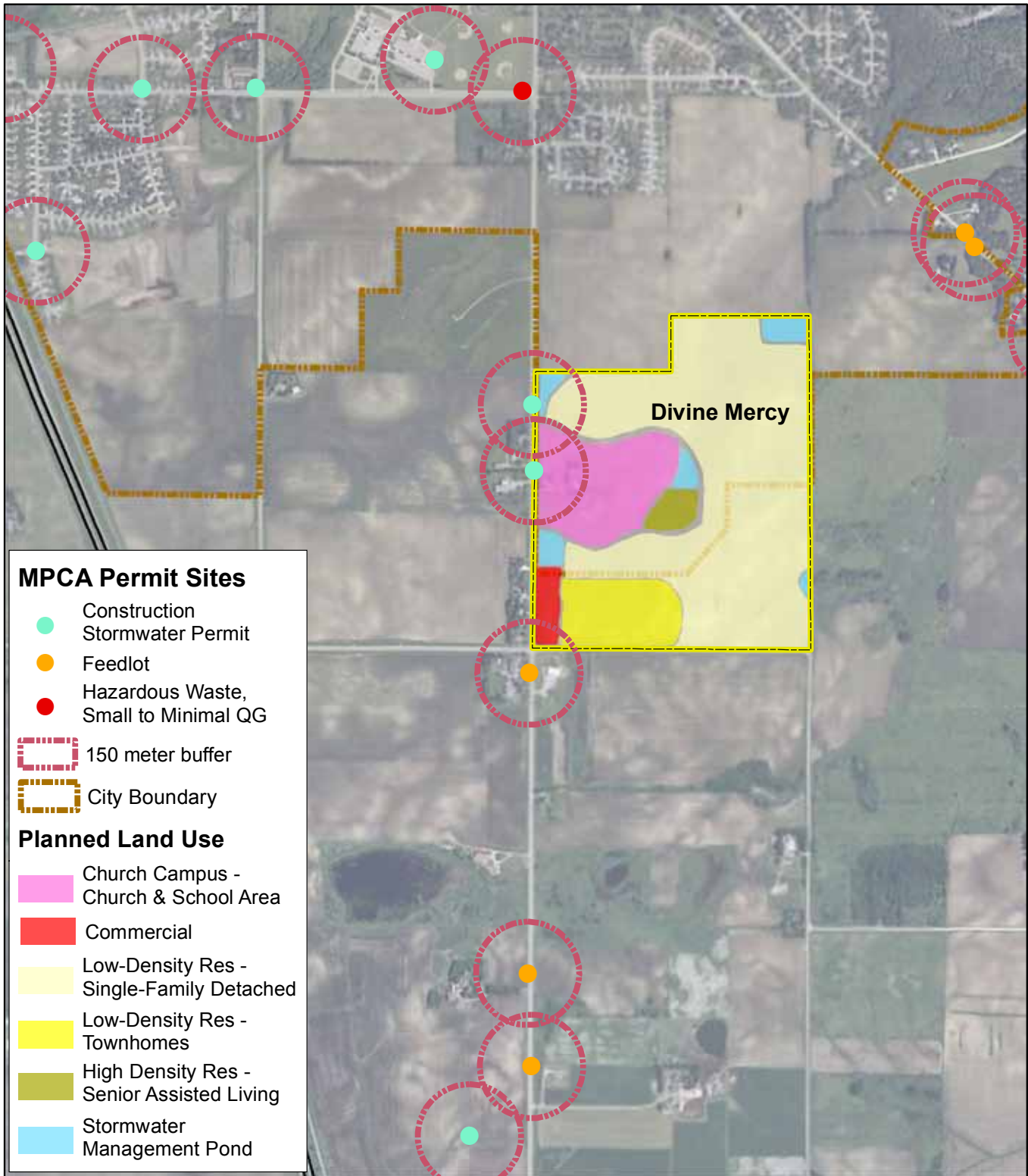
Proximity of Sensitive Uses to Major Roads



Map created August 2011



Map 2 Proximity of Sensitive Uses to MPCA Permit Sites



Map created August 2011
 Source: Minnesota Pollution Control Agency (MPCA) "What's in my Neighborhood?"

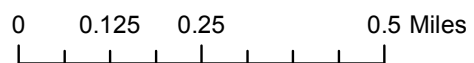
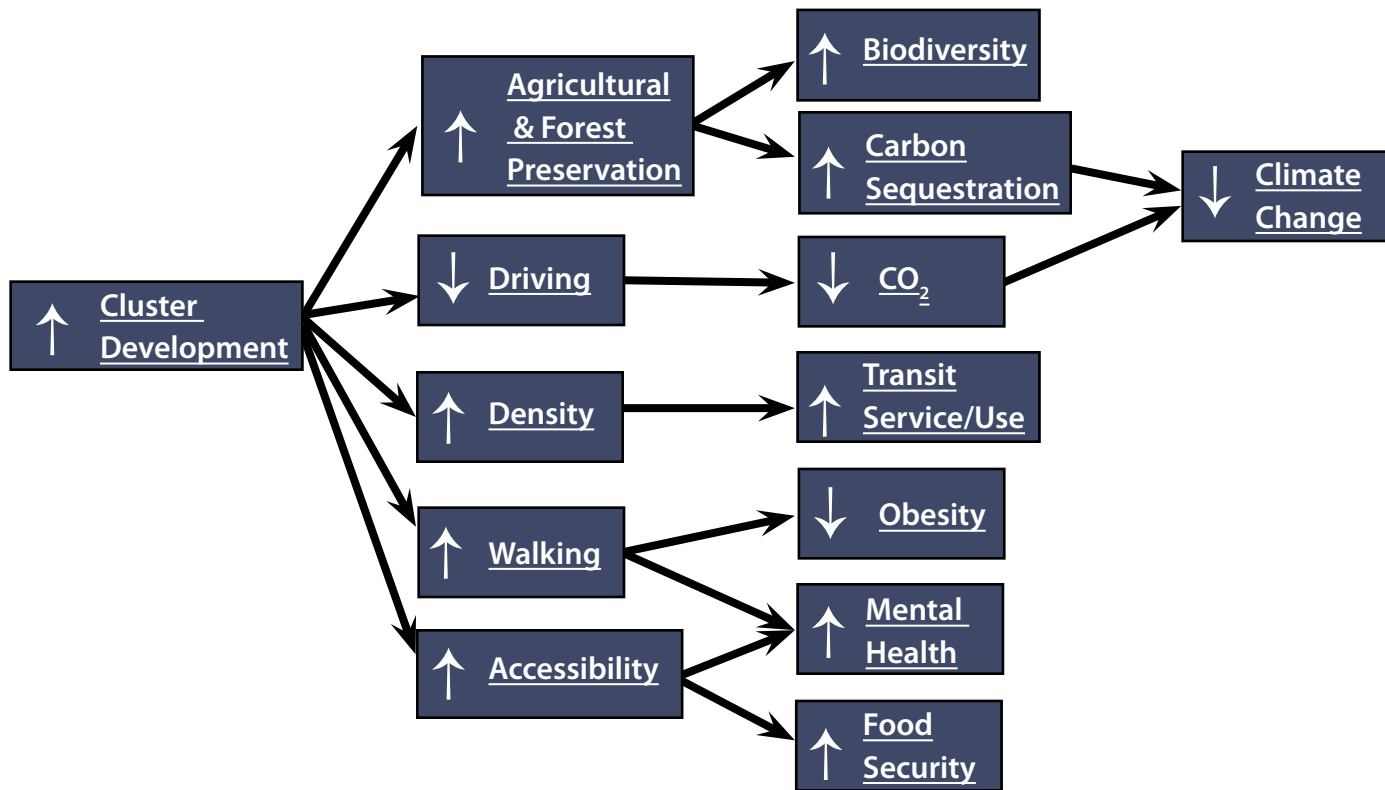


Figure 3: Land Pathway - Cluster Development & Minimized Fragmentation

Land Development

Objective:

Encourage connectivity to proximate existing or planned infrastructure (e.g., sewer, trails, parks, services, transit, amenities, schools, etc.) and cluster development to preserve open space (e.g., forest, prime agriculture, etc.).

Discussion:

Urban sprawl, the continued growth of urban and suburban neighborhoods from large cities into previously undeveloped land, has two main environmental issues: 1) the loss of natural habitat for flora and fauna or farmland, and 2) an increase in vehicle miles traveled (VMT) with the resulting health effects on humans and the environment. (Bengston et al, 2005; Burchell et al, 1998) Increasing the connectivity and density of development will preserve open space for recreation, farmland for local food production, and natural habitat for biodiversity. Additionally, allowing for mixed-uses within clustered development will increase trips taken by walking and bicycling and has been shown to reduce obesity and decrease air pollutants. (Frank, 2006; Schweitzer & Zhou, 2010) Clustering development can also save local and

state governments money on infrastructure that would otherwise be required to serve sprawling communities.

Health Indicator 3:

Residential Density – For suburban or rural areas, is the project designed with a residential density at or above five dwelling units per residential acre (or at or above nine dwelling units per residential acre for projects <1/2 mile from regional mass transit stops including rail, ferry, or bus service)?

Description:

Residential density is an important component for providing efficient transit service. Public transit is important to health because it reduces the use of polluting vehicles and increases physical activity.

One of the two main factors that influence the use of public transit is residential density (the other being commercial or employment density). To achieve minimum service provision, residential density must be at least four dwelling units/gross acre. (DFH, 2007b) To achieve frequent transit service, residential densities should exceed 15 dwelling units/gross acre. (DFH, 2007b)

Findings:

The majority of the Divine Mercy Development's planned residential is approximately two units of single family housing per acre. This is insufficient density to provide transit service. Current Faribault transit service is located approximately ¾ miles away; farther than the ¼ to ½ mile most transit riders are willing to walk. [See Map 3: Residential Density.]

Recommendations:

The project should consider higher residential and commercial densities than currently planned.

Health Indicator 4:

Does the plan allow for clustering of different activities (e.g., neighborhood commercial, mixed-use development, etc.) to facilitate access to a variety of services at one stop via public transit, bicycling, and walking?

Description:

Mixed-use neighborhoods have populations that drive less, walk more, and are less likely to be obese. (Frank, 2004, p.95) In fact, "opportunities for walking to accomplish routine activities . . . are as effective as structured aerobic exercise in losing weight." (Jackson, 2003, p.195) Improving land use from 100% residential to a 25% non-residential land use mix can reduce the likelihood of obesity by 6.85%. (Frank, 2004, p.91) Since health care costs for obesity and inactivity have been estimated at more than \$100 billion annually, increasing active travel and reducing obesity can save a significant amount of money while improving health. (Jackson, 2003) Figure 3 summarizes the pathways of how increasing clustered development can improve health and reduce climate change impacts.

Findings:

The Divine Mercy Development clusters a mix of land uses together. The project includes 126 acres of low density residential, 2.5 acres of high density senior housing, 33.5 acres for the church and school grounds, and 4.3 acres of neighborhood commercial. While the mix is overwhelmingly low density residential, it does

provide over 20% non-residential within a half mile by half mile square which still achieves the benefits of mixed-use walkability, assuming pedestrian infrastructure and connections are provided adequately. [See Map 4: Cluster Activities.] Nearly 53% of Minnesotans do not achieve daily recommended levels of activity. (BRFSS, 2009) Providing mixed-use development may increase daily activity levels and lead to increased health for Divine Mercy residents.

Recommendations:

The mixed-use development may encourage physical activity and help prevent or reduce obesity of the residents provided sufficient pedestrian infrastructure. Therefore, MDH recommends that the development ensure sufficient pedestrian infrastructure.

Health Indicator 5:

Does the project minimize fragmentation and development of agricultural, forest, wildlife and high quality open space lands?

Description:

Preserving prime farmland is important as agriculture shifts toward local food production. Frequent droughts and flooding have demonstrated that relying on large, monoculture farms can lead to problems simply by concentrating all resources in a few geographic areas. As fuel prices increase it will become not only more secure but more cost effective to produce food locally than to ship it nationwide. If new development builds over the highest quality farmland, it will be more difficult to produce agricultural products in the future. The majority (78%) of Minnesotans do not eat the recommended daily servings of fruit and vegetables. (BRFSS, 2009) Preserving land for reliable food production helps ensure food security and access to healthy foods.

Preserving forest and open space is important to maintaining a healthy ecosystem that provides habitat for wildlife, while at the same time providing recreational opportunities for local populations. In addition to environmental health benefits, nature has mental health benefits. Research has shown that access to nature,

ranging from a few trees to scenic views of forests and other natural landscapes is related to decreased levels of domestic violence, increased cognitive function in low-income children and general mental health benefits as a result of reduced stress levels. (Jackson, 2003)

Finally, natural habitat and even some agriculture can act as carbon sinks, which absorb CO₂. “In 2005, 85% of new U.S. CO₂ sequestrations were from forests.” (Younger, 2008, p.521) Conversely, when land use changes from natural to developed it can substantially increase the generation of pollutants. “Land use, land-use change, and forestry accounted for 12% of U.S. GHG emissions in 2005.” (Younger, 2008, p.521)

Findings:

Based on maps and data provided from the EAW, the Divine Mercy Development plans to build over prime agricultural land. The existing site is 172.5 acres of farmland, the majority of which (approximately 75%) is

prime farmland; the remaining 25% is a mix of farmland of statewide importance and prime farmland if drained. There are no significant forest or water features on the site. This means the development will not destroy significant forest or disrupt water habitat, but it does eliminate 129 acres of available prime farmland that can no longer be used for local food production.

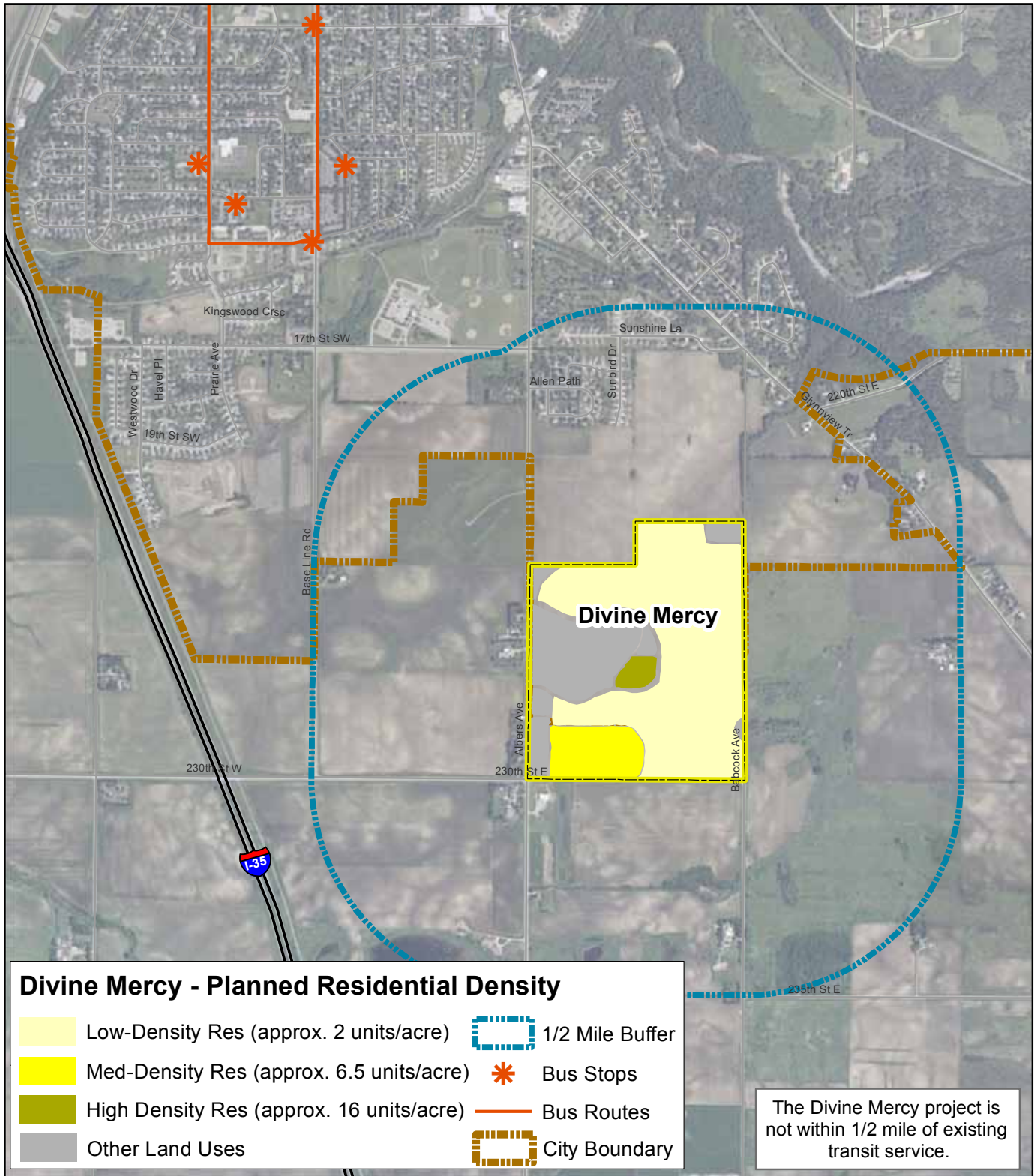
Recommendations:

The project should progress with compact development to preserve as much farmland as possible until complete build-out. This will provide the potential for cultivating crops on high quality farmland if the project does not fully develop; enable community gardens on high quality farmland; and/or preserve permeable surface for stormwater management and water quality.

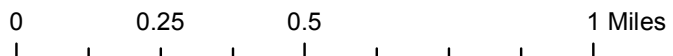
Image 4: Boundary Waters Area



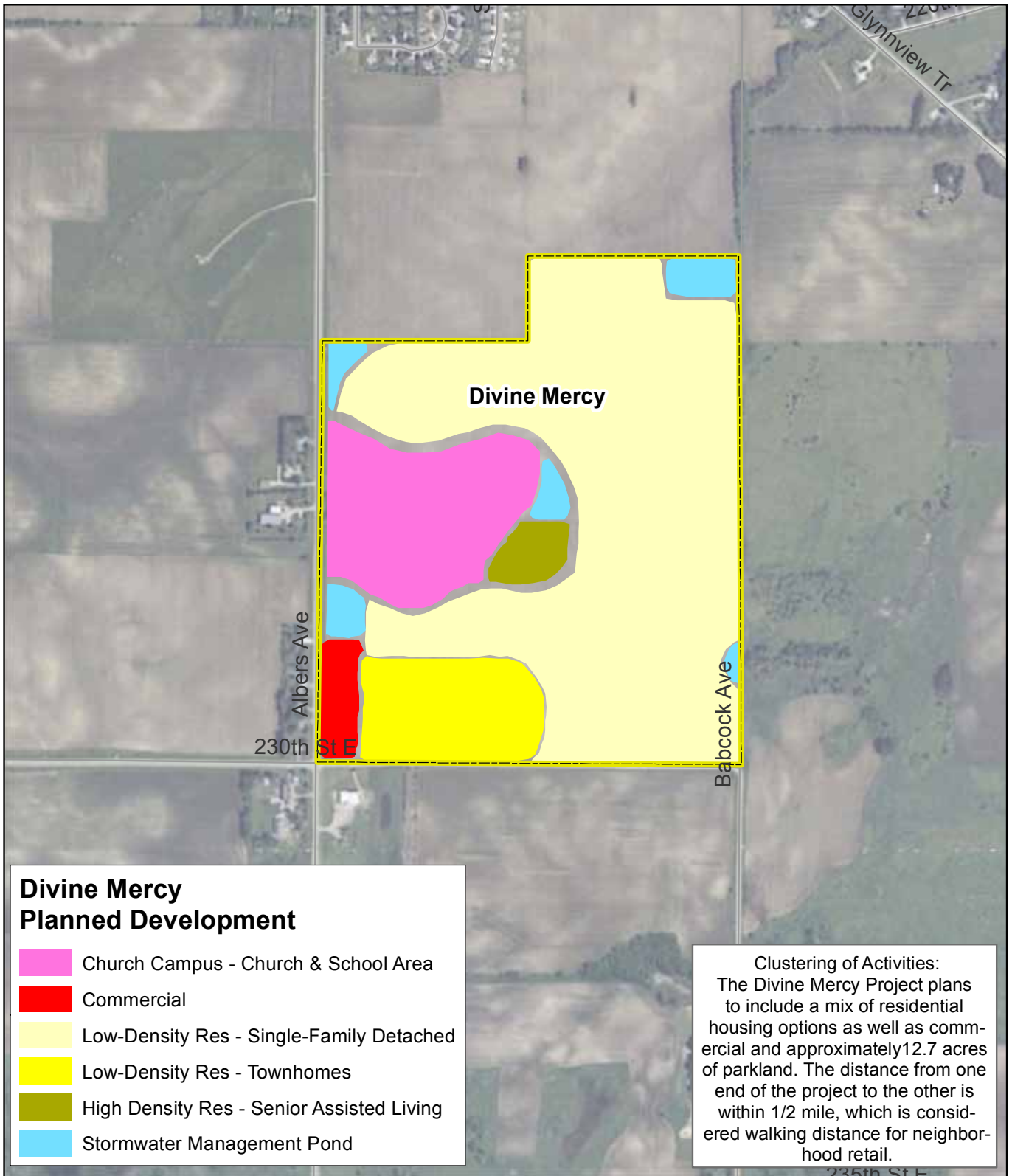
Map 3 Residential Density and Proximity to Transit Service



Map created August 2011
Source: City of Faribault -
Planning & Zoning



Map 4 Clustering of Activities



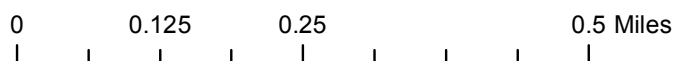
**Divine Mercy
Planned Development**

- Church Campus - Church & School Area
- Commercial
- Low-Density Res - Single-Family Detached
- Low-Density Res - Townhomes
- High Density Res - Senior Assisted Living
- Stormwater Management Pond

Clustering of Activities:
The Divine Mercy Project plans to include a mix of residential housing options as well as commercial and approximately 12.7 acres of parkland. The distance from one end of the project to the other is within 1/2 mile, which is considered walking distance for neighborhood retail.



Map created August 2011



Parks

Objective:

Preserve and provide access to parks and green spaces for improved levels of physical activity and mental health.

Discussion:

Public parks play an important role in providing a free or low cost opportunity for people to get their recommended amount of daily exercise. Physical activity can prevent weight gain or encourage weight loss. Providing opportunities for physical activity is particularly important given the epidemic of overweight children and adults. According to the Surgeon General, between 1980 and 2002, the number of overweight children has tripled in the U.S. Approximately 13% of our nation's 2- to 5-year olds; 18% of 6- to 11-year olds; and 17% of 12- to 19-year olds were overweight in 2003–2004. (Surgeon General) Children who are obese are likely to be obese as adults. (Whitaker, 1997) Results from the 2009 Behavioral Risk Factor Surveillance Survey found that 63.3% of adult Minnesotans are overweight or obese. (BRFSS, 2009) In Rice County, 26% of adults are obese, the same percentage of adults as the rest of the state. Encouraging physical activity by providing parks, recreational facilities, and trails can be an effective strategy to improve the public's health.

Many Americans visit their local parks, and nine out of 10 engage in one or more outdoor recreational activities annually. (Cordell, 2004; Godbey, 1992) Many factors affect the use of parks for physical activity. The closer parks, green spaces and trails are to residences the more likely people are to use them. Park proximity is associated with higher levels of park use and physical activity among a variety of populations, particularly youth. (Kaczynski, 2007; Brownson, 2001) Children who live in close proximity to parks, playgrounds, and recreational facilities tend to be more active compared to children who do not live near those facilities. (Bauman, 2007)

Besides providing a setting for physical activity, parks and green spaces support general health and provide a reprieve from everyday stressors. Living in proximity to

green spaces is associated with reduced negative health symptoms and better health as assessed by a self-rated health questionnaire. (Vries, 2003) Several studies have suggested that access to nature through parks and green spaces reduces stress and depression and improves the ability of a person to focus, be productive, and recover from illnesses. (Maller, 2005) One study in Chicago showed that people living in a housing project who had some green space near them managed major life issues better, procrastinated less, and found their issues to be less difficult than those who lived in barren surroundings. (Guite, 2006) Green spaces and parks provide an attractive setting for people to socialize and bond as a community. A study in Chicago found that 83% more people participated in social activities in green spaces compared to barren spaces. (Sullivan, 2004)

Parks and green spaces act as an important public health intervention by providing areas for increasing physical activity and improving mental health.

“ . . . access to nature through parks and green spaces reduces stress and depression and improves the ability of a person to focus, be productive, and recover from illnesses.”

Image 5: Millenium Park, Chicago**Health Indicator 6:**

Is the project within $\frac{1}{4}$ mile access of a neighborhood or regional public park (a park larger than $\frac{1}{2}$ acre)?

Description:

As described above, nearby public parks provide convenient and free or low-cost access to places for physical activity and recreation for adults and children. A study of 3,000 youth ages 5 to 20 found that youth who had recreation or open space facilities close to home were two to three times more likely to take a walk over a two-day period than were youth who had no parks nearby. (Frank, 2007) Providing close access to public parks supports public health and increases physical activity.

Findings:

There are no city parks greater than $\frac{1}{2}$ acre within $\frac{1}{4}$ mile of the development's boundary. However, there are four parks greater than $\frac{1}{2}$ acre, ranging from 1.2 acres to 759

acres, just beyond $\frac{1}{4}$ mile from the boundary. All four parks are located to the north of the development. The Divine Mercy Development proposes a 7% park and open space dedication as part of the development. This would be equivalent to 12.7 acres at full built-out, and within $\frac{1}{4}$ mile of all sections of the development. Based on existing and planned park space, the development exceeds the park provision indicator. [See Map 5: Park Proximity.]

Recommendations:

The development allows for a significant amount of park space within $\frac{1}{4}$ mile of the development. Thus, it is anticipated that physical activity may increase or stay the same. No recommendations are suggested.

Health Indicator 7:

Does the project meet or achieve a standard of 10 acres of publicly accessible open space¹ per 1,000 population in the planning area?

Description:

In addition to having nearby parks, providing more parks and more park area (i.e., acreage) within a community is associated with higher physical activity levels. (Li, 2005; Rosenberger, 2005) One study showed that a 1% increase in park space can increase physical activity in youth by 1.4%. (Roemmich, 2006)

Findings:

Based on 2010 Census data, the city has an average household size of 2.61 persons. Assuming the development will have the same household size, at 366 residential units, the project's proposed residential developments will have approximately 955 residents. The development proposes 7% park and open space dedication, or approximately 12.7 acres, which exceeds the park requirement of a minimum of 10 acres per 1,000 population. [See Map 5: Park Proximity.]

Recommendations:

The development allows for a significant amount of park space for the projected population of the development. Thus, it is anticipated that physical activity may increase or stay the same. No recommendations are suggested.

Health Indicator 8:

Is the project within ¼ mile of a public recreational facility²?

1 Open space is areas for "parks", "green spaces", and other open areas. The landscape of urban open spaces can range from playing fields to highly maintained environments to relatively natural landscapes. They are commonly open to public access, however, urban open spaces may be privately owned.

2 Public recreational facilities include community centers, publicly accessible gyms, playgrounds, boating facilities, fishing piers and platforms, public golf courses, public sports facilities, swimming and wading pools, and parks with such facilities.

Description

Public recreational facilities encourage a variety of different types of active play and physical activity, and include facilities such as playgrounds, swimming pools, and soccer fields. One study found that parks with more features, including recreational facilities, were more likely to be used for physical activity than parks with fewer features. (Kaczynski et al, 2008) Another study analyzed data from over 2,000 women in five states and found that the density of fitness facilities in an individual's ZIP code predicted their body mass index (BMI).³ The study estimated that an additional fitness facility per 1,000 residents in a ZIP code is associated with a reduction in BMI of 1.39 kg/m². (Mobley, 2006) These studies suggest that provisions of recreational facilities can aid in promoting physical activity.

Findings:

There are no public recreational opportunities within ¼ mile of the development, but the Faribault Middle School is approximately 1 mile from the development's geographic center which hosts several baseball fields and a track. Additionally, one of the city's four proximate parks, just south of the middle school, is a soccer complex. [See Map 6: Recreation Proximity.]

3 Body mass index (BMI) is a measure for classifying people's weight into categories, including overweight and obesity. BMI is determined by a person's weight and height. A larger BMI is associated with increased risks for certain illnesses and premature death.

Image 6: Loring Park Community Center



Recommendations:

The project currently does not provide nearby recreational facilities, but does provide nearby park space. To further increase physical activity and reduce overweight and obesity, the project should consider a public recreational facility, either as part of its park development or a separate community facility, which should be accessible to all residents of the development.

Health Indicator 9:

Are trails that provide for bicycling, rollerblading and walking incorporated into the project within 400-600 meters of all residential areas?

Description:

A growing body of evidence suggests that the built environment,⁴ including trails, can positively influence physical activity. (Heath, 2006; Kahn et al, 2002; TRB, 2005) A study conducted in 2006 indicated that about one-quarter of adult men and women used a walking, hiking or bicycling trail at least once per week. (Librett et al, 2006) Research suggests that in order for trails to be an effective strategy to encourage physical activity, trails need to be located near people's homes. Several studies have demonstrated that trails located close to where people live are more likely to be used. (Lieber & Fesenmaier, 1985; Gobster, 1995; Furuseth & Altman, 1991; Moore & Graefe, 1994; Ottensmann & Lindsey, 2008) A study in Massachusetts found that the likelihood of adults using a suburban rail-trail decreased by 42% for every ¼ mile increase in distance from a home to the trail. (Troped et al, 2001) In Minnesota, a Minneapolis study found a sharp decline in trail use among bicyclists who had to travel 1.5 miles or further to access a trail. (Krizek, 2007)

Findings:

The southwestern most edge of the River Bend Nature Center (the 700+ acre park to the northeast of the development) is the closest access to trails dedicated to walking and biking. The start of the trail is just within the

“In Minnesota, a Minneapolis study found a sharp decline in trail use among bicyclists who had to travel 1.5 miles or further to access a trail.”

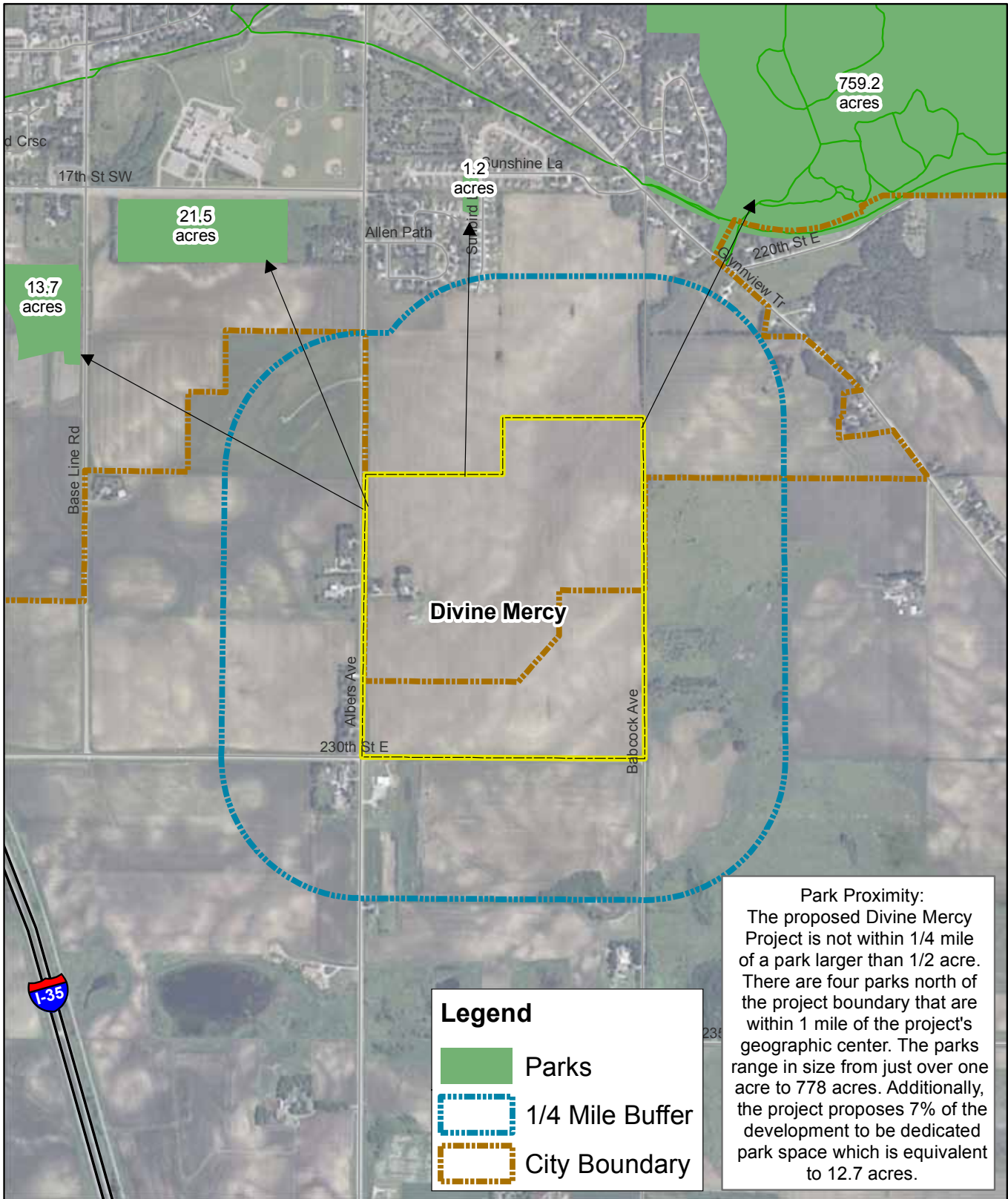
600 m maximum distance from the northeast corner of the development. This trail is connected to a system of trails that runs through the River Bend Nature Center and into other areas of Faribault, north and west. [See Map 7: Vegetated Trails.]

Recommendations:

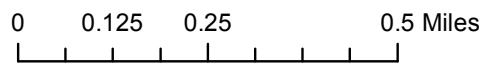
Because the project site is barely within the maximum recommended distance to access trails dedicated to walking and biking, it is assumed that the existing trails will not significantly increase physical activity. The development should consider working with the city to extend the trail network south and west to the residential areas of the project to increase the use of trails and provide additional physical activity options for Divine Mercy Development residents.

⁴ Broadly defined, the built environment includes man-made surroundings, such as neighborhoods, streets, transportation systems, buildings, commercial centers, schools, parks, and trails.

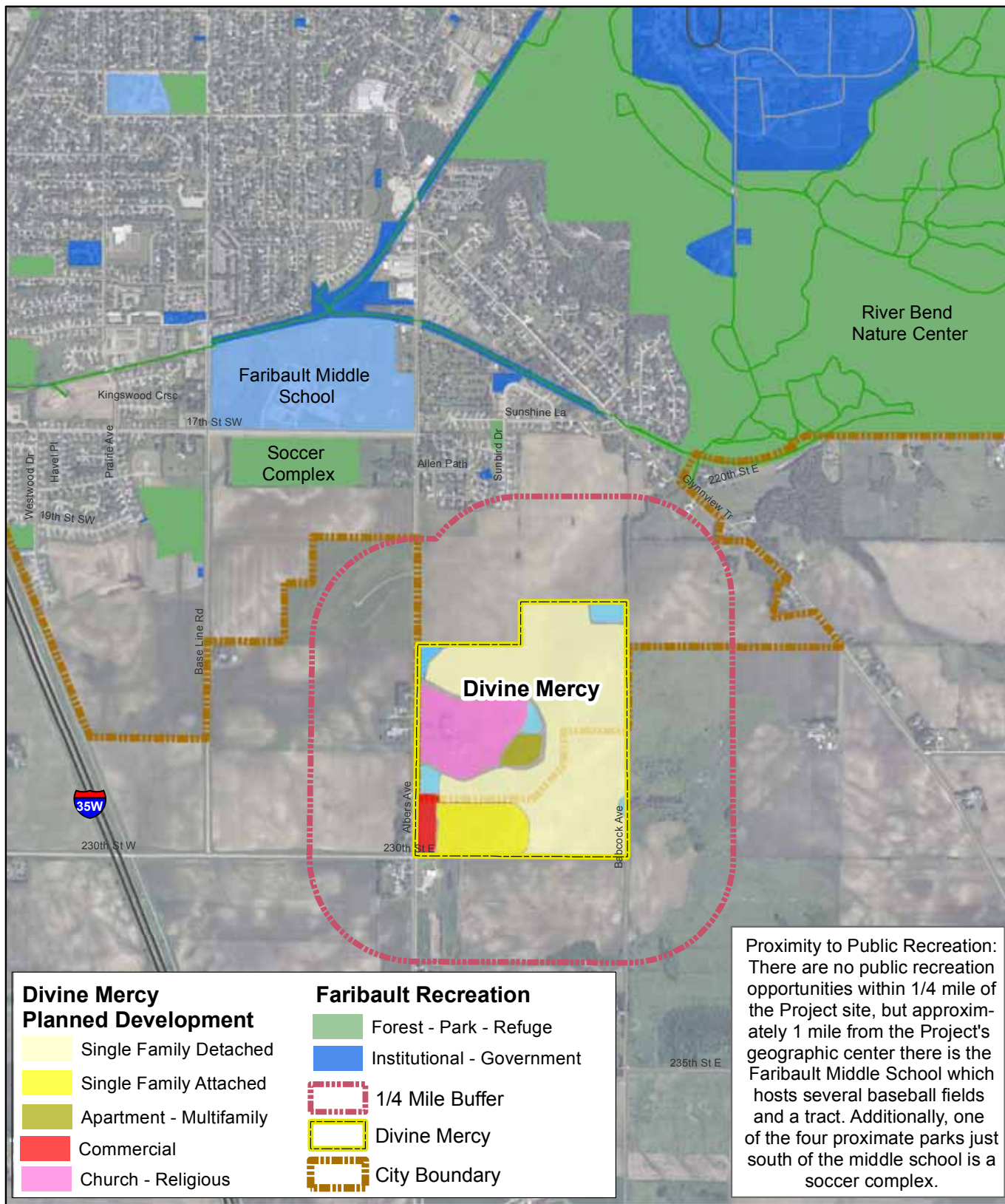
Map 5 Proximity to Parks Larger than 1/2 Acre



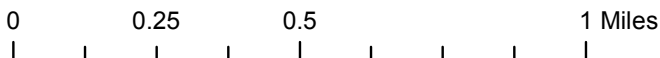
Map created August 2011
Source: City of Faribault -
Planning & Zoning



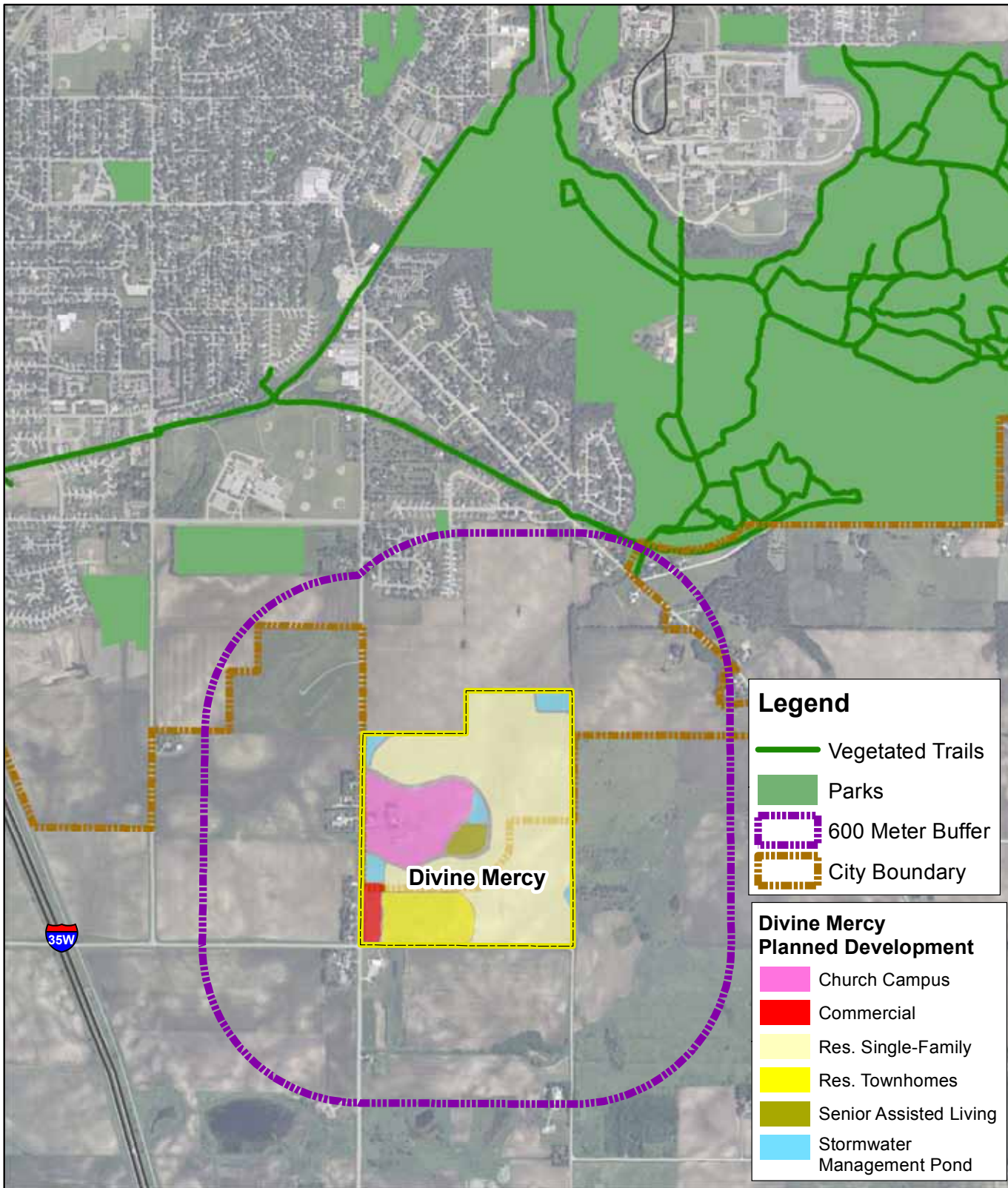
Map 6 Proximity to Public Recreation



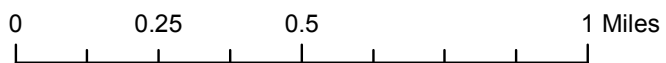
Map created August 2011
 Source: City of Faribault - Planning & Zoning



Map 7 Proximity to Vegetated Trails



Map created August 2011
Source: City of Faribault -
Planning & Zoning



Trees and Vegetation

Objective:

Preserve and increase trees and vegetation for multiple benefits.

Discussion:

Preserving or expanding tree canopy¹ and vegetation provides many benefits to communities, including lowering air temperatures, mitigating climate change, reducing air pollution, enhancing water quality, and providing psychological, physiological, and quality of life benefits.

Reduce temperatures and the heat island effect.

Trees and vegetation reduce air temperatures in two ways: 1) by providing shading for buildings and other impervious surfaces that absorb and retain heat from the sun; and 2) through evapotranspiration². Studies have

1 Tree canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

2 Transpiration and evaporation are referred to as evapotranspiration. Transpiration is the loss of water vapor from parts of a plant. Trees and vegetation absorb water through their roots and emit it mostly through their leaves. A large oak tree can transpire 40,000 gallons of water per year, and an acre of corn can transpire 3,000 to 4,000 gallons a day. (U.S.

Image 7: Tree Canopy



measured temperature reductions in tree groves, irrigated agricultural fields and grass sports fields compared with areas without vegetation. (Huang et al, 1990; Kurn et al, 1994) One of the studies showed that suburban areas with mature trees are 4 to 6°F cooler than new suburbs without trees. Cooling from trees and vegetation is most effective when planted in strategic locations around buildings and other impervious structures that retain heat from the sun. (Kurn et al, 1994; Simpson & McPherson, 2001; McPherson & Simpson, 2000) Reducing air temperatures in the summer is particularly important to public health, as very hot days can cause heat-related illnesses and even heat-related deaths. It is predicted that Minnesota will experience more days with high temperatures. (Union of Concerned Scientist, 2011) Trees and vegetation can help reduce both indoor and outdoor temperatures, minimizing adverse health effects from extreme heat.

Mitigate climate change.

Trees and vegetation provide shade and lower air temperatures, reducing the amount of energy buildings use. One study found that trees planted near buildings provided a cooling energy savings ranging between 7% and 47%. (Akbari et al, 1997) Reduced energy consumption results in decreased fossil fuel burning in power plants, and thus lowers carbon emissions from the power plants. One modeling study estimated that the direct energy savings from shading by trees and vegetation could reduce carbon emissions in various U.S. metropolitan areas by 1.5% to 5%. (Konopacki & Akbari, 2002)

Trees also remove CO₂ from the air and store carbon as cellulose in their trunk, branches, leaves and roots. This process is known as sequestration, and it reduces levels of CO₂ in the air. In 2005, the net rate of carbon sequestered by urban trees in the continental U.S. was estimated to be approximately 88.5 teragrams (Tg) CO₂ equivalent. (U.S. EPA, 1990-2005) Planting more trees and strategically placing trees lowers energy usage and aids in the removal

Geological Survey, 2011) Evaporation, the conversion of water from a liquid to a gas, also occurs from the soil around vegetation and from trees and vegetation as they intercept rainfall on their leaves and other surfaces. Evapotranspiration cools the air by using heat from the air to evaporate water.

of carbon from the air. Carbon reduction is a key strategy in reducing climate change, and climate change has been linked to many public health problems. (IPCC, 2007; Haines et al, 2009)

Reduce Air Pollution.

Trees and plants contribute to improved air quality by removing certain gases in the air that cause air pollution. (Nowak, 2000) Trees and plants can reduce various pollutants found in the urban environment, including PM, NO_x, SO_x, CO, and ground-level ozone. A 2006 study of urban trees in the U.S. estimated total annual air pollutant removal at 784,000 tons, with a value of \$3.8 billion. (Nowak et al, 2006) However, certain trees emit pollutants, so it is important to plant the right trees to gain a positive environmental effect.

Air pollution can affect health in many ways. Short-term effects of air pollution include irritation to the eyes, nose and throat, and upper respiratory infections such as bronchitis and pneumonia. Air pollution also can aggravate medical conditions such as asthma and emphysema. In the great “Smog Disaster” in London in 1952, over 4,000 people died prematurely from a few days of high concentrations of airborne pollutants (recently revised estimates of death from the disaster are much greater). (Bell et al, 2004) Long-term health effects of air pollution can include chronic respiratory disease, lung cancer, heart disease, and even damage to the brain, nerves, liver, or kidneys. By reducing air pollution, trees and vegetation can aid in reducing the negative health consequences of poor air quality.

Enhance Water Quality.

Trees and vegetation can help reduce stormwater runoff that can have an adverse impact on water resources and public health. Trees reduce stormwater runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere through evapotranspiration. In addition, tree roots and leaf litter create soil conditions that promote the infiltration of rainwater into the soil and help recharge groundwater reservoirs. During the summer, in Sacramento, CA, a study found that evergreens and conifers intercepted over 35% of rainfall. (Xiao et

“A 2006 study of urban trees in the U.S. estimated total annual air pollutant removal at 784,000 tons, with a value of \$3.8 billion.”

al, 1998) Stormwater runoff picks up and carries with it many different pollutants that are found on paved surfaces such as sediment, nitrogen, phosphorus, bacteria, oil, grease, trash, pesticides and metals. Reducing stormwater runoff helps prevent contaminated runoff from entering streams, lakes and other water bodies, which may be used for recreational purposes or drinking water. Waterborne illnesses from recreational swimming and drinking water are associated with runoff. More than half of waterborne disease outbreaks since 1948 have followed extreme rainfalls. (Curriero et al, 2001) One public health study concluded that stormwater management to minimize runoff and associated pollution appears to be a cost-effective way of protecting public health. (Gaffield et al, 2003)

Provide Psychological and Physiological Health Benefits.

Several studies demonstrate the positive psychological and physiological benefits of viewing nature (i.e., trees and vegetation) on a range of people in different settings including office workers, college students, and hospital patients. (Kaplan, 1993; Tennessen & Cimprich, 1995; Ulrich, 1984) These studies found that a view of nature can improve overall satisfaction with a job, reduce number of physical ailments, improve test scores, shorten post-operative hospital stays, and decrease use of pain medication. The presence of forests, trees and other

vegetation have been shown to improve adult recovery from mental fatigue and reduce behavior problems among children. (Wolf, 1998; Hansmann et al, 2007; Taylor et al, 2001)

Provide Quality of Life Benefits.

Trees and vegetation provide habitat for birds, insects, and other living species. Also, urban trees and vegetation have been linked to reduced crime and increased property values. (Kuo & Sullivan, 2001; Des Rosiers et al, 2002)

Health Indicator 10:

Is there a tree planting/tree canopy plan, and does it establish a goal of 40% or greater canopy coverage in the development area?

Description:

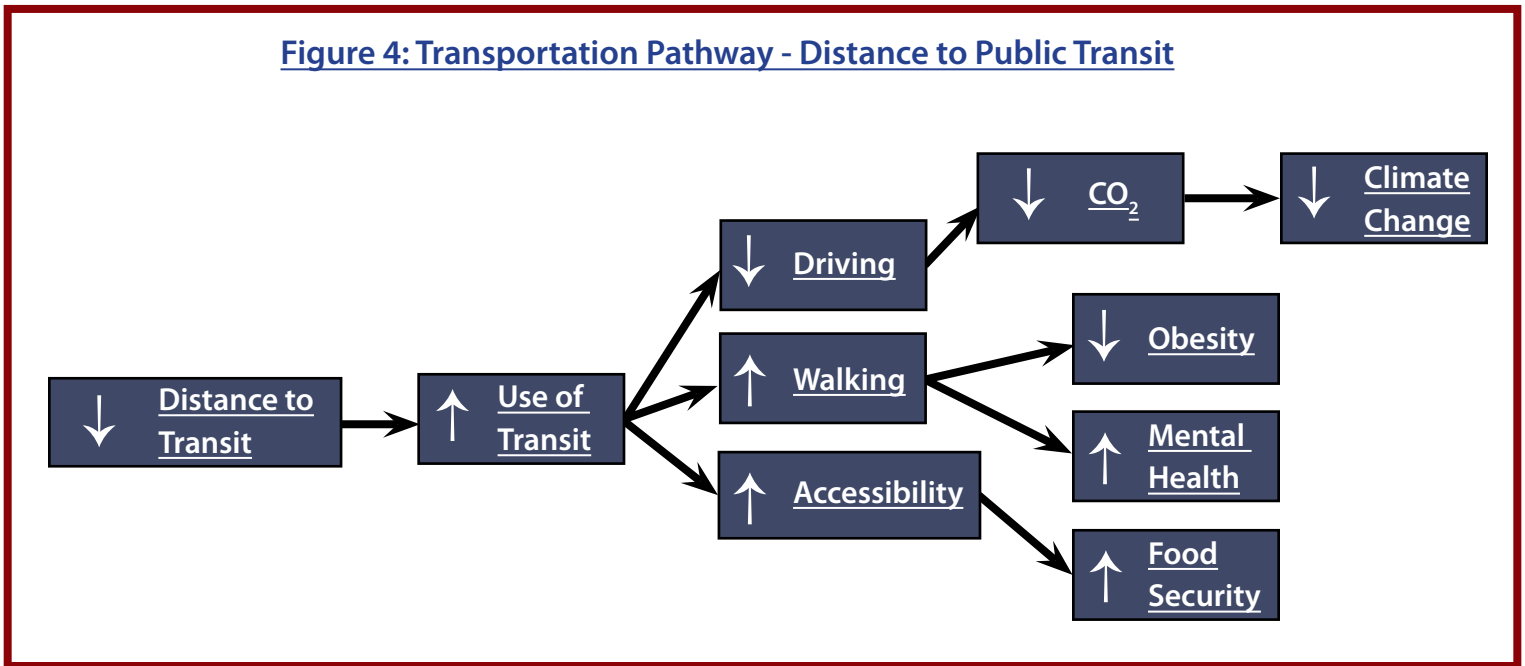
In order to receive the many benefits of trees, the American Forests, a nonprofit citizens' conservation organization, recommends setting a canopy cover goal of 40%. Suburbs, which have more growing space for trees, should attempt to reach a 50% tree canopy coverage goal. (Moll, 1997)

Findings:

According to the EAW, there is no tree planting/canopy plan for the development. The development area consists primarily of agricultural fields and has very few trees.

Recommendations:

Because the project currently does not contain a significant number of trees, no benefits of tree canopy will be realized. Developing a tree canopy plan to reach 40% tree canopy coverage may provide many benefits to the community, including lowering air temperatures in the summer, reducing air pollution, enhancing water quality and providing psychological and quality of life benefits.

Figure 4: Transportation Pathway - Distance to Public Transit

Transportation

Objective:

Improve health through increasing physical activity, improving air quality and increasing accessibility by promoting alternative modes of transportation such as walking, biking, and transit.

Discussion:

Since the invention of the personal automobile and the creation of the interstate highway system, the U.S. has become dependent on the automobile. Relying on the personal automobile as our primary transportation mode has several negative health consequences, including pollution, injuries, physical inactivity, and inequity. Motor vehicles generated 28% of total U.S. greenhouse gas (GHG) emissions in 2006 (Younger, 2008); motor vehicle crashes were the leading cause of death for ages 3 through 33 in 2002 (Subramanian, 2005); and, driving contributes to a sedentary lifestyle, resulting in health effects like obesity and heart disease. According to the 2009 BRFSS, 25% of Minnesotans are considered obese and 53% do not achieve the weekly physical activity recommendations. The combined effects of reliance on driving cost the U.S. billions of dollars every year in climate change-related extreme weather events, lost agricultural productivity, and health damage and medical expenses. (EPA, 2001)

On the other hand, shifting towards greater use of public transit would have positive outcomes for individual and environmental health. U.S. transit riders walk a median of 19 minutes per day simply going to and from transit, and 29% of transit riders walk more than the 30 minutes per day, as recommended by the Surgeon General. (Besser & Dannenberg, 2005) People of lower socioeconomic status obtained the greatest amount of physical activity by walking to and from transit. In addition to positive health effects, public transit decreases road congestion and air pollution.

Public transit also increases accessibility for the most disadvantaged populations. Policies that reduce private car use by encouraging cycling, walking and public transit enable low income, disabled, elderly and youth populations to access goods and services without the use of a private vehicle. (Gorman, 2009)

Health Indicator 11:

Is the project within ½ mile of a regional transit station OR does the project include shuttle trips to regional transit, with timing and frequency based on estimates of area demand? AND is the project within ¼ mile of a local transit stop?

Image 8: Faribault Flyer**Description:**

It is generally accepted that transit users are willing to walk ¼ mile (five minutes at three miles per hour) to a bus stop. (Ewing, 2000, p.5) This was confirmed by a study of 1990 Nationwide Personal Transportation Survey data. Other research has found that light rail transit (LRT) riders are willing to walk ½ mile to LRT stops. (O’Sullivan & Morrall, 1996). Providing transit within walking distance and at peak ridership times is essential to promoting transit ridership. Increasing transit ridership induces physical activity and reduces mobile sources of air pollution. Figure 4 demonstrates the pathways between distance to transit and health and climate change outcomes.

Findings:

Faribault is a small city with limited bus transit service. The Faribault Flyer, the local bus service, runs a route every hour from 7:30AM to 5:30PM through the main downtown portion of the city. This bus transit service is not located within ¼ mile of planned residential development in the Divine Mercy Development. The closest bus stop is between ¾ miles and 1 mile from planned residential; farther than the average bus rider is willing to walk to a station. [See Map 8: Transit Service.] Only 1% of

Faribault’s residents 16 years old and older who work take public transportation as a means of commuting to work.¹ However, 7% of households do not own a vehicle.² Based on these figures it is assumed that there is latent demand for a more extensive public transit service.

Recommendations:

Because no regular transit service is located within ¼ mile of the development, levels of physical activity will not increase due to riders walking to transit. Accessibility to goods and services will be dependent on people owning a car. The project plans for 40 units of senior housing. The senior population can be a particularly transit dependent population. In order to provide access to goods and services and to increase physical activity, the development should consider operating a shuttle bus into the city for residents, especially senior residents, at convenient times for running errands and seeking entertainment.

Health Indicator 12:

Does the plan link existing and future housing development with services (i.e., employment centers, grocery stores, hospitals, etc.) through a specific multimodal transportation plan?

Description:

Approximately 25% of trips in the U.S. are shorter than one mile; of these, 75% are by car. (Frumkin, 2002) By providing linkages to destinations for pedestrians and bicyclists in a multimodal transportation plan, people shift from driving to walking and cycling. Increased physical activity and reduced short-trip emissions generate improved health at the local level. Neighborhoods with retail services within walking distance of residences have more non-motorized trips than neighborhoods with no retail services within walking distance of residences. (Ewing, 2006) Other linkages can include shuttle service or public transit, connecting housing development with services to create equitable access for those who do not have the means to own or operate a motor vehicle. For example, approximately 21% of elderly do not drive, and because of limited access they take significantly fewer trips

1 2009 American Community Survey 5-year estimates, B08119

2 2009 American Community Survey 5-year estimates, B25944

to the doctor, shops and restaurants, and social activities than elderly who do drive. (Ewing, 2006)

Findings:

In Faribault, 3% of residents 16 years old and older who work walked to work.³ This figure could potentially increase with more linkages between housing and employment centers and other services. The EAW does not specifically address transportation or linkages for the project. However the proposed development does include a mix of uses including residential and commercial. It is assumed that the development is intentionally siting these mixed uses together to link future housing development with services.

Recommendations:

The amount of commercial development or employment opportunities proposed for the Divine Mercy Development is unlikely to meet all the needs of the development's residents. Because the development plans for 40 units of senior housing and the senior population can be a particularly transit dependent population, and because local municipal or regional transit service is not currently provided, the development should consider operating a shuttle bus into the city for residents, especially senior residents, at convenient times for running errands and seeking entertainment.

Health Indicator 13:

Does the project include (or is it within ¼ mile of) bicycle lanes and/or paths that are linked to the city's existing bicycle network and/or connected to at least five diverse uses (e.g., schools, employment centers, grocery stores, etc.)?

Description:

Bicycle infrastructure provides the opportunity for non-automotive transportation at longer distances than walksheds.⁴ Biking contributes to improved health

Image 9: St. Anthony Main Bicycle/Pedestrian Path



through physical activity and improves air quality because it produces no emissions. Bicycle paths that connect to regional networks allow for commuting to work, and bicycle paths that connect to destinations provide access to essential services. According to the Scottish Sustainable development strategy, “the ability to travel is vital to people’s sense of wellbeing, and cycling and walking bring major health benefits as well as environmental benefits.” (As quoted by Coyle, 2009, p.e22)

Similar to improved pedestrian environments, designated or signed bicycle infrastructure improves safety for bicyclists by encouraging more riders and alerting motor vehicles to bicyclists’ presence. In fact, improving streets to better accommodate bicyclists may lead to enhanced overall safety for all road users. (Garrick & Marshall, 2011) Cities with high rates of bicycling have lower risk of fatal and severe crashes for all road users due to street network design (more specifically street network density than connectivity) and the presence of a large number of bicyclists, which both reduce vehicle speeds. (Garrick & Marshall, 2011)

Findings:

The northeast corner of the development boundary is more than ¼ mile from existing bicycle and vegetated trail infrastructure. The development does not propose

1 mile distance.

3 2009 American Community Survey 5-year estimates, B08119

4 A walkshed is the area that is walkable from a point of origin or destination and accounts for pedestrian barriers like major crossings, highways, megablocks, etc., rather than calculating distance as-the-crow-flies. Walksheds vary by user but are generally calculated at the ¼, ½, and

any additional lane miles or connections. [See Map 7: Vegetated Trails in “Parks” chapter.]

Recommendations:

Divine Mercy should consider adding bicycle trail connections through the development to existing vegetated trails and bike paths to increase access to a variety of destinations, including recreation.

Health Indicator 14:

Does the project identify areas (intersections, streets, small areas) where pedestrian injury collisions have occurred in or near the project area, or identify where potential future conflicts exist in or near the project area and target pedestrian environment improvements to those areas?

Description:

Introducing more pedestrians to a transportation network increases the risk of accidents. It is important to identify and remedy potential unsafe pedestrian environments to prevent additional accidents. There are many ways to improve pedestrian environments. These include techniques such as traffic calming measures that reduce vehicle speeds, signage and lighting to alert other transportation users to the presence of pedestrians.

Findings:

The National Highway Traffic Safety Administration operates the Fatality Analysis Reporting System (FARS). Based on FARS data there were four traffic fatalities in 2009 and 12 traffic fatalities in 2008 just within Rice County. One of the traffic fatalities in 2008 involved pedestrians. None of these fatalities were in the project area.

Since 2006, according to MnDOT’s records, there have been a total of 7 accidents at intersections and along streets adjacent to the project boundary. Four of these accidents occurred at the intersection of 230th Street and Babcock Avenue. Three of the crashes involved drivers age 17 or younger and did not involve a collision with another vehicle. Two of the crashes were due to failure to yield right-of-way. One crash was due to illegal speed and the final accident was not specified. [Source: MnDOT; see Map 9: Pedestrian Safety.]

Recommendations:

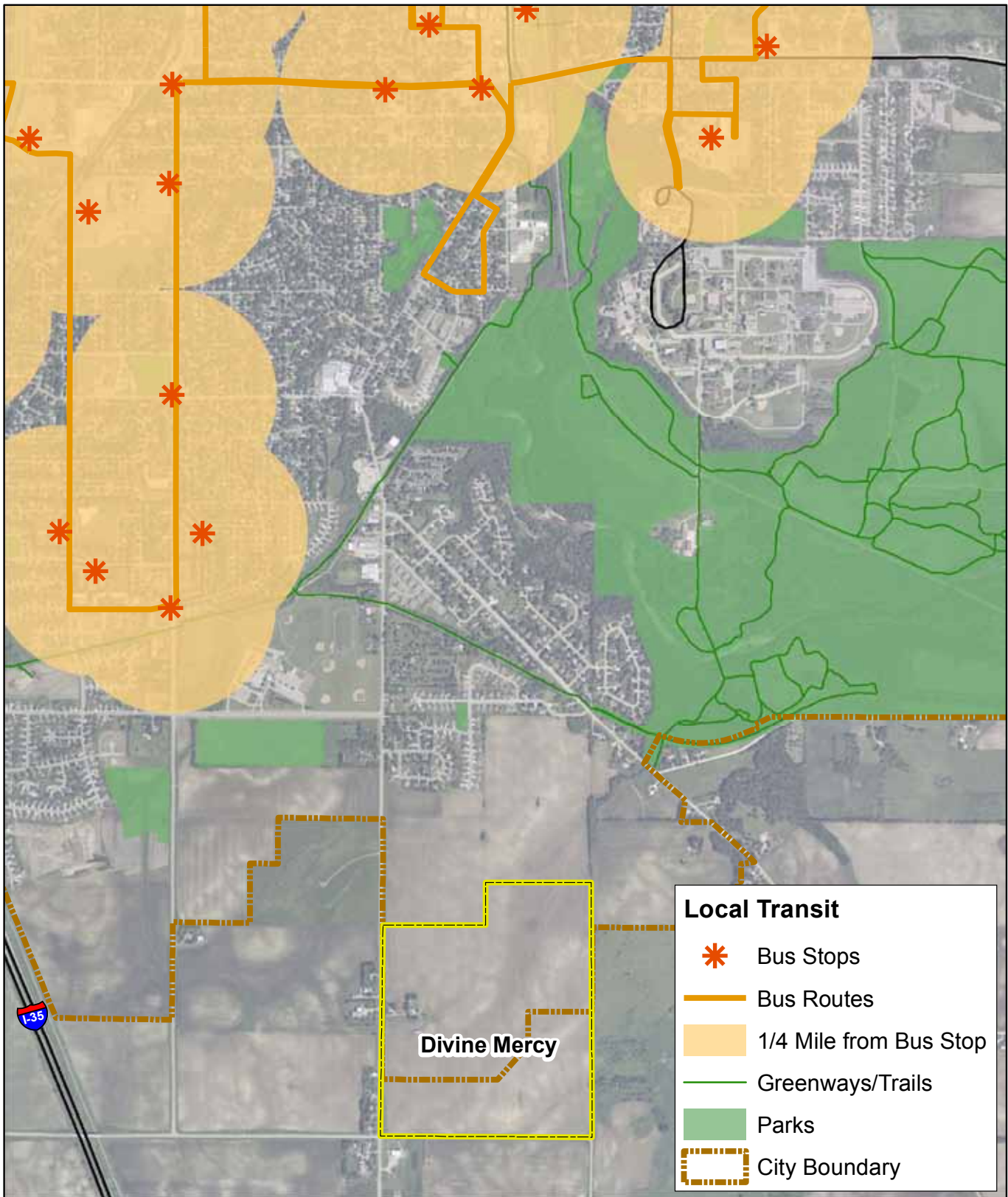
The addition of roads, intersections, and subsequent users as a result of the Divine Mercy Development may increase the incidence of accidents on area roads. The data provided is baseline information. In the future, accidents should be tracked to identify problem intersections and safety mitigations applied where problems are identified.

Image 10: Lake Harriet Bicycle/Pedestrian Trail



Image from the Metropolitan Design Center Image Bank.
© Roger B. Martin. Used with permission.

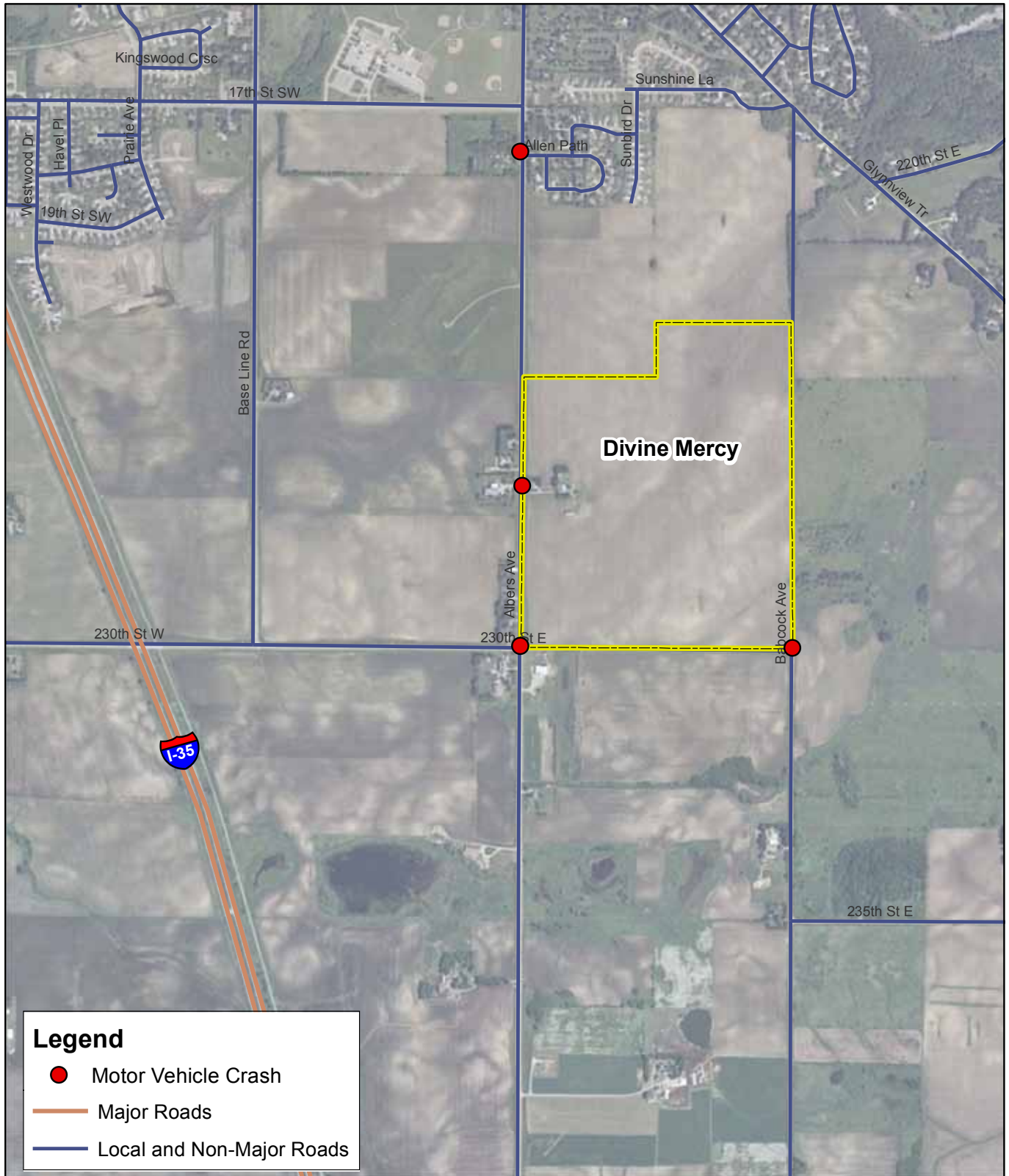
Map 8 Proximity to Transit Service



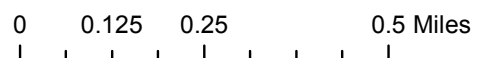
Map created August 2011
Source: City of Faribault -
Planning & Zoning

Map 9

Pedestrian Safety: Location of Accidents 2006 - 2010



Map created August 2011
 Source: DNR DataDeli
 Mn/DOT Road Basemap and
 Mn/DOT D6 Traffic Office



Housing

Objective:

Preserve or provide affordable housing to reduce overcrowding and to support home-ownership, housing stability, and development of social networks.

Discussion:

Stable, affordable housing is important for health in a number of ways. When residents spend less than 30% of pre-tax income on housing (affordability threshold) they have more money to spend on healthcare, doctor visits, medication, and healthy food. Additionally, instable housing – or frequent mobility – can cause stress and other mental health conditions like depression. (Cohen, 2011) Opportunities for ownership can also have a positive impact on individual health. Ownership has been associated with higher-quality housing and higher levels of self-esteem, perhaps due to stability or pride in ownership. (Rohe et al, 2001; Cohen, 2011) The effect of housing unaffordability has been shown to be greater among renters than owners. (Pollak et al, 2010)

The supply of stable, affordable housing is shrinking and demand is increasing. In the 10 years between 1999 and 2009, nearly 12% of low-cost rentals were lost. (JCHS-HU, 2011) The number of renters with very low incomes (below 50% of the area's median income) increased from 16.3 million to 18.0 million between 2003 and 2009. (JCHS-HU, 2011) By 2009, there was only one affordable unit for every 2.9 extremely low-income renters (earning less than 30% of area median). (JCHS-HU, 2011) More low-income households need housing assistance than receive it. The Department of Housing and Urban Development (HUD) has the capacity to provide subsidies for only one in four renters in need.

Researchers and policy makers alike are making the connection between high concentrations of low-income people living in a single neighborhood and poor neighborhood conditions, including crime, decline in property values, and low educational attainment. (Rohe et al, 2001) It is critical that mixed-income housing is provided in all neighborhoods and that efforts are

made to bridge social ties in order to foster access to opportunities and eliminate cyclical concentrated poverty. A united neighborhood will be safer, healthier, and more economically prosperous.

Health Indicator 15:

If the project results in the demolition or loss of deed-restricted, public, inclusionary, or rent-controlled housing, does the project replace the demolished/lost housing stock at a 1:1 ratio?

Description:

One of the main criticisms of affordable housing redevelopment projects is that the replacement of high-density low-income housing units with medium-density mixed-income units results in a loss of housing units and leaves a lot of original occupants without a home. Often those left out are the most vulnerable to housing instability. They may not qualify for the stricter rental requirements in the mixed-income development and have a more difficult time finding new housing. Many of these vulnerable, low-income households self-reported worse health, including conditions such as hypertension and arthritis, and more cost-related healthcare and prescription non-adherence than their counterparts. (Pollak et al., 2010) While causation cannot be made, the study suggests important issues that many people in unaffordable housing face. Making housing more affordable (e.g., inclusionary housing, rent control, vouchers, etc.) may not eliminate other problems facing low-income households, but it does free up some money for other necessities like healthy food and medicine. With a loss of more than 700,000 HUD-assisted housing units since the mid-1990s (JCHS-HU, 2011), it is imperative that new developments assist with the provision of new affordable units.

Findings:

There is a single rural/farmstead residence on four acres on the site; it will be replaced with 366 units (combination of senior housing, townhouses and single-family-detached).

Recommendations:

There will be a net gain of housing, and more than 16% of the housing units will be provided for vulnerable populations

Image 11: Small lot, single-family home

(i.e., seniors). The Divine Mercy Development is not removing any public, inclusionary or rent-controlled housing. Therefore, MDH has no recommendations at this time.

Health Indicator 16:

Are at least 50% of residential units affordable to persons at or below the median household income, and/or is there at least a 20% ownership and 20% rental unit housing mix in a neighborhood or census tract?

Description:

It is important, especially for lower-income households, to live in a mixed-income neighborhood. Social and economic segregation are associated with higher overall mortality, higher infant mortality, and higher mortality from a variety of specific causes, independent of income and poverty. (Anderson et al, 2003) Living in a high-poverty concentrated neighborhood enforces the cycle of poverty, and does not provide access to social networks, which advance upward mobility for education, employment, and other opportunities. Mixed income housing can improve the health of the most vulnerable populations.

Contrary to public perception, development of government-assisted public housing can have a positive effect on the surrounding neighborhood (e.g., increased property values of single-family houses). Positive impacts were experienced most significantly for developments

that built over previously vacant and abandoned lots. (Gould, 2007) Additionally, demand-side assistance programs (e.g., vouchers) have “shown sufficient evidence of reductions in exposure to crimes against person and property and decreases in neighborhood social disorder.” (Anderson, 2003, p.56) Providing a proper mix of owners and renters allows for a balance of income levels while still maintaining the neighborhood investment most associated with homeownership.

Findings:

The Census Tract that overlaps with the development has a 75% household owner-occupied rate (25% rental). However, to the south, west, and east of the development, the homeownership rate exceeds 80% - higher than the recommended mix. [See Map 10: Tenure Owner.] It is unknown what percentage of housing is rental in the Divine Mercy Development.

Faribault’s household median income was \$49,511 (\pm \$2,389).¹ A housing unit affordable to half of the median income (approximately \$25,000/year) would cost \$625/month or less (30% of annual income divided by 12 months).

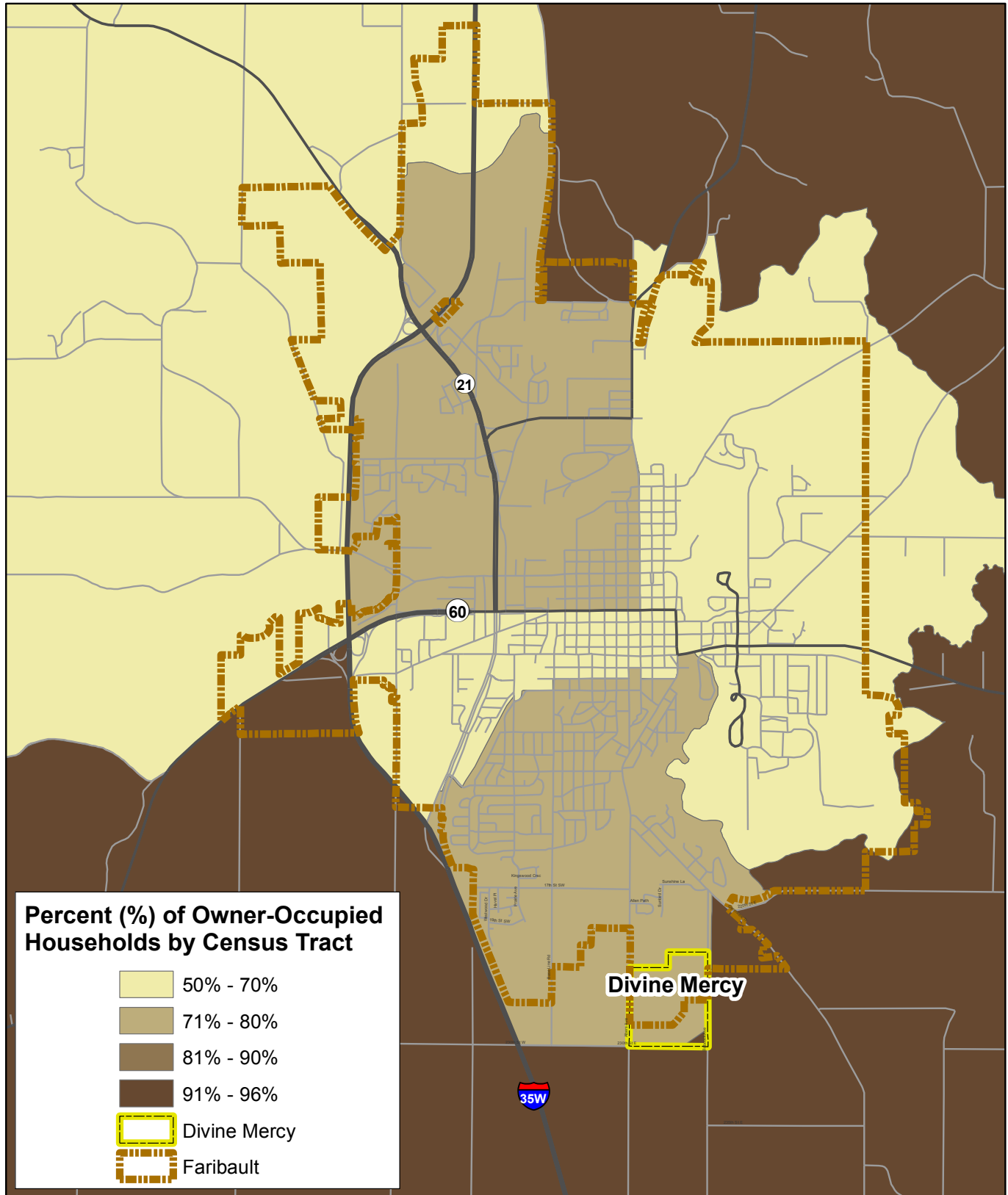
Recommendations:

The project EAW does not address whether the senior housing units or any of the townhomes or single family detached housing will be rental or ownership. While the senior housing is likely rental, the development should ensure additional townhomes and single family detached units are available to the renter population, at least 20% of the total units within the development. Additionally, at least 50% of the residential units should be affordable to persons at or below the median household income.

1 Source: American Community Survey 2009 5-year estimates

Map 10

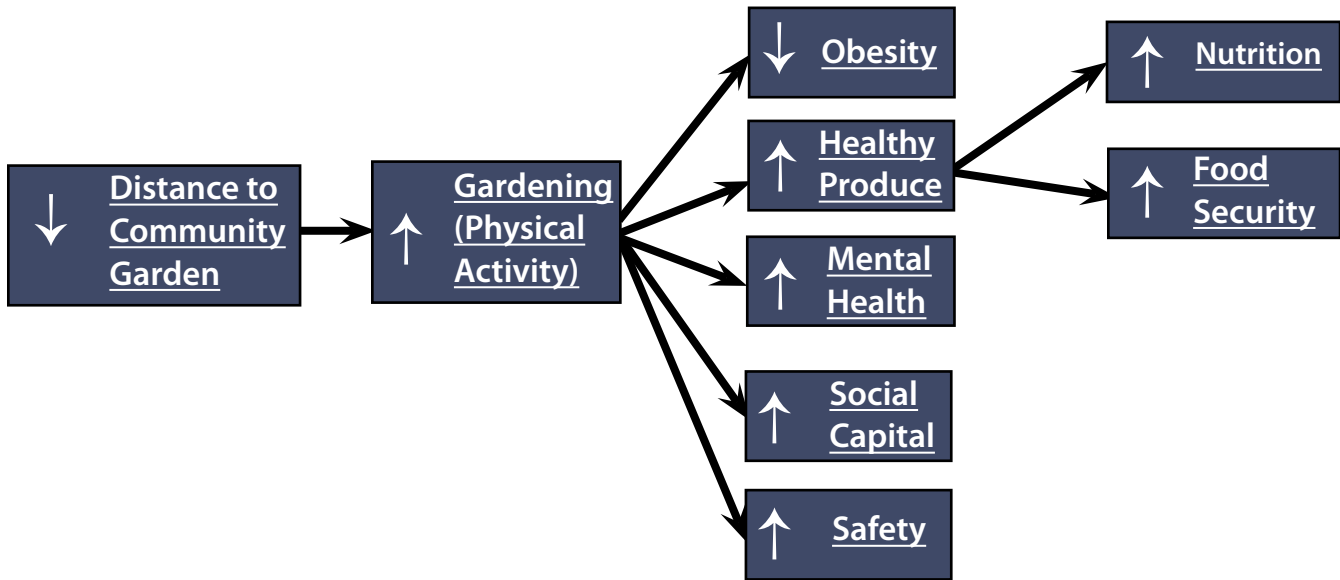
Percent Owner-Occupied Households



Map created August 2011
Source: 2010 Decennial Census Tracts



Figure 5: Food Pathway - Distance to Community Gardens



Food

Objective:

Provide access to fresh and healthy foods to reduce obesity, increase equity and food security, and support general health and nutrition.

Description:

Rates of overweight, obesity and diabetes are on the rise in the U.S.. According to a 2009 survey, 63.3% of adult Minnesotans are overweight or obese. (BRFSS, 2009) Additionally, research has shown that the single best predictor of type 2 diabetes is being overweight or obese. Overweight and obesity are caused by consuming more calories than are burned and are directly related to the types of food consumed. Over time eating energy dense foods, such as high fat foods and high sugar foods, can cause a person to become overweight or obese if the extra calories are not burned. From the same 2009 survey, results showed that 78.1% of Minnesotans do not consume the recommended number of daily servings of fruits and vegetables. (BRFSS, 2009) One strategy for encouraging consumption of healthier foods (e.g., less energy dense foods, such as fruits and vegetables, which also tend to have more nutrients) and preventing or mitigating overweight and obesity is to provide access to these healthy foods.

Overweight and obesity affect a large percentage of the U.S.'s population; however, some populations are disproportionately affected, including the poor and communities of color. (Drewnowski, 2004) Studies have shown that consumption of healthy foods such as fruits, vegetables, low-fat dairy, etc., occurs less in lower-income populations than in higher-income populations. Unhealthy foods and energy dense foods are readily found at fast-food restaurants and convenience stores, which are more heavily concentrated in low-income, predominantly black/African American communities. (Moreland et al, 2002a; Moore, 2006; Zenk, 2005)

There is a significant correlation between distance to a supermarket and consumption of healthy foods in lower-income populations. (CCPHA et al, 2008; Gordon, 2011; Inagami, 2006; Wrigley, 2002) Lower-income populations are more reliant on transit, walking and biking. If a supermarket is not along a transit route, or within walking or biking distance it is less likely that people without cars will have access to a large source of healthy foods. While access to a supermarket is not the only factor that affects healthy food consumption (cost and choice are also factors), a study by Wrigley demonstrated that a new supermarket developed near a low-income community resulted in 45% of the residents switching to the new



Image 12: Farmers' market

supermarket and “those who switched to the new store from a limited-range/budget store significantly increased their fruit and vegetable consumption by 18% (or 0.44 portions per day).” (2002, p.18)

Proximity of a new residential development to existing supermarkets and other healthy food retailers (e.g., farmers markets, grocers, and some convenience stores) is an indicator of community health.

Health Indicator 17:

For residential uses, is the project within ½ mile of a supermarket, or does the project create a new on-site or off-site “healthy food supply” within ½ mile?

Description:

Supermarkets, by their large nature and geographic service area, have more fresh food and healthy food options than neighborhood grocers or convenience stores. A supermarket within ½ mile of residential uses,

or even a transit stop, is an accepted walking distance. For low-income neighborhoods this is more critical as the residents may lack private transportation, which leaves them at a disadvantage when attempting to achieve a healthy diet. (Moreland et al, 2002) The availability of supermarkets is shown to increase fruit and vegetable consumption among African Americans and pregnant women. (Inagami, 2006) In addition to providing a larger selection of healthy foods, supermarkets are generally less expensive than local convenience stores or neighborhood markets and more likely to accept food support vouchers.

Findings:

The development is more than ½ mile from any grocery store, supermarket, or convenience store that sells fresh foods. The development does not address the creation of a new on-site or off-site healthy food supply within ½ mile. [See Map 11: Supermarkets.] The development also is not within walking distance to a transit stop that could provide transportation to a grocery store. In

Faribault, 4% of owner-occupied households do not have access to a car and 24% have access to only one-vehicle per household.¹ For renter-occupied households, 16% do not have access to a car and 50% have access to only one-vehicle.² It is assumed that the people living in the Divine Mercy Development will have a similar access to vehicles. Households with no vehicles or only one vehicle rely on other means of transportation, such as transit, walking and bicycling, to access healthy food retailers. If there is no on-site healthy food retailer in the Divine Mercy Development a significant number of households will have limited access to healthy food. Studies have shown that limited access to healthy foods will negatively impact the health of those households. (CCPHA et al, 2008; Gordon, 2011; Inagami, 2006; Wrigley, 2002)

Recommendations:

Since the southern portion of Faribault lacks a significant fresh and healthy food source and access to healthy foods may help reduce the population’s rate of obesity, the development should consider attracting a grocer or supermarket to the neighborhood commercial area of the development. The store would serve both Divine Mercy Development residents and south Faribault residents.

Health Indicator 18:

Is the project within ½ mile of a food establishment that accepts state or federal food assistance programs, or does the project reserve retail space in a proposed project for fresh food retailers authorized to participate in state or federal food assistance programs?

Description:

It is not merely accessibility that limits consumer purchase of fruits and vegetables, but also price. The retail price for fresh fruit and vegetables increased by 118% between 1985 and 2000. (Inagami, 2006) Accessing stores that sell sufficient quantities of healthy foods and accept food stamps or other food assistance are essential for lower-income or mixed-income communities.

“There is a significant correlation between distance to a supermarket and consumption of healthy foods in lower-income populations.”

For low-income populations, following the nutritional guidelines for general health and especially for special medical needs like diabetes is difficult due to the price of healthy foods and their lack of availability. One study in East Harlem, New York found that 40% of diabetic adults surveyed did not follow recommended dietary guidelines specifically because of access and price. (Inagami, 2006) Food assistance recipients also report issues of cost and accessibility. Additionally, food assistance recipients are more likely to buy pre-packaged foods and meat – “energy dense foods” – than fresh fruits and vegetables because they will receive more calories for their vouchers. (Inagami, 2006) Fresh foods are more expensive on a calorie per dollar basis. When a person is worried about hunger he or she will be more inclined to buy the cheaper, higher calorie foods. Accessible retail space for produce and farmers markets that accept EBT and other vouchers will foster consumption of fresh foods by achieving accessibility and cost reduction simultaneously.

1 Source: 2009 American Community Survey 5-year estimates.

2 Source: 2009 American Community Survey 5-year estimates.

Findings:

The development is more than ½ mile from a food establishment that accepts state or federal food assistance programs. The development does not specifically address retail space for fresh food retailers authorized to participate in state or federal food assistance programs. [See Map 12: Food Assistance.] The population of Faribault has a poverty rate of 13.6%.³ It is assumed that the population of the Divine Mercy Development will have similar characteristics as the City overall. Persons in poverty rely on food assistance programs to obtain a significant portion of the food they eat every week. Persons in poverty may also have limited access to vehicles. Currently there is no transit provided from the Divine Mercy Development

3 Source: 2009 American Community Survey 5-year estimates.

Image 13: Community Garden

to the City where low-income households could access stores that accept food stamps.

Recommendations:

Building off of the previous indicator’s recommendations, the neighborhood commercial portion of the Divine Mercy Development should consider including a grocery store or supermarket that accepts food assistance.

Health Indicator 19:

Does the project create and maintain a community garden on-site, or provide safe access to off-site community garden resources within ¼ mile of residential or mixed-use areas?



Description:

Community gardens have multiple positive health benefits. They provide better access to fresh foods, resulting in improved nutrition for the gardeners and broader community. The act of gardening promotes increased physical activity, especially for seniors. (Wakefield, 2007) Spending time in nature, including community gardens, reduces stress and promotes other mental health benefits. (Wakefield, 2007; Armstrong, 2000; Maller et al, 2006) Community gardens can strengthen communities by promoting neighborhood pride and creating social networks. Stronger communities generally have less neighborhood crime. (Armstrong, 2000; Twiss et al, 2003)

For low-income communities, community gardens provide an affordable source of fresh foods. A study in Upstate New York found that “46% of the gardens were located in low-income urban areas. In approximately 30% of the gardens, the majority of gardeners were African American or other racial minority, or Hispanic.” (Armstrong, 2000, p.322) Additionally, community

“community gardens located in low-income neighborhoods were associated with resolving other issues in the neighborhood including crime, safety, vandalism, etc.”

gardens located in low-income neighborhoods were associated with resolving other issues in the neighborhood including crime, safety and vandalism. (Armstrong, 2000; Maller et al, 2006) Figure 5 on page 41 demonstrates the pathways of distance to community gardens and improved public health outcomes.

Findings:

Faribault has a poverty rate of 13.6%⁴, and 13.1%⁵ of their population is 65 years old or older. It is assumed that the Divine Mercy Development will have a similar population in poverty and likely a higher percentage of seniors due to the 40 units of senior housing included in the development. Both low-income and senior populations benefit most from the access to healthy foods and physical activity that community gardens provide. There are currently four community gardens in Faribault with more being pursued by local organizers and the Rice County Public Health Department. None of the existing gardens are within ¼ mile of the Divine Mercy Development, nor does the development propose the creation of community gardens within its boundaries. [See Map 13: Community Gardens.]

Recommendations:

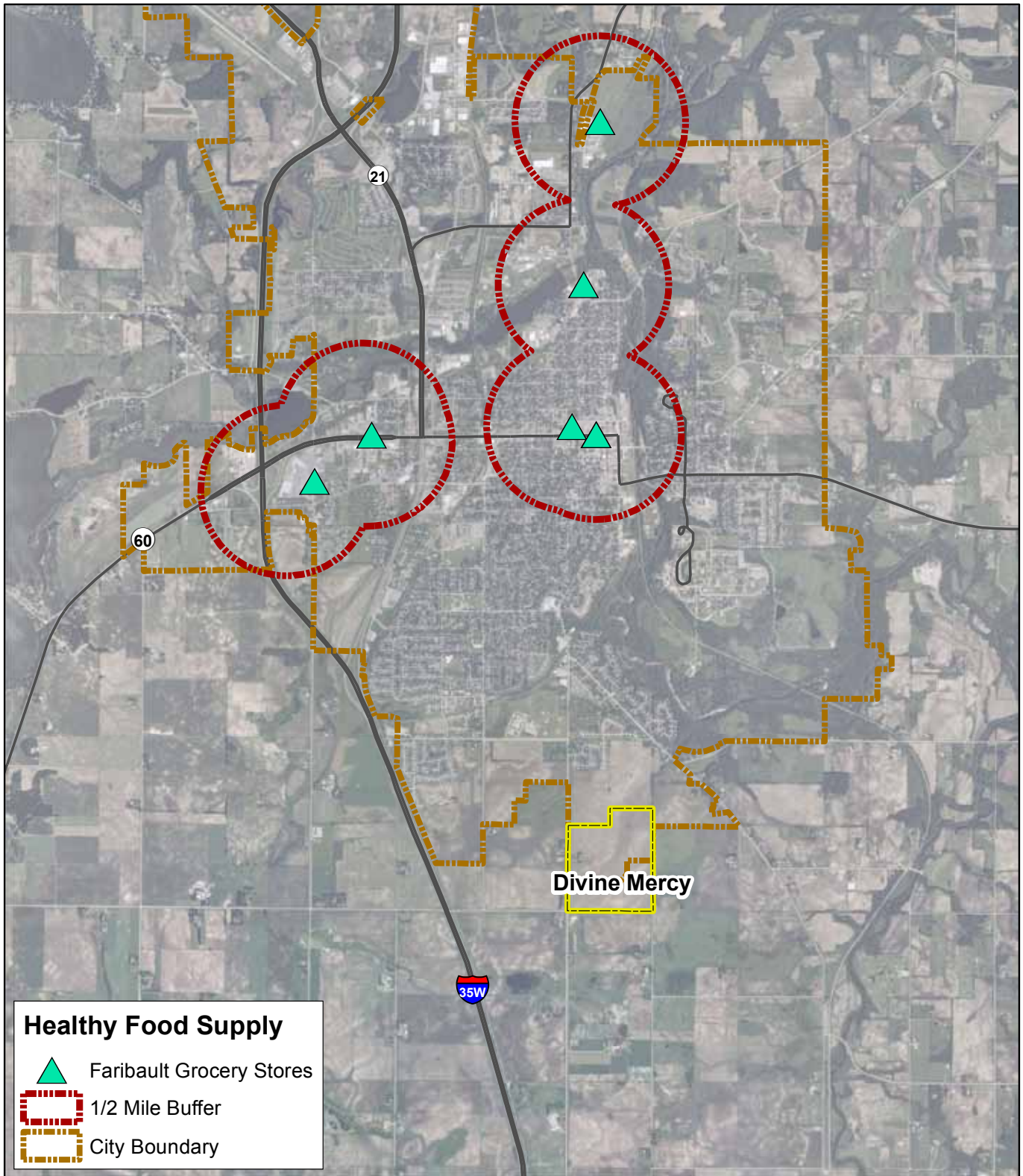
To promote the health of all residents in the Divine Mercy Development, but especially the health of low-income and senior populations, the development should consider providing space for a community garden. The community garden would be best sited close to the senior housing as it provides a positive mental and physical activity for older people. A garden in this development would likely flourish as the land is predominantly prime agricultural soil.

⁴ Source: 2009 American Community Survey 5-year estimates.

⁵ Source: 2009 American Community Survey 5-year estimates.

Map 11

Accessibility of Supermarkets/ Healthy Food Supply

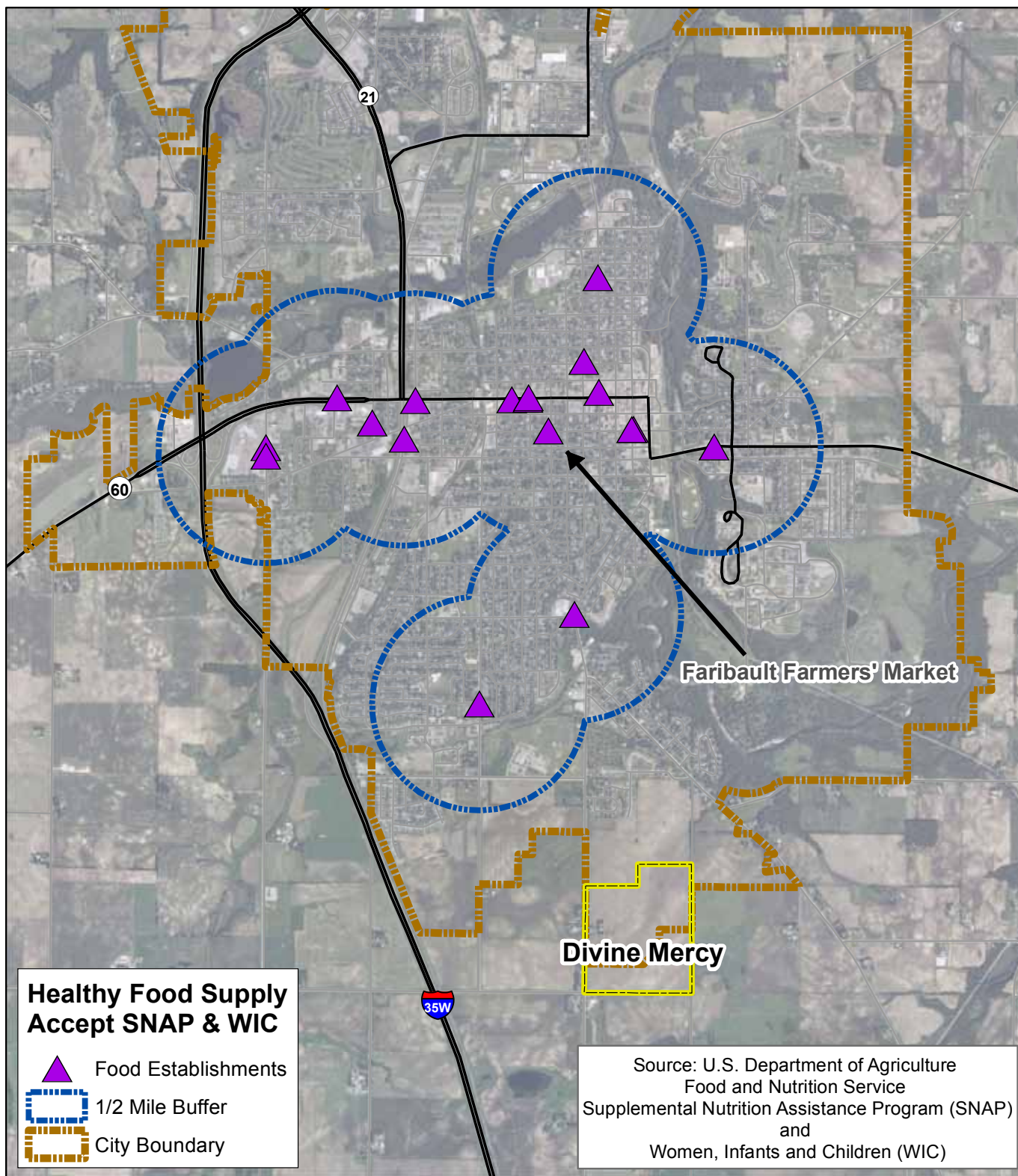


Map created August 2011
Source: Google Maps - Grocery Stores

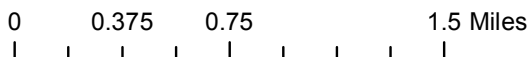


Map 12

Food Establishments that Accept Food Support (SNAP & WIC)

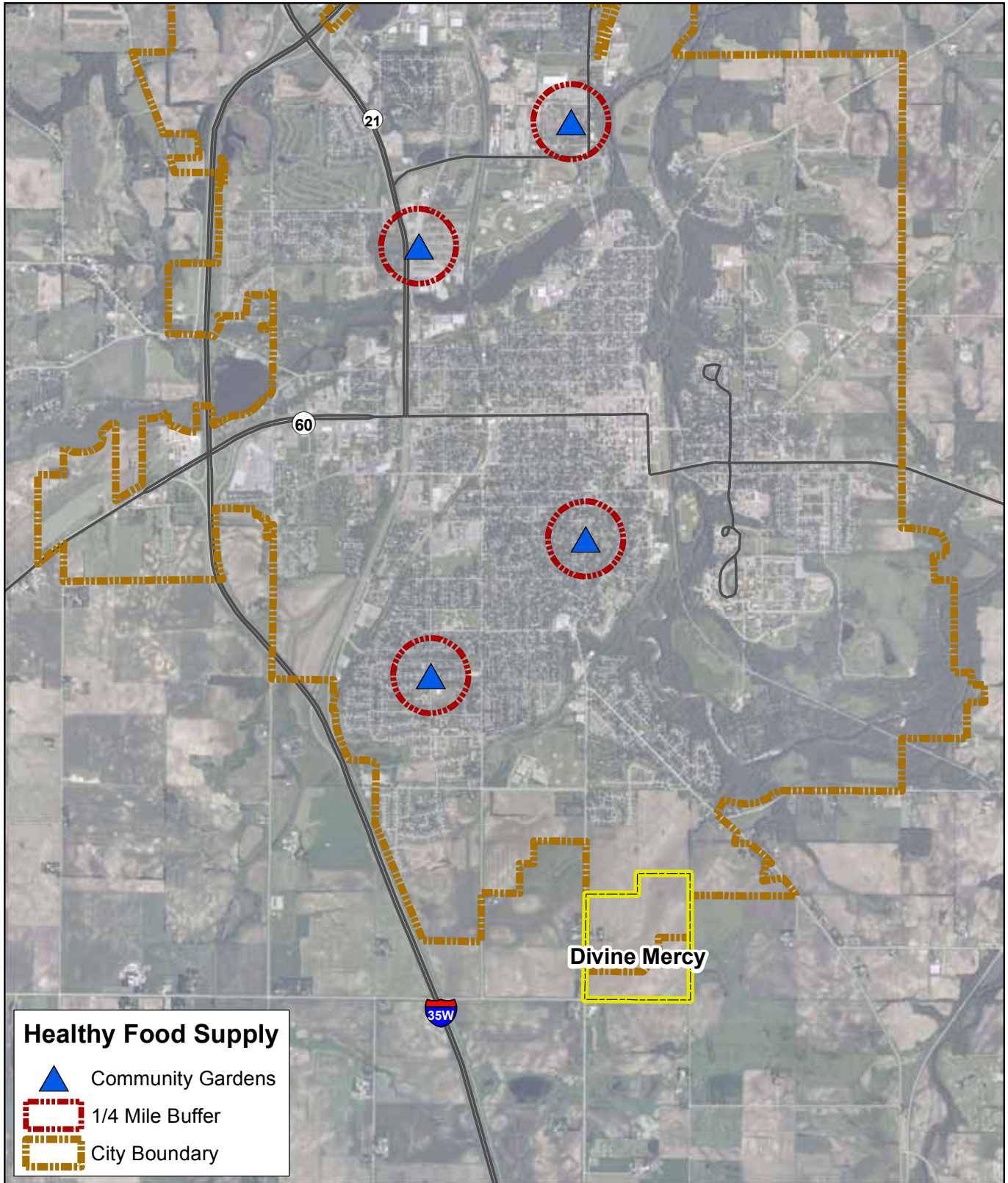


Map created August 2011

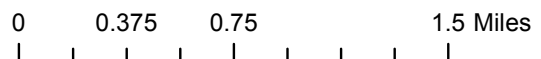


Map 13

Proximity of Community Gardens



Map created August 2011
Source: Rice County Public Health



Water

Objective:

Protect and preserve the quality of water resources through pollutant reduction, on-site treatment, and flooding prevention.

Discussion:

Storm water.

Increased development creates more impervious surfaces (e.g., roofs, roads, parking lots, etc.) that collect pathogens, metals, sediment, and chemical pollutants. These contaminants are conveyed to receiving waters as storm water runoff during rain and snowmelt events. (Gaffield, 2003) Exposures to storm water contaminated swimming and recreational areas, drinking water supplies, and fisheries can cause potential chronic and/or acute human health effects. (Pitt, 2001; Gaffield, 2003) Storm water runoff volumes have been shown to increase linearly with increased impervious surface areas. Increased imperviousness also has been shown to lead to higher flood peaks. (Gaffield, 2003)

Floods.

Flooding can be caused by storm surges, climate variability, terrain, drainage systems, infrastructure, and increased runoff. (WHO, 2002) Possible health outcomes from flooding can include loss of life, displacement, diseases (e.g., malaria, diarrhea, and other waterborne diseases), infrastructure destruction (e.g., land transport systems, buildings, power supplies, etc.) and disruption of crop production. (WHO, 2002) A summary of the potential impacts of floods and possible human health effects are shown in Table 5.

Climate and land use changes have the potential to contribute to increased flood risks and associated health burdens. (Ahern, 2005) Under future climate conditions, altered patterns of precipitation are expected to increase the frequency and intensity of floods. (Ahern, 2005) Coupled with increased impervious surfaces that result in greater rates of runoff, flooding events in Minnesota are likely to increase in both frequency and intensity.

Health Indicator 20:

Is the project located at a distance greater than 100 ft from existing shorelines of water bodies -- seas, lakes, rivers, streams and tributaries? If the project is located within 100 ft from existing water bodies, are there existing or planned vegetated buffers along all water bodies (preferably 20m to 50m) to prevent non-point pollution from impervious surfaces?

Description:

The use of vegetated buffers protects water quality because these buffers absorb soil, fertilizer, pesticides, and other pollutants in storm water runoff before they can reach water bodies. (NOAA, 2011) Vegetated buffers filter as much as 75 to 100% of sediment, capture nutrients, degrade pollutants into less toxic forms, and remove up to 60% of some pathogens. (Grismer et al, 2006) Removal of these pathogens and pollutants can reduce exposure to storm water contaminants in water bodies used for recreation, fisheries, or drinking water sources.

Findings:

There are no water bodies located within the project site.

Recommendations:

There are no recommendations because the site does not contain any water bodies.

Image 14: Loring Pond Vegetative Buffer



Table 5: Effects of floods on human health

Direct effects	
Causes	Health implications
Stream flow velocity; topographic land features; absence of warning; rapid speed of flood onset; deep floodwaters; landslides; risk behavior; fast flowing waters carrying boulders and fallen trees	Drowning Injuries
Contact with water	Respiratory diseases; shock; hypothermia; cardiac arrest
Contact with polluted waters	Wound infections; dermatitis; conjunctivitis; gastrointestinal illnesses; ear, nose and throat infections; possible serious waterborne diseases
Increase of physical and emotional stress	Increase of susceptibility to psychosocial disturbances and cardiovascular incidents
Indirect effects	
Causes	Health implications
Damage to water supply systems; sewage and sewage disposal damage; Insufficient supply of drinking water; Insufficient water supply for washing	Possible waterborne infections (enterogenic E. coli, Shigella, hepatitis A, leptospirosis, giardiasis, campylobacteriosis); dermatitis and conjunctivitis
Disruption of transport systems response	Food shortage; disruption of emergency
Underground pipe disruption; dislodgment of storage tanks; overflow of toxic-waste sites; release of chemicals; disruption of gasoline storage tanks may lead to fires	Potential acute or chronic effects of chemical pollution
Standing waters; heavy rainfalls; expanded range of vector habitats	Vector borne diseases
Rodent migration	Possible diseases caused by rodents
Disruption of social networks; loss of property, jobs and family members and friends	Possible psychosocial disturbances
Clean-up activities following floods	Electrocutions; injuries; lacerations; skin punctures
Destruction of primary food products	Food shortage
Damage to health services; disruption of “normal” health service activities	Decrease of “normal” health care services, insufficient access to medical care
Source: Menne, et al. 2000. Floods and public health consequences, prevention and control measures (MP.WAT/SEM.2/1999/22)	

Health Indicator 21:

Protect floodplain functions: is the project site located within 100- and 500-year floodplains?

Description:

A 100-year flood event has a 1% probability of being equaled or exceeded in one year. A 500-year flood event has a 0.2% probability of being equaled or exceeded in

one year. (Watson and Adams, 2011) Future climate conditions are anticipated to result in increased frequency and intensity of floods. Construction within designated floodplains can reduce the effectiveness of these areas in containing flood water. Additionally, construction in these areas is more susceptible to impacts from flood events. People living in flood-plain areas will be at increased risk for flood-related human health impacts, such as injuries, drowning, and other health issues as outlined in Table 5.

Findings:

As shown in Map 15: Floodplain – Flood Hazard, the Divine Mercy Development is not located within a 100- or 500-year floodplain.

Recommendations:

Since the development is not within a flood plain, there most likely will be no additional health risks related to floods. No recommendations are suggested.

Health Indicator 22:

Manage storm water on site: can the project pre-treat and infiltrate a 50-year storm (or greater) as applicable per site conditions?

Description:

Infiltration of storm water runoff can compensate for some of the loss of infiltration that results from increased impervious surfaces. Increased impervious surfaces reduce groundwater recharge, and storm water infiltration can minimize the potential resulting impacts to groundwater quantity reductions. Reductions in groundwater quantity can threaten available drinking water supplies. However, urban storm water has potentially high concentrations of pollutants that may require some pre-treatment prior to infiltration. (Pitt, 1994) Pre-treatment of storm water runoff can reduce potential degradation to groundwater quality, maintaining the integrity of groundwater as a drinking water source.

Findings:

As indicated in the EAW, the development's five proposed storm water detention ponds will be designed to accommodate flow rates for up to 100-year rainfall events and will include pre-treatment measures. A 100-year rainfall event in south and central Rice County is 6.1 inches in 24 hours. (Minnesota Hydrology Guide) Some runoff detained in these ponds may be infiltrated, but the EAW indicates that ultimately this runoff will be discharged into the Straight River. It is unknown if the development will infiltrate a 50-year rain event (or greater). A 50-year storm event is 5.45 inches in 24 hours. (Minnesota Hydrology Guide)

“People living in flood-plain areas will be at increased risk for flood-related human health impacts, such as injuries, drowning, and other health issues.”

Recommendations:

In addition to storm water detention ponds, the development should consider incorporating other storm water management features designed to infiltrate rather than collect storm water. Infiltration features may include rain gardens.

Health Indicator 23:

Do proposed impervious surfaces exceed 10% of total site surface area?

Description:

Degradation of water quality in receiving water bodies begins when impervious surfaces exceed 10% and is unavoidable when impervious surfaces exceed 30%. (Arnold & Gibbons, 1996) When impervious surfaces exceed 10% impacts may include reduced groundwater recharge, increased frequency and size of flood events, and increased contamination. (Center for Watershed Protection, 2003) According to Jackson (2003), watershed imperviousness should not exceed 10-15% in order to ensure the quality of groundwater, which is a common source of public drinking water.

Findings:

Based on Map 16: Impervious Surfaces, the development plans to build over a primarily pervious site with impervious surfaces. The proposed impervious surfaces will exceed 10% of the surface area of the site. Faribault requires that post-development runoff rates do not exceed pre-development rates. To decrease peak runoff rates and provide preliminary pre-treatment of storm water runoff resulting from the increase in impervious surfaces, the EAW proposes five on-site storm water ponds. Therefore, although the development will exceed 10% impervious surfaces, impacts are anticipated to be mitigated via the proposed storm water ponds.

Recommendations:

No further recommendations.

Health Indicator 24:

Are site development reviews (including site conditions, management practices, minimized grading/vegetation removal) provided for developments within 1,000 ft of wells?

Description:

Provision of a buffer around a well serves to protect public health and safety by minimizing contamination of aquifers and preserving and protecting existing and potential sources of drinking water supplies. (EPA, 2011) Delineation of an appropriate buffer will vary depending on hydrogeological conditions and vulnerability of the well. (MDH, 2009) The U.S. Environmental Protection Agency (EPA) indicates that the area within 1,000 ft of a well is a drinking water critical impact zone and recommends regulating land use within this zone. (EPA, 2011)

Findings:

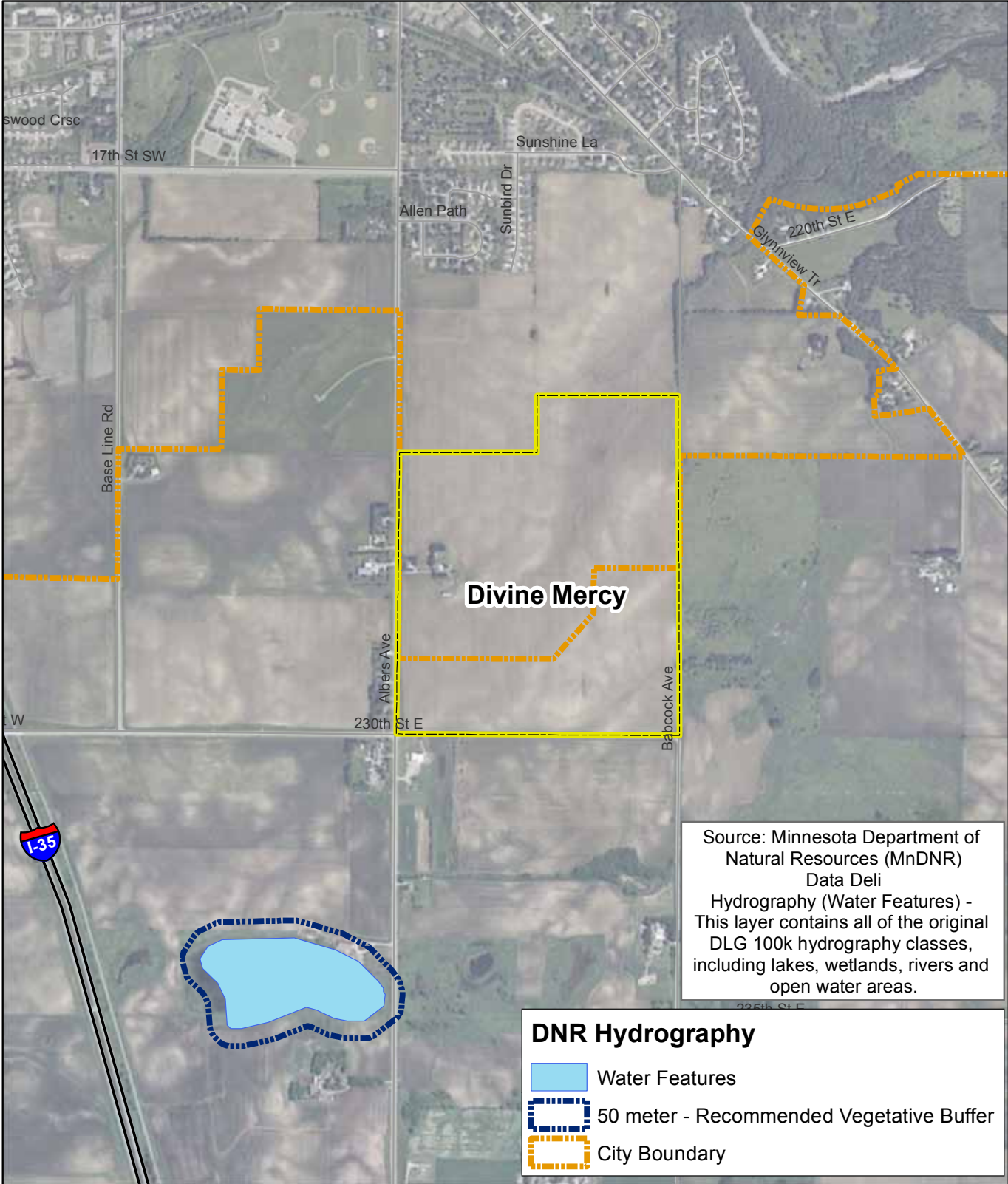
As shown in Map 17: Public Wells, the southwest corner of the development is located within 1,000 ft of a well. Commercial land uses are proposed in this area. Some commercial uses are prohibited within a drinking water critical impact zone. The commercial uses proposed in this area should be reviewed and potentially regulated

to exclude those uses listed by the EPA as prohibitive within 1,000 ft of a well (e.g., gas stations, dry cleaners, underground storage tanks, etc.).

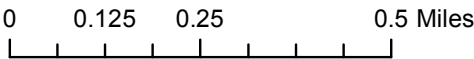
Recommendations:

Since it is unknown what uses will be proposed within the drinking water critical impact zone, health effects cannot be predicted; however, it is recommended that a review of the commercial uses proposed in this area be conducted. Uses should exclude those listed by the EPA as prohibitive within 1,000 ft of a well (e.g., gas stations, dry cleaners, underground storage tanks, etc.).

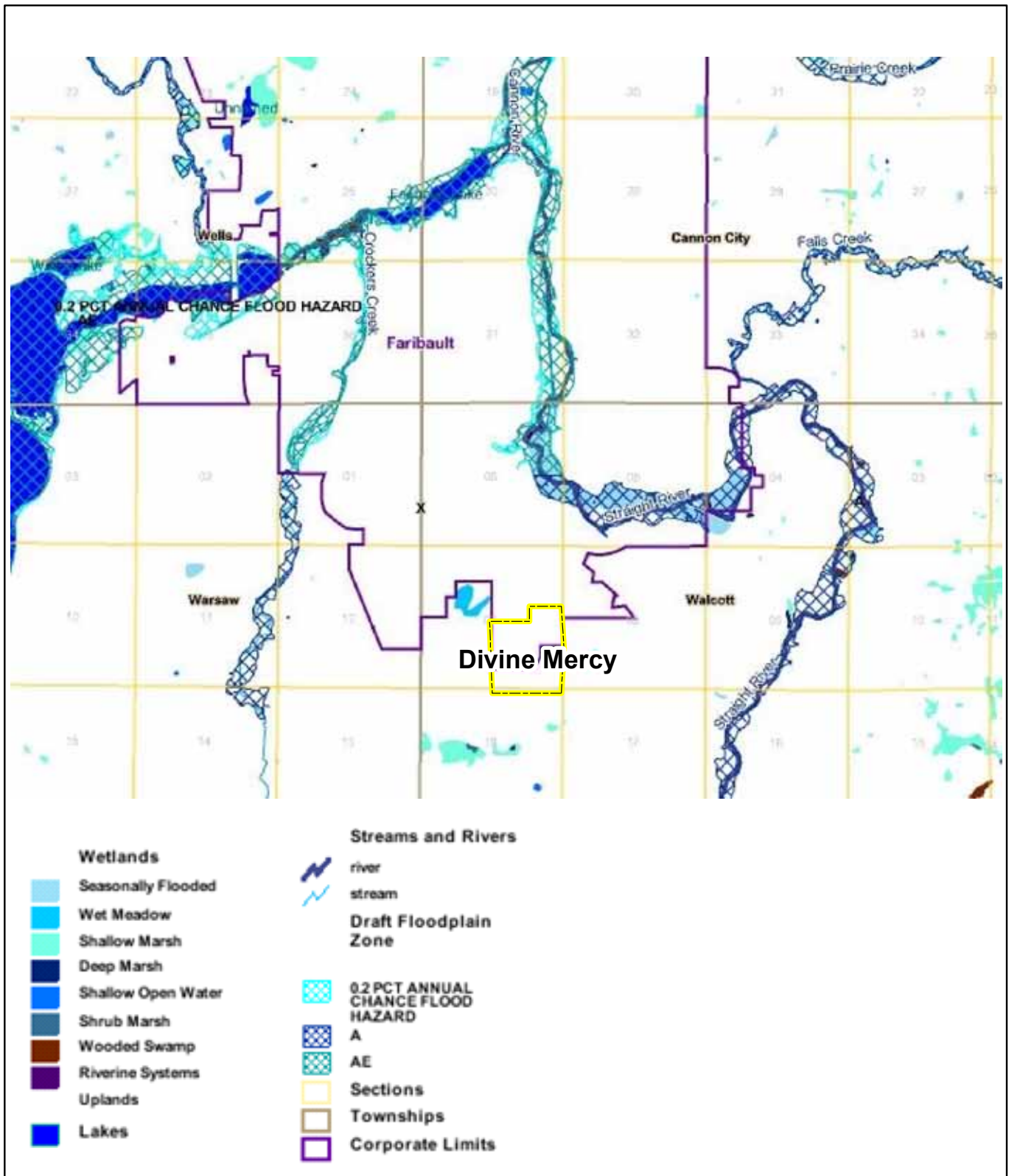
Map 14 Vegetative Buffer Along Water Bodies



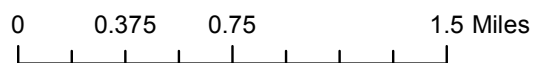
Map created August 2011



Map 15 Floodplain - Flood Hazard

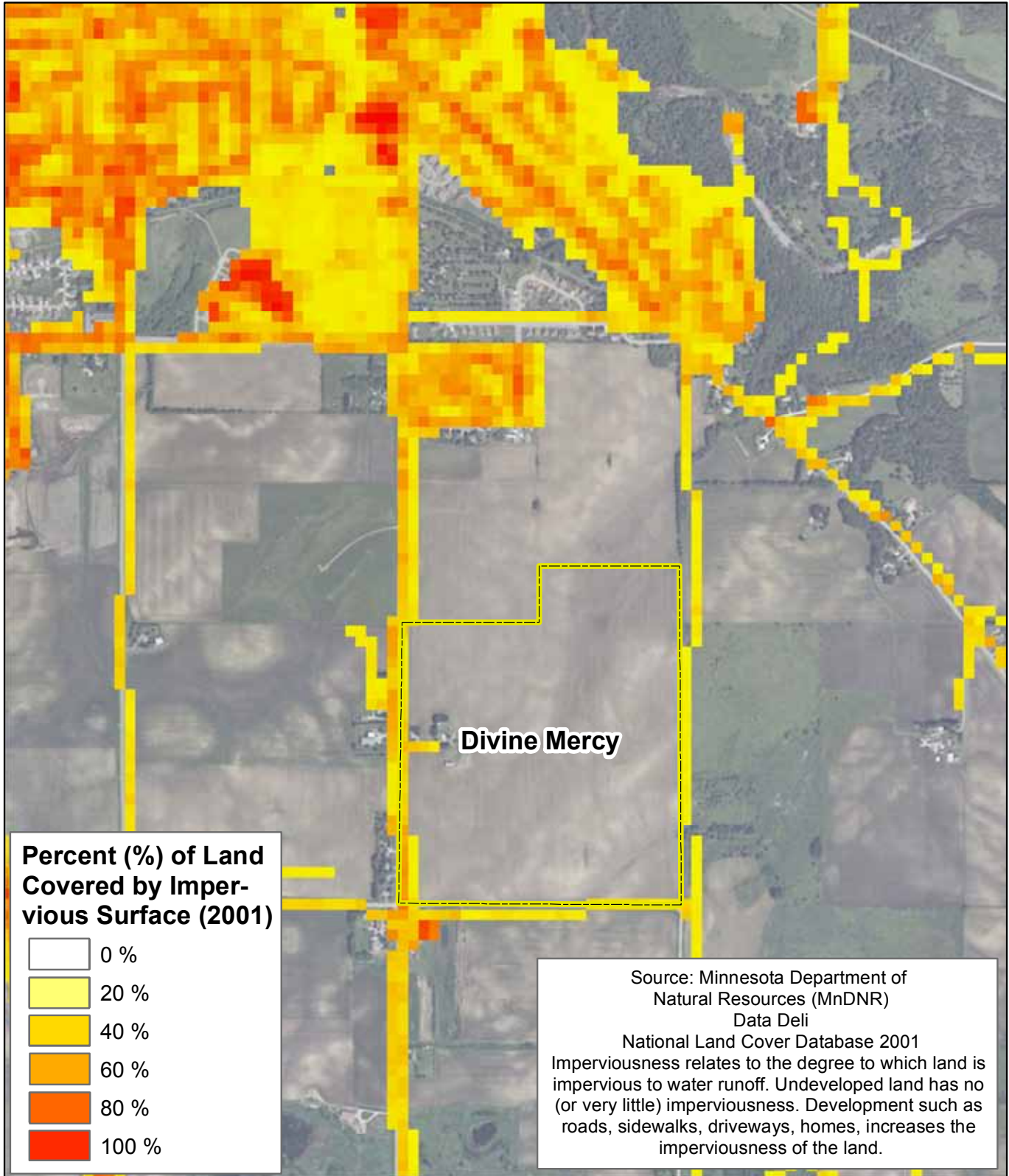


Map created August 2011
 Source: Image taken from Beacon-Schneider Corporation GIS website for Rice County, August 11, 2011

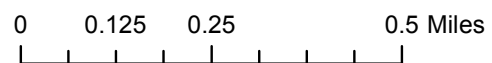


Map 16

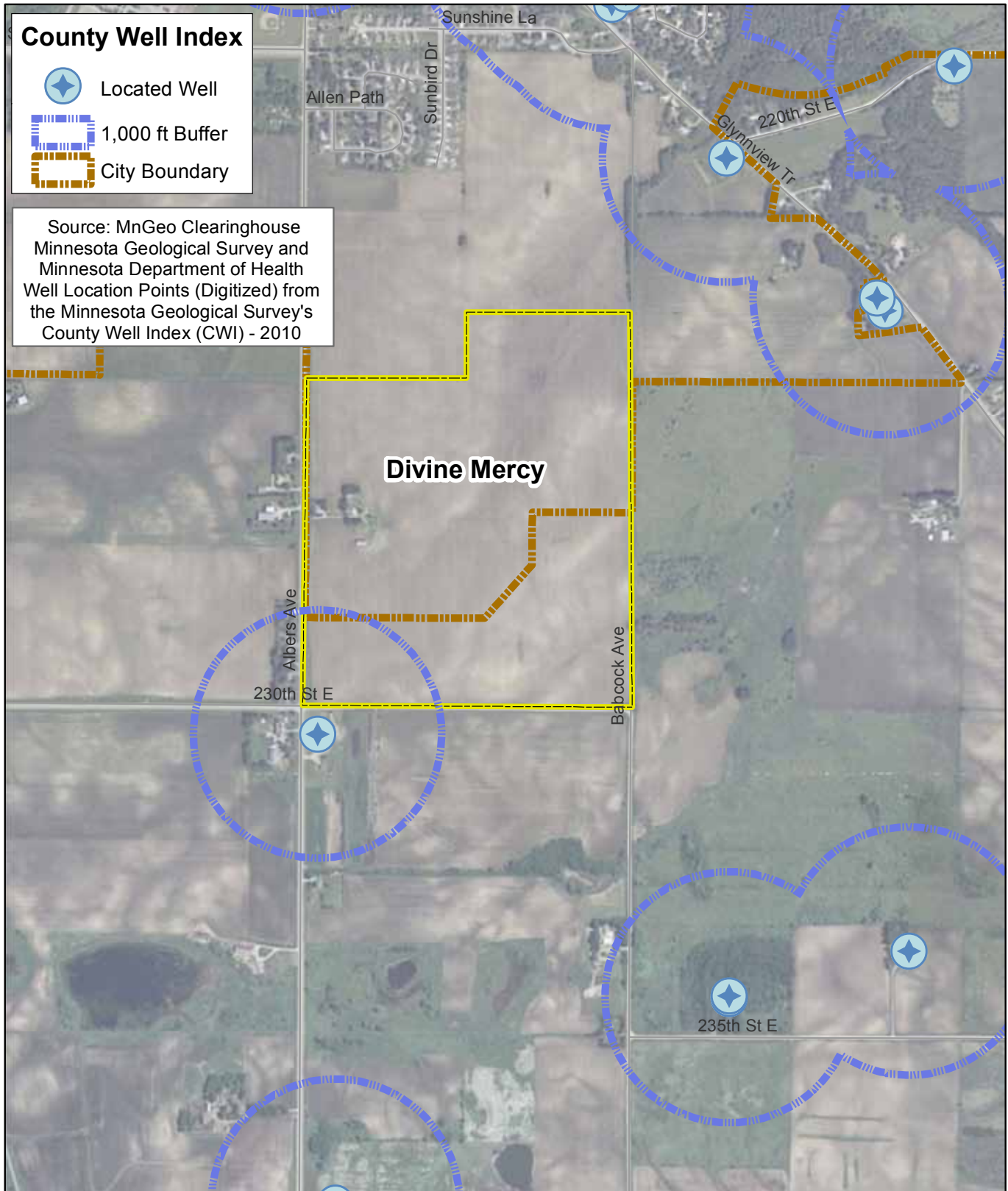
Pervious (Vegetation) v. Impervious Coverage



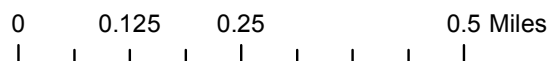
Map created August 2011
Areas of development shown by aerial map are presumed to have been developed since 2001 National Land Cover Database Impervious Surface shapefile



Map 17 Located Public Wells



Map created August 2011



Noise

Objective:

Maintain safe levels of community noise.

Discussion:

Noise, or any unwanted sound, is a physical and psychological stressor that stimulates the nervous and endocrine systems and can cause adverse health effects. (Braubach, 2011) An adverse health effect from noise exposure is any short- or long-term deterioration in physical, psychological or social functioning. (Berglund, 1999) Adverse health effects from environmental noise may include hearing impairment, sleep disturbance, and cardiovascular, physiological and mental health effects. (Berglund, 1999) Road traffic noise has been identified as a significant risk factor for ischemic heart diseases. (Braubach, 2011) Vulnerable populations (e.g., the elderly, persons with existing health conditions or disabilities, and children) are particularly at risk from excess noise. (Berglund, 1999)

The State of Minnesota has established noise standards to preserve public health and welfare. For residential areas, nighttime noise levels must be lower than 55 decibels to meet speech, sleep, annoyance, and hearing conservation requirements. (Minnesota Rule 7030.0040)

Health Indicator 25:

Where ambient nighttime noise levels are >55 decibels do residential projects mitigate interior noise levels?

Description:

The World Health Organization's threshold for the onset of negative health effects from environmental noise is 55 decibels (Berglund, 1999). Acceptable indoor noise levels are <35 decibels (Berglund, 1999). Indoor noise from outdoor noise sources such as neighbors and traffic will not usually result in hearing loss but may cause annoyance and sleep disturbance and possibly other long-term health outcomes. Improved sound insulation can reduce exposure to outdoor noise and this may reduce impacts. (Braubach, 2011)

“Adverse health effects from environmental noise may include hearing impairment, sleep disturbance, and cardiovascular, physiological and mental health effects.”

Findings:

While there has been no monitoring onsite, the project site is currently used for agricultural purposes and is primarily open fields. The project will increase activity, population, and traffic on and around the site. Therefore, noise levels will most likely increase from existing conditions both during construction and upon project completion. Nighttime noise levels in urban/suburban areas are typically 40 decibels (California Department of Transportation, 1998). Therefore, nighttime noise levels in the proposed residential areas are not likely to exceed the identified threshold of 55 decibels.

Recommendations:

Since noise levels are not expected to exceed thresholds of safety, MDH has no recommendations at this time.

Safety : Access to Emergency Services

Objective:

Promote safety of population within project area.

Discussion:

The health of the public is best protected through preventative measures like diet, exercise, and routine doctor visits. However, emergencies still arise that require quick medical response. Emergencies can be medical, fire related, safety related or a combination. Populations that are more vulnerable to emergency situations include those who are elderly, sick, or disabled; those who have difficulty accessing medical care; and persons that live in older, crowded homes that may not meet building codes, or newer homes where smoke detectors or sprinkler systems do not function properly. (USFA, 2004; USFA, 2008) In rural and suburban areas where distances to services are greater, residents are generally at greater risk of mortality because of the increased time it takes for emergency responders to reach patients. (Jackson, 2003) In urban areas, buildings with 10 or more stories can increase the time interval from arriving on-site to arrival at the patient's side. (Silverman, 2007)

Health Indicator 26:

Is the project within a five minute response time from a nearby fire station (or other emergency response service)?

Description:

Research studies have shown that for patients with intermediate or high risk of mortality, emergency medical response times within four to five minutes improved survival rates. (Blackwell, 2002; Pons, 2005) Between five and 10 minutes, there is no statistically significant difference in survival rates. (Blackwell, 2002; Pons, 2005)

Findings:

Faribault does not have a policy or an ordinance requiring a maximum response time for the fire department or for North Memorial, the area's Advanced Life Support (ALS) provider. (Berg, 2011) The project is approximately 2.8 miles from the Faribault fire department and similarly distanced to the closest hospital. The estimated drive-

“Research studies have shown that for patients with intermediate or high risk of mortality, emergency medical response times within four to five minutes improved survival rates.”

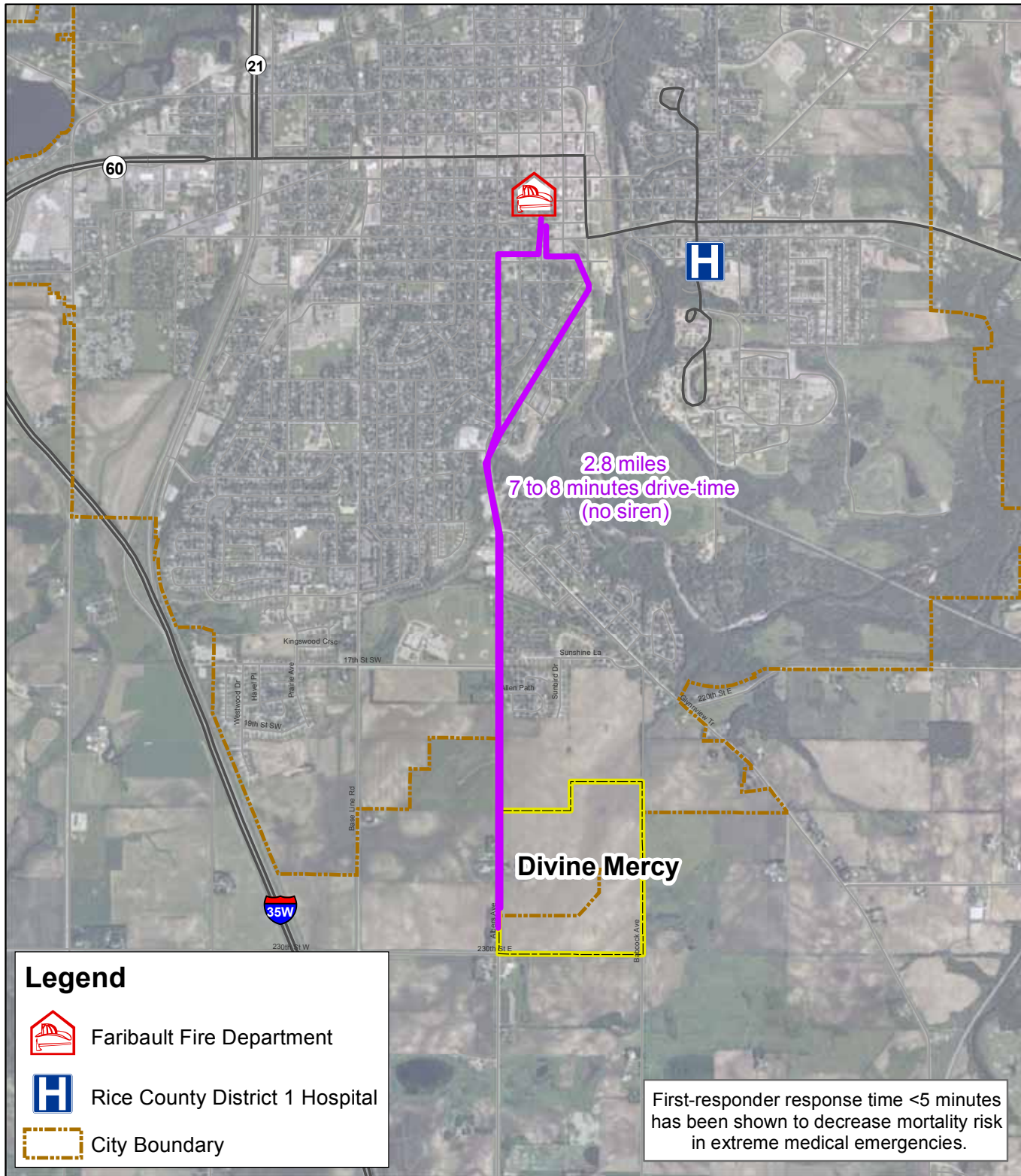
time without a siren is 7 to 8 minutes. Drive-time with a siren was indeterminable but likely less than 7 minutes. [See Map 18: Fire Safety.]

Recommendations:

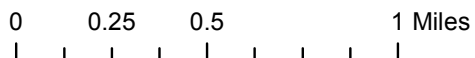
No recommendations.

Map 18

Distance to Emergency Medical Services Fire Station & Hospitals



Map created August 2011



+ Recommendations Review:

This section summarizes the recommendations provided throughout the indicator assessment and describes the links between the health categories and indicators. MDH reviewed health indicators related to the Divine Mercy Development in 10 health categories: air quality, land development, parks, trees and vegetation, transportation, housing, food, water, noise, and safety. Several of the health indicators are related. Thus, performing well on one health indicator may enhance or impede another health indicator. For example, compact, mixed-use development within the land development health category encourages physical activity and also increases land available for parks and food.

Air Quality

The Divine Mercy Development did not pose a significant threat to public health from air pollution according to the two indicators that MDH reviewed. The development is far enough away from major roads that it should not be adversely impacted by pollutants from vehicles traveling on Interstate 35W. The feedlot near the southwest corner of the development is potentially buffered by proposed commercial development. It is unknown if the feedlot will become a nuisance in the future. Therefore, MDH recommends monitoring the feedlot for air quality issues, so that action can be taken if necessary.

Land Development

Divine Mercy's proposed land development is healthy in a number of ways, but more strategies could be employed to potentially benefit public health. The planned cluster of mixed land uses encourages walking and use of alternative transportation to access the proposed mixed uses. Trips taken by bike or foot versus automobile save energy, do not emit pollutants and GHG, and increase physical activity. Providing a mix of uses does not guarantee active living; providing destinations and pedestrian infrastructure, such as sidewalks and trails, also are necessary to encourage walking. Walkability could be further enhanced by increasing residential density. The development is overwhelmingly low density residential and is inadequate to support public

transportation. The Divine Mercy Development may want to consider increasing the density of the development and clustering activities more closely together. The majority of the development builds over prime farmland, which is essential to local food production. The tighter the cluster of development, the more walkable the community and the more land is preserved for open space and agricultural uses.

Parks

Although tighter clustering and increased density could improve the project from a public health standpoint, the Divine Mercy Development does allow for a suitable amount of park acreage. The development exceeds the standard of 10 acres per 1,000 population and provides park space within ¼ mile of all proposed residential areas. Currently, the development does not provide any nearby recreational facilities or linkages to a large park and trail system at the northeast corner for the site. The Divine Mercy Development may want to consider building a recreation facility and including trails that link the residential and commercial areas with the River Bend Nature Center park and trail system.

Trees and Vegetation

The Divine Mercy Development should consider developing a tree planting plan that aims to provide the recommended 40% tree canopy coverage for residential and commercial areas of the site. The recommended tree canopy will provide many benefits to communities, including lowering air temperatures, mitigating climate change, reducing air pollution, enhancing water quality, and providing psychological, physiological, and quality of life benefits.

Transportation

Transportation has not been adequately addressed within the Divine Mercy Development. Public transportation is not located within ¼ mile of the residential development. Public transportation is particularly important to seniors so that they are able to access goods and services within Faribault. Since the project plans for 40 units of senior housing, the development should consider providing bus service for residents, especially for those most in need of

public transit. Although the development contains mixed uses, it is unlikely that the commercial uses will meet all the needs of the development's residents, which further reinforces the need for public transit. The project also should consider trails, sidewalks and other pedestrian-friendly linkages both to the commercial areas of the site and to other trails to increase access to a variety of destinations, including recreation.

Based on the review of MnDOT data, the most hazardous intersection near the site is at the intersection of 230th Street and Babcock Avenue. This intersection should be monitored during and after the development's construction to see if road/intersection enhancements should be made to prevent traffic accidents. Additionally, future accidents should be tracked in the development to identify problem so that safety improvements can be implemented.

Housing

The Divine Mercy Development does not result in a loss of public or rent-controlled housing, and there will be a net gain of housing, with 11% dedicated to seniors. However, it is unknown if the development will provide rent-controlled or affordable residential units to persons at or below the median household income. Also unknown is the percent mix of ownership and rental units. To ensure a healthy mix of housing, at least 20% of units should be owner-occupied and at least 20% of units should be rental. Additionally, the Divine Mercy Development may want to promote a stronger, more diverse community through ensuring that at least 50% of the rental housing is affordable to persons at or below the median household income.

Food

Access to healthy food promotes better nutrition and community health. The Divine Mercy Development is more than ½ mile away from any supermarket that sells fresh foods, and the project does not address creation of a new healthy food supplier. As noted earlier, the project also does not provide transportation into Faribault so that residents can access healthy foods. The development should consider attracting a grocer to the site. This would

improve availability of healthy foods and encourage walking to the store versus driving. Additionally, the grocer should accept state and federal food assistance programs to ensure the residents have the ability to purchase healthy foods. If a grocery store is not located on site, public transportation should be provided so that people without a car can obtain healthy foods. The Divine Mercy Development also may want to consider setting aside land to develop community gardens. Community gardens not only provide access to healthy foods, they increase physical activity and promote community engagement.

Water

The Divine Mercy Development planned for water quantity and quality issues. The site is not located near any water bodies that need protecting, and the site is not located within a 100- or 500-year flood plain. The developers proposed five storm water detention ponds to accommodate rain for up to a 100-year rainfall event. It is unknown how much of the rainfall will be pretreated before it is discharged into the Straight River. To improve water quality, the storm water detention ponds should be designed to pre-treat and infiltrate a 50-year rainstorm. Although the impervious surfaces will exceed 10% of the total site area, the storm water ponds should prevent the post-development runoff rates from exceeding the pre-development rates. The project is located within 1,000 feet of a well, so land uses within this critical zone should be reviewed to ensure that development will not impact the drinking water from the well.

Noise and Safety

MDH does not have any recommendations regarding noise and access to emergency services. There has not been any noise monitoring on the site, but since the development is fairly standard, it is predicted that the noise levels will not exceed the recommended nighttime noise levels of greater than 55 decibels. The site is approximately 2.8 miles from an emergency response service. It is unknown if drive-time with a siren would be within five minutes, but given the close proximity of the service, MDH would not recommend any additional services.

Indicators Summary

Of the 26 health indicators assessed in this HIA, only the following 12 were addressed by the Divine Mercy Development EAW: health indicators #1, #2, #5, #6, #7, #9, #14, #15, #22, #23, #24, and #25. The EAW addressed health indicators at differing levels of completion. The EAW addressed the health indicators by doing one or more of the following: 1) mentioning the subject of the health indicator, 2) describing the environmental impacts of the health indicator, and/or 3) addressing the health concerns of the health indicator. Only one indicator (health indicator #5) was fully addressed in the EAW (i.e., the subject, the environmental impacts, and the health concerns were addressed). Health indicator #5 asks: Does the project minimize fragmentation and development of agricultural, forest, wildlife and high quality open space lands? In the cumulative effects section of the Divine Mercy Development EAW, the proposer acknowledges the competing issue of balancing development with agricultural needs, open space and natural resources.

Of the remaining 11 indicators, four describe the environmental impacts in detail, but do not address the health concerns of the health indicator. For example, two health indicators in the Water category, stormwater management and public wells, are described in great detail but the proposer does not mention that providing stormwater management strategies and mitigating water contamination are important to preserving water quality for public health. The remaining seven barely address the subject of the health indicator. For example, the estimation of traffic emissions includes the number of vehicles and average emissions per vehicle, but there is no mention of where the emissions occur – on or off the project site – or if the emissions will be generated near sensitive uses.

In summary, the health indicator categories of air quality, water, and noise were analyzed for environmental impacts or general requirements in the EAW, but not necessarily for health impacts. The health indicator categories of housing, food, and safety were almost entirely absent from the EAW. The health categories of transportation,

parks, land development, and trees and vegetation were discussed but not thoroughly analyzed from a health perspective.

MDH acknowledges that the additional work required to include a thorough analysis of all 26 health indicators may be substantial; however, much of the information needed to analyze some of the health indicators are already collected within the EAW, such as determining impacts on water resources. Indicators, such as proximity to grocery stores, community gardens, etc., would require additional data gathering, but would not be onerous. Developing a planting plan or integrating sidewalks and trails into project design would take additional time and money. However, integrating these kinds of healthy features at the beginning of the design phase is much more cost effective than trying to retrofit a development at a later date. A developer would need to weigh the additional cost of meeting some of the health indicators with the benefits of improved public health and the marketing opportunities provided by creating a “healthy development.”

In addition to this HIA on the Divine Mercy project, MDH is preparing a second report that will draw upon available information as well as lessons learned from this pilot project to provide recommendations on how to efficiently and effectively include health and climate change analysis in the EAW.

+ HIA Step 5: Reporting

MDH will report the findings of this HIA in a number of ways. First, MDH will provide the HIA and its findings to the Divine Mercy Development to inform them of possible actions to improve health for future residents. As a grant deliverable, MDH also will submit this document and a second paper describing incorporation of health and climate change indicators into the EAW to CDC. Additionally, MDH will submit both the HIA and the EAW papers to the EQB for its review and consideration.

+ Limitations and Conclusions

This was a desktop HIA based on information found within either the completed Divine Mercy Development EAW or from available published research and data. The HIA process did not involve any stakeholders, and thus did not contain any input from people involved in the development, nor does it include the sixth step of the HIA process: monitoring and evaluation.

Research on the health indicators was based primarily on a review of available scientific literature that was corollary in nature and could not prove causation. The HIA provided possible direction of a health impact, but was unable to determine magnitude and likelihood of impact. Most of the indicators were based on best-practices with correlational research to justify the indicator.

The health and climate change indicators were selected by MDH staff. Had the community been involved in the scoping process, community input and concerns would have guided the selection of the health indicators and may have reduced the number assessed, potentially resulting in reducing the required analysis time. The 26 health indicators within this report provided a broad overview of health issues and did not address known community-specific concerns. Community-led processes promote buy-in of a project and serve to influence the developer and responsible government unit according to the issues and values of the community.

The pilot project did not assess the actual time and cost it would take the developer to include all the features recommended within this report in the development. Estimating the cost for building supplies, workforce, and other expenses was out of the scope of this HIA. Also, it is unknown if meeting one health indicator versus another health indicator would be more cost-effective and/or have more of a positive health impact. The purpose of the HIA was to provide general recommendations that have been shown through existing research and MDH expertise to

promote health; it was not to determine which health indicators are more important to promoting health.

Since this was a pilot project intended to inform the EAW, MDH will not be monitoring the impact of the HIA on the Divine Mercy Development. MDH will monitor the final recommendations to the EQB regarding incorporating health and climate change analysis into the EAW.

MDH acknowledges that examining only one type of project does not provide sufficient information to discover all of the public health impacts of the different EAW projects. However, the process of conducting an HIA and/or including health and climate change indicators in the EAW does add value to both the environmental review process and the development under review. This pilot project is just one example of how a mixed-use project EAW could benefit from implementing an HIA. Raising the awareness of health and climate change issues to the government, the developer and the community promotes the development of healthier communities.

Appendix A

<i>EAW Projects Public-Noticed in Fiscal Years 2008, 2009, & 2010 (by Category)</i>			
Category	FY08/09	FY10	Total
Air pollution	1	-	1
Airport	5	-	5
Campground	7	3	10
Commercial	18	7	25
Communication tower	-	2	2
Feedlot	25	2	27
Fuel conversion	6	-	6
Highway	27	1	28
Historical places	1	3	4
Land use conversion	1	-	1
Landfill	5	2	7
Marina	3	1	4
Metallic	1	1	2
Mixed use	8	-	8
Natural areas	1	-	1
Nonmetallic	18	5	23
Other	1	-	1
Other discretionary	1	-	1
Public waters	16	2	18
Recreational trail	5	2	7
Residential	18	2	20
Solid waste	1	1	2
Sports facility	1	-	1
Storage facilities	2	1	3
Streams & ditches	4	3	7
Transmission lines	8	3	11
Water appropriation	1	-	1
Wind farm	1	-	1
Wastewater treatment facilities	12	2	14
Total	198	43	241

Appendix B

<i>Screening Mixed Use EAWs</i>			
	Name of Project Reviewed: Divine Mercy Catholic Church Development		
	Date of Project: July 2007		
	Reviewer: Michele Ross, April 2011		
	Part 1: Is it of enough significance to assess?	No	Uncertain Yes
	[Note: Point values vary]		
1	Geographical extent: Does it apply to a geographic area of a full city block or larger (i.e., 5 acres or 2 hectares)?		2
	<i>Notes: The project site is 181 acres.</i>		
2	Reversibility: Will the changes be difficult or expensive to reverse once put in place?		2
	<i>Notes: Project will result in the conversions of agricultural uses to residential and commercial uses that will be expensive to implement.</i>		
3	Population size: Does it substantially increase the residential population or workforce of any area of 100 acres or more (e.g. an increase greater than 33%)?		2
	<i>Notes: Project will increase population by ~915 persons (366 units X ~2.5 persons per household) and will provide ~602 jobs (150,500 x 400 jobs per 100,000 sf). Total Faribault population is ~23,000, however, current site population is small and site would be annexed.</i>		
4	Cumulative impact: Is it occurring in a place where specific local health problems have been identified (e.g. traffic safety, air quality, lack of healthy foods, contaminated brownfield)?		1
	<i>Notes: Site contamination is not anticipated, however, previous agricultural uses may result in some contamination issues.</i>		
5	People affected: Does the project or plan affect vulnerable groups (e.g. children, older people, and people with low incomes)?		2
	<i>Notes: Children and the elderly are likely residents of the new housing development, additionally, a school and senior housing are proposed.</i>		
6	Land use: Does it substantially change the predominant land (e.g. from residential to commercial)?		2
	<i>Notes: Project will result in the conversions of agricultural uses to residential and commercial uses.</i>		
7	Institutional capacity: Is the capacity of local government, nonprofit, and private organizations to address any potential problems adequate?		1
	<i>Notes: It is anticipated, but not certain, that the local government would have the capacity to adequately handle potential problems.</i>		
	Total points:	12	
	If >11, HIA may be needed, move on to Part 2		
	If 7-10, HIA potentially needed, moving on to Part 2 recommended		
	If 6<, HIA not required		

Appendix B

<i>Screening Mixed Use EAWs</i>				
	Part 2: Does the plan or proposal meet some initial thresholds for a healthy community? Answer the following in relation to the plan or project and adjacent uses.	No	Uncertain	Yes
8	Accessibility: Does the plan involve residential components that are built at an average density greater than seven units per acre of buildable land available for residential use? <i>Notes: Although some high density residential is proposed, the project will be primarily low density residential.</i>	2		
9	Accessibility: Is there regularly scheduled transit service within three-quarter miles of all residential and employment areas? <i>Notes: Regularly schedule transit is not currently available at the project site.</i>	2		
10	Physical activity/social capital: In order to provide options for physical activity and social interaction, particularly for children, are all residential areas located within 400 meters of either a neighborhood park, trail, or open space? <i>Notes: The project does state whether it would include parks, trails, and open space and it is unlikely that all residential areas would be located within 400 meters of these facilities, if they were included in the project.</i>	2		
11	Social capital: Does the plan or project include a mix of housing densities and/or tenures (e.g. at least 15-20% of the housing stock in a different use tenure or as apartments/condos)? <i>Notes: The project does provide for a mix of housing densities (senior housing and single family homes), however, it is unclear if affordable housing would be available (although senior housing may be considered affordable).</i>		1	
12	Air quality: Are there any residential areas or schools within 200 meters of a major auto-related transportation corridor such as a freeway or road with six or more lanes? <i>Notes: There are no six or more lane roadways in the project vicinity, but there are major thoroughways adjacent to the project site.</i>		1	
13	Air quality: Does the plan or project area include businesses that disproportionately contribute pollutants (e.g., dry cleaners, automotive paint, manufacturing)? <i>Notes: The project plan does not define future businesses and there is a possibility that this type of business may be on site.</i>		1	
14	Water quality: Is it developed on a site with existing water and sewer infrastructure? <i>Notes: New connections would need to be developed.</i>	2		
15	Food: Are there supermarkets or fruit and vegetable stores located within a mile of each home? <i>Notes: There are no grocery stores in the vicinity of the project site.</i>	2		
16	Safety: Does the plan or project adequately account for safe circulation patterns for all modes such as employing traffic calming measures, using separate facilities for non-motorized modes, or ensuring adequate lighting and sight lines. <i>Notes: It is assumed that the project would comply with applicable safety regulations, however, it is not anticipated that it would incorporate complete street principles.</i>		1	

Appendix B

Total points:	14		
If >13, HIA recommended			
If 8-12, HIA potentially needed			
If 7<, HIA not required			
	Total Points		
Other Mixed-Use EAWs Screened	P. 1	P. 2	
Afton Center	11	11	
Centerville DwnTwn Redevelopment	10	9	
Cold Spring Granite Mixed Use Development	12	11	
Highland Preserve	12	12	
Hustad Mixed Use Development	12	13	
Wayzata Bay Center Redevelopment	13	9	

Appendix C

<i>Final HIA Indicator Checklist</i>		
Category	Objective	Health Indicators
I. AIR QUALITY	Reduce impacts of pollution on air quality by preventing generation of pollutants or siting sensitive uses away from pollution sources.	1. Are all sensitive uses (e.g., residential areas, schools, day care facilities, playgrounds and sports fields) at least 200m (656 ft) from a major road, and at least 150m (492 ft) from a truck route? If not, does the project reduce population contact to air pollution?
		2. Does the project avoid locating sensitive uses in close proximity to a major industrial stationary source of air pollution?
II. LAND	Encourage connectivity to proximate existing or planned infrastructure (e.g., sewer, trails, parks, services, transit, amenities, schools, etc.) and cluster development to preserve open space (e.g., forest, prime agriculture, etc.)	3. Residential Density – For suburban or rural areas, is the project designed with a residential density at or above 5 dwelling units per residential acre (or at or above 9 dwelling units per residential acre for projects <1/2 mile from regional mass transit stops including rail, ferry, or bus service)?
		4. Does the plan allow for clustering of different activities (e.g., neighborhood commercial, mixed-use development, etc.) to facilitate access to a variety of services at one stop via public transit, bicycling, and walking?
		5. Does the project minimize fragmentation and development of agricultural, forest, wildlife and high quality open space lands?
III. PARKS	Preserve and provide access to parks and green spaces for improved levels of physical activity and mental health.	6. Is the project within 1/4 mile access of a neighborhood or regional public park (a park larger than 1/2 acre)?
		7. Does the project meet or achieve a standard of 10 acres of publicly accessible open space per 1,000 population in the planning area?
		8. Is the project within 1/4 mile of a public recreational facility?
		9. Are trails that provide for bicycling, rollerblading and walking incorporated into the project within 400-600 meters of all residential areas?
IV. TREES and VEGETATION	Preserve and increase trees and vegetation for multiple benefits.	10. Is there a tree planting/tree canopy plan and does it establish a goal of 40% or greater canopy coverage in the development area?
V. TRANSPORTATION	Improve health through increasing physical activity, improving air quality, and increasing accessibility by promoting alternative modes of transportation such as walking, biking, and transit.	11. Is the project within 1/2 mile of regional transit station OR does the project include dedicated shuttle trips to regional transit, with timing and frequency based on estimates of area demand? AND is the project within 1/4 mile of a local transit stop?
		12. Does the plan link existing and future housing development with services (i.e. employment centers, grocery stores, hospitals, etc.) through a specific multimodal transportation plan?
		13. Does the project include (or is it within ¼ mile of) bicycle lanes and/or paths that are linked to the city’s existing bicycle network and/or connected to at least five diverse uses (e.g., schools, employment centers, grocery stores, etc.)?
		14. Does the project identify areas (intersections, streets, small areas) where pedestrian injury collisions have occurred in or near the project area OR identify where potential future conflicts exist in or near the project area AND target pedestrian environment improvements to those areas?

Appendix C

Final HIA Indicator Checklist

Category	Objective	Health Indicators
VI. HOUSING	Preserve or provide affordable housing to reduce overcrowding, support home-ownership, housing stability, and development of social networks.	15. If the project results in the demolition or loss of deed-restricted, public, inclusionary, or rent-controlled housing, does the project replace the demolished/lost housing stock at a 1:1 ratio?
		16. Are at least 50% of residential units affordable to persons at or below the median household income, and/or is there at least a 20% ownership and 20% rental unit housing mix in a neighborhood or census tract?
VII. FOOD	Provide access to fresh and healthy foods to reduce obesity, increase equity and food security, and support general health and nutrition.	“17. For residential uses, is the project within 1/2 mile of a supermarket? OR Does the project create a new on-site or off-site “healthy food supply” within 1/2 mile?”
		18. Is the project within 1/2 mile of a food establishment that accepts state or federal food assistance programs? OR Does the project reserve retail space in a proposed project for fresh food retailers authorized to participate in state or federal food assistance programs?
		19. Does the project create and maintain a community garden on-site or provide safe access to off-site community garden resources within 1/4 mile of residential or mixed-use areas?
VIII. WATER	Protect and preserve the quality of water resources through pollutant reduction, on-site treatment and flooding prevention.	20. Is the project located at a distance greater than 100 feet from existing shorelines of water bodies -- seas, lakes, rivers, streams and tributaries? If the project is located within 100 feet from existing water bodies, are there existing or planned vegetated buffers along all water bodies (preferably 20m to 50m) to prevent non-point pollution from impervious surfaces?
		21. Protect floodplain functions: is the project site located within 100- and 500-year floodplains?
		22. Manage storm water on site: can the project pre-treat and infiltrate a 50-year storm (or greater) as applicable per site conditions?
		23. Do proposed impervious surfaces exceed 10% of total site surface area?
		24. Are site development reviews provided for developments within 1,000 feet of wells (site conditions, management practices, minimized grading/vegetation removal)?
IX. NOISE	Maintain safe levels of community noise	25. Where ambient nighttime noise levels are >55 Ldn do residential projects mitigate interior noise levels?
X. SAFETY	Promote safety of population within project area.	26. Is the project within a five minute response time from a nearby fire station (or other emergency response service)?

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