Woodland Cove Development Scenarios

Prepared for the city of Minnetrista
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CITY OF MINNETRISTA

Introduction

The City of Minnetrista is at a crossroads in its long-term development. Development plans are being created for a portion of the City currently known as Woodland Cove. This development is guided for a minimum of 1,071 units, increasing the overall number of household units in the city by 50 percent.

A driving force behind this development is the Metropolitan Council's *2030 Regional Development Framework,* which sets residential density standards in developed and developing areas where urban services are located or planned. This framework is important to the efficient use of regional systems, including wastewater system investments. Communities that significantly over-utilize or under-utilize regional systems can cause inefficiencies in the use of regional resources.

What follows are two development scenarios reflecting not only the Metropolitan Council's Development Framework, but also additional driving forces for development that are germane to the City of Minnetrista.

The scenarios presented here are just two possibilities and are not considered definitive. Rather, these scenarios are presented to offer some varying alternatives, based on different inputs, for policymakers to examine.

These alternatives incorporate the latest technology for modeling, visioning, and producing renderings of Woodland Cove. The ultimate goal is to assist policymakers in creating a set of public values that drive development regulation in the City of Minnetrista, using this site as a case study.

This report is broken into several sections. First, the current conditions of the Woodland Cove area are discussed. Next driving forces for development are outlined, providing the framework for development. The Methodology section discusses the process and technology for creating the development scenarios. Finally, two development scenarios are presented, one demonstrating a public park system with smaller lots and the other with homeowner association parks and larger lots. These scenarios are compared and contrasted using common economic, environmental, and social indicators.

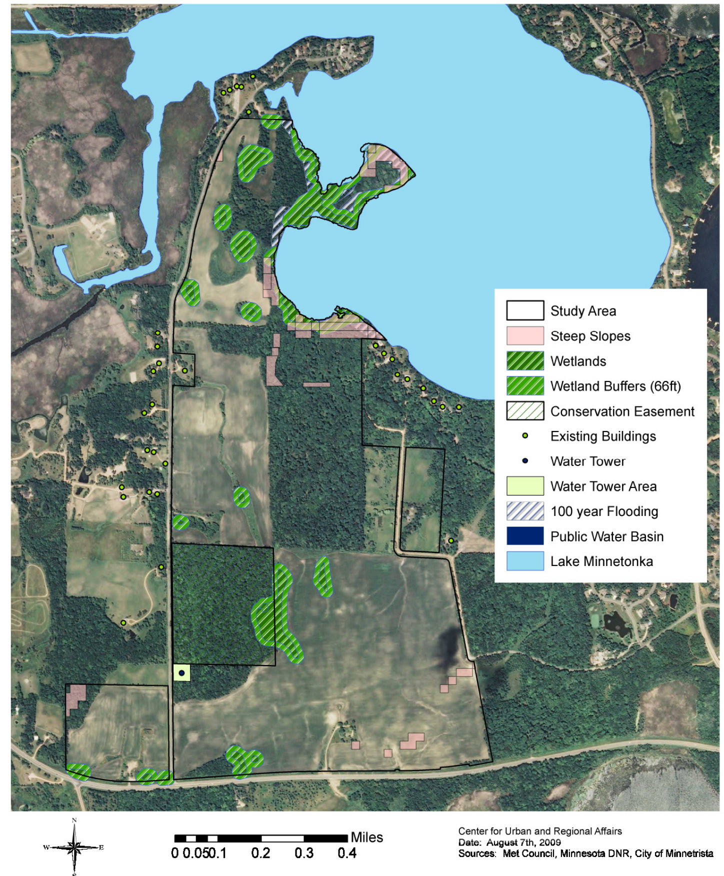
The Appendix offers a discussion concerning development tradeoffs highlighting the effects of changing one development criteria on the other development criteria.

Woodland Cove Development Area

Woodland Cove is a series of parcels totaling roughly 488 acres, located at Kings Point Road and State Highway 7.

This property has brought and will continue to bring a series of challenges and opportunities to the City, largely because of its positioning between two regional parks, location on Lake Minnetonka with over 8,800 feet of shoreline, high-value natural resources, unique landscape and access to a State Highway.

Map 1 illustrates the development area and key environmental features. To the north, near Lake Minnetonka, wetlands within or near the 100-year flood plain dominate. In the center of the development are significant forests which provide an east-west corridor for wildlife movement. This site also borders a privately held 38 acre conservation easement, which supplements the 80 acre maple basswood forest to the north east.



Map 1: Development Area

Criteria for Development

Woodland Cove is a dynamic and unique area, subject to both policy and environmental development criteria. This section highlights three key policy criteria, as well as the environmental criteria for development.

Density Criteria

In 2006, the City of Minnetrista and the Metropolitan Council came to an agreement through a Comprehensive Plan Amendment. This amendment stipulated that this piece of property would develop at a minimum of 1,071 units (2.2 units per net acre). Any development proposal or scenario must consider this in the overall development plan.

City of Minnetrista Values Criteria

City leadership articulated a larger set of values for Woodland Cove. City leadership specifically discussed trails, parks, wildlife, pollution, and flexibility concerning the built infrastructure to create added public value in the development. City leaders came together to establish a larger vision and value set for Woodland Cove, including seven key areas:

- Density
- Preservation/restoration of open space and ecological systems
- Public park and trail opportunities
- Storm water management
- Flexibility with ordinances
- Long-term natural resource stewardship
- Appropriate scale for commercial area

Comprehensive Plan and Current Codes Criteria

Using the 2030 comprehensive plan as well as current City of Minnetrista building codes as a guide for development, the scenarios presented make a best effort to take into consideration lot sizes and setbacks.

Environmental Criteria

Of the total 488 acres, over 100 acres are undevelopable. Table 1 details these environmental constraints.

The largest development constraint is wetlands and the associated wetland buffers. Allocating buffer space around wetlands acts as a layer of protection in wetland conservation.

Minnetrista code calls for a smaller buffer around wetlands. However, to accommodate storm water management, this buffer is increased to 66 feet. Wetlands and wetland buffers consume roughly 63 acres.

Combined, steep slopes and flood plain consume approximately 35 acres. Developable land could be reclaimed with grading or incorporation into lots to mitigate the constraint of steep slopes. However for the scenarios presented, steep slopes remain a constraint.

Table 1: Unchangeable Building Criteria (acres)*	
Steep Slopes	17
Flood Plain	17
Public Water Basin	6
Wetlands	18
Wetland Buffers (66 feet)*	45
Total Unchangeable Building Constraints	**103****

**Data for these calculations come from the DNR and the Metropolitan Council. A site survey is necessary to validate these numbers.*
***Minnetrista code calls for a smaller buffer around wetlands. This buffer is increased to accommodate storm water management needs.*

Methodology

The follow development scenarios were created in an industry-standard program called Community Viz. Community Viz Scenario 360 is a geographic information system (GIS)–based decision support software for planners and resource managers. GIS systems are used to make maps of people, places, and things. Community Viz is a plug-in to ArcGIS®, the industry standard GIS software. This plug-in provides interactive analysis tools and a decision–making framework and has the ability to:

- Easily create and experiment with hypothetical development scenarios
- Assess economic, environmental, social, and visual considerations of development scenarios
- Incorporate and show the outcomes of community values
- See the impacts of proposed changes
- Create 3D visualizations of development scenarios

Community Viz also has the ability to generate economic, environmental, and social reports based on the development scenario. This report presents information that is most applicable to the city of Minnetrista.

Scenario A – Urban Street Pattern with Public Parks

Map 2 shows development scenario A, which consists of a more traditional urban street grid pattern and a public park system. This public park system connects Three Rivers Park to the east with Six Mile Marsh to the west. This scenario consists of slightly smaller lot sizes, averaging less than .5 acres per lot and incorporates development constraints into parkland areas, where possible.

Key elements of scenario A include:

- A more traditional street grid pattern.
- A density gradient favoring R1 and R2 development densities.
- Limited traffic conductivity towards the north, guiding traffic patterns towards circulator roads.
- Increased traffic conductivity towards the south of the study area to accommodate higher densities.
- A well-defined and integrated "Trail Experience," making connections within the entire area.

Map 2: Scenario A – Urban Road Style / Public Parks

Other key elements of scenario A include:

- Parks are used to buffer housing densities that are significantly different as well as Highway 7.
- Highest densities are concentrated around the commercial area and nearest to Highway 7.
- Natural habitat corridor between east and west.

Total developable land for this scenario is 351 acres. Table 2 shows that this scenario sets aside 44 acres of developable land for parks and has 137 acres of undevelopable land, as previously defined.

The overall density is 3.06 dwelling units per acre, given the 1071 unit goal.

A 3D movie of this scenario is located on YouTube. Follow this link to watch the movie.

http://www.youtube.com/watch?v=SD1ng5iK8HA

Table 2: Scenario A Buildable Land (acres)	
Total Developable Land For New Public Parks	44
Total Undevelopable Land	137
Total Study Area	488
Total Developable Land (acres)	351
Goal (units)	1,071
Overall Density (DU/acre)	**3.06**

Scenario B – Suburban Street Pattern with Home Owner Association Parks

Map 3 shows development scenario B, which consists of a more typical suburban street grid pattern with more private home owner association (HOA) parks and slightly larger lot sizes. Where possible, this scenario incorporates development constraints into parkland.

Key elements to scenario B are:

- A more typical suburban street grid with cul-de-sacs and terminating streets.
- Limited traffic conductivity towards the north, guiding traffic patterns to collector roads.
- Increased traffic conductivity towards the south of the study area to accommodate higher densities.
- More evenly distributed density gradient throughout the site.
- Defined Home Owner Associations
- Home Owner Association parks act as activity hubs for surrounding neighborhoods.
- Public park system buffering Highway 7.

Map 3: Scenario B – Suburban Road Style / HOA Park Space

Other key elements of scenario A include:

- A "Trail Experience" that utilizes right-of-ways and HOA parks to make connections within the site.
- Higher densities are used to achieve overall density goal.

Total developable land for this scenario is 346 acres. Table 3 shows that this scenario sets aside the same amount of developable land for parks. However, the total undevelopable land is slightly less, given that more undevelopable land is incorporated into the HOA parks.

The overall density is 3.09 dwelling units per acre, given the 1,071 unit goal.

A 3D movie of this scenario is located on YouTube. Follow this link to watch the movie.

http://www.youtube.com/watch?v=L9UF1HL8ebA

Table3X: Scenario B Buildable Land (acres)	
Total Developable Land For New HOA Parks	44
Total Undevelopable Land	142
Total Study Area	488
Total Developable Land (acres)	346
Household Goal (household)	1,071
Overall Calculated Density (DU/acre)	**3.09**

Compare / Contrast

For each scenario, different combinations of densities are used within each zone to achieve the desired 1,071 units. The combinations are optimized to come as close as possible to the total unit goal.

Table 4 shows the different densities per acre for each scenario, compared to the zoning code. Scenario B generally aligns with densities expressed in city code. Scenario A, however, falls below what is expressed in the code for densities per acre.

The following Figures 1 – 3 offer further indicators of what development densities could look like, given the dwelling units per acre.

Table 4: Scenario DU per Acre			
Zone	**Code (avg)**	**A**	**B**
R1	1.9	1.5	1.9
R2	2.5	2.0	2.5
R3	3.1	3.0	3.0
R4	5.6	5.0	4.5
R5	Not Specified	6.0	5.75

Buildable Acreage per Zoning District

Figure 1 displays the amount of buildable acreage that each scenario allocates per zoning district. In scenario A, urban street patterns, 100 acres is allocated to R2. This scenario allocates between 40 and 60 for the remaining zones.

Scenario B, suburban street patterns, 90 acres is allocated to R5. For the remaining zones, this scenario allocates between 40 and 60 acres.

Figure 1 suggests that a more suburban street pattern with less public parkland requires more R5 (higher density) housing. Conversely, more public parkland including a greenway allows for more allocation within R1 and R2 zoning districts.

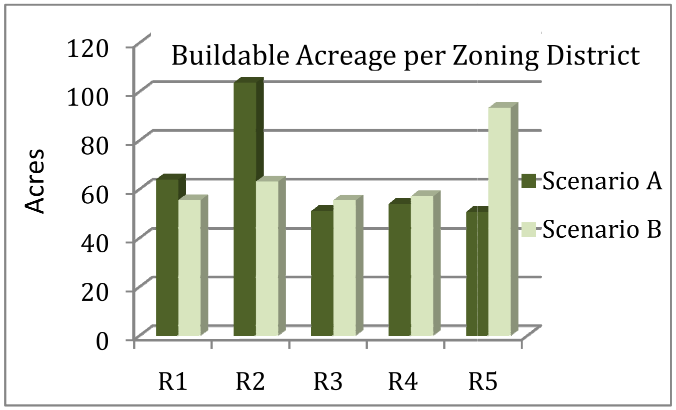


Figure 1: Buildable Acreage in Each Zone

Households per Zone

Figure 2 displays the number of households per zone for each scenario. For scenario A density distributions remain generally consistent throughout the site, with R2 and R5 allocated slightly more households than the other zones.

In contrast, households per zone in scenario B exhibit a 'ramping up' pattern. Zone R1 has the fewest households per zone where as zone R5 has the most households per zone.

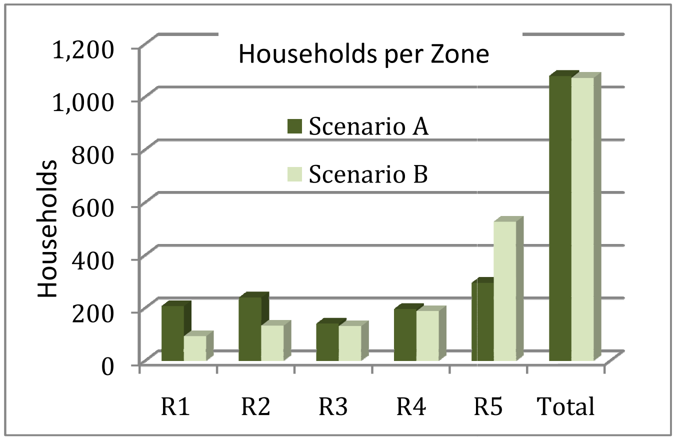


Figure 2: Number of Households

Buildings per Zone

Figure 3 displays the number of buildings per zone. Buildings per zone takes into consideration how the massing of buildings in each development zone influences how densities are visually perceived.

Scenario A places the largest number of buildings per zone in zones R1 and R2. This scenario then 'ramps down' the buildings per zone with R5 having the fewest buildings per zone.

Scenario B 'ramps up' and then 'ramps down' the number of buildings per zone. In this scenario, R2 and R3 have the most buildings per zone whereas R1 and R5 having the fewest buildings per zone. Concerning the total number of buildings per zone, scenario B has significantly less buildings overall when compared to scenario A.

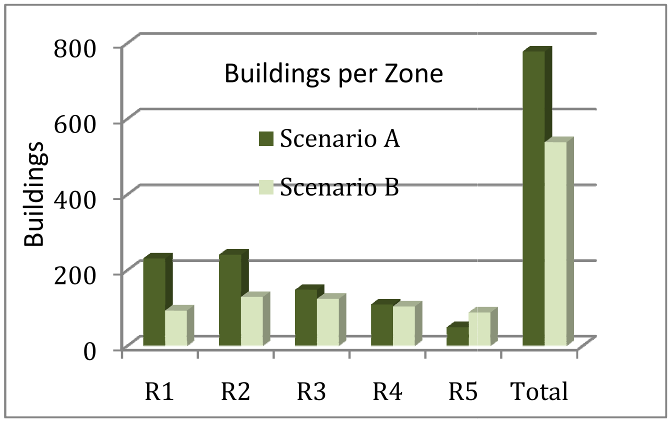


Figure 3: Buildings per Zone

Other Indicators

Table 5 displays a comparison of common economic, social and environmental indicators associated with new development. These indicators are an output of the CommunityViz analysis and are based on industry-standard calculations.

Though the two scenarios share the same density requirement for households, the two scenarios calculate slightly different populations for the area. This may be attributable to the overall lower density combination needed to meet density requirements.

The net result is that all economic, social and environmental indicators for scenario B are lower than scenario A. Remaining constant are the indicators concerning the commercial area. Both scenarios have identical commercial footprints.

Table 5: Other Indicators

Indicator	**Units**	**A**	**B**
Annual CO Auto Emissions	Lbs	1,010,169	997,147
Annual CO2 Auto Emissions	Tons	9,467	9,345
Annual Hydrocarbon Auto Emissions	Lbs	127,595	125,951
Annual NoX Auto Emissions	lbs	63,332	62,515
Commercial Energy Use	million BTU/year	5,957	5,957
Commercial Floor Area	sq/feet	70,000	70,000
Commercial Jobs		85	85
Commercial Jobs to Housing Ratio*		.08	.08
Labor Force Population	ppl	1,137	1,122
Population	ppl	2,780	2,744
Residential Energy Use	million BTU/year	109,686	108,272
Residential Water Use	gallons/year	164,988,480	152,990,480
School Children	ppl	525	519
Vehicle Trips per Day	trips/day	6,462	6,378

** The ideal ratio is 1*

Phosphate

Controlling the amount of phosphates entering Halsted Bay and important wetland areas is a priority for the City of Minnetrista. Table 6 displays high-level, estimated calculations of potential phosphate load for the area given existing conditions and both scenarios. The highest phosphate load is occurring today, given the agricultural use.

Scenario B produces the lowest phosphate load. This is consistent with this scenario's allocation to higher densities. Developing Woodland Cove is likely to have a positive impact on phosphate loads. This loading reduction could be further maximized by incorporating natural infiltration and innovative storm water management techniques.

Table 6: Phosphates Loads*

Indicator	Now**	A	B
Lb/year	644	570	369

*Calculations from the MPCA
**Assumes that manure is not used to fertilize.

A Framework

When considering the development of Woodland Cove, three public policy areas should have considerable influence over the final development plans. These three policy areas are density requirements, City codes and City values, as discussed in the Criteria for Development section. In concert, these three policy areas create a possible framework for considering development decisions.

Figure 4 depicts this framework as a triangle. Placement on a triangle shows the relationship that these policy areas have to one other. Density represents the overall density requirement from the Metropolitan Council. City Values express the importance of parks, trails and a quality of life. City Codes articulate development requirements.

The scenarios presented here highlight the interplay within this framework. These scenarios begin to show that development in line with City Code has impacts on density requirements. As well, these scenarios show that the density requirement may conflict with city values.

Woodland Cove is a dynamic and unique area. Applying this framework to development possibilities may assist policy makers in understanding and managing the trade-off decisions concerning density, City Values and City Code. See the Appendix for a detailed discussion of these tradeoffs.

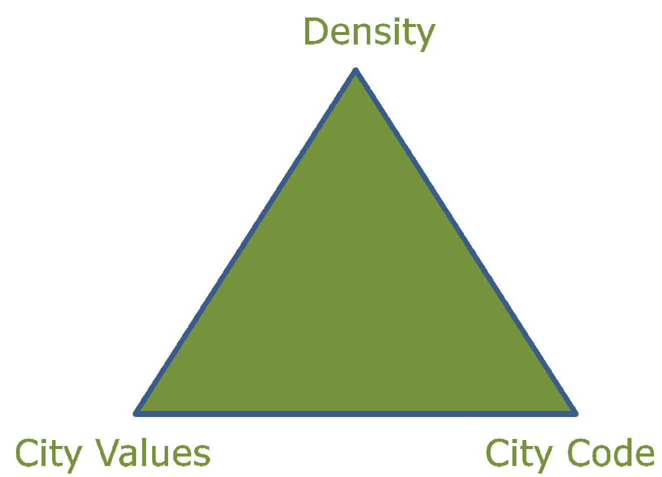


Figure 4: Development Framework

Appendix – Trade-off Decisions

What follows is an extension of the initial analysis from the previous scenarios. The purpose is to provide a discussion concerning the trade-offs of 'what would happen if' the original criteria of the development scenarios were modified. Key to this discussion is keeping the development framework of Density, City Values and City Code in mind.

Table 7 displays the impact an increase of park size/greenway size might have on the overall site density. Nearly doubling the allocation to parks to 80 acres increases the overall site density to 3.43. Mitigation techniques to lower the overall density because of this increase might include:

- Decreasing lot sizes, which may result in a smaller overall house size
- Modifying setback requirements
- Decreasing road widths

Table 8 displays the impacts of a 50 percent reduction in the acreage allocated to buffer parks and wetlands from development. The scenarios used larger buffers to accommodate storm water management needs. Doing this brings the overall density closer to the overall desired density for the site.

Table 7: Increasing Park Allocation (acres)	
Total Developable Land for New Parks	80
Total Undevelopable Land	176
Total Study Area	488
Total Developable Land	312
Household Goal (household)	1,071
Overall Calculated Density (DU/acre)	**3.43**

Table 8: Increasing Park Allocation (acres)	
Total Developable Land for New Parks	44
Total Undevelopable Land	97
Total Study Area	488
Total Developable Land	391
Household Goal (household)	1,071
Overall Calculated Density (DU/acre)	**2.74**

This discussion looked at how the three policy areas of Density, City Values and City Code interact. Conclusions can be drawn concerning the effect of expressing City Values of open space and the environment on overall Density. However, to fully understand how to maximize City Code to support the desired overall density of 2.2 dwelling units per acre would require further analysis.