# White Bear Lake Area Comprehensive Plan Study 13

## Potential Water Savings from Alternative Low-Input Turf Grasses

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METROPOLITAN COUNCIL

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# Purpose of the study

- Land use and parcel-level evaluation
- Irrigation demand and turfgrass assessment
- Water savings analysis
- Cost and implementation considerations

# Agenda

- Data collection and review
  - Grass data
  - Land use data
- Potential low-input turf grass areas analysis
  - Current land use analysis
  - Future land use analysis
- Findings and recommendations

# Data Collection and Review

# Grass data

- **Kentucky Bluegrass**
  - Dominates retail seeding market & general recognition
  - Provides a generally good curb appeal
  - Require significant maintenance
  - Requires significant fertilizer
- **Tall Fescue**
  - Generally robust can be used in high traffic areas such as athletic fields
  - Good Shade Tolerance
  - Low  Annual Fertilizer requirements
  - Similar general maintenance as Kentucky Bluegrass
- **Fine Fescue**
  - Good shade tolerance
  - Does not do well for high traffic areas but is well suited for low foot traffic areas
  - Requires about half as much maintenance as Tall Fescue or Kentucky Bluegrass

Kentucky Bluegrass

Tall Fescue

Fine Fescue

# Land use data

- To accurately account for land use, data was collected from various sources
  - Cities Current and Future Land Use Projections
  - Cities 2040 Comprehensive Plans
  - 2023 NLCD Fractional Impervious Cover
  - 2023 NLCD Fractional Tree Cover
  - NWI Wetland Index

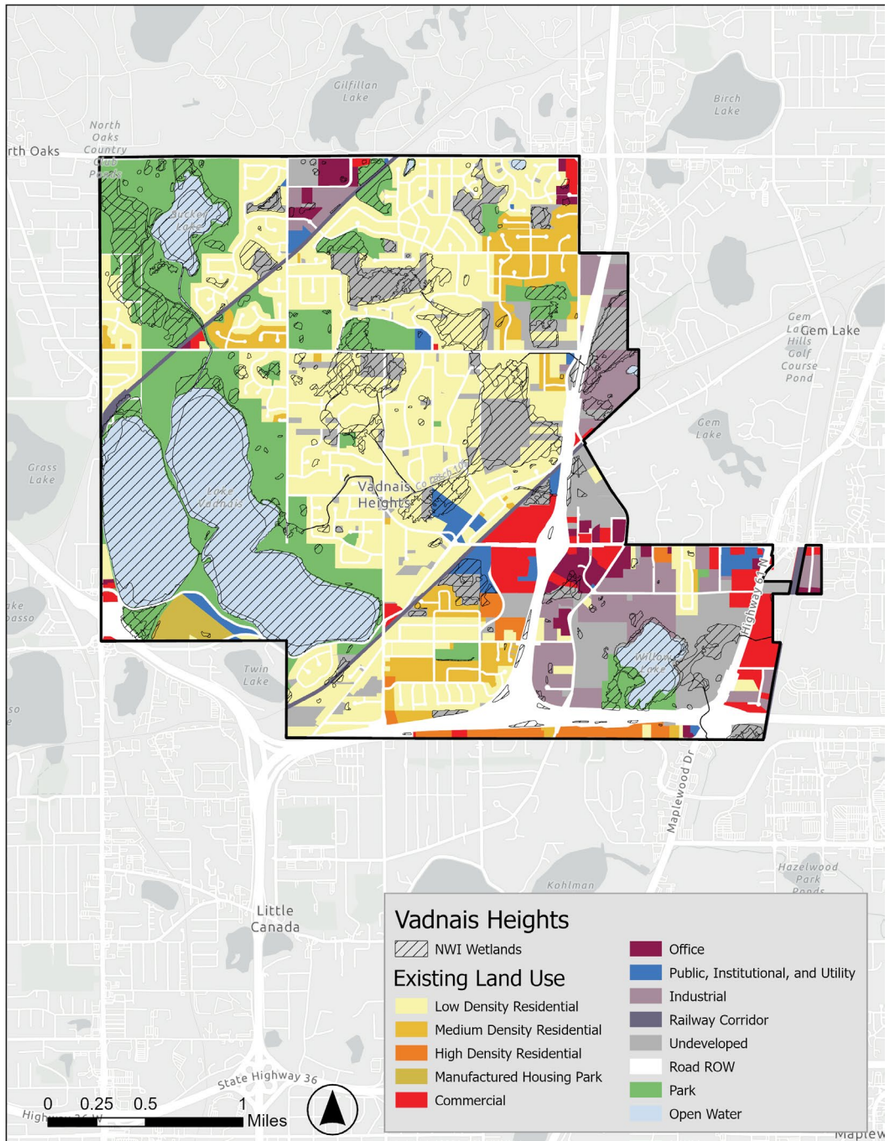
| Cities | County | Existing Land Use | Future Land Use[1] |
|---|---|---|---|
| Stillwater | Washington | Provided by City | Provided by City |
| Mahtomedi | Washington | Provided by City | Provided by City |
| Hugo | Washington | Met Council 2020 | Provided by City |
| Lake Elmo | Washington | Provided by City | Provided by City |
| Lino Lakes | Anoka | Provided by City | Provided by City |
| North St. Paul | Ramsey | Met Council 2020 | City's Comprehensive Plan |
| Oakdale | Washington | Provided by City | Provided by City |

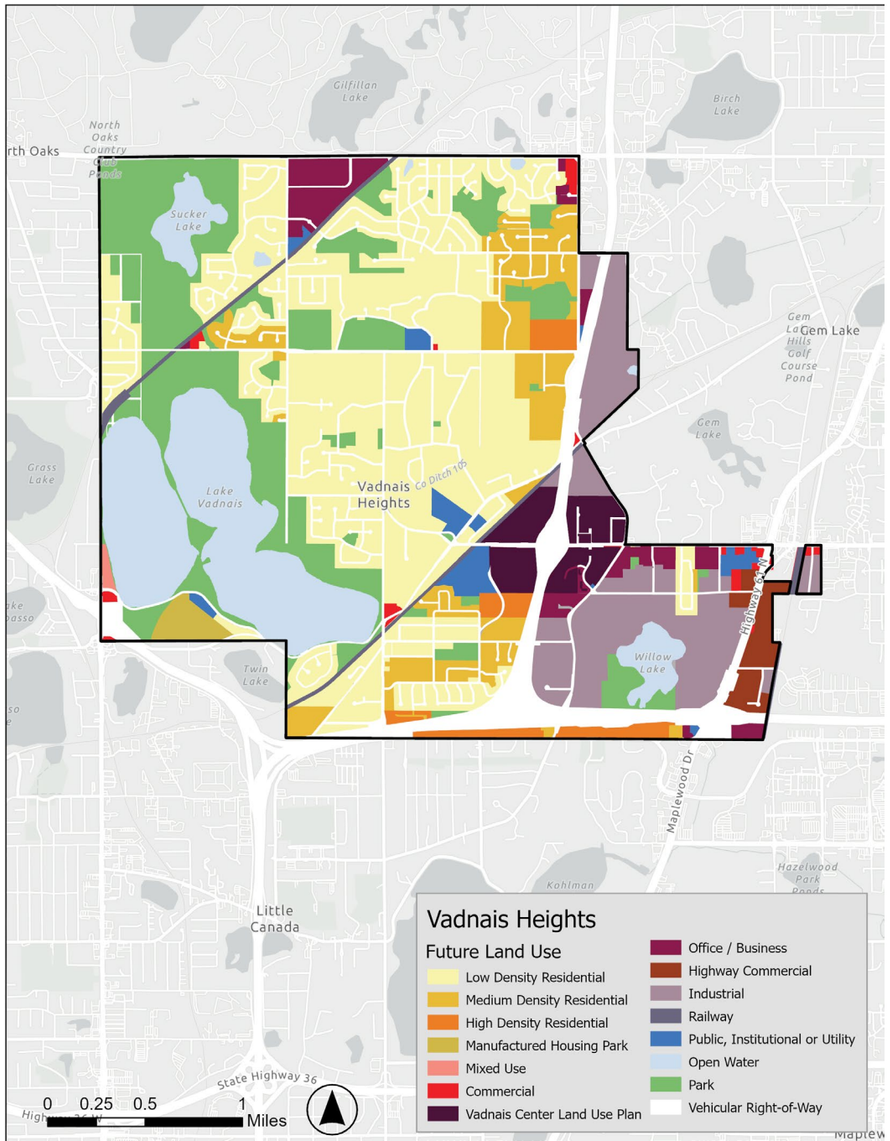
| Cities | County | Existing Land Use | Future Land Use[1] |
|---|---|---|---|
| Vadnais Heights | Ramsey | Provided by City | Provided by City |
| Shoreview | Ramsey | Met Council 2020 | City's Comprehensive Plan |
| Woodbury | Washington | Met Council 2020 | City's Comprehensive Plan |
| New Brighton | Ramsey | Provided by City | Provided by City |
| White Bear Lake | Ramsey | Provided by City | Provided by City |
| White Bear Township | Ramsey | Met Council 2020 | City's Comprehensive Plan |
| North Oaks | Ramsey | Met Council 2020 | City's Comprehensive Plan |

*Notes:[1] Each Future Land use % Pervious was based on Existing Land Use % Pervious*

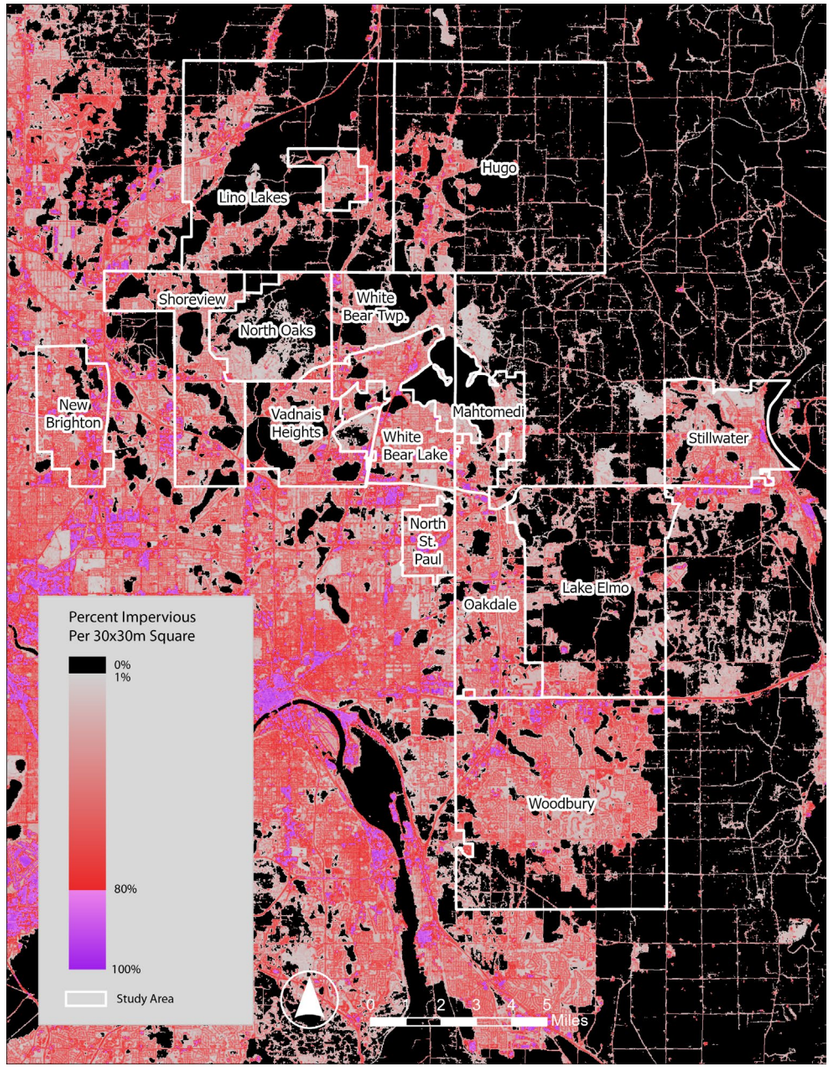
# Potential Low-Input Turf Grass Analysis

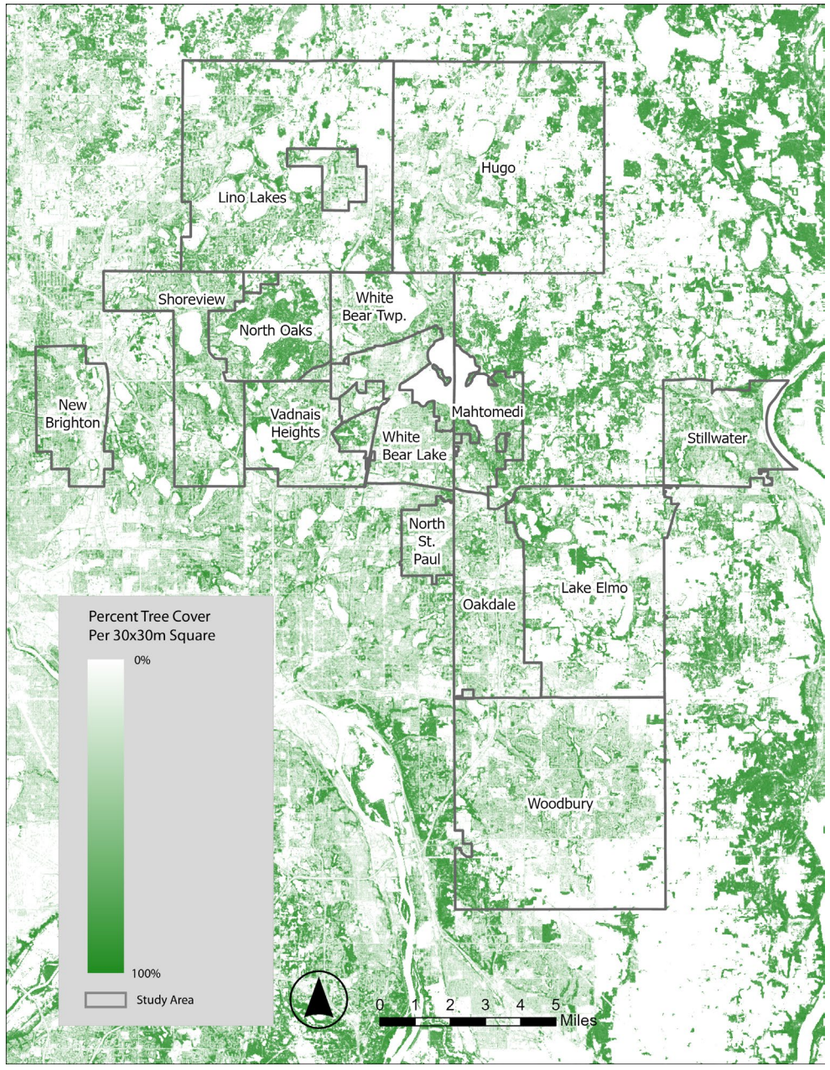
# Land use maps



# Impervious and tree cover maps



# Potential low-input turf grass analysis

## Land use analysis

- Land use was split into Publicly and Privately owned properties.
- Land uses that are excluded - Utilities, ROW, Rail, Open Water, Agricultural, Farm, Undeveloped and Golf Courses
- Original assumption - All current grass in the area is Kentucky Blue Grass
    - Evaluation of 20, 30, 40, and 50% transition to low-input turf grass

$$(Fraction\ Pervious\ Percentage * Area\ by\ Land\ Use\ Category) - Open\ Water\ Area - Wetland - Canope\ Coverage\ Area$$ = **Area of Potential Pervious Surface by Land Use**

# Estimated costs

- All costs are based on a Per Acre Basis.
- Establishment is assuming a late summer to early fall construction/implementation
- Estimated seed, erosion blankets, fertilizer, aeration, mowing, and water costs are all included in the evaluation

| Type of Grass | Establishment | General O&M |
|---|---|---|
| **Kentucky Bluegrass** | $4,255 | $6,954 |
| **Tall Fescue** | $4,527 | $6,851 |
| **Fine Fescue** | $4,379 | $3,453 |

# Per acre water savings

It is common knowledge that the irrigation needs for KGB play a major role in the peak summertime water demands that occur in the White Bear Lake area. Reducing these demands could significantly reduce groundwater pumping from the aquifer and result in less impact on the surface water elevations in White Bear Lake.

| Grass Type | Inches Per Week | Acres | Water Per Week (Gal) | Average Weekly Rainfall[1] (Gal) | Additional Water Required Excluding Rainfall Per Year[2] (Gal) | Reduction in Water from Low-Input Turf Grass Implementation (Gal) |
|---|---|---|---|---|---|---|
| Low Input Turf Grass-(Tall Fescue) | 0.25-0.5 | 1 | 6,788 - 13,576 | 26,500 | 149,300-298,700 | Up to 66,300[3] |
| Low Input Turf Grass-(Fine Fescue) | 0.25-0.5 | 1 | 6,788 - 13,576 | 26,500 | 149,300-298,700 | Up to 66,300[3] |
| Kentucky Bluegrass | 0.8-1 | 1 | 21,722 - 27,152 | 26,500 | 477,900-597,400 | -- |

1. ***Based on irrigation season between May and September (22 Weeks)***
2. ***Based on grass needs and does not include rainfall***
3. ***Based on individual grass needs and accounting for rainfall (22 Weeks)***

# Findings

## Potential water savings

- Water savings evaluate 20,30,40, and 50% conversion to low-input turf grass.

| Community | Land Use Classification | Existing Water Savings (MGY) | Future Water Savings (MGY) |
|---|---|---|---|
| Lake Elmo | Private | 27-67 | 55-138 |
| | Public | 24-61 | 39-98 |
| Lino Lakes | Private | 39-98 | 11-29 |
| | Public | 12-29 | 18-45 |
| New Brighton | Private | 14-35 | 2-6 |
| | Public | 2-4 | 3-7 |
| North Oaks | Private | 10-25 | 2-5 |
| | Public | 3-7 | 0.2 - 0.6 |
| Oakdale | Private | 24-60 | NA[2] |
| | Public | 5-12 | 3-7 |
| Vadnais Heights | Private | 9-22 | 2-4 |
| | Public | 3-6 | 0.7-1.8 |
| White Bear Lake | Private | 15-38 | 4-9 |
| | Public | 4-9 | NA[2] |

| Community | Land Use Classification | Existing Water Savings (MGY) | Future Water Savings (MGY) |
|---|---|---|---|
| Mahtomedi | Private | 6-14 | 0.3-0.8 |
| | Public | 2-4 | 0.2-0.6 |
| Stillwater | Private | 8-20 | 1-3 |
| | Public | 7-18 | 0.1-0.2 |
| Hugo | Private | 25-63 | 31-78 |
| | Public | 10-24 | NA[2] |
| North Saint Paul | Private | 6-14 | 0.1 |
| | Public | 2-4 | NA |
| Shoreview | Private | 19-46 | NA[2] |
| | Public | 7-18 | NA[2] |
| Woodbury | Private | 49-124 | 29-73 |
| | Public | 22-55 | 3-9 |
| White Bear Township | Private | 11-28 | NA[2] |
| | Public | 8-19 | NA[2] |

*[1]Based on average MN rainfall in MN between May and September*
*[2]Based on irrigation between May and September and average MN rainfall*

# Recommendations

**Match turf type to application**

- Tall Fescue – High-traffic areas (e.g., athletic fields)
- Fine Fescue – Low-traffic areas (e.g., yards, low sunlight)

**Adjust irrigation practices**

- Modify traditional irrigation for low-input turf grasses

**Use seed mixtures where appropriate**

- Blended mixes increase turf resilience and success rate

**Incorporate into future development and retrofits**

- Implement low-input turf grass in new developments and retrofits
- Educate communities on benefits and implementation

**Visit UMN turf grass trial sites (Lake Elmo Water Tower Site)**

- View low-input turf grass varieties and develop educational literature

**Modify existing city policies**

- Consider modifying existing city policies to promote the use of low-input turf grasses for existing development and require it for proposed future development through adoption of a city ordinance

# Questions

Ramsey County MN