



North Yahara

Future Urban Development Area Planning

FUDA Study



North Yahara Future Urban Development Area Study

August 2012

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**RESOLUTION OF THE NORTH YAHARA FUTURE URBAN DEVELOPMENT AREA (FUDA)
STEERING COMMITTEE**

RELATED TO THE NORTH YAHARA FUTURE URBAN DEVELOPMENT AREA STUDY

WHEREAS, the Village of DeForest, Town of Windsor, and Town of Vienna (“participating local governments”) partnered with the Capital Area Regional Planning Commission (“CARPC”) to engage in a collaborative, locally-driven planning effort, known as Future Urban Development Area (“FUDA”) planning for the North Yahara FUDA study area; and

WHEREAS, the purpose of FUDA is to protect vital natural resources, promote efficient development, and preserve farmland through cooperative planning for long-term growth; and

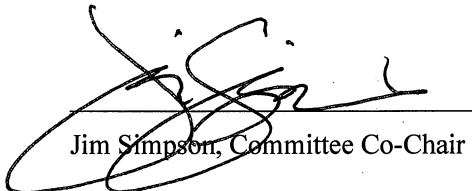
WHEREAS, a FUDA Steering Committee of local Board members, Plan Commissioners, and citizens at large were appointed by the participating local governments to guide the FUDA process; and


WHEREAS, through extensive research, data gathering and analysis, public outreach, and FUDA Steering Committee review, the North Yahara FUDA Study was produced to provide information and analysis on environmental resources, present a future urban development scenario with natural resource and agricultural preservation areas, and provide implementation methods to achieve that scenario; and

WHEREAS, the FUDA Study may be advanced by the participating local governments through subsequent activities, such as amendments or updates to their Comprehensive Plans.

NOW, THEREFORE, BE IT RESOLVED, the North Yahara FUDA Steering Committee hereby:

1. Accepts the North Yahara FUDA Study dated August, 2012 as representing the wishes and direction of the Committee, except where may be otherwise indicated within the Study.
2. Encourages that the participating local governments consider incorporating the FUDA Study’s recommended future urban development scenario and implementation measures, when and where practical, into their comprehensive plans and other plans, ordinances, and related activities.
3. Forwards the FUDA Study dated August, 2012 to CARPC as a guide for future regional planning efforts affecting the FUDA study area.
4. Recognizes that the applicability, content, and/or recommendations of the FUDA Study dated August, 2012 may change as policies, circumstances, and conditions of and within the participating local governments change over time.


Jim Simpson, Committee Co-Chair


Bruce Stravinski, Committee Co-Chair

Date Adopted: 8/8/12 Vote: 5-0

Project Team & Qualifications

The project team includes a diverse and well-qualified membership of both appointed steering committee members and local and regional planning staff. Steering Committee members represent three different jurisdictions and several areas of expertise including urban and rural development, agriculture, natural resources, and government process and relations. The steering committee members spent several months reviewing and vetting data and forming Future Urban Development Area (FUDA) recommendations for local and regional consideration. Steering Committee Members include:

Village of DeForest

- Jim Simpson, P.E. & R.L.S., Committee Chair- Plan Commissioner, Resident since 1999, B.S., Civil Engineering & Mathematics
- Paul Blount- Village Trustee (involved in the first half of the project)
- Judd Blau- Village President (Involved in the second half of the project)
- Scott Mink, At Large Member, Friends of the Yahara River

Town of Windsor

- Bruce Stravinski, Co-Chair- Town Supervisor, Plan Commissioner, Token Creek Conservancy Committee member, DeForest Area Community Center and Senior Center Board of Directors, Token Creek Watershed Association Board of Directors, Windsor resident 23 years, Vienna for 12 years. Retired. UW Madison Graduate
- Bill LeGore- Plan Commissioner, Resident since 1995, Director of Facilities & Maintenance, DCR Airport, A.A.S., Aviation Maintenance Technology; B.S., Aviation Management
- Alan Buchner, life long resident, Town Supervisor, B.S. UW Madison Ag Business Commodity Marketing

Town of Vienna

- Jeff Freppon- Town Supervisor, Resident since 1996, Corn Breeder/Research Station Manager, Ph.D. Agronomy, Ohio State University
- Rick Mueller, At Large Member
- Greg Smithback, Plan Commission member, VP of Business Development, Bachmann Construction

The Steering Committee members requested and reviewed materials, made regular progress reports to their local plan commissions and boards, and considered significant amounts of data and community input before developing the recommendations presented in this Study.

Project staff included both local and regional planners, clerks, directors, and administrators. Staff brought significant expertise and practice to the FUDA process and outcomes. Local and regional staff also gave regular reports to local and regional planning commissions.

Village of DeForest

- Steve Fahlgren - Administrator & Finance Director, Resident since 2001, Bachelor's Accounting & Business Administration
- Mike Centinario - Planning & Zoning Specialist, B.A., Human & Physical Geography
- Mark Roffers - Planning Consultant, MDRoffers Consulting LLC, Master's in Urban and Regional Planning, University of Minnesota

Town of Windsor

- Kevin Richardson P.E. - Public Works Director, Resident since 1994, Town/Consulting Engineer, M.B.A.; B.S., Civil & Environmental Engineering
- Robert Wipperfurth - Town Chair, served as an elected official for consultation. Windsor Farmer.

Town of Vienna

- Shawn Haney - Town Clerk/Manager, Resident since 1987, B.A., Criminal Justice; A.D., Political Science

Capital Area Regional Planning Commission

- Kamran Mesbah P.E. - Deputy Director, M.S. & B.S., Civil & Environmental Engineering; B.A., Urban Studies
- Steve Steinhoff - Senior Community Planner, Masters, Urban Planning & Policy; B.S., Biology & Environmental Studies
- Bridgit Van Belleghem - Senior Community Planner, M.S., Urban & Regional Planning; B.S., Environmental Biology & Management, LEED Legacy Certification, Facilitation Certificate
- Dan McAuliffe - Senior Community Planner & Urban Designer, Masters, Urban Planning; Masters, Architecture; B.S., Architectural Studies
- Rachel Holloway - Community Planner; M.S., Urban & Regional Planning; B.A., Liberal Studies
- Mike Kakuska - Senior Environmental Planner, M.S., Water Resources Management; B.S., Limnology
- Mike Rupiper P.E. - Environmental Engineer; M.S., Environmental Studies; B.S., Civil & Environmental Engineering
- Jason Granberg - Restoration Ecologist/ Biologist, M.S. & B.S., Biology; A.S., Biology
- Steve Wagner - Graphic Designer, B.F.A., Graphic Design; A.D., Commercial Photography
- Aaron Krebs - GIS Specialist, B.S. Cartography GIS UW Madison, B.S. in History and Human Geography, A.D.s in Arts, Science, and Applied Science (weather technology)
- Heath Anderson - GIS Specialist, MS, Urban & Regional Planning, concentration in Geographic Information Systems (GIS), UW-Milwaukee (2011); Carthage College, Geography specializing in GIS and Demographics (2005-2008); University of Wisconsin Baraboo/Sauk County (2004-2005); University of Cincinnati (2003-2004)

FUDA Study

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- Supplement A: Enabling Resolutions and Authorizing Actions
- Supplement B: North Yahara FUDA Public Participation Description
- Supplement C: Scenario Creation and Process
- Supplement D: North Yahara FUDA (HIA) Health Impact Assessment
- Supplement E: North Yahara Environmental Conditions Report (ECR)

Summary

In late 2010, the Village of DeForest, Town of Windsor and Town of Vienna began working with the Capital Area Regional Planning Commission (CARPC) to pursue a joint FUDA process, known as the North Yahara Future Urban Development Area project (see enabling resolutions in Supplement A). This study concludes this project, describes the North Yahara Steering Committee's Recommended Scenario and presents several implementation measures and next steps for future urban development and area preservation in the North Yahara area. The steering committee submits these recommendations to respective local governments and CARPC to review and incorporate the recommendations, in whole or in part, into governing plans, policies, and implementation decisions.

A multi-jurisdictional steering committee directed project staff to design and implement a process to review existing plans and municipal agreements, historic trends and future demographic projections, natural and agricultural resources and to gauge public opinion for future development and preservation. This steering committee directed 3 major activities: (1) Environmental Conditions Report (ECR) development, (2) Scenario Evaluation, (3) Future Urban Development Area (FUDA) Study. Each activity included public outreach and engagement to inform the steering committee process and outcomes. Supplement B provides more detail on the public participation approach, activities, materials, and results.

FUDA Scenario Overview

The steering committee and staff developed three polling scenarios: (A) Dispersed Character, (B) Adopted Plan Character and (C) Compact Character.

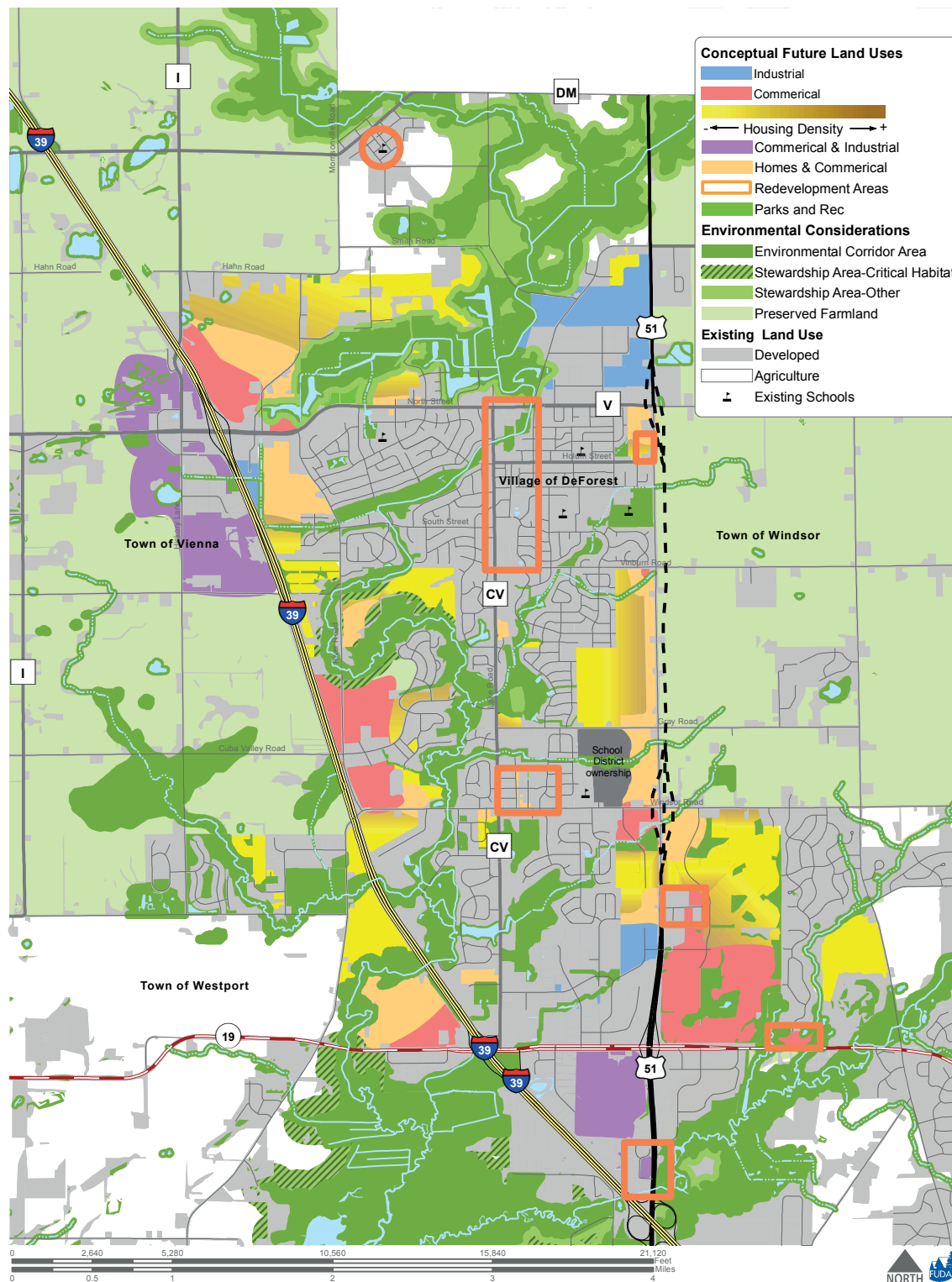
The steering committee compared each scenario across indicators, or impacts, on the communities' future states. Indicator categories include: land efficiency, economy, travel, environment, farmland and health. If the Department of Administration population projection is correct, the 'Future Northern Urban Service Area' identified in locally-adopted plans and explored in the scenarios contains more than enough land area to serve the projected 25-year land area demand.

North Yahara FUDA Scenario Recommendations

The Recommended Scenario is illustrated in Map 2 and further described by the recommendations that follow.

The Recommended Scenario is a hybrid of locally adopted plans and intergovernmental agreements, adjusted with opportunities presented in the Compact Character Scenario. Most public participants preferred the Compact Character and Adopted Plans Scenarios over the Dispersed Character Scenario. Recommendations are divided into two major sections: Recommended Scenario, and Recommendations for Further Analysis Areas. The recommendations are presented generally here and are presented in further detail in the main body of this Study.

The North Yahara FUDA Recommended Scenario is illustrated in Map 2 below and is further described by the recommendations that follow:



NOTE: This map conceptually represents the Steering Committee's Recommended Scenario for future growth and presentation in the FUDA study area. It may guide the amendment of future land use maps in local comprehensive plans and future zoning decisions. However, it should not be used or interpreted as a comprehensive plan, future land use plan, or a zoning map. Future land use categories within comprehensive plans and zoning districts will likely vary from representations on this map.

Redevelopment & Infill Recommendations

1. DeForest and Windsor are advised to establish additional redevelopment/infill areas respectively.
2. DeForest and Windsor are advised to use incentives and other programs to facilitate a higher redevelopment/infill implementation probability for adopted and recommended sites.

Land Use and Neighborhood Design Recommendations

3. DeForest and Windsor are advised to allow for greater density in strategic locations in the Urban Service Area (see Map 2).
4. DeForest and Windsor are advised to permit complete neighborhoods that integrate a range of quality residential, civic, open/public and business spaces in the Urban Service Area.
5. DeForest, Windsor and Vienna are advised to develop and implement streetscaping and community design/character guidelines in the Urban Service Area.

Mobility and Access

6. DeForest, Windsor and Vienna are advised to establish a connected street, sidewalk, path and trail network that promotes walking, biking, and transit in addition to motor vehicles.

Intergovernmental Cooperation

7. North Yahara communities are advised to continue or establish intergovernmental agreements with each other and surrounding jurisdictions.

Natural Resources (beyond legal requirements for environmental corridors)

8. DeForest, Windsor, and Vienna are advised to incorporate recommended “Stewardship Areas” in development planning (map2).
9. DeForest, Windsor and Vienna are advised to utilize Environmental Corridors and Stewardship Areas as open-space amenities in developments for residents and patrons.
10. DeForest, Windsor and Vienna are advised to protect mineral resource areas, evaluate the areas for infiltration and groundwater recharge see ECR (Map 9), and extract the resource and reclaim the land for development before development is permitted (ECR Map 3).
11. DeForest, Windsor, Vienna and are advised to maximize stormwater infiltration and groundwater recharge for new and existing development where opportunities exist and protect water quality in closed basins, the Upper Yahara River, Token Creek, and Lake Mendota.
12. Municipalities and their local water and wastewater utilities are advised to continue their water conservation and reuse practices and enhance infiltration measures to help mitigate the municipal water withdrawal impacts.

Working Lands

13. The North Yahara communities are advised to support and implement methods to prevent the premature conversion of farmland to developed land.
14. DeForest, Windsor, Vienna and are advised to prevent agricultural land conversion permanently in mutually agreed locations.
15. Windsor and Vienna are advised to examine the scope and scale of land management practices to identify, enhance and maintain ecological services and functions on or adjacent to agricultural land.

Utilities

16. DeForest, Windsor and Vienna are advised to ensure effective public water supply, wastewater infrastructure planning and the cost effective provision of drinking water and sewer service for future development areas.

Further Analysis Areas (FAAs) Recommendations

The Study also outlines additional opportunities for analysis in the following locations: DeForest and Vienna between Conservancy Place and Hickory Lane, wetland/floodplain preservation area east of Morrisonville, east of the Interstate between Hahn Road and North Street, Highway 19 Corridor West of Interstate, and additional reinvestment and redevelopment sites.

Recommended Scenario Impacts

The Recommended Scenario was evaluated across several indicator categories.

Population and Housing

The Recommended Scenario could accommodate about 18,000 new residents in the DeForest, Vienna and Windsor desired future urban development area with public water and sewer.

The Recommended Scenario estimates roughly 7,000 homes could be built in this area to accommodate the future population, with an average of 2.53 people per housing unit. Approximately 260-600 homes could be built through redevelopment and infill according to plans and scenario evaluations. The study recommends housing a greater population closer to destinations, encouraging more activity, reducing trip length and allowing more options for walking and biking.

Land use and efficiency

The Recommended Scenario would result in the development of approximately 3,200 acres to accommodate demands for residential, commercial, industrial, civic and transportation uses. The Recommended Scenario incorporates more redevelopment than identified in the Adopted Plans Scenario, estimating the potential for several hundred dwelling units and tens of acres for commercial. Overall, the Recommended Scenario includes a total developed area per person of approximately 0.18 acres. This compares to existing developed areas per person of 0.24, 0.28 and 0.71 in DeForest, urban Windsor and urban Vienna respectively. The Recommended Scenario shows a mix of higher-density residential and commercial uses in strategic locations.

Taxes, jobs and shopping

Analysis projects 78 jobs for every 100 new residents in the future growth areas. Population growth could bring over \$200,000,000 in new annual consumer spending, enough to support over 540,000 commercial square feet (108 stores at 5,000 sq. ft. each).

Travel

As the communities grow in a more compact pattern, the total mileage driven is shown to decrease, due to shorter trips and greater ability to walk, bike or take transit up to four percent compared to existing development. An estimated 140,000 trips per year could be walking or biking to commercial destinations in newly developed areas, based on the number of residents living within a quarter mile from those destination and observed non-motorized trip data for Dane County. This scenario also suggests a more interconnected street pattern, allowing for more direct trips and enabling walking and biking.

The Recommended Scenario could require 25 percent less road miles per person than the Dispersed Character Scenario, providing significant cost savings to future home and business owners and reducing municipal maintenance costs.

Environment

The Recommended Scenario incorporates protected areas from adopted plans and highlights other opportunities for preservation to the south, west and north of DeForest. Increased walking and biking in this scenario indicates less car trips for short distances than in adopted plans, and therefore less tail-pipe emissions reducing approximate annual carbon emissions to 280 pounds per driver.

Farmland

The Recommended Scenario, if built-out, will consume the same amount of farmland as the polling scenarios that led to it because a fixed-land area analysis was chosen (see Supplement C for more details). However, under this scenario, farmland conversion will occur at a slower rate, with more defined edges between urban and rural environments. This scenario maintains all existing legal farmland preservation policies and plans, and municipal boundary agreements.

Human health

Health Impact Assessment found that the most healthy scenario was the Compact Character Scenario across most indicators. Some indicators, such as views and vistas, are often

compromised in more compact areas. However, intentional design and layout, can preserve views. Through the Recommended Scenario the steering committee aims to enhance these potential health benefits over existing plans.

Water resources

Stormwater modeling shows that stormwater management would need to handle nearly 2,600 acre-feet of runoff annually to meet the 100 percent pre-development stay-on standard under the Recommended Scenario (2010 Land Use Inventory, CARPC).

Under the Recommend Scenario, wastewater generation is expected to increase to a total of 4.27 million gallons per day. The area studied includes 564 acres anticipated to be part of the Madison Metropolitan Sewerage District (MMSD) service area between 2030 and 2060 and another 342 acres after 2060 (2009 MMSD Collection System Evaluation). A phasing plan for developing this area is essential for cost effective wastewater infrastructure planning and sewer service.

At buildout, the Recommended Scenario's daily public water demand within the North Yahara Future Urban Development Area is expected to increase from currently levels by 2.93 million gallons. Groundwater modeling projects that future pumping would reduce baseflow between 12 percent and 15 percent in the areas creeks and rivers. Reductions in water table levels range between 1 to 3 feet under this scenario.

Strategies focused on maintaining and restoring stormwater infiltration can reduce both volumes of stormwater and pollutant loads to receiving surface waters. The Village of DeForest adopted an ordinance requiring runoff volume control to 100 percent of pre-development stay-on volumes and maintain pre-development groundwater recharge.

Implementing Recommendations through Governing Document Updates

Many recommendations and implementation measures associated with the Recommended Scenario could be incorporated in comprehensive plans, intergovernmental boundary agreements, zoning and subdivision ordinances and other governing documents. (see Table 8 in Study)

This FUDA Study is submitted for local consideration and incorporation into existing plans and policy, or developing new tools, to enhance the quality of life for current residents and generation to come. The findings of this Study are intended to be updated every five years to account for changing conditions. Participating governments should jointly track progress towards implementation and evaluate the outcomes of the FUDA planning process.

North Yahara FUDA Study

Introduction

In late 2010, the Village of DeForest, Town of Windsor and Town of Vienna began working with the Capital Area Regional Planning Commission (CARPC) to pursue a joint planning process known as the North Yahara FUDA project (see enabling resolutions in Supplement A).

More and more, communities nationwide are realizing the interconnected and regional nature of their environmental and community challenges, and are coming together to identify where and how they should grow and where they want to preserve ecosystems and working lands. The purpose of FUDA planning is to protect vital natural resources, promote efficient development and preserve farmland through cooperative planning for long-term growth. FUDA planning focuses on areas that are, or could be, served by municipal water and sewer over the next 25 years. In this study, any development with public water and sewer infrastructure is called “urban.”

Urban

Any development (business, housing, government, schools, etc) with public water and sewer infrastructure.

In petitioning the Governor to restore the Regional Planning Commission in Dane County in 2007, communities recognized the need for proactive long-range planning to advance local and regional planning and inform the Urban Service Area (USA) amendment process. The USA amendment process is a tool for implementing part of the federal Clean Water Act. Typically, communities seek approval from CARPC and the WI Department of Natural Resources to expand urban service areas. Item 7 in the petitioning resolution reads,

“The [Dane County Water Quality] Plan shall also define a 25-year Future Urban Development Area with 5-year updates. The Plan shall be developed in cooperation with area communities, including towns, and shall consider adopted comprehensive plans and intergovernmental agreements” (for more, see Supplement A).

FUDA planning intends to empower local jurisdictions with a set of tools and resources to make informed planning decisions and facilitate local comprehensive planning, intergovernmental coordination, the USA amendment review process and regional plan updates.

This study describes the North Yahara steering committee’s Recommended Scenario and presents several implementation measures and next steps for future urban development and rural preservation in the North Yahara area. The steering committee submits these recommendations to respective local governments and CARPC to review and incorporate the recommendations, in whole or in part, into governing plans, policies, and implementation decisions. The intent is to update this study every five years to account for significant changes in existing conditions, such as unforeseen population fluctuations and policy changes.

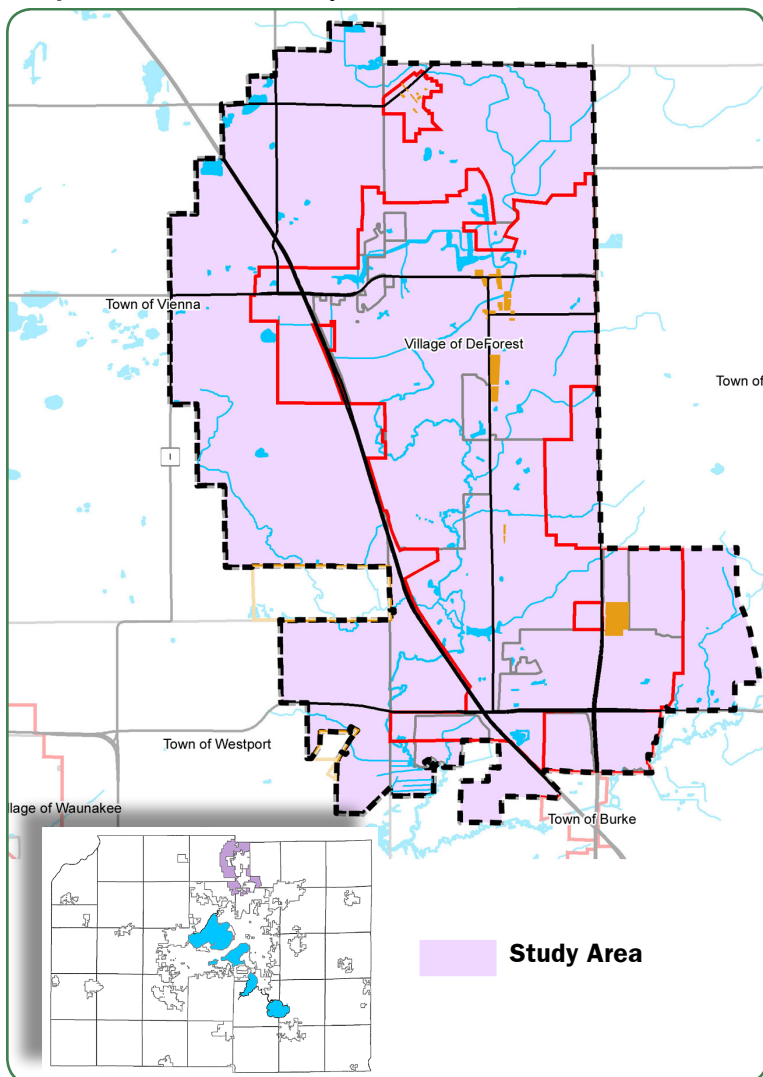
Process and Methodology

A multi-jurisdictional steering committee directed project staff to design and implement a process to review existing plans and municipal agreements, historic trends and future demographic projections, natural and agricultural resources and gauge public opinion for future development and preservation in the North Yahara Study Area (see Map 1). The committee met nearly 20 times to complete this process.

This steering committee directed 3 major activities:

1. **Environmental Conditions Report (ECR) development** – an in-depth inventory and assessment of the natural and agricultural resources and historic population trends and projections for the study area. The data was used to develop, evaluate, and inform scenarios and implementation measures presented in this FUDA Study. The ECR is provided as a supplement to this Study and provides information for planning and engineering professionals working in these communities (though it is not itself part of this FUDA Study).

Map 1: North Yahara Study Area



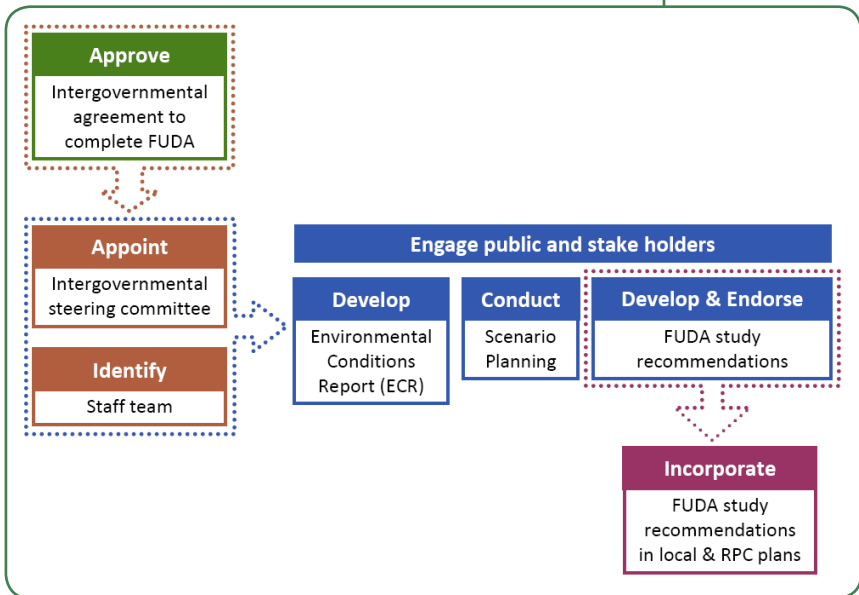
2. **Scenario Evaluation** – the creation and evaluation of growth scenarios was based on findings in the ECR, adopted local land use plans and community and steering committee input. Scenarios were derived from the 'Future Northern Urban Service Area' in DeForest's Comprehensive Plan, which also reflects planned urban development in Windsor's and Vienna's comprehensive plans. Analysis was done to determine the number of years it could take for various growth mixes and densities to fill the locally mapped Future Urban Service Area, and the potential community and regional impacts of this development. Three public polling scenarios were developed and are presented in Supplement C. The steering committee derived a hybrid scenario based on the polling scenarios and community input called the "Recommended North Yahara FUDA Scenario," or "Recommended Scenario." Evaluation and analysis for the Recommended Scenario is in the Scenario Evaluation section of this Study.

3. **Future Urban Development Area (FUDA) Study**— this document illustrates and describes the FUDA scenario the steering committee endorses and the recommendations the jurisdictions could take to implement the Recommended Scenario. The Study analyzes potential impacts of the proposed development pattern and outlines comprehensive plan or other governing document updates the communities could make to implement the FUDA Study recommendations. **This document is the North Yahara FUDA Study - the only document the steering committee took action on.**

Each activity included **public outreach and engagement** to inform the steering committee, process and outcomes. The steering committee adopted a Public Participation Plan and engagement strategies that exceeded the requirements in the state comprehensive planning statute (Wis. Stat. 66.1001). Public participation was organized into five phases:

1. Information gathering, preparation and publicity,
2. Introduction to FUDA, community goal affirmation and visual preference survey,
3. Existing conditions education and conceptional scenario mapping,
4. Scenario polling and
5. Municipal and regional commission/board processes.

Figure 1: FUDA Process

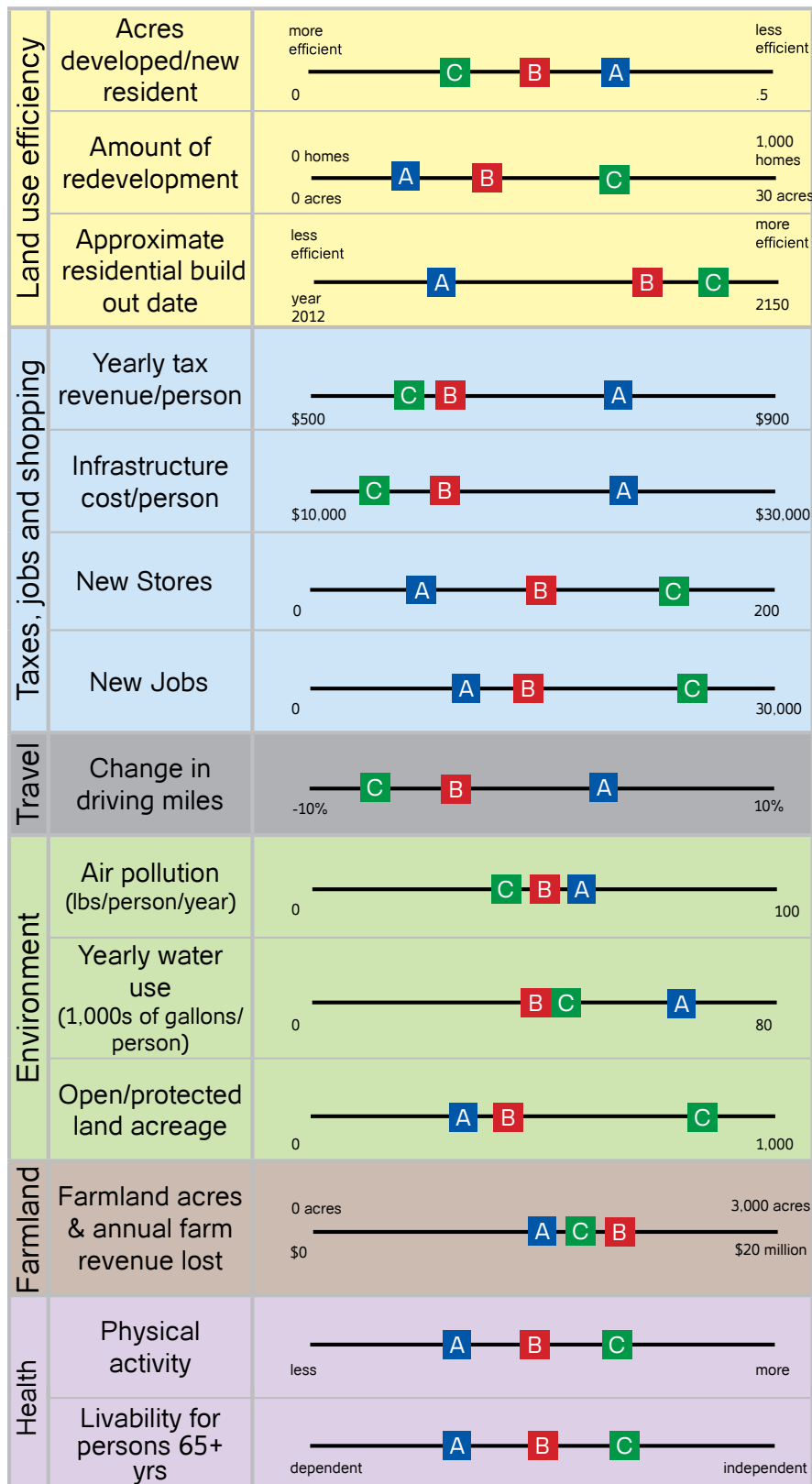


Phases 1-4 already occurred in each participating jurisdiction, and inform the findings and recommendations in this study. Phase five occurred with the release of this report and may continue at the municipal and regional levels until comprehensive and regional plan updates are complete. Supplement B provides more detail on the public participation approach, materials, activities and results.

Each activity also included research on trends, projections, satellite imagery analysis and other geographic information systems (GIS) analysis. ECR development also included site visits and analysis for environmental quality.

Figure 2: Indicator and scenario impacts

A- Dispersed Character B- Adopted Plan Character C- Compact Character



FUDA Scenario Overview and Recommendations

The steering committee and staff developed three polling scenarios: (A) Dispersed Character, (B) Adopted Plan Character and (C) Compact Character. Scenarios were derived from the 'Future Northern Urban Service Area' in DeForest's Comprehensive Plan, which also reflects planned urban development in Windsor's and Vienna's comprehensive plans. Land use designations (commercial, residential, institutional, natural land, agricultural land, etc.) and implementation standards (density, housing mix, etc.) were adjusted based on input from community members, existing plans, and potential opportunities. If the Department of Administration population projection is correct, the 'Future Northern Urban Service Area' identified in locally adopted plans and explored in the scenarios contains more than enough land area to serve the projected 25-year land area demand. The three scenarios were displayed at four polling stations and online for a month in early spring 2012 for community feedback.

The steering committee compared each scenario across indicators, or impacts, on the communities' future states. Indicator categories include: land efficiency, economy, travel, environment, farmland, and health. See Figure 2 for a complete list of indicators and how the scenarios compare and Supplement C for the methodologies used to develop and analyze the scenarios and indicators.

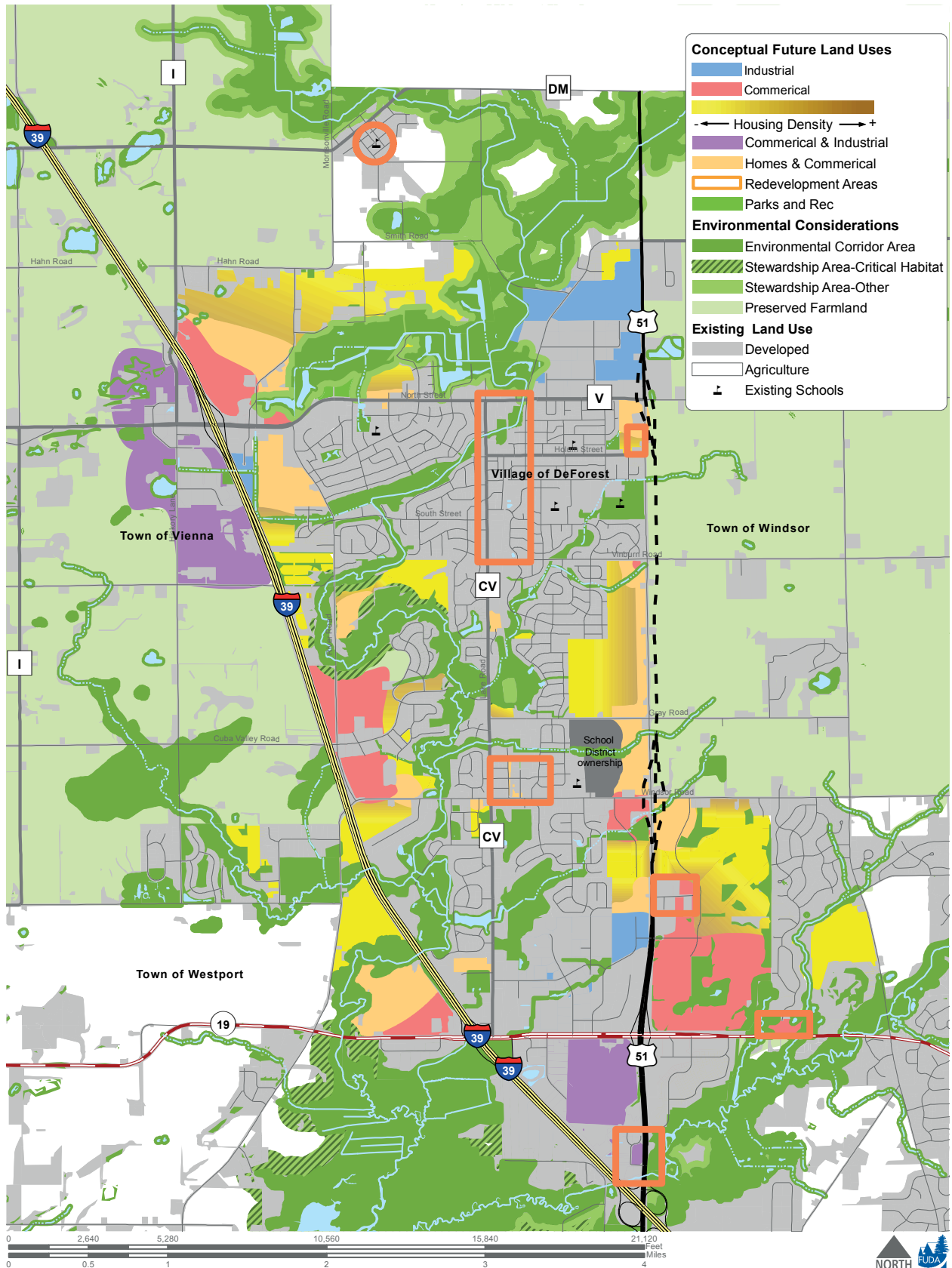
North Yahara FUDA Scenario Recommendations

Considering existing plans and inter-jurisdictional agreements (Figure 8), environmental and agricultural conditions, community goals and trends (Supplement E), scenario impacts (Supplement C), citizen participant opinions (Supplement B) and the many opportunities for the future, the steering committee recommends the Future Urban Development Area and conceptual future land use pattern designated in Map 2.

The Recommended Scenario is a hybrid of locally adopted plans and intergovernmental agreements enhanced with opportunities presented in the Compact Character scenario. Most public participants preferred the Compact and Adopted Plans Scenarios over the Dispersed Character Scenario.

Recommendations are divided into two major sections: **Recommended Scenario**, and **Further Analysis Areas**. Each section contains recommendations and associated implementation measures. The steering committee rationale is presented next to the recommendation(s). Furthering the recommendations, the Study identifies potential amendments to local comprehensive plans and other governing documents.

Map 2: Recommended North Yahara FUDA Scenario



NOTE: This map conceptually represents the Steering Committee's Recommended Scenario for future growth and presentation in the FUDA study area. It may guide the amendment of future land use maps in local comprehensive plans and future zoning decisions. However, it should not be used or interpreted as a comprehensive plan, future land use plan, or a zoning map. Future land use categories within comprehensive plans and zoning districts will likely vary from representations on this map.

Recommended Scenario

Redevelopment and Infill Recommendations

1. DeForest and Windsor are advised to establish additional redevelopment/infill areas respectively.

- 1.1 DeForest and Windsor are advised to evaluate and plan, or update an existing plan, for redevelopment/infill sites identified in the Land Demand and Supply Section of the Environmental Conditions Report (see orange boxes denoted on Map 2, Table 1 and Maps 3-6).
- 1.2 DeForest and Windsor are advised to identify additional new redevelopment/infill areas presented in “5. Additional Redevelopment Areas: Further Analysis Area” and shown on Map 2.

2. DeForest and Windsor are advised to use incentives and other programs to facilitate a higher redevelopment/infill implementation probability for adopted and recommended sites.

- 2.1 Continue to attract and retain high-activity uses (civic and festive uses) to downtowns to support existing and new business and reduce financial risk for developers.
- 2.2 Allow for higher density residential in and around downtowns to build a community base.
- 2.3 Continue to identify funding mechanisms to incentivize redevelopment including Tax Increment Financing, Business Improvement Districts and specific economic development funds.
- 2.4 Help assemble redevelopable lands and distribute Request for Proposals (RFPs) to developers.

Rationale for Recommendations 1 & 2

Existing plans/goals: Includes existing planned redevelopment and infill sites.

Participant opinion: Respondents supported redevelopment at greater levels.

Steering committee recognizes:

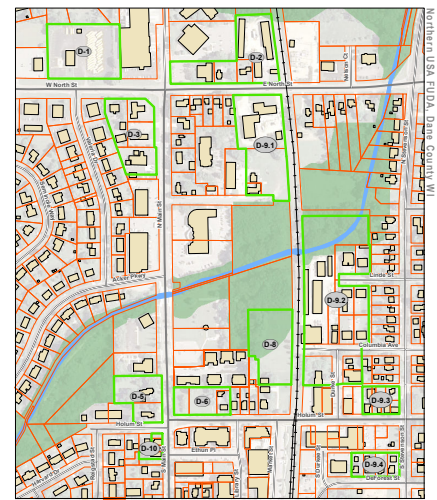
- DeForest and Windsor downtown areas are critical resources with further opportunity for redevelopment and reinvestment.
- Opportunities for walking and biking exist in these areas.
- Several existing civic uses.
- Realignment and intensification of Hwy 51 will repurpose many east-west streets.
- Logistical and market challenges in redevelopment and infill projects may warrant public action.

Table 1: North Yahara Redevelopment Areas

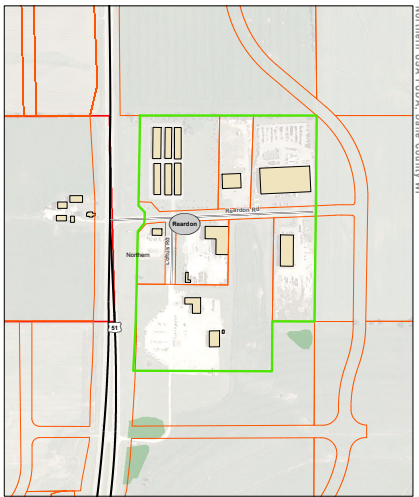
	Sub-Areas	Acres	Existing Uses	Existing Commercial SF	Existing Residential Units	Potential Future Uses
DeForest	1	2.75	Bus barn (First Student/Laidlaw)	4,651	0	Redevelopment for office and/or parking
	2	2.97	UW Health DeForest Clinic	6,853	2	Potential medical, office or multi-family
	3	2.16	Retail, Auto Service, MF Residential	7,432	5	Gateway Commercial, bank (drive thru?)
	5	1.30	Single Family Res.	0	2	Key Redevelopment, Ent. Rest, Service, 1.5-3 Stories
	6	1.08	Two-Family Res., Vacant	0	2	Key Redevelopment Site, Diner, Niche Retail 1.5-3 stories
	8	3.36	Vacant	0	0	Transit Stop and Associated Development
	9.1	3.88	Manufacturing, Vacant	28,530	0	Long-term Redevelopment
	9.2	6.29	Single Family Res, Apartments, Commercial	38,635	35	Long-term Redevelopment
	9.3	0.74	Single Family Res, Retail, Office, Vacant	8,875	2	Long-term Redevelopment
	9.4	0.80	Single Family Res	0	4	Long-term Redevelopment
	10	0.26	Single Family Res, Restaurant	3,181	2	Food/Entertainment (additional parking req.)
	Reardon Rd	25.71	Industrial	53,607	0	Business Park
Windsor	1	0.38	Vacant	0	0	Neighborhood Mixed Use
	2	0.23	Depot Building	0	0	Neighborhood Mixed Use
	3	0.56	Commercial Service, Storage Facility	9,087	0	Neighborhood Mixed Use
	4	0.49	Vacant and Commercial Service	3,446	0	Neighborhood Mixed Use
	M-1	0.45	Vacant	0	0	Commercial
	M-2	0.26	Vacant	0	0	Commercial
	M-3	0.54	Vacant building	1,542	0	Duplex Residential
	M-4	0.36	Vacant	0	0	Duplex and Stormwater area
	M-5	0.39	Partial Lot, Vacant	5,202	0	None - Intensification with Duplex
	M-6	0.29	Vacant	0	0	None - Single Family
	M-7	0.17	Single Family Res, Large lot	3,682	0	None - Intensification with Duplex
	M-8	0.34	Vacant - School owned Parcel	0	0	None - Intensification with Duplex
	M-9	0.24	Vacant	3,774	0	None - Single Family
DeForest Additional Areas	S. Main 1	6.68	Strip retail, post office, vacant parcel	46,766	0	Mixed Commercial Residential
	S Main 2	8.88	Strip retail, grocery store	86,658	0	Mixed Commercial Residential
	S Main 3	6.34	Retail, Bank, Health Care Clinic	59,858	0	Mixed Commercial Residential

Table 1 summarizes CARPC staff analysis of redevelopment with various areas identified in previously adopted plans. Adopted plans allow 300,000 commercial square feet and over 260 new housing units on infill and redevelopment sites. Analysis showed potential for an additional 200,000 commercial square feet and approximately twice the housing units on these infill and redevelopment sites. The sites outlined in green on Maps 3-6 highlight these already adopted redevelopment/reinvestment sites.

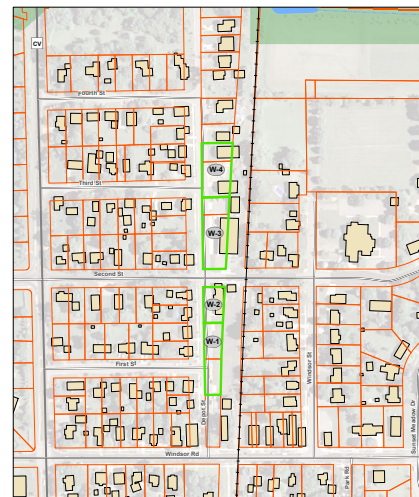
Map 3:
Downtown DeForest Redevelopment Sites



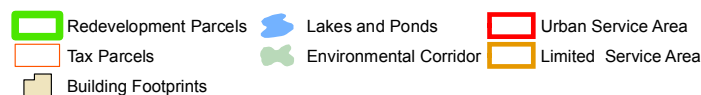
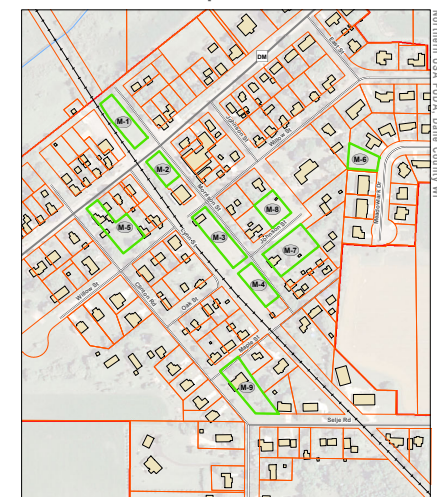
Map 4:
Reardon Rd. Redevelopment/Reinvestment Area



Map 5:
Windsor Redevelopment Sites



Map 6:
Morrisonville Redevelopment Sites



Land Use and Neighborhood Design Recommendations

3. *DeForest and Windsor are advised to allow for greater density in strategic locations in the Urban Service Area (see Map 2).*

- 3.1 Permit higher residential and commercial densities and mixed-use development at the northeast corner of North Street and I-90/94/39 west of Morrisonville Road.
- 3.2 Permit increased mixed-use and higher density along old Highway 51/North Towne Road focused around existing and future cross street intersections.
- 3.3 Allow mixed commercial development on public sewer and water service in Revere Trails on Highway 19 frontage (east of Bear Tree/North Towne Trails).
- 3.4 Allow additional mixed commercial/residential development and higher densities in future urban development areas with excellent highway access, such as Savannah Brooks, North Towne Trails (Bear Tree Commercial Area) and Windsor Crossing.
- 3.5 In general, allow for greater density near existing and future destinations (parks, civic uses, entertainment venues, retail) to encourage walking, biking, and when feasible, transit.

4. *DeForest and Windsor are advised to permit complete neighborhoods that integrate a range of quality residential, civic, open/public and business spaces in the Urban Service Area.*

- 4.1 Permit affordable senior residences (life-cycle housing), single-family lots and homes with a broad mix of sizes and price-points, and multi-family housing, including homes accessible to people with disabilities.
- 4.2 Mix housing, civic, open/public, retail and office uses horizontally and vertically.

Rationale for Recommendations 3 & 4

@ North Street & I-90/94/39 Existing plans call for separated commercial and residential uses.

Participant opinion: The Compact Character Scenario was popular and proposes a larger commercial area, a mixed-use zone and higher density residential than in the Adopted Plan Scenario.

@ Hwy 51/North Towne Road Existing plans allow “planned neighborhood” development to occur, including neighborhood-scale office and commercial uses.

Participant opinion: The Compact Character Scenario was more popular and proposes greater mixed-use and commercial development opportunities at road intersections along North Towne Road after Highway 51 realignment.

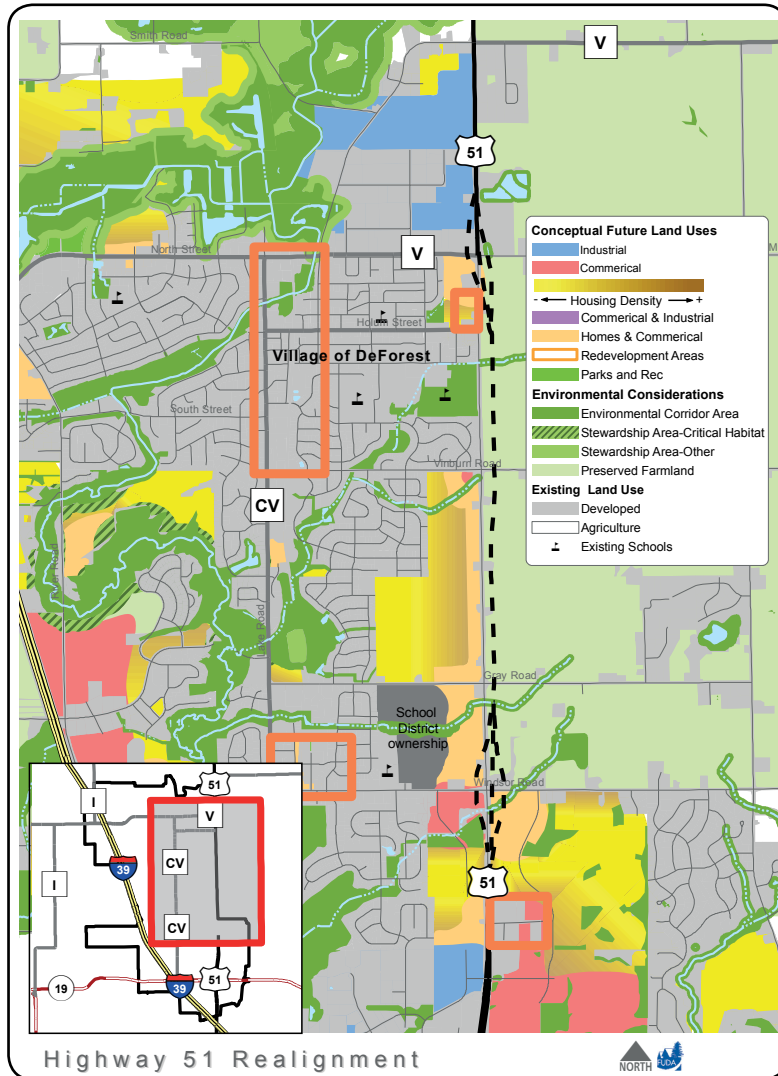
@ Revere Trails on Highway 19 Existing plans allow for rural development.

ECR: The high water table can flood residential basements. Allowing commercial development and the potential for public utilities here adds flexibility and can utilize the natural conservation amenities.

Steering committee recognizes:

- The advantage of I-90/94/39 highway access location and the realigned Highway 51 construction to be completed 2014.
- The increase in the baby boomer population and the existing waiting list at area senior housing locations.
- Decreasing household sizes and national trends towards smaller homes.
- The benefits from co-locating residential, work and daily destinations to foster walking and making social ties.
- Comprehensive Planning Law requires a TND ordinance when a population exceeds 12,500 and DeForest will consider adopting a TND ordinance in its pending Comprehensive Plan update.
- A Transit Corridor Study exploring an express bus service to and from the DeForest area is currently underway through Sustainable Communities Planning Grant. DeForest and Windsor can build on opportunities for transit supportive densities along this potential route.
- Affordability Considerations: Rents/mortgages within 30%, and transportation costs within 15% of household income (www.htaindex.org). Regulations and incentives for energy and maintenance-efficient construction, efficient layout and design for non-automobile trips, ability to grow food onsite and age in place in life-cycle housing are methods these communities could do to keep living affordable.

Map 7:



5. DeForest, Windsor and Vienna are advised to develop and implement streetscaping and community design/character guidelines in the Urban Service Area.

- 5.1 Develop a coordinated physical identity with a streetscaping and way-finding program and ordinance along central corridors including Lake Road/Main Street, Windsor Road, Highway 19 and North Street and other streets including Vinburn Road, Gray Road, Innovation Drive and River Road for vehicles, pedestrians, bicycles and other travelers.

- 4.3 Design neighborhoods and street and trail networks to provide convenient walking and biking access for residents to civic, business and open space uses.
- 4.4 Create adopt, and implement a Traditional Neighborhood Design (TND) district, that prescribes neighborhood functions, in the DeForest zoning code.
- 4.5 Develop design guidelines for new development along North Towne Road (currently Highway 51).
- 4.6 Leverage the recent investments in trails and proposed park investments to build community image and enhance development potential and quality in the Urban Service Area.

Rationale for Recommendation 5

In a visual preference survey participants preferred images that showed attractive streets and other aesthetic improvements.

Existing efforts:

- With the Highway 51 reconstruction project, DeForest and Windsor will begin implementation of a way-finding sign system.
- “Growing the Good Life” branding for DeForest, Windsor, Vienna, and to promote a shared identity and market the area.

Steering committee recognizes:

- DeForest and Windsor are making significant investment in parks, trails, and open space worth promoting.
- With Highway 51 realignment and expansion, many intersecting streets will no longer connect to Highway 51 and other streets will change to higher traffic levels.
- Lake Road and Main Street are the same street (CTHV) and could be unified in appearance.

Mobility and Access

6. *DeForest, Windsor and Vienna are advised to establish a connected street, sidewalk, bike-path and trail network that promotes walking, biking, and transit in addition to motor vehicles.*

- 6.1 Permit new development with a highly connected travel network for pedestrians, bikers, transit, vehicle and other travelers.
- 6.2 Evaluate existing development to determine where connectivity can be improved.
- 6.3 Continue to establish local and regional interconnected transit and trail networks between the North Yahara Communities and neighboring communities.
- 6.4 Accommodate transit (traditional and para-transit), ride-share, walking, biking and other non-vehicular forms of travel to accommodate persons of different ages and abilities in the Urban Service Area (USA).

Intergovernmental Cooperation

7. *North Yahara Communities are advised to continue or establish intergovernmental agreements with each other and surrounding jurisdictions.*

- 7.1 DeForest and Vienna are advised to update their existing intergovernmental boundary agreement set to expire late in 2013. See Further Analysis Area 1 for details.
- 7.2 DeForest and Westport are advised to establish an intergovernmental boundary agreement to discuss preservation and development opportunities. See Further Analysis Area 3 for details.
- 7.3 Vienna is advised to establish an intergovernmental boundary agreement with the Village of Waunakee.

Rationale for Recommendation 6

Participant Input: The Compact Character scenario emphasized the desire to walk and bike.

Steering committee recognizes:

- The automobile is the dominant travel method.
- Many people, young, elder, blind, differently abled persons cannot use a car and are dependent on others to get around reducing their independence.
- Daily walking, biking, etc. are part of a healthy lifestyle.
- A Transit Corridor Study exploring express bus service to and from the DeForest area is currently underway through Sustainable Communities Planning Grant.
- Transit and walking supportive densities of both people and places can be strategically connected and leveraged for a greater return on investment.

Rationale for Recommendation 7

Existing plans: The North Yahara Communities are area leaders in intergovernmental cooperation on a variety of topics, pushing aside past periods of conflict. Several intergovernmental boundary and service agreements are currently in place.

Participant Input: The North Yahara and North Mendota FUDA processes indicated strong support for community separation between each other, Madison and other neighboring urban areas.

Steering committee recognizes:

- DeForest, Westport, Vienna and comprehensive plans show the area west of the Interstate for agricultural preservation.
- Existing cooperative efforts also include joint economic development, community marketing, recreation and farmland/open space preservation.
- The Town of Westport has expressed interest in beginning intergovernmental discussions with DeForest.
- Interjurisdictional competition can be debilitating, while working together can better advance the region on a national and an international scale.
- Long-term agreements add predictability and reduce risk for municipalities and the many sectors that build them.
- The North Mendota FUDA project and Waunakee Future Land Use Map show current and future land development reaching the Waunakee/Vienna boundary.

Figure 3:

Considerations and Best Practices for Recommendation 8

Ecological Restoration Guidelines: Natural resource area restoration will be necessary to maintain ecological functions and the services they provide to humans, flora, and fauna, and to maintain our natural heritage for future generations. While each location will require tailored designs, restoration projects should generally follow these guidelines:

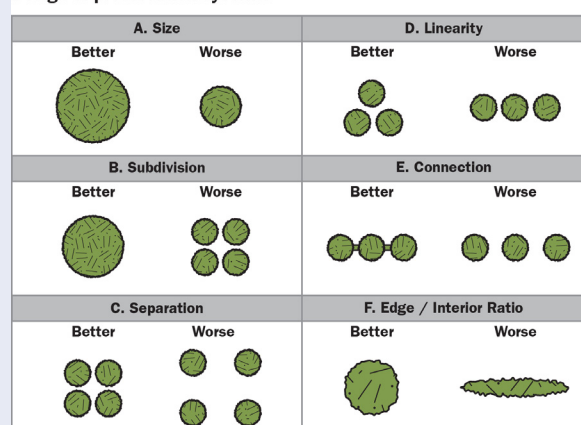
- Natural resource conservation and management is less costly than ecological restoration.
- For successful restoration, the factor causing the degradation must be identified and removed or abated.
- Often it is not possible to restore or create an ecosystem that is an exact copy of a previous or idealized state.
- Restoring physical attributes within an ecosystem will not always result in positive biotic responses or occupation by desired species.
- Restoration takes time. Depending upon the ecosystem, it may take a few years or several decades before restoration is complete.
- Restoration needs long-term management and monitoring to determine if additional corrections are required.
- Ecosystem restoration is complicated, not as easily manipulated as human engineered systems, and thus, it may not be possible to control for all aspects within a project.
- Each restoration project will have unique challenges requiring specific approaches.
- The restoration goal is to create a self-organizing and sustaining system that no longer requires active human intervention.
- Large sums of money, time and other resources will not solve ecological problems. Nor will waiting for advances in science and technology. Proactive restoration policies and actions are beneficial to preserving and improving our quality of life.

Habitat Connectivity Guidelines: Biodiversity is rapidly declining worldwide. Habitat fragmentation and loss of connectivity is one of the major reasons for decline and is largely from increasing agriculture, infrastructure and urbanization. Natural resource planning applies landscape ecology principles to overcome fragmentation. For the North Yahara FUDA Study Area, retaining connectivity in this landscape will require:

- (1) Providing buffer protection for the natural resources near Morrisonville, Cherokee Marsh & Token Creek.

- (2) Providing buffer protection along the Yahara River and mitigating development impacts on wildlife using native landscaping, appropriate road and building orientation and ensuring low traffic.

Design of preservation systems



Some "better-worse" comparisons of design of preservation systems as derived from island biogeographic theory. (Modified from Diamond 1975)

- 7.4 Maintain the Town of Burke, Village of DeForest, City of Sun Prairie and City of Madison Cooperative Plan, and work with the communities to make potential refinements in the implementation phases, such as improved community separation.
- 7.5 Maintain existing intergovernmental agreements, such as the DeForest-Windsor Cooperative Plan, and amend as necessary by mutual agreement.

Natural Resources

8. DeForest, Windsor and Vienna are advised to incorporate Stewardship Areas in development planning.

- 8.1 Incorporate "Stewardship Areas- Critical Habitat" and "Stewardship Areas-other" as shown in Map 2: Recommended North Yahara FUDA Scenario into local plans and apply habitat loss mitigation and restoration management standards for new development (see Figure 3).
- 8.2 Explore potential opportunities to establish or expand riparian buffers in these areas through pollutant trading between agricultural and urban sources involved in the Rock River Total Maximum Daily Load (TMDL) project.

- 8.3 Explore opportunities through the Conservation Reserve Program and other voluntary cost-share/set-aside/nonpoint source control programs administered through the Dane County Land Conservation Department with willing land owners.
- 8.4 Consider the roadless area north of DeForest and east of Morrisonville for preservation in long-term planning. See Further Analysis Area 2.
- 8.5 Windsor is advised to work with WDNR to restore the native brook trout fishery in the reach downstream of the Culver Springs. See ECR Map 28.

9. DeForest, Windsor and Vienna are advised to utilize environmental corridors and stewardship areas as open-space amenities in developments for residents and patrons.

- 9.1 Prepare and adopt stewardship design guidelines for development and open space in these areas.
- 9.2 Preserve viewsheds and vistas.

10. DeForest, Windsor and Vienna are advised to protect mineral resource areas (ECR Map 3), evaluate the areas for infiltration and groundwater recharge (ECR Map 9), and extract the resource and reclaim the land before development is permitted.

11. DeForest, Windsor, Vienna and are advised to maximize stormwater infiltration and groundwater recharge for new and existing development where opportunities exist and protect water quality in closed basins, the Upper Yahara River, Token Creek, and Lake Mendota.

- 11.1 Use areas with sub-surface glacial till deposits for enhanced infiltration (ECR Map 33).

Rational for Recommendations 8-12

Existing Plans: Accommodate Environmental Corridor designations and identify critical resources in the Natural, Agricultural and Cultural Resources elements of the communities' comprehensive plans. Many of these resources and their preservation potential are identified in the DeForest Parks and Open Space Plan.

Participant input: Participants favored community separation, environmental protection of vital resources and access to open space.

ECR: Stewardship Areas expand out from an environmental corridor feature and indicate where development may need to meet certain stewardship standards.

- Stewardship Areas-Critical Habitat and Stewardship Areas-Other are locations where special conditions might be required to protect the critical habitat (Map 37) and ecological services.
- The ECR contains the features that form the Environmental Corridor, Stewardship Areas and several other natural features including groundwater infiltration areas (Map 31), prairies (Map 36), woodlands (Map 4), extraction sites (Map 3), springs (Map 28), wells (Map 29), wetlands (Map 5), slopes (Map 4), watersheds (Map 10 and 11), surface waters (Map 11), etc.

The steering committee recognizes:

- The Environmental Corridor Expansion Areas shown in the Compact Character Scenario and ECR Map 37, as being converted to "Stewardship Areas-Critical Habitat."
- This area is the headwaters of the Yahara and Token Creek Watersheds that lead into the Mendota Chain of Lakes.
- Preservation efforts require willing landowners.
- Windsor and DeForest have existing site assessment/environmental conditions checklists and stewardship planning (Windsor Token Creek Conservation Area) that can be enhanced with FUDA recommendations.
- Water quantity and quality management is a regional concern with responsibility dispersed among many jurisdictions. Numerous local and regional strategies will need to be implemented in these communities to protect the watershed and those downstream.
- Water quality impacts come from point sources and non-point sources. Extensive efforts for point sources have occurred, while non-point sources, e.g. agricultural run-off, present challenges.
- Dane County is phosphorus rich while many places around the globe are reporting low phosphorus availability. Discussions about exporting phosphorus are beginning at the County through biodigesters.

11.2 The Towns of Windsor and Vienna are advised to adopt storm-water ordinances for maintaining pre-development stay-on volumes and recharge rates similar in scope to the Village of DeForest for the territories in the Urban Service Areas.

- 11.3 DeForest, Windsor, and Vienna are advised to continue to collaborate on promoting water conservation, increasing the efficient operation of their municipal water supply systems and minimizing the potential impacts of these systems on the local and regional water resources.
- 11.4 Minimize impact from impervious areas in new construction using best management practices and pervious surfaces.
- 11.5 Increase financial resources to implement broad agricultural best management practices to reduce negative impacts on natural resources.
- 11.6 Increase financial resources for broader implementation of retrofit urban best management practices in old urban areas.
- 11.7 Explore restoring wetlands, woodlands, prairies and pastures in select areas (ECR Maps 5, 4 and 36). Restore large depressional wetlands (ex. Town of Vienna sections 11 and 23) and poorly drained hydric soils that fail to produce cash crops in agricultural areas.
- 11.8 Capitalize on opportunities for capturing phosphorus within the watershed and exporting it outside the region, for example the manure digester in Vienna and the Madison Metropolitan Sewerage District's adaptive management planning project.
- 11.9 Continue to develop and adopt standards for both urban and agricultural non-point sources of pollution.

Figure 4:

Example Mitigation Standards- Country View Estates Neighborhood, DeForest

1. Permanent preservation of wetland areas & buffers: Exceed normal dedication requirements for public space.
2. Developer commitment to build low-impact trail network within buffer areas.
3. Developer to prepare wetland mitigation plan for 200+ acre wetland within development area.
4. Developer must mitigate 50 acres of wetland in conjunction with adjacent housing development.
5. Developer to dedicate 40+ acre upland park adjacent to wetland areas.
6. 100% stay-on for stormwater.
7. Thermal control for stormwater.
8. Modified street designs for environmental sensitivity.

12. Municipalities and their local water and wastewater utilities are advised to continue water conservation and reuse practices and enhance infiltration measures to help mitigate the municipal water withdrawal impacts.

- 12.1 Employ a series of best management practices (BMPs) such as directing downspouts to vegetated areas and lawns, installing rain gardens, and constructing active infiltration basins as part of urban stormwater treatment and management.
- 12.2 Increase water conservation with low flow fixtures and rainwater harvesting for irrigation purposes.

Working Lands

13. Support and implement methods to prevent the premature conversion of farmland to developed land.

- 13.1 Support and help maintain the Agricultural Enterprise Areas (AEAs) in Windsor and Vienna/Westport/Dane.
- 13.2 In new and extended intergovernmental agreements between DeForest and Westport, DeForest and Vienna, and Vienna and Waunakee, consider similar agricultural preservation approaches as used in the DeForest-Windsor Cooperative Plan. See Recommendation 6, and Further Analysis Areas 1 and 3 for details.
- 13.3 Maintain A-1: Ag-exclusive zoning and housing at or below current ratios in Windsor and Vienna.
- 13.4 Adjust DeForest's A-1 Exclusive Agriculture Zoning District to enable farmers within such zoned areas to obtain tax credits.
- 13.5 Increase financial resources to implement broad agricultural best management practices.

14. DeForest, Windsor, and Vienna are advised to prevent agricultural land conversion permanently in locally agreed locations.

- 14.1 Continue and enhance the Windsor Purchase of Development Rights Program.

Rationale for Recommendations 13-15

The North Yahara and North Mendota communities' comprehensive plans identify large areas west of the Interstate and areas east of Highway 51 for agricultural preservation, use A-1 Agricultural Exclusive zoning and include an Agricultural Enterprise Area in Windsor east of Highway 51 and north of Windsor Road. Several intergovernmental boundary agreements reinforce these intentions.

Participant Input: Participants rated agricultural preservation highly and supported the higher level of preservation in the Compact Character scenario.

Steering committee recognizes:

- This area boasts some of the best soils in the county and is connected to Arlington Prairie, one of the best agricultural areas in the state.
- This area boasts large areas of contiguous agriculture enabling a stronger agricultural land base. See ECR Map 50.
- DeForest and Westport comprehensive plans show northeast Westport in agricultural preservation.
- The North Yahara and North Mendota FUDA processes indicated support for community separation.
- The DeForest/Windsor/Vienna area boasts a highly successful agricultural sector.
- Vienna, Dane and Westport established an AEA in summer 2012.
- Waunakee growth plans extend to the Vienna town boundary.
- The conflict between ideal development conditions and ideal agricultural conditions often put large scale development and agriculture at odds. See ECR Map 43.
- Agricultural land is valuable in its own right, not only for holding land for development and is worth protecting from development.

- 14.2 Continue to use conservation easements and deed restrictions in farmland preservation areas.

15. Windsor and Vienna are advised to examine the scope and scale of land management practices to identify, enhance and maintain ecological services and functions on or adjacent to agricultural land.

- 15.1 Use open space corridors (a network of sensitive natural resource areas in the Dane County Parks and Open Space Plan) (ECR Map 38) as a guide and resource to create a network of permanent agricultural and open space conservation areas protected from development.
- 15.2 Restore former wetlands drained with underground drainage tiles and ditching where opportunities exist. See Map 5 in ECR.
- 15.3 Stewardship Areas should be designed so that the land owner would continue to benefit financially from the land. This can be done either through product sales from these conservation areas or through payments for the ecosystem service being provided.

Utilities

16. DeForest, Windsor and Vienna are advised to ensure effective public water supply, wastewater infrastructure planning and the cost effective provision of drinking water and sewer service for future development areas.

- 16.1 Establish a phasing plan for the potential future urban development areas identified in the Recommended Scenario.
- 16.2 Coordinate and leverage investments in infrastructure and community building within the North Yahara Communities and the greater region.
- 16.3 Continue municipal collaboration on utility services in DeForest and Windsor Sanitary District No. 1 and between the DeForest and Vienna systems.
- 16.4 Continue to protect existing infrastructure from flooding and avoid placing new infrastructure in the 100-year floodplain where possible to maintain resilient infrastructure systems.
- 16.5 Attempt to locate future municipal water wells outside of capture zones for springs. See ECR Map 28.
- 16.6 Water utilities should continue to foster and participate in collaborative strategies with other communities to mitigate well water withdrawal impacts on surface water features.

The next section outlines recommendations for areas that arose in discussing opportunities for future development and preservation. These areas are presented for future study.

Further Analysis Areas (FAAs) Recommendations

This section provides issues, opportunities, and the implementation measures for five further analysis areas:

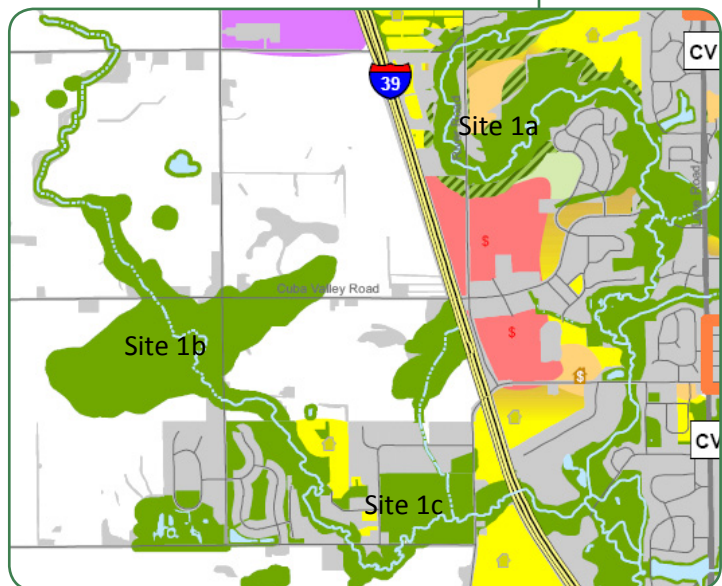
1. DeForest and Vienna between Conservancy Place and Hickory Lane
2. Wetland/floodplain preservation area east of Morrisonville
3. East of the Interstate between Hahn Road and North Street
4. Highway 19 corridor west of the Interstate
5. Additional reinvestment and redevelopment areas

1. DeForest and Vienna between Conservancy Place and Hickory Lane: Further Analysis Area Profile

This area is characterized by the Conservancy Place development in the Village east of Interstate 90/39/94 and relatively large agricultural parcels in Vienna west of the Interstate.

Area Recommendations:

1. DeForest and Vienna are advised to include this area in their upcoming discussions regarding potential extension and expansion of their intergovernmental boundary agreement, expiring late 2013.
2. The Village and Conservancy Place developer are advised to continue discussions on the most desirable land use mix within the undeveloped portions of Conservancy Place.
3. DeForest and the Conservancy Place developer are advised to implement mitigation and restoration measures in “Stewardship Areas - Critical Habitat” in Environmental Site 1a, particularly for the interior woodland surrounded by the stream and determine if herons are actively living in the rookery.
4. DeForest is advised to implement a proactive, and long term invasive species eradication program with monitoring in perpetuity for the fen (part of Environmental Site 1a) to continue in its current state.
5. Area landowners and local jurisdictions are advised to ecologically restore Environmental Sites 1b and 1c.



Issues and Opportunities:

Environmental Site 1a: Located east of I-90/94/39 this area contains two important natural resources according to DNR records and previous USA documents (1) a rare wetland called a calcareous fen and (2) a heron rookery. If these resources are present, they are highly sensitive to human activity.

Retaining these resources' ecological properties presents substantial challenges because (1) adjacent lands are developed or slated for development and may damage the resource as people and pets move through them, and by lawn fertilizers and herbicides, (2) if a well is ever located to the south, it may negatively alter the groundwater flow through these fens, this is because of their unique hydrology, geology, chemistry and biology, impacting the water chemistry fen plants need (if groundwater stressors become too severe, restoration will not be enough to maintain these fens and they will degrade into an alternative wetland ecosystem) and (3) these fens host invasive species along the perimeter and within the interior of the sedge meadows.

Environmental Site 1b: Located west of I-90/94/39 the Environmental Corridor is predominantly a floodplain and in agriculture use. Restored vegetation will help with floodplain issues, provide habitat for multiple species and facilitate greater connectivity.

Environmental Site 1c: Located west of I-90/94/39 this area would benefit from ecological restoration that would link the wetlands in the northern portion of this patch to the woodland that follows the stream to the south. This would promote better habitat for species that use both ecosystems.

Interstate Proposal: Since Conservancy Place was approved in the mid-2000s, roughly 120 housing units were built. None of the planned office/research or mixed use development has occurred. The developer is working to obtain state and federal approvals for a new interchange near the current Cuba Valley Road Interstate crossing to spur the planned and approved non-residential development in Conservancy Place. The Village has expressed a willingness to entertain a new interchange, provided that no general Village funds are used.

Agricultural: The land in Vienna is in an Agricultural Enterprise Area (AEA) and Vienna and DeForest comprehensive plans advise long-term agricultural preservation west of the Interstate. Some Vienna representatives have expressed concerns with the Interstate interchange in the area, based on conflicts with the Town's farmland preservation goals and additional traffic on Cuba Valley Road. Agricultural landowners in this general area have expressed interest in long-term farming while others may have future development interests.

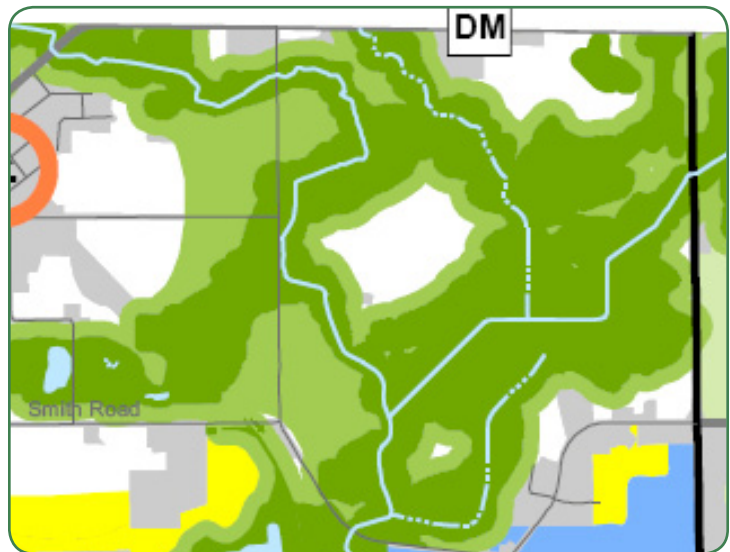
Participant Input: Participants supported the Compact Character and the Adopted Plans Scenarios with agricultural uses in this area. Participants strongly support local and regional goals to preserve agriculture.

2. Wetland/floodplain preservation area east of Morrisonville: Futher Analysis Area Profile

Largely roadless area with a high water table and other barriers to development north of DeForest, east of Morrisonville and south of the Dane/Columbia County border. Significant open space corridor features here warrant future protection.

Area Recommendations

1. If and when the landowner is willing, local jurisdictions are advised to discuss additional future preservation and restoration actions.
2. Jurisdictions and/or the landowner are advised to actively manage invasive species in this area several years before and during any restoration.
3. Jurisdictions and/or the landowner are advised to restore natural features to enhance environmental corridors.



Issues and Opportunities

Existing Plans: Dane County and DeForest Park and Open Space Plans identify this area as a natural resource protection area, for preservation, restoration and possible future acquisition of land or development rights. Land features in this area meet Dane County Open Space Corridor criteria. Comprehensive plans do not identify this area for development.

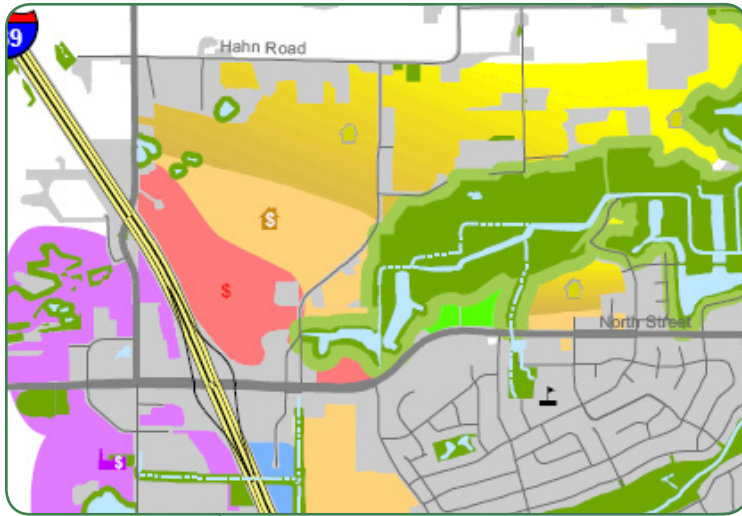
Environmental: This area contains four different ecosystems: streams, woodlands, prairies and wetlands. Combined, these ecosystems provide significant opportunities for habitat variation and interaction, thus supporting a higher likelihood of more diverse wildlife. The current distribution of natural areas and potentially restored areas will permit restoration projects to be completed over time. The extent of Environmental Corridors and Stewardship Areas permit easier wetland reconnection during restoration. The remaining areas would be best for prairie restorations.

Agricultural: This area is largely undisturbed by roads and development, with limited residential and agricultural uses.

Public Input: Participants supported preserving this area.

Other: The current property owners have not expressed interest in developing or selling land or development rights. The area contains significant natural barriers to development.

3. East of the Interstate between Hahn Road and North Street: Futher Analysis Area Profile



This analysis area is characterized by highway and tourist oriented retail and services and a large amount of vacant land planned for urban development east of Interstate 90/39/94 and South of Hahn Road.

Area Recommendations

The Village of DeForest is advised to consider amendments to its Comprehensive Plan to:

1. Permit greater intensity commercial and residential development.
2. Permit quality multi-family and senior housing.
3. Permit mixed commercial/ residential uses.

Issues and Opportunities

Existing Plans: Plans call for development in this area and it is addressed in the current DeForest-Vienna Boundary Agreement.

Environmental: Very few natural resource concerns exist that cannot be resolved with Environmental Corridors around open water bodies in the east. The small woodlands to the north are perforated with rural development and not suitable for wildlife conservation.

Agricultural: This area is generally fragmented into smaller agricultural parcels.

Participant Input: Participants supported the Compact Character Scenario with higher density development and added commercial in this area, and mixing commercial and residential uses to create active and efficient places.

Other: This area abuts land planned for industrial development on the west side of the Interstate and is adjacent to planned development with open space amenities in the Village. Higher densities and more commercial uses could help support infrastructure in developing adjacent lands to the east in the Village also planned for development.

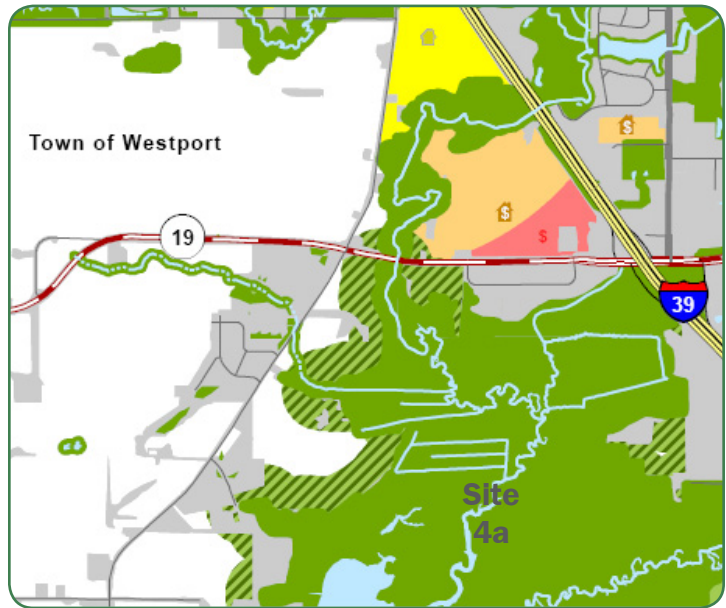
4. Highway 19 Corridor West of Interstate: Further Analysis Area Profile

Current and future Village lands exist north and south of Highway 19, between the Interstate and River Road. These lands are or will be annexed from Burke and Windsor upon development (see respective Cooperative Plans).

Area Recommendations

DeForest is advised to:

1. Complete more detailed neighborhood planning for its planned development area between River Road, Highway 19 and the Interstate.
2. Consider compatible land use transitions, progressive stormwater management, preservation and enhancement of the Yahara River corridor and transportation access.
3. Communicate with neighboring communities including Westport and Waunakee.
4. Work towards an intergovernmental agreement with Westport to discuss issues and areas of mutual concern for lands west of River Road.
5. Jurisdictions are advised to protect Environmental Site 4a with protective buffers and corridors wider than Environmental Corridors connecting the Cherokee Marsh area to facilitate organism movement, preserve habitat and prevent disturbance to wildlife; avoid narrowing the environmental corridor or locating high traffic or disturbance activities here; implement invasive species removal and management in the current environmental corridor areas to prevent spread into Stewardship Areas - Critical Habitat.



Issues and Opportunities

Existing Plans: Plans call for agricultural preservation for a part of the area west of River Road. Lands north of Highway 19 and east of River Road are undeveloped, are currently outside of the Urban Service Area, are partially held by development interests and are planned for future development in the Village Comprehensive Plan.

Environmental: Lands south of Highway 19 abutting the northern reaches of the Cherokee Marsh are in the Urban Service Area, with upland areas in the Union Conservancy Park office/commercial development. Lands north of Highway 19 and east of River Road are undeveloped, have the Yahara River winding through them and are planned for future development.

Environmental Site 4a: Cherokee Marsh is one of the largest and most valuable natural resource areas in Dane County. There are multiple landscape features that constrain the movement of organisms within the FUDA study area.

Agricultural: Lands west of River Road are in the Town of Westport, and currently planned by all local governments for agricultural preservation. During this FUDA Study process, committee members discussed the potential for future community separation and/or development west of River Road in the Highway 19 corridor. This area is not suggested in this FUDA Study or the North Mendota FUDA Study (involving the towns of Westport and Springfield, the Village of Waunakee and the City of Middleton) for future urban development at this time. Several conservation easements exist in this area preventing development on affected parcels.

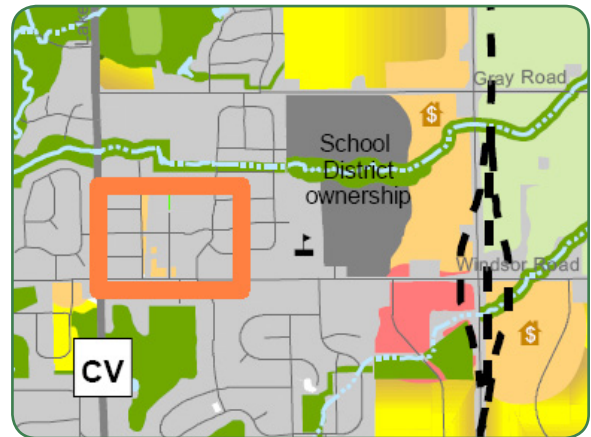
Participant Input: The participants generally supported this area for community separation between DeForest, Waunakee and Madison, and supported the broader community goal of community separation.

5. Additional Reinvestment and Redevelopment

The steering committee identified additional properties that might become redevelopable in the coming decades that are not yet included in local plans. The areas are presented in Map 2.

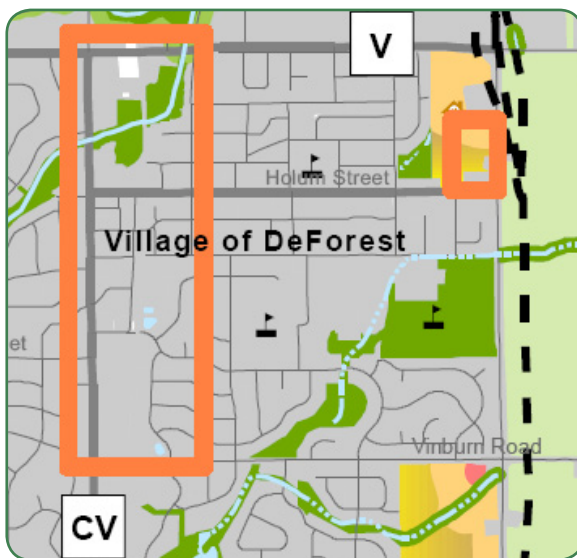
Recommendations

1. The Town of Windsor is advised to explore reinvestment opportunities for properties along Windsor Road.
2. DeForest is advised to explore redevelopment potential for properties on North Street/ County Highway V including those identified in its Downtown Revitalization Concept Plan and scattered sites both east and west of Main Street.
3. Identify the potential redevelopment market with regional developers and builders to determine where redevelopment is feasible and what development types have market support.
4. When redeveloping properties with or adjacent to environmental corridor features, DeForest, Windsor and property owners are advised to restore features to capture the economic value and restore the ecological value.



Issues and Opportunities

Existing Plans: With the realignment of Highway 51 certain intersecting streets will no longer connect to Highway 51, redistributing traffic to other streets, such as from Holum Street to North Street in DeForest. In Windsor, the new interchange at Highway 51 and Windsor Road will send more traffic to Windsor Road. In both cases, this spike in vehicle traffic could stimulate development and redevelopment on these corridors.



Environmental: No major natural resource concerns. However, considerations should be given to preserving the resources found within the current environmental corridor areas to capture their amenity value.

Participant Input: Participants supported higher levels of redevelopment and additional locations.

Other: This Study recommends the redevelopment of several locations connected to North Street and Windsor Road. When projects on these streets become feasible, communities are advised to ensure new development's design and character are coordinated with the central corridors as described in Mobility recommendation #5.

Recommended Scenario Impacts

The Recommended Scenario presented earlier was developed using a series of information sources and analyses performed on the initial three scenarios (Compact, Adopted and Dispersed). For the purpose of this Study this analysis was performed on the Recommended Scenario for several variable and indicator categories including: population; land use and efficiency; housing; taxes, jobs, and shopping; travel; environment; farmland; health; and water (stormwater, water use and waste, and groundwater). Note that flexibilities in land use plans (such as a mixed-use districts allowing commercial and/or residential) could allow outcomes and impacts different from those discussed below.

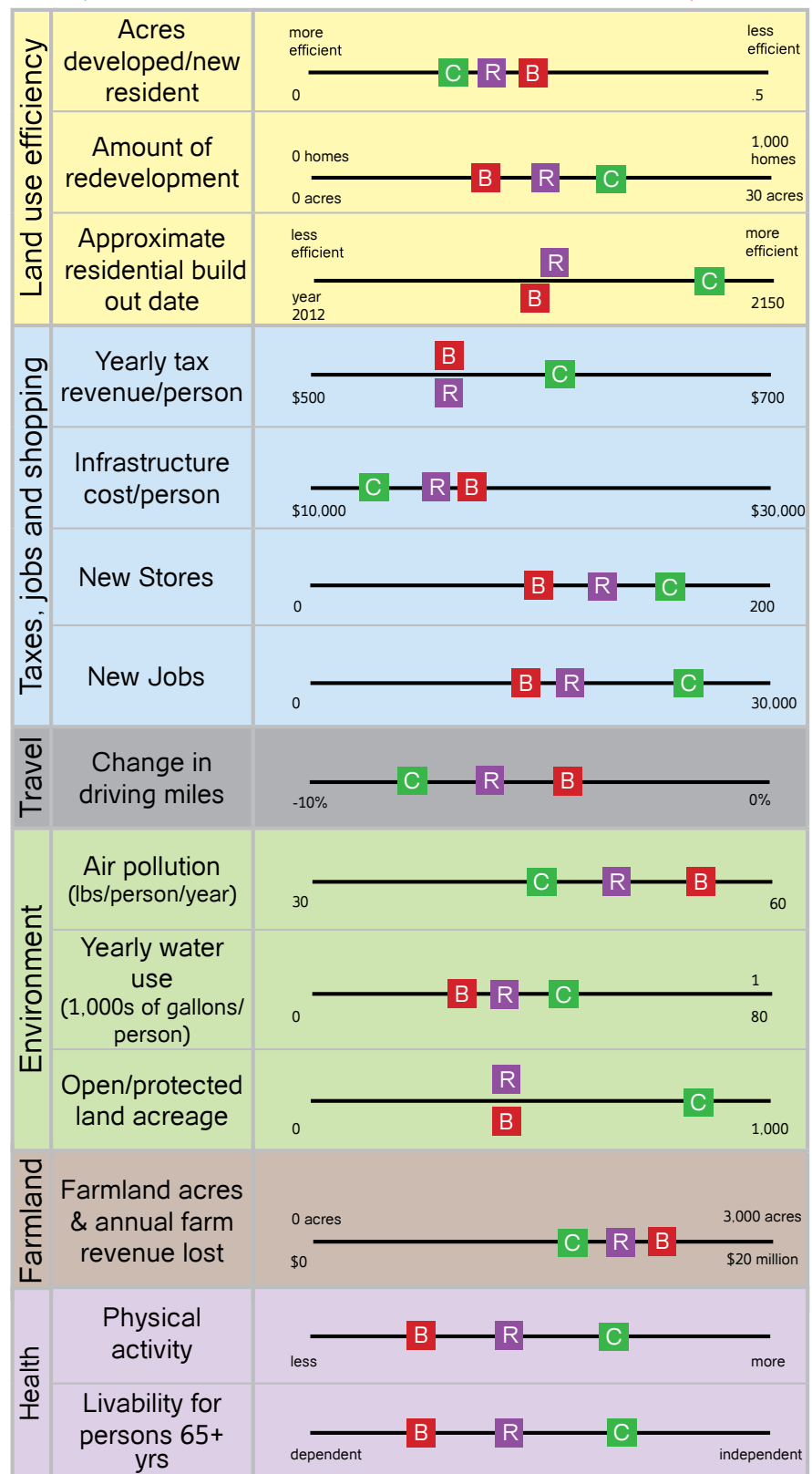
Population

The Recommended Scenario could accommodate about 18,000 new residents in the DeForest, Windsor and Vienna desired future urban development area with public water and sewer. With roughly 13,000 residents within urban service areas in these communities (2010), this scenario represents a nearly 140 percent population increase in the future urban area plus the additional people accommodated through redevelopment and infill in the existing Urban Service Area.

The area defined in scenario evaluation, based on locally adopted future land use maps, used two alternative growth rate assumptions to estimate when build-out of the land would occur. The first rate was derived from the Department of Administration

Figure 5: Indicator and scenario impacts

C- Compact Character Scenario R- Recommended Scenario B- Adopted Plans



municipal population projections. At this rate, the land area in the Recommended Scenario may take up to the year 2100 to reach development build-out. The second rate was based on recent years of rapid growth. At this rate, the land area in the Recommended Scenario may take up to the year 2050 to reach development build-out.

The steering committee preferred this second alternative growth rate to accommodate any significant changes in factors influencing community growth, such as improved interjurisdictional relations, significant transportation investments and other variables that may accelerate population growth. For more information see Supplement C on Scenario Evaluation.

Housing

The Recommended Scenario estimates roughly 7,000 homes could be built in this area to accommodate the future population, with an average of 2.53 people per housing unit. Redevelopment and infill sites could accommodate 260 to 600 of the 7,000 homes.

The Recommended Scenario utilized a mix of four different residential character types, with higher density neighborhoods often located adjacent to frequent destinations, such as commercial areas, schools and parks. This places a greater population closer to these areas, encouraging more activity, reducing trip length and allowing more options for walking and biking. The four residential character types create more housing options for future residents and allows for lower densities in locations where intense development may negatively impact sensitive environmental areas. The variability of housing also provides opportunity for more affordable options, for both homeowners and renters.



Image from the Visual Preference Survey rated highly by public participants

In the Recommended Scenario, 72 percent of new housing units are projected to be single family, consistent with adopted local policies that a minimum of 65-70 percent of new housing be single family homes. While density would likely vary by location, new single family homes could have lot sizes averaging 10,000 square feet. For multi-family homes, the Recommended Scenario reflects the public participant preference for smaller multi-family buildings, including townhomes and duplexes; mixed-use buildings with apartment-style units over commercial space were also preferred.

The Recommended Scenario includes a projected FUDA-wide residential density increase to help preserve farmland and natural areas, maintain a compact and walkable community character and respond to expected market demand. The projected gross residential density for 'greenfield' development within the Recommended Scenario is 4.5 housing units per acre. Assuming that 25 percent of land that is developed for new housing is actually in roads, stormwater areas, or common open space, the



Image from the Visual Preference Survey rated highly by public participants

projected net residential density in the Recommended Scenario is 5.3 units per acre. This is higher than current net residential densities in the Northern Urban Service Area (4.3 units per acre in DeForest, 2.9 units per acre in Windsor, and 3.8 units per acre overall). Although the Recommended Scenario's projected residential density can be a FUDA-wide goal for the North Yahara communities, it is not always possible or desirable to achieve these higher densities at a neighborhood or individual project scale.

Land use and efficiency

The Recommended Scenario would result in the development of approximately 3,200 acres to accommodate demands for residential, commercial, industrial, civic and transportation uses.

As mentioned, the Recommended Scenario increases residential density above current rates and within the guidelines established by communities' comprehensive plans. Changing residential density will have the largest impact on total land consumption in growing communities, as residential areas account for 40 percent of all developed land in Dane County.¹ The scenarios explored changing commercial densities, however the Recommended Scenario did not assume a change from existing commercial densities in the North Yahara area. Market forces arising from land values, site development standards required for businesses (such as parking requirements), consumer and business preferences, conservative lending practices, production efficiencies for industrial uses and other factors work against higher densities in suburban areas. Regional market studies underway and continued conversation with developers may identify opportunities for greater densities and mixed-uses, increasing value and return on investment to the developer and government.

Another area investigated was infill and redevelopment. The Recommended Scenario incorporates more redevelopment than identified in the Adopted Plans scenario. The Adopted Plan scenario incorporated redevelopment sites that were identified in adopted plans, generally clustered in the downtowns of DeForest, Windsor and Morrisonville. Adopted plans estimate 260 dwelling units and commercial space equivalent to roughly 18 acres of greenfield development. The Compact Character Scenario incorporated additional sites south of downtown DeForest and assumed a higher rate of redevelopment (a greater likelihood of re-

¹ CARPC 2005 Land Use Inventory.

development, not larger buildings or higher density development), increasing the total to over 600 dwelling units and 21 acres of commercial. Additional redevelopment areas along North Street in DeForest and Windsor Road are identified as further analysis areas and could see future development interests with the Highway 51 reconfiguration.

Overall, the Recommended Scenario estimates a total developed area per person of approximately 0.18 acres. This compares to existing developed areas per person of 0.24, 0.28 and 0.71 in DeForest, urban Windsor and urban Vienna respectively. This is largely due to projected increases in residential density under the Recommended Scenario, and is already-being advanced in area developments.

Additionally, adopted plans allow for a mixture of compatible land uses in several locations in the Study area. The Recommended Scenario takes advantage of this opportunity and shows an appropriate mix of higher-density residential and commercial uses in these areas also, generally located along streets with high visibility now and in the future. A limited number of additional mixed-use areas are also included.

Taxes, jobs and shopping

The Recommended Scenario includes substantial amounts of commercial and industrial development, increasing the tax base and balancing the urbanized area with greater employment opportunities and local shopping opportunities for residents. The scenario projects 78 jobs for every 100 new residents in the future growth areas. Population growth could bring over \$200,000,000 in new annual consumer spending, enough to support over 540,000 commercial square feet (108 stores at 5,000 sq. ft. each).

Travel

Transportation impacts were evaluated several ways during scenario evaluation. Communities with a more compact development pattern tend to result in lower amounts of driving (miles per person), due to shorter trips and greater ability to walk, bike or take transit. Following this pattern, new growth areas in the Recommended Scenario are projected to experience a four percent reduction in the amount of driving miles per person when compared to the existing community.

Mixing uses and increasing employment opportunities in the North Yahara area is expected to support this decrease in vehicle miles traveled per person. An estimated 140,000 trips per year could be made by walking or biking to commercial destinations in newly developed areas, based on the number of residents living within a quarter mile from those destinations and observed non-motorized trip data for Dane County.



Increased street connectivity rated highly by public participants

Character images of this scenario also suggest a more interconnected street pattern. This allows more direct trips and facilitates walking and biking. Many comments during the scenario evaluation process cited the need for a multi-jurisdictional path system to better connect areas of the Village and Towns.

Additionally, if homes and businesses are located closer together, fewer miles of local roads and other infrastructure are needed. The Recommended Scenario could require 25 percent less road miles per person than the Dispersed Character Scenario, providing significant cost savings to future home and business owners and reducing municipal maintenance costs from \$38 to \$36 dollars per person. Even more compactness could reduce costs to below \$30, according to the Compact Character Scenario evaluation.

Since transit does not serve in the North Yahara area, it was not a primary factor in scenario planning. However, the Recommended Scenario reflects a long-term desire to have transit service, and locates higher density mixed-use areas in the locations that could be served by express bus service currently under investigation by the Madison Area Transportation Planning Board (MPO).

Environment

The Recommended Scenario incorporates protected areas from adopted plans and highlights other opportunities for preservation to the south, west and north of DeForest. Beyond these land based protections, numerous other environmental factors are impacted by changes in other indicators. For example, increased walking and biking could indicate fewer car trips for short distances, and therefore less tail-pipe emissions. The Recommended Scenario models an approximate 280 pound reduction in annual carbon emissions per driver compared to adopted plans.

Farmland

The Recommended Scenario, if built-out, will consume the same amount of farmland as the other polling scenarios that led to it because a fixed-land area analysis was chosen (see Supplement C for more details). However, under this scenario, farmland conversion will occur at a slower rate, with more defined edges between urban and rural environments. The scenario maintains all existing legal farmland preservation policies and plans, and municipal boundary agreements. Farmland in Windsor is generally protected through such agreements through 2040, increasing urban development pressure in other areas, including the agricultural lands west of the Interstate. A recent AEA in Vienna aims to preserve farmland west of the Interstate. In general, the rural communities here host some of the region's highest quality soils for farming. An emphasis on developing north and south of DeForest maintains these high quality lands in agricultural production.

Human health

The root causes of poor health are complex and extend beyond healthcare to a variety of community contextual factors. The UW Population Health Institute estimates that 50 percent of modifiable health determinants pertain to the social, economic and environmental context.

Healthy community design is a comprehensive strategy for shaping and organizing our communities for physical, mental and social well-being. Healthy community design can improve population health including: increasing accessibility to public or healthcare services, healthy foods, and physical activity; decreasing injury rates and mental health stresses; providing equitable access to livelihood or education resources and strengthening the social fabric of a community.

Figure 6:

Health Impact Assessment Process

- Screening - determines the added value and the potential impact of conducting an HIA
- Scoping - determines the focus of the HIA, including deciding on related indicators and research questions.
- Assessment - gathering information on the existing conditions and potential health impacts related to the proposed plan.
- Recommendations – develop relevant and reasonable recommendations based on information gathered during assessment to avoid, minimize, or mitigate adverse effects and to optimize beneficial ones.
- Reporting – disseminating recommendations and/or mitigation strategies to decision-makers, stakeholders, and community members.
- Monitoring - evaluates the ways in which the HIA recommendations impact the proposed plan's implementation, the process in which the HIA is conducted and the effect the results have on health outcomes.

While there are varying degrees in which HIA's are implemented in communities, this HIA was performed as a "rapid" HIA over the course of two months. The Wisconsin Public Health Association (WPHA) HIA Section is the project lead for this HIA.

According to the International Association for Impact Assessment, a Health Impact Assessment (HIA) is formally defined as a "combination of procedures, methods and tools that systematically judges the potential and sometimes unintended effects of a proposed project, plan or policy on the health of a population and the distribution of those effects within the population (2006)." An HIA also proposes enhancing positive impacts and managing or eliminating any negative effects.

Health Impact Assessment can provide a mechanism for different sectors to consider potential positive and negative health impacts of decisions on communities. HIA can help to advance the well-being of all individuals by improving community health and focusing on the needs of disadvantaged populations. To this effect, the

steering committee asked the HIA project team to focus on two indicator areas (1) physical activity/obesity and (2) livability for persons 65 years and older. A full "rapid" HIA for the three polling scenarios and the Recommended Scenario is available as Supplement D.

Table 2: Physical Activity/Obesity Indicators used for HIA

1	Trails and bike lanes and walking and biking
2	Traffic-related accidents, complete streets and pedestrian and cyclist safety
3	Transit and transit oriented development
4	Social interaction, gathering places, recreational amenities, and crime prevention through environmental community design
5	Mixed-used development & clustered activities; linking existing and future housing development with employment and services; trip reduction and reduced VMT; walking and biking; senior services
6	Food Access: Local food production, contiguous agricultural land, healthy food outlets
7	Maps of large recreational facilities, community gardens, schools, large parks and open space

Table 3: 65+ Livability Indicators used for HIA

1	Affordable, good quality, life-cycle housing and energy efficient building codes
2	Developments with views of greenery/vistas for mental health and tree canopy preservation
3	Emergency department visits related to asthma
4	Climate change and allergic diseases
5	Greenhouse gases and pollutants

HIA found that the most healthy scenario was the Compact Character Scenario across most indicators. Some indicators, such as views and vistas, are often compromised in more compact areas, however, intentional design and layout, can preserve views. Through the Recommended Scenario, the steering committee aims to capture these potential health benefits.

The Recommended Scenario will benefit health in a number of ways, though mainly through increased density. Increased residential density with interconnected street patterns adjacent to commercial areas of frequent travel will increase walking and biking as residents will be able to physically commute to these destinations. Increased residential density will preserve farmland and open space which will provide views of green space, improving mental health. Affordable quality housing will increase health through reduction in allergen triggers from low quality housing and decreases in the stress associated with low-income/low quality housing. Increased density coupled with more local employment opportunities will decrease VMTs, increase air quality, and reduce greenhouse gas emissions, air pollution and other allergen and asthma triggers. The preservation of small community character through moderately dense residential districts and preservation of farmland and open space will also increase social cohesion, benefiting health. Increased density may encourage more farmers' markets, increasing access to healthful foods, and increased density near commercial areas will improve access to grocery stores and other food outlets.

Based on the Recommended Scenario, the following methods will encourage or increase positive health effects of the scenario while at the same time mitigating any negative health effects of the proposed scenario.

- To both encourage and protect walkers incorporate sidewalks into redevelopment, new development plans and integrated into existing neighborhoods where practical. Prioritize putting sidewalks and bike paths into denser neighborhoods that have convenient access to destinations to maximize usage. In busy commercial districts, consider a “road diet,” lowering speed limits for vehicles where safety is a concern, adding button-operated pedestrian signals at signalized intersections, adding stops signs at critical locations, and adding bump outs or medians for shorter pedestrian crossings.
- To both encourage and protect bikers designate bike lanes, bike arrows (pavement markings on shared roads) and bike paths be integrated into communities. To encourage and facilitate biking incorporate bike racks into commercial districts. Provide the community with information on proper bike safety road rules.
- To facilitate aging in place and encourage physical activity of senior citizens, create walking paths that incorporate their needs such as frequent benches for resting, water fountains for rehydrating, and shade trees to protect from the sun. In addition, these walking paths could include low impact exercise structures to encourage physical activity. Other improvements include adding bump outs at busy intersections with signage and user-activated crossing signals that are clear and easy to understand for pedestrians with limited faculties (eye-sight, hearing, etc).
- The creation of a local food council could encourage more frequent farmers’ markets with more local vendors, increasing access to healthy local foods. This food council could also provide community outreach and information on how to obtain, store, prepare and enjoy healthy foods.

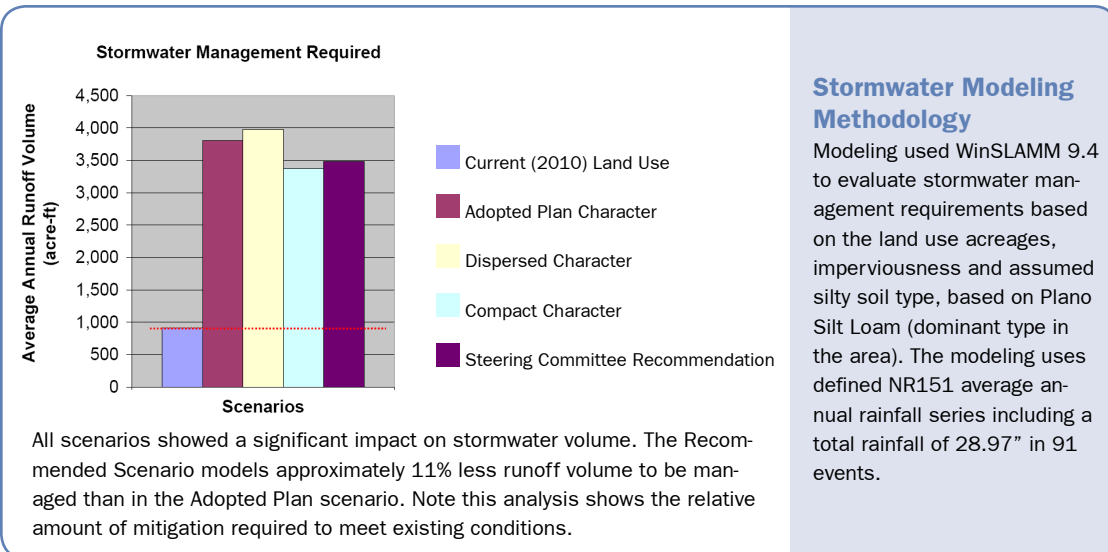
Table 4: Impact Analysis – Recommended Scenario

Determinant	Effect of Recommended Scenario on Indicators
Housing Impact	Higher density housing districts adjacent to frequent destinations encourages more physical activity through more walking and biking. Sensitive environmental areas will be preserved, allowing for views of greenery and tree canopy preservation, increasing mental health. Higher density reduces trip length, increasing air quality and reducing asthma triggers. More affordable housing options increase health through better quality housing, reducing exposure to allergen triggers, and reducing stress associated with unaffordable housing.
Environmental Impact	Higher density reduces trip length, increasing air quality, reducing air pollutants and greenhouse gas emissions. Sensitive environmental areas will be protected, and a balance will be created between preserving farmland and open space and maintaining small village character, increasing mental health and social cohesion.
Mobility and Access	Interconnected street patterns allow for direct trips and encourage walking and biking. Reduction in need for road space per person provides cost savings to home owners, business owners and municipalities, reducing financial stress and increasing disposable income available for other health related activities/issues/etc. as well as for public services. A long-term desire for transit service, which higher-density mixed-used areas in plan will support, will decrease vehicle miles traveled and encourage more walking and biking to and from transit stations.
Density	Increased residential density preserves farm and open spaces, providing green space beneficial to mental health. Infill and redevelopment increase density, providing health benefits and helping preserve green space, benefiting mental health. A mix of higher density residential and commercial uses encourages more physical activity through more walking and biking, reduces trip length, increasing air quality and reducing asthma triggers. Increased tax base and employment opportunities improve the quality and quantity of public services and increases income leading to lower stress levels. Local jobs decrease vehicle miles traveled, improving air quality and reducing greenhouse gas emissions.
Food Access	Mix of higher-density residential and commercial land uses will increase food access. Preservation of farmland will protect local food production. Dense residential areas may enable more farmer's markets, improving access to healthy foods.

Stormwater

Stormwater modeling shows that stormwater management would need to handle nearly 2,600 acre-feet of runoff annually to meet the 100 percent pre-development stay-on standard under the Recommended Scenario (2010 Land Use Inventory, CARPC). The Recommended Scenario and existing practices and ordinances in the North Yahara communities require progressive stormwater management practices (see Figure 7).

Figure 7: Stormwater runoff volume without volume control BMPs



Wastewater

Combined, the Village of DeForest, the two sanitary districts in the Town of Vienna, and the four sanitary districts in the Town of Windsor generated an average of 1,340,500 gallons of wastewater per day in 2010. This was about 3.1 percent of the average daily wastewater received at the Madison Metropolitan Sewerage District's (MMSD) Nine Springs Treatment Plant in 2010. A combined total of over 79 miles of sanitary sewer and force main are necessary for wastewater collection within these communities.

Under the Recommend Scenario, wastewater generation is expected to increase to a total of 4.27 million gallons per day.² The area studied includes 564 acres anticipated to be part of the MMSD service area between 2030 and 2060 and another 342 acres after 2060 (2009 MMSD Collection System Evaluation). A phasing plan for developing this area is essential for effective wastewater infrastructure planning and cost effective provision of sewer service.

An alternative satellite wastewater treatment plant in the upper Yahara River basin was identified, but not further evaluated, in MMSD's 50-year Master Plan (adopted 2008). This plan concluded that, for the planning period, a satellite plant alternative is less favorable than continued operation and expansion of the Nine Springs Treatment Plant. However, this alternative may become viable in the future with changes in the political environment, water resource demand or improvements in wastewater treatment technologies. As part of the MMSD collection study, CARPC staff included uncertainty levels, likelihood of timing and long-term development in and around urban areas. The scenarios evaluated in the FUDA process do not provide detail that would change the results of the MMSD Collection Study.

² based on current water and wastewater rates and the projected population at build-out†

Public Water System

The Village of DeForest and the Windsor Sanitary District No. 1 both operate public water supply systems. The population served by the public water supply in 2010 is estimated to be 11,805 in DeForest, Windsor and Vienna. Combined the NUSA public water supply systems distributed an average of 943,000 gallons per day of water in 2010. The public water demand within the North Yahara Future Urban Development Area is expected to increase 2.93 million gallons per day.³ Table 5 breaks down this water use for this and the polling scenarios.

Cooperative Utility Agreement

In 2012, the Town of Windsor, Village of DeForest and Windsor Sanitary District No. 1 entered into an intermunicipal cooperation agreement for the provision of utility services for the Bear Tree development. The DeForest - Windsor Cooperative Plan has provisions that support future cooperation on utility service in the area.

Table 5: Estimated Water Use for Various Alternative Development Scenarios

Well water withdrawals within the North Yahara FUDA are expected to increase to between 2.13 and 3.73 million gallons per day (mgd) based on four development scenarios and associated water use projections.

	2010	Recommended	Adopted Plans	Dispersed	Compact
Incremental Population Served (1)		17,737 ⁽⁵⁾	18,733	7,933	22,378
Total Population Served (2)	11,805	29,542	30,538	19,738	34,183
Incremental Water Pumped (gpy) (3)		726,973,000	735,024,000	433,090,000	1,018,133,000
Incremental Water Pumped (mgd)		1.99	2.01	1.19	2.79
Total Water Pumped (gpy) (4)	344,202,000	1,071,175,000	1,079,226,000	777,292,000	1,362,335,000
Total Water Pumped (mgd)	0.94	2.93	2.96	2.13	3.73

Notes:

(1) Projected population increases for each scenario

(2) 2010 population served is DeForest 2010 Census population + Windsor Sanitary District #1 2010 PSC Annual Report population served + 2010 multifamily population served

(3) Calculated from projected population growth + 2010 avg. Commercial and industrial water use per acre for Windsor & DeForest * projected future acres

(4) DeForest and Windsor Sanitary District #1 PSC Annual Report for 2010

Source: Capital Area Regional Planning Commission 2012

(5) Note: The population decreases in the Recommended Scenario resulted from a higher ratio of commercial to residential development.

³ based on current water rates and the projected population growth and land uses in the Recommended Scenario.

Groundwater

Pumping and Diversion

Pumping groundwater from one location and then discharging it to another can alter the local ground and surface water balance; particularly in urban areas where concentrated pumping can lower water table levels and reduce baseflow to area waters, such as Token Creek or the Yahara River.

Groundwater modeling was conducted to estimate the impacts of high capacity municipal well water withdrawals for the Dane County Regional Hydrologic Study (DCRPC 2004). As seen in Table 6, baseflows fell by 16 percent in Token Creek and nearly half (45 percent) in the Yahara River measured at McFarland, compared to pre-development conditions (no wells pumping). Projected future pumping is expected to result in additional reductions of between 12 percent and 15 percent, respectively, and 15 percent in the Upper Yahara River near Windsor. This provides important regional context since groundwater does not recognize political boundaries.

Groundwater Modeling Methodology

Wisconsin Geological and Natural History Survey
Groundwater modeling used projected well withdrawals based on future population projections and historic per capita water use without mitigation.

Table 6: Results of Simulations for Well Withdrawals in Dane County

Stream	Pre-Development (Wells turned off)	2000 (% reduction)	2030 (% reduction)
Token Creek	18.48 cfs	15.50 (16%)	13.33 (28%)
Upper Yahara River	11.71 cfs	10.00 (15%)	8.14 (30%)
Yahara R. @ McFarland	127.28 cfs	70.00 (45%)	54.21 (57%)

Source: Dane County Regional Hydrologic Study 2004

To better understand the impact of municipal well withdrawals to area waters, additional groundwater modeling was conducted using the water use estimates derived in Table 5 distributed equally among a community's existing and planned wells. Reductions attributed to well withdrawals by the North Yahara communities are indicated in Table 7. According to Table 7, the projected baseflow reduction is 5 percent for Token Creek, 22 percent for the Upper Yahara and almost 2 percent for the lower Yahara down stream. Other streams are likewise affected to varying degrees. Reductions in water table levels generally range between 1 to 3 feet in the North Yahara Study Area under this scenario (see Map 7). Reductions in Table 6 represent a portion of the pumping reductions from other municipalities (e.g., Sun Prairie and Madison); whereas the reductions in Table 7 are specific to DeForest, Windsor, and Vienna. As such, both local actions and regional cooperation will be needed to address this growing challenge.

Because of the higher population accommodated, the Compact Character Scenario has the greatest well withdrawals at 28.4 percent in the Upper Yahara River. This is an additional 2.16 cfs (19.7%) reduction over existing conditions in 2000. Overall, the impact of the Recommended Scenario is about midway between the Compact and Dispersed Character Scenarios, and is a slight improvement over the Adopted Plans Scenario.

Table 7: Results of Simulations for Baseflow Reductions Across Development Scenarios

Stream	FUDA wells off	2000 (% reduction)	Recommended (% reduction)	Adopted (% reduction)	Dispersed (% reduction)	Compact (% reduction)
Token Creek	15.70 cfs	15.50 (1.3%)	14.91 (5.0%)	14.91 (5.0%)	15.11 (3.8%)	14.74 (6.1%)
Upper Yahara River @ Windsor	10.95 cfs	10.00 (8.7%)	8.52 (22.2%)	8.48 (22.6%)	9.20 (16.0%)	7.84 (28.4%)
Yahara River @ McFarland	71.38 cfs	70.00 (1.9%)	67.23 (5.8%)	67.20 (5.9%)	68.36 (4.2%)	66.16 (7.3%)

Source: Capital Area Regional Planning Commission 2012

Recognizing the cumulative impacts of well withdrawals on sensitive water resources, the Village of DeForest and the WDNR entered into a Memorandum of Understanding (MOU) in 2004 “Regarding the Use of New and Existing Wells and Their Impact on Token Creek and Other Area Surface Waters.” In the MOU the Village agrees to take all reasonable management steps to limit the impacts of their well system on Token Creek. One of the operational considerations was to limit water withdrawal from Well #5 to 3 hours per day (included in the simulations presented here). This is the well closest to a number of particularly sensitive

springs tributary to Token Creek. However, groundwater model simulation of streambase flows (see Table 7) would indicate that pumping limitations imposed at Well #5 may not be enough to stem the additional reductions in stream baseflows under the various development scenarios, without infiltration and/or conservation efforts.

Regional Sustainability Consideration

In our region, conventional urban development pumps groundwater to provide the municipal drinking water supply. The wastewater is treated at a municipal treatment plant and discharged as surface water, typically far away from the drinking water source. This system can be made more sustainable by increasing the infiltration of stormwater to recharge groundwater, and/or returning treated effluent to recharge the groundwater used for the drinking water source.

Groundwater Recharge Loss

When rain or snow melt soaks into the ground the water recharges groundwater and provides the baseflow for streams, keeps water temperatures low, augments oxygen levels and favors habitat for fish and other sensitive aquatic species. Alternatively, water that does not infiltrate into the ground typically runs off the land picking up pollutants from impervious surfaces (roads, rooftops, parking lots), requiring treatment to protect surface waters. The increase in impervious surfaces absent active stormwater infiltration practices (such as rain gardens) causes substantial reduction in the natural groundwater recharge. Furthermore,

additional runoff volumes, if not controlled, can result in higher stream flows and, if allowed to accumulate, can cause extensive stream bed and bank erosion and habitat damage.

Elsewhere in the Region

Baseflows fell 65% from 1990-2010 in the Black Earth Creek headwaters in western Dane County.

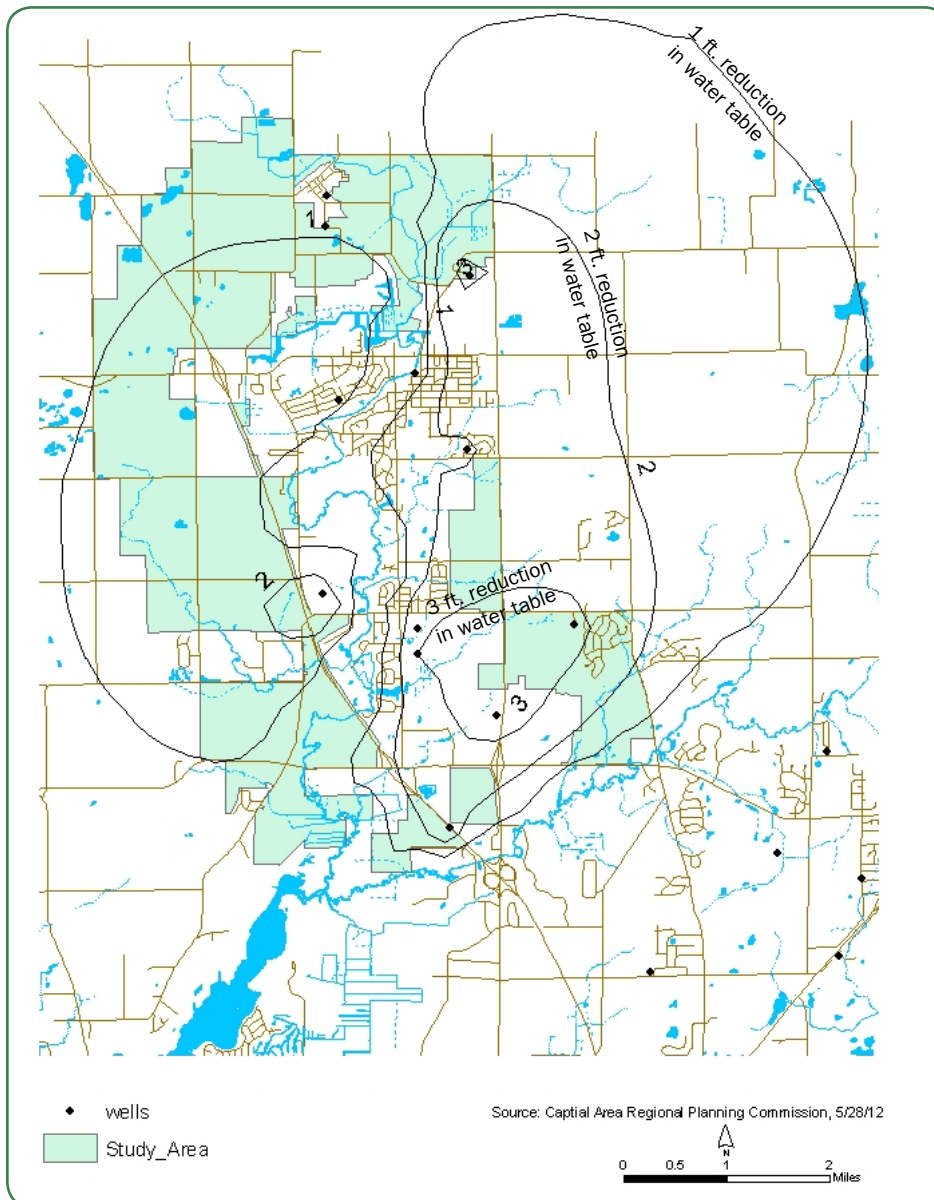
In 2011, Dane County adopted a stormwater ordinance requiring runoff volume control for all new development to 90 percent of pre-development stay-on volumes. Municipalities in Dane County are required to meet these requirements. The Village of DeForest adopted an ordinance requiring runoff volume control to 100 percent of pre-development stay-on volumes and maintain pre-development groundwater recharge to provide additional mitigation and resource protection. Strategies focused on maintaining and restoring stormwater infiltration can reduce both volumes of stormwater and pollutant loads to receiving surface waters.

Taking the Lead

DeForest's runoff volume control ordinance is a worthy goal for other communities in the region and should also be considered for addressing the impacts of pre-existing development, where opportunities permit. The Town of Windsor also accepted this standard for their approved 2012 USA amendment area.

Map 8:

Simulated Water Table Level Reductions of one, two or three feet in the North Yahara area under the Recommended Scenario.



Implementing Recommendations Through Governing Document Updates

Many of these recommendations and implementation measures could be incorporated in comprehensive plans, agreements, ordinances and other governing documents to advance the recommendations.

Table 8 lists recommendations that may be included in updates to local comprehensive plans or other governing documents. Taking on the recommendations might also warrant updates to other local plans, agreements, ordinances and governing documents. Performing a full assessment of local zoning and other ordinances is beyond the scope of this study and is best completed at the local level.

Figure 8:

Existing Area Plans and Agreements as of July 2012

Village of DeForest Comprehensive Plan
Village of DeForest Downtown Revitalization Strategy Plan
DeForest TID Plans 1-7
DeForest River Road Neighborhood Plan
DeForest Parks and Open Space Plan
Tourism Assessment Recap and Recommendations
Upper Yahara River User Analysis, Future Opportunities and Priority Projects
Strategic Plan for the Yahara River Corridor
Town of Windsor Comprehensive Plan
DeForest-Windsor Cooperative Plan
Town of Vienna Comprehensive Plan
DeForest - Vienna Boundary Agreement
Burke, Sun Prairie, DeForest, Madison Cooperative Plan
DeForest Area Economic Opportunity Study
DeForest Area School District Safe Routes To School Plan

Table 8: Potential Comprehensive Plan and other Governing Document Updates (not an exhaustive list)			
Recommendation	Plans to amend or update	Plan Element(s)	Other Documents to Prepare, Amend, or Update
Map 2: North Yahara FUDA Recommended Scenario	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Issues and Opportunities (Map 2), Land Use	
1.1 Evaluate/Update Redevelopment/infill	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use, Economic Development	DeForest TID Plans, DeForest Downtown Revitalization Plan
1.2 Identify new redevelopment/infill opportunities	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use	DeForest TID Plans, DeForest Downtown Revitalization Plan
2.2 Allow higher density in and around downtowns	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use	DeForest TID Plans, DeForest Downtown Revitalization Plan
3.1 North Street & I-90: Intensify and mix development	DeForest Comprehensive Plan	Land Use	Zoning Ordinance
3.2 North Towne Road: Intensify and mix development	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use	
3.3 Revere Trails: Highway access areas - Intensify and mix development	Windsor Comprehensive Plan	Land Use	Zoning Ordinance
3.4 Highway access areas: Intensify and mix development	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use	PUD Zoning Plans
3.5 Major destinations: Intensify and mix development	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use, Transportation	Detailed Area/Neighborhood Plans
4.1 Permit affordable senior housing	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use, Housing	
4.2 Mix uses horizontally and vertically	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use	PUD Zoning Plans
4.3 Walking and bike access	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Transportation, Housing	Official Maps
4.4 Traditional Neighborhood Design (TND)	DeForest Comprehensive Plan	Land Use, Housing	Zoning Ordinance
4.5 North Towne Road design guidelines	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Land Use, Economic Development	Site Plan Ordinances, Design Guidelines
5.1 Coordinate streetscaping and way-finding program	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Land Use	Corridor Plan, Way-finding Sign Program
6.1 Highly connected travel network	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Transportation	PUD Zoning Plans, Official Map

Table 8: Continued

Potential Comprehensive Plan and other Governing Document Updates (not an exhaustive list)

Recommendation	Plans to amend or update	Plan Element(s)	Other Documents to Prepare, Amend, or Update
6.2 Evaluate existing connectivity	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Transportation	Safe Routes to School Plan
6.4 Transit, ride share, biking, walking, etc.	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Transportation	Safe Routes to School Plan
7.1 DeForest Vienna boundary agreement	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Intergovernmental Cooperation	DeForest-Vienna Boundary Agreement
7.2 DeForest Westport boundary agreement	DeForest Comprehensive Plan	Intergovernmental Cooperation	DeForest-Westport Boundary Agreement
7.3 Burke, DeForest, Sun Prairie, Madison Cooperative Plan	Vienna Comprehensive Plan	Land Use, Agriculture, Intergovernmental Cooperation	Waunakee-Vienna Boundary Agreement
8.1 Stewardship areas	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	
8.2 Expand riparian buffers	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	
8.3 CRP, cost-share	Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	
8.4 Roadless area preservation	DeForest Comprehensive Plan	Natural Resources	Parks and Open Space Plan
8.5 Culver Springs native Brook Trout	Windsor Comprehensive Plan	Natural Resources	
9.1 Stewardship guidelines	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Natural Resources	Zoning Ordinance, Subdivision Ordinance
10. Mineral resources, recharge, and extraction	Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	Stormwater Ordinance, Subdivision Ordinance
11.2 Windsor/Vienna stormwater ordinances	Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	
11.6 Financial resources for ag BMPs for natural resource protection	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Agricultural and Natural Resources	
11.7 Retrofit urban BMPs for natural resource protection	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	Downtown Revitalization Plans, DeForest TIF Plans
11.9 Phosphorus capture	Windsor Comprehensive Plan, Vienna Comprehensive Plan	Natural Resources	

Table 8: Continued Potential Comprehensive Plan and other Governing Document Updates (not an exhaustive list)			
Recommendation	Plans to amend or update	Plan Element(s)	Other Documents to Prepare, Amend, or Update
12.2 Water conservation, fixtures, and harvesting	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Natural Resources	
13.1 AEA	Windsor Comprehensive Plan, Vienna Comprehensive Plan	Agriculture	
15.1-15.3 Open space corridors, former wetlands, and stewardship area design	DeForest Comprehensive Plan, Windsor Comprehensive Plan	Agriculture	
16.1 FUDA phasing plan	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Utilities and Community Facilities, Land Use, Growth Phasing Map	
16.2 Leverage investments	DeForest Comprehensive Plan, Windsor Comprehensive Plan, Vienna Comprehensive Plan	Utilities and Community Facilities, Issues and Opportunities	Intergovernmental Agreements

Conclusion

This FUDA Study is submitted for local consideration and incorporation into existing plans and policy, or in some cases developing new tools, to enhance the quality of life for current residents and generation to come. The findings of this Study are intended to be updated every five years to account for changing conditions. Participating governments should maintain contact to track progress toward implementation and evaluate the outcomes of the FUDA planning process.