



**TECHNICAL MEMORANDUM**

TO: Minnesota Department of Transportation  
Wisconsin Department of Transportation  
FHWA

FROM: Monique MacKenzie, Senior Planner  
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DATE: April 22, 2004

SUBJECT: TECHNICAL MEMORANDUM, LAND USE IMPACTS

This memo outlines findings on land use impacts associated with the proposed St. Croix River Crossing. These findings are supported by existing studies and reports, as well as preliminary scenarios used to estimate potential land use impacts. The Tables and Figures referenced within are presented at the end of this memorandum.

**A. EXISTING PATTERNS AND TRENDS ANALYSIS**

**Washington County**

Population Growth – (see Table 1 and Table 2)

- Washington County growth continued at very high rates since the 1990 census. Population increases have concentrated in urbanized areas and cities.
- Recent growth has settled in Hugo, Forest Lake, Cottage Grove and Woodbury.
- Future growth forecasted by Metropolitan Council reinforces an existing pattern of concentrating population in larger urbanized areas.

Building Permit Activity – (see Table 3 and Table 4)

- Smaller communities in Washington County have seen relatively steady rates of new housing construction. These communities typically have low density lot requirements, such as one dwelling per ten acres of land.

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- An exception to this pattern is found in West Lakeland Township, where lot density requirements are one dwelling per 2.5 acre lot.
- The largest annual number of permits issued by West Lakeland Township were recorded between 1996 and 1999. As more of the Township's land has been converted to residential uses, the volume of permits issued has decreased. The land supply has been depleted in a relatively short period of time.
- Washington County census data for housing units built between 1990 and 2000 confirm the pattern of greater building activity occurring in urbanized areas.

#### Land Use Change

- Recent land use development (between 1990 and 2000) has resulted in large gains in residential and park/recreation uses. The most notable change in land use patterns has occurred with loss of agricultural and vacant lands, decreasing by about 28,699 acres between 1990 and 1997.<sup>1</sup>

#### St Croix County

##### Population Growth – (see Table 5, Table 6 and Figure 1)

- Recent population growth patterns (from the late 1990s through 2003) have somewhat accelerated.
- More residential, commercial and industrial development has occurred in the western towns and villages than in the eastern parts of the county.
- St Croix County's land use, population and housing trends suggest that the most significant changes in growth have occurred in the Town and Village of Somerset and in the City of New Richmond.
- Future population growth at the local level (towns, villages and cities) show notable growth rates continuing through 2030. Towns and villages are anticipated to grow by an equivalent increment (in absolute numbers). The larger cities of Hudson and New Richmond will absorb the largest numbers of new residents.
- Relative to state-wide growth, St. Croix and other counties at the western border are expected to experience some of the highest growth rates, according to the Wisconsin Department of Administration population projections released in January 2004.

##### Trip to Work Choices – (see Table 7)

- According to Census data, the majority of Wisconsin workers living in the areas of St. Croix, Polk and Pierce County included in the larger project area work in Wisconsin. The 31,000 workers in this group who live and work in WI account for 62% of all workers living in the greater project area.
- The next most common workplace destination is Bayport or Oak Park Heights/ Stillwater, accounting for 8% of workplaces, about 4,100 workers.

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<sup>1</sup> Metropolitan Council GIS generated land use data, retrieved at website [www.gis.metc.mn.state.mn.us/landuse2k](http://www.gis.metc.mn.state.mn.us/landuse2k)

- Finally, the remaining workers (30% or 14,947 workers) are headed for a variety of destinations in the 7 county or collar communities.

### Socio Economic Changes

- Housing units doubled between 1970 to 1995. Most growth occurred in unincorporated areas, in the form of single family houses. Median housing unit valued quadrupled between 1970 and 1990.
- A decreasing rural farm population has been replaced with an increasing non-farm rural population. This group increased 30% from 1970 to 1990.
- The number of farms has declined since the 1970s. According to the 1990 Census, farm households decreased to comprise 85% of the county's households. Agricultural acreage has declined from 75% of the total land area in the early 1970s to 70% in the early 1990s.

### Agricultural Land Use Change – (see Table 8)

- St Croix County land use comparisons are based on data published in the St. Croix County Development Management Plan. This data was collected in 1973 and 1993.
- Agricultural and vacant land declined by 25,600 acres between 1973 and 1993. Residential land use increased by an additional 12,500 acres in the same time period. Very little change was made to the proportion of unincorporated land (approximately 97% or 455,000 acres) of the county's land areas) to incorporated land (about 3% or 6,600 acres) between 1973 and 1993.
- With the exception of agricultural land cover data from the 2002 Census of Agriculture, more recent land use/ land cover data is not available at the time of writing.

### Water Quality

- The county has 13 municipal sanitary district treatment plants.
- In 1990 there were 8,631 private sewer systems in the county. This has increased 24% or an additional 1, 673 systems since 1980.
- The county's 12 public wastewater treatment systems are found in
  - Baldwin
  - Deer Park
  - Glenwood City
  - Hammond
  - Hudson
  - New Richmond
  - North Hudson
  - River Falls
  - Roberts
  - Somerset
  - Star Prairie
  - Wilson
  - Woodville

Soil Suitability – (see Figure 2)

- The County mapped soil conditions based on permeability, depth to bedrock and water table and susceptibility to flooding. Based on these conditions, even septic system siting and installation that meets state requirements may threaten ground water quality.
- Septic system suitability mapping indicates that 633 square miles, or 87% of the county's total land area is unsuitable for septic or onsite sewage disposal systems.

Agricultural Soils/ Agricultural Productivity – (see Figure 3)

- LESA Soils Group 1-5 were selected by the St. Croix County Land Conservation Department and the District Soil Scientist at the NCRS as soils with agricultural potential.
- These potentially productive soils are clustered in the middle regions of the County, stretching in a diagonal from the south central area around River Falls to the north east. Most of the Town of St. Joseph is not mapped as potentially productive agricultural land.
- Agricultural land use remains the predominant land use in St. Croix County. As of 1993, agricultural acreage comprised 70% of the total county land areas.

Building Permit Activity – (see Table 9 and Table 10)

- Since the mid 1990's, certain towns in St. Croix County, such as the Town of Somerset, Roberts and Star Prairie have experienced high demand for building permits for new home construction, equal to urbanized areas with municipal services such as the Village of Somerset and the Village of Roberts.
- Other towns such as the Town of St. Joseph have experienced a steady but lesser demand for new construction compared to neighboring municipalities.
- The greatest diversity in new housing types occurs in urbanized areas such as the Village of Somerset and the Cities of Hudson and New Richmond.
- Census data for housing built between 1990 and 2000 shows strong housing growth in all St. Croix County communities. With the towns of Hudson, Star Prairie and the Village of Somerset adding substantial numbers of new units to their existing housing stock, equivalent to at least a 40% increase between 1990 and 2000.

## **B. PLANNING CONTEXT**

### **Washington County**

The Washington County Comprehensive Plan (1997 update) provides future land use guidance to unincorporated areas of the county. The plan identifies areas of suburban housing in close proximity to existing urban core areas and areas of future expansion. These areas of urban growth closely align with the *Regional Development Framework's* MUSA. Some discrepancy occurs in the northern section of the county where the *Regional Development Framework* projects urban growth within the future MUSA line, and the Washington County Plan designates the area for long-term agriculture, particularly in Hugo and Forest Lake Townships. The

Washington County Plan also focuses extensively on preserving rural character through the use of Open Space development concepts and the long-term preservation of open space and natural resource areas. "...Clustering of houses on small lots is a defining characteristic of this land use Plan. The purpose of clustering houses is to provide a more efficient use of the land while preserving good agricultural land, open space, scenic views, natural drainage systems and other desirable features of the natural environment."

Several categories of future land uses are identified on the generalized land use plan map, including:

- Suburban Housing (densities that support urban sewer and water);
- Transitional Areas;
- Rural Residential (16 units per 40 acres);
- Semi-Rural Residential (8 units per 40 acres);
- General Rural (4 units per 40 acres);
- Long-Term Agriculture (2 units per 40 acres);
- Long-Term Agriculture (1 unit per 40 acres);
- Commercial/Industrial; and,
- Parks and Natural Areas.

With respect to the TH 36 corridor east of TH 5, the Washington County Comprehensive Plan identifies land uses as 'Commercial/Industrial' along TH 36 from the west project limit to approximately Osgood Avenue, 'Suburban Housing' as TH 36 merges with TH 95 and proceeds north, and Commercial/Industrial within downtown Stillwater. These designations are largely consistent with existing land use patterns in the project area. Figure 4 shows the Washington County Future Land Use Plan.

Washington County has established basic zoning regulations for each of the townships; however, townships have the authority to establish more (but not less) restrictive zoning regulations for their community. The incorporated cities of Stillwater and Oak Park Heights have adopted comprehensive plans and zoning regulations of their own.

### **City of Stillwater**

The City of Stillwater's Comprehensive Plan (1995) designates the north side of TH 36 to Osgood Avenue as 'Business Park Commercial'. Land adjacent to TH 95 as it proceeds north into downtown Stillwater is designated 'Two-family Residential', and the downtown area is designated 'Central Business District'. These designations and accompanying zoning follow existing land use patterns. The Comprehensive Plan does not suggest any future changes in land use or character in these areas.

### **City of Oak Park Heights**

The Oak Park Heights Comprehensive Plan and Zoning Map (1998) suggests a mix of commercial and residential uses along the south side of TH 36, although 'General Business' predominates near intersections. The Comprehensive Plan also provides direction for the

redevelopment of the area west of Oakgreen Avenue. A diversity of commercial retail (big-box) and multi-family housing has recently been developed in this area. The intent is to increase commercial goods and services as well as residential densities in the city's remaining undeveloped land. A large area west of Beach Road North is zoned 'Industrial'. To the east of Beach Road North (including the land cleared for the 1995 Final EIS Preferred Alternative), the land is zoned for 'Low and Medium Density Residential'. East of TH 95, the Sunnyside Marina and Condominiums area is zoned 'Multiple Family Residential'. The Wastewater Treatment Plant area is zoned, in part, as 'Open Space Conservation', and the remainder of the area (to the south) is zoned as 'Industrial'.

### **Planning Context- St. Croix County**

The St. Croix County Development Management Plan was adopted in 2000. Development of the plan included analysis of physical characteristics and socio-economic trends, extensive public involvement and the development of three development alternative scenarios.

The plan seeks to mitigate the impacts of continued development in the area by preserving natural resources, supporting agriculture, and encouraging fiscally responsible extension of municipal utilities. According to the document, the less densely populated portion of the county should generally maintain a rural appearance, with agriculture being the predominant use and any new development limited primarily to residential areas at densities and with site designs consistent with the rural character of the area. Three planning areas are designated in the draft plan: urban, transitional, and rural. Each planning area is recommended to have a different development pattern and density (Table 11). The designation of planning areas within St. Croix County is shown in Figure 5.

The plan also maps some of the natural resource and physical constraints to development found within the county's boundaries. Limitations for septic systems, potentially productive agriculture land, depth to ground water and steep slopes are mapped in the plan document, suggesting that there could be potential consequences for natural systems that may result from certain development decisions. For example, Figure 2 shows limitations for septic systems throughout most of the County. When compared to Figure 5, the clustered pattern of urban/transitional/ rural planning areas indicates that there is a large land area classified as rural that would likely be served by septic systems rather than municipal sanitary sewer. This scenario could create adverse impacts on groundwater if the pace of development relying on septic systems places too much stress on natural systems in rural areas.

The St. Croix County plan focuses urban development around existing cities and villages, and stresses cluster developments and conservation site design to preserve rural character outside these urbanized areas. As described previously, towns in Wisconsin that have adopted county zoning enforcement may subsequently opt out but only at such time as the county adopts a comprehensive revision of the zoning ordinance. A town may also adopt its own comprehensive zoning but only if it has not previously adopted the county ordinance. Such a zoning ordinance would require approval of the county board. Table 12 summarizes the status of land planning regulations among jurisdictions located in western St. Croix County.

**City of Hudson:**

The City of Hudson guides future growth and development based on their 1993 Comprehensive Plan. The plan discusses demographic trends, including work commuter patterns to the Twin Cities, and utilizes this data to develop a future land use plan. The resulting guide map establishes several land use categories, including five residential and three commercial categories, as well as industrial, conservancy, public, institutional, and park categories. The majority of the city is zoned for sewered single-family development, with lot sizes ranging from one-half to three-quarters of an acre. This translates into a gross density of two units per acre or less.

**Glenwood City:**

Glenwood City is in the process of updating their current plan that was first drafted in 1973. Currently, Glenwood City does not rely on long-range land use planning to any great extent to guide their growth and development.

**City of New Richmond:**

The City of New Richmond has a draft comprehensive plan that is being prepared under the Wisconsin Smart Growth Comprehensive Planning Law. The plan regulates long-range land use planning, staging for annexation and infrastructure extensions. The plan is scheduled for approval by 2005.

**Villages of North Hudson, Roberts:**

The Village of North Hudson adopted a comprehensive land use plan in 1987 which has not been updated. The Village does, however, have a zoning ordinance (1994) and a local subdivision ordinance (1994). The Village of Roberts has a master plan (1992) and administers a zoning code and local subdivision regulations. North Hudson and Roberts have exercised their authority to conduct plat reviews within their extraterritorial jurisdictions (i.e., unincorporated areas within 1.5 miles of the corporate limits).

**Village of Somerset:**

The Village of Somerset adopted a comprehensive plan in 2002. It administers local zoning and subdivision controls as well as municipal water and sanitary systems.

**Towns of Hudson, St. Joseph, and Somerset:**

All three towns have comprehensive land use plans in effect. These plans are subject to county subdivision regulations that are supplemented by local regulations. The Town of Hudson and the Town of St. Joseph have their own zoning ordinance. The Town of St. Joseph is also in the process of updating its comprehensive plan at the present time. The Town of Somerset has adopted county zoning.

## C. FINDINGS

### Direct Impacts

Direct impacts are defined as those impacts which occur at the same time and place as the action causing them. Direct effects on land use are limited to the acquisition of right-of-way (e.g., homes, businesses or farmland) and the redevelopment or re-use of previously acquired right-of-way no longer needed for transportation purposes. Direct impacts are also caused by project construction which mandates a change in current or planned land use. Examples of these types of impacts are access changes to parkland that prohibits vehicle access.

Table 13 indicates the number of parcels and the land area affected by direct land acquisition.

### Indirect Impacts

Indirect or secondary effects are defined as those impacts caused by the project which would occur later in time and/or would be farther removed in distance but are still reasonably foreseeable. Examples of indirect effects could result from changes in traffic patterns or routes, volumes or general accessibility and visibility. Indirect effects on land use may include effects related to changes in population density, or growth rates or land conversion activity.

### Planning Theory and Research on Factors Affecting Indirect Land Use Change

The extent to which improvements to a regional traffic facility are directly responsible for land use change and development interest had not been conclusively proven, according to a number of regional studies and national research projects.<sup>2</sup>

A recent Twin Cities study by the University of Minnesota Center for Transportation Studies attempted to measure the relationship between transportation facilities and land use. This study of regional Twin Cities urbanization has concluded that over a 30 year period, there has been a statistically significant correlation between the locational choice of new housing development and transportation improvements as measured by access to arterial highways. However, the degree of correlation has varied over time, with a correlation coefficient value at its highest (0.38) in the 1980s to a low of 0.04 in the 1990's. A correlation coefficient of 1.0 signifies a direct relationship between two variables.<sup>3</sup>

The same study performed a multiple regression analysis hypothesizing that, in addition to access to arterial highways, the location of a town, village or city within the 24 county study area had a clear relationship to the variation in housing construction among localities. The coefficient

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<sup>2</sup> Desk Reference for Estimating the Indirect effects of Proposed Transportation Projects, NCHRP/ TRB 2002. Also, Highway Improvements and Land Development Patterns in the greater Twin Cities Area, 1970-1997: Measuring the Connections, University of Minnesota Center for Transportation Studies.2002

<sup>3</sup> This study was titled Highway Improvements and Land Development Patterns in the Greater Twin Cities Area, 1970-1997: Measuring the Connections, published by the Center for Transportation Studies in 2002. It measured building permit data compared to accessibility to arterial highways in 241 Municipal Civil Divisions (MCDs) in 24 counties in the greater metro area.

of determination resulting from the combined location and access to highways regression analysis reaches a high point of correlation in the 1980s at 0.25. This suggests that other factors besides highway access account for the remaining 75 percent variation among local municipalities in the number of building permits issued.

Another finding from studies of the relationship between transportation improvements and development location choices indicates that reduced trip times on improved transportation facilities directly relates to growth in travel demand as measured by growth in vehicle miles traveled.<sup>4</sup> This growth in travel demand can have a statistically significant relationship between improved transportation corridors (where capacity is increased and higher travel speeds are realized) and development of all types, while recognizing other development-related factors are still influential.

### **Boundary Definition**

Land use change based on increased traffic and changed accessibility, as well as overall market demand, or indirect land use impact, is likely to occur within at least a one half-mile radius of highway interchanges. This geographic area is considered a minimal definition as cited by best practices literature.<sup>5</sup> The St. Croix River Crossing Project's land use impacts study assumed one half-mile distances around new interchanges, defined by the point of access/egress to highway ramps.

For each Build Alternative (B-1, C (Options 1 and 2), D and E), a half-mile distance within new and existing highway interchanges was mapped to indicate the primary influence of the new roadway. These areas are mapped in Figures 6 through Figure 10.

These boundaries resulted in a total of 13 areas surveyed in greater depth. Four are located on the Minnesota side, clustered next to TH 36 and nine are located in Wisconsin. There is overlap between the areas due to the close proximity of some interchanges. Mapping techniques blended these boundaries to create 'collapsed' zones of influence.

The summary of acreage falling within the one half-mile radius boundary is described in Table 14. This tally indicates gross undeveloped areas, without distinguishing between undevelopable (due to land use regulation, physical condition or ownership conditions such as federally controlled wildlife habitat areas or park lands) and developable land. It is important to note that the undeveloped acreage figure represents a maximum possible scenario and likely overstates the amount of land that might be converted to other uses, given the factors noted above.

Mapping of developed and undeveloped areas shows a range of 365 acres (Alternatives D and E) to 555 acres (Alternative C – Option 2) of land that is currently agricultural or vacant/undeveloped, that could be subject to market-driven development interest and enhanced by improved accessibility and travel time savings that the proposed Build Alternatives would bring to the area.

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<sup>4</sup> Cervero, Robert. 2003. "Road Expansion, Urban Growth and Induced Travel: A Path Analysis". Journal of the American Planning Association, v.69 (2), 145-163

<sup>5</sup> Wis/DOT 1996, I-8

## Estimate of Impacts

Recognizing that indirect land use impacts could occur beyond a one half- mile radius of newly built interchanges, and in the absence of a predictive model that could make use of known statistically significant relationships to create a likely future land use model, an alternative methodology was employed.

This methodology was developed to estimate the potential growth-related effects of reduced accessibility based on the hypothesis that residential development in 2030 may be at a lesser level if a new bridge is not built and congestion on the existing bridges causes a reduction in accessibility to jobs.

This methodology assumes a fully elastic relationship between development location and access to jobs. However, it is known from the studies cited above that development patterns are primarily affected by other factors such as land prices, sewer/water availability, school quality, crime, and tax policies.

Consequently:

- any analysis using this methodology must be considered as illustrative examples of possible outcomes;
- and the outcomes likely overstate the effect of reduced accessibility given the other factors described above.

The causal relationship asserted above has not been validated using actual data.

A technique was developed to test the effect of reduced river-crossing access on development levels in the areas of western Wisconsin included in the travel demand forecasting model, including southern Polk and northern Pierce, as well as St. Croix Counties. Since the base year 2030 forecasts are assumed to include the new river crossing, the technique needed to work from the premise that growth would be lower if the bridge was not built (instead of the more-intuitive analysis of increasing development due to increasing accessibility). The following process was used:

1. Commercial-industrial development in western Wisconsin was assumed to occur regardless of the alternative. The western Wisconsin area is currently a net exporter of labor force and continued economic development could be reasonably expected to reduce the jobs-housing imbalance and therefore reduce commuting demand. In addition, commercial-industrial development is efficiently focused on villages and cities with industrial parks.
2. “Reasonable access” was defined as a travel time to work within 120 percent of the estimated average travel time to work from a given Traffic Analysis Zone (TAZ) in western Wisconsin. The value used for each TAZ was the reported mean travel time to work from the 1990 Census Transportation Planning Package and adjusted based on the known change in the county-wide mean travel time to work between 1990 and 2000

which has been released by the 2000 U.S. Census. This measure reflects not only reasonable access to jobs but the tradeoff between longer work-trip distances and lifestyle or cultural choices for certain areas.

3. The forecast year 2030 number of job opportunities located within the above-calculated average travel time to work was calculated for each TAZ using the four-lane Build Alternative (Alternative C) (without traffic on the existing bridge). This number, indexed back to the existing condition, defines the maximum accessibility and the value upon which the forecast population growth was based.
4. The forecast year 2030 number of job opportunities located within the average travel time to work was calculated for each TAZ for the No-Build alternative and indexed relative to the existing condition.
5. The numeric growth in households and population from 2000 to 2030 was calculated for each community and each TAZ.
6. A revised numeric growth was estimated based on the following:
  - a. If the accessibility index was the same under both the Build and tested alternative, the assumed baseline 2030 forecast growth was used.
  - b. If the number of accessible jobs declined from the Build to the tested alternative but was greater than the number of existing accessible jobs, the household forecast growth was reduced in proportion to the reduction in the accessibility index.
  - c. If the index declined from the Build to the tested alternative and was less than the number of currently-accessible jobs, no growth was assumed between 2000 and 2030.
7. The amount of retail employment growth was similarly adjusted if necessary based on an assumption that retail development is be driven by residential demand.

The population, households and retail employment reduction from western Wisconsin was reallocated to Washington County TAZs to ensure that regional control totals in the model would be maintained. A proportionate distribution was made to rural and developing areas.

Table 15 shows the resultant effect of the reduced accessibility estimate on the Wisconsin communities. In total, this methodology indicates that 6,400 persons or 2,600 households<sup>6</sup> could make a locational decision to avoid western Wisconsin as a result of the reduced accessibility that would ensue if the bridge were not built. Several communities in western St. Croix County experience a loss of accessibility and therefore a reduction in forecast growth. Due to increased congestion at the I-94 crossing under a No-Build scenario, the model shows a notable reduction

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<sup>6</sup> This figure is derived from 0.25 correlation coefficient of a total population of 25,587 and is rounded up to 6,400 people or 2,600 households at 2.5 persons per household.

in growth could occur along I-94 as well as STH 35/64, reflecting an increase in traffic on I-94 that would have otherwise used the new St. Croix River Crossing.

Figure 11 shows the location of zones where the highest reduction in growth assumptions occurred. New Richmond, which is a large and rapidly growing community on STH 64, would have the largest reduction in populations and households. On a percentage basis, many TAZs in Wisconsin were calculated as having no growth between 2000 and 2030 using this methodology. In addition, Figure 11 shows that the diversion of traffic to the I-94 bridge and the resultant increase in congestion would cause a reduction in accessibility and growth along that corridor as well.

The ‘reduced accessibility’ methodology, assuming a correlation coefficient of .25 of the total population reduction, likely overstates the degree to which there is a direct causal relationship between development location decisions and access to improved regional transportation facilities. However, it represents a ‘worst case scenario’ and serves as a tool for planning purposes.

#### **D. CONCLUSIONS/ SUMMARY**

- Growth in western St. Croix County has been continuous since the early 1960’s. Dramatic increases in the population became noticeable starting in the 1970s. The new rural residential population has generated demand for new services, schools and transportation routes within the county’s westernmost towns and villages.
- There are a number of factors that influence land use patterns and the pace of development in an area with strong growth rates. They include:
  - **The state of the regional economy** – economic demand fueling new jobs, household formation and home construction, financing, business location decisions, perception of available work force, suppliers and local markets and property values;
  - **Location attractiveness** – ease of access to jobs, shopping, services; natural amenities (physical features); ‘quality of life’ factors (schools parks/ recreational facilities, community identity); character of existing development;
  - **Availability of developable land** – absence of remarkable physical constraints and a sufficient supply of willing sellers and /or area vacancy rates; absorption and backlog of existing housing/ commercial space;
  - **Local political/ regulatory conditions** – tax on business, property, sales. Development incentives (such as tax abatement); regulatory environment (speed and ease of development review process); and
  - **Land use controls** – local zoning and comprehensive plans; land use policies that support development; other local controls such as permitting and nuisance ordinances.
- The social and economic influence of cities like Hudson and New Richmond exert a sub-regional influence on housing location choice, workplace locations and the daily trip

destinations. The self-sustaining development in the growing towns, cities and villages generates demand for improved transportation facilities, whether the trip is made between the Town of Somerset and New Richmond, the Town of St. Joseph and Downtown Stillwater, or between the Village of North Hudson and the Oak Park Heights commercial district along TH 36.<sup>7</sup>

- Washington County's decision to focus growth in urbanized areas and preserve rural character and population densities elsewhere in the county has contributed to the dynamics of land prices, pressures for land conversion and overall rates of land consumption in areas within Minnesota and Wisconsin.
- The accessibility of the larger area draws not just on the inter-regional river crossing in the Stillwater area but the principal interstate crossing at I-94 in Hudson and the smaller subregional crossing at Highway 8 in Osceola. The I-94 crossing in particular exerts influence over commuter trip to work decisions, as shown in Census data viewed over time since the bridge was built.
- Differing tax policies and the intent of local plans and regulations on both sides of the river are directly related to the extent to which foreseeable indirect land use impacts can be altered.
- There is no predictive model available to quantify the indirect impacts on land use and development related to transportation improvements on a regional transportation facility. In the absence of such a tool, a reduced growth methodology relying on the travel forecasting model was employed, in tandem with findings on correlation coefficients between transportation facilities and development in the Twin Cities metropolitan area. The results suggest that approximately 6,400 people or 2,600 households may make a decision to locate in the communities of western St. Croix County based on improved accessibility resulting from a new St. Croix River Crossing.

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<sup>7</sup> These statements are supported by the 'reduced accessibility' analysis conducted in the travel demand forecast for the 2004 SDEIS and also discussed in the Cumulative Impacts chapter of the document.

**TABLE 1  
POPULATION CHANGE WITHIN WASHINGTON COUNTY, 1990-2000**

<b>Community</b>	<b>2000 Population</b>	<b>1990 Population</b>	<b>Percent change 1990-2000</b>	<b>Percent of Total 2000 Washington County Population</b>
Afton	2,839	2,645	7.3	1.41
Bayport	3,162	3,200	-1.2	1.57
Baytown Township	1,533	939	63.3	0.48
Denmark Township	1,348	1,172	15.0	0.67
Grant	4,026	3,778	6.6	2.0
Hugo	6,363	4,417	44.1	3.16
Lakeland	1,917	2,000	-4.2	0.95
Marine on St. Croix	602	602	0.3	0
New Scandia Township	3,692	3,197	15.5	1.46
Oakdale	26,653	18,374	45	13.25
Oak Park Heights	3,957	3,486	13.5	1.97
Stillwater	15,143	13,882	9.1	7.53
Stillwater Township	2,553	2,066	23.6	1.27
West Lakeland Township	3,547	1,736	104.3	1.76
Woodbury	46,463	20,075	131.4	23.1

**TABLE 2  
WASHINGTON COUNTY COMMUNITIES: POPULATION CHANGE 1990-2030  
(FORECASTED)**

	<b>Washington County</b>	<b>City of Oak Park Heights</b>	<b>City of Stillwater</b>	<b>Stillwater Township</b>	<b>City of Bayport</b>
1990	39,104	2,220	7,040	136	3,200
2000	63,616	3,000	10,169	112	4,478
2010	87,750	3,900	11,550	120	5,200
2020	105,280	4,500	12,500	120	5,700
2030	118,290	5,100	13,600	120	6,300

Source: Metropolitan Council 2030 Framework Projections

**TABLE 3  
BUILDING PERMIT ACTIVITY 1995 TO 2003, WASHINGTON COUNTY COMMUNITIES**

Municipality/ Location	Number of Permits Issued by Year								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
Minnesota									
May Township Population: 2,928	18 SF	18 SF	18 SF	18 SF	18 SF	18 SF	21 SF	9 SF	18
Marine on St. Croix Population: 602	N/A	N/A	N/A	N/A	N/A	N/A	5 SF	1 SF	6 SF
New Scandia Township Population: 3,692	N/A	N/A	N/A	N/A	28 SF	21 SF	30 SF	33 SF	33 SF
City of Afton Population: 2,839	N/A	N/A	10 SF	9 SF	N/A	N/A	N/A	14 SF	15 SF
West Lakeland Township Population: 3,547	43 SF	80 SF	57 SF	89 SF	81 SF	47 SF	36 SF	23 SF	17 SF
Stillwater Township Population: 2,553	N/A	N/A	N/A	N/A	N/A	N/A	9 SF	5 SF	5 SF
City of Bayport Population: 3,162	N/A	N/A	N/A	N/A	N/A	N/A	3 SF	4 SF	4 SF
Baytown Township Population: 1,533	N/A	N/A	N/A	N/A	N/A	N/A	1 SF	1 SF	1 SF
City of Oak Park Heights Population: 3,957	N/A	N/A	N/A	N/A	N/A	N/A	0	0	8 SF
City of Stillwater Population: 15,143	N/A	N/A	N/A	N/A	N/A	N/A	198 SF 16 MF	124 SF 152 MF	91 SF
City of Grant Population: 4,026	N/A	N/A	N/A	NA/	NA/	N/A	12 SF	10 SF	4 SF

Notes: "Permits Issued" is specific to new construction. Numbers cited refer to residential units (ex: 4 fourplex = 1 fourplex with 4 residential units).

Abbreviations: SF = Single Family DUPL = Two Units (Duplex, Twin Homes, etc) MF = Multi-family N/A = Not Available

**TABLE 4  
HOUSING UNITS BUILT 1990 – 2000**

Geographic Area	Total Housing Units	Built 1990 – March 2000	
		Number	Percentage of Total Built 1990-2000 <sup>(1)</sup>
<b>MINNESOTA</b>			
<b>Washington County</b>	74,462	24,100	33.7
<b>City of Bayport</b>	761	49	6.4
<b>City of Grant</b>	1,379	234	17.0
<b>City of Lake Elmo</b>	2,347	471	20.1
<b>City of Oak Park Heights</b>	1,534	365	23.8
<b>City of Stillwater</b>	5,804	1,097	18.9
<b>Stillwater Township</b>	818	202	24.7
<b>TWIN CITIES MSA- WI (13 COUNTY AREA)</b>	1,136,615	198,835	17.5

Source: 2000 Census – U.S. Census Bureau

<sup>(1)</sup>Indicates percentage of total housing units within each jurisdiction built between 1990 and 2000

**TABLE 5  
POPULATION GROWTH (HISTORICAL), ST. CROIX COUNTY MUNICIPALITIES**

	Population Count					Percent Change			
	1960	1970	1980	1990	2000	1960-1970	1970-1980	1980-1990	1990-2000
<b>Towns</b>									
Hammond	773	764	822	819	947	-1.2	7.6	-0.4	15.6
Hudson	649	925	2,012	3,692	6,213	13.2	39.2	8.4	68.28
Richmond	701	1,090	1,338	1,400	1,556	55.6	22.6	4.6	11.1
St Joseph	1,068	1,357	2,180	2,657	3,436	27.1	60.7	21.9	29.3
Somerset	976	1,185	1,833	1,975	2,644	21.4	54.7	7.8	33.8
Star Prairie	1,015	1,390	1,900	2,098	2,944	37.0	36.7	10.4	40.3
<b>City/ Village</b>									
Baldwin	1,184	1,399	1,620	2,022	2,667	18.2	15.8	24.8	31.9
Hammond	645	768	991	1,097	1,153	19.1	29.0	10.7	5.1
Hudson	4,325	5,049	5,434	6,378	8,775	16.7	7.6	17.4	37.5
New Richmond	3,316	3,707	4,306	5,106	6,310	11.8	16.2	18.6	23.5
North Hudson	1,019	1,547	2,218	3,101	3,463	51.8	43.4	39.8	11.6
River Falls	625	991	1,498	1,769	2,318	58.6	51.1	15.3	31.0
Roberts	304	484	833	1,043	969	57.1	72.1	25.2	-7.0
Somerset	729	778	860	1,065	1,556	6.7	10.5	23.8	46.1
Star Prairie	331	362	420	507	574	9.4	16.0	20.7	13.2
<b>TOTAL St Croix County</b>	29,164	34,354	43,262	50,251	63,155	N/A	NA/	NA/	NA/

**TABLE 6  
ST CROIX COUNTY LOCAL MUNICIPALITIES: CURRENT AND PROJECTED  
POPULATION**

	<b>2000 Census</b>	<b>2003 Estimate</b>	<b>2025 Projection</b>	<b>Change 2003-2025</b>
<b>Towns</b>				
St Joseph	3,436	3,589	4,957	1,368
Somerset	2,644	2,957	4,446	1,489
Star Prairie	2,944	3,243	5,075	1,832
<b>Villages</b>				
Somerset	1,556	1,874	3,052	1,178
Star Prairie	574	642	910	268
North Hudson	3,463	3,626	4,892	1,266
<b>Cities</b>				
Hudson	8,775	10,101	16,060	5,959
New Richmond	6,310	6,952	9,231	2,279
<b>St Croix County</b>	<b>63,155</b>	<b>70,121</b>	<b>100,806</b>	<b>30,685</b>

Source: Demographic Service Center, Department of Administration State of Wisconsin, Jan 2004

**TABLE 7  
DESTINATION OF ST. CROIX COUNTY WORKERS' TRIP TO WORK**

<b>Residents of St. Croix County with workplace in:</b>	<b>2000 Census</b>	<b>Percent of Total</b>
Wisconsin	30,846	61.8%
Bayport	2,203	4.4%
Oak Park Heights/ Stillwater	1,941	3.9%
Maplewood	1,007	2.0%
Woodbury	1,297	2.6%
St. Paul (Excluding Downtown)	2,531	5.1%
St. Paul Downtown	1,250	2.5%
Minneapolis (Excluding Downtown)	1,327	2.7%
Minneapolis Downtown	325	0.7%
Other (7 County Metro)	7,210	14.4%
<b>Total</b>	<b>49,937</b>	<b>100.0%</b>

**TABLE 8  
AGRICULTURAL LAND USE ST. CROIX COUNTY AND WASHINGTON COUNTY, 1997 AND 2002**

	Washington County		St. Croix County		Chisago County		Pierce County		Polk County	
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Total Land Area (acres)	250,691		461,967		267,284		368,951		587,054	
Land acreage in farms (acres)	92,683	96,089	342,478	310,178	131,305	116,948	288,878	267,311	301,786	292,860
Proportion of total land area in farms (percent in 2002)	38.3%		67.1%		43.8%		72.5%		49.9%	
Average size of farms (acres)	125	119	181	166	153	124	190	177	184	177
Average value of land and buildings (dollars)										
Per farm	\$455,365	\$656,084	\$253,063	\$520,418	\$245,430	\$390,987	\$230,856	\$439,725	\$200,023	\$381,997
Per acre	\$3,686	\$5,200	\$1,403	\$3,229	\$1,659	\$2,897	\$1,180	\$2,320	\$1,021	\$2,150

Source: 2002 Census of Agriculture (US Department of Agriculture)

**TABLE 9  
BUILDING PERMIT ACTIVITY 1995 TO 2003, ST. CROIX COUNTY COMMUNITIES**

Municipality/ Location	Number of Permits Issued by Year								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
Wisconsin									
Town of Somerset Population (2003): 2,957	N/A	N/A	NA/	NA/	NA/	30+ (data incomplete) SF	88 SF	73 SF	92 SF
Village of Somerset Population (2003): 1,874	5 total 1 SF 4 fourplex	15 total 9 SF 6 DUPL	14 total 6 SF 8 DUPL	18 total 14 SF 4 DUPL	23 total 15 SF 8 fourplex	20 total 4 SF 16 DUPL	93 total 17 SF 76 DUPL	74 total 62 SF 12 DUPL	65 total 53 SF 4 DUPL 8 fourplex
City of New Richmond Population (2003): 6,952	76 total 17 SF 24 DUPL 35 MF	90 total 33 SF 16 DUPL 41 MF	52 total 28 SF 16 DUPL 8 MF	183 total 35 SF 22 DUPL 126 MF	94 total 20 SF, 34 DUPL 40 MF	60 total 24 SF 26 DUPL 10 MF	165 total 37 SF 24 DUPL 104 MF	166 total 110 SF 48 DUPL 8 MF units	216 total 77 SF 50 DUPL 71 MF
Town of St. Joseph Population: 3,600	29 SF	26 SF	26 SF	46 SF	37 SF	39 SF	28 SF	26 SF	36 SF
City of Hudson Population: 11,510	133 total 28 SF 105 MF	151 total 57 SF 94 MF	159 total 69 SF 90 MF	190 total 78 SF 112 MF	272 total 146 SF 126 MF	254 total 164 SF 90 MF	272 total 166 SF 106 MF	235 total 103 SF 132 MF	263 total 93 SF 170 MF
Town of Roberts Population: 1,230	0	2 SF	1 SF	0	0	25 SF	69 SF	74 SF	46 SF

Notes: "Permits Issued" is specific to new construction. Numbers cited refer to residential units (ex: 4 fourplex = 1 fourplex with 4 residential units).  
Abbreviations: SF = Single Family DUPL = Two Units (Duplex, Twin Homes, etc) MF = Multi-family N/A = Not Available

**TABLE 10  
HOUSING UNITS – YEAR STRUCTURE BUILT**

Geographic Area	Total Housing Units	Built 1990 – March 2000	
		Number	Percentage of Total Built 1990-2000 <sup>a</sup>
<b>WISCONSIN</b>			
<b>St. Croix County</b>	23,410	6,268	26.8
<b>City of Hudson</b>	3,673	1,059	28.8
<b>City of New Richmond</b>	2,553	599	23.5
<b>Town of Hudson</b>	1,956	839	42.9
<b>Town of Richmond</b>	521	116	22.3
<b>Town of Somerset</b>	953	288	30.2
<b>Town of Star Prairie</b>	1,003	407	40.6
<b>Town of St. Joseph</b>	1,187	341	28.7
<b>Village of North Hudson</b>	1,306	261	20.0
<b>Village of Somerset</b>	615	250	40.6
<b>Village of Star Prairie</b>	193	35	18.1
<b>Twin Cities MSA (13 County Area)</b>	1,136,615	198,835	17.5

**TABLE 11  
ST. CROIX COUNTY PLANNING AREAS**

<b>Planning Area</b>	<b>Residential Gross Density (d.u. = dwelling unit)</b>	<b>Density Bonus for Cluster/ Conservation Site Design</b>	<b>Open Space Goal for Cluster/Conservation Site Design Development</b>	<b>General Character/Uses</b>
Urban	Maximum of 14 d.u./acre multi-family, 4 d.u./acre single or two family	N/A	N/A	Urban uses (residential, commercial, industrial), planned for public utilities
Transitional	Maximum of 3 d.u./acre sewered, 1 d.u./acre unsewered, ghost platting required	Cluster/ conservation site design allowed, no bonus, minimum lot size based on site conditions	At least 50% of the site permanently preserved in open space	Suburban and urbanizing character, large subdivision development, some commercial, some clustered development
Rural	Average of 8 d.u./ 40 acres, 2 acre minimum lot size	25% of applicable site density, minimum lot size based on site conditions	At least 50% of new residential development in conservation site design, with 65% to 85% of such sites in permanent open space or agriculture	Rural character, non-farm residential, smaller farms, limited commercial, clustered development

Source: St. Croix County Development Management Plan (March 21, 2000)

**TABLE 12  
PLANNING AND ZONING AUTHORITY FOR SELECTED VILLAGES AND TOWNS  
ST. CROIX COUNTY, WISCONSIN**

	<b>Master Plan/ Comprehensive Plan</b>	<b>General Zoning Ordinance</b>	<b>Extraterritorial Zoning Exercised</b>	<b>County Subdivision Regulations</b>	<b>Local Subdivision Regulations</b>	<b>Extraterritorial Plat Review Exercised</b>
<b>Village of North Hudson</b>	Adopted 1987	Adopted 1994	Not exercised	N/A	Adopted 1994	Exercised
<b>Village of Somerset</b>	Adopted 2002	Adopted 1994	Not exercised	N/A	Adopted 1994	Exercised
<b>City of New Richmond<sup>(1)</sup></b>	Under revision at present time. Expected adoption in 2004	Local ordinance adopted in 1994	Not exercised	Implemented by county ordinance	Adopted 1994	Exercised
<b>Town of Hudson</b>	Adopted 1989	Local ordinance adopted 1994	No authority	Implemented by county ordinance	Additional local ordinance adopted 1992	N/A
<b>Town of St. Joseph</b>	Adopted 1996, under revision at present time	Has adopted county ordinance	No authority	Implemented by county ordinance	Additional local ordinance adopted 1993	N/A
<b>Town of Somerset</b>	Adopted 1998	Has adopted county ordinance	No authority	Implemented by county ordinance	Additional local ordinance adopted 1999	N/A

Source: Policy Analysis Section of St. Croix County Development Management Plan (March 2000)

<sup>(1)</sup>City of New Richmond data obtained by SRF Consulting Group.

**TABLE 13  
DIRECT LAND USE IMPACTS – LAND ACQUISITION**

**MINNESOTA**

	1	2					3									
	Previous Acquisitions (for 1995 Final EIS Preferred Alternative)	New Acquisitions					Excess Right-of-Way <sup>(1)</sup>					Total Right-of-Way Required (Column 1+2-3)				
		Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E	Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E	Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E
<b>Total Area to be Acquired for Right-of-Way</b>																
Acres	73	57	59	59	66	64	20	26	26	25	25	<b>110</b>	<b>106</b>	<b>106</b>	<b>114</b>	<b>112</b>

**WISCONSIN**

	1	2					3									
	Previous Acquisitions (for 1995 Final EIS Preferred Alternative)	New Acquisitions					Excess Right-of-Way <sup>(1)</sup>					Total Right-of-Way Required (Column 1+2-3)				
		Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E	Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E	Alt B1	Alt C - Option 1	Alt C - Option 2	Alt D	Alt E
<b>Total Area to be Acquired for Right-of-Way</b>																
Acres	133	99	82	139	112	112	45	37	99	54	54	<b>187</b>	<b>179</b>	<b>173</b>	<b>191</b>	<b>191</b>

<sup>(1)</sup>That portion of acquired right-of-way remaining after construction is completed and available for sale as excess right-of-way.

**TABLE 14  
SUMMARY OF LAND AREA LIKELY TO BE INFLUENCED BY ROAD  
IMPROVEMENTS<sup>(1)</sup>**

<b>Alternative</b>	<b>Total Gross Acreage</b>	<b>Undeveloped Land within Buffered Area<sup>(2)</sup></b>	<b>Developed Land within and outside of Buffered Area</b>
<b>B-1 (Wisconsin only)</b>	678 acres	487 acres	191 acres
<b>C – Option 1 (Wisconsin only)</b>	648 acres	477 acres	171 acres
<b>C – Option 2 (Wisconsin only)</b>	683 acres	557 acres	126 acres
<b>D (Wisconsin only)</b>	622 acres	365 acres	257 acres
<b>TH 36 (TH 5 to Osgood Avenue) (Minnesota)</b>	1,242 acres	43 acres	1,171 acres

<sup>(1)</sup>This calculation was based on area within ½ mile of new or improved interchanges.

<sup>(2)</sup>Undeveloped land does not distinguish developable from non-developable area. Restrictions on steep slopes, environmentally protected or federally-owned lands unlikely to be developed, such as wildlife habitat preserves, are not accounted for in these figures.

**TABLE 15  
WISCONSIN MODEL AREA ACCESSIBILITY-BASED DEMOGRAPHIC  
FORECASTS<sup>(1)</sup>**

	<b>No Build</b>	<b>Alternative B-1<sub>a</sub><sup>(2)</sup></b>	<b>Alternative D</b>	<b>Alternative E</b>
<b>2000 Population</b>	95,976	95,976	95,976	95,976
<b>2030 Baseline</b>				
Population	167,200	167,200	167,200	167,200
Growth (2000 to 2030)	71,224	71,224	71,224	71,224
<b>2030 Accessibility-adjusted</b>				
Population	141,613	166,891	165,384	161,903
Growth (2000 to 2030)	45,636	70,914	69,407	65,926
Percent Change in growth (Baseline to Accessibility-adjusted)	-36%	0%	-2%	-7%

<sup>(1)</sup>Alternative C was considered as the Baseline for accessibility, therefore by definition it would not have any reduction in growth under the accessibility-based alternative.

<sup>(2)</sup>Under Alternative B-1<sub>a</sub>, there is no traffic on the Lift Bridge.

**FIGURE 1 COUNTY PROJECTED GROWTH RATES, WISCONSIN 2000-2030**

**FIGURE 2 SOIL SUITABILITY- ST. CROIX COUNTY**

**FIGURE 3 POTENTIALLY PRODUCTIVE AGRICULTURAL LAND- ST. CROIX COUNTY**

**FIGURE 4 WASHINGTON COUNTY FUTURE LAND USE PLAN MAP**

**FIGURE 5 ST. CROIX COUNTY DEVELOPMENT MANAGEMENT PLAN MAP**

**FIGURE 6 INDIRECT LAND USE IMPACTS STUDY – TH 36 (TH5 TO OSGOOD AVENUE) (ALL ALTERNATIVES)**

**FIGURE 7 INDIRECT LAND USE IMPACTS STUDY – ALTERNATIVE B-1**

**FIGURE 8 INDIRECT LAND USE IMPACTS STUDY – ALTERNATIVE C – OPTION 1**

**FIGURE 9 INDIRECT LAND USE IMPACTS STUDY – ALTERNATIVE C – OPTION 2**

**FIGURE 10 INDIRECT LAND USE IMPACTS STUDY – ALTERNATIVES D AND E**

**FIGURE 11 MAXIMUM GROWTH REDISTRIBUTION**