

Department of Public Works

City Hall
730 Washington Ave.
Racine, WI 53403
262.636.9121 - Public Works
262.636.9191 - Engineering



Richard M. Jones, P.E.
Commissioner of Public Works

Thomas M. Eeg, P.E.
Asst. Comm. of Public Works/Operations

John C. Rooney, P.E.
Asst. Comm. of Public Works/Engineering

April 23, 2007

To the Honorable Mayor and Common Council:

I respectfully request permission to apply for a CMAQ grant (Grant Control No. 2007-024) from the Wisconsin Department of Transportation for Signal Interconnect and System Timing Optimization for Sixth Street north to the city limits.

This should be referred to the Finance and Personnel Committee for their consideration.

Sincerely,

John Rooney
Asst. Commissioner/Engineering

HMF:hf

APPLICATION FOR FUNDING CMAQ PROGRAM FYs 2008-2010

Wisconsin Department of Transportation

Date of Application <i>April 16, 2007</i>	Application Number	WisDOT Project ID Number
Project Title <i>Signal Interconnect and System Timing Optimization</i>	Location(s) Served by Project <i>City of Racine</i>	
Project Description - Project Limits <i>City of Racine</i>	County/Counties Served by Project <i>Racine County</i>	
Project Description Continued <i>Sixth St. & North to City Limits</i>	Total Cost of Project (Including Local Match) <i>\$598,000.00</i>	
Name and Address of Public Sponsor <i>City of Racine 730 Washington Ave. Racine, WI 53403</i>	Name, Telephone & Fax Numbers of Public Sponsor Contact <i>John Rooney Tel: (262) 636-9191 Fax: (262) 636-9545</i>	
Other Organization(s) Involved in Project (e.g. Private Partner) <i>Southeast Region DOT Racine County Village of Mt. Pleasant Town of Caledonia</i>	Name, Telephone & Fax Numbers of Private Partner <i>Mike Andreasen Village of Mt. Pleasant Tel: (262) 554-8750 Fax: (262) 554-6785 Michael Hayek Town of Caledonia Tel: (262) 835-6423 Fax: (262) 835-2388</i>	
Project Category/Categories <input type="checkbox"/> Public Transportation <input type="checkbox"/> Bicycle/Pedestrian <input type="checkbox"/> Car and Vanpooling <input type="checkbox"/> Park & Ride Lot <input checked="" type="checkbox"/> Traffic Flow Improvement (e.g. System Signalization) <input type="checkbox"/> Alternative Fuels <input type="checkbox"/> Other (Please Describe, e.g., Diesel Retrofit):	Sponsor's Metropolitan Planning Organization Area <input checked="" type="checkbox"/> Southeastern WI Regional Planning Commission (SEWRPC) <input type="checkbox"/> Bay-Lake Regional Planning Commission (BLRPC) - only for Sheboygan Metropolitan Planning Area <input type="checkbox"/> Non Metropolitan Planning Area	
Project Description - Be Brief But Complete		
<p>1. Where is the project located? Who does it serve? How large will it be? What will it be made of? How will it be accomplished? <i>Important: In addition to describing the project location below, attach a map of the project site to this application.</i></p> <p><i>This project will be concentrating on the Signalized intersections from Sixth St. and North to the City limits, linking them together for optimal coordination.</i></p> <p><i>Altogether, the City of Racine has 81,855 residents and a shopping population of over 200,000. There are 261.64 miles of roadway with 80.26 miles of connecting Highway, Arterial or Collector streets. The City operates 79 signals plus 4 multi-jurisdictional signals. Our active interconnect system includes 27 Intersections on fiber optics, 5 on copper and 7 on radio frequency (RF) for a total of 39 of our 83 intersections connected to the (ITS) Central Computer at City Hall. The City proposes (with both applications) to install 9.00 miles of 2" conduit and 10.79 miles of fiber optic interconnect cable, 8 (RF) antennas and related hardware. This will interconnect 64 intersections on fiber, 5 on copper and 13 on (RF) for a total of 82 intersections connected to the (ITS) at City Hall.</i></p> <p><i>The City proposes to contract the purchase and installation of fiber cable in conduit and related equipment. The City intends to apply a computer-based optimization program to all 82 signalized intersections and create coordinated networks within our jurisdiction, including 4 multi-jurisdictional locations.</i></p>		

2. Why is the project necessary? How will it contribute to improving air quality?

A complete interconnect system and optimized signal network will achieve a significant reduction in fuel consumption. An interconnect system will provide real time communications for consistent coordination and incident management. Transyt-7F will optimize Phases and signal timings and compare measures of effectiveness including fuel consumption and delay. Improved fuel consumption and delay will have a great effect on emissions like Hydrocarbons, Carbon monoxide and Nitrogen oxides. This project will provide the City of Racine with a safe and efficient traffic signal system resulting in a considerable reduction of vehicle emissions and delay.

A recently installed 48 count fiber optic backbone feeds 18 of the 38 signalized intersections in the southwest quadrant of Racine. In addition, a recently installed 48 count fiber backbone feeds the signalized intersections in the downtown business district.

The North side of Racine has 27 uncoordinated signalized intersections with no communications of the central computer at City hall. Uncoordinated intersections create delay and excess emissions. A fiber backbone to the North side is a high priority.

3. Realistically, how much use will this facility or service get?

The vehicle traffic within the City of Racine will benefit from a more efficient signalized system on a daily basis. This service will be able to give attention to the peak volumes in the morning and afternoon to better control oversaturated intersections. The signalized network carries between 2,600 to 23,000 vehicles daily. The average daily traffic throughout the entire signalized network is about 11,600, with the top 85% of the network miles having an ADT of 12,500.

4. What is the project timeline? How will the sponsor ensure that the project is implemented in a timely manner?

The design work for will begin in the year 2008. The City will gather all field data investigations necessary for putting a contract together in order that construction to begin in the year of 2009. The awarded contractor will then enter into an agreement through the City which will bind them to the time frame specified in the contract documents, and if the work is not completed with in that time the contractor will suffer liquidated damages.

5. What obstacles or problems must be overcome to implement this project?

Agreements would need to be entered into with adjacent municipalities for the multi-jurisdictional applications for implementation of project required infrastructure.

Train staff in the use of Traffic Engineering Application Package (TEAPAC)

6. What will make this project a success?

The installation of a fiber optic interconnect system with direct distributive network control using the existing ITS at City Hall. The installation of a radio frequency interconnect system to isolated intersections will provide communications to the existing ITS at City Hall.

The installation of optimized signal timing plans and consistent real time coordination will achieve a significant reduction in fuel consumption and delay for the motorist.

Project Cost Estimate & Timetable ¹			
Item	Year 1	Year 2	Year 3
Engineering & Design ²	\$ 70,000	\$	\$
State Design Review ³	\$	\$	\$
Real Estate & Easements	\$	\$	\$
Utility Relocation	\$	\$	\$
Construction	\$	\$ 450,000	\$
Bridges & Buildings	\$	\$	\$
Landscaping	\$	\$	\$
Railroad Signals/Crossings	\$	\$	\$
Traffic Control Devices	\$	\$	\$
Operation & Maintenance	\$	\$	\$
Marketing & Promotion	\$	\$	\$
Other: e.g. transit operating	\$	\$	\$
Other: e.g. transit capital	\$	\$	\$
Other:	\$	\$	\$
Subtotal	\$ 70,000	\$ 450,000	\$
Contingencies & Constr Mgt ⁴	\$ 10,500	\$ 67,500	\$
Total	\$ 80,500	\$ 517,500	\$
Local Share ⁵	\$ 16,100	\$ 103,500	\$
Federal Share ⁶	\$ 64,400	\$ 414,000	\$

¹ Typically design is done in Year 1, real estate acquisition in Year 2, and construction in Year 3.

² Engineering/Design cost is typically 15% to 20% of the construction cost.

³ State design review is typically 3% of construction cost, minimum \$5,000. This covers plan review, bid advertisement, and printing/mailling of plan sets to potential bidders. *This cost applies only to projects that will be let and administered by WisDOT.*

⁴ Contingencies and construction management are typically budgeted at 15% of the Subtotal.

⁵ Local share for this program is normally 20%.

⁶ Federal share for this program is normally 80%.

Please affirm your understanding of the following project conditions by initialing in the spaces provided:

- JLR A. Private organizations proposing projects generally must have a public sponsor (a local government unit or transit operator).
- JLR B. The project sponsor or private partner must provide matching dollar funding of at least 20% of project costs.
- JLR C. This is a reimbursement program. The applicant organization must finance the project until Federal reimbursement funds are available.
- JLR D. The applicant must fund project costs in excess of the amounts indicated in the above Project Cost Estimate (i.e. cost overruns) at no expense to State/Federal funding sources.
- JLR E. Projects must be designed and constructed in accordance with all applicable federal and state requirements, including but not limited to those on page 13 of the application.

If the public sponsor is submitting more than one application, prioritize this project here (e.g., 1 of 5):

1 of 3

I hereby certify that the above statements are true and complete to the best of the applicant's knowledge and understanding.

Name of Applicant Organization
City of Racine

Name of Signer (Printed Clearly)
John Rooney

Title
*Asst. Commissioner of Public Works
- Engineering*

Signature



Date

Information Below to Be Completed by the WisDOT Region Office

Environmental Document Type	Improvement Type	Program Year
Primary ID	Related ID's	Program <i>CMAQ</i>
Responsible Projects Group	Project Supervisor	

WisDOT Region Approvals

Team Leader Approval	Date	Group Manager Concurrence	Date
Programming Team Approval	Date	Systems Planning Manager Concurrence	Date

PLEASE ATTACH A SITE MAP, PHOTOGRAPHS, OR ANY OTHER GRAPHICS THAT WILL ASSIST THE SELECTION COMMITTEE IN UNDERSTANDING THE LOCATION AND NATURE OF THE PROPOSED PROJECT.

Existing Interconnect



City of Racine

- Traffic signals ●
- Existing fiber signals ⊕
- Existing radio frequency signals ●
- Existing conduit and fiber —
- Multi-jurisdictional signals ■

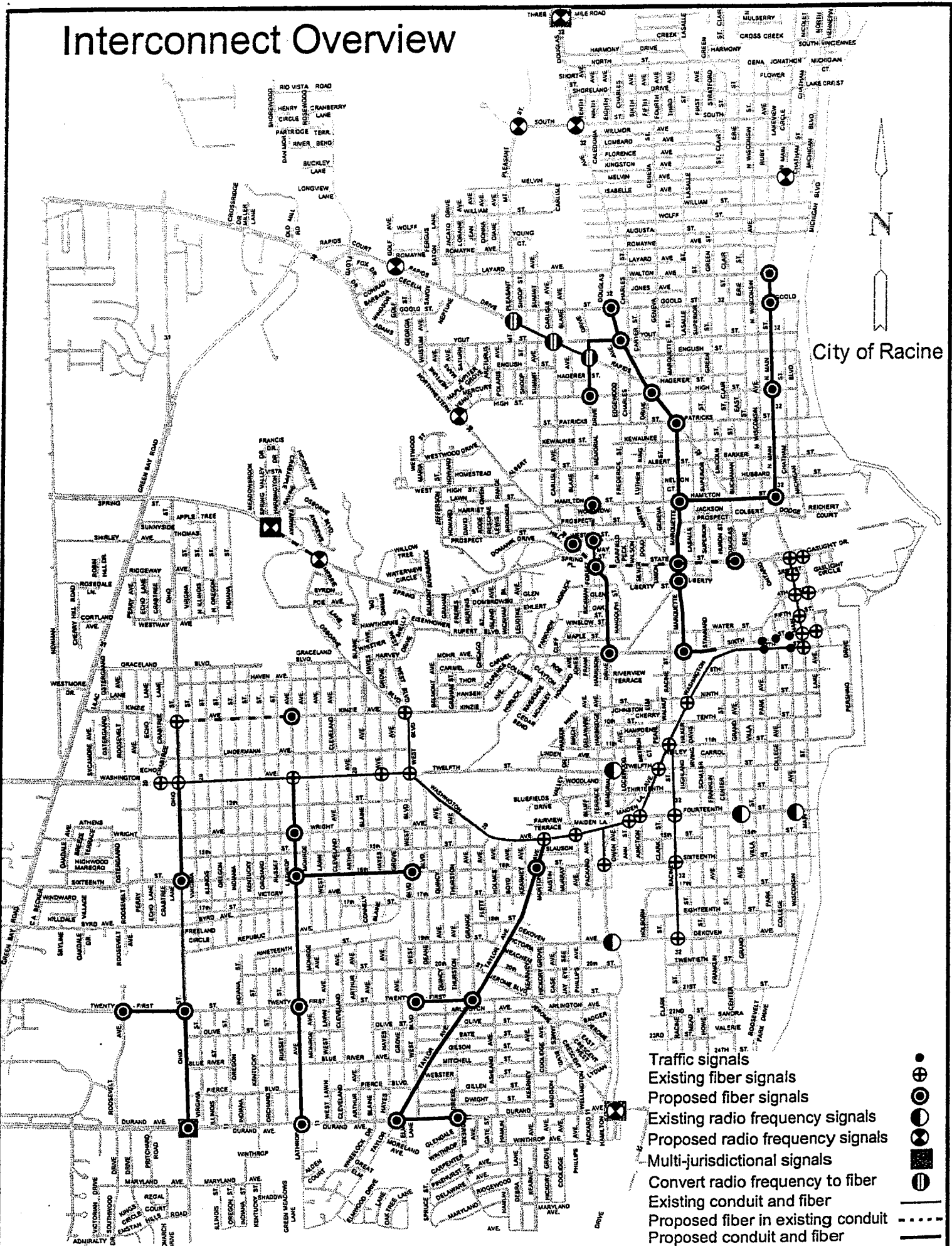
Proposed Interconnect North Side



City of Racine

- Traffic signals
- Proposed fiber signals
- Proposed radio frequency signals
- Multi-jurisdictional signals
- Proposed fiber in existing conduit
- Proposed conduit and fiber

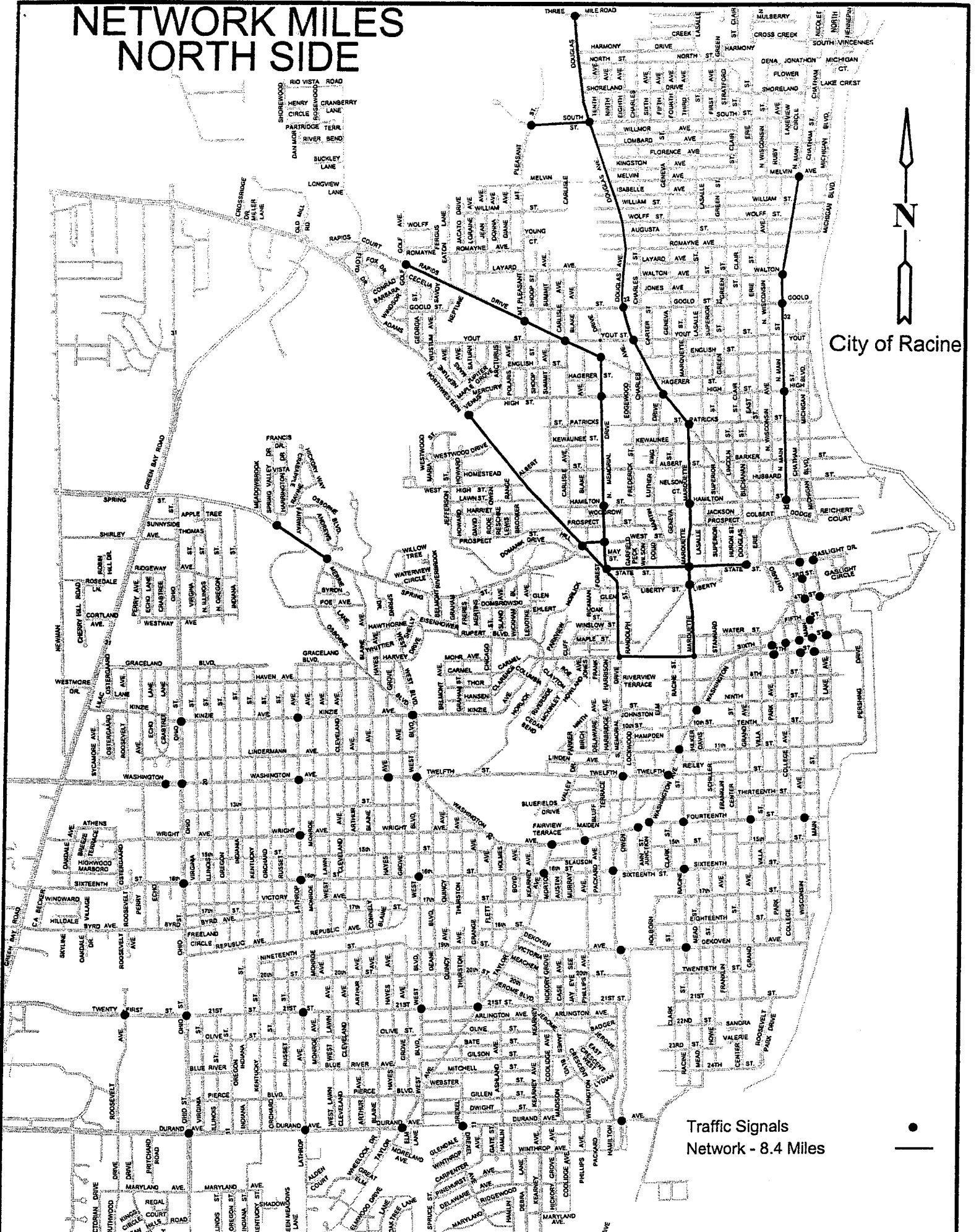
Interconnect Overview



City of Racine

- Traffic signals
- Existing fiber signals
- Proposed fiber signals
- Existing radio frequency signals
- Proposed radio frequency signals
- Multi-jurisdictional signals
- Convert radio frequency to fiber
- Existing conduit and fiber
- Proposed fiber in existing conduit
- Proposed conduit and fiber

NETWORK MILES NORTH SIDE

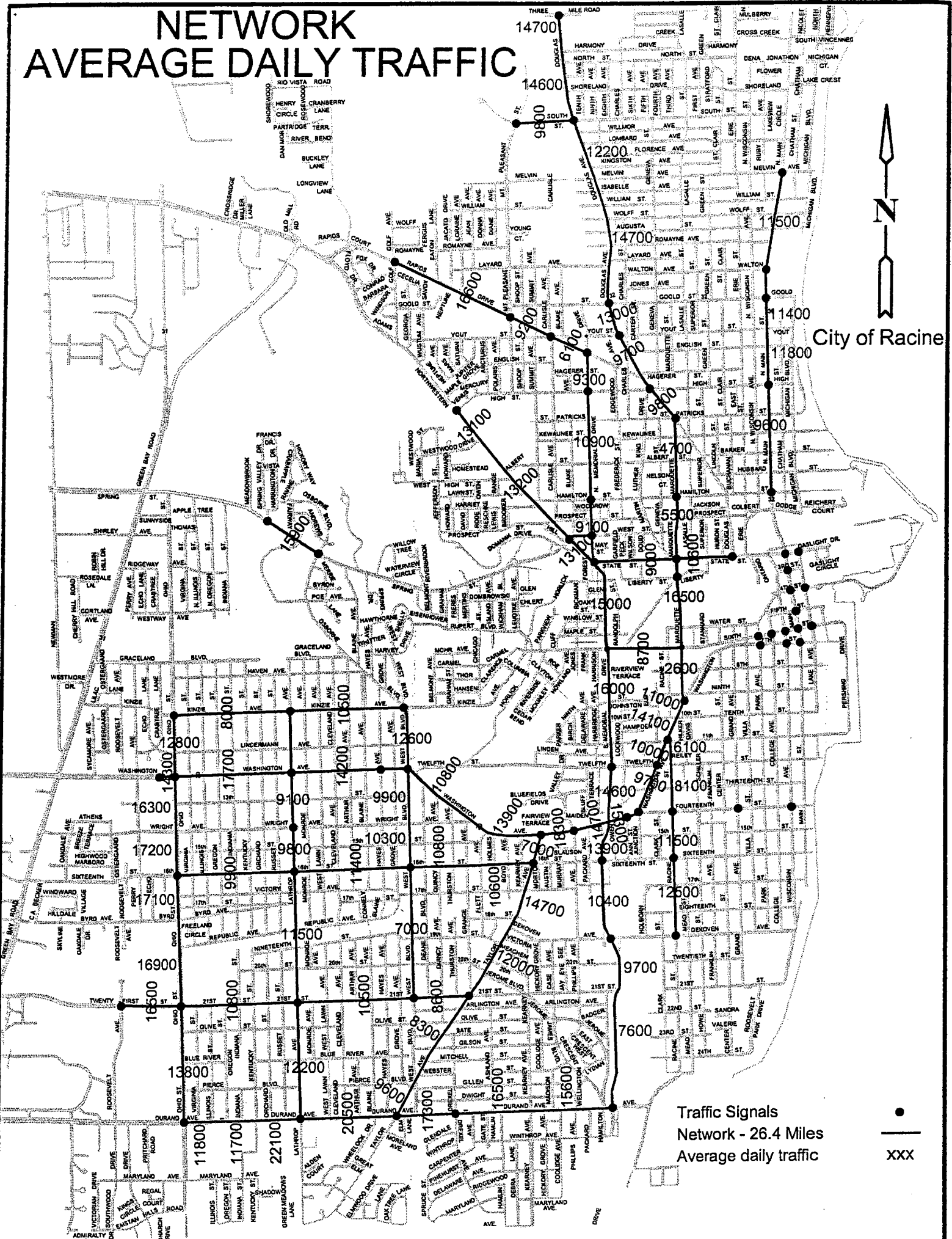


City of Racine

Traffic Signals
Network - 8.4 Miles



NETWORK AVERAGE DAILY TRAFFIC



City of Racine

Traffic Signals
 Network - 26.4 Miles
 Average daily traffic

XXX

Side	Network Segments	Feet	Miles	% of Entire City Network	ADT	VMT
North	South St - Mt Pleasant to Douglas	1,281.34	0.24	0.9%	9,800	2,378.2
North	Sixth - N. Memorial to Marquette	1,663.30	0.32	1.2%	8,700	2,740.7
North	Spring St - Spring Valley to N. Osborne	1,380.00	0.26	1.0%	15,900	4,155.7
North	West - State, Spring to Douglas	4,480.74	0.85	3.2%	9,100	7,722.5
North	Rapids Dr - Golf to N. Memorial	4,919.30	0.93	3.5%	10,633	9,906.9
North	N. Memorial Dr - Rapids to 6th St.	6,932.40	1.31	5.0%	11,650	15,295.9
North	N. Main St - Hamilton to Melvin	7,302.00	1.38	5.2%	11,075	15,316.2
North	Douglas - Marquette - 6th St.	16,638.70	3.15	11.9%	10,665	33,607.4
Total			8.45	31.9%	10,940	
Entire City Signalized ADT					11,447	