A photograph of a flooded residential street. In the center, a person stands on a small wooden platform in the water, holding a long pole. The water is murky and reflects the surrounding houses and trees. Several houses with light-colored siding are visible, some with water reaching their windows. A boat is partially submerged in the water. A utility pole with a yellow pole is in the foreground on the left. The background is filled with lush green trees.

Racine County Hazard Mitigation Plan: Local Planning Team Meeting

October 27, 2015



SEWRPC

Serving the counties of
Kenosha, Milwaukee,
Ozaukee, Racine, Walworth,
Washington, and Waukesha

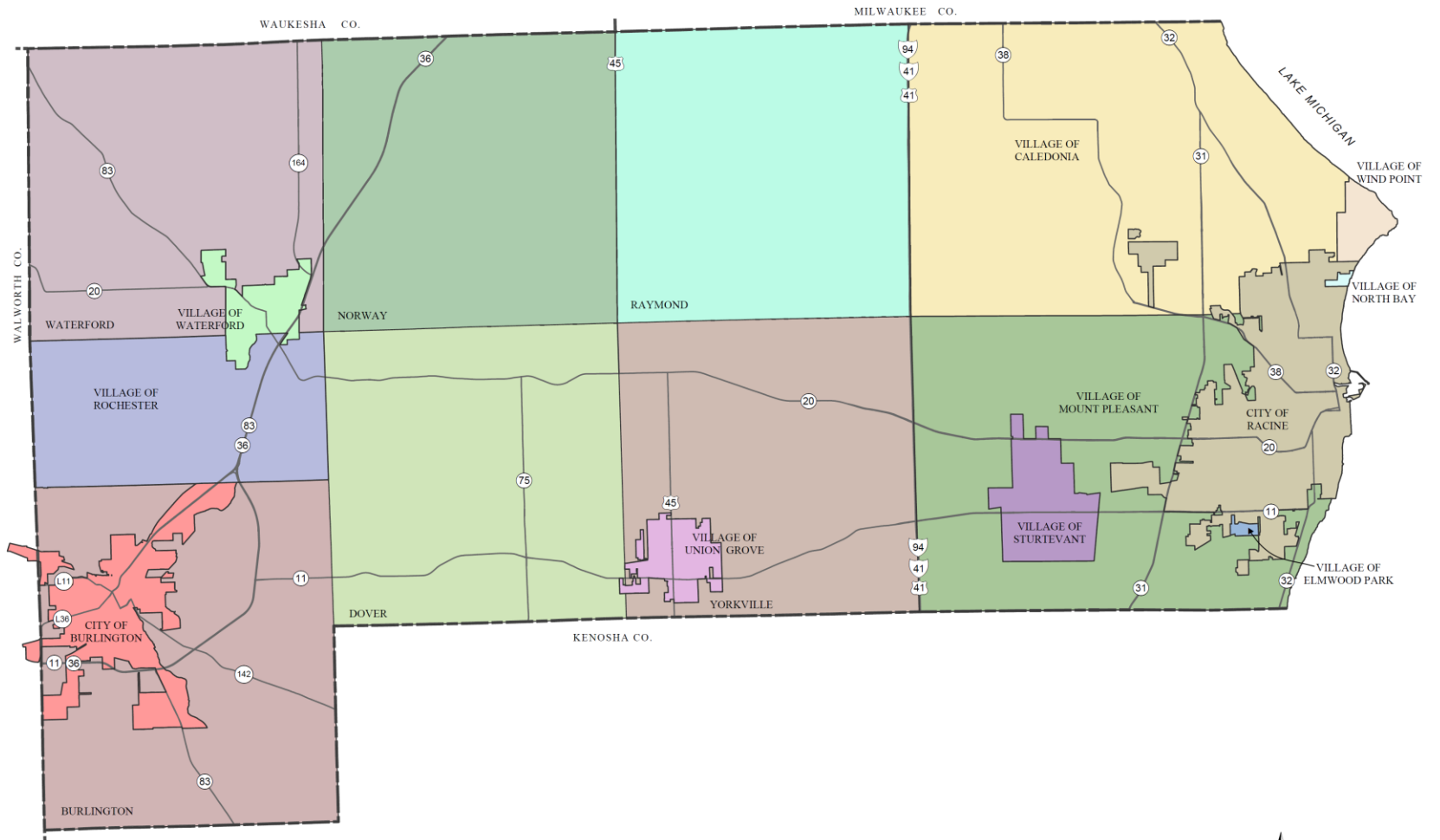
Aaron Owens, Planner
Southeastern Wisconsin Regional Planning Commission

Chapter I

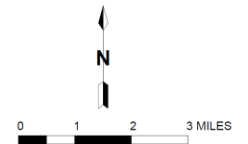
Introduction and Background

Map I - 1

CIVIL DIVISION BOUNDARIES IN RACINE COUNTY: 2015



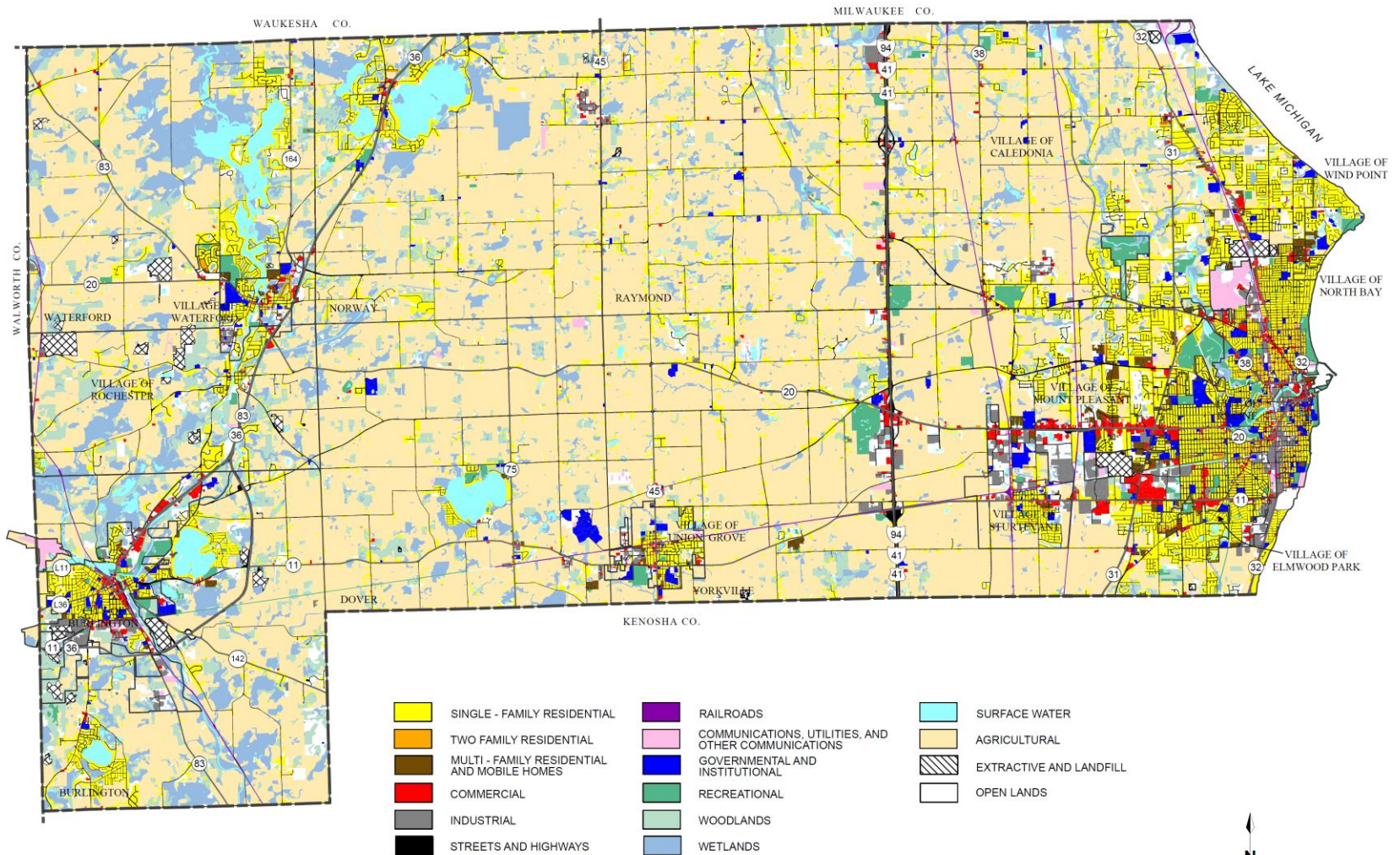
Source: SEWRPC.



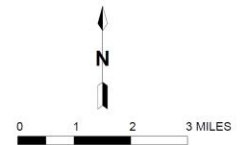
Chapter II

Basic Study Area Inventory and Analysis

Map II - 1 EXISTING LAND USE IN RACINE COUNTY: 2010

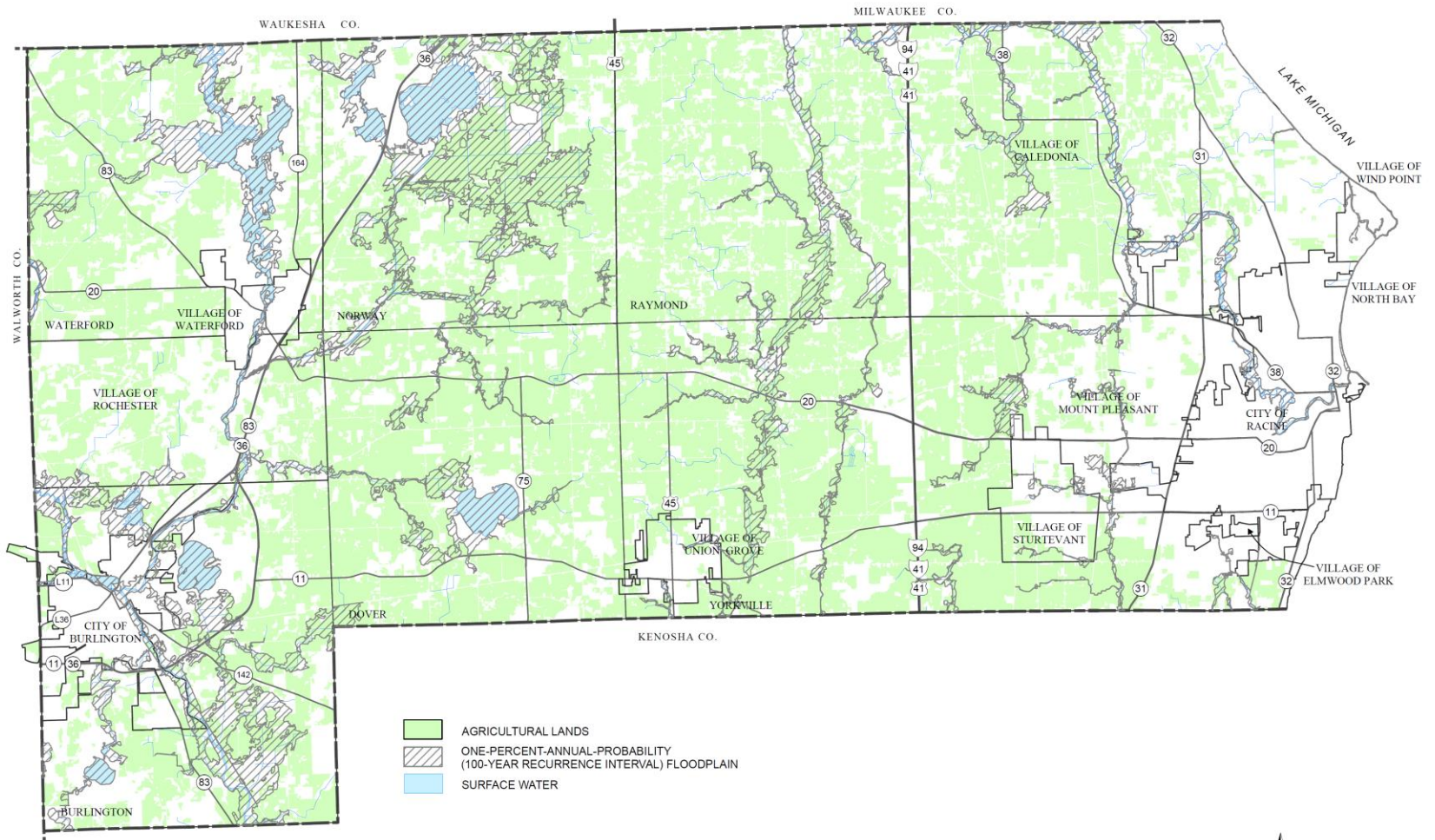


Source: SEWRPC.

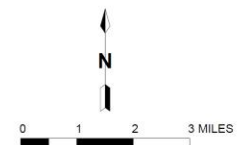


Map II - 2

AGRICULTURAL LANDS IN RACINE COUNTY: 2010

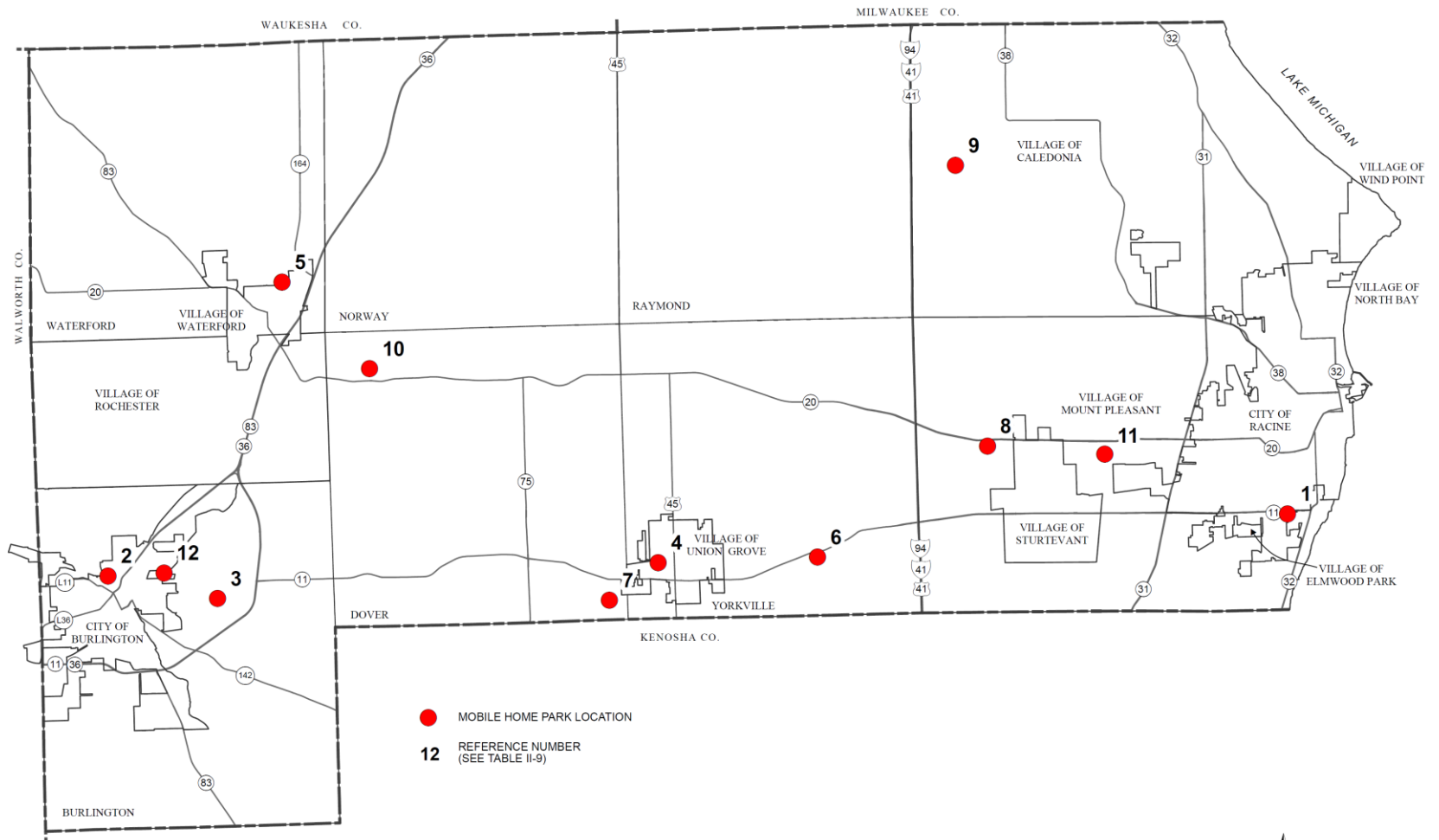


Source: SEWRPC.



Map II - 3

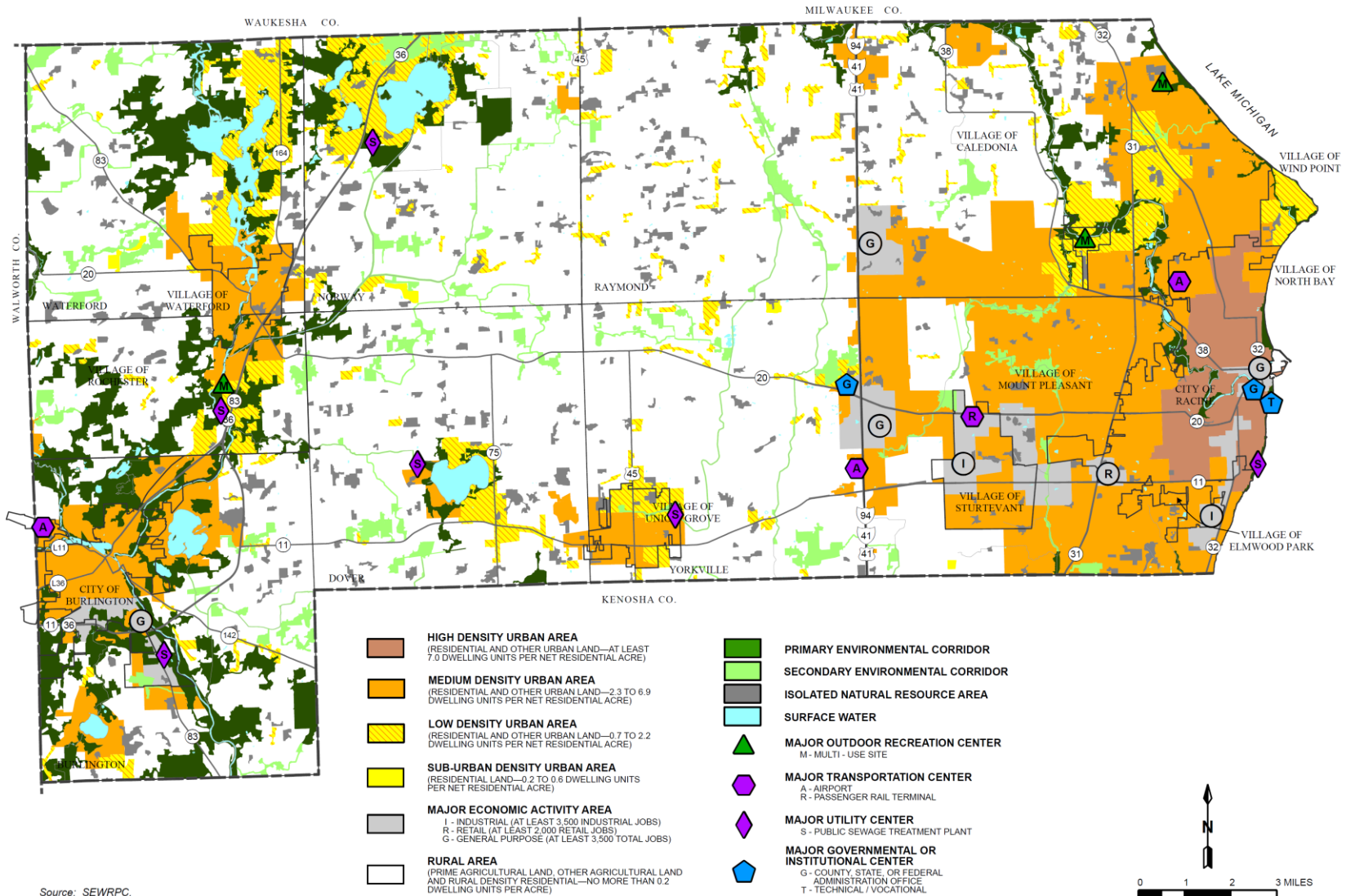
MOBILE HOME PARKS IN RACINE COUNTY: 2015



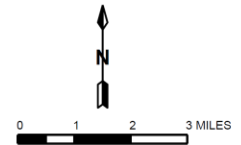
Source: SEWRPC.

Map II - 4

2035 REGIONAL LAND USE PLAN AS IT PERTAINS TO RACINE COUNTY

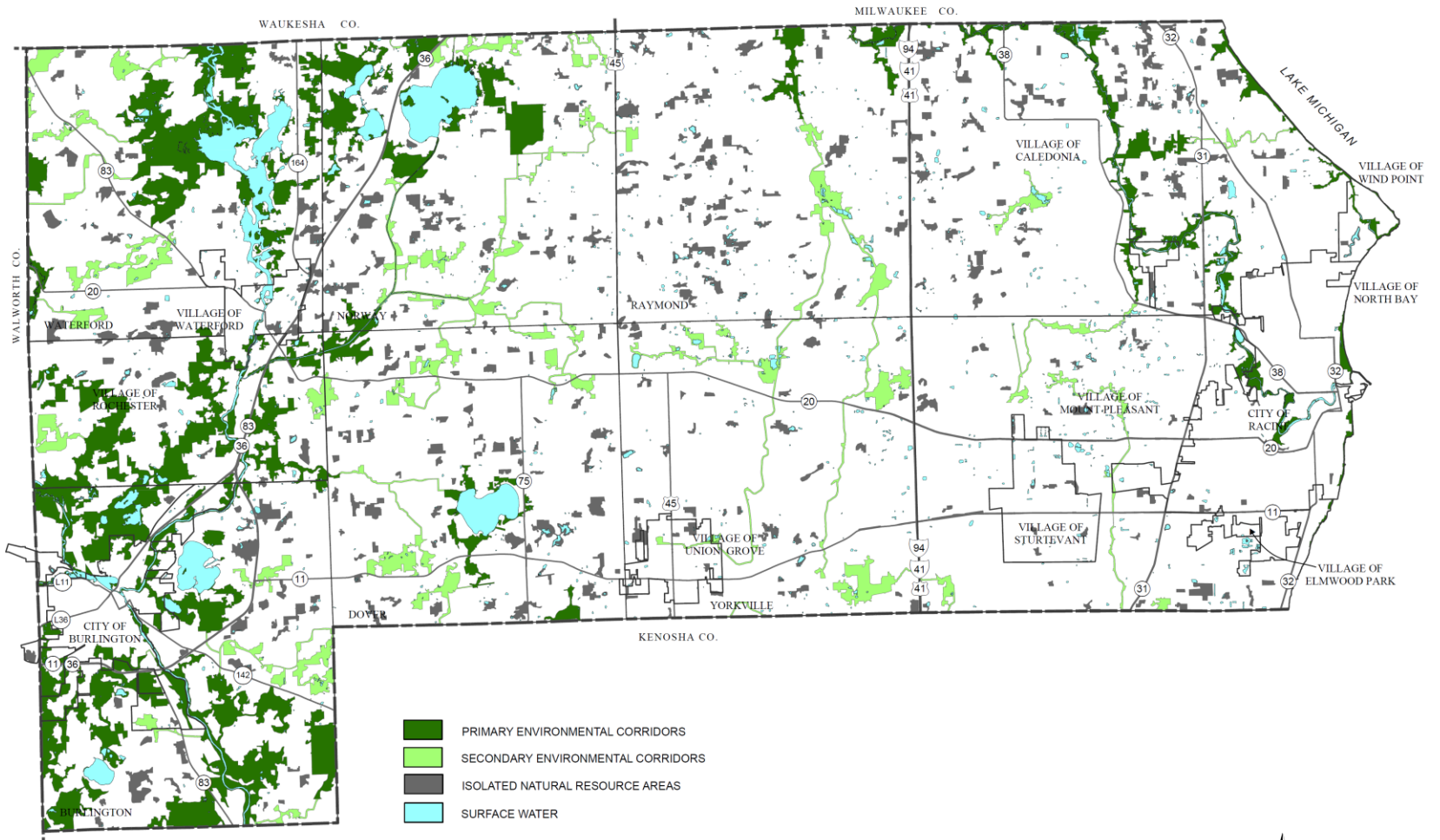


Source: SEWRPC.

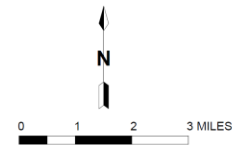


Map II - 5

ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS IN RACINE COUNTY: 2010

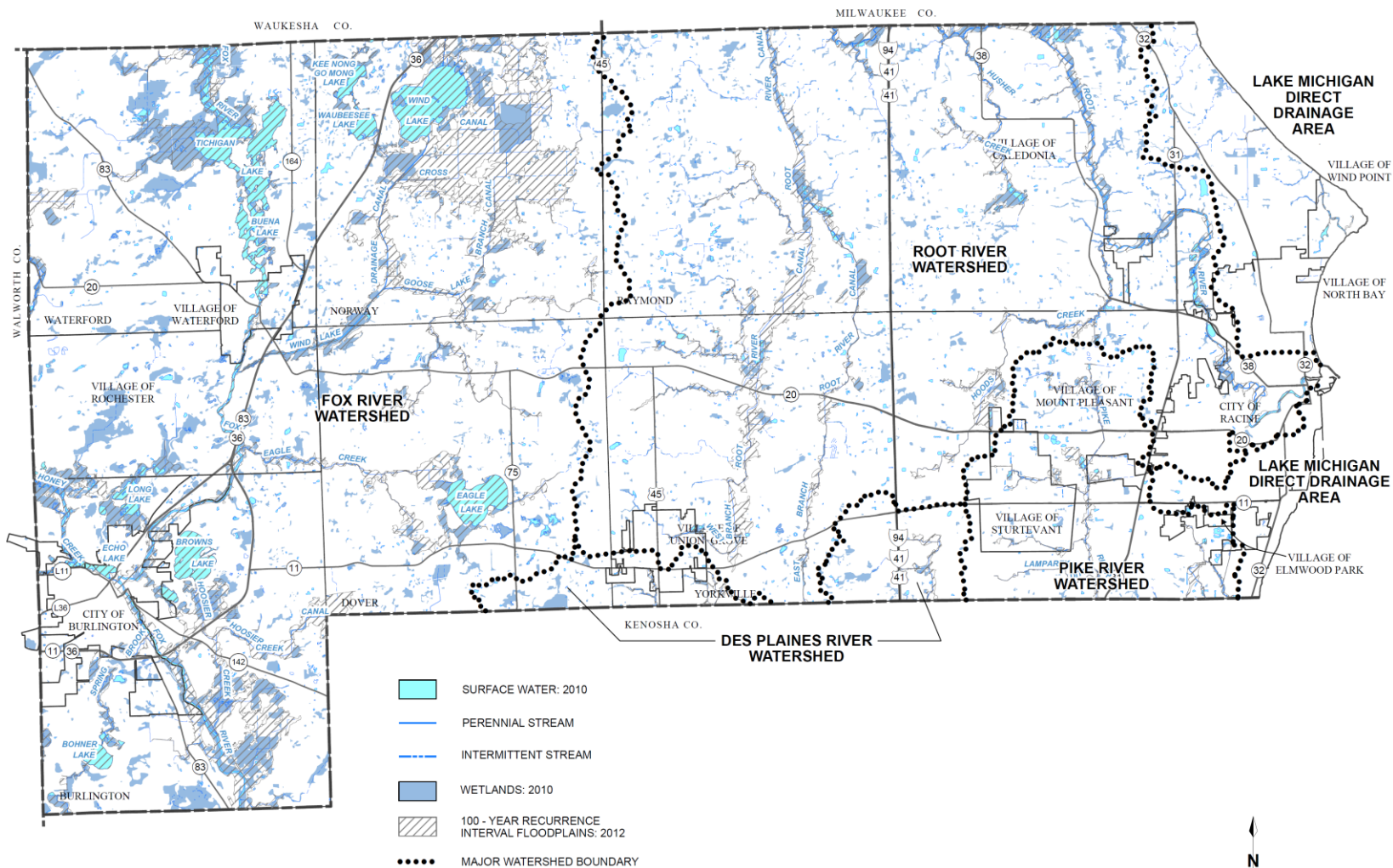


Source: SEWRPC.



Map II - 6

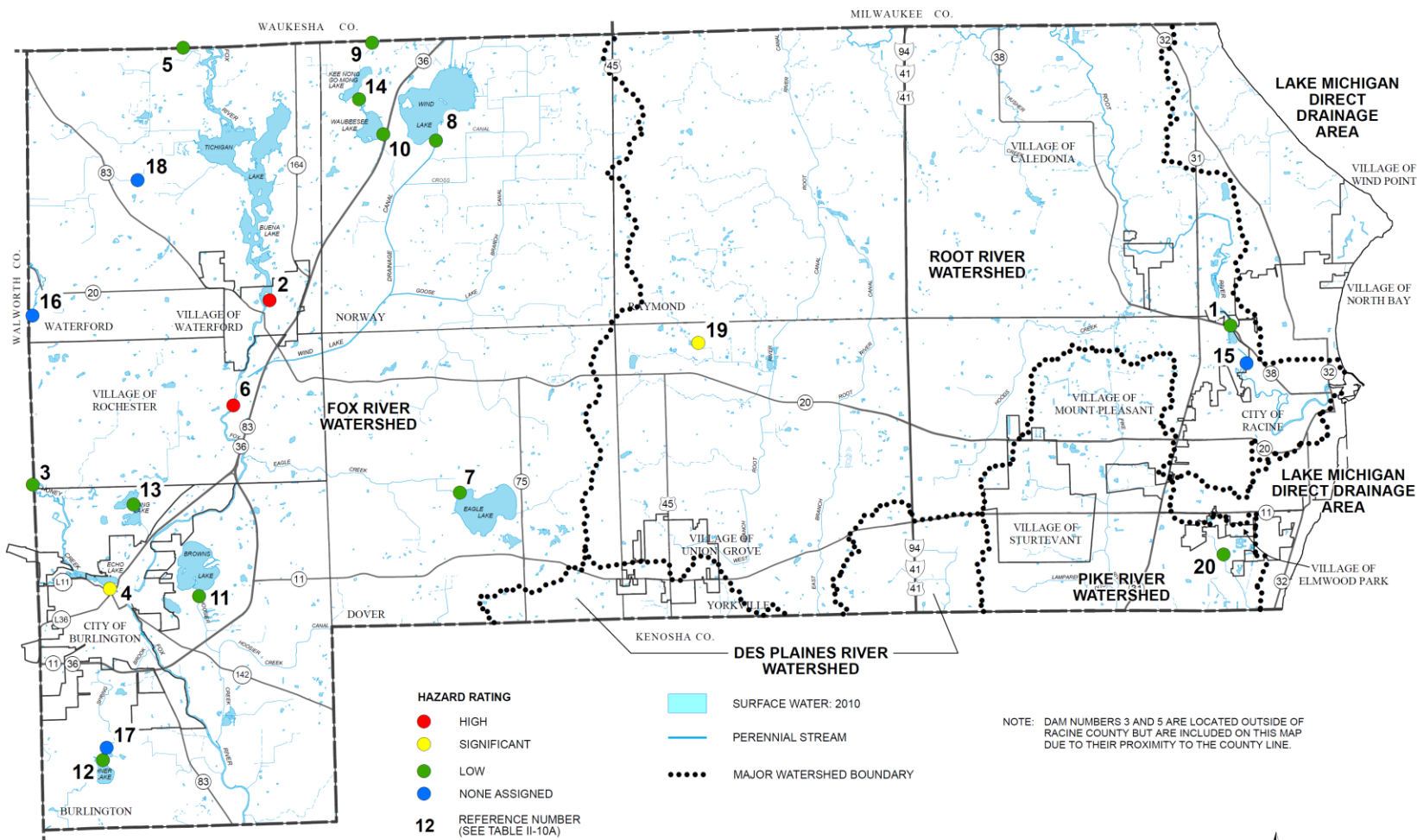
SURFACE WATERS, WETLANDS, AND FLOODPLAINS IN RACINE COUNTY: 2015



Source: Federal Emergency Management Agency and SEWRPC.

Map II - 7

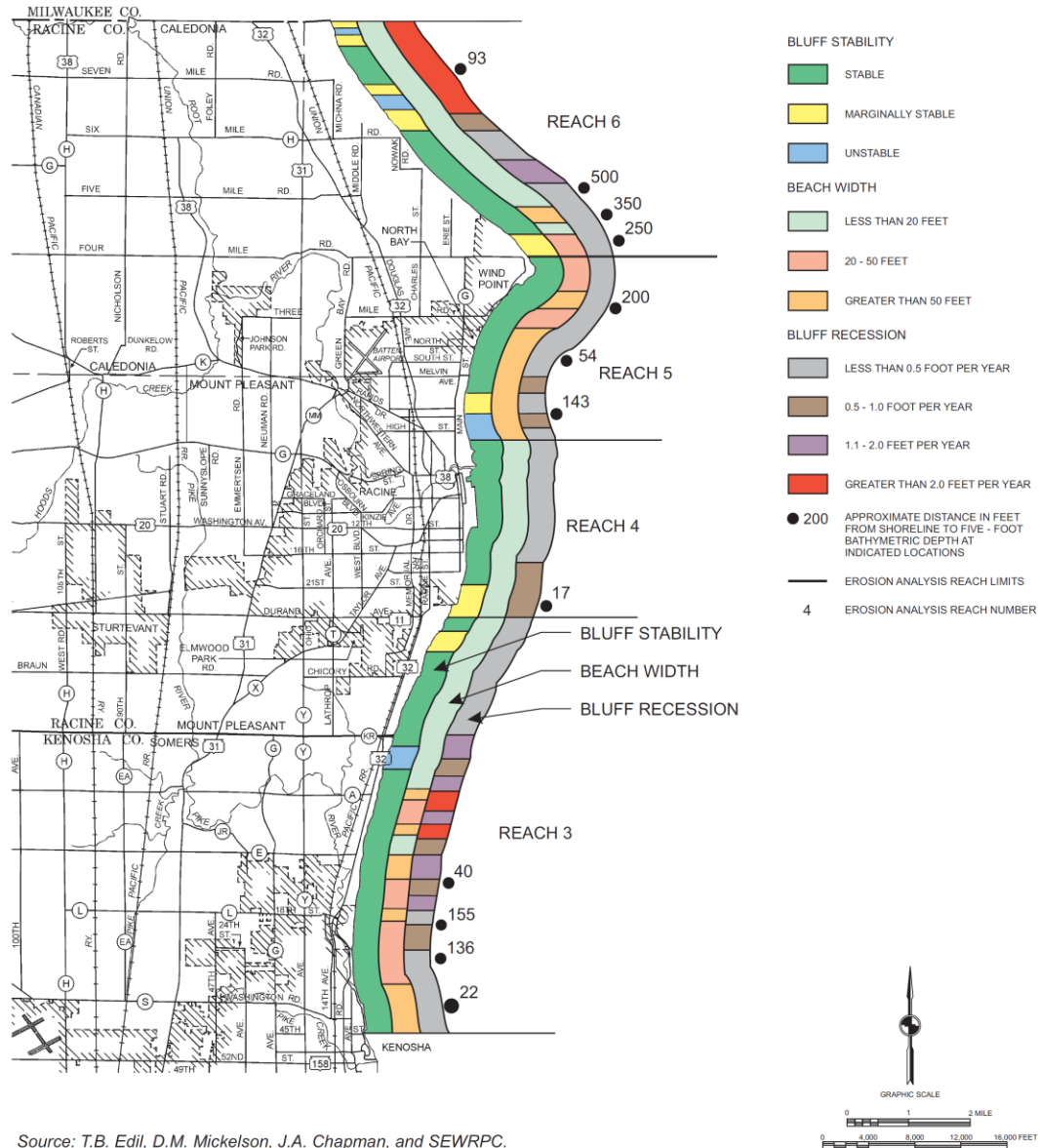
WISCONSIN DEPARTMENT OF NATURAL RESOURCES DAM INVENTORY LOCATIONS: 2015



Source: Wisconsin Department of Natural Resources and SEWRPC.

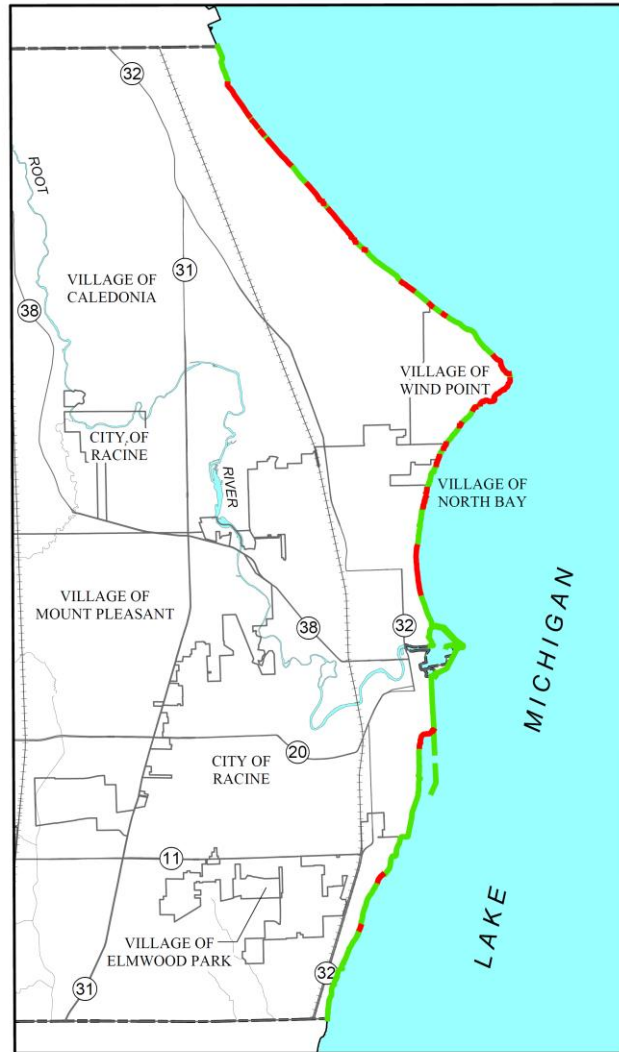
Map II-8

**SUMMARY OF LAKE MICHIGAN SHORELINE EROSION
AND BLUFF STABILITY ANALYSES IN RACINE COUNTY: 1995**



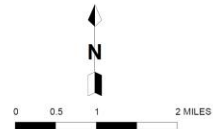
Source: T.B. Edil, D.M. Mickelson, J.A. Chapman, and SEWRPC.

LAKE MICHIGAN SHORELINE / EROSION PROTECTION IN RACINE COUNTY: 2005



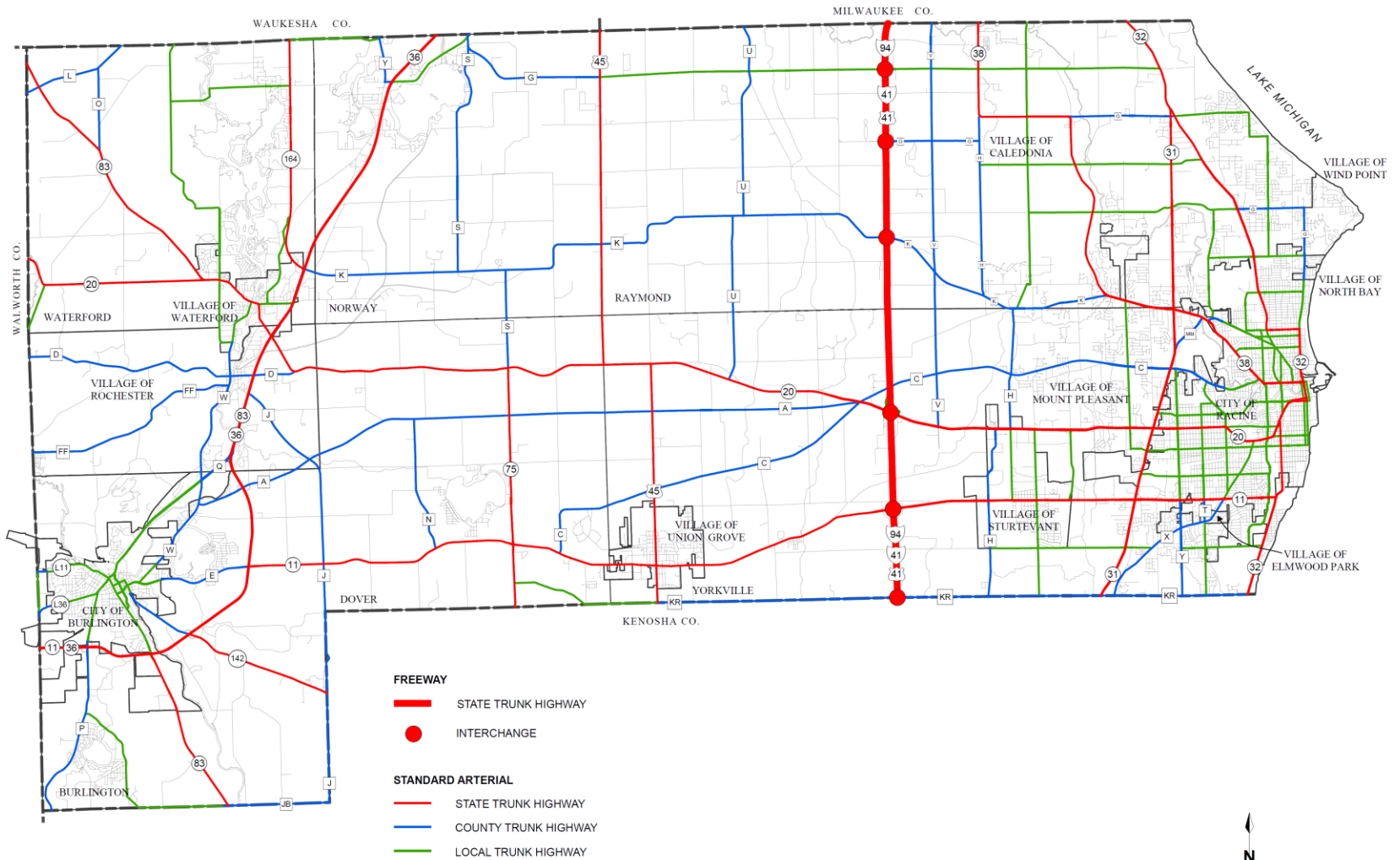
-  PROTECTED SHORELINE
-  UNPROTECTED SHORELINE

Source: S.D. Mackey Habitat Solutions NA and SEWRPC.

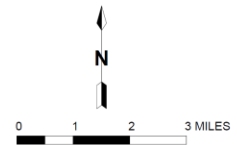


Map II - 10

ARTERIAL STREET AND HIGHWAY SYSTEM IN RACINE COUNTY: 2015

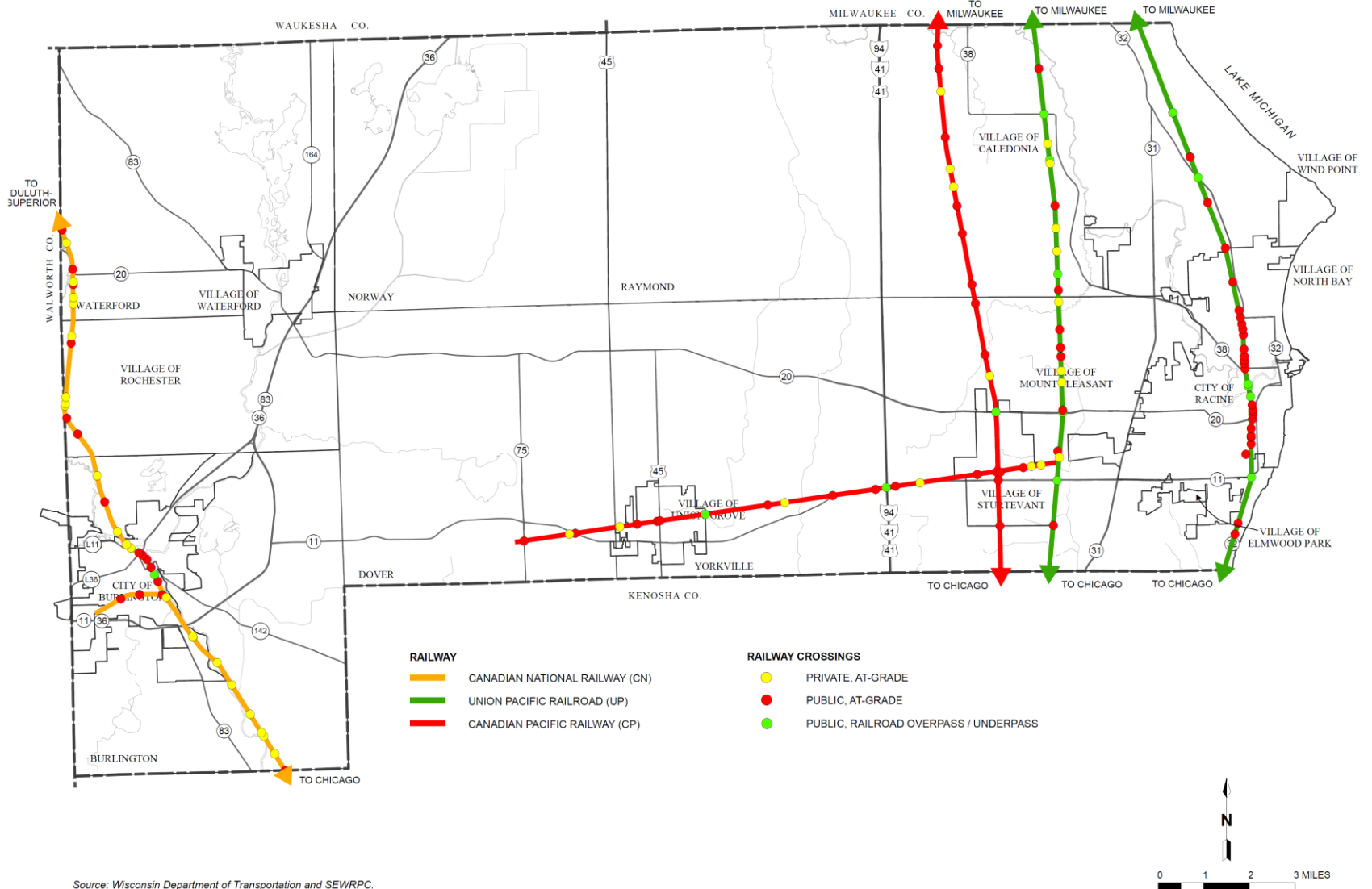


Source: SEWRPC.

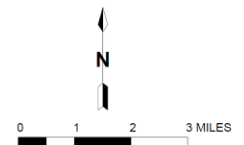


Map II - 11

COMMON CARRIER RAIL FREIGHT LINES IN RACINE COUNTY: 2015

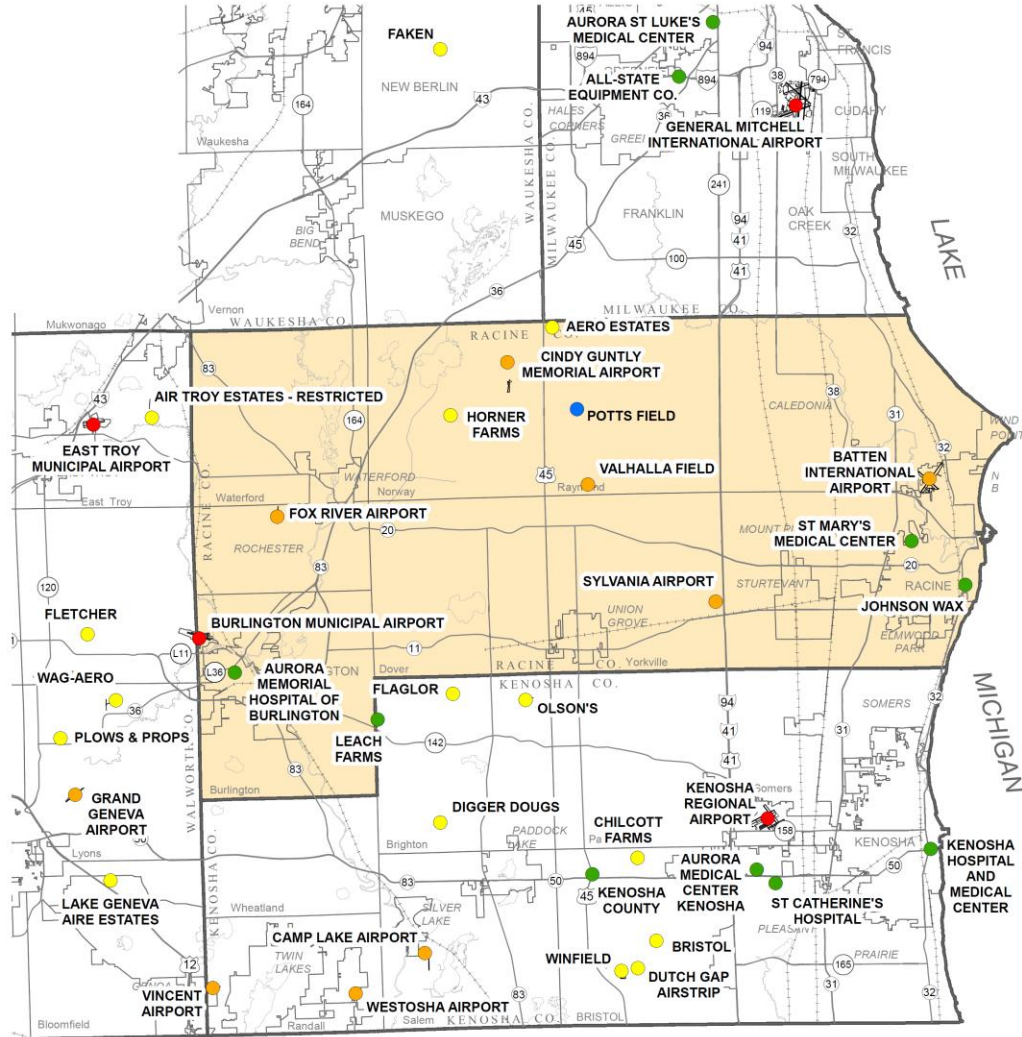


Source: Wisconsin Department of Transportation and SEWRPC.



Map II - 12

EXISTING AIRPORTS IN RACINE COUNTY AND VICINITY: 2015



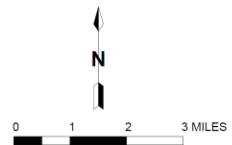
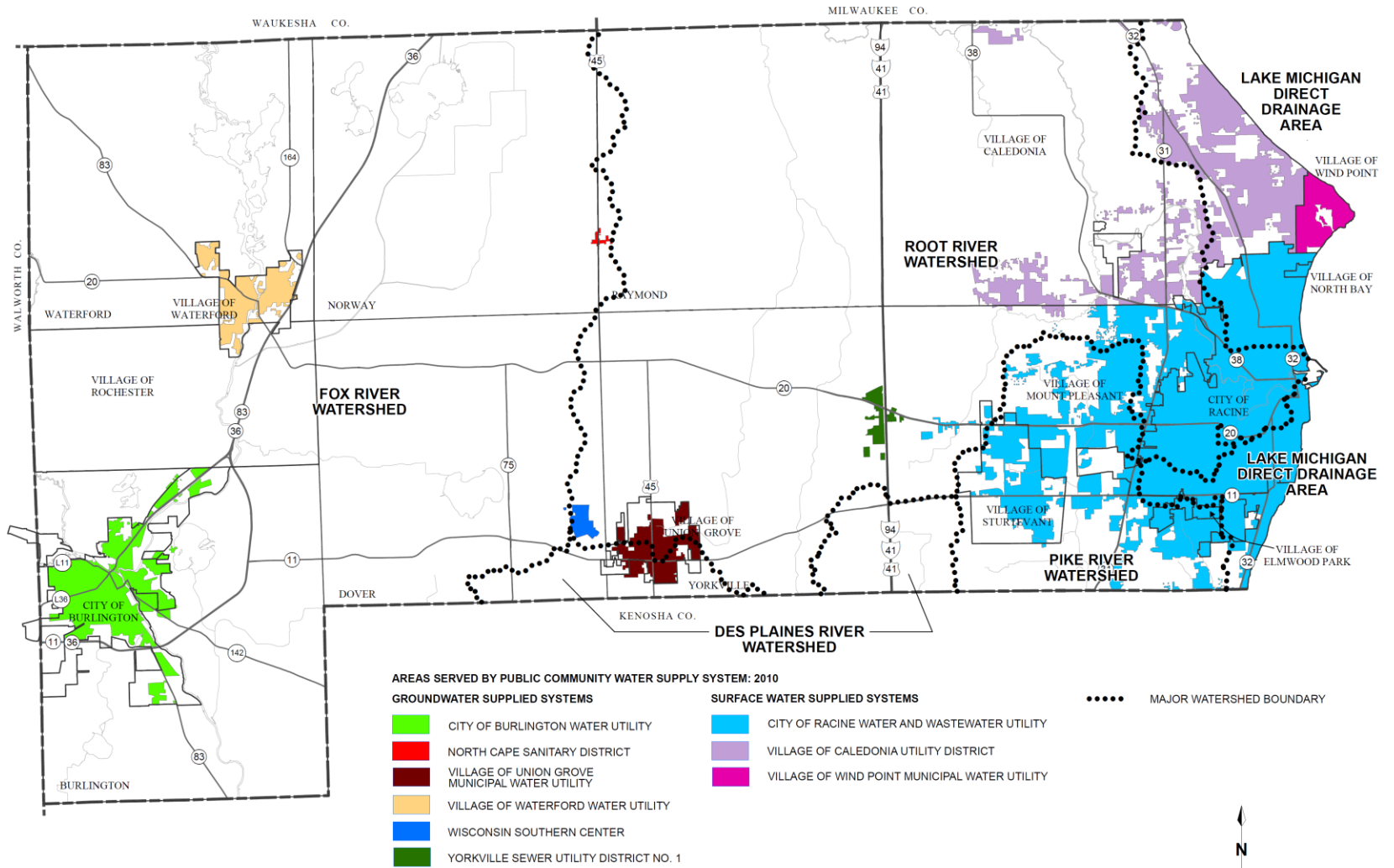
- PUBLIC-USE AIRPORT - PUBLIC OWNERSHIP
- PUBLIC-USE AIRPORT - PRIVATE OWNERSHIP
- PRIVATE-USE AIRPORT - PRIVATE OWNERSHIP
- PUBLIC-USE HELIPORT - PRIVATE OWNERSHIP
- PUBLIC-USE SEAPLANE BASE - PRIVATE OWNERSHIP

Source: Wisconsin Bureau of Aeronautics and SEWRPC.



Map II - 13

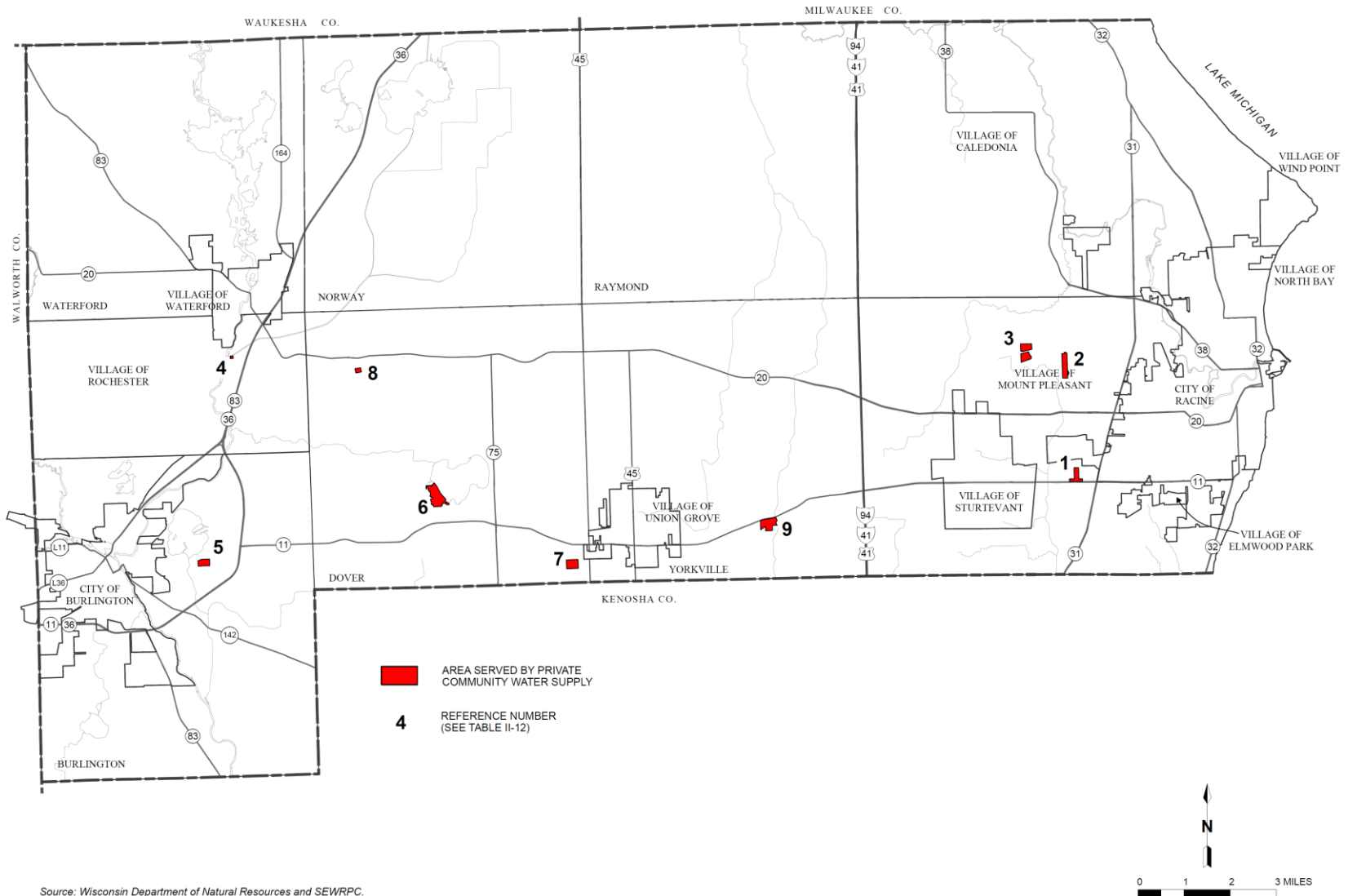
PUBLIC COMMUNITY WATER SUPPLY SYSTEMS AND AREAS SERVED IN RACINE COUNTY: 2015



Source: Wisconsin Public Service Commission, Water Utilities, and SEWRPC.

Map II - 14

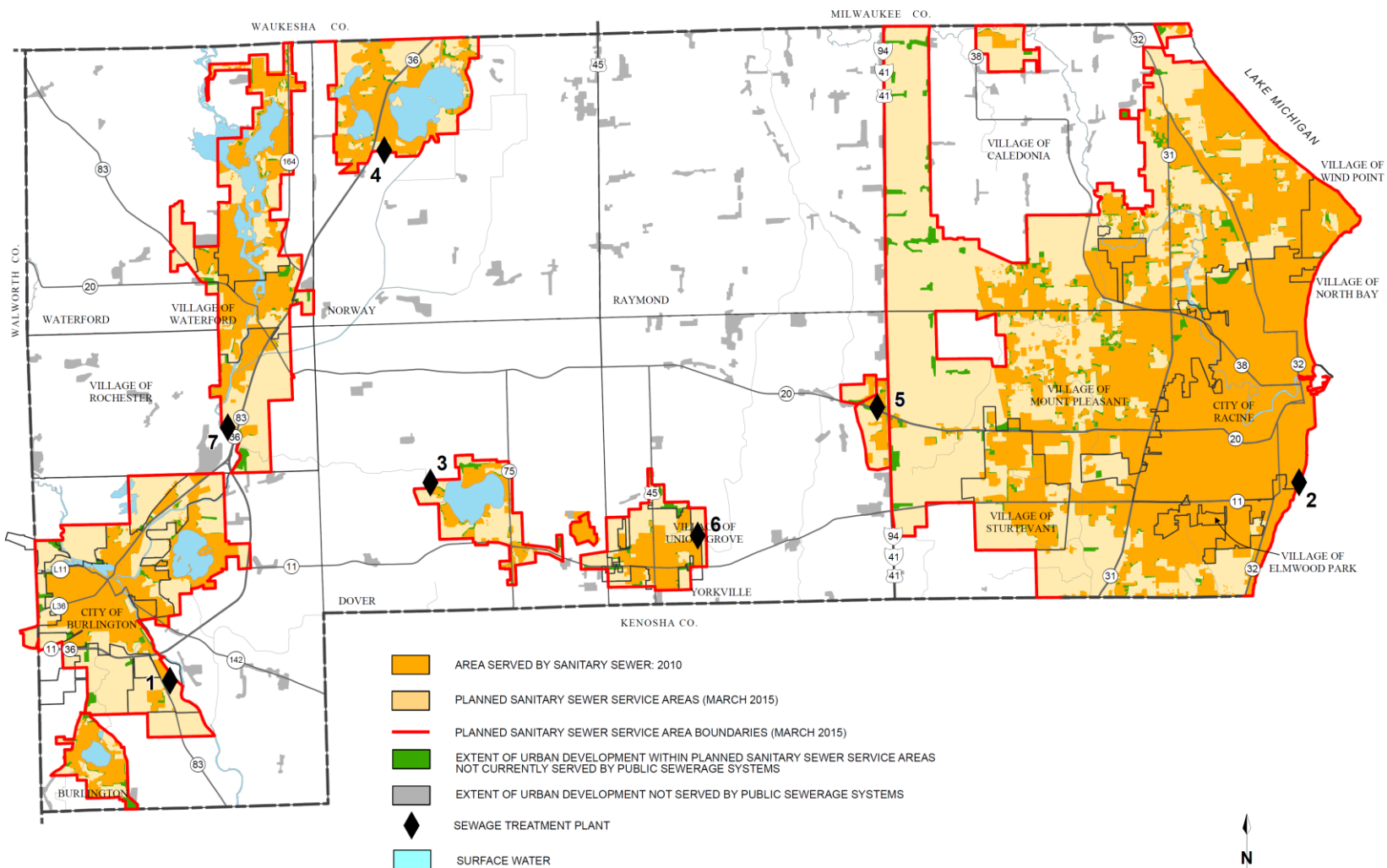
PRIVATE RESIDENTIAL COMMUNITY WATER SYSTEMS IN RACINE COUNTY: 2014



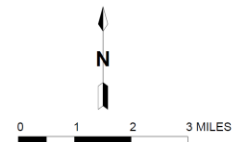
Source: Wisconsin Department of Natural Resources and SEWRPC.

Map II - 15

PLANNED SANITARY SEWER SERVICE AREAS AND AREAS SERVED BY SEWER IN RACINE COUNTY

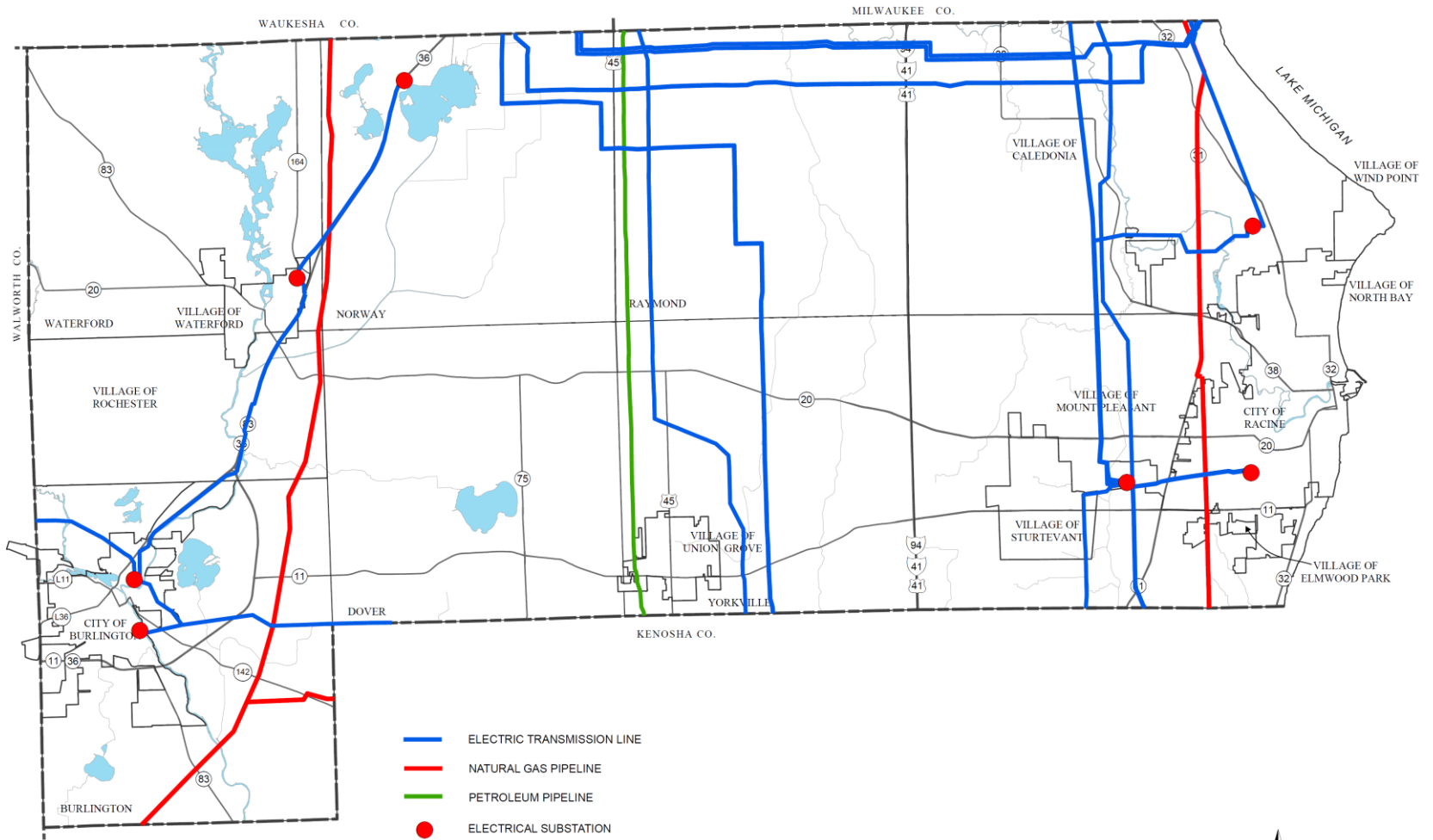


Source: Wisconsin Department of Natural Resources and SEWRPC.

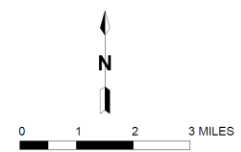


Map II - 16

ELECTRIC TRANSMISSION LINES, NATURAL GAS PIPELINES, AND PETROLEUM PIPELINES IN RACINE COUNTY

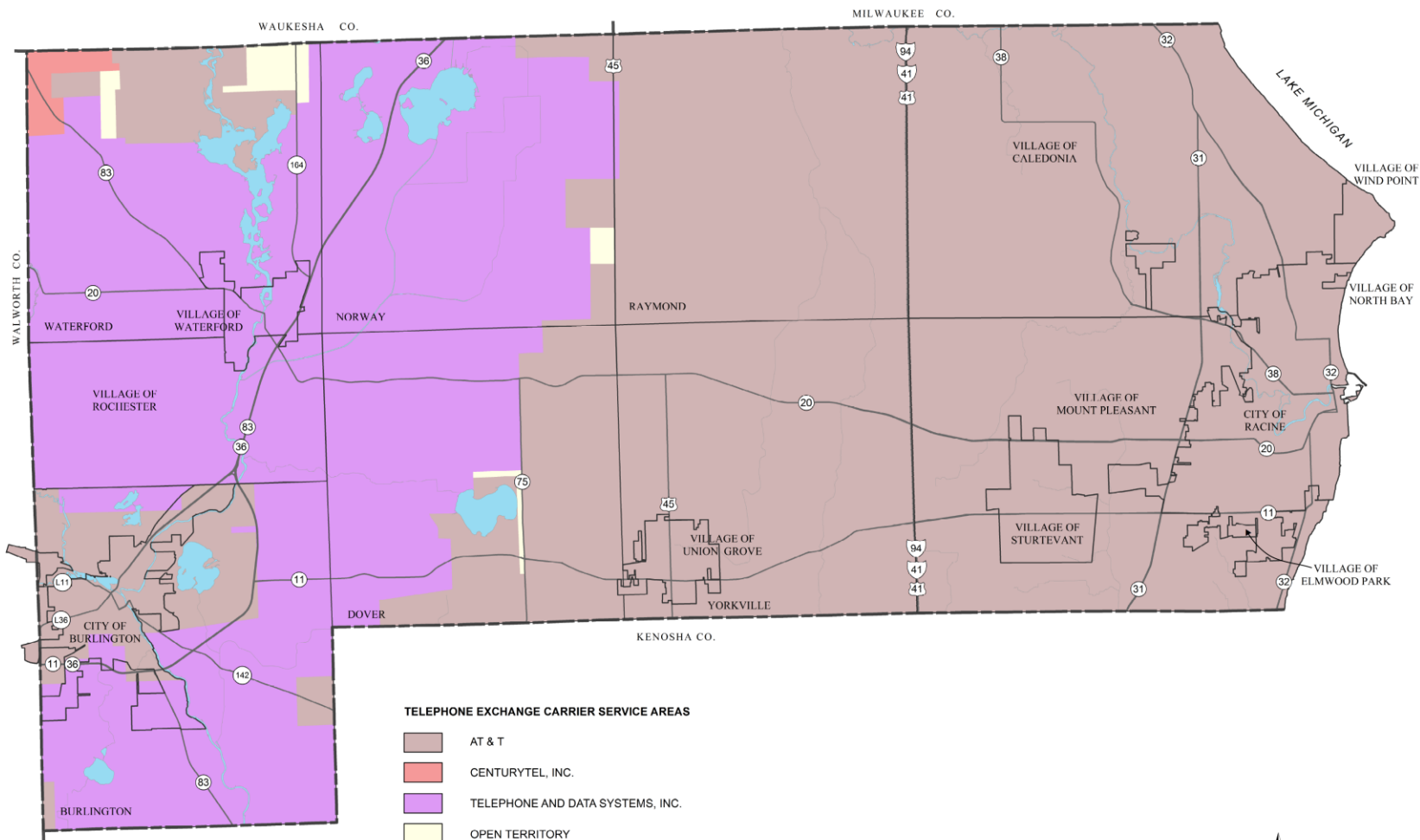


Source: Public Service Commission of Wisconsin and SEWRPC.



Map II - 17

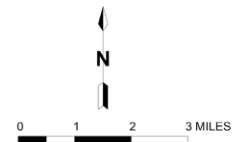
TELEPHONE EXCHANGE CARRIER SERVICE AREAS IN RACINE COUNTY: 2011



TELEPHONE EXCHANGE CARRIER SERVICE AREAS

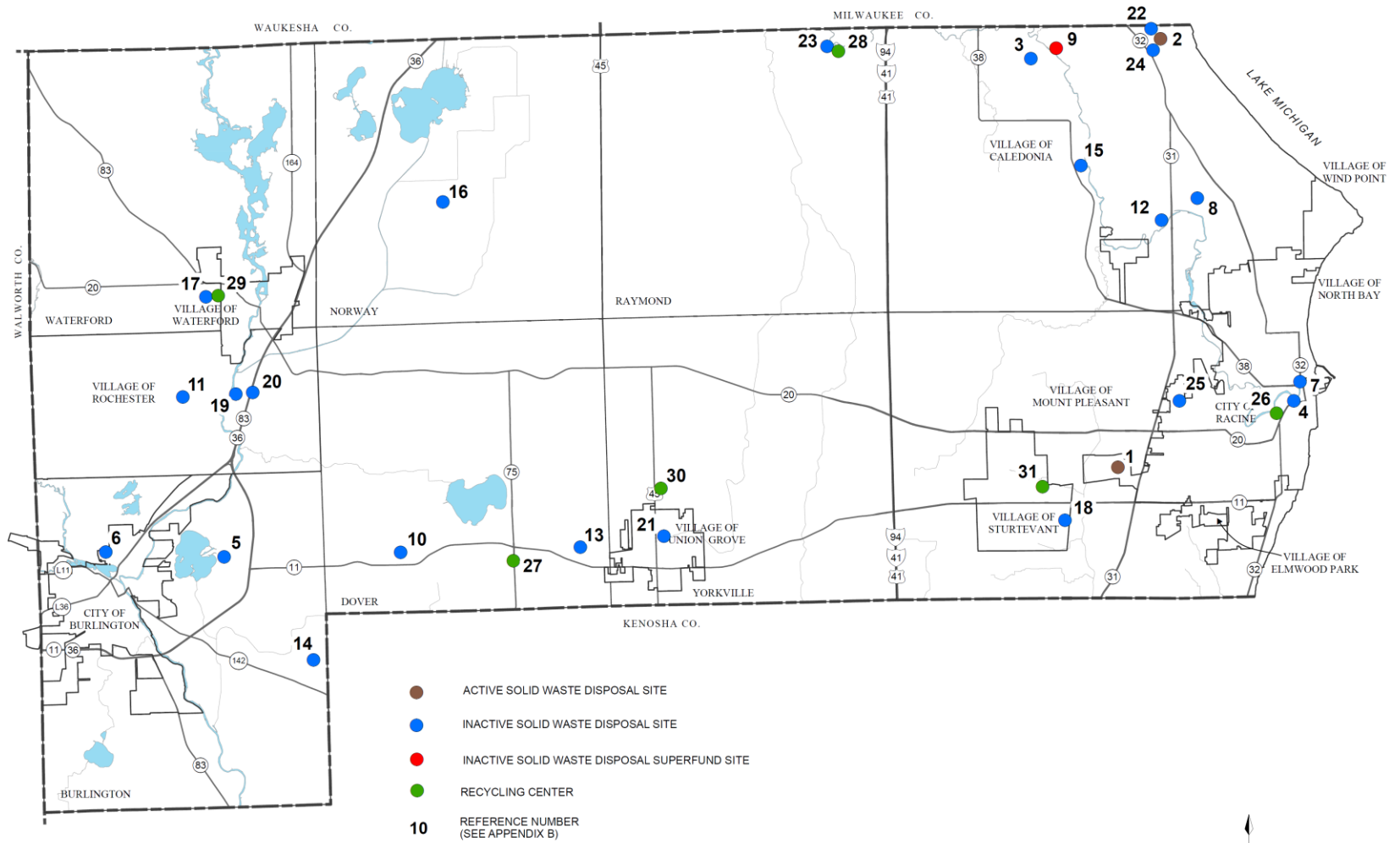
-  AT & T
-  CENTURYTEL, INC.
-  TELEPHONE AND DATA SYSTEMS, INC.
-  OPEN TERRITORY

Source: Wisconsin Public Service Commission and SEWRPC.

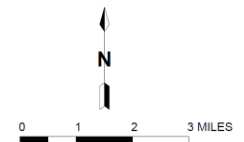


Map II - 18

SOLID WASTE DISPOSAL AND RECYCLING CENTERS IN RACINE COUNTY: 2015

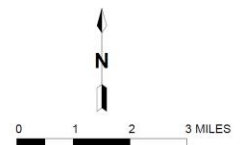
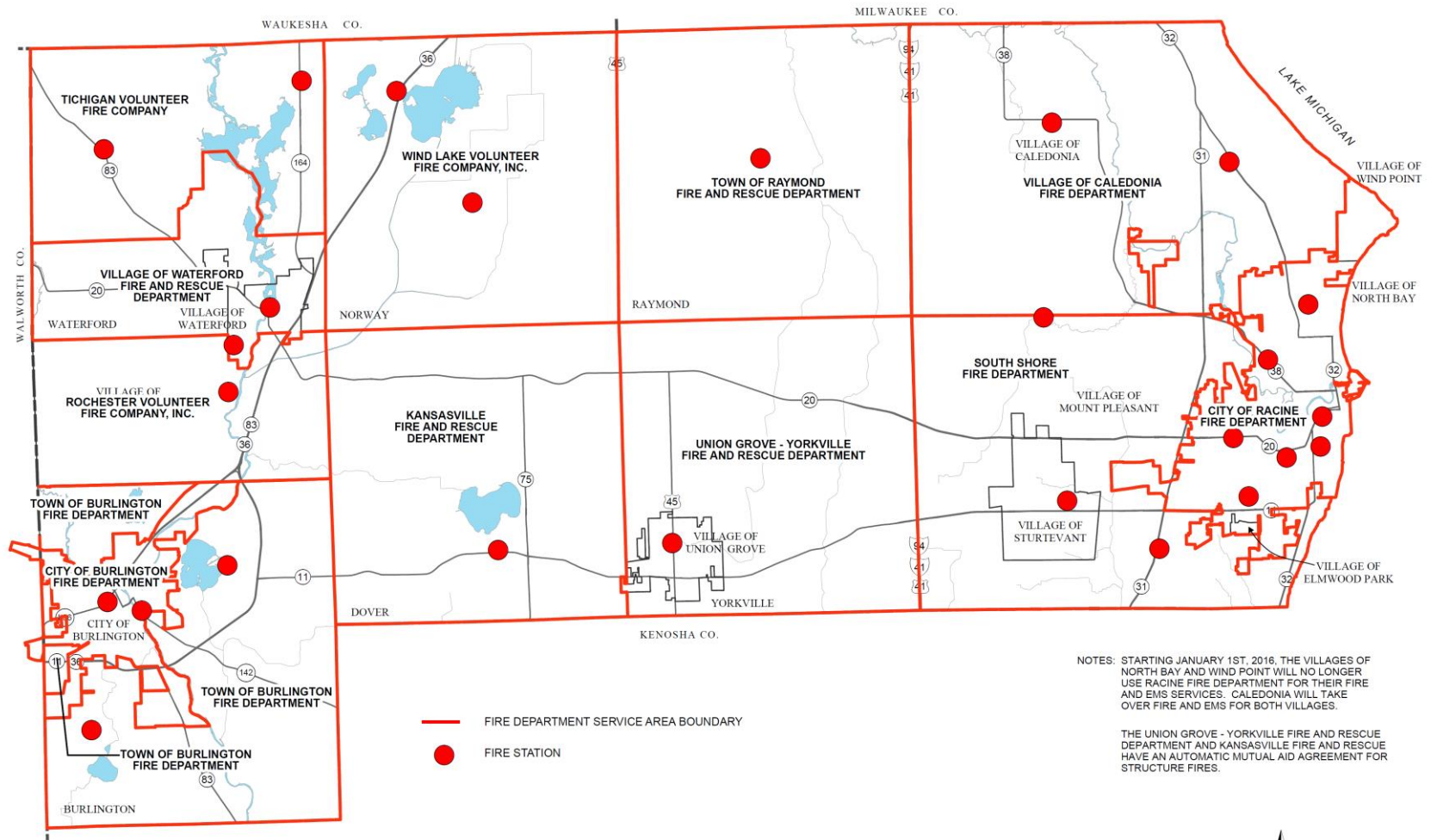


Source: Wisconsin Department of Natural Resources, Racine County, and SEWRPC.



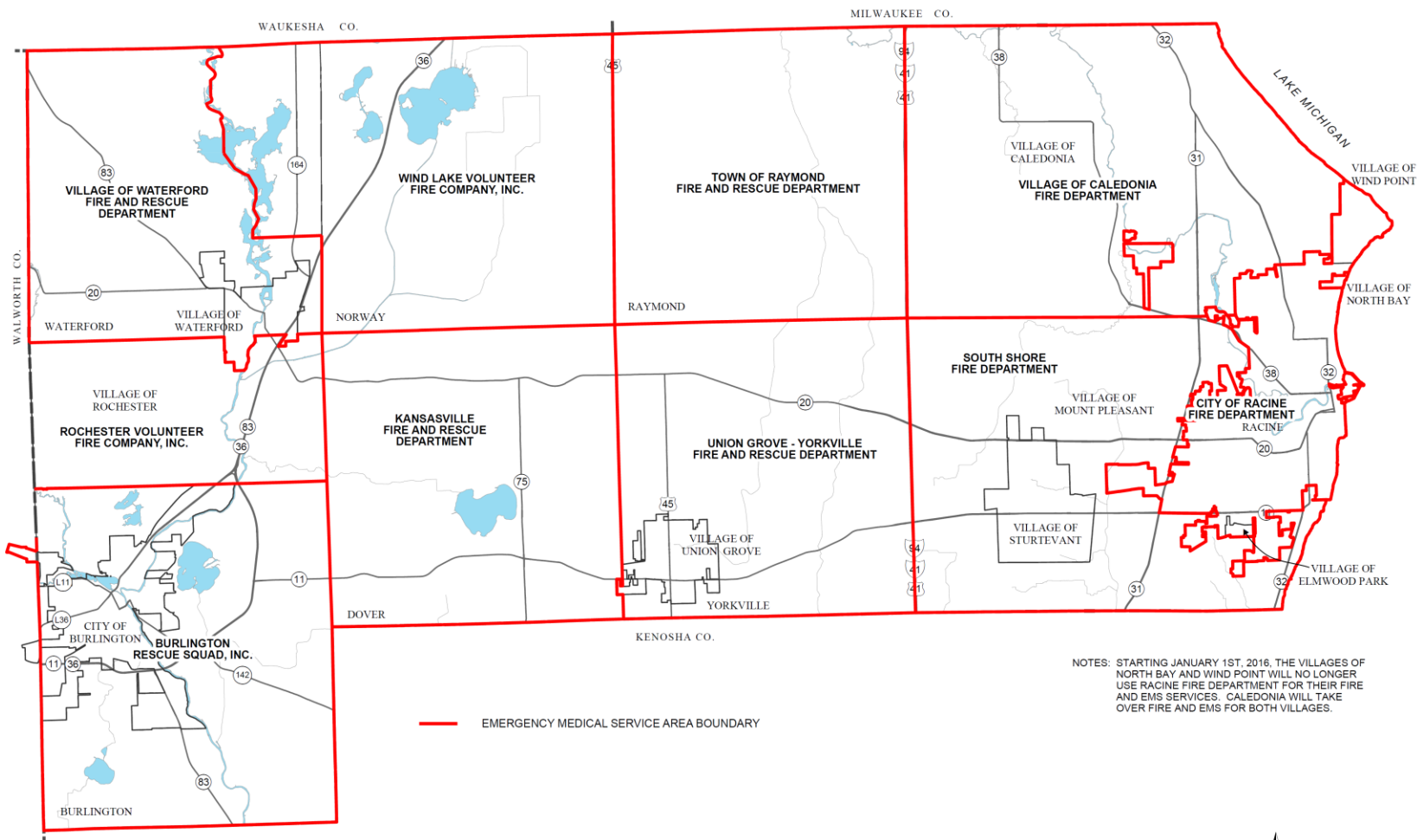
Map II - 19

FIRE STATIONS AND FIRE DEPARTMENT SERVICE AREAS IN RACINE COUNTY: 2015



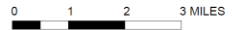
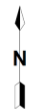
Map II - 20

EMERGENCY MEDICAL SERVICE AREAS IN RACINE COUNTY: 2015



— EMERGENCY MEDICAL SERVICE AREA BOUNDARY

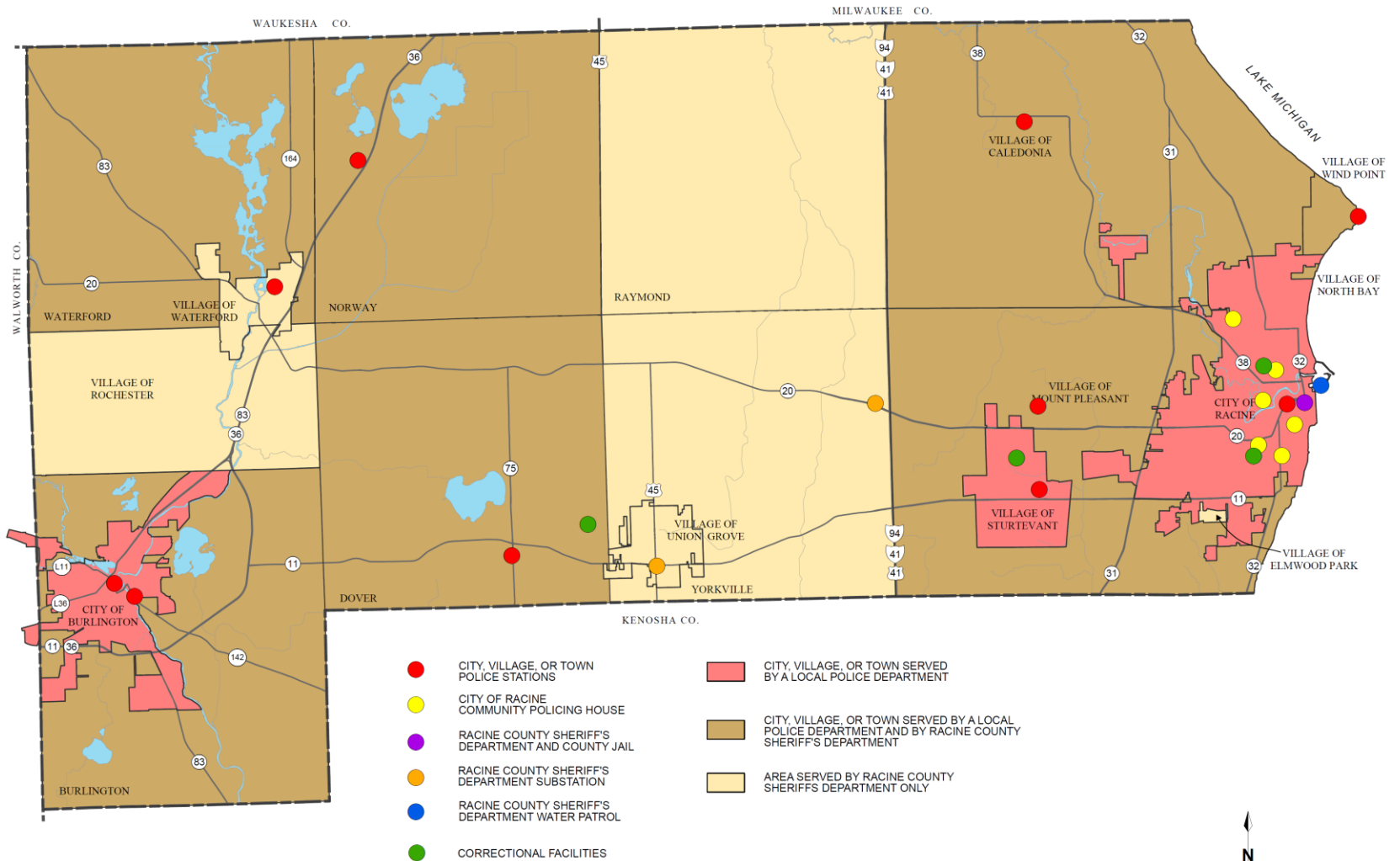
NOTES: STARTING JANUARY 1ST, 2016, THE VILLAGES OF NORTH BAY AND WIND POINT WILL NO LONGER USE RACINE FIRE DEPARTMENT FOR THEIR FIRE AND EMS SERVICES. CALEDONIA WILL TAKE OVER FIRE AND EMS FOR BOTH VILLAGES.



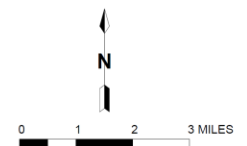
Source: Racine County Office of Emergency Management Department and SEWRPC.

Map II - 21

POLICE STATIONS AND SERVICE AREAS IN RACINE COUNTY: 2015

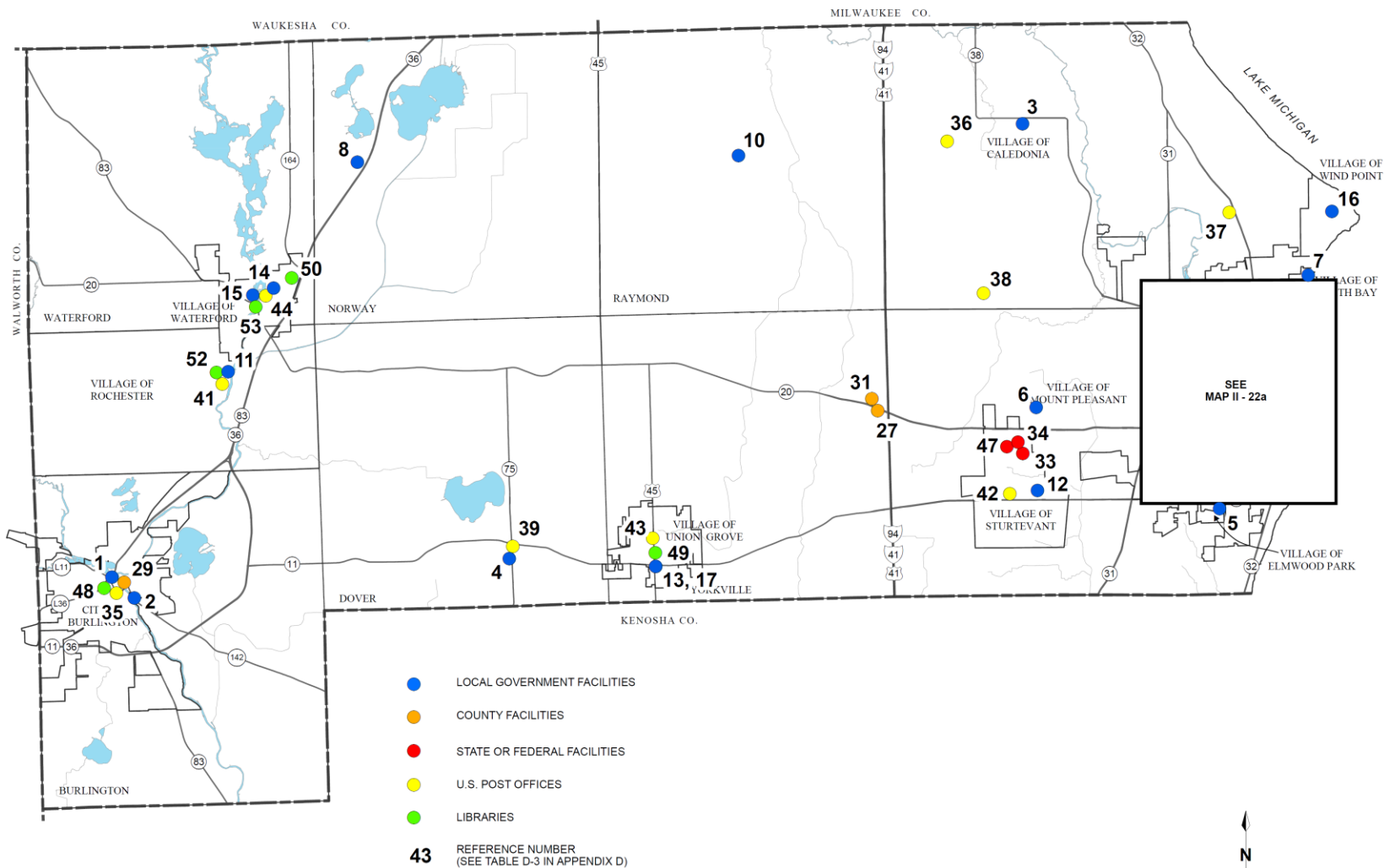


Source: Wisconsin Department of Justice (WILENET), Racine County, and SEWRPC.



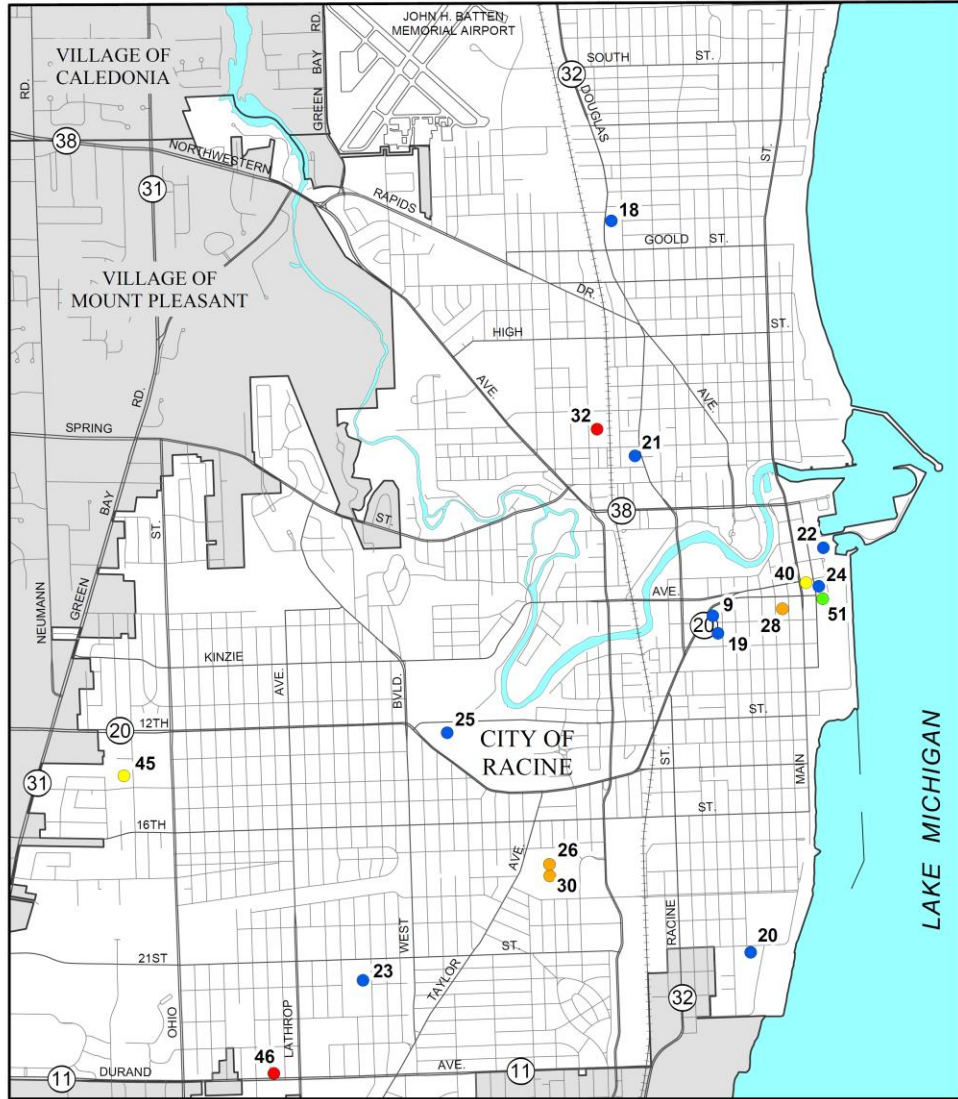
Map II - 22

SELECTED GOVERNMENT BUILDINGS IN RACINE COUNTY: 2015



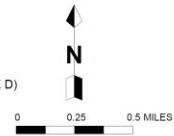
Source: Racine County and SEWRPC.

SELECTED GOVERNMENT BUILDINGS IN THE CITY OF RACINE: 2015



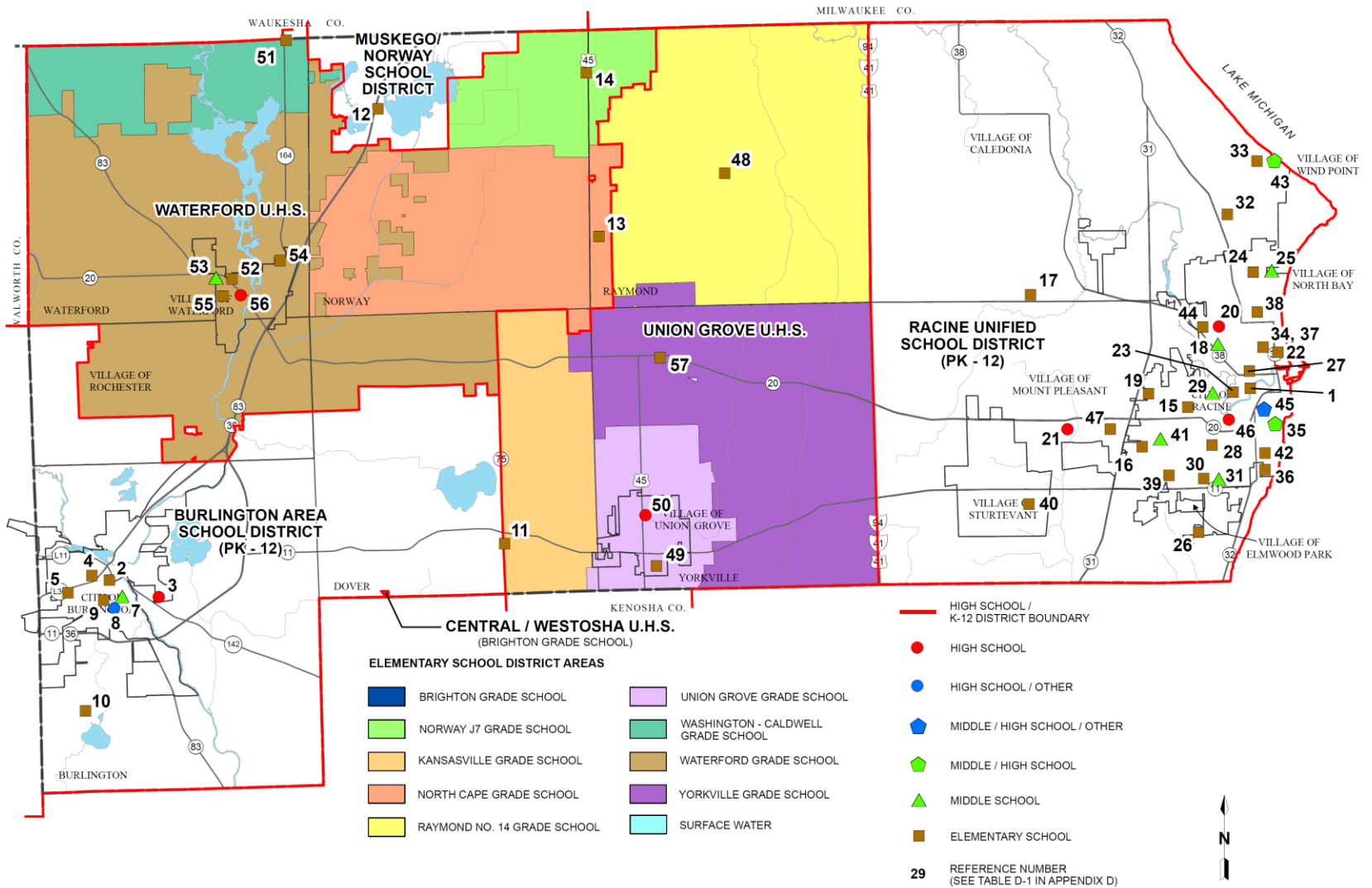
- LOCAL GOVERNMENT FACILITIES
- STATE OR FEDERAL FACILITIES
- LIBRARIES
- COUNTY FACILITIES
- U.S. POST OFFICES
- 26** REFERENCE NUMBER (SEE TABLE D-3 IN APPENDIX D)

Source: Racine County and SEWRPC.



Map II - 23

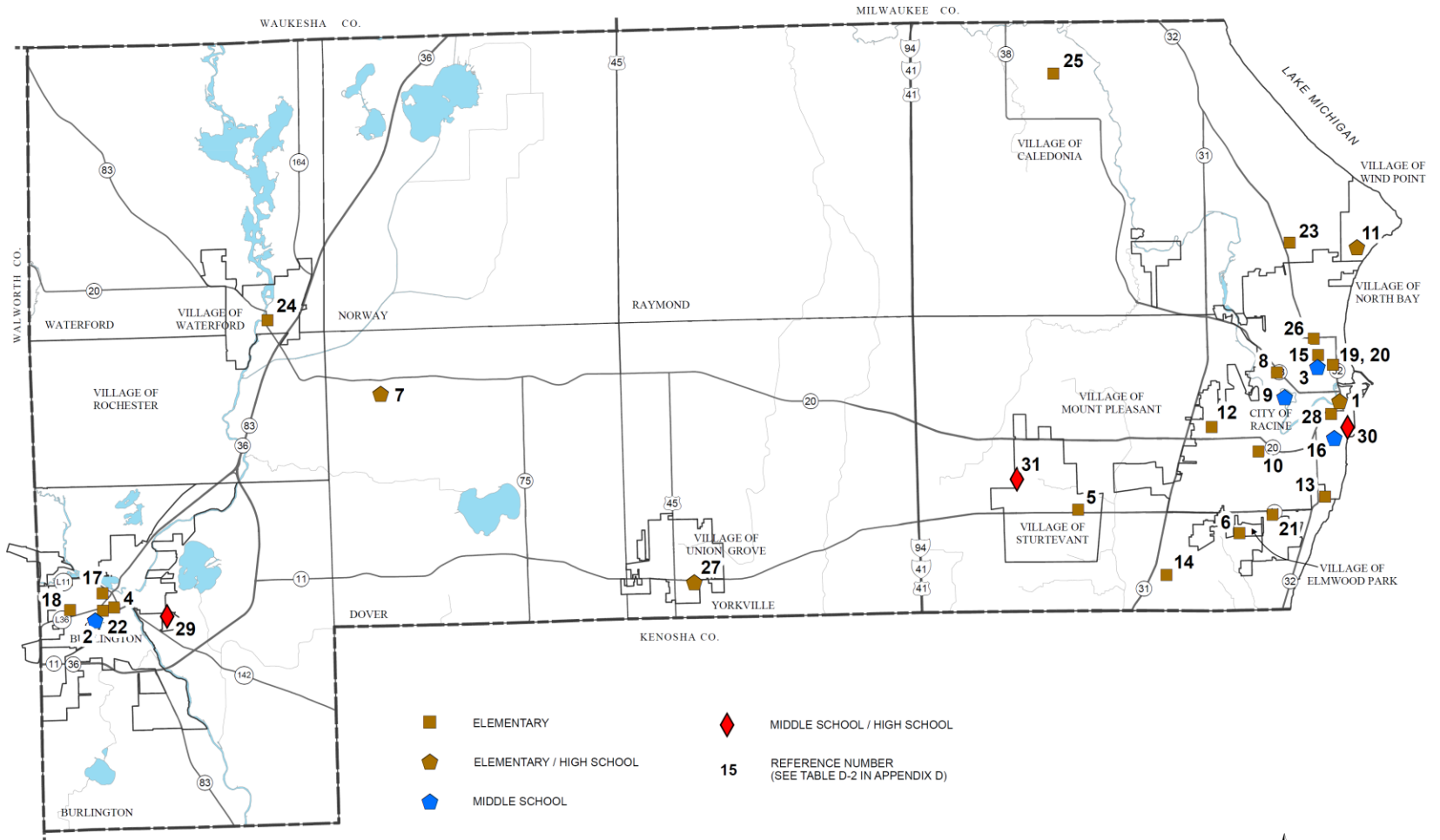
PUBLIC SCHOOLS AND SCHOOL DISTRICTS IN RACINE COUNTY: 2015



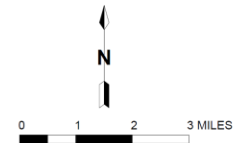
Source: Wisconsin Department of Public Instruction, Racine County, Center for Education Statistics, and SEWRPC.

Map II - 24

PRIVATE SCHOOLS AND TECHNICAL COLLEGES IN RACINE COUNTY: 2015

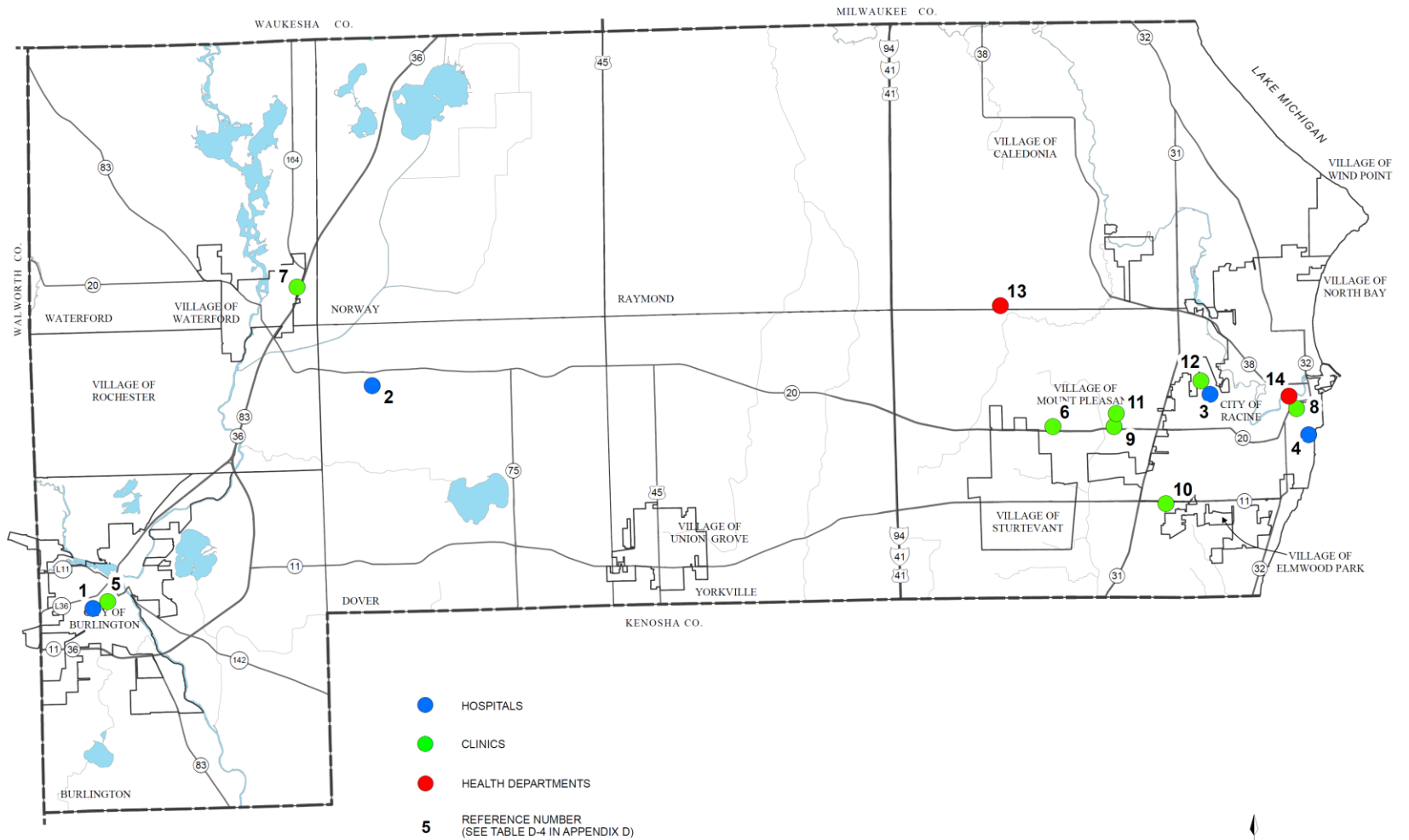


Source: Wisconsin Department of Public Instruction and SEWRPC.



Map II - 25

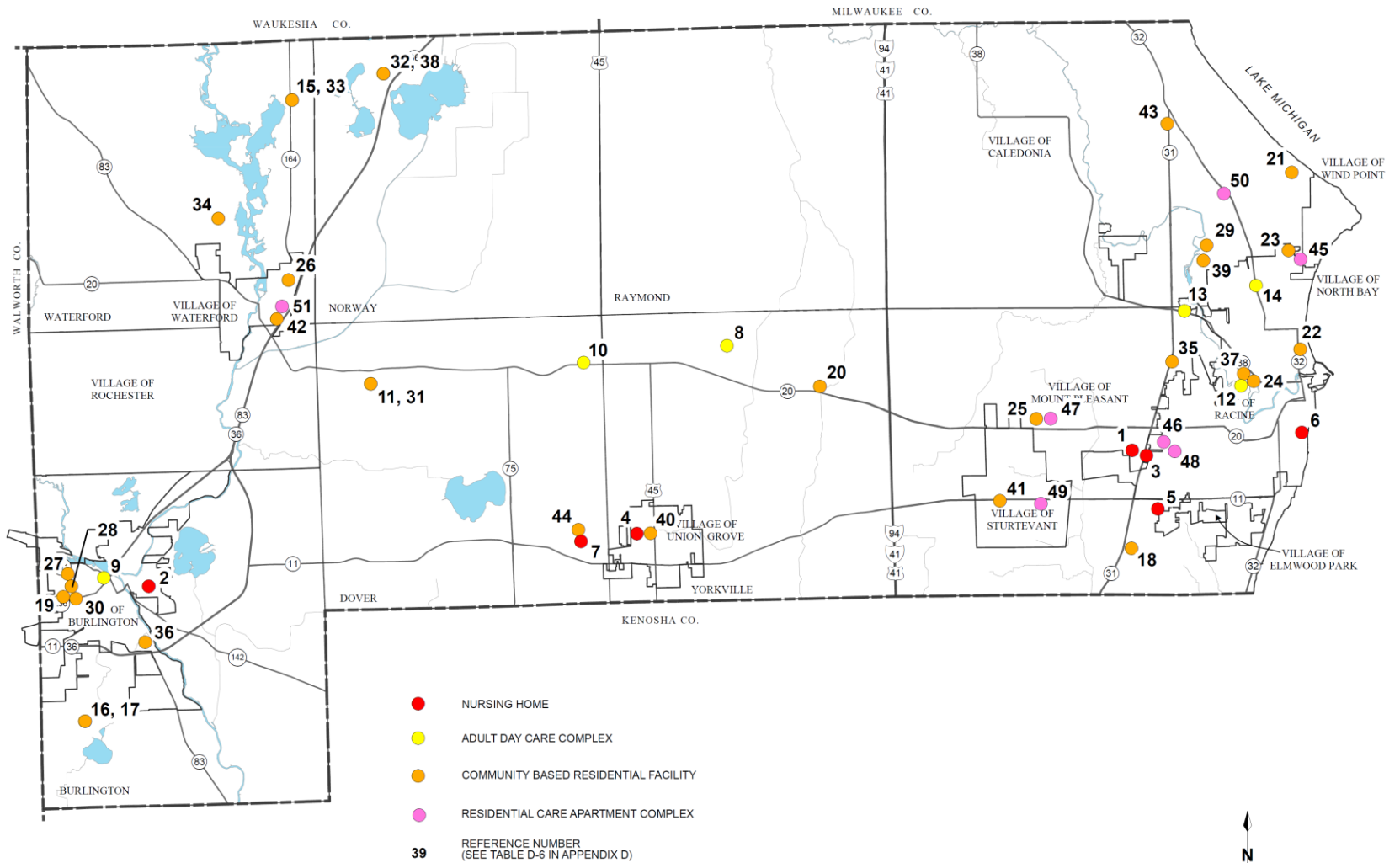
HOSPITALS AND MAJOR CLINICS IN RACINE COUNTY: 2015



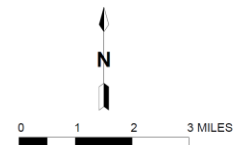
Source: Wisconsin Department of Health and Social Services, Racine County, and SEWRPC.

Map II - 26

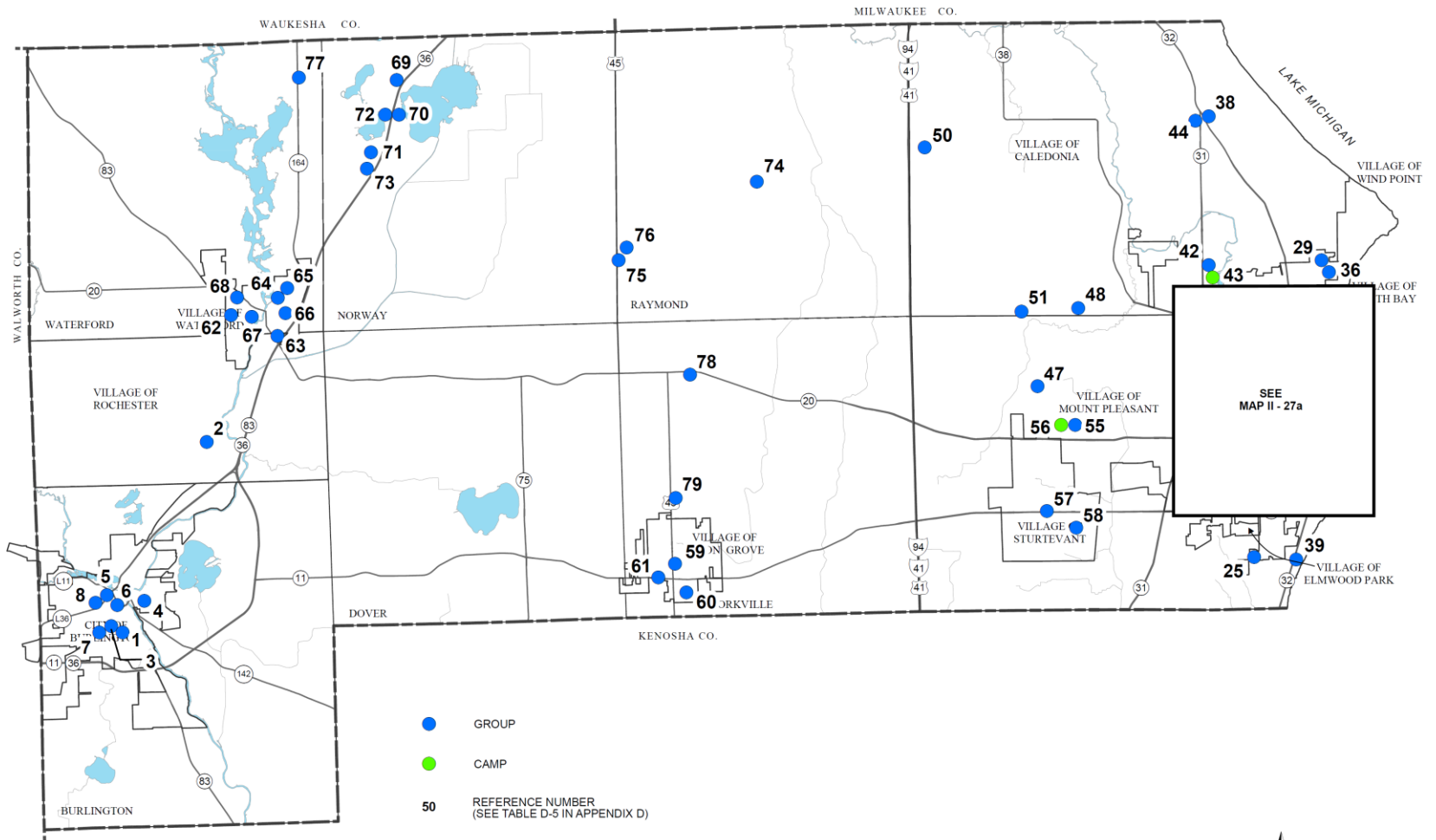
NURSING HOMES AND SELECTED ASSISTED LIVING FACILITIES IN RACINE COUNTY: 2015



Source: Wisconsin Department of Health Services and SEWRPC.



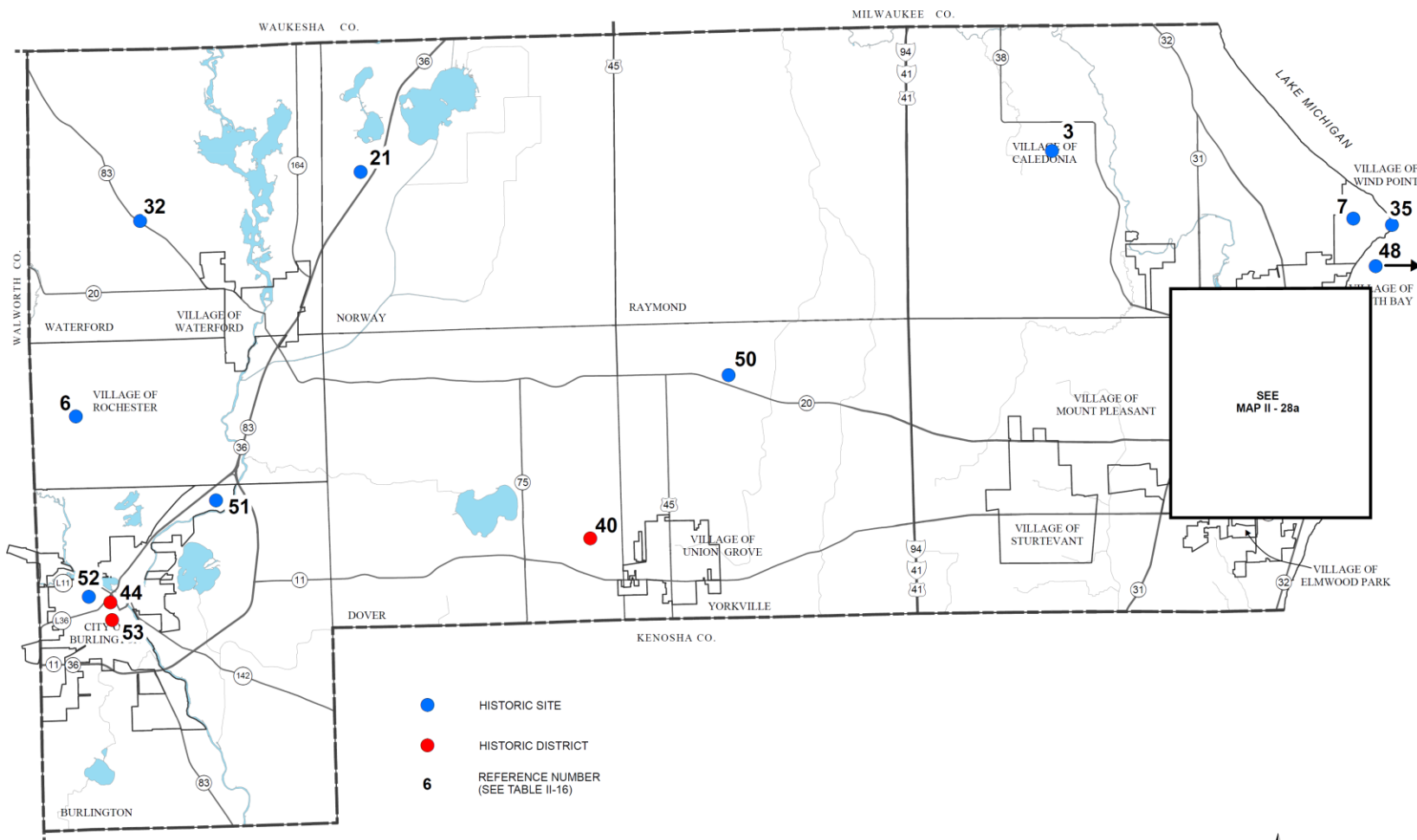
Map II - 27 CHILD CARE CENTERS IN RACINE COUNTY: 2015



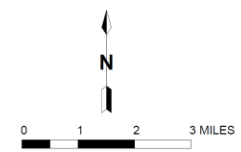
Source: Wisconsin Department of Children and Families and SEWRPC.

Map II - 28

NATIONAL AND STATE REGISTERS OF HISTORIC SITES AND DISTRICTS IN RACINE COUNTY: 2014



Source: SEWRPC.



Hazard and Vulnerability Assessment Tool

Exhibit D (continued)

Attachment 3

HAZARD AND VULNERABILITY ASSESSMENT TOOL RACINE COUNTY HAZARD MITIGATION PLAN UPDATE

EVENT	PROBABILITY <i>Likelihood This Will Occur</i>	SEVERITY = (MAGNITUDE - MITIGATION)				RISK <i>Relative Threat*</i>
		HUMAN IMPACT <i>Possibility of Death or Injury</i>	PROPERTY IMPACT <i>Physical Losses and Damages</i>	BUSINESS AND AGENCY IMPACT <i>Interruption of Services</i>	PREPAREDNESS <i>Preplanning</i>	
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
A1. Riverine flooding						0%
A2. Stormwater flooding						0%
A3. Lake flooding						0%
A4. Tornado						0%
A5. Thunderstorm						0%
A6. High straight-line wind						0%
A7. Lightning						0%
A8. Hail						0%
A9. Heavy snow storm						0%
A10. Blizzard						0%
A11. Ice storm						0%
A12. Extreme cold						0%
A13. Extreme heat						0%
A14. Drought						0%
A15. Fog						0%
A16. Dust storm						0%
A17. Lake Michigan Erosion						0%
A18. Earthquake						0%
B1. Contamination or loss of water supply system						0%
B2. Loss of sewerage system						0%
B3. Loss of telecommunication						0%
B4. Electrical system outage						0%
B5. Computer system incident/cyber attack						0%
C1. Hazardous materials railroad incidents						0%
C2. Hazardous materials roadway incidents						0%
C3. Hazardous materials pipeline incidents						0%
C4. Hazardous materials fixed facility incidents (industries, bulk fuel storage sites, grain elevators, agricultural chemical storage, and explosives, including fireworks storage)						0%
D1. Railroad transportation accidents						0%
D2. Roadway transportation accidents						0%
D3. Aviation accidents						0%
E1. Correctional center incidents						0%
E2. Civil unrest						0%
E3. Terrorism incidents (bomb threats, hostage situations, biological incidents)						0%
E4. Workplace violence						0%
E5. School violence						0%
F1. Communicable disease outbreak or epidemic						0%
F2. Large-scale food contamination						0%
G1. Wildfire						0%
G2. Large structure fires						0%
G3. Explosions						0%
G4. Mass casualty incidents						0%
G5. Building collapse or cave-in						0%
H1. Dam failure						0%
H2. Landslide						0%
H3. Land subsidence						0%
Other Event (write in)						0%
AVERAGE SCORE	0.00	0.00	0.00	0.00	0.00	0%

*Threat increases with percentage.

Source: Kaiser Permanente and SEWRPC.

RISK = PROBABILITY * SEVERITY		
0.00	0.00	0.00

Hazard and Vulnerability Assessment Tool

1. Risk assessment based determined by

$$\text{Risk} = 100 \times \left[\frac{(\text{probability}/3) \times (\text{Human impact} + \text{Property impact} + \text{Business impact} + \text{Preparedness})}{(4 \times 3)} \right]$$

2. Percent risk (0 to 100 percent)
3. Relative measure → Higher indicates greater perceived risk
4. Interquartile range is the range of the middle half of responses
5. Smaller interquartile range indicates greater agreement among team members → used to break ties

HVA Results – Top 10 Perceived Risks



1. Heavy Snow



2. Tornadoes



3. Blizzard



4. Extreme Cold



5. Thunderstorms

HVA Results – Top 10 Perceived Risks



6. Ice Storm



7. Roadway Transportation Accidents



8. Lightning



9. Riverine Flooding



10. Large Structure Fire

HVA Results – Other Notable Risks



Flooding-related

11. Stormwater Flooding



Hazardous Material Incidents

13. Roadways

14. Railroads

15. Fixed Facilities



Thunderstorm-related

12. High Straight-Line Winds

16. Hail



HVA Results – Bottom Ten Perceived Risks

36. Large-scale food contamination

37. Drought

38. Dam failure

39. Lake Flooding

40. Wildfire

41. Earthquake

42. Correctional center incidents

43. Land subsidence

44. Landslide

45. Dust storm

Hazard Identification

- FEMA requires the plan to address natural hazards
 - Examples:
 - Tornadoes, Winter Storms, Flooding, Thunderstorms, Drought
- The plan can also address human-induced or technological hazards
 - Examples
 - Hazardous Material Incidents, Transportation Accidents

Annual Damages

Hazard	Years	Incidents per Year	Annual Property Damages	Annual Crop Damages	Total Annual Damages
Automobile Accidents	13	4,170.15	\$65,753,600	\$0	\$65,753,600
Flood	18	2.17	\$439,800	\$2,106,875	\$2,546,675
Thunderstorms/Wind	47	3.42	\$472,945	\$51,370	\$524,315
Tornadoes	51	0.39	\$454,110	\$283	\$454,393
Lightning	13	2.23	\$115,247	\$0	\$115,247
Drought	25	0.44	\$0	\$233,193	\$233,193
Pipeline Hazmat	25	0.16	\$4,002	\$0	\$4,002
Hail	44	1.48	\$4,773	\$0	\$4,773
Temperature Extremes	13	2.85	\$2,532	\$0	\$2,532
Winter Storms	14	2.64	--	--	--

Note: All damages are in 2014 dollars

Fatality and Injury Totals

Hazard	Years	Incidents	Fatalities	Injuries	Total
Automobile Accidents	13	54,214	248	30,954	31,202
<i>Sexually-Transmitted Diseases</i>	8	10,159	0	10,159	10,159
<i>Communicable Diseases</i>	8	2,641	0	2,641	2,641
Temperature Extremes	13	37	29	71	100
Railway Accidents	15	72	8	60	68
Thunderstorms/Wind	47	161	6	28	34
Lightning	13	29	1	8	9
Tornadoes	51	20	0	7	7
<i>Aviation Accidents</i>	13	22	5	1	6
Pipeline Hazmat Accidents	25	4	0	1	1
Winter Storms	14	37	0	1	1

Annual Fatalities and Injuries

Hazard	Years	Incidents per Year	Fatalities per Year	Injuries per year	Annual Total
Automobile Accidents	13	4,170.15	19.07	2,381.07	2,400.14
<i>Sexually-Transmitted Diseases</i>	8	1,269.88	0.00	1,269.88	1,269.88
<i>Communicable Diseases</i>	8	330.13	0.00	330.13	330.13
Railway Accidents	15	4.80	0.53	4.00	4.53
Temperature Extremes	13	2.85	2.23	5.46	7.69
Thunderstorm/Wind	47	3.42	0.13	0.60	0.73
Tornadoes	51	0.39	0.00	0.14	0.14
<i>Aviation Accidents</i>	13	1.69	0.38	0.08	0.46
Pipeline Hazmat	25	0.16	0.00	0.04	0.04
Lightning	13	2.23	0.08	0.62	0.70
Winter Storms	14	2.64	0.00	0.07	0.07

Hazards Currently Profiled in the Plan

Natural Hazards

1. Flooding
2. Thunderstorms, Wind, Hail, Lightning
3. Tornadoes
4. Temperature Extremes
5. Wildfires
6. Winter Storms
7. Coastal Erosion
8. Drought
9. Earthquakes

Hazards Currently Profiled in the Plan

Technological Hazards

- 12. Transportation Accidents
(roadway, railway, airport)
- 13. Contamination or Loss
of Water Supply
- 14. Hazardous Materials
Incidents
(fixed facility, roadway, railway)
- 15. Emergency Medical
Incidents
- 16. Terrorism Incidents
- 17. Power Outage Incident

Hazards NOT Profiled by the Plan

Natural Hazards

1. Dam Failure
2. Fog
3. Wildfire
4. Dust Storms
5. Land Slide
6. Land Subsidence

Hazards NOT Profiled by the Plan

Technological Hazards

7. Large Structure Fire
8. Cyber Attack
9. Mass Casualty Incident
10. Civil Unrest
11. Workplace Violence
12. Building Collapse
13. Loss of Telecommunication System
14. School Violence
15. Loss of Sewerage System
16. Large-Scale Food Contamination
17. Correctional Center Incident

Project Web Site

- <http://www.sewrpc.org/SEWRPC/communityassistance/Hazard-Mitigation-Planning.htm>
 - Agendas and other meeting materials
 - Summary notes from meetings
 - Presentations
 - Draft chapters as they are completed
 - Comment screen
 - Other ways to send a comment
- Email to aowens@sewrpc.org