

When Does Congestion Matter to a Park Visitor?:

Translating Park Roadways' Level of Service to Impacts on the Visitor Experience

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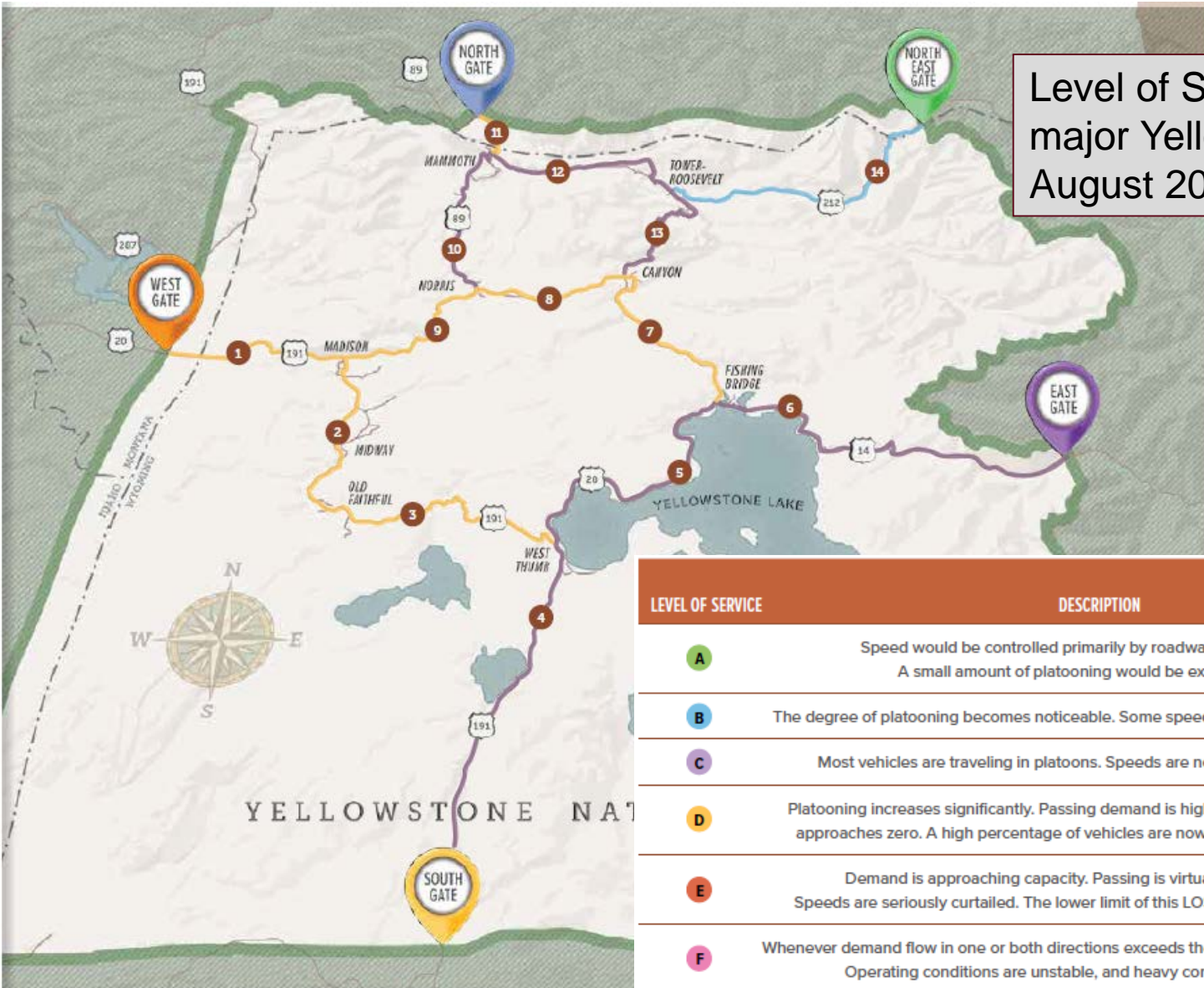
Jake Jorgenson - RRC Associates, Boulder, CO

Mandi Roberts - Otak Inc., Redmond, WA





Level of Service (LOS) on major Yellowstone NP links – August 2016



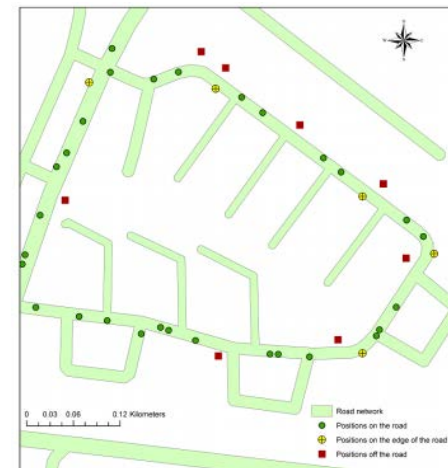
| LEVEL OF SERVICE | DESCRIPTION | PERCENT TIME SPENT FOLLOWING |
|------------------|--|------------------------------|
| A | Speed would be controlled primarily by roadway conditions. A small amount of platooning would be expected. | < 40.0 |
| B | The degree of platooning becomes noticeable. Some speed reductions are present. | > 40.0 to 55.0 |
| C | Most vehicles are traveling in platoons. Speeds are noticeably curtailed. | > 55.0 to 70.0 |
| D | Platooning increases significantly. Passing demand is high, but passing capacity approaches zero. A high percentage of vehicles are now traveling in platoons. | > 70.0 to 85.0 |
| E | Demand is approaching capacity. Passing is virtually impossible. Speeds are seriously curtailed. The lower limit of this LOS represents capacity. | > 85.0 |
| F | Whenever demand flow in one or both directions exceeds the capacity of the segment. Operating conditions are unstable, and heavy congestion exists. | - |

Source: 2010 Highway Capacity Manual.

TRANSPORTATION AND VEHICLE MOBILITY STUDY

Yellowstone Summer Visitor Use Patterns, Preferences, Expectations, & Values

- In the moment collection of the visitor experience
- Travel & visitation patterns

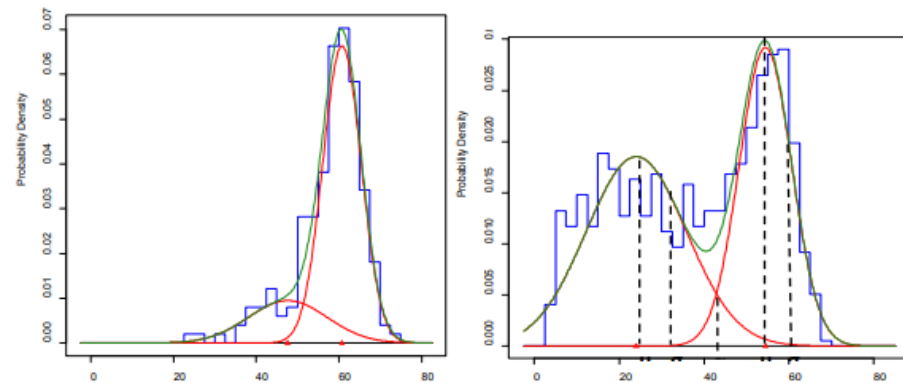


Developing a GPS-Based Truck Freight Performance Measure Platform

WA-RD 748.1
(TNW 2010-02)

Edward D. McCormack
Xiaolei Ma
Charles Klocow
Anthony Currarei
Duane Wright

April 2010

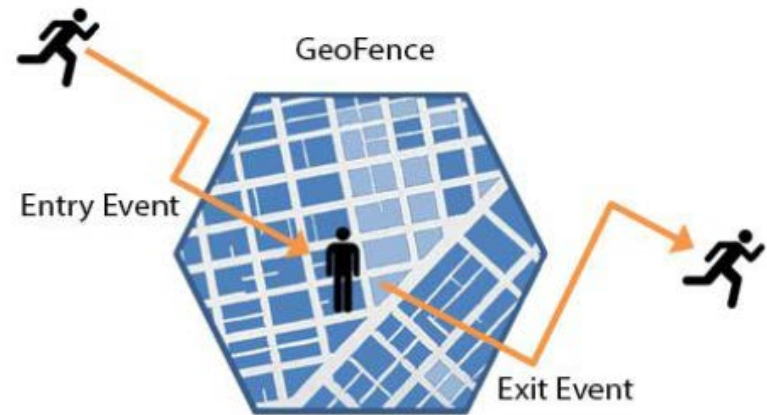
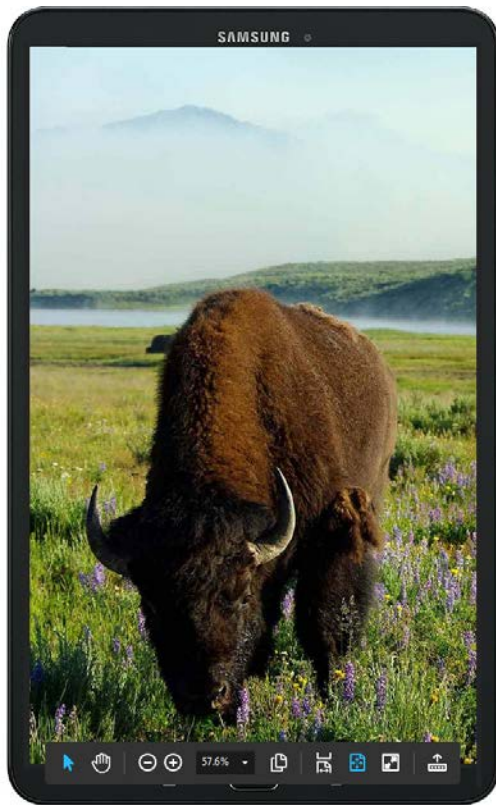


Development of a Freight Benefit/Cost Methodology for Project Planning

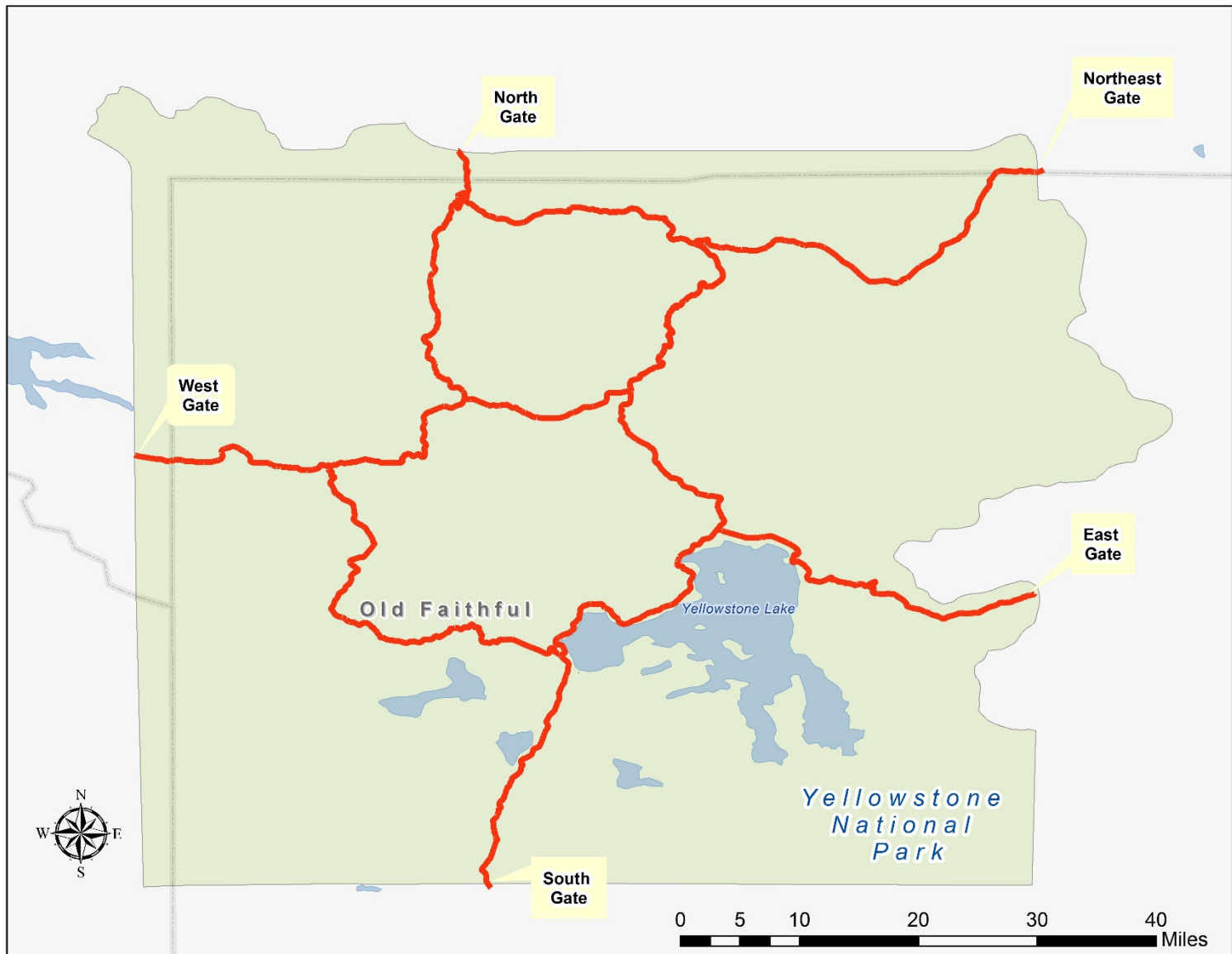
WA-RD 815.1

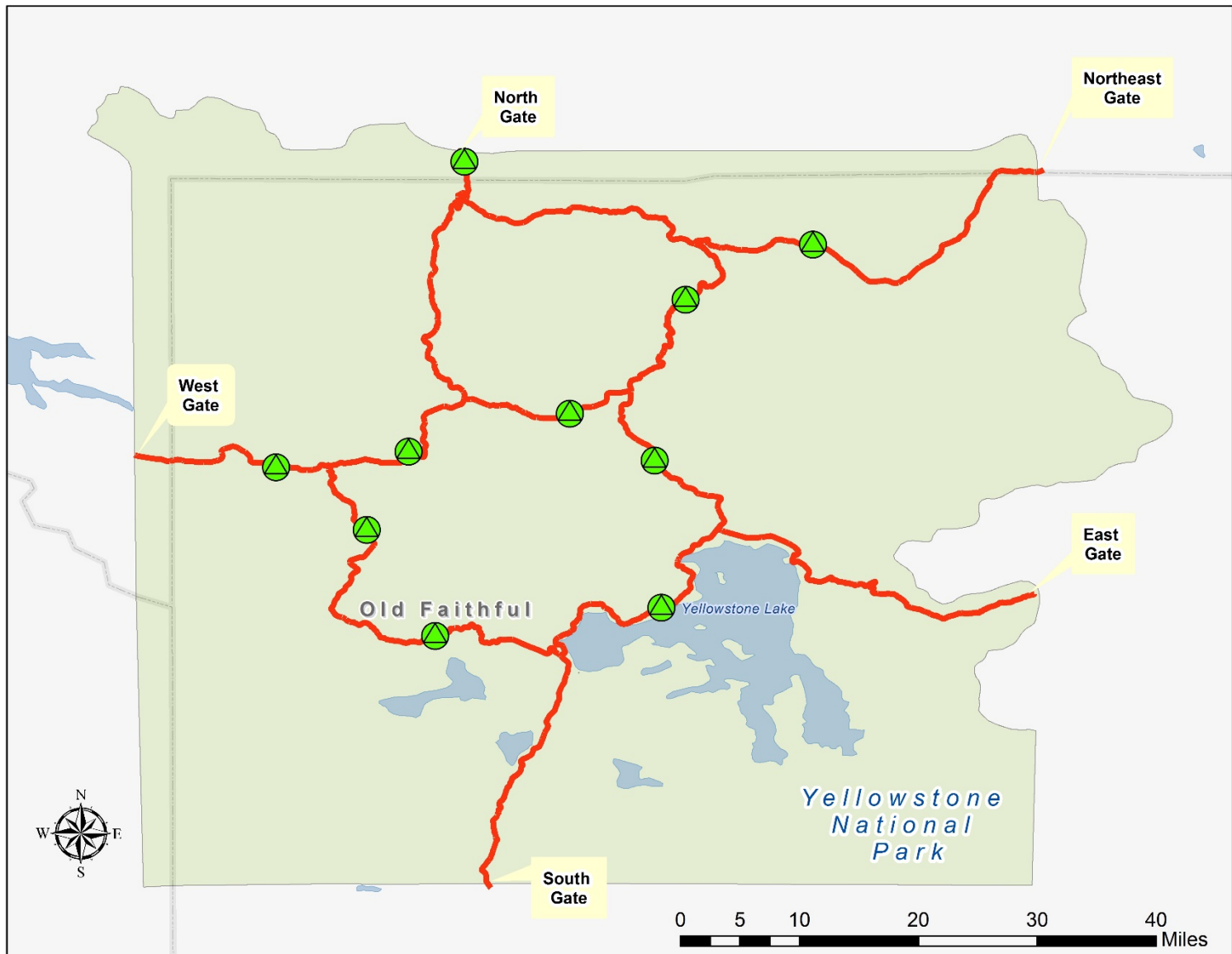
Jeremy Sage
Ken Casavant
Anne Goodchild
Ed McCormack
Zun Wang
B. Starr McMullen
Daniel Holder

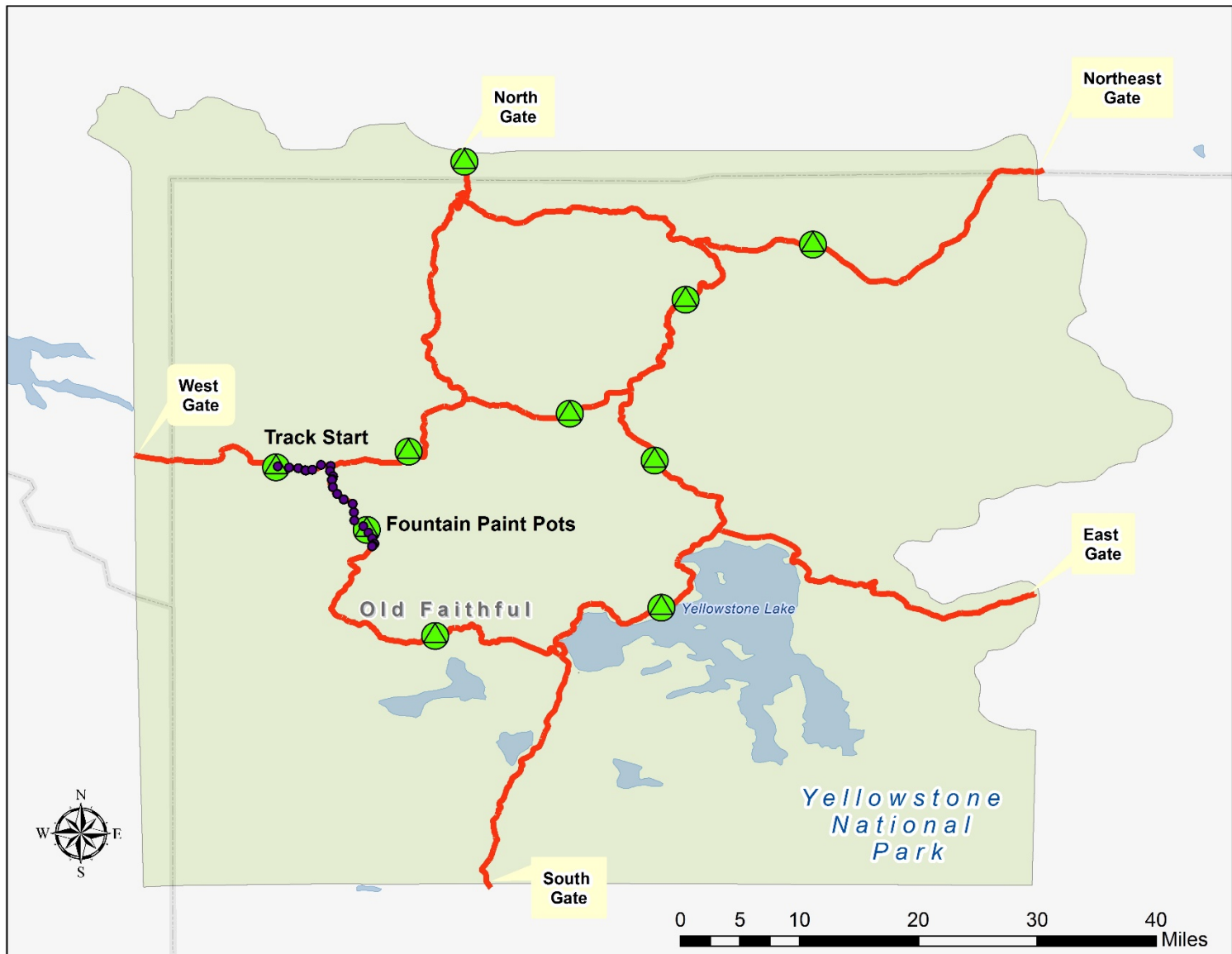
June 2013



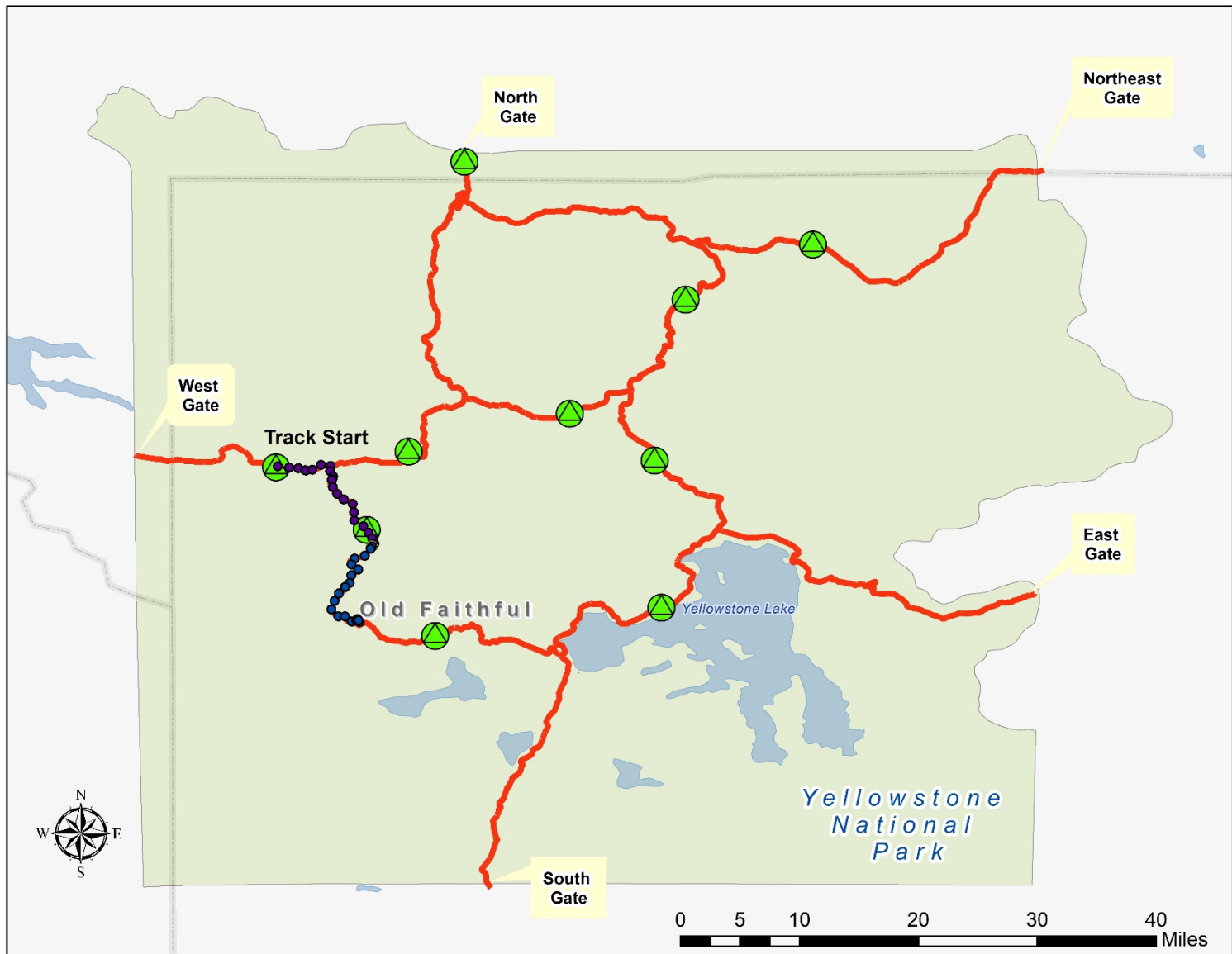
NeoTreks
geospatial apps

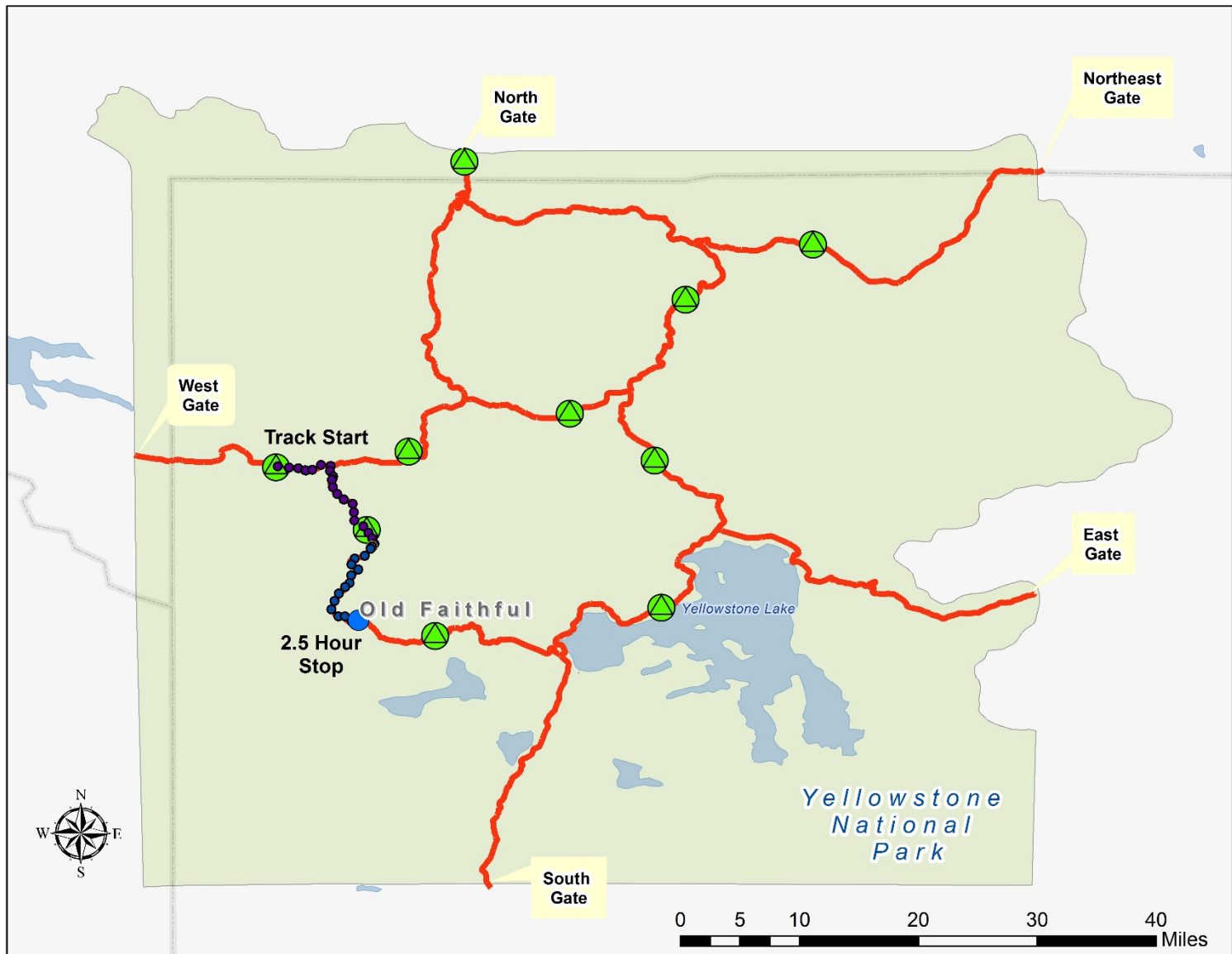








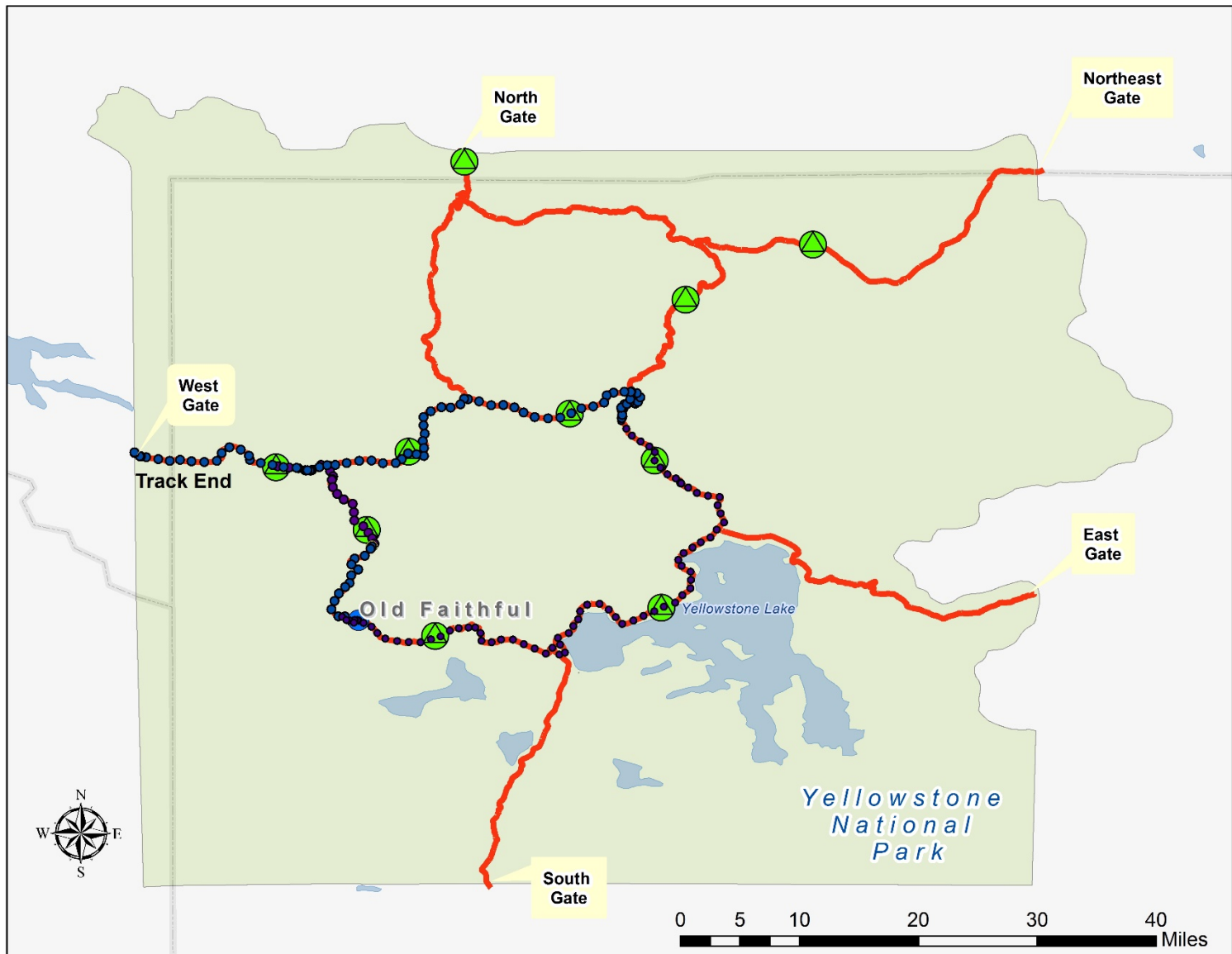




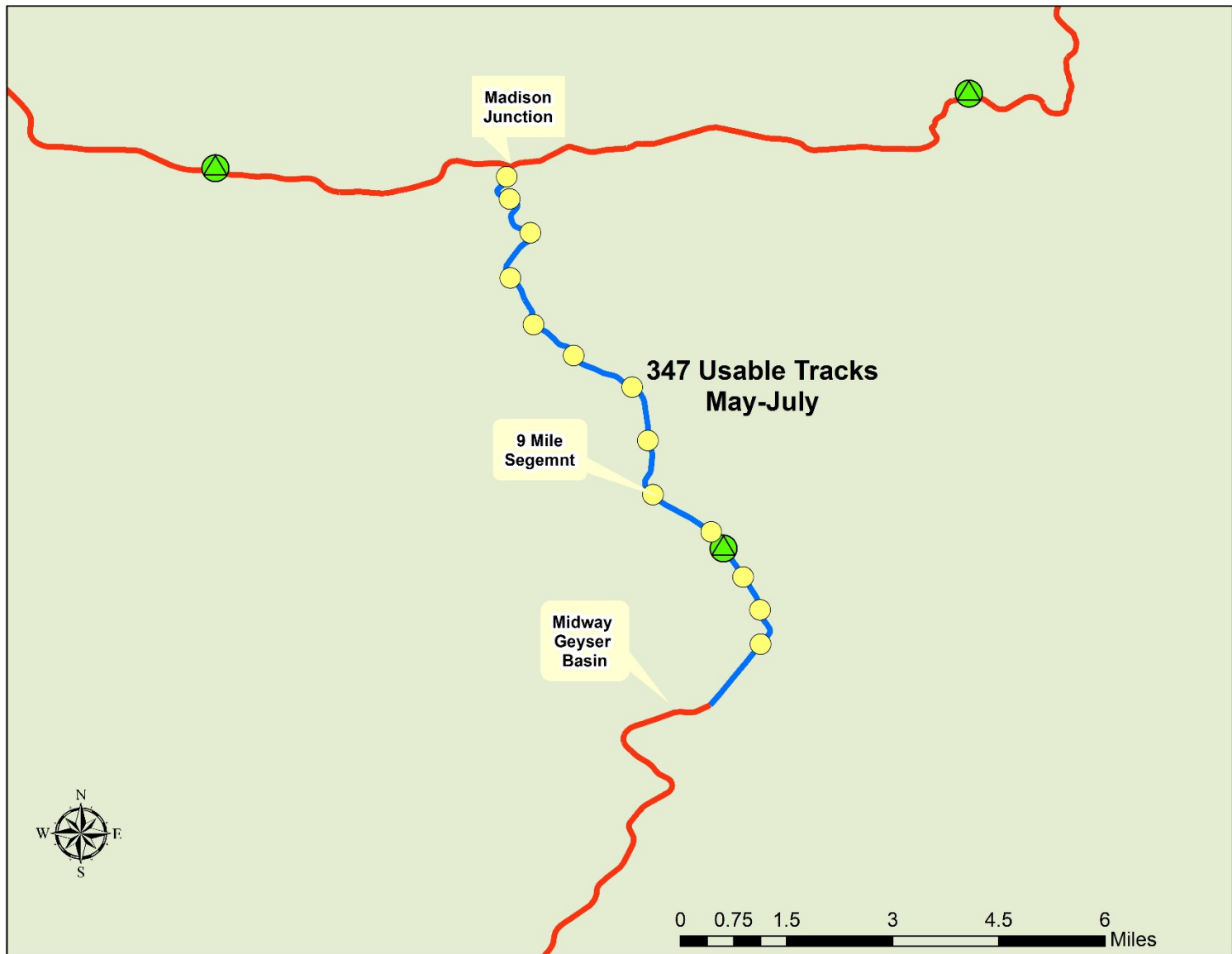


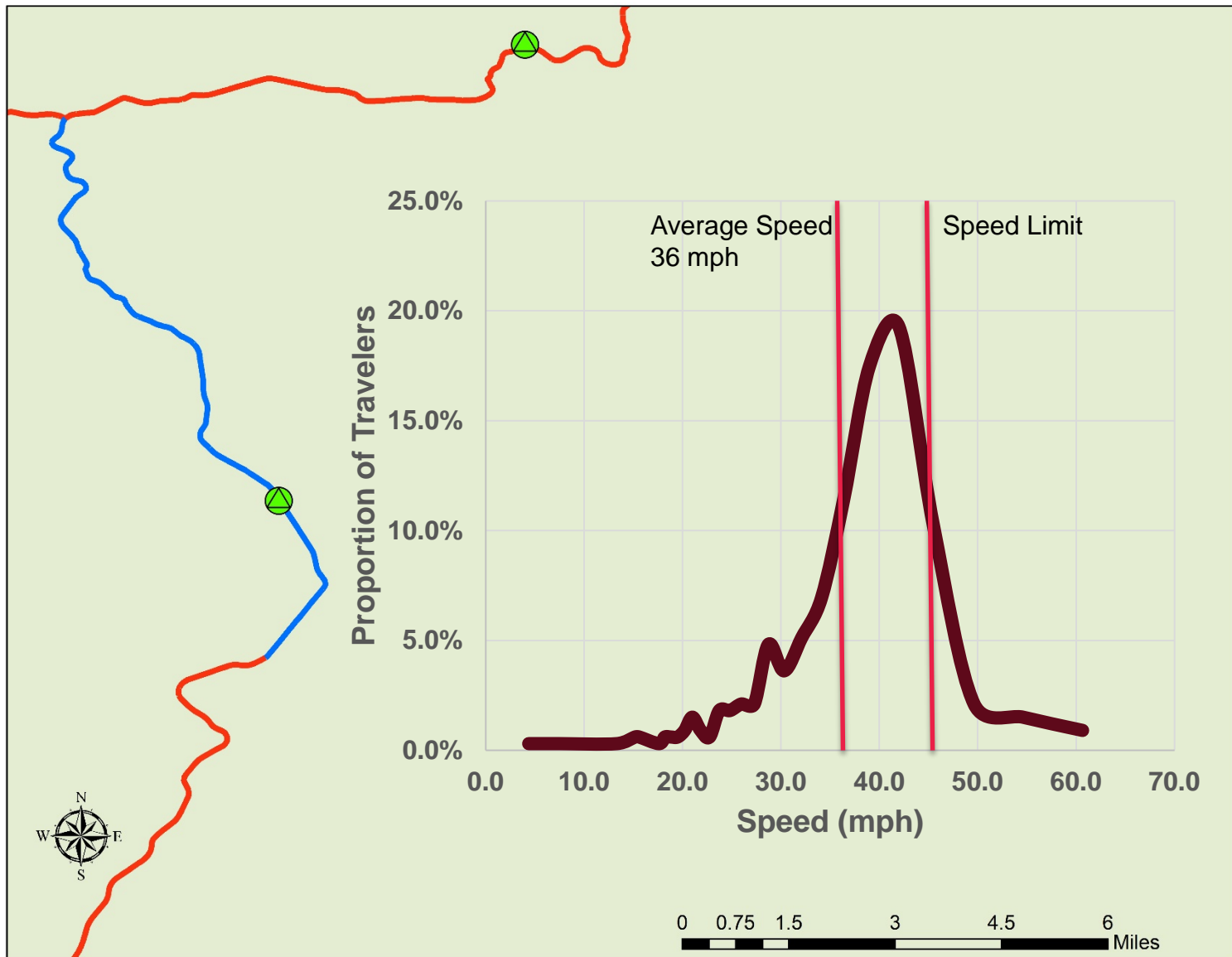


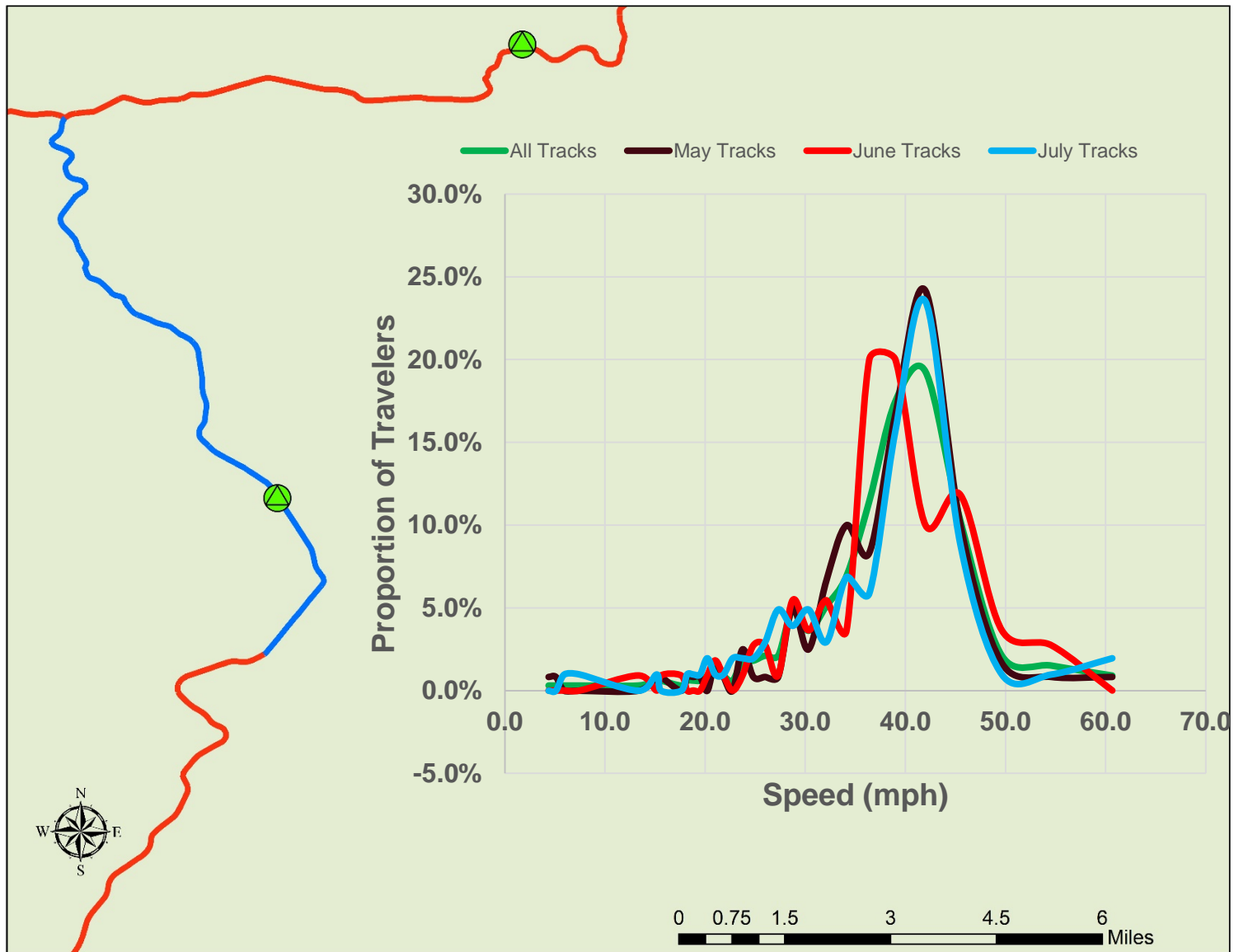


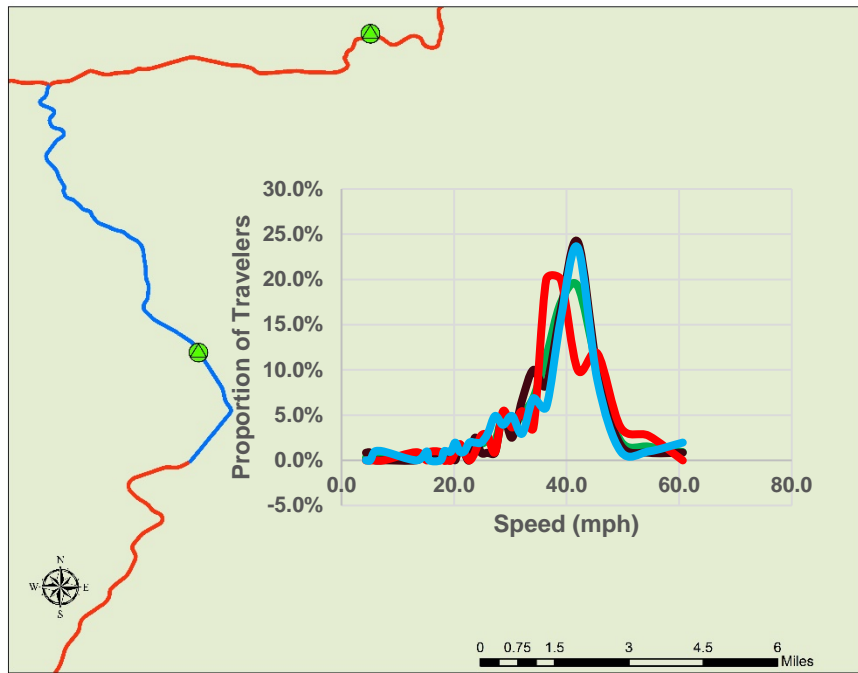






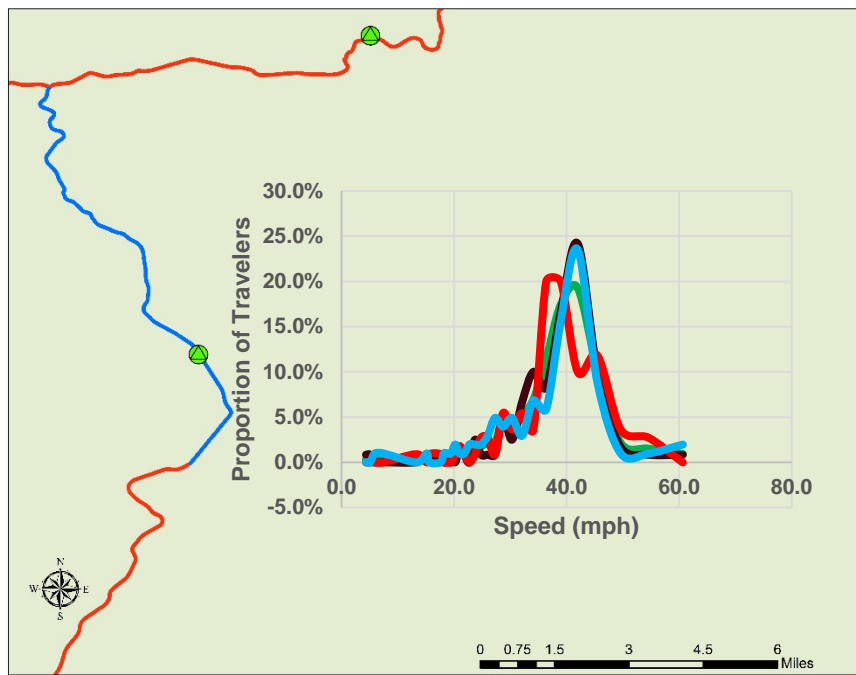






How frustrated are you with the amount of time you have spent in traffic congestion behind other vehicles?

| Quartile | Speed (mph) | Average Speed (mph) | Frustration (Average) | Very Frustrated (5) | Frustrated (4) | Moderately Frustrated (3) | Slightly Frustrated (2) | Not at all Frustrated (1) |
|--------------------------|-------------|---------------------|-----------------------|---------------------|----------------|---------------------------|-------------------------|---------------------------|
| Bottom 25% of Travelers | <31 | 24.0 | 1.5 | 3% | 4% | 6% | 14% | 73% |
| 26th-50th% of Travelers | 31-38 | 34.8 | 1.31 | 0% | 2% | 8% | 11% | 79% |
| 51st-75th % of Travelers | 39-42 | 39.0 | 1.39 | 0% | 0% | 8% | 22% | 69% |
| Top 25% of Travelers | >42 | 44.6 | 1.55 | 1% | 3% | 8% | 26% | 62% |



Other than weather conditions, how would you rate your experience right now?

| Quartile | Speed (mph) | Average Speed (mph) | Experience (Average) | Excellent (5) | Good (4) | Fair (3) | Poor (2) | Very Poor (1) |
|--------------------------|-------------|---------------------|----------------------|---------------|----------|----------|----------|---------------|
| Bottom 25% of Travelers | <31 | 24.0 | 4.31 | 49% | 47% | 4% | 0% | 0% |
| 26th-50th% of Travelers | 31-38 | 34.8 | 4.37 | 59% | 33% | 8% | 0% | 0% |
| 51st-75th % of Travelers | 39-42 | 39.0 | 4.39 | 56% | 35% | 8% | 0% | 0% |
| Top 25% of Travelers | >42 | 44.6 | 4.18 | 38% | 47% | 13% | 1% | 0% |

Avenues for Future Use of Data

- Expand analysis to each Roadway Geofence;
- Expectations and experience;
- Reliability and travel time;
- Smaller scale segments, and I.D. bottlenecks;
- Incorporate attribute importance metrics;
 - e.g. see wildlife, get away from crowds, etc.
- Time of day, and length of time in park;
- Direction of travel;
- Circling/waiting for parking;
- Length of stop per parking area.

Avenues for Future Use of Data



Acknowledgements

- National Park Service/Yellowstone National Park
 - Dan Wenke, Christina White, Judy Knuth Folts, Dave Pettebone, Bret Meldrom, Gate & Visitor Center Staff
- Research Team
 - Norma Nickerson (ITRR), Jake Jorgenson (RRC), Mandi Roberts (OTAK)
- Surveyors
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