Abstract

Commercial crowd-sourced probe vehicle data has been gaining traction in recent years as a ubiquitous and scalable resource for identifying traffic congestion on limited access roadways. It is routinely used in real-time by navigation software that displays color coded maps. However, outside of public agency traffic management centers, there are no factual "big picture" reports on traffic conditions. The media likes to fill this gap, but they either provide descriptions of construction locations, or highly subjective opinions. This paper proposes and illustrates a "big picture" characterization of regional and national traffic conditions using archived and real-time data. Average speeds of vehicles on segments of roadway can be retrieved in near real-time at one-minute intervals to produce performance metrics that measure cumulative miles of congestion per route, per entire Metropolitan Statistical Area (MSA), and on coast-to-coast Interstates during the week of June 28 to July 6 was proposed and illustrates a "big picture" characterization of regional and national traffic conditions using archived and real-time data. Average speeds of vehicles on segments of roadway can be retrieved in near real-time at one-minute intervals to produce performance metrics that measure cumulative miles of congestion per route, per entire Metropolitan Statistical Area (MSA), and on coast-to-coast Interstates during the week of June 28 to July 6 was used as a case study to illustrate the concepts.

Probe Data Scope

Start with one segment's data downloaded in real time

Segment Level: 1 segment, 0.5 miles
Corridor Level: 64 segments, 53.8 miles
Metro area
National Level: ~170,000 segments, 127,000 miles

Data Reduction

1-minute sample → 15-minute median
94% reduction in query response time

Metro Congestion

July 2, 2015 at 5:00PM Locally

600 Segments
476 Miles
Indiana Tollway

Indianapolis, IN

3,316 Segments
1,596 Miles

31 mph

Los Angeles, CA

4,645 Segments
2,503 Miles

15% of I-80 congestion

New York, NY

17% of I-80 congestion

National Level:
~170,000 segments, 127,000 miles

Metro Level:
4,645 segments, 2,503 miles

Coast to Coast Congestion

July 2, 2015 at 5:00PM EDT

41% of I-10 congestion

26% of I-10 congestion

22% of I-10 congestion

30% of I-80 congestion

15% of I-80 congestion

67% of I-80 congestion in PA

I-80 through Pennsylvania Counties

Scope of corridor

Metro area

Coast-to-Coast Interstate

Scope of one segment

Congestion At-A-Glance

July 2, 2015

12:00 PM Locally

3% congested

13% congested

<1% congested

5% congested

5:00 PM Locally

18% congested

32% congested

22% congested

15% congested
Top Congested Routes (Metro Areas) at 5:00PM Locally

Metro Routes Drilldown July 4 Weekend, Local Time

Congestion Coast-to-Coast July 4, 2015 Weekend