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tion further comprises applying a Bayesian update by starting with a grand median of a rescaled speed value, and updating the grand median of the rescaled speed value based on a current observed value from current and neighboring links.

16. The method of claim 9, wherein the smoothing the collected GPS data and the model of re-scaled speed estimation further comprises examining a temporal median as a possible candidate for a missing speed value.

17. A link speed estimation system, comprising:

- a plurality of input including collected GPS data mapped to one or more links comprising a transportation network;
- a plurality of data processing modules, executed by at least one processor within a computing environment, and configured to supply missing speed values among the collected GPS data by utilizing observed information from one link to estimate neighboring links without observed information, the plurality of data processing modules including a preparation module configured to model a re-scaled speed estimation from the collected GPS data mapped to the one or more links by locating a set of closest neighboring links to the one or more links to which collected GPS data is mapped, build a profile of rescaled speed for collected GPS data over a specified initial period at a link and a time period, and perform a cluster analysis to extrapolate observed speed data from the collected GPS data to the set of closest neighboring links to develop a rescaled speed value, and a smoothing module configured to process the collected GPS data by mapping the model of the re-scaled speed estimation to the one or more links comprising the transportation infrastructure network, apply a plurality of different values of re-scaled speed estimation for each observation of a link l, and compare those different values with collected GPS values relative to at least one link l and at least one time period u; and

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an estimation module configured to determine a link speed estimate for all links 1 in the transportation network at all time periods u,

wherein output data generated by the estimation module enables dynamic, real-time routing information for traffic across the one or more links of the transportation network.

18. The link speed estimation system of claim 17, wherein the dynamic, real-time routing information comprises at least one instruction for alternate routing of traffic across the transportation network in response to an increase or decrease in the link speed estimate for any link l at any time period u.

19. The link speed estimation system of claim 17, wherein the dynamic, real-time routing information is used to generate traffic flow data for visualization on an animated map.

20. The link speed estimation system of claim 17, wherein the output data is provided via a third-party application for visualization on in-vehicle telematics equipment.

21. The link speed estimation system of claim 17, wherein the output data is provided via a third-party application for visualization on a mobile device.

22. The link speed estimation system of claim 17, wherein the output data is provided via a third-party application for media distribution.

23. The link speed estimation system of claim 22, wherein the dynamic, real-time routing information is used for traffic planning and operational analytics for transportation infrastructure management encompassing the one or more links.

24. The link speed estimation system of claim 22, wherein transportation infrastructure management includes at least one of planning for congestion alleviation for the one or more links, and efficient operation of mass transit vehicles for the one or more links.

25. The link speed estimation system of claim 12, wherein the GPS data is processed probe data that reflects traffic speed on a transportation network.

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