Supplementary Material for "A Game-Theoretic Approach to Analyzing Equilibria in Coupled Power and Transportation Network"

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In the supplementary material, we give the detailed information of the numerical examples in the paper "A Game-Theoretic Approach to Analyzing Equilibria in Coupled Power and Transportation Network".

I. Sioux Falls Transportation Network

Sioux Falls, South Dakota, USA. The area of Sioux Falls is 190.20 km^2 (73.47 sq mi) [1].

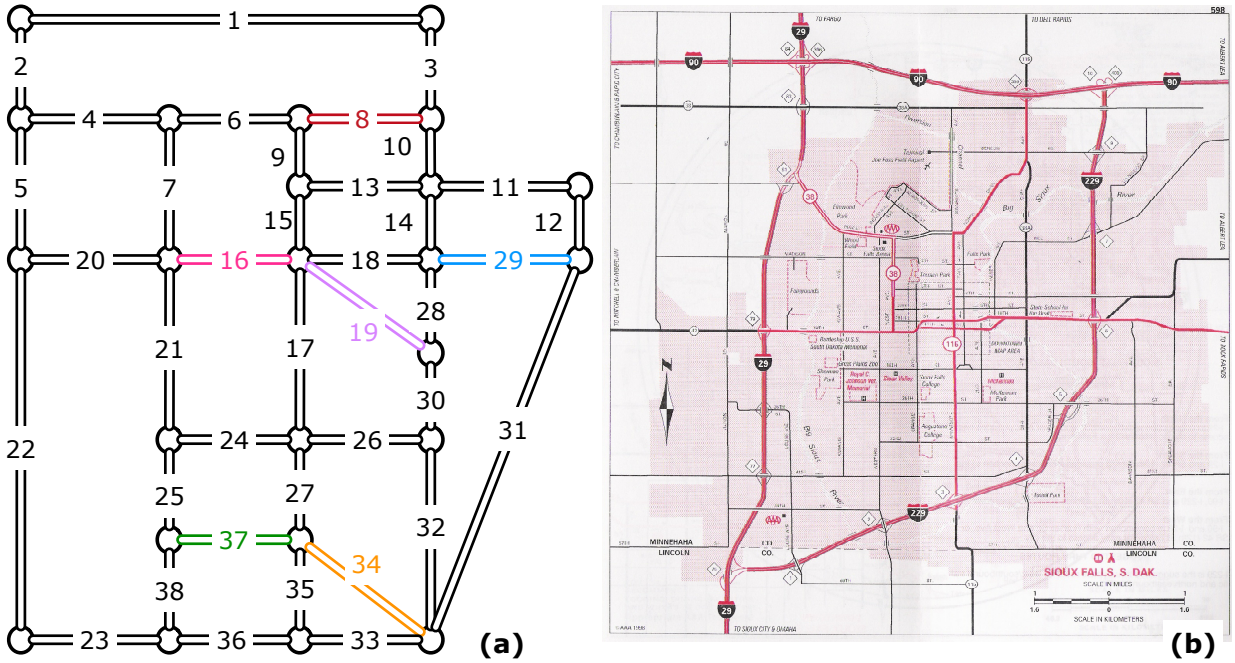

Fig. 1. (a) Sketch of Sioux Falls transportation network. (b) Map of Sioux Falls.

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Road length of the Sioux Falls transportation network [1]. Note that the length of the arcs does not necessarily have direct connection with the geographic length of the roads.

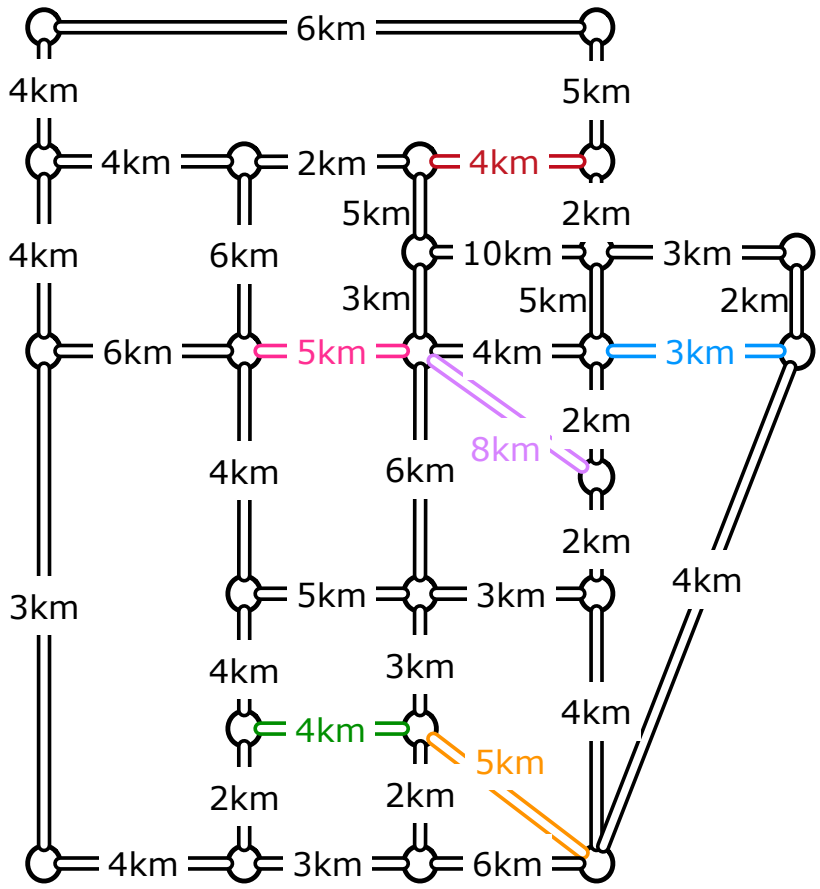

Fig. 2. Road length of Sioux Falls transportation network.

II. 33-node Power Network

33-node radial distribution network [2].
Voltage 12.66 kV.

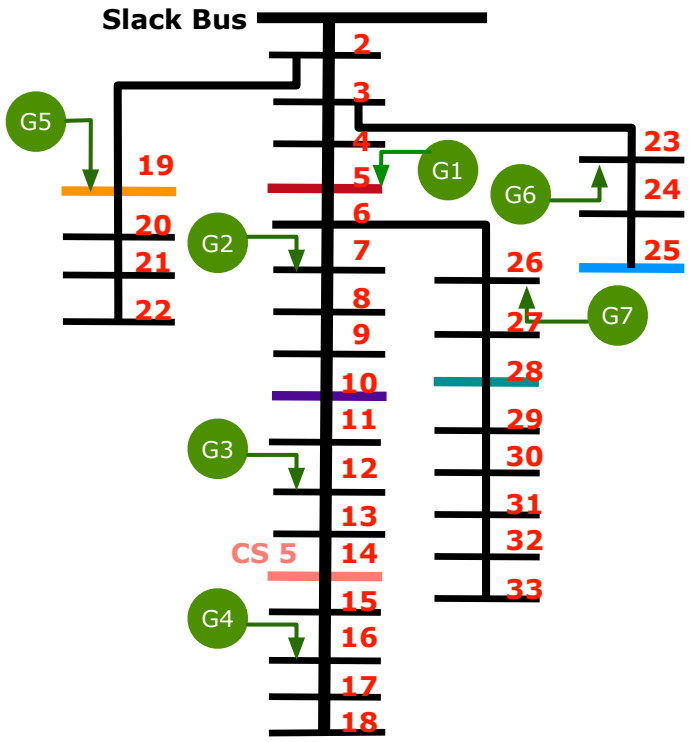

Fig. 3. 33-node power distribution network.

III. Coupling Networks

Sioux Falls transport network coupled with a 33-node power network – see Fig. 4. The coupled nodes/arcs are labeled with identical colors.

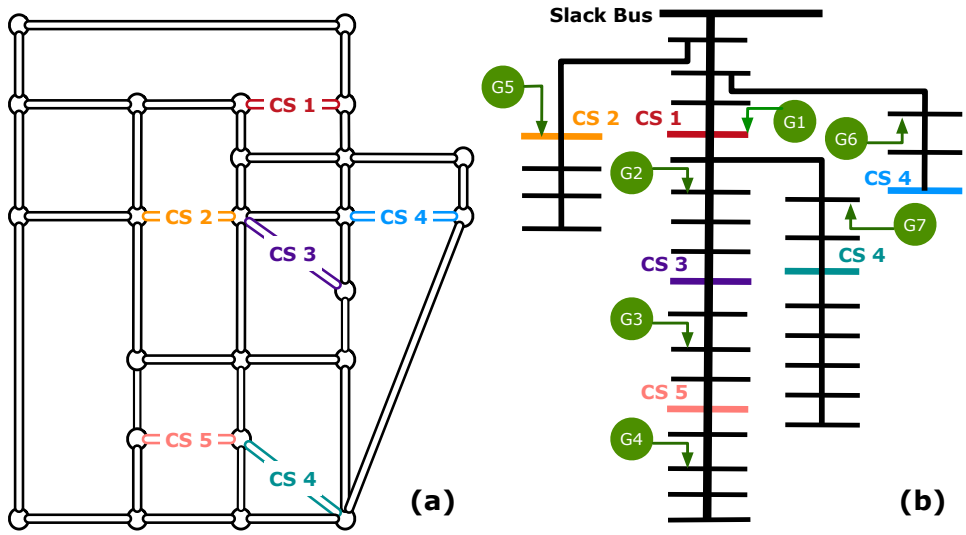

Fig. 4. (a) Sioux Falls transportation network. (b) 33-node power network. The coupled arcs/nodes are labeled in the same colors.

REFERENCES

[1] B. Stabler, "Transportation networks for research." [Online]. Available: https://github.com/bstabler/TransportationNetworks. [Accessed Jan. 23, 2019].
[2] R. D. Zimmerman, C. E. Murillo-Sanchez, and R. J. Thomas, "Matpower: Steady-state operations, planning and analysis tools for power systems research and education," *IEEE Trans. Power Syst.*, vol. 26, no. 1, pp. 12–19, 2011.