

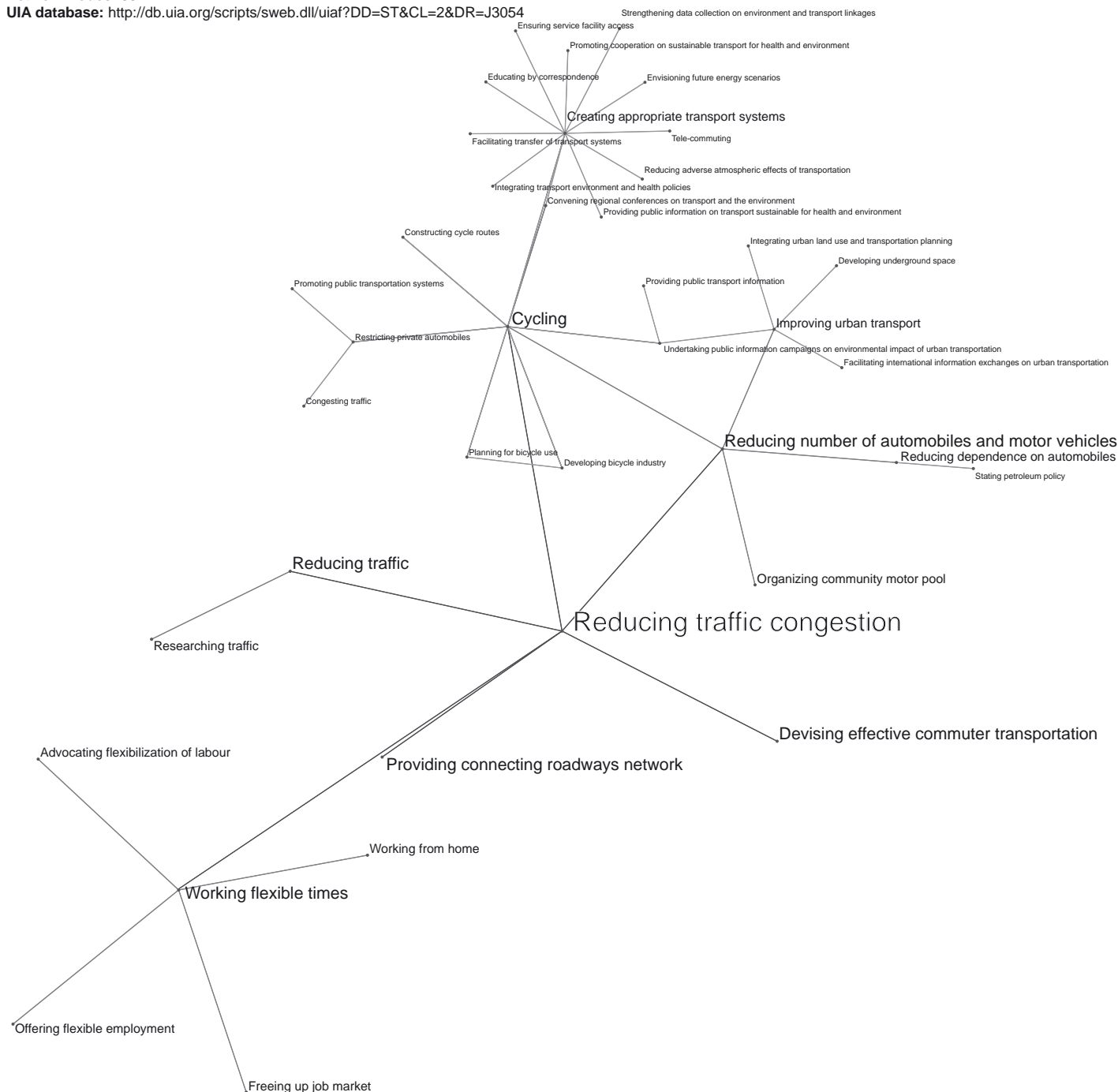
Figure 10.3.17. Reducing traffic congestion

Database: Global Strategies and Solutions

Link type: facilitated by strategies

Network nodes: 39

UIA database: <http://db.uia.org/scripts/sweb.dll/uiaf?DD=ST&CL=2&DR=J3054>



Traffic jams sometimes start for no apparent reason and can last for hours. Based on observations of a German autobahn, three states of traffic on busy highways have been described : "free flow," in which traffic is light enough that drivers can freely change lanes and pass other cars; "synchronized flow," in which the roads are so clogged that drivers can't pass, but can still move; and jams. Surges of vehicles joining the highway disrupt the traffic flow enough to initiate the jump from free to synchronized flow within minutes. After being established by what might be only a brief disturbance, the synchronized flow could last hours. The researchers suggest that heavy traffic behaves like supercooled steam, in which it only takes a molecular "seed" to trigger millions of molecules to condense into water. A highway seed could be the sudden rush of drivers on an entry ramp, or drivers already on the highway slowing to admire the scenery. These apparently isolated disturbances can cause a phase transition to a state with very high density of vehicles which stays for hours on the road. Once synchronized flow is established, free-flow driving resumed only when the traffic volume had dipped to about 50% of pre-transition levels. The findings could be used to help develop traffic forecasting, highway capacity and intelligent transport systems.