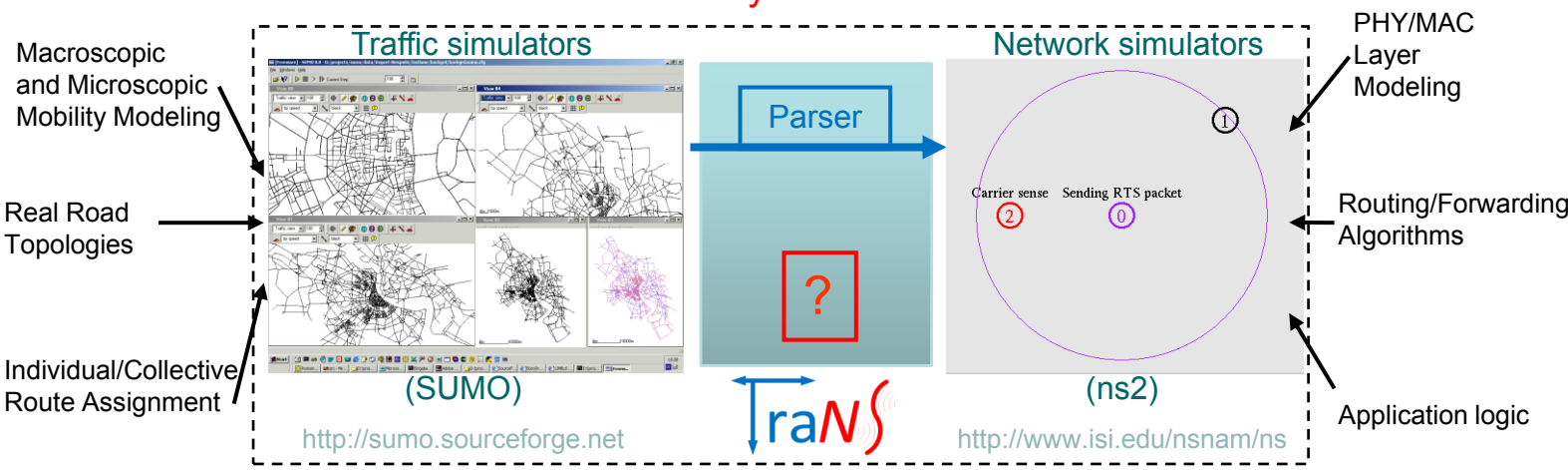
ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE
School of Computer and Communication Sciences
LCA

MobiCom 2007

TraNS Joint Traffic and Network Simulator

M. Piorkowski, M. Raya, A. Lezama Lugo, P. Papadimitratos, M. Grossglauser and J.-P. Hubaux

Realistic Mobility Traces for VANETs

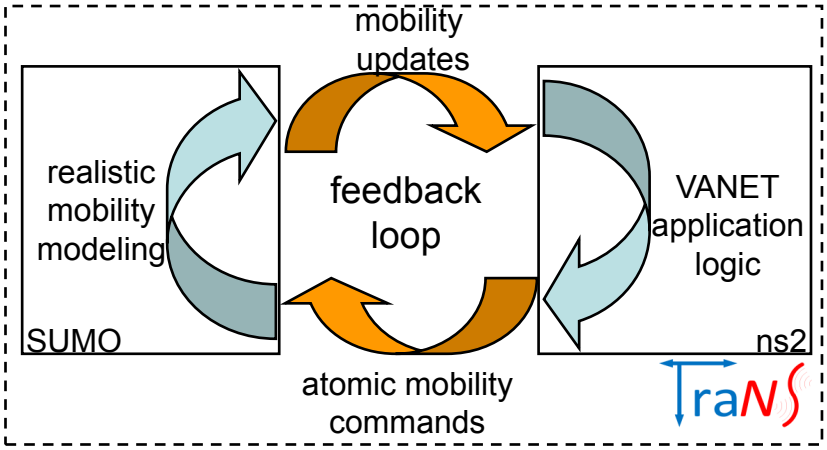


How to simulate VANET applications realistically?

Application Type	Use Cases	Mobility Primitives: STOP	CHANGE ROUTE	CHANGE SPEED	CHANGE LANE
V2V Cooperative Awareness	Traffic Congestion Warning		X	X	X
	Forward Collision Warning	X		X	X
	Cruise Control	X		X	
	Intersection Collision Warning	X		X	
V2V Unicast Exchange	Pre-Crash Sensing		X	X	X
	Merging Assistance	X		X	
	Approaching Emergency Vehicle	X		X	X
V2V Decentralized Environmental Notification	Road Condition Warning		X	X	X
	Low Bridge Warning			X	
	Work Zone Warning		X	X	X
	Fog Zone Warning			X	
	Freezing Bridge/Road Warning			X	
	Post Crash Warning	X	X	X	X
	Incident Detection	X	X	X	X
I2V Communication	Curve Speed Warning			X	
	Stop Light Assistant	X		X	
	Speed Limit Warning			X	

Atomic mobility commands:

```
Stop         := NodeId, StopPosition,
                StopTime
ChangeRoute  := NodeId, CurrentPosition,
                TargetPosition
ChangeSpeed  := NodeId, NewSpeed
ChangeLane   := NodeId, Timeout
```



User-selectable Parameters

- Road network definition
- Vehicle routes definition
- Simulation scenario
- Simulation duration, log files, TCP connection, etc.

Future efforts

- Testing the feedback loop
- Integrating a more realistic 802.11p PHY layer model
- Enabling large-scale simulations (~10'000 nodes)
- Modeling the cost of securing VANET protocols, in particular message overhead and processing delays.
- Comparison to other simulators, in order to come up with an objective benchmark of VANET simulators.

http://trans.epfl.ch