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# PSE

# Verkehrssimulation

Traffic Networks and Visualisation

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# Content

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- Current State and Drawbacks
- Traffic Networks
  - ◆ Nodes
  - ◆ Links
  - ◆ Turns
- Visualisation

# Current State

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- Your traffic simulator is capable of simulating
  - ◆ Single-lane traffic
  - ◆ Simple street with periodic boundary conditions
  - ◆ Textual output of simulation results
  
- Drawbacks
  - ◆ No realistic traffic networks
    - No intersections
    - ...
  - ◆ Simulation results hard to debug

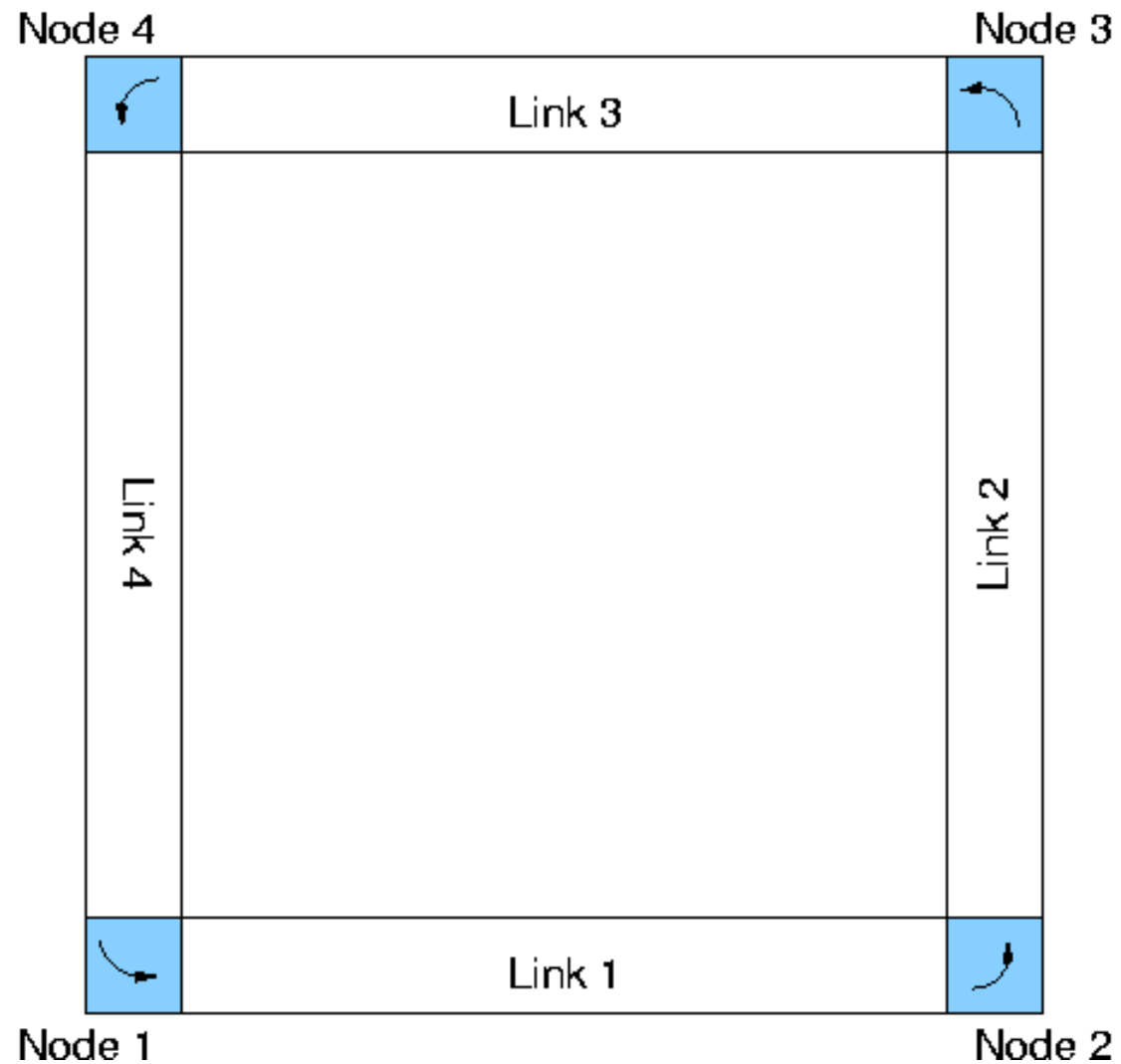
# Traffic Networks

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- Traffic networks describe structure and interplay of street networks
- Several network components are used:
  - ▶ Nodes (Knoten)
  - ▶ Links (Strecken)
  - ▶ Turns (Abbiegebeziehungen)

# Traffic Networks (2)

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# Traffic Networks – Nodes

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- Nodes used to connect Links
- Nodes can represent intersections
- Each node has several parameters:
  - ◆ Unique identifier
  - ◆ Name
  - ◆ Coordinates (x,y) on simulation plane

# Traffic Networks – Links

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- Links represent streets or street segments
- Each Links starts and ends with a node
- Link parameters:
  - ◆ Unqiue identifier
  - ◆ Source Node
  - ◆ Destination Node
  - ◆ Length (in kilometres)
  - ◆ Number of lanes (fixed to 1 in our case)
  - ◆ Maximum velocity allowed on link (in km/h)

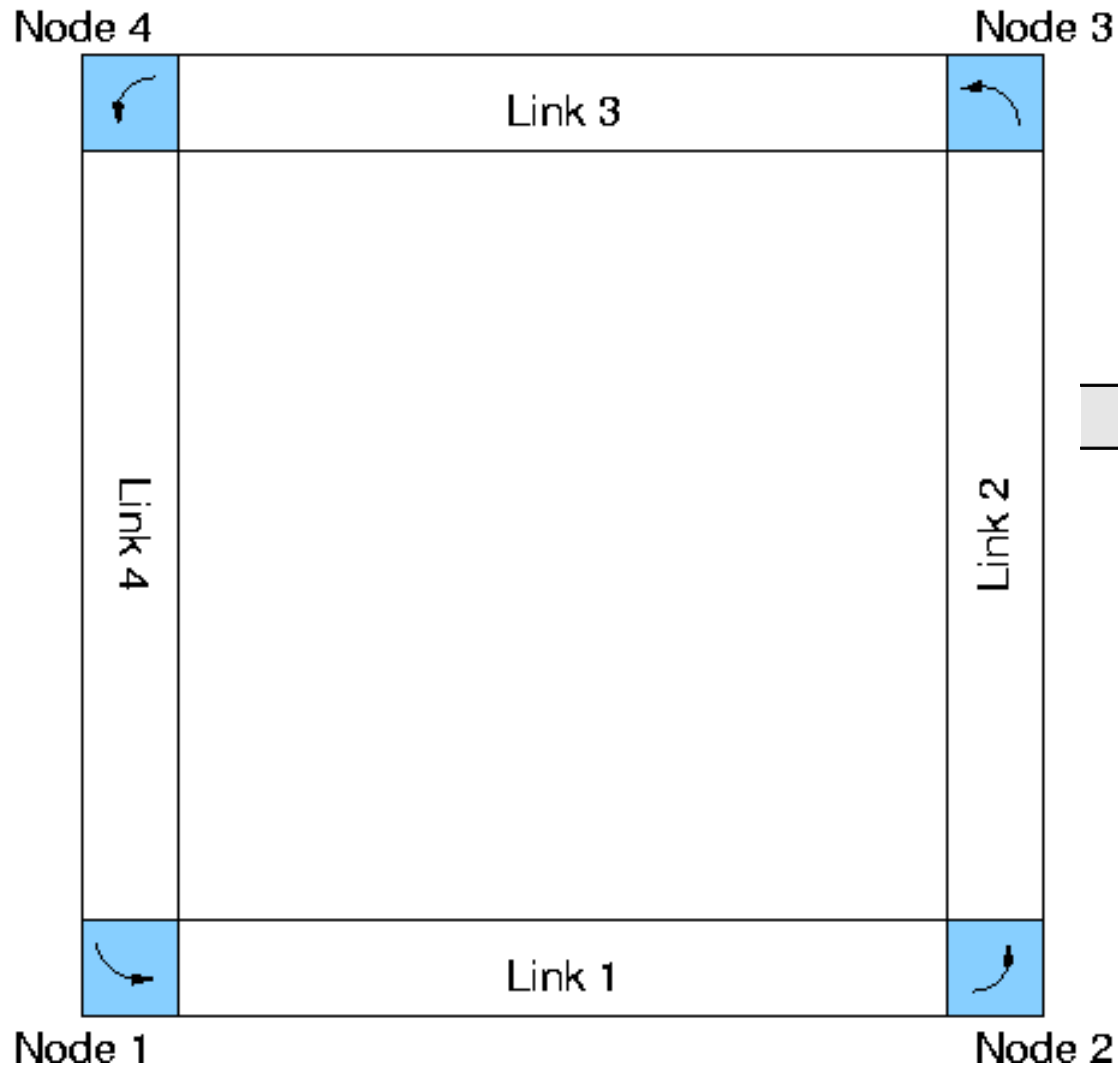
# Traffic Networks – Turns

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- Turns are crucial part for connecting Links
- In real life restrictions for making a turn at intersections
- Turns model these restrictions
- Parameters for Turns:
  - ◆ From
  - ◆ Via
  - ◆ To
- These three nodes are sufficient for modeling a Turn

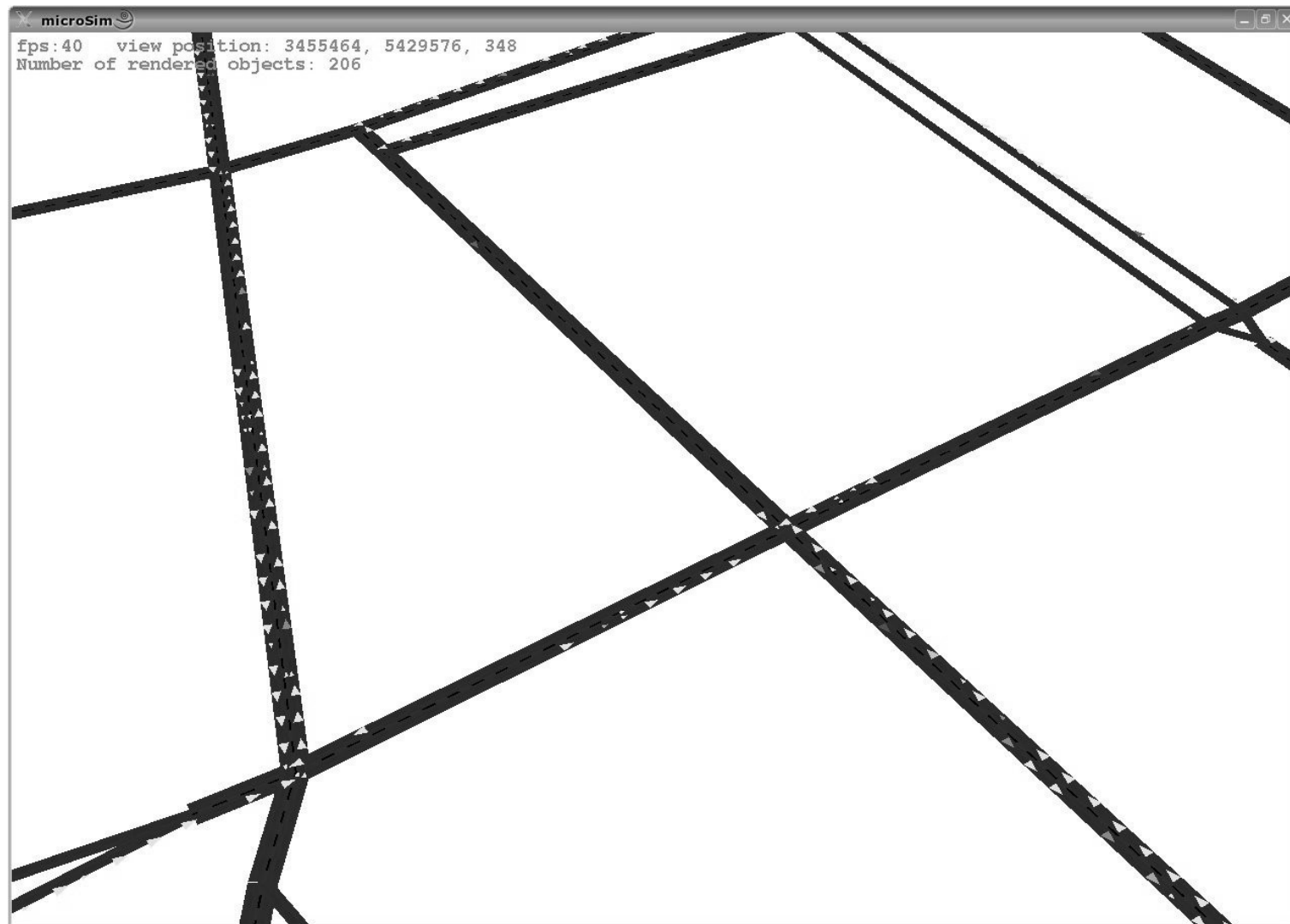


# Traffic Networks – Turns (2)



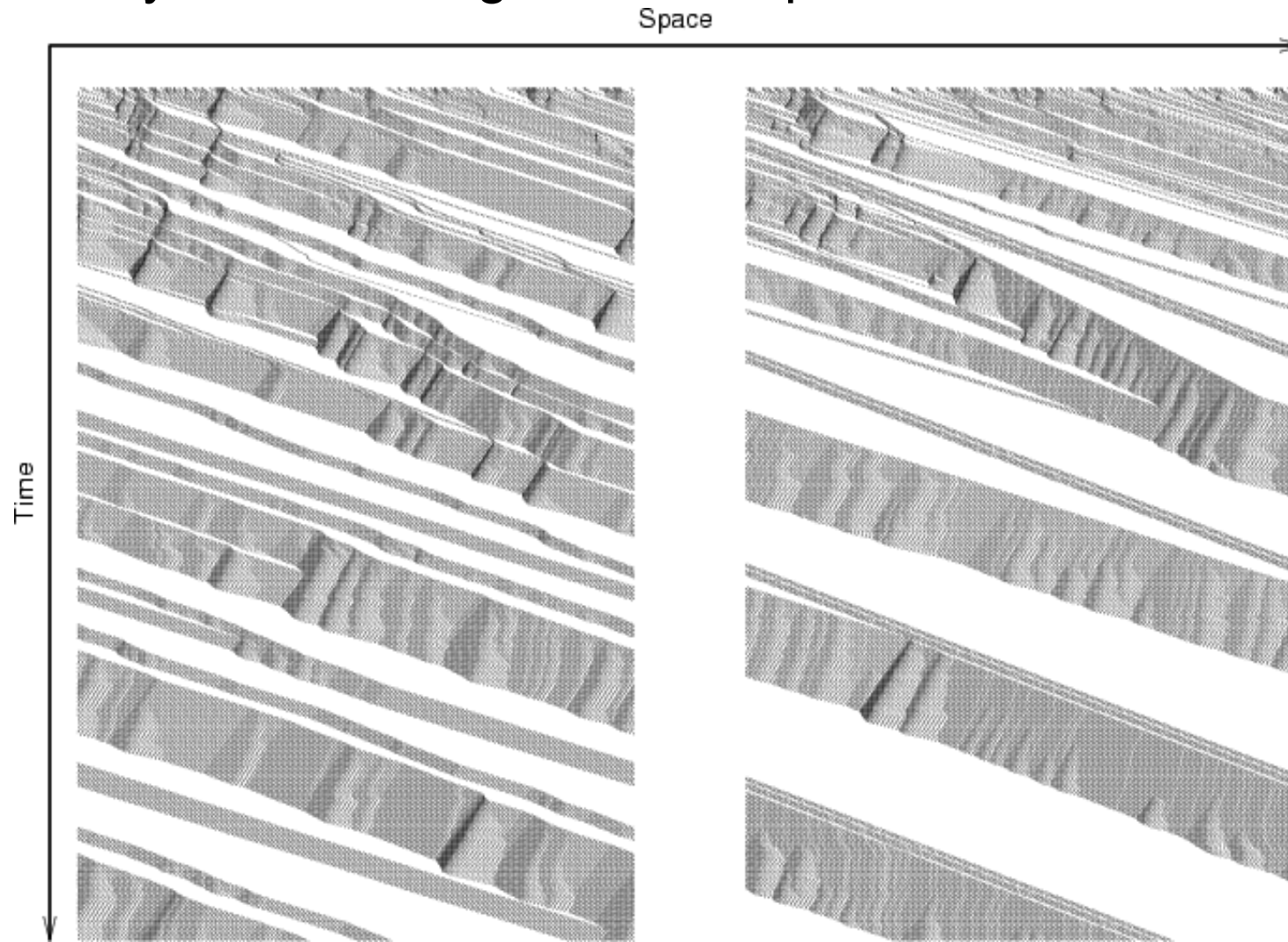
From	Via	To
1	2	3
2	3	4
3	4	1
4	1	2

# Visualisation



# Visualisation (2)

- A way of visualising textual output



# Recommendations

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- Keep in mind:
  - ◆ You will deal with large networks and many cars towards the end of this PSE
  - ◆ Efficiency for visualisation is crucial
- Java-Swing is sufficient for our needs
- Ever thought about Buffered Images?

# Questions?

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