Bringing Development Review into Safe Systems

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R35 Project Team

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Overview

• Research Questions
  1. How is road user safety reflected in contemporary TIA practice?
  2. What barriers exist to making safety an integral outcome of development review?
  3. What gaps exist in conventional TIA that allow for introduction of safety-related outcomes?

• Analysis
  – Grounded theory analysis of interviews and transcripts → Matrix analysis → Causal loop diagramming

• Interpretation
  – Systems archetypes framework

• Developing the SafeTIA approach
Background

- TIA is a common tool for evaluating and mitigating congestion impacts of new land development across the southeast, but with known drawbacks, e.g.,…
  - Discourages infill development
  - Assumes & entrenches car dependency
  - Pits cars against other modes
  - Feeds development==congestion sentiment

- Lots of energy is going into modernizing TIA (yay) but…
- …recent research on evolution in development review practices: safety is rarely discussed as either a consideration in TIA or motivation for adopting new practices (boo)

Combs, McDonald, & Leimenstoll (2020) https://doi.org/10.1177/0739456X20908928
Practitioner Interviews and Developer Focus Groups

**Practitioner Interviews**
- n = 41 interviews
- pop. range: 13,000 to 1.1M

**Developer Focus Groups**
- n = 12 senior-level developers with hands-on experience
- Combined development portfolio in excess of $6B in southeast U.S.
Analysis of literature, interviews, and focus groups

• Themes from grounded theory & matrix analyses
  – Professional judgment is primary means of understanding ‘safety’
  – Pressure to address concerns (aka we address safety as instructed by local authorities)
  – Congestion mitigation is safety
  – More traffic means less safety
  – Frustrated drivers mean less safety
  – (Crash) History is our guide
  – Understanding Safety through Site Plan Review
  – Improving Safety through Site Plan Review
Role of Safety in TIA Practices

Developer

Planner/Engineer

Safety Improvements

R = Reinforcing feedback loop
B = Balancing feedback loop
Results: 2 systems archetypes at play

1. Seeking the Wrong Goal

- Prior experience, engineering judgment, & crash history examination lead professionals & officials to equate congestion with danger, and therefore congestion mitigation with safety improvements

2. Fixes that Fail

- Mitigating congestion generates more traffic
- More traffic means less safety...but also more congestion & driver frustration
- Multiple factors push professionals to focus on the congestion
Findings & Discussion

- Road user safety not explicitly considered in TIA, but subsumed within congestion mitigation (which backfires)
- Entrenched practices/models/tools and prevailing belief systems prioritize LOS at the expense of safety
Developing “SafeTIA”

• Analysis: Site plan review is entry point for road user safety

• Developers’ perspective:
  – Lack of safety is bad business!
  – Openness to implementing evidence-backed safety countermeasures, but
  – *Ad hoc* layering of safety requirements on top of congestion mitigation
    obligations is unwelcome

• Clear standards and processes for assessing and addressing safety:
  – Lessen burdens on developers
  – Reduce the outsize influence of developer/regulator relationship history
    on safety outcomes
  – Circumvent the subjectivity of professional judgment

• Site plan review is a leverage point within developers’ purview for
  introducing, assessing, improving safety outcomes through land
  development
SafeTIA overview

• Goals
  – Reduction in fatal/serious conflicts is core outcome measure
  – Complement, eventually replace conventional TIA
  – Focus on site plan to leverage developer agency & motivation

• Key parameters
  – Straightforward, standardizable, replicable
  – Backed by analytical frameworks derived from safe systems research
  – Focus on conflict risk reduction rather than crash remediation
  – Iterative and dynamic
  – Inclusive of full analytical footprints

• ‘Acceptable risk’ assumption
  – Local agencies have established an acceptable level of risk of roadway deaths and/or serious injuries and a timeline for meeting associated risk reduction goals.
SafeTIA stages

0. Establish acceptable level of risk
1. Project scoping and background
2. Evaluate proposed changes
3. Iterate & mitigate

1. Specify project scope; collect background information about the impact area
2. Identify all existing potential conflict points & access barriers for all users
3. Calculate baseline risk envelope
4. Identify changes to/new access points required for all modes
5. Identify potential conflict points & access barriers for all users
6. Calculate revised risk envelope given the modified access points
7. Calculate difference between baseline & revised risk envelopes

Adjust site plan to mitigate risks to reach pre-determined acceptable level of risk of injury to road users
Next steps

• Disseminate SafeTIA framework (v1) for feedback
• Identify opportunities for demonstration projects to apply, evaluate, and refine future versions of SafeTIA
RESEARCH TO PRACTICE BYTES

Case studies from across the U.S. on using systems thinking tools to inform Safe System partnership, strategic planning, and research

PRESENTER: Becky Naumann
UNC INJURY PREVENTION RESEARCH CENTER

October 26, 2022
2:30-3:00 p.m. ET

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