Collaborative Sciences Center for ROAD SAFETY

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Using Safe Systems approach to assess traffic impact and land development

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R35 Project Team

- UNC DCRP
  - Tabitha Combs
- UNC HSRC
  - Seth LaJeunesse
  - Wesley Kumfer
- FAU
  - Eric Dumbaugh
  - Jesse Saginor

Overview

- Research Questions
  1. How is road user safety reflected in contemporary TIA practice?
  2. What are barriers to making safety an integral outcome of development review?
  3. What openings exist in conventional TIA that might allow for introduction of safety-related outcomes?
- Key Research Methods
  - Data
    - Interviews with 41 municipal planners/engineers working in development review
    - Focus groups with 12 private developers familiar with municipal TIA practices
  - Analysis
    - Grounded theory analysis of interviews and transcripts → Matrix analysis → Causal loop diagramming
  - Interpretation
    - Systems archetypes framework

R35 Project Phases

- Phase I: Data collection
  - Interviews with municipal staff
  - Focus groups with private developers
- Phase II: Analysis
- Phase III: Development of Safe Systems Traffic Impact Analysis Framework (aka SafeTIA)

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 but…
- …recent research on evolution in development review practices in the US southeast: safety is rarely discussed as either a consideration in TIA or motivation for adopting new practices

Combs, McDonald, & Leimenstoll (2020) https://doi.org/10.1177/0739456X20908928
Combs & McDonald (2021) https://www.jstor.org/stable/48646176

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.

Phase II: Analysis

- 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
- Themes from CLD
  - 2 systems archetypes at play…

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

- Q1: How is road user safety reflected in contemporary TIA practice?
  - road user safety not explicitly considered in TIA, but subsumed within congestion mitigation (which backfires)
- Q2: What are barriers to making safety an integral outcome of development review?
  - entrenched practices/models/tools and prevailing belief systems prioritize LOS at the expense of safety
- Q3: What openings exist in conventional TIA that might allow for introduction of safety-related outcomes?
  - New analysis framework: “SafeTIA”
  - Complements (and may eventually replace) conventional TIA
  - Core outcome measure: Reduction in fatal/serious conflicts
  - Focus on **site planning** to leverage developer agency & motivation

Phase III: SafeTIA framework

- Premise
  - Developers recognize lack of safety is bad for business
  - Existing practices lack explicit safety metrics
  - Clear standards and processes for addressing safety…
    - lessen burden on developers,
    - reduce the influence of developer/official relationship history on safety outcomes,
    - circumvent professional (but misguided) judgment
- Site plan review is a leverage point for introducing, assessing, and improving safety

Developing the SafeTIA framework

- Informed by our analyses, safe systems literature, and ITE Safety Council 3/22 Tech Brief
- Key parameters: the framework must be…
  - Straightforward, easy to use, standardizable, replicable
  - Backed by analytical frameworks derived from safe systems research
  - Forward-looking, focusing on conflict risk reduction rather than crash remediation
  - Iterative and dynamic, appropriate no matter the learning curves needed
  - Inclusive of full analytical footprints

SafeTIA's 'acceptable risk' assumption

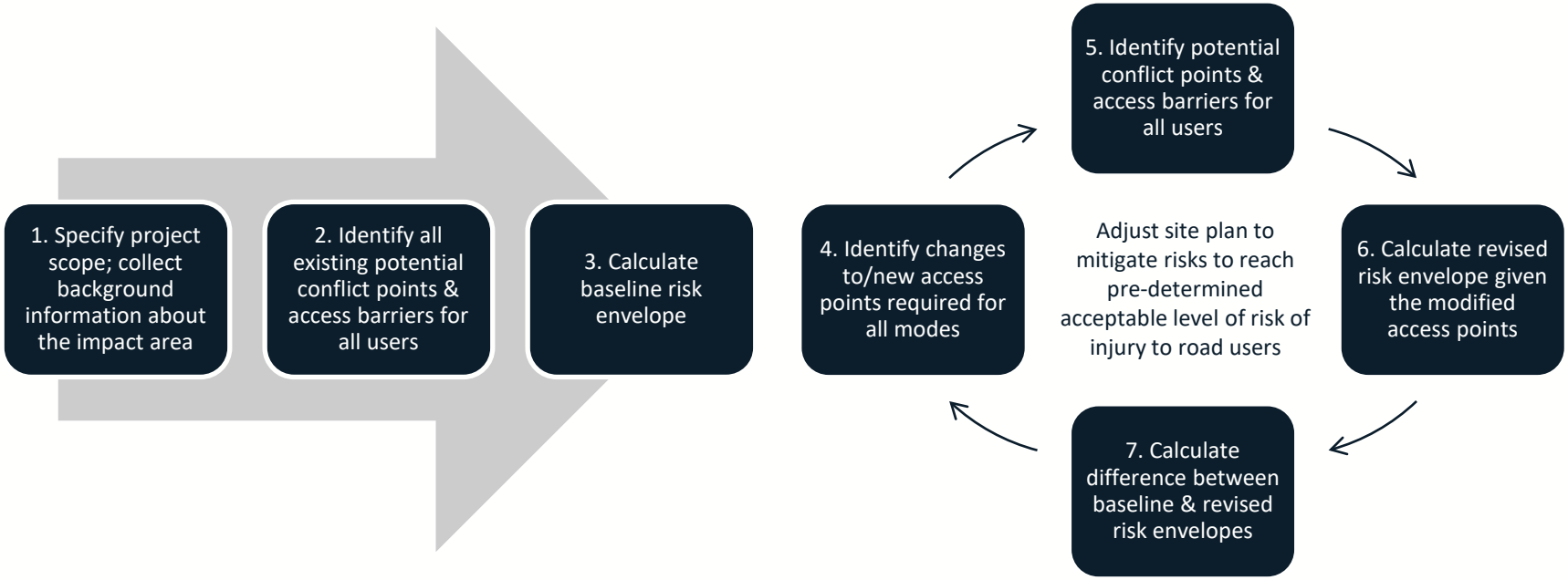
- Local agencies have established an acceptable level of risk of roadway deaths and/or serious injuries and a timeline for meeting associated risk reduction goals.

SafeTIA's 'acceptable risk' assumption

- Implementation of SafeTIA requires that
  - Local agencies have established a goal that clearly articulates an acceptable level of risk of roadway deaths and/or serious injuries and a timeline for meeting this goal
  - The acceptable level of risk represents a reduction vs. current conditions (and is ideally zero)

SafeTIA stages

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



Products and Future Work

- Final report
  - Results of interview and focus group analysis
  - SafeTIA framework and guidance for practice
- Journal article (under review): “Recurrent patterns in the application of traffic impact analyses: Safety first or last?”
- Redacted interview transcripts and data collection instruments (in Dataverse)

- Future: exploring demonstration projects to apply, evaluate, and improve SafeTIA framework