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MEMPHIS

Intermodal Freight
Transportation Institute



Shelby County Livability Project

2017 Tennessee MPO Planning Conference
June 7, 2017

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Presentation Agenda

- Brief background
- Case Study Selection
- Methodology
- Results
- Next Steps



Background: *Livability of Freight Centric Communities*

- Funded through National Center for Freight Infrastructure Research and Education (CFIRE)
- Project team:
 - University of Memphis
 - University of Wisconsin, Madison
 - University of Toledo
- 2013-2016



NATIONAL CENTER FOR
FREIGHT & INFRASTRUCTURE
RESEARCH & EDUCATION

Background: Impetus for Study

- Freight and livability are often conflicting concepts
- Numerous factors must be considered:
 - Safety
 - Congestion
 - Environment
 - Social
 - Economic



Background: Impetus for Study

- What does livability mean to you?
 - Different definitions
 - Multiple stakeholders
 - Difficult to quantify



Background: Impetus for Study

- What is a freight centric community?
 - Communities characterized as residential areas that bear spillover effects from freight movements through neighborhoods.
 - Also defined by a lack of a substantial buffer zone between a freight generator and an adjoining residential area.
 - Further characteristics of FC communities include proximity to freight hubs.

Background: Impetus for Study

- What factors are important for community livability?
- Are the priorities and barriers to livability different between freight-centric communities and non-freight-centric communities?
- Does freight have a significant impact on livability perceptions?
- Does freight have a significant impact on quantitative measures of livability?
- What are some options for reducing the impacts of freight operations on livability?

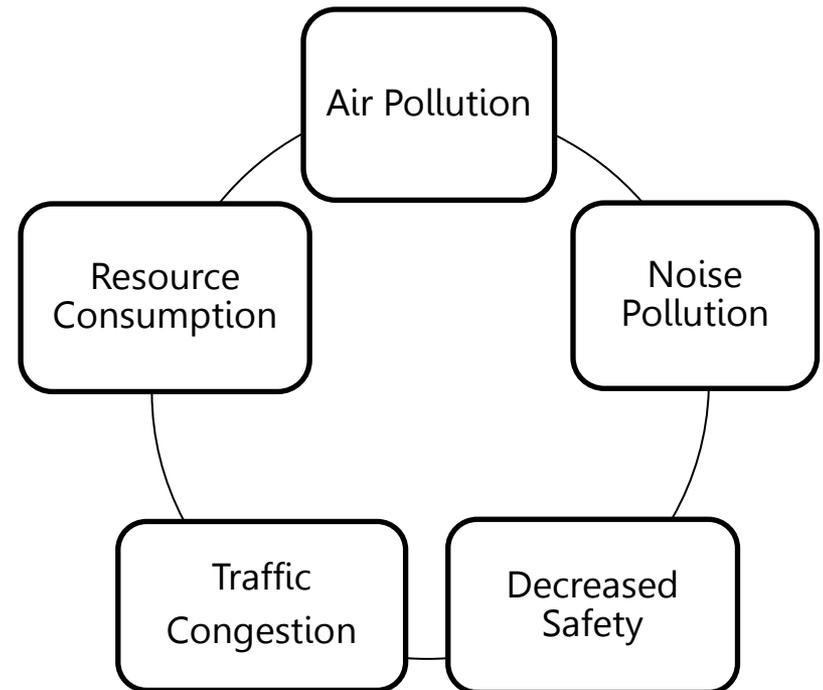
Methodology

- Literature review
- Residential perceptions survey
- AHP survey
- Industry survey
- 'Decision-maker' survey
- Scenario analysis
- Visualization
- Livability metrics



Methodology – Literature Review

- In 2009, the U.S. Department of Transportation, Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA), created the Partnership for Sustainable Communities focusing on six livability principles which have served as a framework for the advancement of performance measure development. These principles include:
 1. the availability of many transportation options,
 2. equitable and affordable housing,
 3. enhanced economic competitiveness,
 4. support of existing communities,
 5. coordinated federal policies and investment, and
 6. an increased value for communities and neighborhoods.



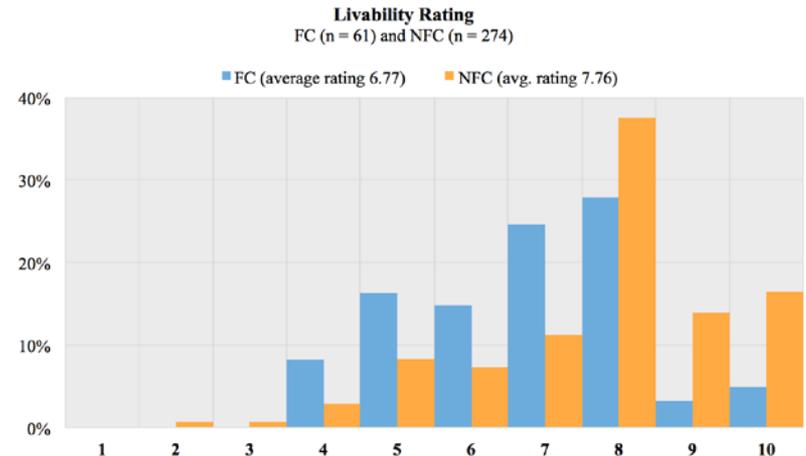
Methodology – Residential Surveys

Challenge: Reflect Community Values

- Residential Perceptions Survey
 - Open ended
 - Reflection on terminology
- AHP Survey
 - Prioritize values
 - Quantify

Methodology - Residential Perception Surveys

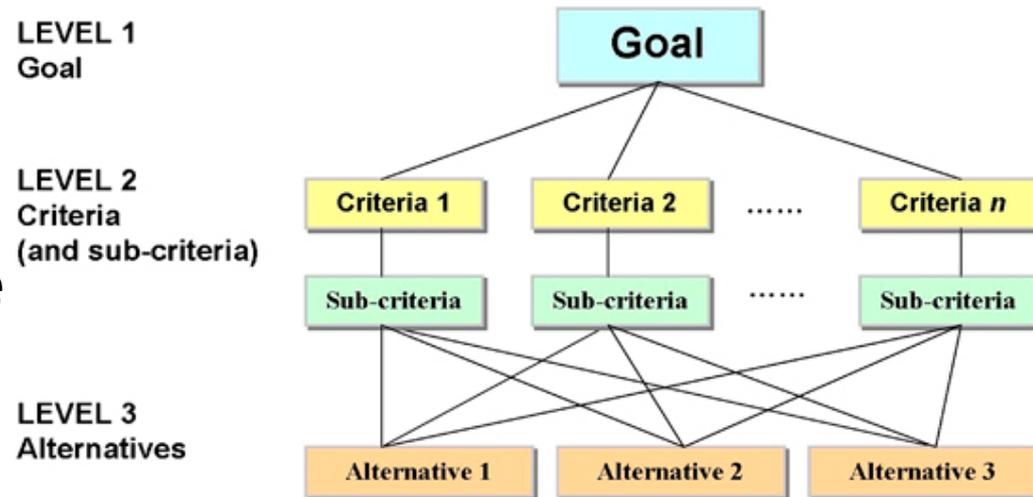
- 32 item survey
 - Definition of livability
 - Perceived barriers to livability
 - Personal commuting patterns
 - Lamar corridor experience
 - Demographic information



- Initially administered in focus group setting
- Final version administered online
- Compared responses from FC (75) and NFC (346) residents

Methodology - Residential AHP Survey

- Replicates how the mind organizes multiple criteria (hierarchy)
- Decision-making technique
 - Pairwise comparison judgments
- Quantifies what we cannot measure



Livability

Sense of Community

Knowing your neighbors

Places to meet neighbors

Social activities for all ages

Environment

Being able to sit outside without noise from trucks, airplanes and trains

Having clean air

Free of blight, litter and pests

Local Neighborhood Economy

Desirable businesses like grocery stores, restaurants and hairdressers in your neighborhood

Job close to home

Public transportation to get where you need to go

Community Investment

Affordable housing

Good neighborhood schools

Good neighborhood road conditions

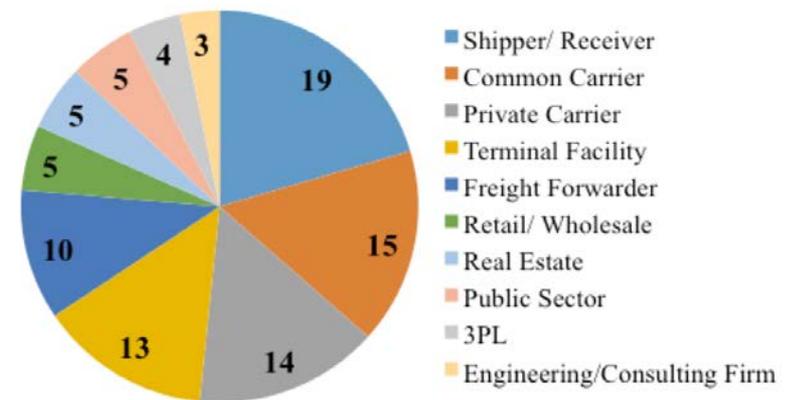
Free of crime



Methodology – Industry Survey

- 13-item survey
 - Company and industry information
 - How location for business was chosen
 - Transportation infrastructure rating
 - Barriers to productivity
 - Strategies for alleviating congestion
 - Strategies for reducing community impacts
- 66 industries responded

C. What type of industry is your business related to?
(Please select all that apply.)



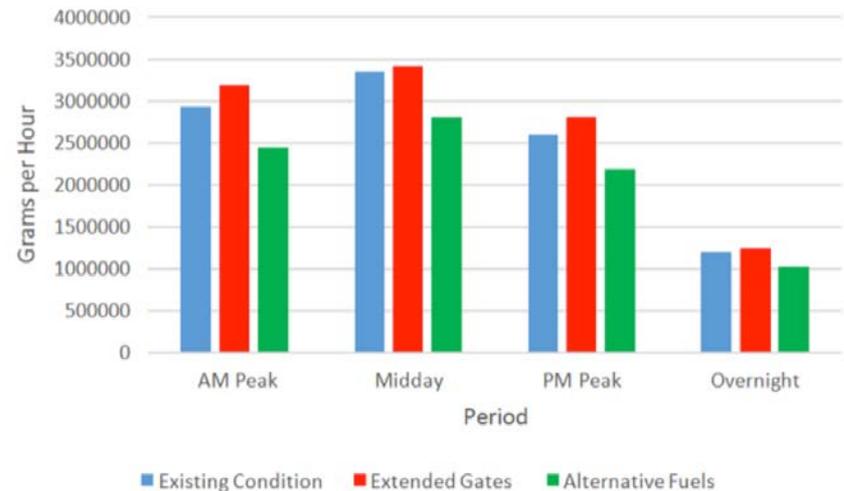
Methodology – ‘Decision-Maker’ Survey

- 4-item survey
 - Importance of community livability
 - Examples of local practice impacting livability
 - Recommend strategies to alleviate barriers to livability

- 5 responses to survey

Methodology – Scenario Analysis

- Quadstone Paramics model (Golias & Naimi, 2012)
- MOVES (emissions)
- 2 Scenarios:
 - Adoption of extended hours on Lamar Ave. Corridor
 - Alternative fuels



Methodology – Visualization

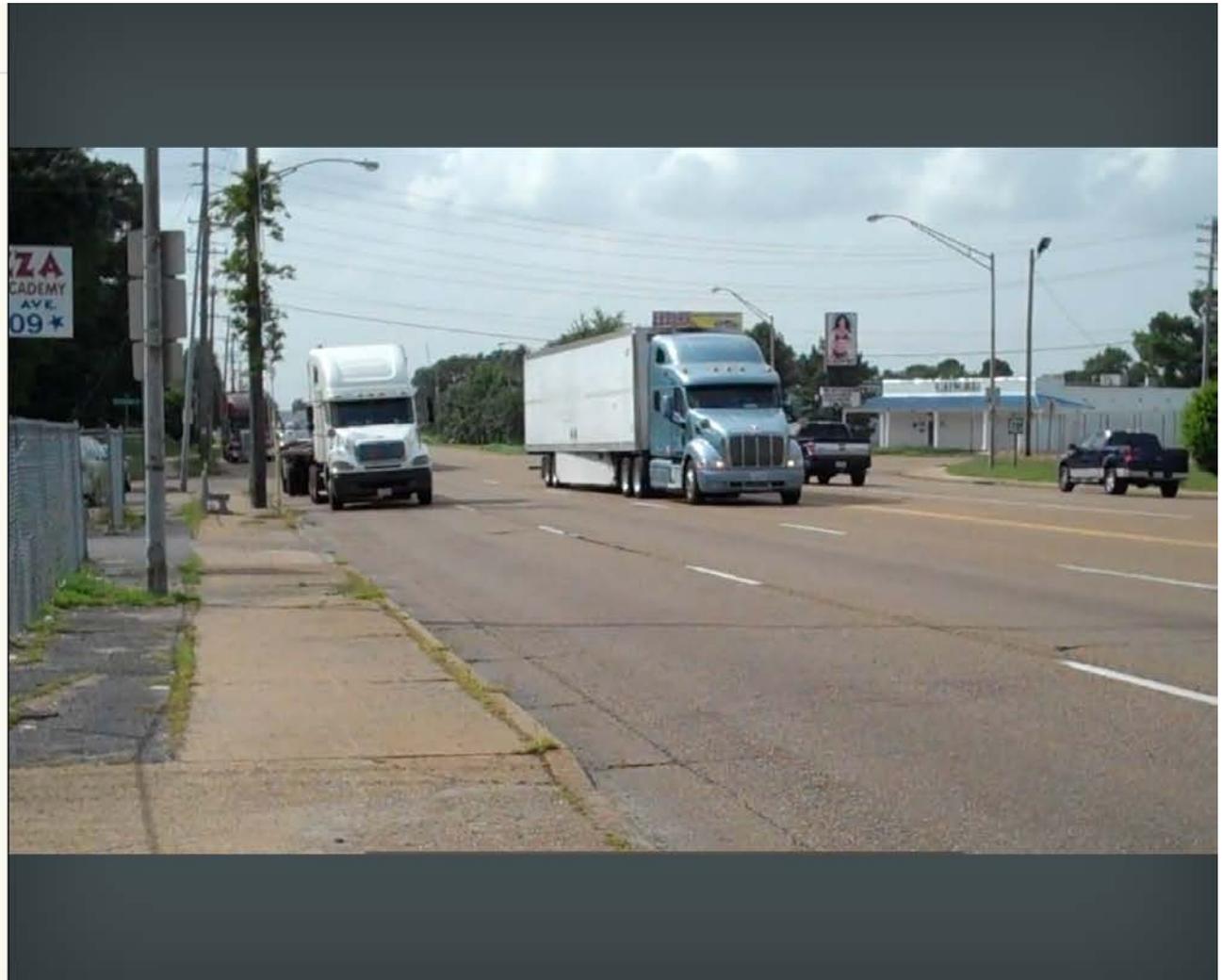
A CFIRE freight story ...



The Living with Freight Project: Memphis

This Deep Map looks at the intersection of *Freight*, *Livability*, and *Environmental Justice* in our American Cities.

Freight refers to the movement, storage, and processing of goods and products. This topic can be divided into freight transportation and freight logistics both of which require specialized infrastructure and complex operations. Freight



Methodology – Visualization

A CFIRE freight story ...



The Living with Freight Project: **Memphis**

- How has your neighborhood changed?
- What are the greatest barriers to livability in your neighborhood?
- What are the most important factors to livability?

Surveys reveal an additional challenge with understanding livability in diverse communities. People are very adaptable to their environments and have flexible expectations for their communities in terms of what levels are needed to be “livable.” While different communities consider similar things to contribute to livability, and possess those features in different amounts, this information was insufficient to predict how they would rate the livability of their community. However,

In 2014, the University of Memphis conducted a number of surveys to learn more about residents' perception of livability. Survey locations and responses can be reviewed in the interactive map.

Freight and Environmental Justice

A considerable concern when examining:

Voices from Memphis: Excerpts from a 2014 Livability Perception Study

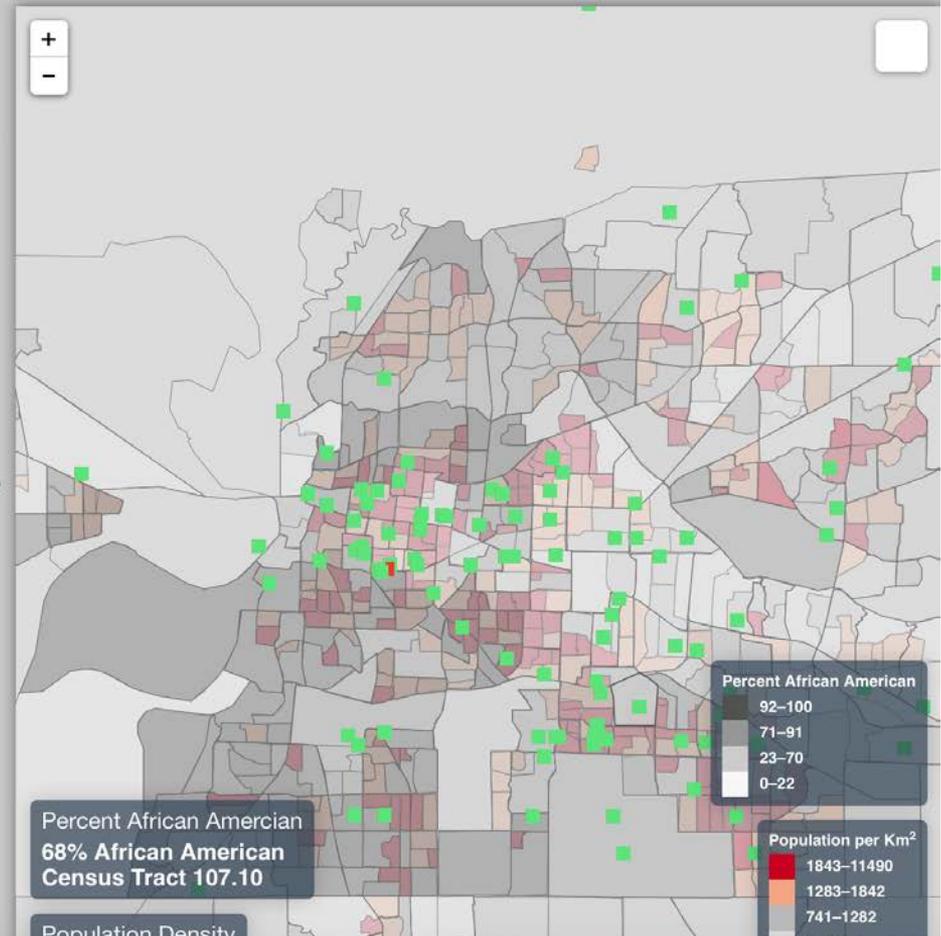
Survey Responses

- How has your neighborhood changed?
- What are the greatest barriers to livability in your neighborhood?
- What are the most important factors in neighborhood livability?
- What are the most important factors in community livability?

Source: University of Memphis, 2014

Demographic Overlays

- Population Density
- Income
- Percentage African American
- Percentage Hispanic
- Percentage Native American
- Percentage Asian American



Results and Conclusions

- Residential perceptions survey showed FC and NFC identify similar factors influencing livability but significant differences in experience
- Predominant focus for residents is safety oriented rather than transportation related
- Need for common understanding/communication between stakeholder types
- AHP shows promise for prioritizing livability factors

Results and Conclusions

- Corridor analysis showed positive impact for alternative fuel scenario, but requires more analysis on feasibility/practicality
- Visualization reveals significant change over time for Lamar residents and demonstrates impact to community
- Initial assessment of livability principles reveals need to better align with community experience

Next Steps

- Assessment of livability principles and implications for different scale and settings (and weights or thresholds for comparison)
- Investigate translation to other communities
- Larger sample size to allow investigation of demographic differences in livability perceptions
- Indicators reflecting health outcomes
- Methodology for defining freight-centric community boundaries
- Application of machine learning techniques to better analyze stakeholder preferences

Questions?

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Visualization:

<http://uw-mad.maps.arcgis.com/apps/MapJournal/?appid=090c0247e1384fcf8092e664670cb0f5>