

***Freight Stories:
Using ESRI Story Map Journal
to Visualize Research***

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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 can be moved by air, rail, trucks, and ships or barges.

When we discuss livability, we are dealing with an issue that continues to elude simple definition. Many definitions exist throughout the literature and different policy entities emphasize different aspects of livability to



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Freight

We focus on major freight-generating nodes – points at which significant amounts of freight begin, end, or change the direction of their journeys. Often these nodes involve multiple modes of transportation, between which freight cargos switch. Three examples of transportation infrastructure around which major freight-generating nodes develop include 1) seaports, where freight is moved to or from ocean or river vessels to trucks or rail for land, 2) intermodal rail terminals, where cargo transitions from long-distance rail movements to finishing their journey using more location-flexible trucking services, and 3) cargo airports, which require truck journeys to complete their freight's pickup or delivery. These infrastructure features are often surrounded by large logistics zones, where companies utilizing these transportation services store, organize, and redirect goods or utilize them for manufacturing processes before again taking advantage of the transportation system to ship the finished goods.

Freight in our country is often unseen and forgotten, even though almost every good



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Freight and the Communities of Lamar Avenue

Lamar Avenue, which is also signed as U.S. Highway 78, serves as an important arterial from downtown Memphis to the south suburbs, which extend across the state line into Mississippi. We identify five neighborhoods which surround urban Memphis' densest freight activity and which, along with the adjacent industry, we collectively refer as the Lamar Avenue Corridor. These neighborhoods constitute a study area roughly bounded by the airport and I-55 in the west, I-240 in the north, TN-385 in the northeast, Riverdale Road in the east, and the state line to the south.

Study area map and transportation infrastructure

For truck traffic around the airport and BNSF yards, Lamar Avenue serves as an essential connector to the National Highway System via I-240 and I-55. South of the airport and BNSF, East Shelby Drive (Tennessee State Route 175) is a major east-west arterial that connects the freight



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Deep Map Exploration

You are invited to further explore the data that we have presented in this Story Map. There are links at the top of the interactive to a paper on Environmental Justice and a timeline of events for Memphis.

References

Airports Council International. 2015. "Media Release - ACI World releases preliminary world traffic rankings for 2014." Montreal, Canada, March 26. <http://www.aci.aero/News/Releases/Most-Recent/2015/03/26/ACI-World-releases-preliminary-world-airport-traffic-rankings-for-2014-DXB-becomes-hottest-airport-for-international-passenger-traffic>

Center for Neighborhood Technology. 2014. *Creating Sustainable Economic Opportunity through Cargo-oriented Development*. Center for Neighborhood Technology: Chicago, IL.

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USDOT. 2014a. "Chapter 6 Transportation Economics." *Transportation Statistics Annual Report 2013: Research and Innovative Technology*

Lamar Corridor

Database

USDA Food Atlas

Zoning

EPA Monitor Locations

Lamar Avenue Freight-Centric Study Area

- Neighborhoods of Interest
- Lamar Area Freight Facilities
- Public Warehouses
- Proposed Intermodal Yard (Collierville: East of Lamar Ave)
- Warehouses
- Distribution Centers
- Freight Facilities
- Truck Terminals
- Intermodal Terminals

Census Tracts

Transportation

- Rail Lines (NTAD 2013)
- Roads (NTAD 2013:

Reset Map

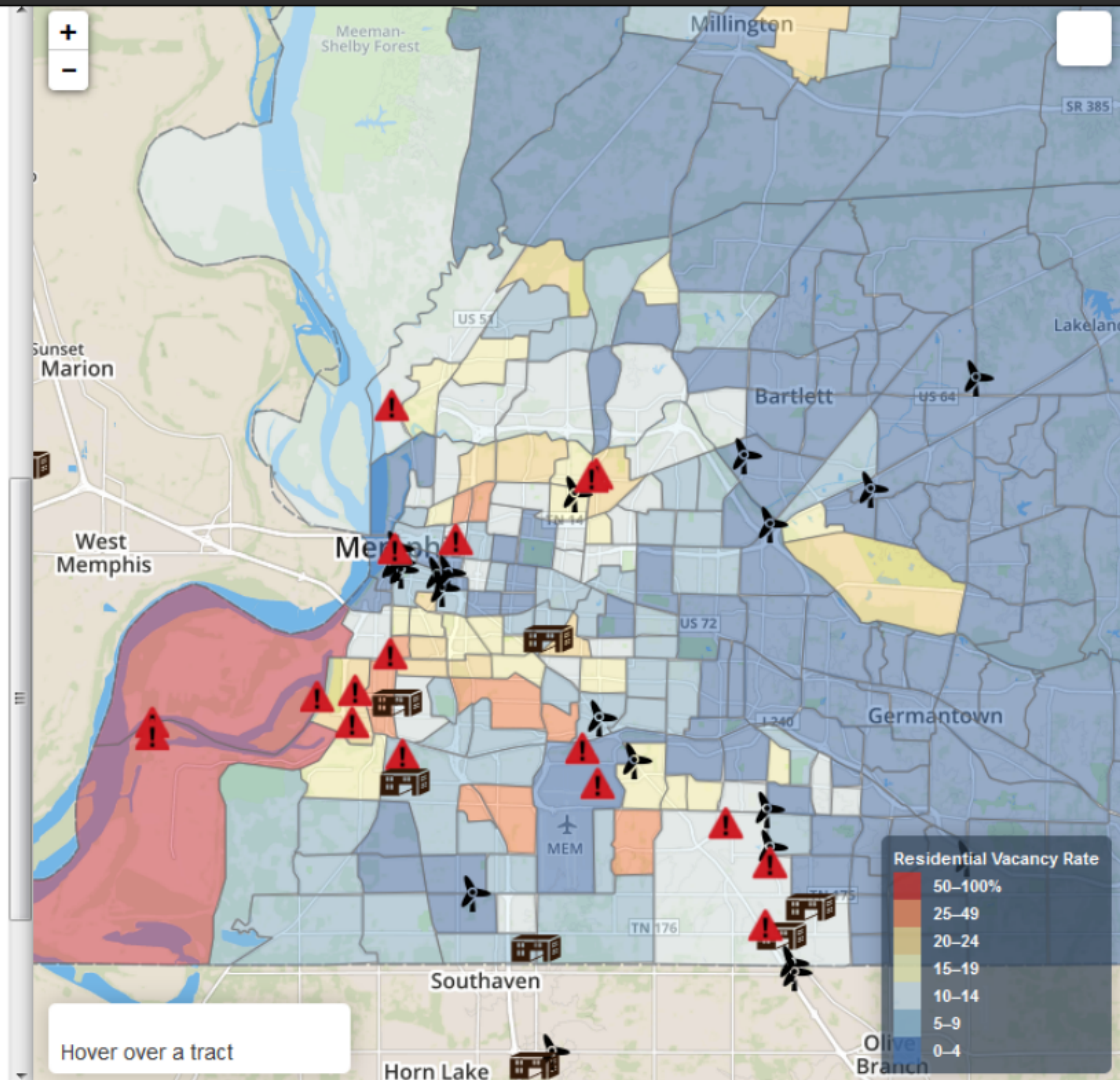
Graphic Summary

Timeline

Statistics

Paper

Maps





The Living with Freight Project: Memphis

What does Livability Mean to Memphis?

Part of the Living with Freight Project includes survey work performed in collaboration with the [...] report. To better understand actual perceptions of livability, we asked questions such as:

- 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.

Voices from Memphis: Excerpts from a 2014 Livability Perception Study

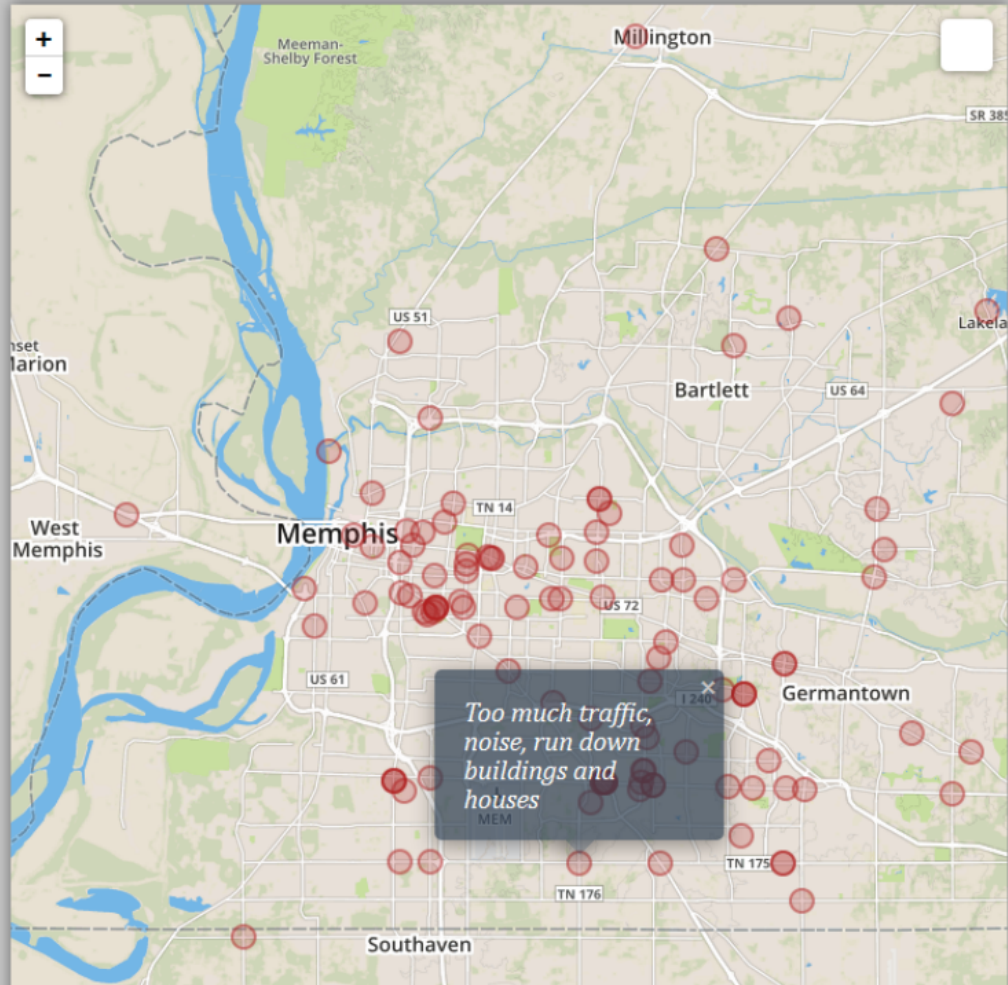
Survey Responses

- 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





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Environmental Justice Indexes

Local air pollutants released by trucks aggravate asthma and cause respiratory impairments for others, as well as leading to lung disease, heart attacks, cancer and even premature death (US EPA, 2014). Concentrations of these pollutants can be several times as high directly adjacent to high volume roadways compared to less trafficked areas.

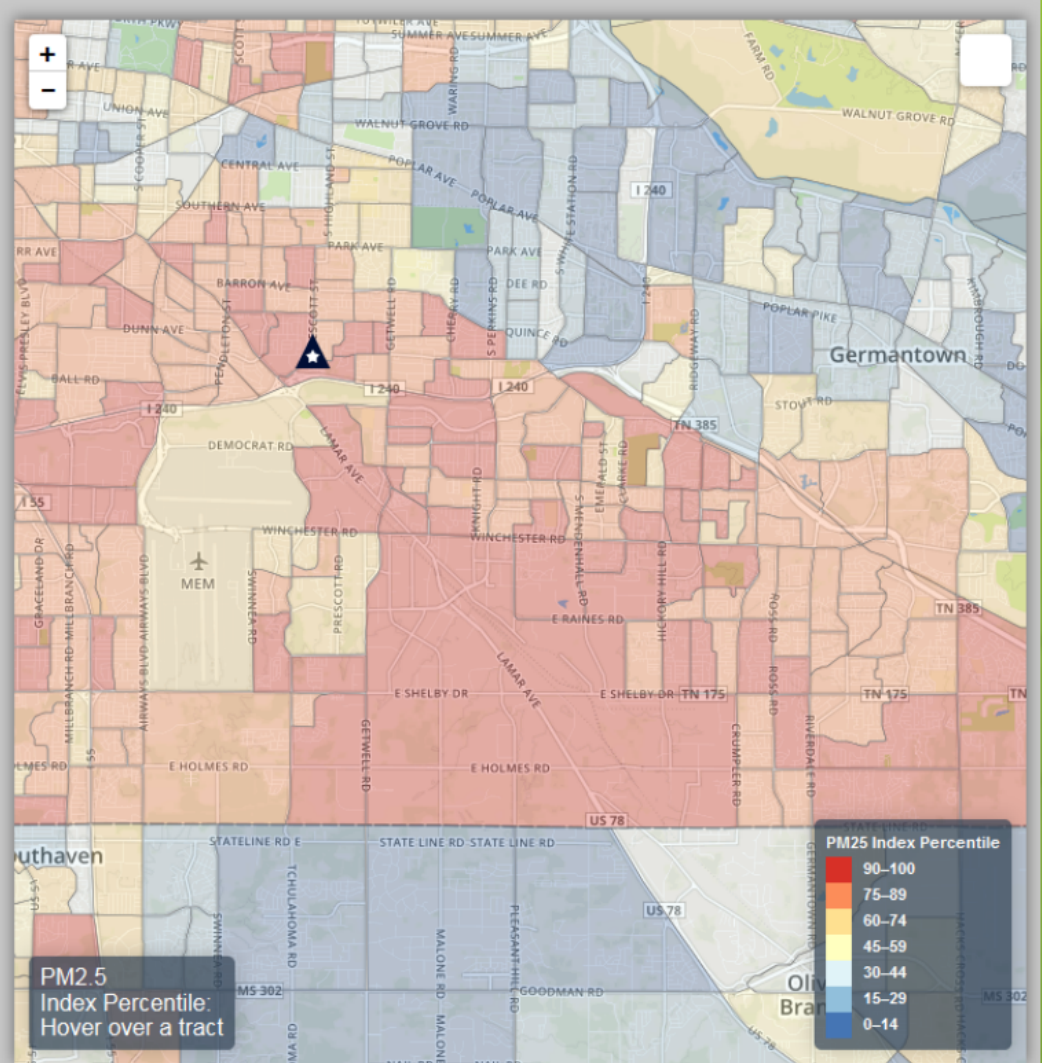
The EPA calculates environmental justice indices based on a combination of pollution measures and demographic characteristics. These indices identify parts of the Lamar Avenue Corridor as falling within the top 95 percent of census blocks in the nation in terms of PM 2.5 and Ozone concerns.

A significant portion of the study area is also in the 95 percentile for the Risk Management Plan (RMP) Proximity Index. Risk Management Plans are prepared by companies which use very hazardous chemicals regulated under the Clean Air Act. This environmental concern is caused by the logistics and manufacturing companies which are located in the Corridor, rather than by the transportation resources directly.

Some businesses have been working to alleviate their contributions to these problems. UPS and

EPA Environmental Justice Data

- PM2.5
- Ozone
- Risk Management Plan
- Neighborhoods of Interest
- Current EPA Monitor Location
- Proposed EPA Monitor Locations



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Improving Livability in Freight-Centric Communities

Despite the challenges of integrating freight into communities, if we return to the six Principles, we can actually see many ways in which freight-centric communities have the potential to be considered livable.

Principle 2 seeks “location- and energy-efficient housing” – a goal that current trends towards suburbanization of freight directly contradict by requiring long commutes. Because of the large share of the economy for which services are responsible today, much discussion of location-efficiency has focused on residential-commercial mixed-use and transit-oriented development. CNT argues for an increased focus on “cargo-oriented development” to increase efficiency of both land-use, transportation infrastructure, and available workforces in our cities.

Slowing the suburbanization of freight and investing in freight-centric communities could also further Principle 2 of the Partnership by providing transportation options to work such as transit, biking, walking, carpooling, taxis, etc, to employees in addition to driving from the city to the suburbs.

Connecting local workforces to jobs could



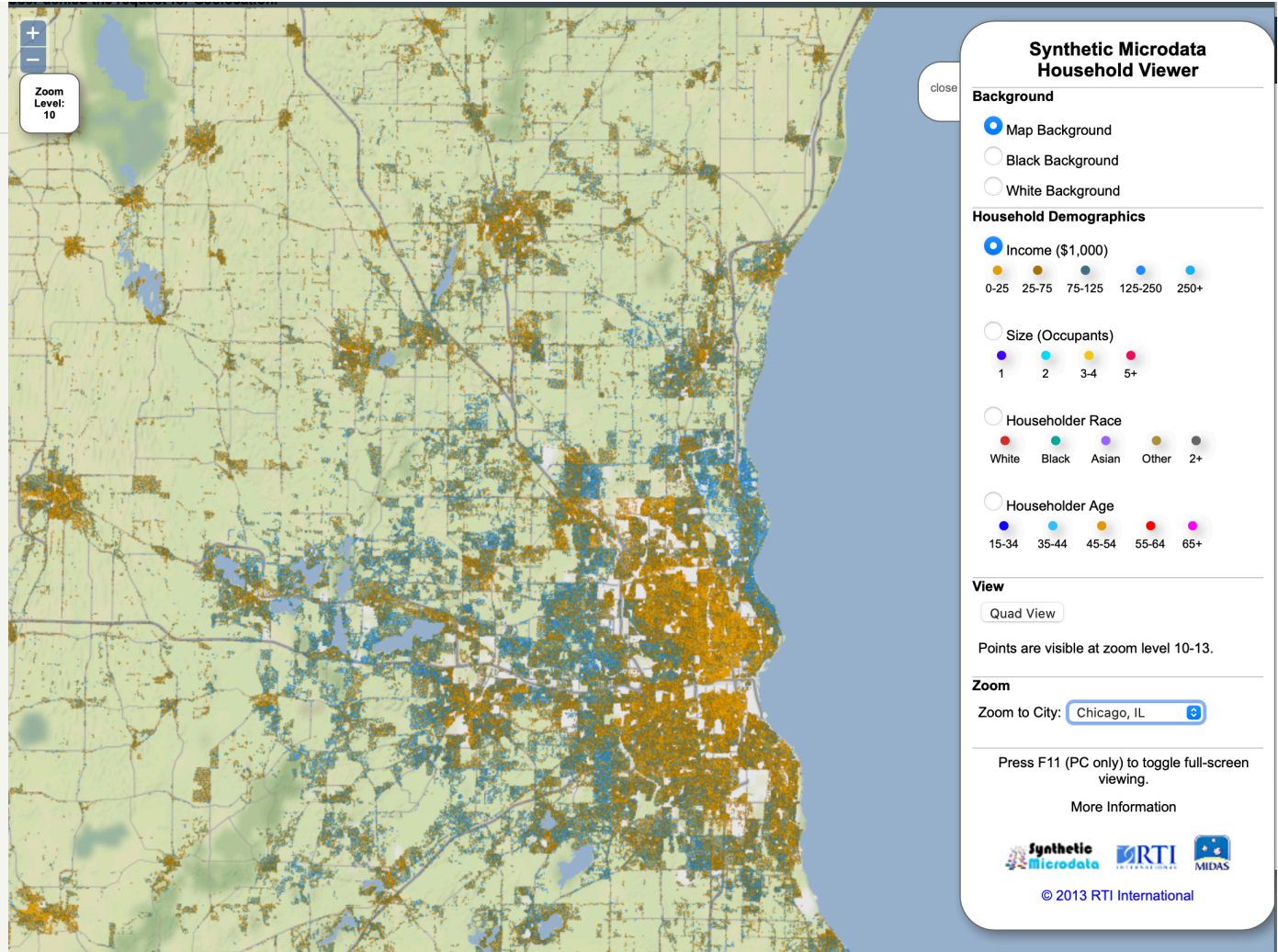
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Freight and Environmental Justice

A considerable concern when examining livability in freight-centric communities is that these areas often have high relative concentrations of disadvantaged populations compared to other communities in a region. This may indicate that the presence of freight in the community lowers property values and causes more advantaged groups to avoid living in the area.

Synthetic data

This concentration of less-advantaged populations along with the environmental externalities of the current freight system raises environmental justice concerns within the corridor. Some of the major issues at stake are local air pollution and noise pollution, especially from trucks. This pollution problem is exasperated by the fact that in some areas there is little to no buffer zone between residences and industrial buildings or high volume roads.



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Noise and Health

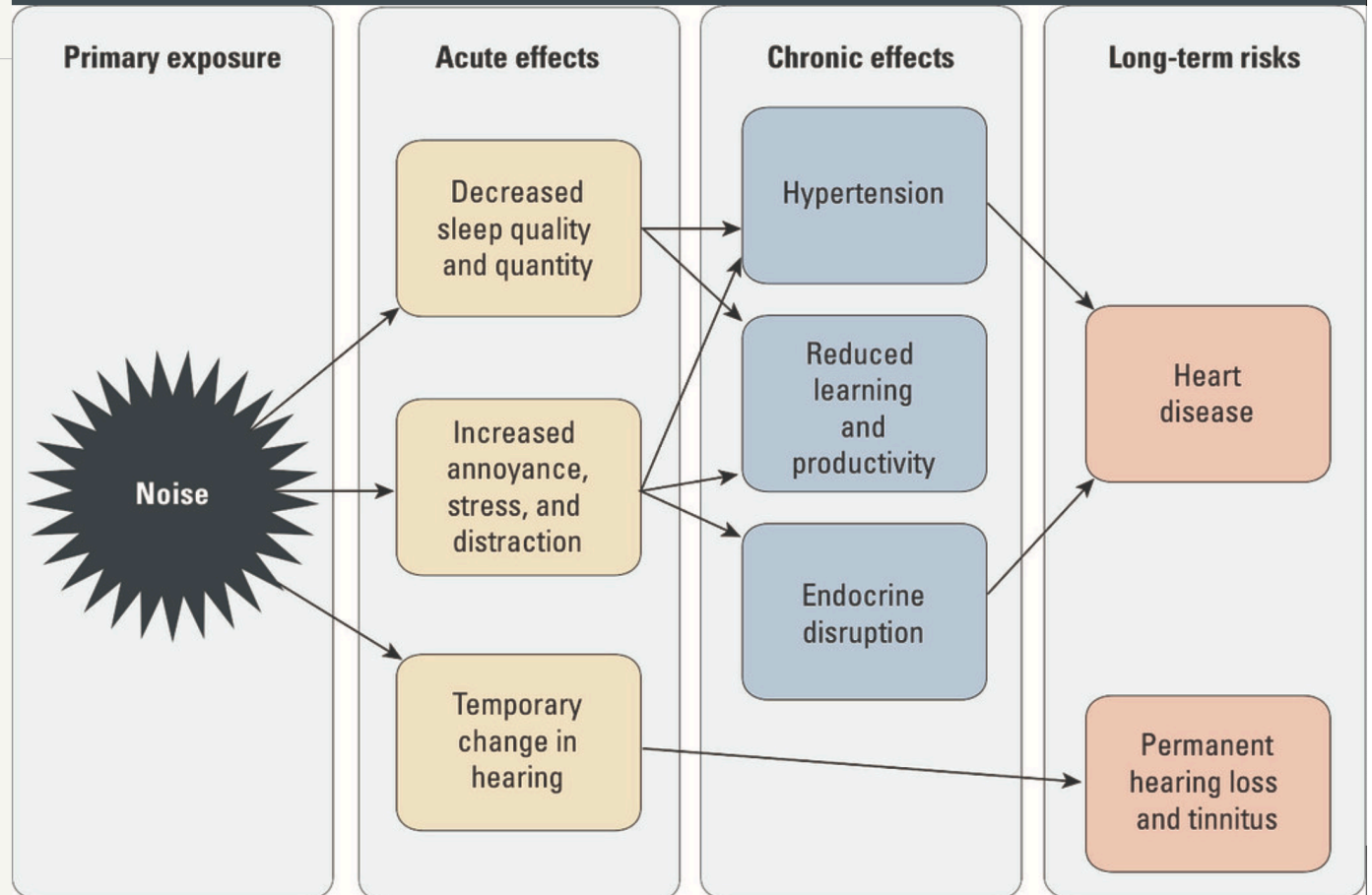
Sound becomes noise when it is “unwanted,” “disturbing,” or disrupts daily activities such as sleeping and conversing (US EPA, 2014). Prolonged exposure to noise can cause hearing loss, lower productivity levels, diminished sleep quality, increased stress levels, and elevated blood pressure (US EPA, 2014).

Nearly 1/3 of the US population experiences continuous average 24-hour noise levels that put them at risk for hearing loss and tens of millions also experience elevated risk of heart disease due to environmental noise levels (Hammer, Swinburn, and Neitzel, 2013).

Much of this noise is caused by road traffic, especially heavy trucks. In the Lamar Avenue Corridor, in addition to very high traffic levels, the rail roads and airport contribute to overall noise levels from transportation and many industrial locations have other onsite noise generating equipment or vehicles.

Image: Effects of Noise on Health

Source: (Hammer, Swinburn, and Neitzel 2013)



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References

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CFIRE Freight Story Maps

Intermodal Terminals in the Midwest

<http://uw-mad.maps.arcgis.com/apps/MapJournal/?appid=08a0a5fb67534bd2bd82db99b44e72fb>

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

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