ENVISION FREIGHT
A ROADMAP TO FREIGHT COMPATIBILITY

CONFLICTING LAND USES AND BARRIERS TO FREIGHT OPERATIONS

A smoothly functioning freight transportation network is essential to the operation of the U. S. economy. However, population growth and economic growth have led to increased market demand for land. This, in turn, has led to competition for land resources near the freight transportation network, as well as competition for the land used by the freight transportation infrastructure, itself. In many instances, the demand for nearby land uses is not fully compatible with the adjacent freight infrastructure and this leads to conflicts between communities and freight operations. Another issue that cannot be ignored in this context is that land provides valuable revenues—through property and commercial taxes—to local jurisdictions.

Demand for affordable land that is situated to city and downtown amenities has also aggravated this issue as many freight facilities are situated in these areas because of their long history

Conflict refers to instances where use of one geographic site for a particular purpose will negatively affect the use of nearby sites for different purposes

All of these competing demands upon land have contributed to a complex situation that many jurisdictions and freight facilities find themselves facing with regard to land use decisions. Because of the high demands for maximizing utility from land (including tax revenues), the siting of other, often incompatible, land-use demands around freight facilities frequently results in conflict between freight operations and alternative uses.

Most residential, educational, and medical related land uses are often incompatible with freight activity. Among the major conflicts non-freight interests have with freight operations are:

- Air and water pollution
- Light pollution
- Noise pollution
- Effects of vibration
- Safety issues
- Congestion

Figures 1 thorough 3 show the main conflicts that arise around air cargo, maritime and industrial yard, and rail activities, respectively.

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FIGURE 1: LAND USES AND CONFLICTS ADJACENT TO AIR CARGO ACTIVITY

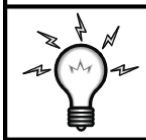
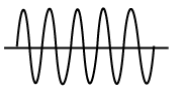
 **Noise Sensitive Uses**	Dwelling units (residential, motels, etc.); educational uses (childcare, schools, colleges, etc.); libraries; hospitals and other residential health care providers; playgrounds.
 **Light Sensitive Uses**	Dwelling units (residential, motels, etc.); and hospitals and other residential health care providers.
 **Vibration Sensitive Uses**	Dwelling units; educational uses; vibration sensitive industries (such as precision high-tech industry); all buildings not constructed to withstand the fatigue caused by rail vibrations.
 **Pollution/Air Quality Sensitive Uses**	Dwelling units (residential, motels, etc.); medical (hospitals and other residential health care providers); educational(childcare, schools, colleges, etc.); recreational uses.
 **Height Sensitive Uses**	Residential and commercial uses that may impact approach and landing flight paths.
 **Time Sensitive Uses**	Night-time sensitive uses.

FIGURE 2: LAND USES AND CONFLICTS ADJACENT TO MARINE/INTERMODAL/TRUCKING ACTIVITY

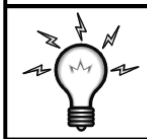
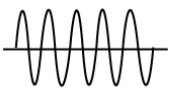
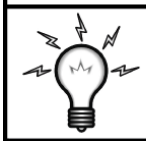
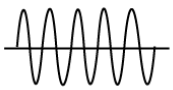
 **Noise Sensitive Uses**	Dwelling units (residential, motels, etc.); educational uses (childcare, schools, colleges, etc.); libraries; hospitals and other residential health care providers; playgrounds.
 **Light Sensitive Uses**	Dwelling units (residential, motels, etc.); and hospitals and other residential health care providers.
 **Vibration Sensitive Uses**	Dwelling units; educational uses; vibration sensitive industries (such as precision high-tech industry); all buildings not constructed to withstand the fatigue caused by rail vibrations.
 **Pollution/Air Quality Sensitive Uses**	Dwelling units (residential, motels, etc.); medical (hospitals and other residential health care providers); educational(childcare, schools, colleges, etc.); recreational uses.
 **Time Sensitive Uses**	Night-time sensitive uses.
 **Traffic and Congestion Sensitive Uses**	Highway and roadway designs; aging infrastructure; capacity.

FIGURE 3: LAND USES AND CONFLICTS ADJACENT TO RAIL ACTIVITY

 **Noise Sensitive Uses**	Dwelling units (residential, motels, etc.); educational uses (childcare, schools, colleges, etc.); libraries; hospitals and other residential health care providers; playgrounds.
 **Light Sensitive Uses**	Dwelling units (residential, motels, etc.); and hospitals and other residential health care providers.
 **Vibration Sensitive Uses**	Dwelling units; educational uses; vibration sensitive industries (such as precision high-tech industry); all buildings not constructed to withstand the fatigue caused by rail vibrations.
 **Pollution/Air Quality Sensitive Uses**	Dwelling units (residential, motels, etc.); medical (hospitals and other residential health care providers); educational(childcare, schools, colleges, etc.); recreational uses.
 **Uses Requiring Potentially Incompatible At-grade Crossings**	Dwelling units; educational uses; libraries; hospitals and other residential health care providers; commercial uses; emergency services.
 **Uses Associated with the Potential for Dangerous Trespass**	Dwelling units; education uses (especially childcare facilities and schools); libraries; playgrounds; commercial uses.

There are many instances in which conflicting uses operate alongside each other and there is no identifiable "conflict" such as a lawsuit. Nevertheless, any time that competing (and, often, incompatible) land uses exist in proximity to one another, there is the likelihood of these uses somehow interfering with each other. This concept is closely tied to the economic concept of externality, where the actions of one party inflict "costs" (such as monetary costs, physical costs, or emotional costs) on another party.

Recognizing conflicting land uses of this nature that already exist or may potentially exist is the first step in the process of planning to avoid or mitigate such conflicts

The conflicts that arise from the incompatibility of some land uses with freight operations often lead to barriers or impediments to the economically efficient transportation of freight.

Barriers are impediments to the economically efficient transportation of freight resulting from conflicts with other types of land uses

Such barriers typically result in higher production and distribution costs. Examples of barriers to efficient freight operations resulting from conflicts with other land uses include:

- Speed restrictions
- Limitations on hours of operation
- Height and clearance impacts
- Size and weight limitations
- Corridor design impacts
- Difficulty of dredging operations and disposing of dredged material

Barriers not only affect freight activities along particular corridors and facilities, but they may also affect route choices and the ability to access freight and manufacturing facilities. For example, if particular roads are designed with turning radii that are too tight, particular types of trucks may not be able to use these routes or access facilities that use these roads.

As noted above, another dimension to these conflicts and barriers is the potential impact on property values. Differing land uses can have adverse effects on landowners due to either rising or falling values, depending on the use involved. For example, freight operations can lower property values because of the noise, vibration, pollution, and general access issues, potentially resulting in pressure from other land owners to move these freight operations. On the other hand, land uses such as residential neighborhoods and commercial districts that are incompatible with freight operations can cause a rise in property values and property taxes, making freight operations in the area more expensive.

Conflicting land uses and resulting barriers to efficient freight operations can arise from a number of sources, including:

- Incompatible zoning policies
- Developmental pressures
- Lack of coordination among overlapping jurisdictions
- Funding issues that affect planning and coordination efforts
- Policy constraints on freight infrastructure that can limit its usefulness
- Infrastructure design issues and structural impediments to freight operations

Ultimately, prevention or resolution of these conflicts and barriers depends on forward-looking land use planning that recognizes the value and importance of freight transportation, and appropriately considers such value in land-use policies.