CONFLICTS BETWEEN FREIGHT AND OTHER LAND USES				
Mode	**Category**	**Conflict**	**Description**	**Impact**
Rail	Safety	At-Grade Crossings	Areas where railroads and roadways cross at the same grade, requiring vehicles to stop if a train is within the crossing zone.	Vehicles, at-grade crossings cause congestion when waiting for trains to cross. Additionally, such crossings may be blocked when a train is parked within the crossing zone but not over the road, as the train is detected by the warning and barrier system (if one is in place). Such crossings present a safety hazard to crossing traffic and surrounding land uses if an accident occurs. At-grade crossings might inhibit emergency vehicle navigation and slow response times. Customer access to commercial businesses might be blocked, leading to decreased sales. For freight operations, the concern and safety hazard of blocked tracks exists. Additionally, speed restrictions are put in place in an attempt to limit accidents at crossings.
Waterway Port	Safety	Navigation Restrictions	Inland waterway navigation is often reduced because of adjacent structures for housing and entertainment.	Along inland waterways with established commercial vessel traffic, such as barges and towboats, housing and entertainment structures, pleasure craft docks, and related permanent and semi-permanent structures. Restrictions can effectively narrow the commercial navigation channel, lower transit speeds, restrict or eliminate capacity, and create wakes.
Rail	Safety	Trespass	Freight facilities are often large, especially in the case of rail tracks, rail yards, and port facilities, and present the possibility of trespass. The presence of unauthorized personnel can be a safety concern with industrial machinery operating.	Safety is the main concern in this respect. Children, teens, and the mentally handicapped are just some of the examples of population segments that could be at risk for trespassing into dangerous freight facilities. Safety is the primary concern for freight operations as well. Accidents from the result of trespass can result in public concern over the operation and its proximity to at-risk segments of the population. Pressure to ban, move, or significantly alter operations could result.

Rail Waterway Truck	Safety	Dangerous Goods	The transportation and storage of dangerous goods (especially the 14 listed hazardous material categories) can pose a severe safety concern for freight operations personnel as well as residential areas.	Hazardous materials require specific handling and routing requirements. All communities in the US have hazardous material routes delineated for safety reasons. However, accidents happen, and freight operational staffers and local communities can be impacted by these toxics.
Rail Intermodal Yards	Safety	Container Storage	Storage of containers on rail sidings and less used routes can pose a concern for communities.	Storage of containers can cause safety, trespass, and visual blight conflicts to arise for both freight private sector groups and the communities themselves.
Rail	Safety	Agricultural Activity	Agricultural landowners often encroach onto railroad ROW by planting crops.	This may be an overlooked area of encroachment, but placing crops on freight real estate can lead to animal/freight interactions, if animals are attracted to this area to feed off crops. Safety issues arise at harvesting time as these may be areas where there are no safety or other measures placed adjacent to the railroad ROW. A driver in a tractor or other piece of farm equipment may not hear the train whistle. Hay storage can also be considered bothersome and a nuisance in some instances.
Rail Air Waterway Port	Safety	Animals	Animals, both wild and domestic, can pose a severe safety concern to all modes of transport when they cross the path of freight operations.	For wildlife, the unnatural elements of freight operations can cut across travel routes that the animals frequent, disrupting their ability to migrate, hunt, and roam. Freight operations can frighten farm animals or household pets, causing stress upon the animals and their owners. For freight operations, wildlife presents an unpredictable obstacle that can cross the path of transport. The most notable examples of conflicting relationships would include ground wildlife/rail, deer/trucks, ground wildlife/trucks, birds/planes, and sea life/maritime operations. An example of the type of restriction that may be put in place is NOAA's finalization of 10 knot speed limit in December 2008 to protect North Atlantic Right Whales in commercial sea lanes off the Northeast Coast of the U.S. Additionally, free-range ranching would require restriction measures surrounding such networks as rail and road corridors.

Rail Air Port Trucking Waterway	Public Annoyance	Noise	Noise from freight operations, such as train whistles, horns, truck braking, plane takeoff/landing, port loading/unloading, and intermodal yard activity can become an annoyance to adjacent types of land use, especially during late hours. Noise can also be accompanied by vibration.	Noise can be an annoyance and lead to complaints to elected officials and freight companies. Disruption of sleep and other prevention of the enjoyment of one's land are the main resulting issues that lead to complaints. For freight operations, the risk of having their activities deemed a nuisance could result in costly or demanding mitigation techniques including: sound barriers, quiet zones, no-jake/air-braking zones, restricted gate or terminal hours, and specifically delineated routes.
Rail Air Port Trucking Intermodal Waterway	Public Annoyance	Vibration	Shaking/trembling caused by the movement of heavy freight and machinery, such as train movement and freight movement at ports. Vibration could result from plane takeoff/landing as well. Vibration is typically accompanied by noise.	Vibration not only can be an annoyance resulting in complaints, but it can also result in actual property damage at certain frequencies over sustained periods of time, which requires additional construction procedures to withstand the vibration. For freight operations, costly mitigation techniques may be required or even lawsuits/settlements for property damages.
Rail Air Port Trucking Intermodal Waterway	Public Annoyance	Light	Light from freight operations, such as landing lights from planes or headlights of trains/trucks. Also could include the large amounts of light needed to move freight at facilities in the night.	Light can be an annoyance and lead to complaints to elected officials. Disruption of sleep and other prevention of the enjoyment of one's land could be a result. For freight operations, the risk of having their activities deemed a nuisance could result in costly or demanding mitigation techniques (time restrictions, walls, light pollution guards).
Rail Air Port Trucking Intermodal Waterway	Environment	Pollution	Pollution can result from various sources, from day-to-day operations to accidents releasing hazardous material into the environment. Engine operation, waste production, dust, and chemical spills/leaks are all examples of pollution opportunities.	Pollution presents various health risks to the public depending on the type. Long-term effects could result from day-to-day operations, while serious short-term effects could result from an accident. Additionally, segments of the population who are more sensitive to pollution could have their complications worsened. For freight operations, public concerns could result in mandates to use pollution reduction options, such as low-emission diesel engines, scrubbers, hybrid vehicles, and water treatment systems. Other restrictions to cut pollution could result in speed restrictions, no idling rules, operational cutbacks, or specific route mandates.

Port/Waterway	Environment	Lock closures to block invasive species	The system of locks used for inland waterway transport relies on the release of massive amounts of water between controlled portions of the waterway. This forms a temporary connection between bodies of water that can facilitate the spread of invasive species. In certain instances, shutting down lock systems has been proposed as a strategy to prevent the spread of invasive species.	Invasive species do present a real threat to local ecosystems. Shutting down a particular lock, however, is unlikely to permanently stop an otherwise uninhibited species from entering a waterway. Human actions and severe weather events can also facilitate the spread of invasive species even when natural barriers have been sealed. Temporary lock closures may be deployed as part of a temporary and targeted strategy to interdict and neutralize an invasive species.
Port/Waterway	Environment	Water quality impacts from dredging	Dredging can temporarily change the salinity or turbidity of surrounding bodies of water. It can also dislodge pollutants deposited from past industrial activities or disturb benthic ecosystems	In most cases, the impacts of dredging are minor and changes in salinity and turbidity that are caused by dredging also occur during natural weather events. The environmental impact from the release of pollutants from undisturbed soils is difficult to predict. It is most commonly a problem in capital dredging projects in which a channel is widened or deepened and is more rarely a problem during routine maintenance dredging which is used to remove recently deposited sediment.
Port/Waterway	Environment	Restrictions of ballast water	Ships and barges release ballast water when arriving in port. This water can contain exotic species from the port in which the ship originally sailed.	The Coast Guard is required to regulate the number of invasive species introduced via ballast water by the National Invasive Species Act of 1996. The Coast Guard has recently taken steps to strengthen the regulations. However, there are concerns from the maritime shipping industry that further regulations could inhibit maritime commerce.
Trucking Rail	Land Planning	Traffic congestion & bottlenecks	Lack of adequately designed infrastructure (poor turning radii, signal timing, etc.), aging infrastructure, and a simple lacking of capacity all can contribute to congestion and bottlenecks. At-grade crossings can also be a part of this conflict.	Congestion and bottlenecks have similar effects on both freight and non-freight travelers. Such conflicts can cause operational safety concerns due to high volumes of infrastructure users. For the public, stalled traffic creates additional pollution concerns and lost productivity. Frustration over large amounts of truck traffic can lead to complaints and demands for restrictions in place. Emergency response services can also suffer a difficulty to providing essentially rapid responses when a corridor becomes congested. For freight operations, the cost of slower transport is incurred, along with safety concerns for train operators whose route goes over busy at-grade crossings and for truckers handling passenger vehicles cutting into their safe-braking buffer. Frustration over truck traffic can lead to route restrictions and tolling.

Rail Waterway Port Trucking	Land Planning	Operational activity	Differing land uses can affect freight scheduling and operations.	Many freight operations require 24-hour operations. As an example, tugs and barges often operate on 24/7 schedule. Without the flexibility to run such schedules, the cost of tug and barge services may rise. Railroads and intermodal yards also cited this is as an ongoing issue/barrier for operational flexibility.

BARRIERS TO EFFICIENT FREIGHT TRANSPORTATION			
Category	**Barrier**	**Description**	**Impact**
Mapping	Lack of Access to Maps	Easy access to maps of freight facilities has led to many jurisdictions having incomplete maps of their cities/regions and the freight network. This leads to poor future planning and to current incompatibilities that arise where residential and other sensitive land use developments abut, or are in proximity to, freight uses.	The impact of poor mapping means that planners and developers may not fully understand the type and intensity of freight activity within an area. This can lead to poor development design and lot layout, and at its zenith, to residential complaints for noise, vibration, and other safety and nuisance concerns. It also often leads to channeling of children onto rail lines as 'shortcut' to get to school and other activities.
Operational	Speed Restrictions/Reductions	Less than optimal speeds for freight movers can result from various sources. Congestion from passenger movement and growth of an area's density and population can make it unsafe for speedy travel through a corridor. Neglected infrastructure can also reduce the speed capacity of a segment.	Speed restrictions—often instigated to appease community concerns—limit the capacity of infrastructure, especially on railroads. They also limit shipping availability and can restrict just-in-time supply chains. Speed reduction due to congestion creates uncertainty that must be priced with the cost of doing business.
Operational	Height Impacts (trucking and rail)	Height in terms of new structures being built on the highway side can also impact both rail and trucking operations.	New structures and infrastructure that is built can reduce existing height clearances for the trucking industry. This will impact the availability of route choice for trucks. In other instances, height restrictions impact the operation of double stack containerized trains. Again, this can lead to bottlenecks and reduced operational times, affecting JIT manufacturing.

Operational	Height Impacts (airports)	Height issues caused by tall developments around airports impact flight paths and approach and departure procedures, often leading to airline payload penalties.	These are growing increasingly challenging at urban airports that are surrounded by tall developments. Airport operators are working aggressively to protect airspace around them. Airport operators typically lack the zoning authority to limit building heights off-airport, and federal regulations lack teeth to ensure that approach and departure procedures aren't adversely impacted by tall structures off-airport. This can result in airline payload penalties (which often hit cargo carriers hardest) and, in worst case scenarios, can limit effective use of runways by arriving and departing aircraft.
Operational	Size and Weight Impacts (trucking)	Rules and regulations placed regarding size and weight (specifically for trucking) can impact the ability to move these loads efficiently	Conflicts are growing around many ports that are importing and exporting large 'one-off' type pieces of equipment, for example wind turbines and wind towers and blades. These large items may need to be drayed to a rail yard for rail shipment and then drayed from rail to their final destination. In many instances, local communities are restricting the routes that can be utilized for such loads. This leads to bottlenecks and to the inability to effectively manage large load movements of such manufactured items.
Operational	Highway and Roadway Design	Highway and road design often lead to difficulties for the trucking industry in terms of turning radii and other elements coming into and out of freight and manufacturing facilities.	As an example, concrete islands in the centers of roadways can limit right hand turns for trucks. Other structures built in roadways, often built under the rubric of 'context-sensitive-solutions' to improve roadway aesthetics, can also affect capacity.
Operational	Truck Idling Restrictions	Truck idling restrictions are always put into place in areas that are classed as non-attainment for air quality. Other jurisdictions also chose to enact idling restrictions from a health and safety perspective.	Idling restrictions, while much needed, can create other operational stresses that have to be mitigated throughout the supply chain. They can reduce route choice, could potentially require more truck idling rest areas, and can tap into an environmentally friendly fuel supply, as drivers adhere to their mandated rest times under Hours of Service Rules imposed upon truck drivers.
Operational	Channel Depth	Ensuring channel depth for waterways requires dredging that necessitates acquiring permits and Corps of Engineers approval.	The process for dredging is long and convoluted, usually requiring NEPA analysis and other legal reviews. With the development of larger container ships, dredging has become a critically important component for many ports to ensure their economic well-being. The Army Corps of Engineers is responsible for dredging activities at ports, the GIWW, and Mississippi River.

Operational	Shared Use of Corridors	In many instances, local jurisdictions are reviewing the opportunity to utilize existing freight corridors for commuter service.	Shared use corridors, while presenting opportunities for commuter rail development, may find over the longer-term that developing transit oriented developments adjacent to these corridors can cause community conflicts. This is because, in many instances, freight traffic is temporally shifted (usually to night-time service), leading to residents facing noise, vibration, and whistles at grade crossings during the nighttime freight service.
Planning	Development Pressures/Power	Development can be a highly profitable business, and that can often bring about a heavy influence over land use and policy.	Pressure and power from the development community can lead to the development of the most profitable project, which may not be a compatible use to nearby freight operations. This can then lead to many of the conflicts listed in the Conflicts table. Difficulty to expand or improve operation can result for the freight operations. Additionally, such pressure and power can thwart or complicate long-term planning efforts, such as transportation and/or freight plans for a region, as well as for future expansion of freight facilities.
Planning	Permit and Environmental Review Processes	Permit processes can forestall efficient implementation of freight facilities.	Some freight facilities take years to come to fruition because of slow permitting processes and the length of time to conduct environmental reviews and, in some cases, confusion over whether a NEPA review is required. Upgrades and additions to freight facilities can also spur conflicts with local communities. This has been especially prevalent in airport upgrade and improvement projects. Because of the complex interplay between the various jurisdictions who are responsible for airports, projects can take many years to be completed and can impact the ability of all-cargo airports to effectively continue or increase business opportunities.
Planning	Development of Open Space	Increasing property values and/or the need for more development has at times reduced or eliminated this space.	Open space is often used for buffering incompatible land uses and freight operations. The reduction of this space in favor of development can lead to many of the conflicts that are prevented by the space to become apparent, leading to many of the impacts described in the Conflicts table. It can also alter water management, which may affect freight operations through flooding.

Planning	Reuse of Abandoned or Banked Facilities	Abandonment of railroads has occurred over the past 30 years. Many communities do not realize that the abandonment process is often a 'holding' process to keep access to the ROW for potential future use.	Over the past 30 years, many railroad rights-of-way have been abandoned by the railroad and either purchased by the DOT or local jurisdiction for banking or utilized for interim trail use. Subdivisions have been built up around these corridors, and home buyers are often told that the corridor will be converted for trail use. If a railroad wishes to recommence services, communities will often coalesce to stop resumption of rail service.
Planning	Property Value	Differing land uses can have adverse effects on each use's property value, which includes both rising and falling values depending on the use involved.	For incompatible uses, freight operations can lower property values due to many of the conflicts documented here. For freight operations, increased incompatible land uses such as residential neighborhoods and commercial districts can cause a rise in property values. This in turn makes it more expensive to operate in the area and potentially results in pressure from other land owners to move the operation due to the opposite effect the industrial land use has on the incompatible land uses or because of the development potential the industrial site has.
Planning	Airport Zoning	While there are federal policies and local zoning rules to protect airports from incompatible land use, the FAA cannot enforce local formal zoning rules, and cities and counties are often pressured to remove zoning restrictions by developers.	Because there is no federal preemption to effectively enforce FAA rules, encroachment around airports has become an issue. While the FAA has provided grants to mitigate for noise and grants for airports to purchase properties, conflicts still arise. Litigation has also occurred around airports when zoning rules have been changed that have limited the height or other aspects of buildings.
Funding	Cost/Funding Availability	The cost of acquiring land for preservation or expansion is becoming increasingly burdensome, while funding sources can fluctuate in availability but are generally declining.	The ability of local governments and other government agencies that have land acquisition powers for preservation/expansion purposes continues to become more costly, especially in areas where development has already occurred or in highly-valued locations. This makes it difficult to buy excess land for future use. Additionally, there are a growing number of funding-seekers for a decreasing pool of funding. Historically, freight rail has not been given public funding. Recently, this has begun to change, but freight rail projects still compete with passenger projects that are often more visible to the public. This can result in difficulty gaining funding, unless the project has a passenger transport value as well.

Funding	Acquisition Methods	The methods available to involved agencies to acquire land for preservation or expansion sometimes varies by state and can often be limited.	In areas where the government or its agencies are heavily limited in their ability to acquire land, the ability to adequately plan and reserve space for expansion is difficult. This can increase the cost of transportation development. Railroads are also reluctant to use their condemnation power given the current political climate since the *Kelo v. New London* decision.
Funding	Dredging and Lock Maintenance	Funding for lock maintenance and dredging is limited and therefore requires the Corps of Engineers to prioritize projects across the entire marine network.	In areas where recreational boating and marine activities lie in close proximity to marine activities, the ability to maintain channel depth is especially critical for continued port viability. Historically, Corps maintenance and dredging funding has been considered to be severely underfunded. This has impacted maintenance and dredging activities.
Communication	Communication from Private Sector	Historically, the freight community has not engaged within the community, attended planning meetings, or been 'visible' in the community.	The historic lack of effective and ongoing communication has often led to a 'them-and-us' type dynamic between freight, local planners, developers, and citizens. In many instances, the different planning horizons led freight to not be involved in long-range and other planning initiatives. This meant that these agencies did not learn first-hand the issues surrounding freight and potential impacts, and most importantly, they did not fully understand the value that the freight system brought to their community in jobs, taxes, and other economic benefits. Non-engagement also meant that educational institutions have often not taught freight in planning and other policy-type classes, as they have not known who to call in freight groups to discuss freight planning.
Education	Lack of Freight-Awareness	Freight is not always on the list of concerns for agencies or local governments that may have authority to program funding for freight projects in their policy documents. Often this can be attributed to simply a lack of awareness as to the importance of freight networks to a region.	The lack of freight awareness can result in many of the items in the Conflicts table. Increasing the awareness of freight operations could reduce the likeliness of incompatible land uses. Additionally, freight plans can provide a glimpse at what are the important freight corridors in an area and what the future freight goals of an area might be. Again, the lack of awareness can lead to unknowingly conflicting development.

Education	Outdated Perceptions	Various perceptions of freight transportation exist, often related to the lack of freight-awareness. Such things as the belief that rail is not an important mode of freight transport is an example.	Outdated perceptions can make freight activities, however important, unpopular despite any attempts to mitigate possible conflicts. This can make freight advancements difficult to push in a community and hurt the importance of all modes of transport.
Government	Multitude of Government Layers/Overlapping Jurisdictions	As an example, a single location can often fall under the jurisdiction of multiple government entities, from local governments to water districts.	Organizing various layers and agencies of government with various concerns and directives can be burdensome to traverse when attempting to complete a large project. A jurisdiction that knows it is one of the remaining areas to approve a project could use their position in an attempt to gain more concessions out of the project, causing delays and cost increases. The threat of a jurisdiction refusing to cooperate at all is also a possibility, leading to perhaps a less desired option that is more costly and difficult to accomplish. This burden could be so severe as to prevent advancement altogether.
Government	Political Will	Freight projects and policy often do not receive the political importance as other options, such as passenger rail-related options and highway funding items. It is often politically difficult to convince the public to provide public funds to projects that will benefit the private sector.	Freight projects do not provide much political visibility for elected officials, thus they often do not receive the attention they might need. Additionally, policies such as overlay districts and freight-related zoning, along with proper land use coexistence measures, have yet to receive heavy political backing in many areas. They can be legally difficult at times, thus officials may avoid them. Such tools could positively guard against the items listed within the Conflicts table, but the lack of political will results in the status quo of development policy. The lack of political will is a result of a variety of causes, which probably include the search for local tax base from new development, a desire for an attractive built environment, the votes of residents placed in opposition to non-resident freight operators, ignorance of the importance of freight among both elected officials and their constituents, and dislike for all the negative impacts of freight (noise, congestion, etc.). There is also something of a “tragedy of the commons” that happens—it is in each locality’s individual self-interest to support other uses at the expense of freight, but it is in the collective interest of all to support freight.

Staffing	Labor Issues at Ports	Labor groups at ports often implement new rules for members that impact surrounding communities.	Labor organizations have begun to refuse to work while trains are entering into port facilities, leading to operational impediments and the back-up of other freight components in local neighborhoods, often many miles from the ports' operations. Some labor organizations have also begun to implement stricter 'break-time' rules which affect the operational capacity of freight facilities. This has been especially noticed at the Port of LA/Long Beach and has led to both trucks and freight trains having to 'wait' until staff return from such breaks.
Staffing	Ongoing Labor Staffing and Training Issues for the Industry	There will be a critical need in the next twenty years for highly qualified and competent freight staffers.	The labor staffing and training issues for the freight industry are an ongoing problematic issue. The U.S. trucking industry's human resources component has been cited as needing many more drivers over the next twenty years to handle the expected trucking expansion because of continued global trade expansion. Similarly qualified engineers and other locomotive staff for the shipping and railroad industries will cause barriers for efficient freight movement.