

441 G St. N.W.
Washington, DC 20548

March 8, 2021

The Honorable Brian Schatz
Chair
The Honorable Susan Collins
Ranking Member
Subcommittee on Transportation, Housing and Urban Development, and Related Agencies
Committee on Appropriations
United States Senate

The Honorable David E. Price
Chairman
The Honorable Mario Diaz-Balart
Ranking Member
Subcommittee on Transportation, Housing and Urban Development, and Related Agencies
Committee on Appropriations
House of Representatives

Commercial Shipping: Information on How Intermodal Chassis Are Made Available and the Federal Government's Oversight Role

Containerized shipping—performed by oceangoing vessels using standardized shipping containers—accounted for approximately 60 percent of all world seaborne trade, which was valued at approximately \$12 trillion in 2017.¹ At a port, shipping containers are placed on “intermodal chassis” (chassis)², standardized trailers that carry shipping containers and attach to tractors for land transport.

Some stakeholders have expressed concerns about chassis provisioning, including requirements where only certain chassis may be used to move a shipping container, unless drivers use their own chassis. These requirements could affect the efficiency of moving containers, as extra care is needed to match the container and chassis, and drivers may need to change chassis if moving more than one container during the day. Additionally, chassis have sometimes been reported as being in poor operating condition, which could potentially cause delays in the movement of cargo if a driver must wait for the chassis to be repaired or replaced in order to meet safety regulations.

While the movement of shipping containers is largely a private sector endeavor, there are two federal agencies involved in the oversight of chassis: the Federal Maritime Commission (FMC)

¹Bethany Stich, James Amdal, Ian Butler-Severson, Dennis Thornton, and Peter Webb, University of New Orleans Transportation Institute, *White Paper on International Chassis* (2017).

²For purposes of this report, we refer to “intermodal chassis” as “chassis.” Other chassis types exist—for example, domestic chassis, which carry non-international shipping containers—but are outside the scope of this work.

and the Federal Motor Carrier Safety Administration (FMCSA) within the Department of Transportation. FMC oversees ocean carriers providing service in the United States and works to ensure a competitive and reliable ocean transportation supply system. FMCSA, among other things, establishes regulations for commercial vehicles, including chassis, to ensure that they are being safely operated.

Senate Report 116-109—incorporated by reference into the explanatory statement accompanying the Further Consolidated Appropriations Act, 2020—contained a provision for GAO to study intermodal chassis.³ This report describes selected stakeholders' views on: (1) the ways in which chassis are made available for the movement of shipping containers and the benefits and drawbacks of those models, and (2) the federal government's role in the chassis market. This report provides a summary of our findings related to these objectives; for more detailed information on our findings, see the attached enclosure, which provides the finalized version of a briefing that we provided to your staffs in December 2020.

To address these objectives, we reviewed relevant reports on chassis provisioning and federal oversight. We interviewed representatives from FMC, FMCSA, five industry associations, and the three largest intermodal equipment providers. We also interviewed three ocean carriers, five port operators, and a motor carrier selected, in part, for their large number of container movements. The information we obtained from these interviews provides a broad perspective of relevant issues but is not generalizable to all entities.

We conducted this performance audit from April 2020 to March 2021 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Shipping containers have standardized dimensions and do not include wheels, so chassis are needed to transport the container over land. Multiple entities are involved in the movement of shipping containers:

- **Intermodal equipment providers** (IEP) own and provide chassis for a fee for container moves and may also lease chassis for long-term use.
- **Ocean carriers** transport cargo over water, often using shipping containers.
- **Motor carriers** provide truck transportation for shipping containers via chassis between inland destinations and ports.
- **Port operators** provide gateways for the movement of international goods between navigable waterways and landside transportation systems, such as highways.
- **Shippers** are the persons or companies that are the supplier or owner of the cargo being shipped.

³S. Rep. No. 116-109, at 162 (2019).

The logistical and financial arrangements underlying the movement of shipping containers typically fall under one of two types of agreements. Under one agreement, a shipper contracts with an ocean carrier to provide door-to-door transportation for the cargo, including to its final destination. Under the other agreement, the shipper contracts with both an ocean carrier to deliver a shipping container to a port, and with a motor carrier to deliver the cargo to its final destination. Ocean carriers, shippers, and truckers may each have contractual agreements with IEPs, which include negotiated fees for the use of the chassis.

Multiple Models Are Used to Make Chassis Available to Transport Shipping Containers, Stakeholders Identified Benefits and Drawbacks of Each

Four distinct models are used to make chassis available to motor carriers, each with benefits and drawbacks according to the entities we interviewed.

- **Single Chassis Provider Model:** In a single chassis provider model, chassis are owned by an IEP, which directly provides the chassis to a shipper or motor carrier and charges a rental rate. The IEP manages the chassis, controls their supply, and is responsible for maintenance and repair of the chassis.
- **Motor Carrier-Controlled Model:** Motor carriers can own or hold a long-term lease for a chassis. Motor carriers are typically responsible for maintenance and repairs on the chassis, including those being leased long-term.
- **Gray Pool Model:** Under the gray pool model, a single pool manager oversees the operations of a pool that is made up of chassis contributed by multiple IEPs. A gray pool is designed to allow interoperability of all chassis, in that the motor carrier may select any chassis in the gray pool, regardless of who owns the chassis, to transport any shipping container. Like some of the other chassis provisioning models, gray pools can serve multiple pickup and drop off points (also referred to as start/stop locations) within a large geographic area.
- **Pool-of-Pools Model:** The top three chassis providers created the pool-of-pools at the Ports of Los Angeles and Long Beach by agreeing to cooperate with each other. Each of the IEPs operates and manages its own pool, but motor carriers are free to pick up and drop off chassis at any IEP pool location. As with the gray pool, the chassis are considered “gray” and interoperable. However, unlike the gray pool, in the pool-of-pools each IEP is responsible for and continues to manage its own chassis fleet in regard to operating rules, maintenance, and repair.

While some models were developed to increase efficiencies in the use of chassis, the entities we interviewed identified multiple benefits and drawbacks to each of the chassis provisioning models. Regarding benefits, for example, both the single chassis provider model and the motor carrier-controlled model allow IEPs and motor carriers to have direct control over the maintenance and repair of their chassis, something these entities potentially lose under other chassis provisioning models. Further, the gray pool and the pool-of-pools models can resolve many of the logistical concerns regarding the use of chassis, leading to operational efficiencies for port operators and the ability of motor carriers to choose whatever chassis they wish. Regarding drawbacks, cost considerations were identified in some cases. For example, under the single chassis provider model, two IEPs told us that while an expected part of the business, repositioning chassis to ensure there is a sufficient supply of chassis where they are needed can be costly to the IEPs. An IEP and a trade association told us that a gray pool model is able

to operate with fewer chassis to meet peak demand periods than might be needed under the single chassis provider model. This is, in part, because the chassis are “interoperable,” meaning that any chassis in the pool may be used by any motor carrier to move any ocean carrier’s shipping container. However, under the gray pool model, the gray pool manager—and not the IEPs—oversees maintenance and repair services on chassis contributed to the pool. According to the three IEPs we spoke with, the gray pool manager does not have an incentive to minimize the costs of maintenance and repairs because these costs are passed on to the IEPs.

While entities we interviewed identified benefits and drawbacks of each chassis provisioning model, more than one model may be available at a port. Regardless of the models available, chassis availability issues can sometimes occur. According to two IEP representatives, when such issues occur there is generally a wider scale issue with chassis supply and demand being unbalanced. This imbalance can happen for many reasons, and in 2020 the chassis market experienced wide fluctuations in demand due to the effects on the movement of cargo caused by the COVID-19 pandemic. Representatives from an IEP told us cargo shipments to the United States were drastically reduced and that IEPs and pool managers were asked to place chassis in storage. However, as cargo shipments increased later in 2020, some ports began experiencing chassis shortages. An IEP and a trade association told us that chassis were effectively provided and shortages avoided at some ports under both pooled and non-pooled models.

The Federal Government Oversees Chassis Safety and Has a Limited Economic Oversight Role

FMCSA and FMC are each involved in areas of oversight related to chassis. FMCSA employs several inspection methods to help oversee chassis safety and compliance with regulations. For example, inspectors perform roadside inspections on commercial vehicles, including chassis, in operation. FMCSA data show that from 2010 through 2019, the most common chassis roadside inspection violations were for problems with brakes and lighting. One stakeholder we spoke with stated that FMCSA should consider maintaining safety ratings for IEPs, as is currently done for motor carriers. FMCSA officials told us that they use the motor carrier safety rating system to direct limited inspection and investigation resources, and added that the current processes provide sufficient information to select IEPs for investigation.

FMC oversees ocean carriers that provide service to and from the United States and works to ensure a competitive and reliable ocean transportation supply system. For example, FMC reviews and monitors agreements between relevant parties to ensure they do not cause unreasonable increases in transportation costs or unreasonable decreases in transportation services. According to FMC, in general, to the extent that ocean carriers engage in agreements to discuss or provide chassis or form chassis pools, the agreements must be filed with FMC and comply with relevant statutes. Further, FMC issues rules to guide the interpretation of provisions of the Shipping Act of 1984, as amended (Shipping Act).⁴ Among other things, the Shipping Act’s purpose is to establish a nondiscriminatory regulatory process for the common carriage of goods by water in the foreign commerce of the United States with a minimum of government intervention and regulatory costs. Entities may file complaints with FMC to allege violations of

⁴Pub. L. No. 98-237, 98 Stat. 67 (1984) (codified as amended at 46 U.S.C. §§ 40101-41309).

the Shipping Act.⁵ None of the entities we spoke with identified additional actions they would like for FMC to take regarding chassis.

Agency Comments

We provided a draft of this report to FMC and the Department of Transportation for review and comment. We also provided a draft of this report to the Intermodal Motor Carrier Conference/American Trucking Associations; the Ocean Carrier Equipment Management Association; Direct ChassisLink, Inc.; FlexiVan; and TRAC Intermodal for review and comment. We received technical comments from FMC; the Department of Transportation; the Ocean Carrier Equipment Management Association; Direct ChassisLink, Inc.; and TRAC Intermodal, which we incorporated, as appropriate.

We are sending copies of this report to the relevant congressional committees, the Chairman of the Federal Maritime Commission, and the Secretary of Transportation. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or vonaha@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are Maria Edelstein (Assistant Director); Daniel Paepke (Analyst-in-Charge); Amy Abramowitz; Geoff Hamilton; Gina Hoover; Grant Mallie; Krinjal Mathur; Michael Mgebroff; Joshua Ormond; Pamela Snedden; and Michelle Weathers.



Andrew Von Ah
Director, Physical Infrastructure

Enclosure

⁵One such complaint was filed in August 2020, in which the complainants allege, among other things, that although ocean carriers do not own chassis, they still control the operation of chassis pools at ports. FMC's online docket system indicates that an initial decision on the complaint is expected in August 2021.

March 2021



A Century of Non-Partisan Fact-Based Work

Commercial Shipping

Information on How Intermodal Chassis Are Made Available and the Federal Government’s Oversight Role

Objectives, Scope, and Methodology

Senate Report 116-109—incorporated by reference into the explanatory statement accompanying the Further Consolidated Appropriations Act, 2020—contained a provision for GAO to study intermodal chassis.¹

This briefing describes selected stakeholders’ views on: (1) the ways in which chassis are made available for the movement of shipping containers and the benefits and drawbacks of those models, and (2) the federal government’s role in the chassis market.

To address these objectives, we reviewed relevant reports on chassis provisioning and federal oversight. We interviewed representatives from FMC, FMCSA, five industry associations, and the three largest chassis providers (known as intermodal equipment providers (IEP)). We interviewed three ocean carriers, five port operators, and a motor carrier selected, in part, for their large number of container movements. The information we obtained from these interviews provides a broad perspective of relevant issues but is not generalizable to all entities. We also reviewed FMCSA crash and inspection data from fiscal year 2010 through 2019 and found these data to be sufficiently reliable for describing general safety issues.

We provided content from this briefing to FMC, FMCSA, three IEPs, and two trade associations for their review and comment. We incorporated the comments we received, as appropriate.

View [GAO-21-315R](#). For more information, contact Andrew Von Ah at (202) 512-2834 or vonaha@gao.gov.

Introduction

Containerized shipping—performed by oceangoing vessels using standardized shipping containers—accounted for approximately 60 percent of all world seaborne trade, which was valued at approximately \$12 trillion in 2017.² Upon arrival at a port, shipping containers are placed on “intermodal chassis” (chassis)³, standardized trailers that carry shipping containers and attach to tractors for land transport (see fig. 1). All chassis are composed of a steel frame, tires, brakes, and a lighting system; some may include other capabilities, such as GPS. Within the United States, some stakeholders have expressed concerns about chassis, including limited availability of chassis in some circumstances, as well as the age and safety of chassis.

There are two federal agencies that are involved in areas of oversight related to chassis: the Federal Maritime Commission (FMC) and the Federal Motor Carrier Safety Administration (FMCSA). FMC oversees ocean carriers providing service in the United States and works to ensure a competitive and reliable ocean transportation supply system. FMCSA, among other things, establishes regulations for commercial vehicles, including chassis, to ensure that they are safely operating.

Figure 1: A Shipping Container Being Placed on an Intermodal Chassis



Source: TRAC Intermodal® | GAO-21-315R

¹S. Rep. No. 116-109, at 162 (2019).

²Bethany Stich, James Amdal, Ian Butler-Severson, Dennis Thornton, and Peter Webb, University of New Orleans Transportation Institute, *White Paper on International Chassis* (2017).

³For purposes of this report, we refer to “intermodal chassis” as “chassis.” Other chassis types exist—for example, domestic chassis, which carry non-international shipping containers—but are outside the scope of this work.

Chassis Stakeholders

- **Intermodal equipment providers** own and provide chassis for a fee for container moves and may also lease chassis for long-term use; in such cases, the lessee user is typically responsible for all chassis maintenance. According to one of the IEPs we spoke with, as of 2016, three IEPs owned 74 percent of all chassis used in North America.
- **Ocean carriers** conduct international transportation of cargo over water, often using standardized shipping containers. In some cases, ocean carriers are responsible for arranging the transportation of the cargo over land.
- **Motor carriers** provide truck transportation for shipping containers via chassis between inland destinations and ports. Motor carriers may move one or more shipping containers in a single day.
- **Port operators** provide gateways for the movement of international goods between navigable waterways and landside transportation systems, such as the Interstate highway system. There are two categories of ports: (1) “non-operating” or “landlord” ports that lease land to entities known as “terminal operators” that are engaged in business at the port and (2) “operating” ports that manage the business at the port, including the management of chassis provisioning.
- **Shippers** are the persons or companies that are the supplier or owner of the cargo being shipped.

Background

Chassis are used in the movement of shipping containers between a port, where cargo is loaded and unloaded from a ship, to an inland destination, such as a warehouse or distribution center.⁴ Shipping containers have standardized dimensions and do not include wheels, so chassis are needed to transport the container over land. To pick up a shipping container at a port, a tractor driver will either obtain a chassis then have a container placed onto it, or connect a tractor to a chassis that already has the container on it. The driver will then exit the port to deliver the container to its next destination. Historically, chassis in the United States were owned by ocean carriers and their use was included in the full cost of moving a shipping container from origin to final destination. However, in an effort to reduce costs and in line with models of chassis provision in other countries, many ocean carriers have divested themselves from chassis ownership and shifted these responsibilities to IEPs.

In some instances, ocean carriers require their shipping containers only be moved on chassis owned by an IEP designated by the ocean carriers, unless the motor carrier provides its own chassis. These requirements could potentially diminish the efficiency of moving containers, as extra care is needed to match the container and chassis, and drivers may need to change chassis during the day if moving containers for different ocean carriers. Additionally, chassis have sometimes been reported as being in poor operating condition, which could potentially cause delays in the movement of cargo if a motor carrier must wait for the selected chassis to be repaired or replaced in order to meet safety regulations.

The logistical and financial arrangements underlying the movement of shipping containers typically fall under one of two types of agreements: “carrier haulage” or “merchant haulage.” Under carrier haulage, a shipper contracts with an ocean carrier to provide door-to-door transportation for the cargo, including both the oceangoing portion and the overland transport from port to an inland destination, such as a warehouse, by a motor carrier. Under merchant haulage, the shipper contracts with the ocean carrier to deliver a shipping container over water to a port, and separately contracts with a motor carrier to provide the overland delivery from port to final destination (see table 1). Ocean carriers, shippers, and truckers might each have contractual agreements with IEPs, which include negotiated fees for the use of the chassis.

⁴Chassis may also be used at rail terminals. Containers are placed on railcars, moved to a rail terminal, and then placed on a chassis for transport to an inland destination. Our work focused on ports and not rail terminals.

List of Entities GAO Interviewed

Federal Government

- Federal Maritime Commission
- Federal Motor Carrier Safety Administration, United States Department of Transportation

Intermodal Equipment Providers

- Direct ChassisLink, Inc.
- FlexiVan
- TRAC Intermodal

Motor Carrier

- Evans Network of Companies

Ocean Carriers

- CMA CGM
- Maersk
- Mediterranean Shipping Company

Port Operators

- Port of Houston
- Port of Long Beach
- Port of Los Angeles
- Port of New York/New Jersey
- Port of Virginia

Trade Associations

- Institute of International Container Lessors
- Intermodal Motor Carrier Conference/American Trucking Associations
- National Association of Small Trucking Companies
- Ocean Carrier Equipment Management Association
- Owner-Operator Independent Drivers Association

Background (Continued)

Table 1: Contractual Responsibilities for Overland Services under Carrier Haulage and Merchant Haulage

Action	Carrier haulage	Merchant haulage
Overland transport of shipping container	Ocean carrier contracts with motor carrier	Shipper contracts with motor carrier
Procurement of chassis	Ocean carrier contracts with intermodal equipment provider	Shipper or motor carrier contracts with intermodal equipment provider

Source: GAO analysis of National Academies of Sciences, Engineering, and Medicine, National Cooperative Freight Research Program, *Guidebook for Assessing Evolving International Container Chassis Supply Models*, NCFRP Report 20, (Washington, D.C.: 2012). | GAO-21-315R

Generally, there is one fee associated with the use of a chassis and certain other fees may be charged that are specific to the shipping container it is transporting:

- **Chassis usage fee:** An IEP charges ocean carriers, shippers, or motor carriers a fee for renting a chassis. The amount is negotiated between the relevant parties (e.g., between ocean carriers and IEPs for carrier haulage movements, or between shippers or motor carriers and IEPs for merchant haulage movements).
- **Detention:** Fees are charged by ocean carriers for the use of ocean carrier-provided shipping containers, beyond an allotted free time for the container to be out on the street.
- **Demurrage:** Fees are charged by terminal operators if a shipping container remains at the port beyond the allotted time when it was supposed to be picked up.
- **Street turns:** Some ocean carriers charge an administrative fee for a “street turn,” or the situation in which a motor carrier delivers a container, then uses the empty container to pick up new cargo—potentially from a different shipper—and brings the full container back to the port. Street turns may contribute to efficiencies in cargo movement as they reduce the miles driven with empty containers.

Multiple Models Are Used to Make Chassis Available to Transport Shipping Containers, Each with Benefits and Drawbacks

Examples of How Chassis Are Provided at Different Ports

While chassis are generally provided to motor carriers using one of four models, multiple models may be available at a port. In addition, the 5 ports we spoke with each had slight variations in how chassis are provided at their ports:

- Port of Houston:** Two IEPs operate as single chassis providers within the port. Motor carrier-controlled chassis are also used, but in a smaller percentage compared to the single chassis providers.
- Port of Los Angeles and Port of Long Beach:** The IEPs at these ports entered into an agreement to form the pool-of-pools, whereby motor carriers can pick up and drop off chassis at multiple locations within each port, regardless of which IEP owns the chassis.
- Port of New York and New Jersey:** Due to space limitations and to meet the needs of motor carriers, entities operating at the port agreed to create consolidated locations where motor carriers can obtain a chassis. These depots contain multiple ‘single chassis providers’ that provide chassis directly to motor carriers.
- Port of Virginia:** Unlike the other ports we spoke with, this port is an “operating” port and, thus, the port itself manages the chassis pool. Additionally, about 15 percent of containers are moved using motor carrier-controlled chassis.

Chassis Provisioning Models

There are four distinct models that are typically used to make chassis available to motor carriers (see table 2). The United States is unique compared to other countries, where the motor carriers, shippers, or off-site entities provide chassis.

Table 2: Chassis Provisioning Models

Model 1: Single chassis provider	An individual intermodal equipment provider (IEP) owns chassis that are directly provided to shippers or motor carriers.
Model 2: Motor carrier-controlled	A motor carrier owns or is responsible for a chassis that it has procured under a long-term lease.
Model 3: Gray pool	A single manager, often a third party, oversees the operations of a pool that is made up of chassis contributed by multiple IEPs.
Model 4: Pool-of-pools	Each IEP manages its respective chassis fleet, but each allow motor carriers to use any chassis among the fleets and to pick up and drop off chassis at any of the IEPs’ multiple locations.

Source: GAO. | GAO-21-315R

Billing Method in Gray Pools and Pool-of-Pools

In the gray pool and pool-of-pools models, the concept of “box rules” is applied to determine which IEP will do the billing and receive the usage fee for the chassis used to move the container of a particular ocean carrier. Specifically, ocean carriers contract with an IEP to be their representative and make chassis available. Under box rules, an ocean carrier’s contracted IEP bills for the chassis used to move that carrier’s containers, regardless of which IEP owns the chassis actually used in the move. For example, under a gray pool, if IEP “A” is the chassis provider for ocean carrier “X” and 100 containers owned by ocean carrier X are placed on chassis, IEP “A” is notified. IEP “A” receives information from the pool manager necessary to bill the proper party for the usage of those chassis—typically the ocean carrier (for carrier haulage contracts) or the motor carrier (for merchant haulage contracts).

Chassis Availability

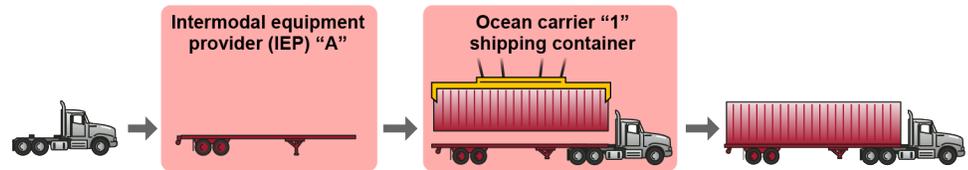
Representatives from two IEPs told us that, should the IEP not be able to provide a chassis, the motor carrier has several options, including waiting until a chassis becomes available. These IEP representatives said that when chassis availability issues occur, there is generally a wider scale issue with chassis supply and demand being unbalanced. This imbalance can happen for many reasons, and in 2020 the chassis market experienced wide fluctuations in demand due to the effects on the movement of cargo caused by the COVID-19 pandemic. Representatives from an IEP told us cargo shipments to the United States were drastically reduced and that IEPs and pool managers were asked to place chassis in storage. However, as cargo shipments increased later in 2020, some ports began experiencing chassis shortages. An IEP and a trade association told us that chassis were effectively provided and shortages avoided at some ports under both pooled and non-pooled models.

Model 1: Single Chassis Provider

Description

In a single chassis provider model, chassis are owned by an IEP, which directly provides the chassis to a shipper or motor carrier and charges a rental rate (see fig. 2). Chassis can be dedicated to a specific shipper or provided to motor carriers that service multiple customers. The IEP manages the chassis, controls their supply, and is responsible for maintenance and repair of the chassis. There may be multiple single chassis providers at a single location, akin to the rental car business model. In this case, ocean carriers, shippers, or motor carriers select an IEP from which to rent a chassis and pick up and return the chassis to a designated location. This model can be referred to as a “private pool,” “proprietary pool,” or “neutral pool.”

Figure 2: Overview of Single Chassis Provider Model



Source: GAO. | GAO-21-315R

Benefits and Drawbacks Identified by Stakeholders

The three IEPs we spoke with identified several benefits to the single chassis provider model, all of which center on having greater control over their chassis. For example, the single chassis provider model allows the IEPs to have direct control over the maintenance and repair of their chassis, something the IEPs we spoke with said they prefer, as they can potentially lose control over chassis maintenance and repair under some of the other models, particularly the gray pool model. IEPs also told us that they can better manage their inventory of chassis to provide greater assurance that there will be chassis available to their customers. According to an IEP and a trade association, this is an important factor to generating business for the IEP and can benefit motor carriers and shippers, as the cargo can generally move as expected without delays. Further, an IEP told us that, since acquiring chassis from ocean carriers, it has made significant investments to improve the quality of its chassis fleet. Such investment can allow IEPs to offer premium features—such as radial tires or light emitting diode (LED) lights—or additional logistical services as a way to attract customers at ports where they have a choice of how chassis are provisioned. One IEP said to attract customers it also offers logistical services to monitor chassis demand and help ensure sufficient availability of chassis.

However, the single chassis provider model can also present certain cost and some potential logistical drawbacks to stakeholders, including IEPs and motor carriers. One of the IEPs we spoke with stated that for the single chassis provider model, it generally must purchase more chassis than it might need to contribute to a gray pool in order to ensure there are always chassis available for use, and that purchasing and maintaining these chassis comes at a significant cost to the IEPs. Further, while not true for all IEPs we spoke with, two IEPs told us that while an expected part of the business, repositioning chassis to ensure there is a sufficient supply of chassis where they are needed can represent logistical issues and can be costly to the IEPs. Specifically, moving chassis from one part of a port to another—or even from one part of the country to another to address changes in the flow of imports and exports—can be time consuming and costly to the IEP.

Model 2: Motor Carrier-Controlled

Description

Under the motor carrier-controlled model, motor carriers own or hold a long-term lease—for example, from an IEP—for a chassis (see fig. 3). Motor carriers are typically responsible for maintenance and repairs on the chassis, including those being leased long-term.

According to two port operators we spoke with, more motor carriers in recent years are choosing to own or long-term lease a chassis. For example, representatives at one port we interviewed estimated that motor carrier-controlled chassis account for about 60 percent of all container moves through September 2020, as compared to about 40 percent in 2014. Additionally, two ocean carriers told us that container moves at ports in South Florida are fully performed by motor carrier-controlled chassis. One IEP we spoke with estimated that this model may account for one-third to one-half of chassis moves nationwide.

Figure 3: Overview of Motor Carrier-Controlled Model



Source: GAO. | GAO-21-315R

Benefits and Drawbacks Identified by Stakeholders

Much like the single chassis provider model, entities we spoke with—including two IEPs and a port operator—told us that having greater control over their chassis is a benefit to the motor carriers under the motor carrier-controlled model. For example, motor carriers benefit from having complete control over the quality of the maintenance and repair of the chassis, something they potentially lose when obtaining chassis under other models. Additionally, a motor carrier and an IEP told us that by owning or long-term leasing a chassis, the driver is always assured of its availability.

However, the motor carrier-controlled model can also present certain drawbacks to the motor carrier, including those related to costs and delivery options. Two IEPs and a trade association told us that motor carriers may not always be able to use their own chassis, for example at a “wheeled” port where the shipping container is removed from a ship and immediately placed directly on a waiting chassis.⁵ Further, in certain situations, the motor carrier may need to relinquish physical possession of the chassis for a period of time. Specifically, in a “drop and pick” delivery situation, the motor carrier will leave the shipping container—along with the attached chassis—to be off-loaded at a warehouse or similar destination. The motor carrier will then return to pick up both the container and chassis at a later time. Interviewees—including a motor carrier, an IEP, and a port operator—also told us that the motor carrier will need to consider the costs associated with owning or holding a long-term lease for a chassis, as the motor carrier would generally be responsible for all costs associated with the chassis, including maintenance, repair, and storage costs.

⁵Other ports are considered “grounded” facilities in which shipping containers are removed from a ship and stacked at the port until ready for pickup.

Model 3: Gray Pool

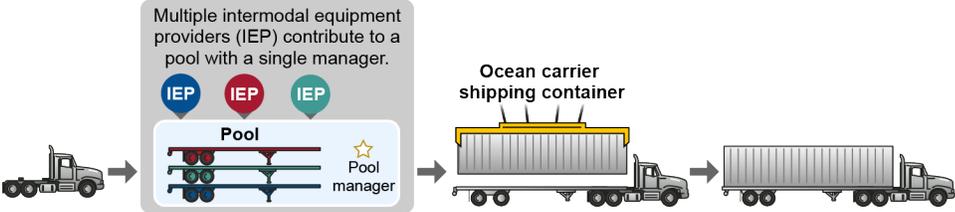
Description

Under the gray pool model—sometimes referred to as a “co-op”—multiple IEPs contribute chassis into a single pool which are then offered to motor carriers (see fig. 4). IEPs contribute chassis to a gray pool based on the number of containers they expect to be provisioning under contracts with ocean carriers and, in some cases, motor carriers. Like some of the other chassis provisioning models, gray pools can serve multiple pickup and drop off points (also referred to as start/stop locations) within a large geographic area. For example, Consolidated Chassis Management—which was formed by the Ocean Carrier Equipment Management Association (OCEMA)—operates a gray pool in the southeastern U.S. where motor carriers can pick up a chassis in Florida and drop it off in Georgia, as both locations are within the gray pool.

A gray pool is designed to allow interoperability of all chassis, in that the motor carrier may select any chassis in the gray pool, regardless of who owns the chassis, to transport a shipping container.

Gray pools have a pool manager that sets the operating rules (e.g., how chassis are contributed to the pool) and is responsible for overseeing the maintenance and repair of chassis within the pool. The pool manager may also be responsible for repositioning chassis to, for example, other pool locations based on demand.

Figure 4: Overview of Gray Pool Model



Source: GAO. | GAO-21-315R

Benefits and Drawbacks Identified by Stakeholders

The gray pool model can yield benefits to different parties, as these pools address many of the logistical concerns with chassis provisioning. A trade association, an IEP, and a motor carrier noted that the gray pool model allows chassis to be “interoperable,” meaning that any chassis in the pool may be used by any motor carrier to move any ocean carrier’s shipping container. Also, motor carriers using a gray pool model would not need to change chassis between pickups for different ocean carriers, creating efficiencies to the motor carriers. Additionally, gray pools can lead to operational efficiencies for port operators, as arriving shipping containers can be placed on any chassis from the gray pool and do not need to be matched to a specific IEP’s chassis, potentially saving time for port operators and motor carriers. Further, all three IEPs, a motor carrier, and a trade association told us that the gray pool model can offer choice for motor carriers, in that they are not obligated to use a specific IEP’s chassis when performing a carrier haulage move. Finally, an IEP and a trade association told us that in some cases, by pooling chassis the gray pool model is able to operate with fewer chassis than individual IEPs would need to meet peak demand periods for chassis. Port operators said this is also a benefit for them because fewer total chassis on port means a smaller footprint to store those chassis, potentially freeing up space for other port operations.

However, gray pools can present drawbacks to certain stakeholders. For example, according to the three IEPs we interviewed, the gray pool manager—and not the IEPs—oversees maintenance and repair services on chassis contributed to the gray pool. One IEP stated that another drawback is that since they have no say in the governance of the pool they have no control over the assets they own. According to the three IEPs we spoke with, the gray pool manager does not have an incentive to minimize the costs of maintenance and repairs because these costs are passed on to the IEPs. However, a trade association told us that gray pools may also be able to lower overall maintenance and repair costs because of the potential for economies of scale. Additionally, the three IEPs, a motor carrier, and a trade association told us that while the chassis within gray pools comply with federal safety standards, they also tend to be older and lack some of the advanced features newer chassis may have, including radial tires and LED lights. Since each chassis within the pool is “gray” and the IEP will be paid regardless of the chassis’ features, there is no incentive for IEPs to contribute chassis with more advanced features.

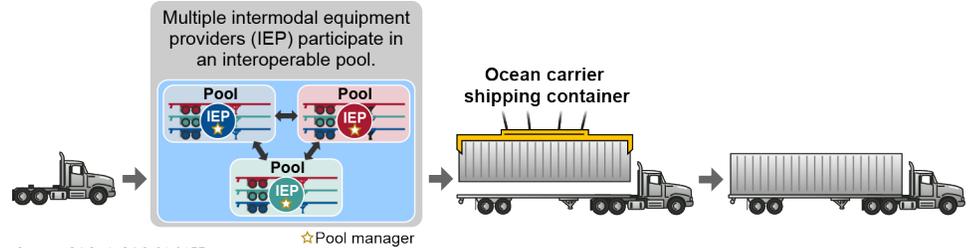
Model 4: Pool-of-Pools

Description

The pool-of-pools model is a unique arrangement that is only found at the Ports of Los Angeles and Long Beach. Given the large size of these ports, the pool-of-pools was formed, in part, to address logistical concerns with chassis that existed at the time, including the need to match specific containers to a specific IEP's chassis, as well as traffic congestion throughout the ports. Following the issuance of a "business review" letter by the United States Department of Justice (DOJ) Antitrust Division,⁶ the pool-of-pools began operating in March 2015.

The top three chassis providers created the pool-of-pools by agreeing to cooperate with each other (see fig. 5). Each of the IEPs operates and manages its own pool, but motor carriers are free to pick up and drop off chassis at any IEP pool location. As with the "gray pool," the chassis are considered "gray" and interoperable. Unlike the gray pool, in the pool-of-pools, each IEP is responsible for and continues to manage its own chassis fleet in regard to operating rules, maintenance, and repair.

Figure 5: Overview of Pool-of-Pools Model



Source: GAO. | GAO-21-315R

Benefits and Drawbacks Identified by Stakeholders

The pool-of-pools model used at the Ports of Los Angeles and Long Beach can produce several logistical benefits to different parties. For example, much like gray pools, the pool-of-pools resolves many of the logistical concerns regarding the use of chassis, leading to operational efficiencies for port operators and the ability of motor carriers to choose whatever chassis they wish. Representatives from three port operators we spoke with noted that a benefit to motor carriers is the ability to pick up and drop off chassis at any of the 18 pool (also referred to as start/stop) locations throughout the Ports of Los Angeles and Long Beach. Also, these locations are within the terminals, eliminating the need for motor carriers to pick up a chassis at an off-site location and then travel onto the port facility. Having the ability to pick up and drop off chassis at multiple locations can benefit motor carriers—by allowing the chassis' return to be more convenient—and port operators—by reducing congestion around the ports.

The pool-of-pools can also present drawbacks regarding billing for the use of chassis. While motor carriers are free to choose any chassis from the pool-of-pools, box rules apply to the fees charged for the chassis. Thus, the motor carrier will be billed by the IEP that has a relationship with the owner of the shipping container. Using a chassis from an IEP that is not aligned with the shipping container's owner can lead to complicated billing procedures that must be resolved. Additionally, according to an IEP and two ocean carriers we spoke with, reviewing and processing these transactions requires multiple staff.

⁶Under 28 C.F.R. § 50.6, the Antitrust Division can review proposed business conduct and state its current enforcement intentions. In September 2014, in response to a business review request of a proposed chassis use agreement, DOJ concluded, based on representations made and DOJ's investigation of the particular facts and circumstances relating to competitive conditions related to the supply of chassis at the Ports of Los Angeles and Long Beach, that it did not appear likely that the proposed chassis use agreement would produce anticompetitive effects. Letter from William J. Baer, Assistant Att'y Gen., to David A. Clanton, Esq., and Valarie C. Williams, Esq. (Sept. 23, 2014).

FMCSA Mission and Chassis Regulations

FMCSA's primary mission is to reduce crashes, injuries, and fatalities involving large trucks, including chassis, and buses. According to our analysis of FMCSA data, from 2010 through 2018, there were an annual average of 4,477 fatalities from crashes involving large trucks and busses and 34 fatalities from crashes involving chassis.

As mandated in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users,⁷ FMCSA issued safety regulations for chassis effective in June 2009.⁸ According to FMCSA, these regulations help clarify IEP and motor carrier responsibilities for repairing safety defects.

Driver-Performed Inspections

Pre-trip inspections: Prior to operating the chassis, drivers are required to ensure that chassis components specified in FMCSA regulations are in good working order. Defective components must be repaired by the IEP or its agent prior to using the chassis, which may result in the driver having to use a different chassis. An IEP and a trade association said that pre-trip inspections might not always be done. FMCSA officials told us that it is the driver's responsibility to do these inspections and that whether the inspection was performed or not is a factor in determining responsibility for roadside inspection violations.

Post-trip inspections: When chassis are returned to the IEP, drivers are required to identify and report any known damage, defects, or deficiencies in equipment. The chassis owner must either (1) repair the damaged equipment or (2) certify that repairs are not necessary before the chassis can be used again.

The Federal Government Oversees Chassis Safety and Has a Limited Economic Oversight Role

FMCSA Has Developed an Oversight System for Chassis Safety

FMCSA employs several inspection methods to help oversee chassis safety and compliance with regulations. For example, qualified staff of IEPs or motor carriers that own chassis are required to perform an annual inspection of each chassis. FMCSA's regulations lists the equipment that must be inspected (e.g., brake systems, lighting, and tires).

Inspectors—often certified state police officers—may also perform roadside inspections on commercial vehicles, including chassis. Inspectors are to use a standardized set of procedures to determine if these vehicles are operating safely. If the inspector believes a vehicle or intermodal equipment would likely cause an accident or a breakdown, the vehicle and/or intermodal equipment will be deemed “out-of-service” and repairs must be made before being put back into operation. FMCSA guidance states that for chassis, an inspector will ask if the driver performed a pre-trip inspection, which will influence whether violations are attributed to the motor carrier or the IEP. According to FMCSA officials, about 90 percent of chassis-related violations identified during roadside inspections are attributed to motor carriers because the violations should have been identified during a pre-trip inspection. FMCSA data show that from 2010 through 2019, the most common chassis roadside inspection violations were for problems with brakes and lighting.

FMCSA staff—or trained state officials—also perform investigations of IEPs to oversee chassis safety. During the investigation, FMCSA staff—and qualified state and local personnel—are to review the IEP's overall compliance with safety regulations. According to FMCSA officials, investigations are handled by the four regional offices, which are expected to perform a minimum of two investigations of IEPs each year. FMCSA staff told us that investigations of an IEP can be prompted by several factors, such as prior crashes involving the IEP's chassis, violations identified during roadside inspections, or complaints filed directly with FMCSA. According to FMCSA officials, nationally, the most common problems identified during investigations include IEPs not performing annual inspections of all chassis, using chassis that have not been annually inspected, and insufficient chassis maintenance and repair programs. Depending on the severity of the findings, an investigation could lead to civil penalties or the issuance of an out-of-service order, which would require the IEP to immediately cease operations.

One stakeholder we spoke with stated that FMCSA should consider maintaining safety ratings for IEPs similar to the safety rating system used for motor carriers. FMCSA officials told us that they use the motor carrier safety rating system to direct limited inspection and investigation resources, and added that the current processes provide sufficient information to select IEPs for investigation.

⁷Pub. L. No. 109-59, § 4118, 119 Stat. 1144, 1729-32 (2005).

⁸Requirements for Intermodal Equipment Providers and for Motor Carriers and Drivers Operating Intermodal Equipment, 73 Fed. Reg. 76794 (Dec. 17, 2008).

FMC Complaint Process

Complaints may be filed with FMC to allege violations of the Shipping Act. The complaint is then handled by an administrative law judge, who holds hearings and renders initial or recommended decisions. These decisions are to include, among other things, a statement of findings and conclusions, as well as the reasoning on all material issues presented on the record, and appropriate sanction, relief, or denial. Parties can appeal the administrative law judge's decision to FMC, which issues a decision on the appeal. Parties can then appeal FMC's final decision to a federal appellate court.

In August 2020, the Intermodal Motor Carrier Conference—an affiliated conference open to members of the American Trucking Associations—filed a complaint with FMC against OCEMA and its ocean carrier members. In general, the complainants allege that OCEMA and its ocean carrier members “have adopted and imposed unjust and unreasonable regulations and engaged in unjust and unreasonable practices.” The complainants allege, among other things, that although OCEMA's ocean carrier members do not own chassis, they still control the operation of gray pools at certain ports, for example through operating rules and through contracts with IEPs. These pools are operated by Consolidated Chassis Management and its affiliates, whose governing boards may only include certain OCEMA members. In September 2020, the respondents moved to dismiss the complaint asserting, among other things, that FMC lacks jurisdiction and that the complainant's commercial objectives and policy disagreements, despite being framed in Shipping Act terminology, fail to allege sufficient facts to support a claim of Shipping Act violations. This motion was denied in November 2020. FMC's online docket system indicates that an initial decision on the complaint is expected in August 2021.

FMC Has a Limited Oversight Role for the Use of Chassis

The Shipping Act of 1984, as amended (Shipping Act), helps establish policy regarding international ocean commerce of the United States.⁹ Among other things, the Shipping Act's purpose is to establish a nondiscriminatory regulatory process for the common carriage of goods by water in the foreign commerce of the United States with a minimum of government intervention and regulatory costs. FMC oversees ocean carriers that provide service to and from the United States and works to ensure a competitive and reliable ocean transportation supply system. For example, FMC reviews and monitors agreements between relevant parties to ensure they do not cause unreasonable increases in transportation costs or unreasonable decreases in transportation services. According to FMC, in general, to the extent that ocean carriers engage in agreements to discuss or provide chassis or form chassis pools, the agreements must be filed with FMC and comply with relevant statutes. For example, the gray pools operated by Consolidated Chassis Management were formed pursuant to an agreement reviewed by FMC. However, other chassis provisioning arrangements that do not involve ocean carriers might not need to be filed with FMC.¹⁰ Further, FMC issues rules to guide the interpretation of Shipping Act provisions. According to FMC officials, there are no economic regulations specifically related to chassis.

FMC also brings parties together to perform research and address shared issues. For example, FMC formed an “innovation team” to identify ways to improve overall international supply chain effectiveness, reliability, and resilience. This innovation team was comprised of a cross-section of port operators, ocean carriers, and others. In 2017, FMC released the final report from this innovation team, which included a number of recommendations to improve supply chain efficiency.¹¹ Additionally, in 2019, FMC completed research on detention and demurrage fees in the movement of ocean containers; this research involved many of the types of stakeholders we interviewed and recommended the formation of an innovation team to refine detention and demurrage approaches.

None of the entities we spoke with identified additional actions they would like for FMC to take regarding chassis. An IEP and a trade association stressed to us that this is a commercial enterprise and market forces should be allowed to work.

(104242)

⁹Pub. L. No. 98-237, 98 Stat. 67 (1984) (codified as amended at 46 U.S.C. §§ 40101-41309).

¹⁰In general, under the Shipping Act, as amended, agreements within certain specified categories (1) between or among ocean common carriers, or (2) between or among marine terminal operators, or (3) between or among one or more marine terminal operators and one or more ocean common carriers, must be filed with FMC. 46 U.S.C. § 40302(a). This filing requirement does not apply to, for example, maritime labor agreements, or agreements (1) related to transportation to be performed within or between foreign countries, or (2) among common carriers to establish, operate, or maintain a marine terminal in the United States. 46 U.S.C. §§ 40301(d), 40302(b).

¹¹FMC, *Supply Chain Innovation Initiative*, (Washington, D.C.: Dec. 5, 2017).

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through our website. Each weekday afternoon, GAO posts on its [website](#) newly released reports, testimony, and correspondence. You can also [subscribe](#) to GAO's email updates to receive notification of newly posted products.

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <https://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [Email Updates](#). Listen to our [Podcasts](#).
Visit GAO on the web at <https://www.gao.gov>.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact FraudNet:

Website: <https://www.gao.gov/fraudnet/fraudnet.htm>

Automated answering system: (800) 424-5454 or (202) 512-7700

Congressional Relations

Orice Williams Brown, Managing Director, WilliamsO@gao.gov, (202) 512-4400,
U.S. Government Accountability Office, 441 G Street NW, Room 7125,
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548

Strategic Planning and External Liaison

Stephen J. Sanford, Acting Managing Director, spel@gao.gov, (202) 512-4707
U.S. Government Accountability Office, 441 G Street NW, Room 7814,
Washington, DC 20548

