

## 2. PROFILE OF THE AFFECTED INDUSTRY

### 2.1 OVERVIEW OF INDUSTRY SECTORS

The trucking industry is not homogeneous. Its various sectors are quite different from one another in their operating characteristics and, therefore, in the way in which they are affected by changes in HOS rules. In this section, we enumerate and describe the principal sectors and the distinctive ways in which they operate

#### 2.1.1 General Description of Operations

In the following table are shown the principal sectors of the industry.

**Exhibit 2-1**  
**Principal Sectors of Trucking Industry**

Over-the-road (OTR)	For-hire		Private
	Truckload (TL)	Less-than-truckload (LTL)	
Local	Local operations are treated as a single sector in this analysis.		

As the table shows, there are two main lines of division in the industry: one division is between private carriage of goods and for-hire carriage; the other is between carriage that is essentially local in character and carriage over longer distances (over-the-road (OTR)). Within OTR for-hire carriage, there is another major division—between truckload (TL) and less-than-truckload (LTL) operation. In OTR service, there are major differences among the operating characteristics of private carriage and the two types of for-hire carriage, and these differences have important implications for the effects of changes in HOS rules. In local operations, these differences, to a large degree, either disappear or cease to have much significance for HOS rules. This is why Exhibit 2-1 does not show separate sectors for local service. For reasons discussed later in this chapter, the HOS rule-change options under consideration would have limited impact on local trucking.

In the following sub-sections, we present and discuss operating practices and firm characteristics in the main sectors of OTR service; this is followed by a discussion of local service. First, however, we need further elucidation of the major sector distinctions shown in Exhibit 2-1.

#### OTR vs. local service

We may think of local service as movement among points within a metropolitan area, and to and from points within two or three hours' drive from that area.<sup>3</sup> In operational terms, one important difference between local and OTR service is the kind of work the driver does. In OTR service, driving is a driver's principal task. He will spend some time loading and unloading, and waiting to load or unload. The amount of time spent on loading and unloading will vary with length of

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<sup>3</sup> As a point of demarcation, we use an average length of haul of 150 miles to distinguish local service from OTR service.

haul, types of customers, and types of service; but the preponderance of an OTR driver's time will be used for driving.

Local drivers will spend less time driving than OTR drivers. This is partly because they make many more stops to deliver or pick up goods or packages. It is also the case that many local drivers are not carrying goods, and their primary function is to perform a service, e.g., plumbing repairs, to which driving is ancillary. For these reasons, and others discussed below, none of the rule-change options (with the exception of the provision for vehicles from 10,000 to 26,000 pounds) will have a noticeable effect on short-haul trucking.

### **For-hire vs. private carriage**

For-hire trucking firms are paid by others to haul goods. Virtually all of their revenue is derived from movement of freight (including packages in some cases) or related services such as logistics management.

Private carriers are firms that manufacture or distribute goods and choose to carry their own goods. Generally, private carriers do this because they are very sensitive to requirements for timely and reliable service, either because of their own methods of supply-chain management or those of their customers. It is also the case for some private carriers that having their own drivers handle delivery to customers is part of their customer-relations efforts.

There are major operational differences between private and for-hire carriage; as a consequence, HOS rule changes will have different effects on these sectors. These differences will be discussed in more detail later. We should note here, however, that a major factor is the regular and repetitive character of private carriage that sets it apart from a large part of for-hire service. Regularity, or its absence, in drivers' schedules makes a significant difference in the effects of HOS rules. In general, regular operations will be less affected by the options under consideration.

### **TL vs. LTL service**

The two principal forms of for-hire OTR service differ markedly from one another, both in the kind of service provided and in mode of operation. A truckload firm moves a full truckload of freight, for a single shipper, directly from origin to destination. The driver goes to a facility of the shipper where the truck is loaded and drives to a destination point where the truck is unloaded. From there, he proceeds to another origin point to pick up another load and continues in the same manner.

An LTL company, by contrast, moves small shipments (typically in the range of 500 to 2,000 pounds) in a series of moves that involve both local and OTR operation. Local-service trucks pick up shipments from a number of shippers, bring them into terminals where they are consolidated into truckloads for OTR moves to other terminals, whence local-service trucks deliver individual shipments to their final destinations.

Regarding the impact of HOS rules, the major difference between for-hire TL and LTL operation is that LTL service operates on a regular basis, and most TL service does not.

Below, we present the following sub-sections on industry operations.

- TL operations
- LTL operations
- Private carriage
- Regular vs. random operation
- Team operations
- Local operations

### 2.1.2 Truckload Operations

The truckload business is an example of an industrial sector where something like atomistic competition actually prevails. This fact is reflected in the tight average operating ratio of this segment, 95.0 percent.<sup>4</sup> At a rough approximation, there are around 50,000 TL firms. Of these, 40,000 are very small, with five or fewer tractors<sup>5</sup>. This group is the owner-operators, those that are genuinely independent firms with their own customers. (There are over 300,000 owner-operators in total, but the great preponderance of them are working under lease to larger TL companies such that they are, in effect, part of the labor force of those companies and not firms seeking business for their own account.)<sup>6</sup>

As we see in Exhibit 2-2, small and middle-sized firms receive a very substantial share of total TL revenue. Assuming annual revenue of \$125,000 per tractor, a company with 100 tractors has revenue of \$12.5 million—not a large company.<sup>7</sup> But firms with fewer than 100 tractors have about 43.0 percent of sector revenue. A fleet of 500 tractors implies revenue of \$62.5 million—no longer a small company but not a very large one. We see that firms with fewer than 500 tractors receive revenue of \$75 billion—68 percent of total TL revenue.

**Exhibit 2-2**  
**Truckload Revenue by Firm Size (in billions of dollars)**

<b>SIZE CLASS (NUMBER OF TRACTORS)</b>	<b>REVENUE</b>	<b>PERCENT</b>
1 TO 5	9.8	8.9%
6 TO 24	12.4	11.2%
25 TO 99	25.6	23.3%
100 TO 499	27.2	24.8%
500 AND MORE	35.0	31.9%
TOTAL	110.0	100%

Some of the operations of TL companies follow regular patterns, but some do not; we refer to the latter as “random” service. A truckload company in random service is analogous to a tramp-

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<sup>4</sup> Operating ratio is the ratio of operating cost to operating revenue.

<sup>5</sup> Virtually all OTR carriage is in tractor-trailer combinations, so tractors can be a measure of TL firm size.

<sup>6</sup> These and other estimates of industry size, revenues, etc., are based on the 2002 RIA, Appendix A.

<sup>7</sup> The methods and sources underlying these estimates are presented in the 2002 RIA, Appendix A.

steamer company in the ocean-freight business. The trucks do not operate on fixed routes and schedules; they go where the loads are. It is a bit difficult to generalize about operating patterns of TL firms. Some firms will concentrate in a particular region, some in very specific traffic lanes, and some will crisscross the nation, taking the best loads, in a business sense, as they find them.

Above some minimum size, a TL company will have one or more people whose task is to assign loads to drivers; this is the dispatch function. The dispatching staff live in a complex world, where they are constantly trying to make optimal decisions as to how to allocate their equipment and drivers to the available loads, bearing in mind a host of cost considerations, and, of course, HOS rules.

Regarding the independent owner-operators, companies with five or fewer tractors clearly cannot support either a sales force or a dispatch center. Typically, such companies function in one of two ways. Some of them will get their business from one or two customers with whom they have contracts, or less formal arrangements, to haul loads among a few points. Others may put their principal reliance on trucking brokers who provide, in effect, their marketing and dispatch functions. As companies increase above the minimal size, there will be at least one person giving most, or all, of his time to sales and dispatch, and then as revenues increase, there will be staff groups for these functions.

### **Length of haul**

In the TL sector, “length of haul” is the distance from the point where a driver picks up a load to the point where he delivers the load. Average length of haul affects the impact of HOS rule changes. People in the truckload business make a distinction between regional and long-haul operations. A regional move is generally one of 500 miles or less, and a company calling itself regional would have an average length of haul under 500 miles or even a maximum of 500 miles. Many in the trucking business think of regional as same-day or next-morning delivery, a maximum of 500 miles. For our analysis, we have distinguished between short-regional, long-regional, and long-haul operations. On an average length-of-haul basis, we classify TL operations as follows:

<b>Short-haul (local)</b>	<150 miles
<b>Long-haul</b>	
<b>Short regional</b>	150-300 miles
<b>Long regional</b>	300-700 miles
<b>Long haul</b>	>700 miles

Trucking-firm behavior varies with length of haul, and these variations affect the impact of HOS rules. A driver in a regional operation, for example, is likely to have at least one pick-up and one drop-off in every day that he works. A long-haul driver will have days with only one pick-up or drop-off and days with neither in which he only drives. This difference affects the propensity to use the 11<sup>th</sup> hour. The less time a driver spends in loading and unloading, the more time he has available in the 14-hour window for driving. To the extent that he has more than ten hours available for driving, he is more likely to drive in the 11<sup>th</sup> hour.

### **2.1.3 Less-than-truckload operations**

LTL companies are a sharp contrast with TL firms, both in degree of concentration and in mode of operation. Thirty-five companies receive 85 percent of sector revenue. While the LTL sector has a much higher degree of concentration than does the truckload business, it is, in total, much smaller than the TL world: just under one-third of TL revenue, perhaps ten percent of TL VMT. (See Exhibit 2-4 below.)

In order to operate its business, whether regional or national, an LTL firm requires a set of terminals. Each terminal will have a force of pick-up and delivery drivers. Typically, they go out in the morning with loaded trucks, make deliveries, spend the afternoon picking up loads, and return to the terminal at the end of the day with outbound loads. These loads are moved across the dock to outbound line-haul trailers. In a regional firm, these trailers will be pulled overnight to other terminals in the firm's network in time for delivery the following morning, when the pick-up and delivery cycle is repeated. Some loads may be going out of a carrier's region; they would be handed over to another LTL firm for onward movement to a destination at one of the other company's terminals.

For the national LTL firms, those that provide long-haul service and have average lengths of haul in excess of 1,000 miles, the operation is somewhat more complicated. These companies will have a set of major hub terminals, each of which is associated with a large number of satellite terminals. Line-haul moves will often be from satellite to hub and hub to satellite. In some circumstances, a trailer may go directly from a satellite to a hub in another region. Where the line-haul is more than 500 miles, moves are frequently handled with either teams or relays.

LTL trucking operates in a scheduled and routinized manner that is utterly different from the opportunistic journeys that comprise much of the business of a TL company. Many, if not most, LTL over-the-road drivers make the same run every night, and many of them never sleep away from home.

### **2.1.4 Private carriage**

As noted above, private carriers are firms engaged in manufacturing and distribution that choose to carry their goods themselves. They do this because they believe they need direct control of the operation to ensure that tight schedule requirements are met, because they believe customer relations are enhanced when their own employees make deliveries, or for other reasons. Whatever the reason may be, private carriers incur a cost for moving their own goods. The alternative in most cases would be for-hire truckload service; private carriage is somewhat more costly than truckload—a premium of a little more than ten percent on a truck-mile basis.<sup>8</sup> Several factors may account for this difference: the high level of service that private carriers provide themselves which would include a higher ratio of empty miles to loaded miles; economies of specialization realized by truckload companies; and generally more generous pay-and-benefits packages for private drivers. Many private carriers try to offset this cost differential by seeking loads on a for-hire basis for their backhauls that would otherwise be empty.

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<sup>8</sup> Transportation Technical Services, *America's Private Carriers*, 1999, p. 101.

It is difficult to generalize about private-carriage patterns of operation, as they have considerable variety. A firm may ship, for example, from a single national point to a small number of regional distribution centers (DCs) which, in turn, ship to a large number of stores or more DCs. Multiple drops are quite common: a driver leaves a factory or warehouse with a full trailer and makes several delivery stops before returning home. Some runs of this nature require the driver to spend several days on the road, just as a TL driver would. There will be other private operations in which the drivers never spend a night away from home.

We believe that, generally, private operations are much more of a scheduled and routine nature than is the case with random for-hire TL operations. Private carriage resembles LTL companies in this regard. We note that many TL companies are plagued with a very high rate of driver turnover; retention of drivers is a major issue in the TL sector. This is much less the case in LTL and private operations. Part of this stems from better pay and benefits in these latter sectors; part of this is because many of these companies either employ union drivers or must compete with employers of union drivers to obtain good drivers. But part of it is surely due to the irregular and often-shifting work times of TL operation.

Some private carriers arrange for this service on a contract basis; they outsource their carriage to a contractor, usually a truckload company that dedicates an agreed number of trucks and drivers to a private carrier's service. Since the equipment and drivers are under the control of the private carrier, such an operation behaves in the same way as any other private carrier.

### **2.1.5 Regular vs. Random Operations**

An important aspect of trucking operations is regularity or the absence of regularity—the degree to which drivers repeat the same or similar routes and working hours over successive days and weeks. As noted earlier, a high degree of regularity tends to be the norm in private carriage and LTL firms. While this is also the case for some for-hire truckload service, a great deal of for-hire TL service is random. The distinction is important, especially for safety effects.

In random TL service, a company's trucks do not follow any fixed pattern. After a rest period at home, a driver picks up an outbound load near his home terminal and begins a road tour. Neither the driver nor the company's managers have any certain idea of where the driver will go after his first load is delivered. The company's sales force will do its best to find loads for him and keep him moving profitably until he completes his road tour and comes home. Most road tours will last from one to three weeks.

The defining characteristic of regular service is that it operates on predictable schedules; both managers and drivers know, with a high degree of certainty, what they are going to be doing. Regular service entails regularly repeating patterns. These may be fixed patterns where trucks follow the same series of origin-destination (O-D) pairs in the same sequence over the same time cycle. This could also be service from one or a few fixed origin points to a limited set of destinations in which loads are not moved over the same routes in a fixed sequence, but the operation is confined to that set of origins and destinations, and loads move between every O-D pair fairly frequently.

Much of the regular service in truckload companies is the dedicated service referred to above in the discussion of private carriage; this is simply out-sourced private carriage. It is often the case

with these contracts that the shipper takes direct operational control of the dedicated fleet; other arrangements are also used. There are also in place contracts which provide for regular service but do not entail dedicated vehicles.

We have information on prevalence of regular service in the TL sector; we estimate it at 40.0 percent of TL VMT.<sup>9</sup>

One might suppose that regularity in operation would allow companies to plan schedules well within the limits of the HOS rules. Our industry experts<sup>10</sup> suggested that this is not necessarily the case; large customers may insist on schedules that leave little margin for error. We used data from an FMCSA survey<sup>11</sup> to test this proposition by comparing on-duty hours per tour of duty between regular and random drivers. We found little difference as seen in the following table.

**Exhibit 2-3**  
**On-duty Hours—Regular vs. Random**  
**Percentage of Tours of Duty<sup>12</sup>**

On-duty Hours	Regular	Random
<b>14</b>	3.2	2.5
<b>13</b>	5.6	5.4
<b>12</b>	12.4	13.5
<b>11</b>	16.3	15.3
<b>&lt;11</b>	62.4	63.2

### 2.1.6 Team Operations

Team operation occurs in all the sectors discussed above—TL, LTL, and private carriage. These operations merit separate discussion, however, because they have some distinct operating characteristics regardless of which sector they are employed in.

The obvious difference between team and solo operation is that the former has two drivers in the cab and the latter has one. A solo tractor moves, at most, ten to 11 hours per day. A team tractor moves 20 hours per day. Even with driving in the 11<sup>th</sup> hour permitted, few teams achieve more than 20 hours per day. A variety of industry sources have told us that four hours or so of break time, with the truck stopped, out of 24 hours are necessary for most people.

The team drivers get their sleep in the berth with the truck moving most of the time they are sleeping. Unlike the case in solo operation, the drivers never sleep in a motel or truck stop as long as they are out on a road tour. As a result, rules on splitting sleeper-berth time need to be examined carefully to determine whether they may have a special impact on team drivers.

<sup>9</sup> Details underlying estimate are in Appendix (I).

<sup>10</sup> A group of trucking-industry experts assisted ICF in the conduct of this analysis. Their names are in Appendix (I).

<sup>11</sup> See sub-section 2.3.1 for explanation of this and other data sources.

<sup>12</sup> A tour of duty is the time from when a driver starts work to when he finishes work on a given day. It is the time constrained by the 14-hour rule.

By their very nature, teams are engaged in long-haul service. Further, two drivers means labor cost per mile is higher than solo operations; accordingly, companies will make every effort to keep teams moving. They will minimize waiting time for teams; not infrequently, if teams have to do loading or unloading, they will be paid by the hour for that work in addition to their per-mile payments.

Data on the extent of team use are not plentiful. In the 2003 RIA, we estimated that ten percent of OTR VMT was accounted for by teams. For this analysis, we have two additional data points on team drivers: interviews with eight TL and one LTL companies (mostly small firms) and information from a survey of its members done by the Owner Operator Independent Drivers Association. In the latter, 6.7 percent of drivers reported themselves as team members.<sup>13</sup> In the nine interviews, firms reported an average of 13.0 percent of drivers as team drivers.<sup>14</sup> Other anecdotal evidence suggests team drivers represent over ten percent of the driver workforce for the larger TL companies. For this analysis, we have assumed that 9.0 percent of VMT is accounted for by teams.

### **2.1.7 Local Operations**

In general, short-haul trucking work has far more in common with “ordinary” work than it does with long-haul trucking. These are five-day-a-week jobs, and much of the time on duty is given to tasks other than driving. Typical work days are eight to ten hours or so and typical weeks are 45 to 55 hours. Many, if not most, of these drivers receive overtime pay past eight hours in a day. Most of the work is regular in character; drivers go basically to the same places and do the same things every day. The HOS rule changes now under consideration are likely to have little effect on such operations.

Short-haul and local operations may be affected by unforeseen circumstances and some operations definitely experience peak-load pressures, often on a predictable basis, which can cause some drivers to approach, and sometimes reach, the 14-hour on-duty limit. There will be occasions when the once-a-week 16-hour on-duty day is used.

Short-haul trucking includes both private and for-hire goods carriers and also services (plumbers, other repairmen, contractors) and utility functions (telephone and electric companies) that use trucks but carry no goods. Private carriage accounts for just over 60 percent of the local VMT generated by goods movement. (See Exhibit 2-5 below.)

Local private carriage is local deliveries of goods (including packages). In such service, a driver starts from a store or warehouse and makes a circuit of deliveries in the region, covering the same approximate route every day. Some of these could be large operations, e.g., a supermarket chain taking goods from warehouses to retail stores or liquor wholesalers delivering to stores and restaurants. Undoubtedly, much of it is also small operations such as florists or other specialty retailers.

The predominant form of local for-hire service is almost certainly pick-ups and deliveries of the package-express companies—UPS, FedEx, and others. Some of it is also the pick-ups and

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<sup>13</sup> E-mail from John Siebert, OOIDA, May 11, 2005.

<sup>14</sup> Interviews conducted by George Edwards, one of the ICF team of industry experts.



deliveries of regional and national LTL firms. There are also some local LTL operations. Over 400 LTL companies list themselves as having average hauls of less than 150 miles.<sup>15</sup> We cannot be certain of the nature of all of these concerns. Some of the service they provide would be local LTL movement in the sense that actual origin and destination are within 150 miles of each other. A good part of their service would also be provision of pick-up and delivery service under contract with a larger LTL company that uses a local concern to avoid investing in a terminal in an area.

Local for-hire truckload service would include a variety of short freight moves. One ubiquitous example is tank trucks taking gasoline from storage facilities to gas stations. In many areas, there will be service hauling railroad-carried trailers and containers between rail yards and origins or destinations. There is a lot of auto-parts service in which parts and components are moved from the factories where they are made to assembly plants; many parts plants are well within 150 miles of assembly plants. We do not believe, however, that for-hire TL service is a large fraction of short-haul operations.

### **Medium and Light-heavy Trucks (10,000 to 26,000 pounds)**

Since one of the rule-change options pertains to trucks in this size class, we note here that these vehicles are predominantly used in short-haul service. We estimate that 88.0 percent of the VMT of this size class are run in operation within 150 miles of their home bases. Indeed, over 60.0 percent occurs within 50 miles of home bases.<sup>16</sup> The percentage of short-haul VMT in commercial service is likely higher than this, because some of the longer-range movements must be accounted for by recreational vehicles.

## **2.2 SIZES OF SECTORS**

The following table shows our estimates of VMT and revenue for the principal sectors of the trucking industry. The VMT numbers give some sense of the relative scale of operations in these sectors. In both short-haul and long-haul operations, private carriage is the largest single sector, and private carriage dominates short-haul service.

**Exhibit 2-4  
OTR Revenue and VMT by Industry Sector**

	<b>Random TL</b>	<b>Regular TL</b>	<b>LTL</b>	<b>Private</b>
Revenue (billions 2002\$)	\$58	\$39	\$27	\$123
VMT (billions)	46	31	8	81

<sup>15</sup> ICF, 2002 RIA, Appendix A, Exhibit A-2.

<sup>16</sup> Estimate based on 2002 Economic Census, Vehicle Inventory and Use Survey, Table 6. Details of the calculations are provided in Appendix (I).

**Exhibit 2-5**  
**Local Revenue and VMT—For-hire and Private**

(billions 2002\$, VMT in billions)	For-hire	Private
<b>Revenue</b>	<b>\$76</b>	<b>\$122</b>
<b>VMT</b>	<b>30</b>	<b>50</b>

NOTE: These estimates are from the 2003 RIA, Exhibit 3-1, p. 3-2. The only change is that truckload has been divided into regular and random service. Revenue figures for private carriage are imputed. Figures for short-haul and local are for carriage of goods; service and utility vehicles are not included. Full details on sources and calculations are in the 2003 RIA, Appendix A, pp. A-9-11.

### 2.3 WORK PATTERNS

In the following sub-sections, we examine patterns of working by drivers in the different sectors of the trucking industry. In particular, we are interested in intensity of effort; this may be thought of as the degree to which drivers work close to the limits imposed by the HOS rules. We can look at this in terms of hours worked (on-duty hours) in a week and in a day, hours driven in a day, days worked and days off in a week. These measures are important for analysis of both productivity and safety effects of rule changes. In developing values for these measures, primary emphasis was placed on OTR service. Some comparable data for short-haul operations are reported in a separate sub-section.

#### 2.3.1 Data sources

The measures of work patterns and intensity presented in this section are based on several principal data sources. For the most part, these sources provide information on for-hire TL, OTR operations. We have four sets of data on current experience (under the 2003 HOS rule): data provided by Schneider National on some aspects of its operations; data from the Owner Operator Independent Drivers Association (OOIDA) based on a survey of its members; a survey of private carriers carried out by Professor Stephen Burks of the University of Minnesota; and data collected by FMCSA (the “field survey”). The Schneider, OOIDA, and Burks data were gathered with the express purpose of obtaining information on use of three aspects of the new rule: the 11<sup>th</sup> hour, restarts, and split sleeper periods.

Each of these sources is focused on a different sector of the industry. Schneider’s data are about a large TL firm. OOIDA data are based on owner-operators and a small number of company drivers for TL firms. The field-survey data largely represent company drivers with small TL companies. In terms of distribution of company size, this makes sense; the great preponderance of TL companies are quite small. In the field survey, 86 percent of for-hire, TL/OTR companies have fewer than 25 tractors. In ICF’s profile of the industry in the 2003 RIA, we estimated that 87 percent of such companies had fewer than 25 tractors. But these small companies account for a fairly small share of TL/OTR VMT—17.0 percent.<sup>17</sup> Viewed in terms of truckload company size, the field survey is a representative sample, but these companies account for a small share of

<sup>17</sup> Calculation from data in ICF, 2002 RIA, Appendix A, Exhibit A-2.

total trucking activity. LTL firms and private carriers are sparsely represented in the field survey. Following is some more specific information on each of these sources.

### **Schneider**

These data cover approximately 16,000 drivers. They were taken from company records for August and October of 2004.

### **OODA**

OODA posted a survey form on its website asking drivers for information on use of the new-rule features in the month of June 2004. The data used here are based on responses from 1,223 drivers.

### **Burks**

Professor Burks mailed a survey form to private carriers asking for information on their drivers' use of the new-rule features in the month of June 2004. He received usable responses from 29 firms covering 3,311 drivers.

### **FMCSA Field Survey**

These data, based on drivers' log books, were obtained from companies in the course of compliance reviews or safety audits. Data cover 542 drivers with 269 firms in the period July 2004 to January 2005. For each driver, data for one month of operation were collected.

In addition to the above data, George Edwards, a member of our team of industry experts, interviewed a number of trucking firms. Information from nine of his interviews was used here; these were eight small TL firms and one small LTL firm.

## **2.3.2 Average hours per day—on-duty and driving**

Two basic measures of work are daily hours of driving and total work, the latter term including all on-duty time, both driving and other work. The field survey and the Schneider data provide information on driving time per tour; only the field survey provides data on on-duty hours per tour. The field survey provides some information on local drivers; the Schneider data do not distinguish between local and OTR operations.

A basic assumption in the calculation is that a day is equivalent to a tour of duty. While there are exceptions, the great preponderance of drivers work one shift in a day. A tour of duty comprises the time from the driver's start of work to end of work, including driving, other on-duty, and off-duty time. Results are in Exhibit 2-6. That the numbers for driving hours for Schneider and OTR drivers from the field survey are so close enhances confidence in these numbers, even though the Schneider data include local service along with OTR operation.

**Exhibit 2-6**  
**Daily driving and on-duty hours—averages**

	<b>Field Survey</b>	<b>Schneider</b>
<b>Driving</b>	7.7	7.6
<b>On-duty</b>	9.2	N/A

NOTE: The field survey is our only source for on-duty hours in tours of duty.

**2.3.3 Average hours and days of work per week**

For OTR drivers, a typical measure of work is number of hours in eight days; that tells us how close drivers work to the 70-hour limit for eight days. A more complete understanding of drivers' work patterns, though, is revealed by examining data on days worked per week. We can calculate this latter measure from both the field survey and the Schneider data.

Both sources give us hours worked in eight days—62 hours for Schneider drivers, 59 hours for field-survey drivers.<sup>18</sup> Some intermediate steps are required to convert these numbers to days per week. We divide them by 9.2 (the field-survey figure for on-duty hours per tour of duty) to obtain days worked per eight days and then make a further adjustment to obtain days worked per seven days. These results are presented in Exhibit 2-7.

**Exhibit 2-7**  
**Average Weekly Hours and Days Worked**

	<b>Field Survey</b>	<b>Schneider</b>
<b>On-duty hours/8 days</b>	59	62
<b>Days worked per week</b>	5.6	5.9

**2.3.4 Degree of intensity of effort**

Were we to look only at the averages shown above for hours of driving and hours and days of work, we might conclude that all drivers work well within the limits imposed by the HOS rules (not allowing for non-compliance). This is, of course, not the case; many drivers work and drive longer hours than the averages. We need to know the percentages of drivers that work close to the limits; this information is important for estimating both productivity and safety effects of a new rule. This information is summarized in the following exhibits on daily driving and on-duty hours and on-duty hours in 8-day periods.

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<sup>18</sup> For both data sources, we discarded all drivers with fewer than 50 hours of work in eight days on the grounds that they were not driving full-time in the period covered.

**Exhibit 2-8  
Driving Hours Per Tour of Duty**

Driving Hours	Percentage of Tours		
	Schneider	Field Survey	OOIDA
<b>11</b>	<b>10.7</b>	<b>16.2</b>	<b>28.0</b>
<b>10</b>	<b>15.5</b>	<b>16.1</b>	<b>N/A</b>
<b>9</b>	<b>16.4</b>	<b>11.2</b>	<b>N/A</b>
<b>&lt;9</b>	<b>57.4</b>	<b>56.5</b>	<b>N/A</b>

NOTE: OOIDA data was collected on a different basis from those of the other sources. The OOIDA survey asked for frequency of use of the 11<sup>th</sup> hour but did not otherwise ask about driving hours. ICF calculated the OOIDA number shown here from the underlying survey data.

It is worth noting that the on-duty hours show a pattern relative to the 14-hour limit different from that of the driving hours relative to the 11-hour limit. Drivers are driving ten or more hours in more than 25.0 percent of their work days while reporting 13 or more on-duty hours for only 8.0 percent of days. The latter number suggests that drivers are generally taking two hours of break in a 14-hour tour or their normal work shifts are shorter than 14 hours. We suspect that both are true. Inaccurate logging of on-duty hours could also be a factor.

**Exhibit 2-9  
On-duty Hours Per Tour of Duty (Field Survey Only)**

On-duty Hours	Percentage of Tours
<b>14</b>	<b>2.7</b>
<b>13</b>	<b>5.5</b>
<b>12</b>	<b>13.2</b>
<b>11</b>	<b>15.6</b>
<b>&lt;11</b>	<b>63.0</b>

From Exhibits 2-9 and 2-10, we see that, while daily on-duty hours tend to “bunch” away from the limit, multi-day on-duty hours bunch close to the limit, closer, indeed, than is the case for driving hours. Exhibits 2-8 and 2-10 give us some information on differences in behavior between company drivers and owner-operators. While driving hours show a marked difference, the difference in multi-day hours is slight. Some of this could be accounted for by the fact that OOIDA’s data include some owner-operators working on their own authority; those in the Schneider data are all leased.

**Exhibit 2-10  
On-duty Hours in 8-day Periods**

On-duty Hours	Percentage of 8-day Periods		
	Schneider		Field Survey
	Company	Leased	All TL
<b>&gt;64</b>	<b>41.0</b>	<b>41.3</b>	<b>26.3</b>
<b>60-64</b>	<b>23.5</b>	<b>25.7</b>	<b>16.6</b>
<b>50-59</b>	<b>35.6</b>	<b>33.1</b>	<b>57.1</b>

Regarding differences in the average driving hours listed in Exhibit 2-8, it should be noted that there are few owner-operators in the field-survey data; the higher percentage of 11<sup>th</sup>-hour use from the field survey, as compared with Schneider, suggests that smaller companies may push harder than larger ones, insofar as the driving limit is concerned. The OOIDA data on the 11<sup>th</sup> hour could be seen as part of such a pattern, especially if we think the own-authority owner-operators are using the 11<sup>th</sup> hour heavily. On the other hand, the multi-day hours show the reverse pattern. For 65.0 percent of reported instances, Schneider’s drivers have over 59 hours; from the field survey, the comparable number is 43.0 percent. This might suggest that a big company does not schedule as close to the driving limits as a smaller company might but enjoys greater success in marketing and, thus, is able to keep its drivers moving more consistently. There could, of course, be other explanations.

In general, we must be wary of reaching too far in drawing inferences from these data. To the extent, however, that data from different sources show consistent patterns, we can use this information in our analysis with some confidence. One pattern that comes through consistently is that the preponderance of OTR drivers and trucking firms are not operating at, or close to, the HOS limits. On an approximate basis, we could say that 25 to more than 30 percent of drivers are driving more than nine hours regularly and 25 to 40 percent of drivers are regularly working more than 64 hours in eight days. Put another way, 70 to 75 percent of drivers do not go past the ninth hour and 60 to 75 percent work fewer than 65 hours in a given eight day period. The industry experts with whom we consulted throughout the study said that this is an accurate general view of industry operations.

### 2.3.5 Local Operations

In general, short-haul trucking is more regular and less intense relative to the HOS rules than OTR trucking. The greater regularity can be seen in the times at which local drivers start and finish work compared to the same times for OTR drivers. The field survey gives us data with which to make this comparison. Exhibit 2-11 shows that a much higher proportion of local drivers are working “normal” days.

**Exhibit 2-11  
Times for Starting and Stopping Work**

	<b>OTR</b>	<b>Local</b>
<b>Percent starting 6-8 AM</b>	28.8	63.3
<b>Percent stopping 4-6 PM</b>	26.4	57.4

Exhibit 2-12, 2-13, 2-14 compare the hours driven and worked, days worked, and intensity of effort of local with OTR service by repeating Exhibits 2-8, 2-9, and 2-10 with an added column for local service. Exhibit 2-12 shows that the averages for daily hours and weekly days in local service are only slightly less than those for OTR service. But, as we see in Exhibits 2-13 and 2-14, comparison on the basis of hours worked near the HOS limits demonstrates that the great preponderance of local operations stay well within those limits.

**Exhibit 2-12  
Average Hours per Day and Days per Week**

	<b>Field Survey</b>	<b>Schneider</b>	<b>Local</b>
<b>Driving hours</b>	7.7	7.6	6.4
<b>On-duty hours</b>	9.2	N/A	9.1
<b>Days/week</b>	5.6	5.9	5.5

NOTE: Number for local days/week come from a Virginia Tech Transportation Institute survey of short-haul drivers (“Impact of Local/Short Haul Operations on Driver Fatigue, Virginia Polytechnic Institute and State University, 2000).

Exhibits 2-13 and 2-14 show, respectively, driving hours and on-duty hours distributed over the number of hours worked or driven. Perhaps the key numbers in these tables are in the bottom rows. We see that 77.3 percent of local drivers drive fewer than nine hours in a tour compared to 57.4 percent of OTR drivers; the same comparison for drivers working fewer than 11 hours (Exhibit 2-14) shows 72.8 percent for local service and 63.0 percent for OTR operations.

**Exhibit 2-13  
Driving Hours per Tour of Duty**

<b>Driving Hours</b>	<b>Percentage of Tours</b>			
	<b>Schneider</b>	<b>OOIDA</b>	<b>Field Survey (OTR)</b>	<b>Local</b>
<b>11</b>	<b>10.7</b>	<b>28.0</b>	<b>16.2</b>	<b>5.6</b>
<b>10</b>	<b>15.5</b>	<b>N/A</b>	<b>16.1</b>	<b>5.2</b>
<b>9</b>	<b>16.4</b>	<b>N/A</b>	<b>11.2</b>	<b>11.8</b>
<b>&lt;9</b>	<b>57.4</b>	<b>N/A</b>	<b>56.5</b>	<b>77.3</b>

**Exhibit 2-14  
On-duty Hours per Tour of Duty**

<b>On-duty Hours</b>	<b>Percentage of Tours</b>	
	<b>OTR</b>	<b>Local</b>
<b>14</b>	<b>2.7</b>	<b>2.5</b>
<b>13</b>	<b>5.5</b>	<b>4.2</b>
<b>12</b>	<b>13.2</b>	<b>10.7</b>
<b>11</b>	<b>15.6</b>	<b>9.8</b>
<b>&lt;11</b>	<b>63.0</b>	<b>72.8</b>

**2.4 USE OF FEATURES OF 2003 RULE**

We examined the use of three aspects of the 2003 rule: restarts, the 11<sup>th</sup> hour, and the split sleeper-berth provision. The data come from the sources already mentioned: Schneider, OOIDA, Burks, and the FMCSA field survey. These sources were supplemented by anecdotal information from George Edwards’s interviews and discussions with other members of our industry-expert team.

### 2.4.1 Restarts

All four of our data sources reported on use of restarts. OOIDA reported that almost ninety percent of drivers used the restart at least some of the time.<sup>19</sup> Burks reported that private carrier drivers in his survey used the restart on 61.0 percent of their runs.<sup>20</sup> Neither OOIDA nor Burks, however, reported on length of restarts. It soon becomes clear when looking at other data and from discussions with industry experts that, when a driver says he used the restart provision, he does not mean he took only 34 hours for the restart period. What he means is that he used the restart rule to calculate the time at which he could go back to work; drivers find the method of calculation far simpler than trying to keep track of on-duty hours in a moving eight-day period. They only have to count the hours from the last restart to know when they are approaching the 70-hour limit. Once they decide to go into restart, they only have to count the hours from that point forward to know when they may go back on duty.

Schneider and the field survey both reported a high level of use of restarts and gave information on the length of restarts. In Schneider's data, only 2.0 percent of restarts were only 34 hours. Depending on the reporting period, one-quarter to one-third of the restarts were 44 hours or fewer. Forty-three percent were 58 hours or fewer. Schneider showed a bi-modal distribution with peaks at 39 and 62 hours. Presumably, the former reflects cases in which the driver has taken one full day off, plus a few hours from the preceding and following days; the latter would reflect two full days off, presumably at home.

From the field survey, we see 33.0 percent of restarts were 44 hours or fewer. This comports well with the Schneider data. On this basis, we can say that at least one-third of restarts are short enough to bring a productivity gain. Using the alternative method of the moving eight-day period, drivers would usually have to stay off more than 44 hours before returning to work.

Our anecdotal information on company attitudes towards restarts is that they like the provision and find some productivity gain even though drivers are staying off more than 34 hours. Managers seem hesitant to demand a return to work after 34 hours, except in unusual situations. It may, of course, be the case that taking only 34 hours off would not fit with the work schedule of many drivers, i.e., there would not be anything for them to do at the 35<sup>th</sup> hour. For example, the 35<sup>th</sup> hour might come at 3:00 AM, and the company might have no use for the driver until 8:00 AM. When a TL driver comes off his restart, his first task is to pick up a new load; the hour at which the company needs his services will be set by the requirements of the shipper of that first load.

### 2.4.2 Split Sleeper-berth Periods

The dominant message from the data is that most drivers never split, and those that do split do so only occasionally. Schneider's data for October 2004 show 97.0 percent of drivers never splitting and only 0.4 percent splitting "regularly." We need to bear in mind that, before the new rule,

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<sup>19</sup> John H. Siebert, "A Survey of Owner-Operators and Company Drivers on their Use of Three New 'Hours of Service Features,'" OOIDA Foundation, September 15, 2004.

<sup>20</sup> Stephen V. Burks, "A Survey of Private Fleets on their Use of Three New 'Hours of Service Features,'" September 15, 2004



Schneider did not allow solo drivers to split at all and has only allowed them to split on an 8-and-2 basis under the new rule.

The data from OOIDA and the field survey show many more drivers splitting occasionally but few splitting frequently. We see this in the following table.

**Exhibit 2-15  
Incidence of Splitting**

<b>Splitting frequency</b>	<b>Field Survey</b>	<b>OOIDA</b>
<b>0 times per month</b>	<b>66%</b>	<b>55%</b>
<b>1-4 times per month</b>	<b>20%</b>	<b>20%</b>
<b>0-4 times per month (sum of above rows)</b>	<b>86%</b>	<b>75%</b>
<b>Average percent splitting per day</b>	<b>6%</b>	<b>13%</b>

Information from the Burks survey suggests a higher percentage of frequent splitting. The Burks data are not directly comparable with those from the field survey and OOIDA. They suggest that 52.0 percent of drivers split four or fewer times a month with the rest splitting more frequently. We think that is a correct general interpretation, but we are not sure. It is not clear why private drivers would split more frequently than others. There might be a higher percentage of teams in Burks's data; we do have evidence that teams split more frequently than solo drivers.<sup>21</sup>

The data in the following table come from an Insurance Institute for Highway Safety (IIHS) survey of drivers at weigh stations in Pennsylvania and Oregon and from FMCSA's Driver Fatigue, Alertness and Countermeasures Study (DFACS).

**Exhibit 2-16  
Incidence of Splitting—Team and Solo  
(percentage of drivers who say they split sometimes)**

	<b>IIHS</b>	<b>DFACS</b>
<b>Solo</b>	<b>24</b>	<b>22</b>
<b>Team</b>	<b>47</b>	<b>52</b>

Given the agreement between the IIHS and DFACS findings, we are safe in saying teams split more than solo drivers. Intuitively, that is what one would expect. There is some anecdotal evidence that the incidence of splitting by teams is higher than that found by IIHS and DFACS. A number of comments to the docket suggested higher percentages than these and also indicated that team splitting is generally balanced; that is, sleeper periods and driving stints are about equal at four to six hours each.<sup>22</sup> We also note that the IIHS/DFACS findings for solo drivers sometimes splitting are lower than those from OOIDA and the field survey.

<sup>21</sup> There is also some ambiguity in the Burks survey which asked for the percentage of "runs" using the splitting rule but did not define runs. It appears that some respondents interpreted "run" to be a multi-day period. In the field survey data, we saw instances in which drivers reported splitting, though one of the "split" rest periods exceeded ten hours. We discarded these cases, but this shows the danger of inaccurate logging of split sleeper periods.

<sup>22</sup> Docket 19608; see comments by Yellow-Roadway, FedEx, CR England, Overnite, ATA, MCFA.

What the data on splitting clearly tell us is that splitting for most solo drivers occurs on an occasional and opportunistic basis. They do not build splitting into their operating routines. When they do take a split period in the sleeper, they go right back to the ten-hour rest at the next rest period. This does suggest that most drivers find the limited rest period unsatisfactory and use it only to avoid some other problem. An unexpected period of congestion would be one example. On the other hand, routine splitting is probably part of the daily operation of many teams.

Anecdotal information from the Edwards interviews is that managers dislike splitting for solos, do not encourage it, but do not forbid it outright.

### 2.4.3 The 11<sup>th</sup> Hour

The following table summarizes our findings on 11<sup>th</sup> hour use.

**Exhibit 2-17**  
**Incidence of 11<sup>th</sup> Hour Use**  
**(percentage of tours or runs on which used)**

<b>Schneider</b>	<b>OOIDA</b>	<b>Field Survey</b>	<b>Burks</b>
<b>10.4</b>	<b>28.0</b>	<b>16.2</b>	<b>31.0</b>

Note: Field-survey numbers for compliant drivers only. Burks data might overstate 11<sup>th</sup> hour use because of previously noted ambiguity about meaning of “run.”

These findings tell us that the 11<sup>th</sup> hour is definitely being used. As between Schneider, OOIDA, and the field survey, there is certainly an implication that big companies use it less often than small companies or owner-operators. That is plausible on the supposition that small firms push closer to the limits than large ones do. Some of the data we have adduced in this chapter certainly suggests that, though we are using data for only one large company.

In any event, in estimating overall use of the 11<sup>th</sup> hour, we have proceeded on the basis that usage is heavier for smaller firms. For this purpose, we chose to use 25 tractors as the point of demarcation between big and small truckload companies. We estimate that 40.0 percent of TL VMT is from small companies and 60.0 percent is from large companies.<sup>23</sup>

The high percentage for the private carriers may have several explanations. One possibility is that the 29 companies reporting are not representative. But we note that many of the responding companies have long runs; they may be building the 11<sup>th</sup> hour into their schedules. Some of the information from the Edwards interviews tells us that LTL managers are now planning some runs that use the 11<sup>th</sup> hour. This would occur, for example, when a company finds that use of the 11<sup>th</sup> hour would bring one or more additional terminals within the overnight reach of a given terminal. If LTL managers are thinking that way, one would expect to find the same thing with private-fleet managers. They, too, have systems with a fixed set of nodes (factories, warehouses, etc.); if they find that the 11<sup>th</sup> hour brings one more warehouse within a day’s trip from a factory, for example, they are likely to take advantage of it.

<sup>23</sup> Calculation from data in ICF 2002 RIA, Appendix A, Exhibit A-2.