



DIGITAL FREIGHT MATCHING

Capturing Technology-Based Efficiencies in the Trucking Industry

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ABOUT ARMSTRONG & ASSOCIATES, INC.

Armstrong & Associates, Inc. (A&A) was established in 1980 to meet the needs of a newly deregulated domestic transportation market. Since then, through its leading Third-Party Logistics (3PL) market research and history of helping companies outsource logistics functions, A&A has become an internationally recognized key resource for 3PL market information and consulting.

A&A's mission is to have leading proprietary supply chain knowledge and market research not available anywhere else. As proof of our continued work in supporting our mission, A&A's 3PL market research is frequently cited in media articles, publications, and securities filings by publicly traded 3PLs. In addition, A&A's email newsletter currently has over 30,000 subscribers globally.

A&A's market research complements its consulting activities by providing continually updated data for analysis. Based upon its unsurpassed knowledge of the 3PL market and the operations of leading 3PLs, A&A has provided strategic planning consulting services to over 30 3PLs, supported 16 closed investment transactions, and provided advice to numerous companies looking to benchmark existing 3PL operations or outsource logistics functions.

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Emergence of Digital Freight Matching

Digital Freight Matching companies aim to match Shipper demand (the need to transport a product) with Carrier supply (truck capacity) via digital (web- or mobile-based) platforms, usually in the form of apps. In the past five years, several Digital Freight Matching (“DFM”) companies have emerged. The sector has attracted over \$180 million in Venture Capital investment since 2011. Armstrong & Associates (A&A) recognizes the potential of new technology to efficiently match freight. We therefore undertook a study of twenty-seven DFM companies to provide an overview of current product offerings. We also assessed current market conditions, industry challenges, and potential uses for DFM technology. Finally, we projected scenarios in which DFM technology may succeed.

Digital Freight Matching is possible due to the development of a larger phenomenon: the genesis of the Sharing Economy and the concurrent rise of Digital Matching firms in other industries. The Sharing Economy goes by many names — the on demand economy, the access economy, and the collaborative economy, to name a few. The principle has existed for eons: sharing assets or labor to squeeze maximum efficiency from a single unit. However, digital platforms vastly increase the scale and speed in which demand can be matched with supply. As a result, companies operating within this space, such as Uber and Airbnb, have expanded from small startups to multi-billion dollar companies in less than a decade. Uber, the clear leader, was most recently valued at \$62.5 billion and has attracted venture capital investment of \$12.5 billion.

Following the success of these vanguards in the ride-hailing and hospitality industries, the startup arena has been flooded with companies aiming to use Digital Matching to revolutionize other industries. Meanwhile, Uber became a byword for any sort of Digital Matching within the Sharing Economy — hence the now-common term “Uber for X,” and now, of course “Uber for Trucking.” At face value, it certainly seems Uber can be applied to trucking. Uber pairs a similar problem (underutilized capacity in taxis) with a similar solution (a mobile-based app which matches passenger demand with taxi-driver supply). However, many of those engaged in Digital Freight Matching companies are loath to be characterized this way. Furthermore, a number of important distinctions separate the Uber problem and solution from those of Digital Freight Matching companies. After studying many of the solutions on the market, A&A found that most DFM companies aren’t simply mimicking the Uber model, and we agree the term distorts the true functionality DFMs offer and conflates the “freight problem” with the “Uber problem.” We do use Uber functionality as a reference point frequently throughout the paper, but generally maintain the opinion that Digital Freight Matching is a more apt moniker than Uber for Trucking.

This is not, of course, the first time a technology-based solution has been proposed. In the late 1990s and early 2000s, many startups seized on the excitement (and available capital) of the dot-com era to establish online freight exchanges. Today, most of these companies are defunct. However, a number of conditions (in addition to the growth of the Sharing Economy) make today’s market more accommodating to DFM companies: technology improvements and access; policy changes to further define the Sharing Economy; a workforce increasingly taking on supplementary, part-time or independent contractor work; and the rise of e-commerce freight and corresponding pressures for improved, speedier performance.

A&A compiled profiles for twenty-seven DFM companies. To qualify for inclusion, companies had to incorporate:

- A digital platform for matching Shipper demand with Carrier supply
- Bundled functionality to automate tasks (i.e. automatic driver payment) and/or reduce transaction friction (i.e. eliminating pricing negotiations)
- Value-added features (such as rewards programs or trip planners)

Each company attempts to digitally match supply and demand and capture other efficiencies, but nuances separate them naturally into five groups. Based on common business models, app characteristics, and functionalities, we separated the analysis into the following categories:

Business Models	# Companies Studied	Description
Uber-like	10	Apps have characteristics such as GPS-based alerts for nearby loads, track-and-trace, task automation, algorithmic/single pricing, digital document storage, and elimination of third-party interaction.
Loadboard-Plus	7	Apps based off existing loadboards which also provide digital freight matching access to Carriers seeking to fill capacity on-the-go. Carriers can search by location or enable GPS tracking to find loads meeting their parameters.
Broker-Plus	5	Proprietary apps published by Freight Brokerage companies for Carrier partners. Functionality frequently includes communication streamlining and digital document storage.
Specialty	3	Apps similar to those in the 'Uber-like' category, but geared towards specialty freight, like heavy haul equipment, automotive transportation, or household goods.
Last Mile	2	Apps used in local peer-to-peer networks or to fulfill last mile delivery (such as e-commerce fulfillment).

A discussion of characteristics and functionalities for each model is discussed, and a profile of each company is included in the report. A summary is included below:

Characteristics	Functionality
Startup activity	Digital device availability
Downloads	Payment via app
Executive background	Carrier payment time
Service area	TMS integration
Property broker status	Track-and-trace
Target users	Document storage
	Value-added features

Uber-like	Loadboard-Plus	Broker-Plus
Cargomatic	10-4 Systems (10-4 Marketplace)	Cargo Chief
Convoy	123Loadboard	CHRWTrucks
DashHaul, Inc.	DAT Trucker	CoyoteGO
Dispatcher, Inc.	FreightFriend (MercuryGate)	TQL Carrier Dashboard
Go by Truck, Inc.	GetLoaded	Trucker Path Truckloads
Keychain Logistics	Transmission	
LaneHoney	ITS Trucker (Truckstop.com)	
LoadSmart, Inc.	Last Mile	Specialty
Next Trucking, Inc.	Amazon Flex	Roadie, Inc.
Transfix	Shipster	uShip, Inc.
		Veritread LLC

DFM companies will face several challenges: competition, regulations, investment, possible cannibalization by other emerging technologies, and issues specific to the nature of the trucking industry.

- Long-established Freight Brokers provide exception handling, backup in the case of equipment breakdown, relationship management, access to Transportation Management Systems, and access to a wide variety of Carriers. DFM companies are therefore competing against formidable incumbents.
- Secondly, the ambiguous nature of the Sharing Economy is both an asset and a liability. While the space sometimes allows circumvention of regulations faced by more traditional industries, it also presents new challenges. Other companies forging the parameters of the Sharing Economy, such as Uber and Airbnb, have encountered policy disputes. Furthermore, as companies operating in this environment face increasing scrutiny, new regulations are also a possibility.
- While investment in Digital Matching companies has increased severalfold over the last five years, a sharp dropoff occurred in the last quarter of 2015 and the first quarter of 2016. Future investment levels are always uncertain and should be monitored.
- Digital Freight Matching is just one of many emerging technologies. Innovations like self-driving vehicles and drones will compete with DFM companies or could preempt them entirely.
- The very nature of the trucking industry and the 'freight problem' presents its own challenges. On

the surface, the problem of freight capacity looks very much like Uber's problem of available taxi capacity. However, further examination shows the problems have fundamental differences, and DFM success will rely on addressing nuances of the underlying problem.

A&A envisions different applications for long-haul trucking versus last-mile delivery. Improved freight matching may be achieved through a DFM company, or by technology developed internally at large Third-Party Logistics (3PL) providers with budgets, scale, and existing Carrier/Shipper relationships. Finally, aspects of technologies present in DFM apps may be implemented piecemeal by loadboards and Freight Brokers to automate tasks and streamline communications.

Problem and Market

Problem

Digital Freight Matching companies are trying to solve two problems:

1. Decrease underutilized capacity (or “empty miles”)
2. Improve inefficient processes in the current state of matching Shippers and Carriers

Empty Miles

Empty mile estimates have ranged from 10-23% in the last five years. In general, empty miles have increased for for-hire trucking and decreased for private companies. These estimates come from various surveys, industry groups, for-hire trucking companies, annual reports, owner-operators, and private fleets. Empty miles by segment is broken down further in the sections below.

The benefits of filling underutilized capacity are apparent for all parties. Carriers have the potential to increase revenue and decrease operational costs. In a competitive market, some of this savings will be passed on to Shippers. Efficient utilization resulting in emissions reduction is also environmentally sound.

Inefficiencies in the status quo

Inefficiencies in current processes fall largely into two categories: non-automated tasks which have the potential to be automated, and transactional frictions, in which a single transaction involves many steps with potential for consolidation.

Examples of non-automated tasks:

- Driver payments
- Paper document delivery
- Paper document management
- Location notifications
- Non-digital dispatch

Examples of transactional friction:

- Multiple Carrier/Shipper/Broker interactions to negotiate price
- Non-immediate booking
- Multi-party interaction (shipment is not arranged solely between Shipper and Carrier)
- Non-centralized communications, or communication via phone, fax, and email

All this is not to say there aren't logical reasons for the status quo. For example, on routes shorter than 150 miles, it is usually not worth finding backhauls. Due to the hourly cost of the driver, it's more efficient to simply return to the point of origin. Many of the processes found in the industry today are ingrained, time-tested processes — the result of years of trial-and-error to work most efficiently within a complex industry. Some elements inherently classified as transactional friction, such as the multi-party interaction due to the existence of Freight Brokers, also add important benefits (discussed later in the report). Finally, many trucking companies may face only a fraction of the problems listed.

Solution proposed by Digital Freight Matching companies

Despite the rationale for the status quo, continuous improvement is a key initiative for many

transportation providers. Newly available technology presents the potential to increase capacity utilization and transition processes to a centralized and convenient digital platform, usually in the form of a mobile application ("app"). While functionality of DFM apps varies, companies incorporate features to solve some or all of the problems detailed above. To decrease empty miles, Digital Freight Matching companies match Shipper freight with Carrier capacity. To improve upon existing processes, DFM apps offer some combination of digital payment, automatic track-and-trace, document management, single pricing interactions, algorithmic pricing, digital dispatch/load alerts to drivers, immediate booking, and in-app communication tools. In addition to core functionality, many apps also include features which appeal to drivers, such as trip planning tools and rate benchmarking. Finally, DFM companies offer other benefits such as a 24-hour payment cycle, a referral or rewards program, fuel card, or discounts.

DFM apps are not the first to offer many of the functions discussed. Many one-off app solutions exist, such as trucker logbook apps, document scanning apps, and driver check-in apps. However, the principle behind most DFM apps is to bundle the solutions to all problems and become the 'go to' app for both Shippers and Carriers.

How is the problem being solved today?

To match freight demand and supply today, Shippers and Carriers either work together directly or with an intermediary — a Third-Party Logistics provider ("3PL") — to arrange transportation.

Even if DFMs can disrupt the industry, the technology is unlikely to elicit latent demand. Instead, DFM companies will need to attract business from existing Shipper-Carrier relationships or win business away from competitors. DFM companies are most likely to compete with Loadboards and Freight Brokers for business. To understand the competitors DFMs will face, we have included descriptions of how Loadboards and Freight Brokers match freight today.

Loadboards

Loads are posted on Loadboards by Freight Brokers and Shippers. They can be accessed online, via a Loadboard's mobile app, and at truck stops. Loadboards are used by trucking companies, fleets, Owner-Operators, and Freight Brokers. It is more common for loads to be posted than available trucks, and Carriers will contact the Broker who posted the load to discuss rates and agree on the job.

Loadboards are subscription-based with tiered pricing; basic plans allow load searching, and higher tiers offer features such as lane rate benchmarking and credit data on Freight Brokers. Pricing/rates are quickly responsive to market conditions

Inefficiencies arise when posted loads are no longer available, criteria for a load doesn't match a Carrier's parameters, Carriers must make multiple calls to get rates, loads are cancelled after agreement, and loads are posted multiple times (when Shippers work with multiple Brokers which each post the load).

Domestic Loadboard leader DAT states that over 200 million loads were searched by carriers in 2015¹. DAT suggests Loadboard use is correlated with fewer empty miles. According to the company, "frequent for-hire users of Loadboards (61%+ Loadboard use) had about 8% empty loads in 2011, while occasional and moderate users had 10.2-10.5%."²

1 DAT <http://www.dat.com/load-board>

2 DAT <http://www.werc.org/assets/1/Publications/935 CarrierBenchmarkSurvey2011.pdf>

DAT's 2013 Carrier Benchmark Survey also indicates that Loadboards are the primary source of freight for for-hire carriers and owner-operators³.

Freight Brokers

Shippers choose to work with Freight Brokers for a number of reasons.

- Brokers help find flexible excess capacity (particularly during peak seasons in late summer and fall).
- As a result of the trucking shortage, tractor capacity is tight. Freight Brokers help Shippers secure necessary capacity.
- Working with a Broker decreases the number of parties Shippers need to work with, as the Broker manages contact with multiple Carriers.
- Brokers can plan complex shipments (such as LTL to truckload consolidation).
- Brokers manage exception handling and source replacements for broken-down equipment.
- Some Freight Brokers provide value-added services, give capacity prioritization to large accounts, and guarantee on-time shipments even at a loss.
- Access to Transportation Management Systems (TMS).
- Some large Shippers negotiate contracts directly with Carriers, and the Domestic Transportation Manager (DTM) will manage daily transportation planning and execution for the Shippers.

Freight Brokers handle an estimated 15% of all less-than-truckload ("LTL") and full truckload ("TL") shipments in North America. About 50,000 Shippers use DTMs. A&A estimates 1,850 licensed Freight Broker companies of size in the United States, 50 of which have net revenue⁴ of greater than \$20 million. The top 40 account for more than 70% of net revenue. Shippers are accustomed to using more than one source to find capacity: 48% of large shippers use 2-5 brokers; 38% use 6 or more⁵. A DAT survey found about 28% of for-hire and owner-operator carriers use Freight Brokers or 3PLs as their primary source of freight.

U.S. DTM 3PL Segment gross revenue was \$58.7 billion in 2015. On average, DTMs operated at a 16.4% margin; 2015 net revenue was \$9.6 billion. The segment is growing rapidly. Net revenue increased 12.4% between 2014 and 2015, and more than 20% the year prior. The segment has a 20-year compound annual growth rate of 11.5% and A&A projects a future gross revenue growth rate of about 10% per year. The sector's revenue is growing at a faster rate than the trucking industry as a whole; A&A estimates trucking revenues are growing at about a third that rate. Gross Profit varies by Shipper size, ranging from 5% for enterprise accounts to 25% for smaller customers.

The majority of Freight Broker revenue is derived from full truckload shipments (85%), while LTL accounts for 9% (the remainder is derived from Intermodal). Of TL revenue, dry freight makes up nearly three quarters, and refrigerated over 20%.

Freight Brokers vary in technology and operations sophistication. "Network Transportation Managers" optimize routes and LTL shipment consolidation with TMS, generally use electronic communication, and use one to three year contracts. DTMs such as C.H. Robinson use load-matching algorithms. Meanwhile, "Transactional Freight Brokers," are characterized by use of IT for support purposes, pre-approved/ simpler contract agreements, pre-approved carrier bases, and key performance indicator (KPI) tracking. Some communication occurs by email or phone.

3 DAT http://www.dat.com/Resources/~media/Files/DAT/Resources/Whitepapers/2013_Carrier_BenchMark_Surveyfinal.ashx

4 Gross revenue less purchased transportation

5 Morgan Stanley

Additional Pages Included in Full Report

Why Now?

In the late 1990s and early 2000s, a wealth of online freight exchanges promised to revolutionize the transportation business. In fact, Armstrong & Associates profiled nearly 100 of these exchanges in 2000; today, few remain. In the last twenty years, changes in technology, the economy, policy, competitive landscape, workforce, and consumer behavior have made today's environment more amenable to technology-based solutions. Below, we detail advancements indicating DFM companies are entering the market at a favorable time.

Technology

Technological developments and ubiquity of access have made Digital Matching apps possible. Digital Freight Matching apps rely on a userbase equipped with internet access and smartphones. The apps themselves leverage GPS-location, map integration, and mobile payment technology, all of which have been developed in the past several years.

- **Internet access.** According to the World Bank, in 2014, 87.4% of people in the United States had access to the internet, as compared to 68% in 2005, 43.1% in 2000, and 9.2% in 1995¹.
- **Smartphone access.** Smartphones are an essential tool for participation in DFM, allowing drivers to easily search for or receive alerts for loads. Smartphone subscriptions have more than tripled in recent years, increasing from 18% in 2009 to 64% in 2014². Access to a smartphone is not a barrier to entry for those wishing to engage in Digital Freight Matching. In Uber's early years, the company provided phones to drivers and waived data fees to attract new employees; now the company leases phones to drivers.
- **GPS.** For companies to operate a true Uber-like app, the app must access a driver's location. This allows algorithmic matching of a driver's location with nearby/en route available loads (rather than the less efficient and more time consuming manual search). It also provides visibility to Shippers via real time track-and-trace. Many companies also use embedded map application program interfaces (APIs). For example, Uber uses the Google Maps API for routing and calculating estimated time-to-arrival.
- **Apps.** Nearly all of the Uber for Trucking companies studied are available as a mobile app, either in conjunction with a desktop app, or exclusively for mobile. On the Carrier side, mobile apps are the primary transaction mechanism; for Shippers, companies usually offer both desktop and mobile apps. Since 2008, apps have been offered via two dominant operating systems, Apple's iOS and the Android operating system. Mobile analytics company Flurry found mobile app use is increasing dramatically every year. Measuring use through number of sessions, the company reported growth rates of 103% in 2013, 76% in 2014, and 58% in 2015³. Furthermore, the share of digital media accessed on mobile apps is increasing relative to other platforms. 67% of all digital media time is via Mobile⁴. Apps aimed at the automotive sector in particular have seen a recent increase in utilization. In the second quarter of 2015, year-over-year visits to auto-related apps increased 25%. Along with the Health sector, Auto experienced the highest sector growth rate in mobile visits⁵.

1 World Bank <http://data.worldbank.org/indicator/IT.NET.USER.P2>

2 Informa/KPCB <http://www.kpcb.com/internet-trends>

3 Flurry <http://flurrymobile.tumblr.com/post/136677391508/stateofmobile2015>

4 ComScore <http://www.comscore.com/Insights/Presentations-and-Whitepapers/2015/The-2015-US-Mobile-App-Report>

5 Adobe Digital Index https://offers.adobe.com/en/na/marketing/landings/_50263_adi_best_of_the_best_benchmark.html

- **Mobile payments.** Mobile payments are a key requirement for any sort of Digital Matching. The U.S. Department of Commerce's definition of Digital Matching firms includes IT-based transactions (i.e., mobile payments) as the first defining element of companies operating within this space. Mobile payments have steadily increased over time. A November 2015 survey by the Federal Reserve found that 24% of all mobile phone owners reported making a mobile payment in the prior year, as compared to 12% in 2011⁶. On the other hand, 24% is a relatively low proportion of users. This is still an area that must be improved to gain acceptance among both Shippers and Carriers. Frequently cited deterrents to mobile payment include concerns about ease/convenience, security, trust, or simply user confusion.

Economy

The Sharing Economy is characterized by renting an asset, and made popular by companies such as Uber, Airbnb, and Lyft. As these leaders shape the economy, drive consumer acceptance, and impact policy, the field is opened to more players. The Sharing Economy extends past Silicon Valley startups; the principles are being adopted by large corporations, both through innovation and partnerships. The normalization of the Sharing Economy allows DFM companies to innovate in a new space.

- **Size and growth of the Sharing Economy.** PricewaterhouseCoopers projects that Sharing Economy global revenues could increase from \$15 billion in 2015 to \$335 billion in 2025⁷. Rockbridge Associates estimates about 10% of Sharing Economy spend in the U.S. is directed to companies in the transportation sector⁸.
- **Participation.** The popularity and media coverage of apps like Uber has begun to normalize the experience of participating in the Sharing Economy. A survey by the Pew Research Center found that 72% of adults surveyed have used at least one shared/collaborative/on-demand service. 15% have used ride-hailing apps. On the other hand, 33% have never even heard of these apps (such as Uber and Lyft). Furthermore, use is highly skewed towards those living in cities. Despite media frenzy, there is work to be done to make Sharing Economy services ubiquitous⁹.
- **Changing business models.** The Sharing Economy is changing the way we think about assets and transforming existing business models. An underlying principle of the Sharing Economy is to increase utilization and efficiency of assets. On a larger scale, global companies are beginning to embrace this mode of thinking, evident in investment in new companies and technologies. In a recent Wall Street Journal interview¹⁰, Mark Fields, CEO of Ford Motor Company, said Ford is changing its way of thinking about cars. Rather than simply considering the number of units sold, Ford will "look at... vehicle miles traveled... it changes your mind to think about what kind of services can we offer via our products." Ford, as part of its Ford Smart Mobility program, is also piloting several Sharing Economy solutions¹¹.
- **Partnerships.** Many partnerships are being formed between automakers and Sharing Economy technology companies. GM entered a partnership with Lyft, which will include passenger/driver

6 Federal Reserve <http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201603.pdf>

7 PricewaterhouseCoopers <https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf>

8 Rockbridge Associates' National Technology Readiness Survey <http://rockresearch.com/techqual/>

9 Pew Research Center survey <http://www.pewinternet.org/2016/05/19/the-new-digital-economy/>

10 Wall Street Journal <http://www.wsj.com/articles/ceo-mark-fields-maps-fords-future-1460502908>

11 Ford Motor Co. <https://media.ford.com/content/fordmedia/fna/us/en/news/2016/03/11/ford-smart-mobility-llc-established--jim-hackett-named-chairman.html>

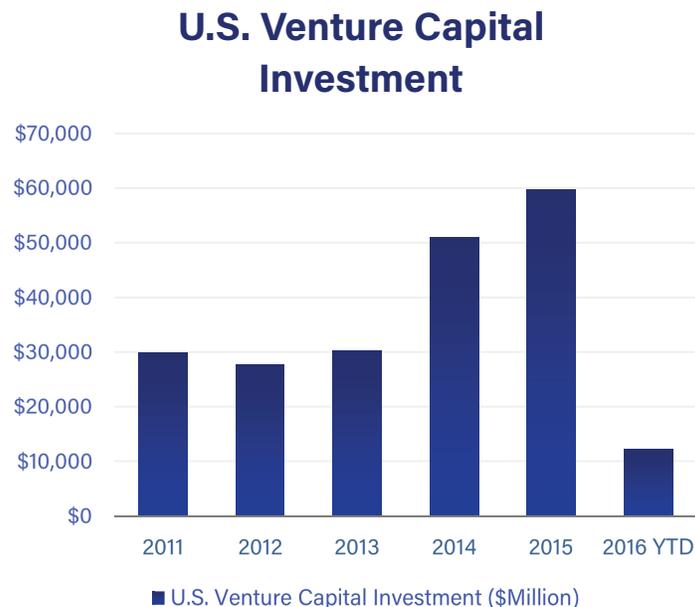
Additional Pages Included in Full Report

Investment

About half of the apps studied are true startups, funded with private capital or venture capital. The other half are companies offering an app as a supplement to primary services (such as Coyote's CoyoteGO or Truckstop.com's app), and are therefore funded through each company's resources. Ten of the companies studied have published information on venture capital funding, and the discussion below is based on data reported on these investments.

Investment Trends

Total U.S. Investment

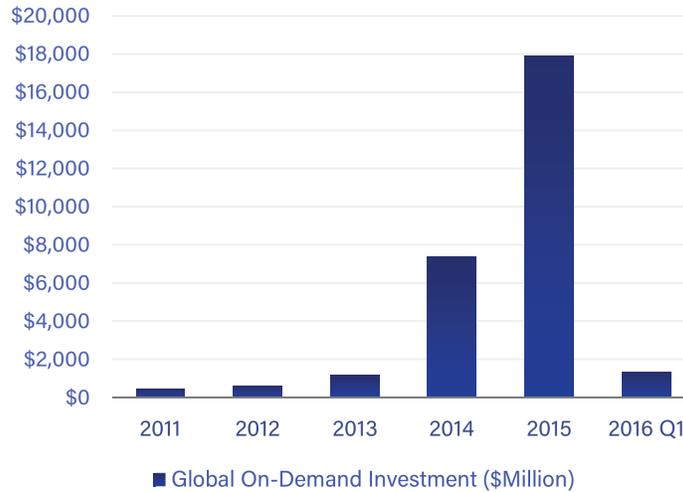


Annual VC investment in the U.S. has been increasing since 2012¹. 2015 was the highest year on record, with investment of \$58.8 billion, a 17% increase over 2014. As expected, the largest industry represented is software (the segment in which DFM falls), accounting for 40% of venture capital invested.

¹ "U.S. Venture Capital Investment" table data from PricewaterhouseCoopers PWC Moneytree — cash-for-equity investments by the professional venture capital community in private emerging companies in the US, based on data provided by Thomson Reuters. PwC/NVCA MoneyTree Report, Data: Thomson Reuters <https://www.dropbox.com/sh/v368agsbelc5p3t/AACYcgw-jXQJiEeYQ1LntHxva?dl=0>

Digital matching trends

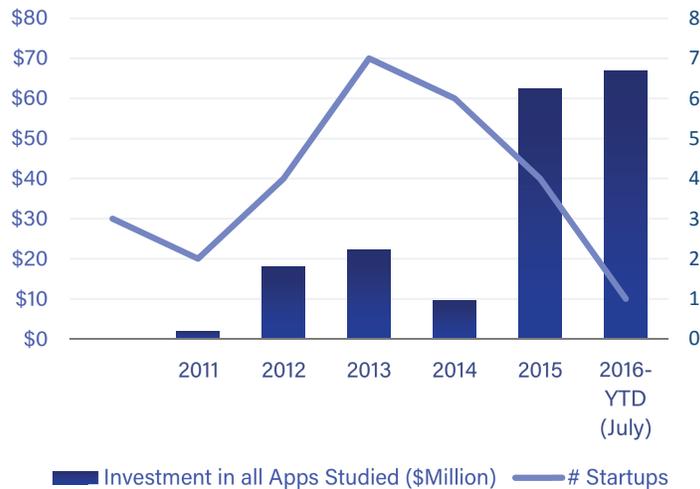
Global Investment in On-Demand



CB Insights, which measures trends in on-demand investment (a definition similar to A&A's use of 'Digital Matching'), estimates global VC investment of nearly \$18 billion in 2015, an increase of 142% over 2014².

Digital Freight Matching trends

Investment in all Freight Matching Apps Studied



VC investment data is available for 10 of the companies studied³. Since 2011, the total VC funding for these 10 companies totals over \$180 million. Most companies were founded between 2012 and 2015; the number of startups peaked in 2013 at 7. In July of 2016, investment amounts already exceeded the entirety

2 "Global Investment in 'On Demand'" data from CB Insights <https://www.cbinsights.com/blog/on-demand-funding-trends/>

3 CrunchBase <https://www.crunchbase.com>

Additional Pages Included in Full Report

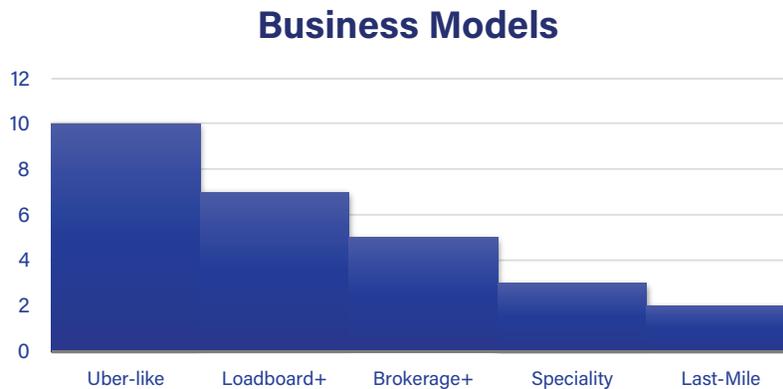
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Summary of App Characteristics

A&A studied 27 applications aiming to increase trucking efficiency; decrease empty miles; speed communication between carriers, shippers, and third parties; automate aspects of arranging transport; and automate aspects of the trucker workload. Common characteristics of these apps are summarized below.

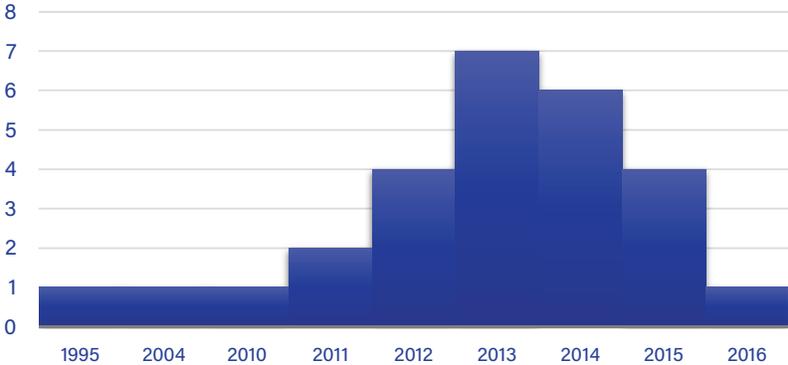


Five different business models are studied, ranging from those most closely resembling Uber to apps that resemble extensions of brokerages and loadboards.

As discussed in the previous chapter, different apps attempt to provide solutions to different Shipper and Carrier needs.

- Ten of the apps studied are similar to Uber, in that they have characteristics such as automatic payment, algorithmic/single pricing, digital document storage, eliminate third-party (Broker) interaction, and location tracking.
- Seven apps are considered 'Loadboard-plus,' meaning they are based off existing Loadboards, but also provide mobile access to Carriers seeking to fill capacity "on-the-go." Carriers can search by location or enable GPS tracking to find loads meeting their parameters.
- Five apps are 'Broker-plus,' which we define as mobile technology based solutions provided by Brokers to Carriers in their networks.
- Three apps meet several of the conditions for Uber-like apps, but are geared towards specialty freight, like heavy haul equipment, vehicles, or household goods.
- Finally, two apps specializing in Last-Mile/Local delivery were studied. This is just a subset of the peer-to-peer and last-mile service market.

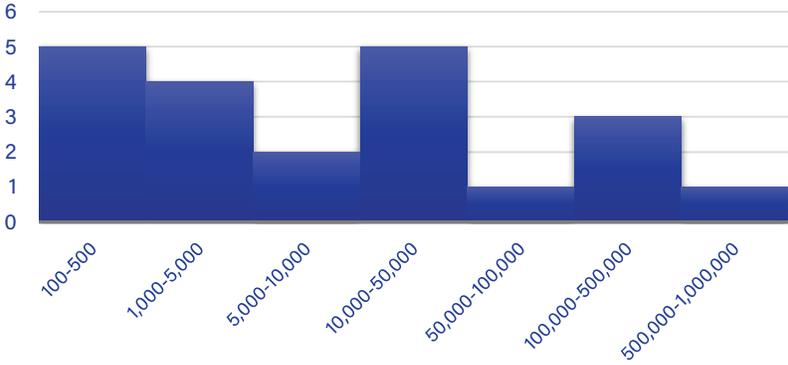
Company Start Dates



The highest startup activity occurred in 2013-2014.

Most companies were founded (or launched a secondary app) within the last five years. The oldest company studied was DAT, which began operations in 1978 as a load finder service, while the most recent, 123Loadboard, launched an app in early 2016. Apps most closely resembling Uber were launched between 2011 and 2015.

Android Downloads



The popularity of apps varies vastly. Loadboard-plus and Broker-plus apps have, on average, the largest userbases.

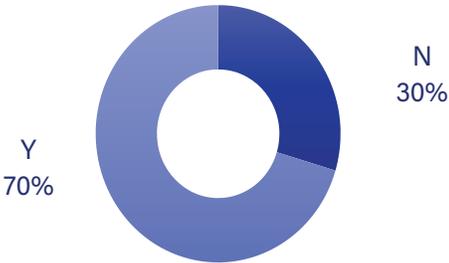
Most of the apps studied are available for both iPhone and Android devices. Google Play, which sells Android apps, publishes the number of downloads for each app. While this number does not represent active users, it does provide a directional indicator of app popularity. Loadboard-plus and Broker-plus apps tend to have a larger number of downloads than Uber-like apps, in part because they are available to users nationwide, and in part because of their history and relationships with Carriers. To succeed in this arena, an app relies on a large number of Carrier users to match Shipper demand. Therefore, Loadboard-plus and Broker-plus apps have the potential to leverage their wide user bases.

Additional Pages Included in Full Report

as Coyote and C.H. Robinson already incorporate much of this functionality into apps used by their Carrier partners; CoyoteGO is a particularly good example.

Functionality

Web App Available



Primary Use



Most apps offer a web app in addition to mobile.

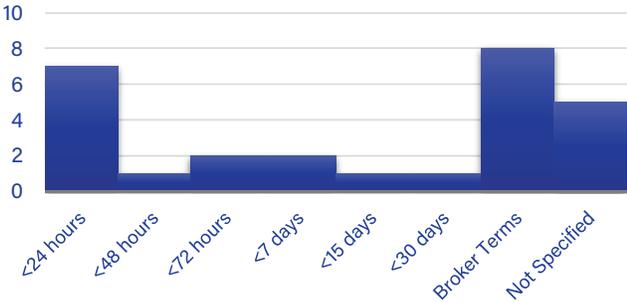
In most cases, apps are designed to be used by Carriers on-the-go. On the other hand, Shippers may prefer to input shipments on a desktop computer, either due to the number of parameters that must be entered as part of the administrative workflow, or because the app syncs with their TMS. Therefore, apps should be designed to meet the requirements of both Shippers and Carriers by including both mobile and web accessibility.

In some cases, companies have considerably developed the desktop or web app, and the mobile app is a secondary feature. In these cases, the desktop version is predominantly used by both Shippers and Carriers.

Payment Via App



Carrier Payment Time



Processing payments entirely within apps is efficient, and Uber-like apps offer quick payments to Carriers.

Just over half of the apps studied offer payment via the app. One key benefit of the Uber app is the frictionless handling of all payments via the app. This allows for quick, transparent payment, with credit information only being entered once. Drivers do not need to procure payment equipment in cars and passengers do not need to worry about broken equipment.

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Five Business Models

The apps studied fall into five business models, each of which is discussed in this chapter.

Business Models	# Companies Studied	Description
Uber-like	10	Apps have characteristics such as GPS-based alerts for nearby loads, track-and-trace, task automation, algorithmic/single pricing, digital document storage, and elimination of third-party interaction.
Loadboard-Plus	7	Apps based off existing loadboards which also provide digital freight matching access to Carriers seeking to fill capacity on-the-go. Carriers can search by location or enable GPS tracking to find loads meeting their parameters.
Broker-Plus	5	Proprietary apps published by Freight Brokerage companies for Carrier partners. Functionality frequently includes communication streamlining and digital document storage.
Specialty	3	Apps similar to those in the 'Uber-like' category, but geared towards specialty freight, like heavy haul equipment, automotive transportation, or household goods.
Last Mile	2	Apps used in local peer-to-peer networks or to fulfill last mile delivery (such as e-commerce fulfillment).

Uber-like	Loadboard-Plus	Broker-Plus
Cargomatic	10-4 Systems (10-4 Marketplace)	Cargo Chief
Convoy	123Loadboard	CHRWTrucks
DashHaul, Inc.	DAT Trucker	CoyoteGO
Dispatcher, Inc.	FreightFriend (MercuryGate)	TQL Carrier Dashboard
Go by Truck, Inc.	GetLoaded	Trucker Path Truckloads
Keychain Logistics	Transmission	
LaneHoney	ITS Trucker (Truckstop.com)	
LoadSmart, Inc.		
Next Trucking, Inc.		
Transfix		
	Last Mile	Specialty
	Amazon Flex	Roadie, Inc.
	Shipster	uShip, Inc.
		Veritread LLC

Uber-like App Model

Overview

Apps following an Uber-like model rely on GPS-enabled tracking, transparent algorithmic non-negotiable pricing, automatic parameter matching, documentation and payment via app, two-party involvement (Shipper and Carrier), and push-notifications to Carriers.

While none of the apps studied encompass all of the features of Uber, the 10 apps discussed in this section most closely resemble Uber's business model. All of the companies studied are privately owned. The companies in the Uber-like app model are Cargomatic, Convoy, DashHaul, Dispatcher App, Go by Truck, Keychain Logistics, LaneHoney, LoadSmart, Next Trucking, and Transfix.

All of these companies have functionality for full truckloads, and a few can handle LTL shipments. A handful of specialty transportation mode selections include drayage, reefer, and flatbed. Some apps operate regionally, either between networked cities (San Francisco and LA, for example), or within a set radius of a city (<150 miles). In all cases, the Bill of Lading is handled by in the conventional fashion between Shipper and Carrier, not by the DFM company.

Variations on the model include examples in which Carriers can search for loads, initial quoted price is negotiable, and Carriers post desired locations rather than relying on GPS location.

Resemblance to the Uber model

The Uber-like apps studied for this report are most similar to Uber in the features that minimize transaction friction. These include features such as communication via the app, limiting transactions to Carriers and Shippers (and excluding Brokers), automating parts of the workflow, such as track-and-trace to automate Shipper check-ins, GPS location and push-notifications, and payment handling via the app.

On the other hand, currently the apps lack sufficient scale and face challenges due to the non-commodity nature of the service provided. The individual features are described in detail below.

Similarities to Uber

Many of the Uber-like apps (70% or more) share the following characteristics with Uber.

- **Communication via app:** All 10 Uber-like apps researched allow any necessary communication between Shipper and Carrier to take place via the app, whether through in-app messaging or transactions occurring entirely through the app without need for direct communication (as is the case with Uber).
- **Limited to two-party interaction:** Eight of the 10 apps are designed to limit transactions to Shippers and Carriers, without the need for any other third-party (broker) intervention. The philosophy behind the Uber model is that the most efficient and price optimized transactions occur without dispatcher intervention. Dispatchers have been eliminated from the equation.
- **Location visibility:** Nine of 10 apps allow Shippers to view the location of en route Carriers. Real time track-and-trace is becoming standard. It adds to Shipper confidence and reduces the need for back-and-forth status updates.

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Competing with Freight Brokers

Freight broker classification

None of the ten companies falling into the 'Uber-like' model is marketed as a Freight Broker, and in the three Terms of Service documents readily available, two explicitly state the company's role is not that of a broker, while the third doesn't mention Freight Broker either way. However, seven of the companies are registered with the FMCSA as Freight Brokers.

FMCSA defines a Freight Broker as a company which is responsible for "the arranging of transportation or the physical movement of a motor vehicle or of property. It can be performed on behalf of a motor carrier, consignor, or consignee." Many industry experts have noted in interviews that the "Uberization" of freight resembles the Freight Broker business.

If the Digital Freight Matching industry grows and becomes more formalized, so too will the definition of these companies as either Freight Brokers or under a newly developed definition.

If the companies are deemed Brokers, each will be required to obtain Freight Broker authority through the FMCSA, which can be acquired with a \$300 application processing fee and proof of insurance coverage (a Surety Bond of Trust Fund Agreement) in the amount of \$75,000¹. Brokers will also often have supplemental insurance (such as vicarious auto liability insurance) and/or contingent cargo insurance (in the case that shippers hold the brokers liable for cargo loss). Many Carriers expect Brokers to have this insurance.

Carriers are reluctant to work with Brokers without established credit, as payment completion and timeliness is a potential issue. If DFM companies are classified as brokers and payment is transmitted from Shipper to Broker to Carrier, the companies will need to establish solid credit ratings.

Additional responsibilities of Brokers including exception handling

Freight Brokers offer a number of benefits to Shippers, such as supplemental 3PL services (for instance, claims handling and auditing). Brokers check Carrier insurance, DOT safety ratings, and FMCSA CSA scores for compliance. Brokers also handle operational exceptions and find alternate Carrier capacity in case of equipment breakdowns.

If a shipment is in route and a truck breaks down, Brokers arrange for an alternate truck to complete the delivery. Since Brokers have relationships with many Carriers, they can find capacity for a variety of equipment types, at all hours of the day, even in remote areas. DFM companies will need to match this level of exception-handling to compete with traditional Freight Brokers, which will require relationships with many Carriers and dedicated 24/7 customer support personnel.

Not all shipments are straightforward. Freight Brokers arrange transportation utilizing multiple modes. Though this represents a small percentage of total trucking shipments (2.4% of shipment value is transported via both truck and rail or both truck and water²) this complexity is another reason Shippers turn to Brokers, as Brokers often have relationships with companies specializing different modes.

¹ FMCSA <https://www.fmcsa.dot.gov/registration/broker-registration>

² U.S. Department of Transportation <http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/ec12tcf-us.pdf>

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KEYCHAIN LOGISTICS



San Francisco, CA

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Editor's Notes

Keychain Logistics, founded in 2012, operates regionally, in California, New York, Massachusetts, and Texas.

The company completes background and insurance checks on carriers.

Keychain charges a transaction fee of 2-3%.

Recent user reviews on Google Play indicate that some users were not finding loads on the app.

Investors (Lead)

Seed

January 2013 — \$2.52M

Unknown

Executives

Founder: Bryan Beshore

Key Dates

Company Start Date: 2012

Seed VC funding: January 2013

Market Area

California (San Francisco, Los Angeles), New York (NYC), Massachusetts (Boston), Texas (Houston, Dallas)

Functionality Summary

Overview

Industry/Brokerage Connection	
Tech/Startup Connection	X
Primary Use (Mobile/Desktop)	Mobile
Mobile App Available	X
Android Downloads (as of 7/2016)	5K-10K
Web App Available	
TL	N/S
LTL	N/S
Specialized	N/S
Short Haul	N/S
Long Haul	N/S
Parcel	N/S
Driver Payment Time	24 hrs

Features

Referral Program	
Reward Program	
Fuel Card	
Trip Planner	
Driver Lane Preference	
Carrier Preference	
TMS Integration	
In-App Messaging	
Fuel Advances	
Dashboard Analytics	
Driver Rating	
Loadboard	
Rate Benchmarking	
Credit Info	
Discounts	

Uber-like Functionality

Digital Transactions/Parameter Matching	X
Auto Payment	
Auto Pricing	X
Auto Dispatch	
GPS Locations	
Track & Trace	X
Push Notifications	
Single Pricing Interaction	
Immediate Booking	
Paperless Document Storage	
Two-Party Interaction	X
All Communication Via App	X
Pooling (Automated)	
Scale (10,000+ downloads)	
Commodity Nature of Service	
Closed Network (Local Freight)	X

Additional Pages Included in Full Report