



Digital Freight Brokerage Platform

CASE STUDY

MANTRA LABS



Hwy Haul, is a **California-based** digital freight brokerage startup that uses data science & optimization algorithms to connect 'Enterprises' with 'Freight Truckers' via a **platform-enabled digital trucking marketplace**.

Hwy Haul simplifies the 'load booking' process for shippers and seamlessly empowers them with a state-of-the-art **Transportation as a Service** (TaaS) solution.

Quick Summary

For **Hwy Haul**, there are 4 types of users: shippers, carriers, drivers and the **operations team**. Each aspect of the new solution revolves around these users and their unique functions.



Why?

Shipper & Carrier companies face difficulties in booking trucks or loads for transporting.

Traditional Process involves

- Contacting traditional third party brokers.
- Manual vetting and selection is tedious.

How?

Overhauling the transportation value chain, with a **digitalized freight brokerage platform** using the latest front & back-end technologies.



**46% MORE
MATCHED LOADS**



**80% FEWER
DEADHEAD MILES**



**32% REDUCED
CARBON FOOTPRINT**



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Expected,

By 2030

Automation of processes will reduce logistics costs for standardised transport by **47%**.

On-road trucks will be in use **78% of the time**, up from only 29% now.

Delivery lead-times will shorten by **40%**.

2019 [PwC report](#).





Problem

For Hwy Haul, the **transportation supply chain** was burdened by a lack of innovation & acute pain-points.

Shippers (*owner-operators*) —

Inflexible pricing, manually booking trucks and ongoing trucker shortage crisis.

Carriers (*fleet drivers*) —

Manually booking loads over the phone and deadhead or *empty* miles.

Key Challenges

The fleet management system required several amended features for an **uninterrupted flow** throughout the value chain.

- Reconciling all the major features into **one single platform** — including merging apps & portals into a single code base.
- Improving the positioning accuracy of the **vehicle tracking system** using statistical models and map-matching algorithms.
- **Reducing idling time** using real-time dispatch and relocating algorithms.



Solution

The **TaaS** solution involved the design, architecture & development of multiple portals for unified role management, using agile & scrum based methodology.

Solution Components

- 1 **Shipper portal** for shipping enterprises to create and track their freight from booking to end-of-delivery.
- 2 **Carrier portal** for trucking companies to manage their fleet and drivers.
- 3 **Ops portal** for internal operations teams to oversee and govern backend systems.
- 4 **Driver mobile app** — iOS & android apps for truckers to book and deliver loads without having to wait or make phone calls.

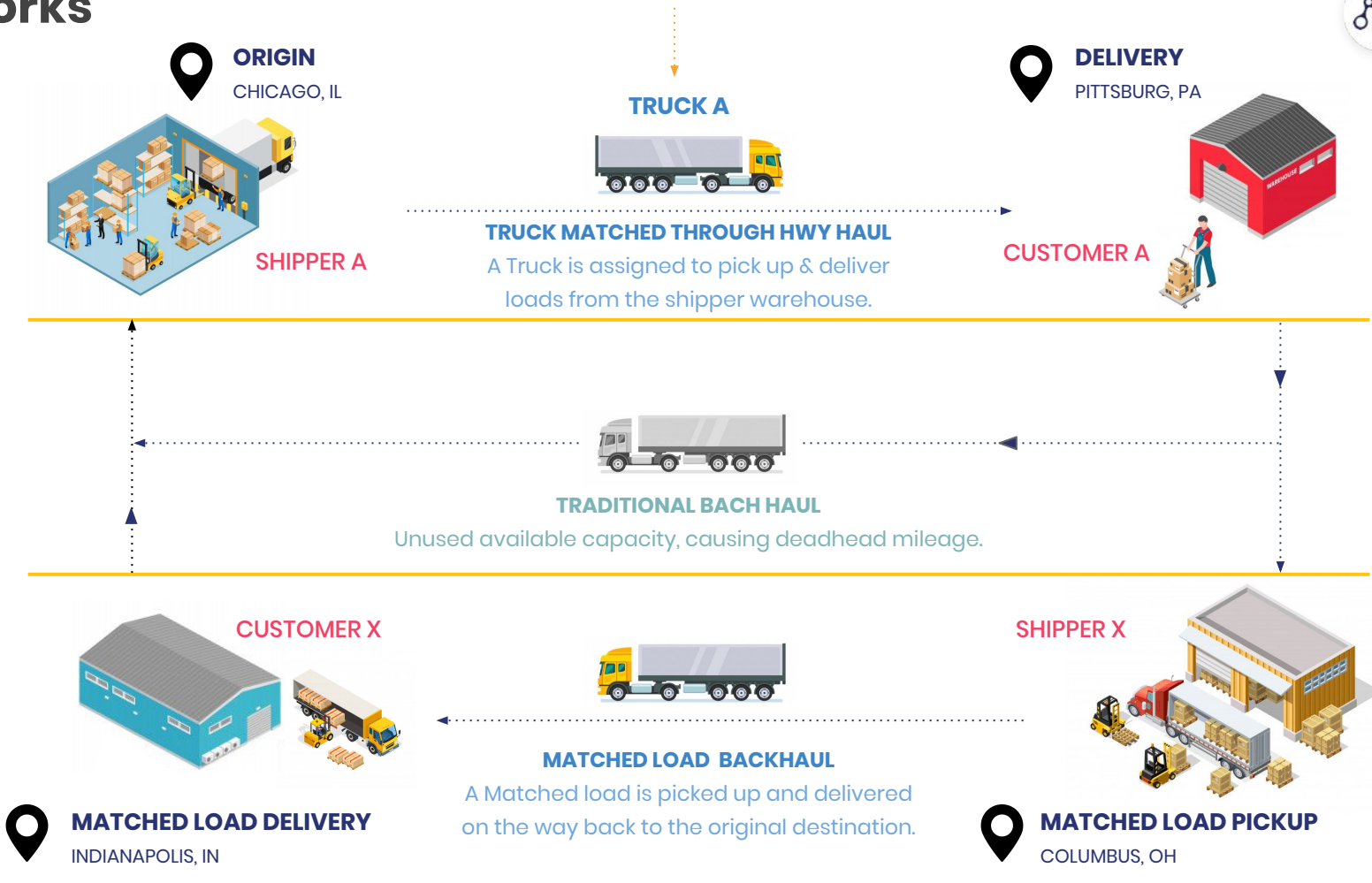
How It Works



FRONT HAUL

TRADITIONAL
RETURN ROUTE

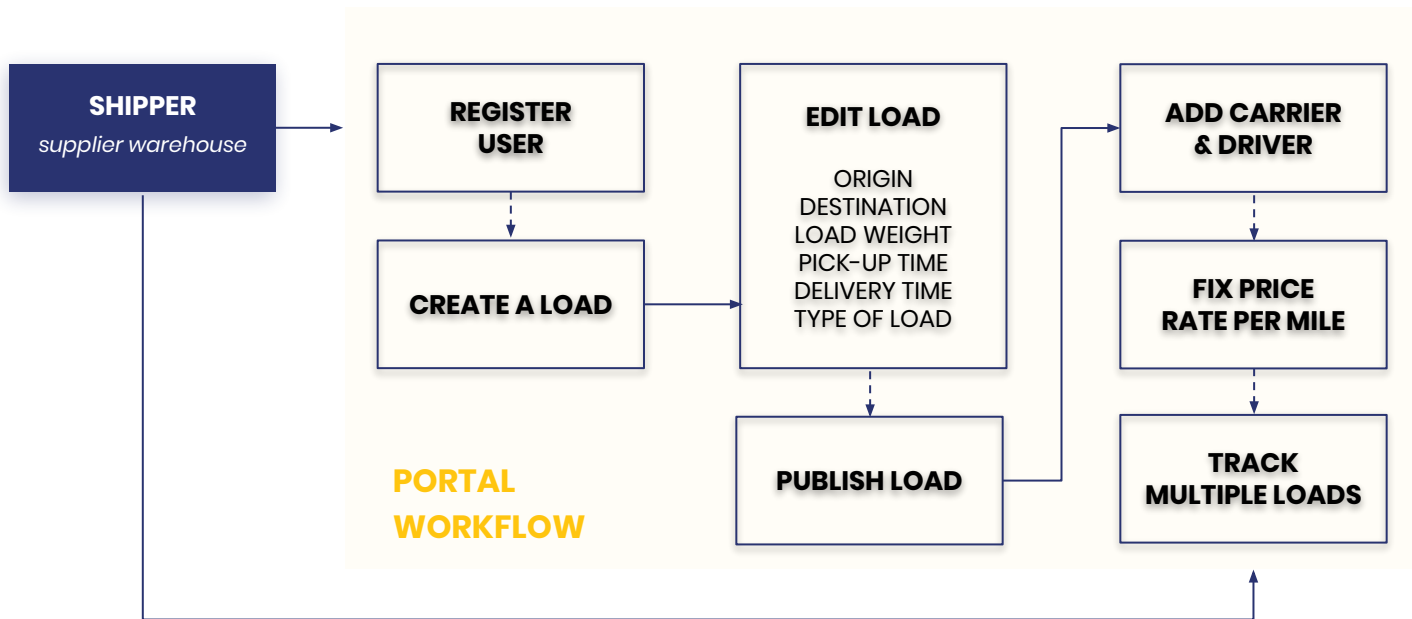
OPTIMIZED
RETURN ROUTE





SHIPPER PORTAL

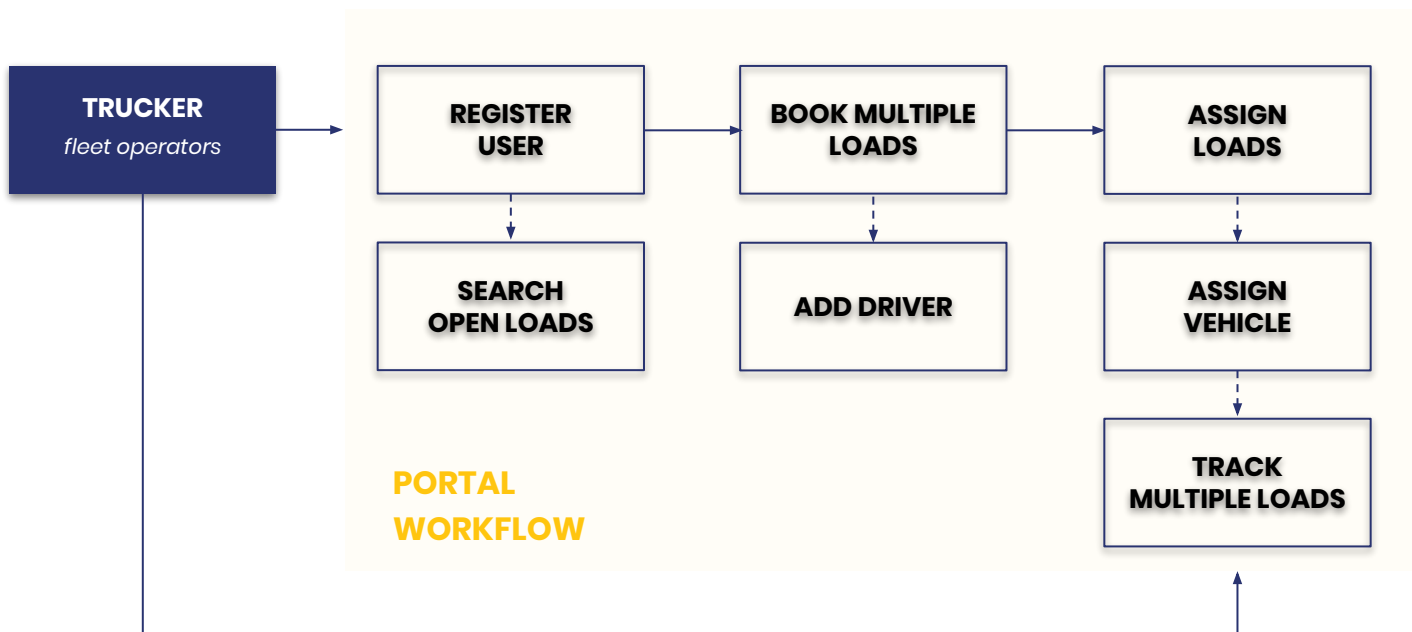
Designed & built using Angular 4 as the **main framework**, with a simple intuitive UI. Multiple tools are used for **deployment** — bootstrap, angular, google maps, docker and jenkins.





CARRIER PORTAL

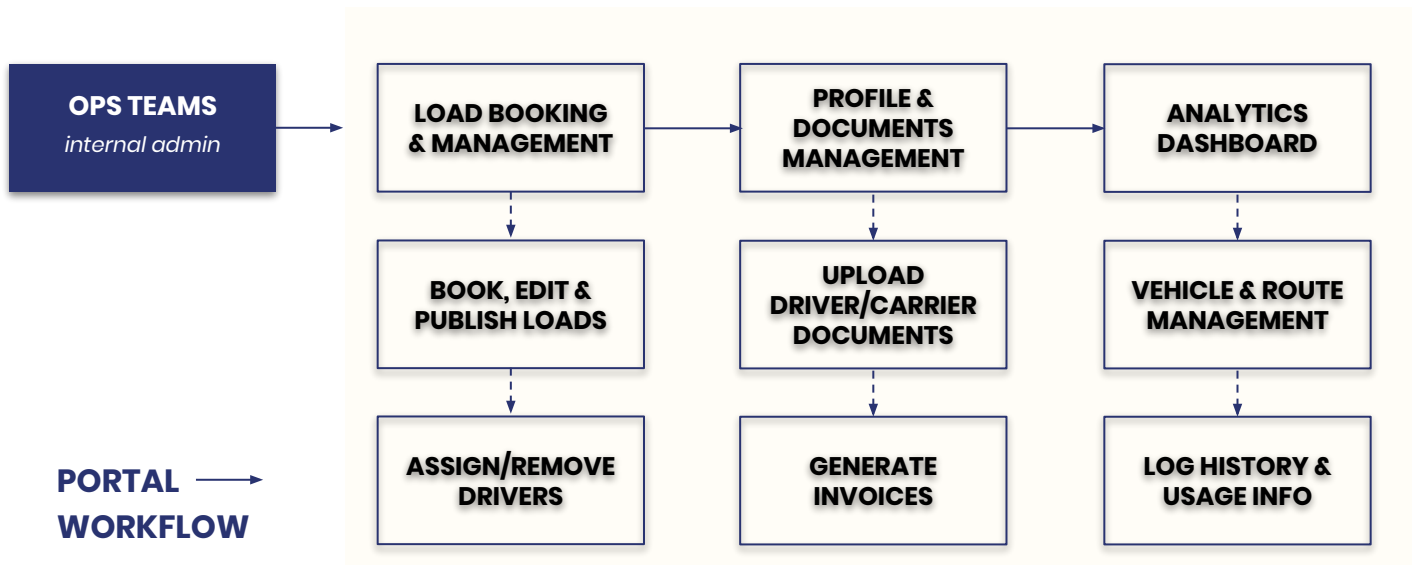
An intuitive UI experience is provided, while the portal itself is built using React 16 as the **base development JS library**, Additional development tools are also used for **deployment** — REDUX, ANTD library, Google map and location API.





OPS PORTAL

The portal is built with **React JS** as the primary base. It is equipped with analytical and visualization tools to draw insights from real-time operations using **React recharts library**.



PORTAL SCREENS

CARRIER/FLEET OWNER

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Search...



Jessica Jones ▾

AVAILABLE LOADS

Available Loads

Load ID ▾	Date/Time ▾	Origin ▾	Destination ▾	Total Trip Rate ▾	Weight ▾	Equipment ▾
12345	↑ 12 Dec'18, 2:00pm ↓ 24 Dec'18, 3:00pm	Santa Clara, CA	Modesto, CA	\$40,500.98	500	Flatbed
12345	↑ 12 Dec'18, 2:00pm ↓ 24 Dec'18, 3:00pm	Santa Clara, CA	Modesto, CA	\$40,500.98	500	Flatbed
12345	↑ 12 Dec'18, 2:00pm ↓ 24 Dec'18, 3:00pm	Santa Clara, CA	Modesto, CA	\$40,500.98	500	Flatbed
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12345	↑ 12 Dec'18, 2:00pm ↓ 24 Dec'18, 3:00pm	Santa Clara, CA	Modesto, CA	\$40,500.98	500	Flatbed



Available Loads →



My Loads



My Trucks



My Drivers

2 PORTAL SCREENS

CARRIER/FLEET OWNER



Search...



Jessica Jones ▾

MY LOADS

My Loads

ALL

TRUCK NOT ASSIGNED

DRIVER NOT ASSIGNED

PICKUP PENDING

ENROUTE TO DROPOFF

DELIVERED

Load ID: 235800

Santa Clara CA

Jan 31, 2019, 06:30 AM IST

3053 miles

Canton CA

Jan 31, 2019, 06:30 AM IST

Assan Ahmed
DRIVER

TRUCK NOT ASSIGNED

\$3456.45

TOTAL TRIP RATE

Load ID: 235800

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TOTAL TRIP RATE



Available
Loads



My Loads →



My Trucks



My Drivers

3 PORTAL SCREENS

CARRIER/FLEET OWNER

LOAD DETAILS



Load #123457 **Truck not assigned**



3053 miles



Store Name

Lorem ipsum dolor sit amet, consectetur

Jan 31, 2019 | 06:30 AM IST

Jan 31, 2019 | 07:30 AM IST

Leesburg

Lorem ipsum dolor sit amet, consectetur

Jan 31, 2019 | 06:30 AM IST

Jan 31, 2019 | 07:30 AM IST



Driver Details

Change Driver

Azzharudin Ahmed Khan

TRUCK NO.

(201) 234-5658



Truck Details

ASSIGN TRUCK

ASSIGN TRAILER



Rate Details

\$3000

TOTAL TRIP RATE

\$3

RATE PER MILE



Load Details

10,000 lbs

WEIGHT

Flatbed

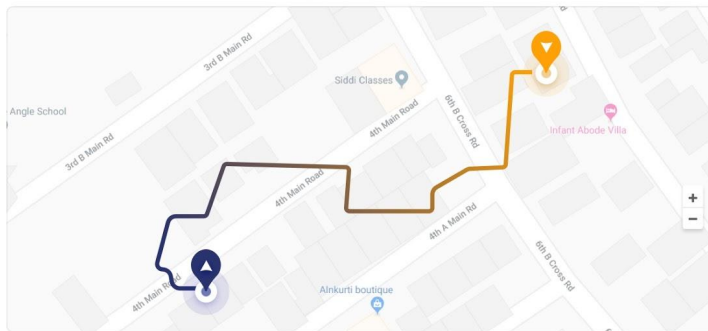
EQUIPMENT TYPE

Fresh Dairy Fresh

COMMODITY

TL

TL/TL



Available
Loads



My Loads



My Trucks



My Drivers



Profile Settings



Logout

4 PORTAL SCREENS

CARRIER/FLEET OWNER



MY TRUCKS



Search...



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My Trucks

ADD TRUCK

Truck No. ▾	VIN ▾	Truck License No. ▾	Make ▾	Model ▾	Year ▾
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008
974948	1234567	123456	Lorem Ipsum	Lorem Ipsum	2008



Available
Loads



My Loads



My Trucks →



My Drivers

5 PORTAL SCREENS

CARRIER/FLEET OWNER

MY DRIVERS



Available
Loads



My Loads



My Trucks



My Drivers →

App Version 4.5.3

Search...



Jessica Jones ▾

My Drivers

ADD DRIVER

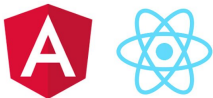
Driver Name ▾	Phone No. ▾	License No. ▾	State ▾	Status ▾
John Smith	415-509-6995	—	—	Not Registered
John Smith	415-509-6995	123456	San Francisco	Registered
John Smith	415-509-6995	—	—	Not Registered
John Smith	415-509-6995	123456	San Francisco	Registered
John Smith	415-509-6995	123456	San Francisco	Registered
John Smith	415-509-6995	—	—	Not Registered
John Smith	415-509-6995	123456	San Francisco	Registered
John Smith	415-509-6995	123456	San Francisco	Registered



TECHNOLOGIES

SHIPPER/CARRIER/OPS PORTAL

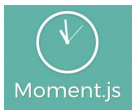
The Front-End is based on **JavaScript** with the latest ES6 version, with the following technologies used for development.



WS WebStorm



 **Redux**



 **axios**



`<Recharts />`



Leaflet 



 **webpack**

node **npm**

BABEL

 **docker**

 **git**



DRIVER MOBILE APP WORKFLOW

UI Visual Design — Tools & technologies used in the design of app and web portals — Sketch, Zeplin, InVision and Principle.

Modules Developed

01

Authentication Module
for registration and signup

User can select role as “Owner Operator” or “Carrier Driver” before sign up.

02

Verification Module
for validating users

Profile verification is processed through ops team. An unverified profile cannot accept or assign any load to carry.

03

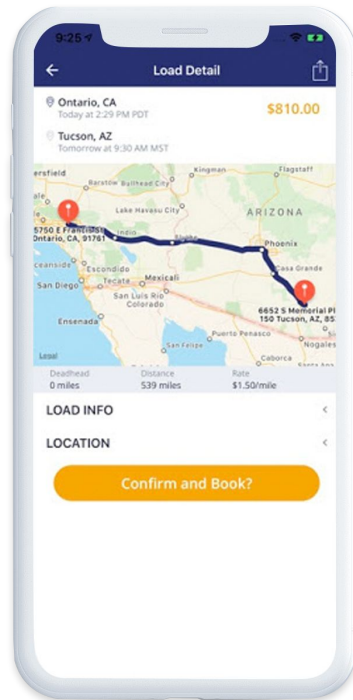
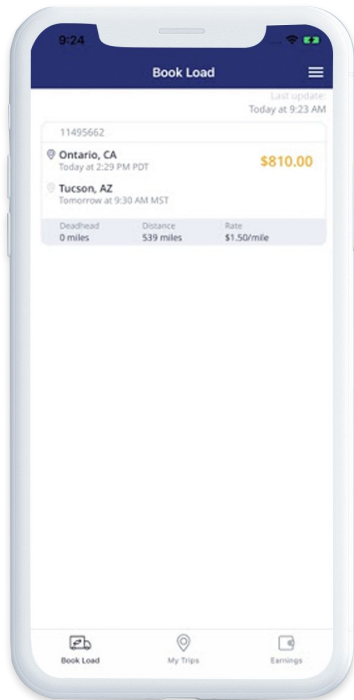
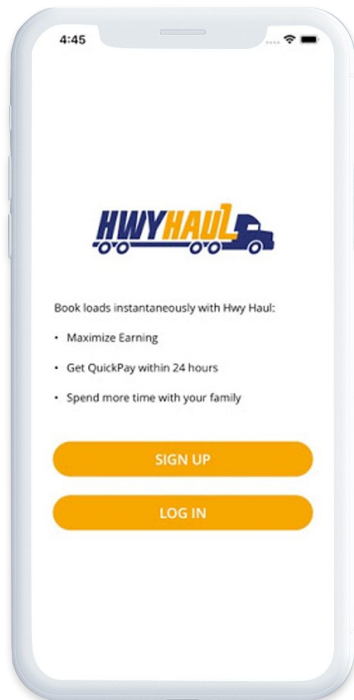
Load Trip Module
for assigning or accepting loads

The user can view/change the details of load pickup & drop.



DRIVER MOBILE APP SCREENS

Built-in Features — Work Manager, Live location tracking based on pickup & drop, Firebase dynamic links for quick signup & access, Firebase push notifications for status updates, MVVM android architectural pattern recommended by Google,





Key Results

46% more
matched loads
for shippers and
carriers

80%

Fewer Deadhead Miles
Improved Route Optimization

14hr +

Fleet Productivity
Average Trucking Activity

32%

Carbon Footprint Reduced
By Reducing Empty Miles



About Mantra Labs

- ◆ Domain Focused Products and Solutions for Digital Enterprises
- ◆ Real World Problem Solving using Artificial Intelligence and Customer Experience Consulting



100+
PROJECTS

150+
GEEKS

03
OFFICES

Key Partnerships



Leading Clients



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