



DSO 599 HR and People Analytics UPS Case Presentation

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Agenda

- 01 > Business Issue
- 02 > Data Description
- 03 > Data Analysis
- 04 > Financial Modeling
- 05 > Dashboard
- 06 > Conclusion

Business Issue



Company Overview

United Parcel Service, Inc. aka UPS is one of the world's largest package delivery companies, with over 528,000 employees globally serving more than 220 countries and territories. In 2019, UPS delivered an average of 21.9 million pieces per day and generated a total of \$74.1 billion in revenue.

UPS has the competitive strengths in its robust global network and the variety of services, such as air, ground, domestic, international, commercial and residential. UPS also focuses on cutting-edge technology which helps them improve not only operation productivity, customer satisfaction but also reduce overall carbon intensity.

Business Issue

Current Pain Points

Increase in Demand

The new norm: covid-19 has made online shopping more appealing

Fierce Competition

- Industry competitor such as FedEx
- New entrants such as Amazon, Uber

High Turnover Rate

A whopping 90% turnover rate for part-time worker



Business Issue

Executive Summary

In 2018 UPS corporate report, the management listed 3 goals in improving UPS's Health & Safety measurements, which are:

2% Improvement Employee Engagement Index

1% Improvement Lost Time Injury Frequency

3% Improvement Auto Accident Frequency

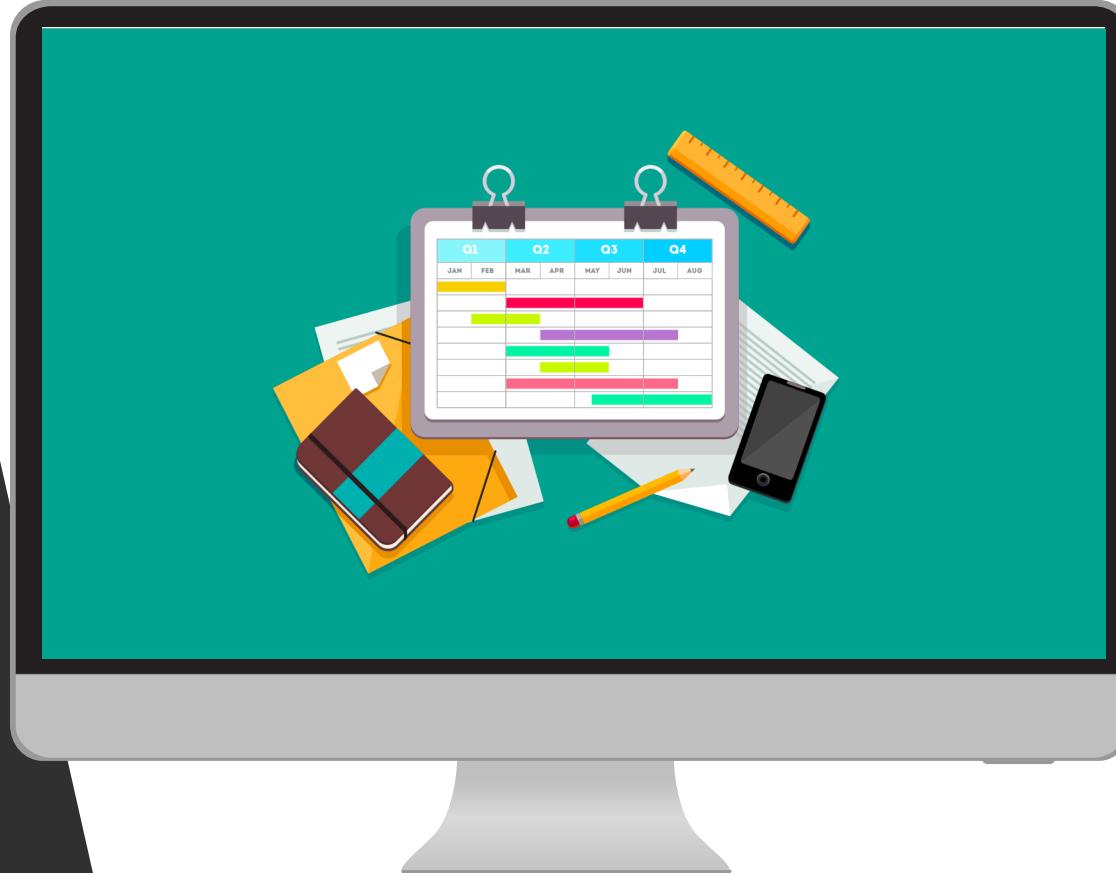
From our research, we've found out that DART rate is tightly correlated with safety indices.

In addition, by lowering DART rate, UPS can not only prevent potential injuries but also save on workers' compensation.



Business Issue

Executive Summary: Recommendation



Implementing Advanced Driver Scheduling System



Based on our statistical analysis, the current high *DART rate* is highly correlated with *number of Auto Accident and Lost-Time injuries*.

By leveraging on the advanced scheduling system, UPS can ensure a flexible and reasonable schedule for all drivers, avoid overtime work and decrease the frequency of injuries or accidents.

Data Description

Dataset source: Provided by UPS

Timeframe: *From 2018 to 2019*

Including data of **135 UPS centers** on the South East coast (covered by 2 distribution centers)

738 Parameters were measured, data is divided into **5 different categories**:



Demographic



Health and Safety



QPR



Survey



Center Performance

Data Description

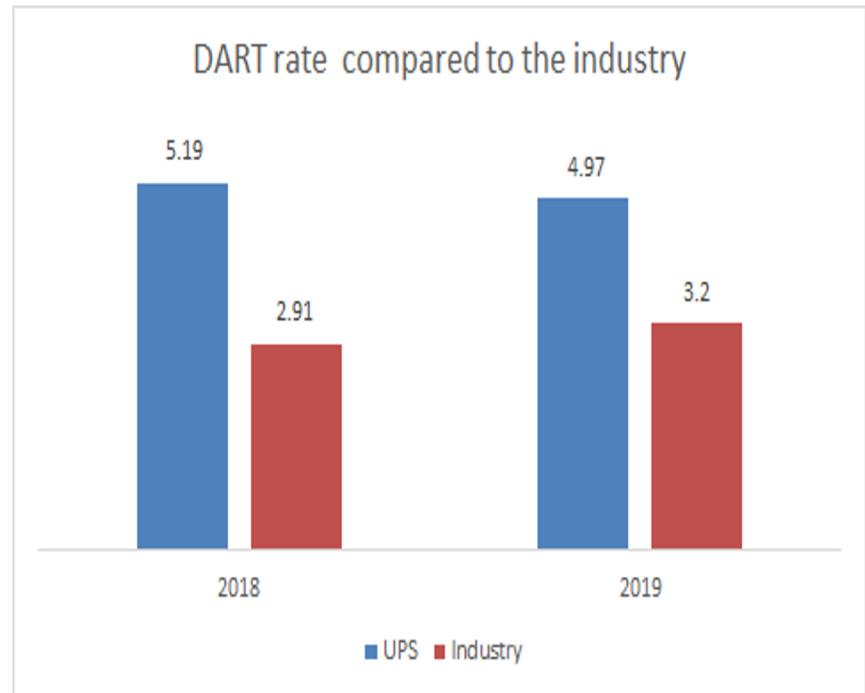
Objective Measures

DART: Days Away, Restricted, or Transferred due to employee-involved incident

(Total number of incidents or illnesses resulting in either the worker missing work, being on restricted duty, or being transferred to another job within the organization x 200,000)

The total number of hours worked by all employees

DART rate is above the average rate of the industry



Data Analysis

Key Drivers



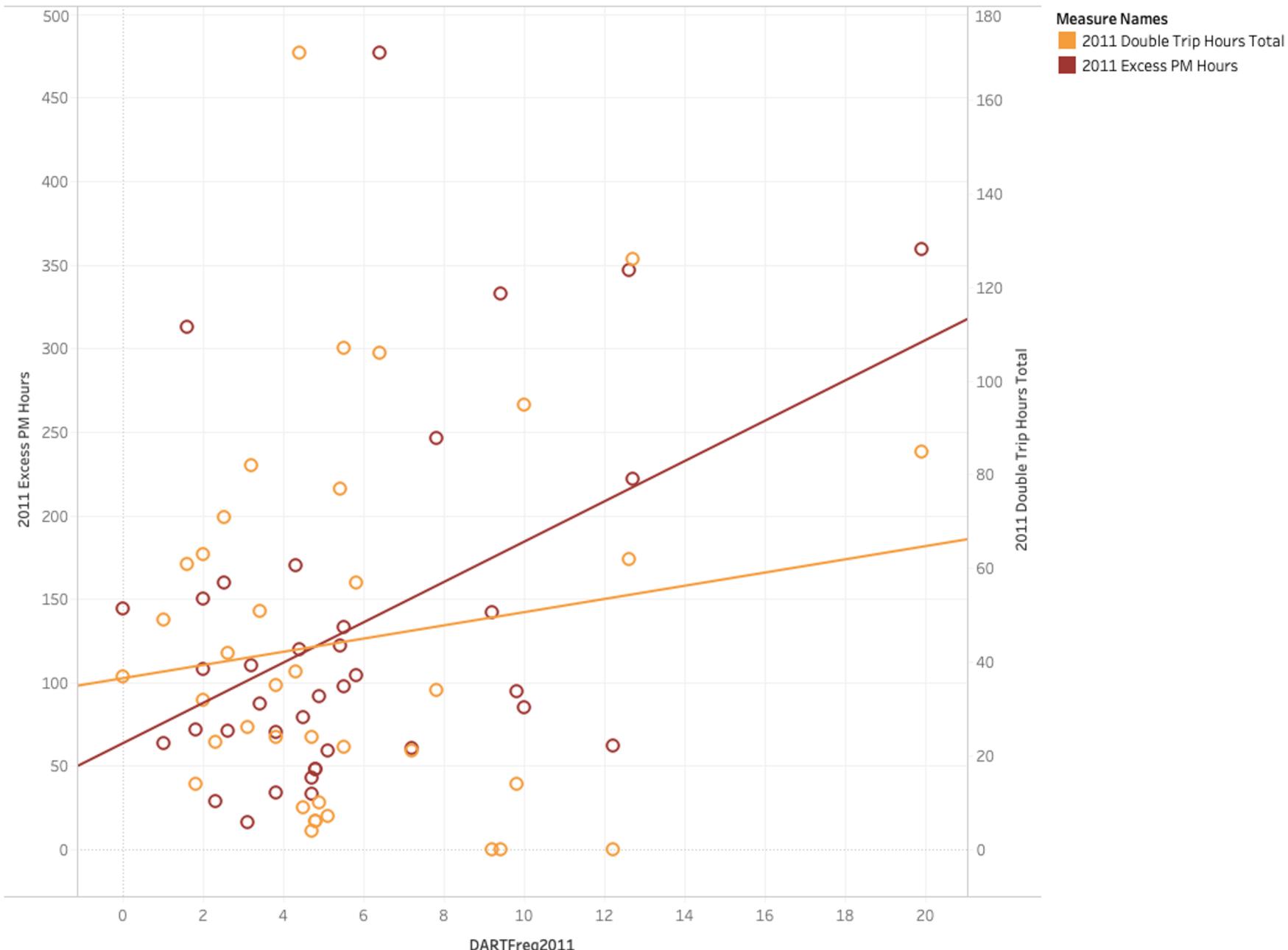
p-value < 0.05

- Excess PM Hours (+)
- Clerk Orig Data Capture Code C01 (+)
- Clerk Total Hours (-)
- Double Trip Hours Total (-)

65%

DART

Correlation plot between Scheduling variables and DART



DARTFreq2011 vs. 2011 Excess PM Hours and 2011 Double Trip Hours Total. Color shows details about 2011 Excess PM Hours and 2011 Double Trip Hours Total. The data is filtered on 2011 Excess PM Hours, which keeps non-Null values only.

Reducing DART Rate with *Driver Schedule Platform*

Impact of Advanced Driver Scheduling Software:

132
Avg. Excess PM Hrs /
distribution center



53%

Improvement from *Driver Schedule* platform
(based on performance lift from competitor*)

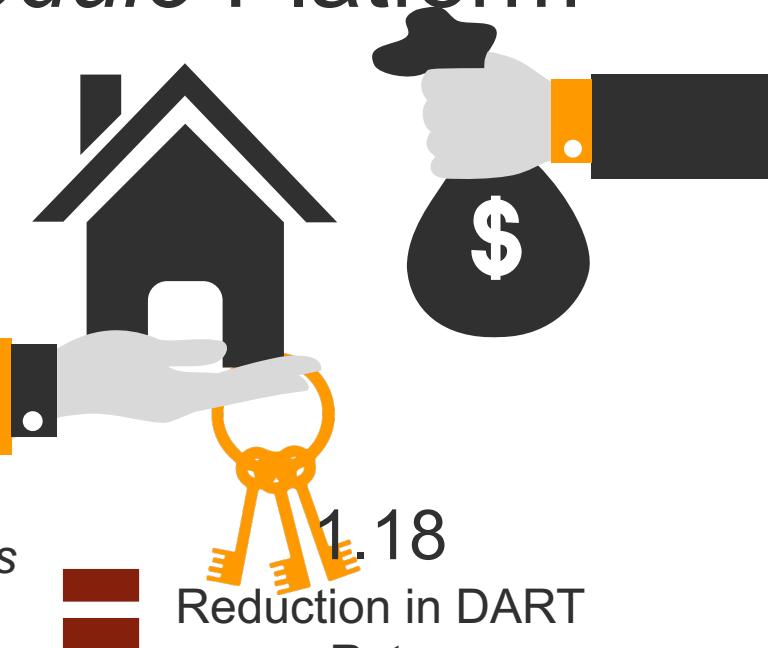


0.0169

Excess PM Hours
coefficient from
regression model



= 1.18
Reduction in DART
Rate



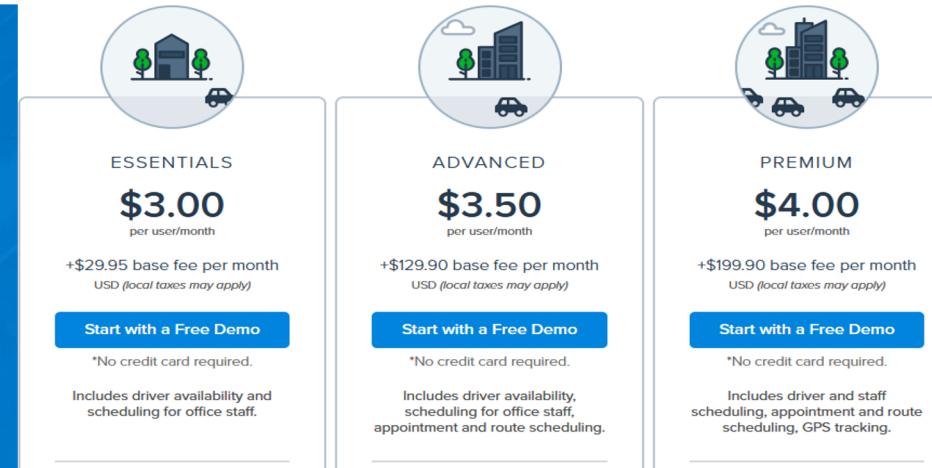
This translates to a **23.7% improvement** against the current DART Rate of 4.97!

Financial Model - Cost

Annual Cost of *Driver Schedule* scheduling software (Premium Price Option):



120,000
Approx. # of UPS
Drivers
(Estimate from online source)



\$48 / Driver
Annual Variable
Cost



\$2,400
Annual Flat Cost

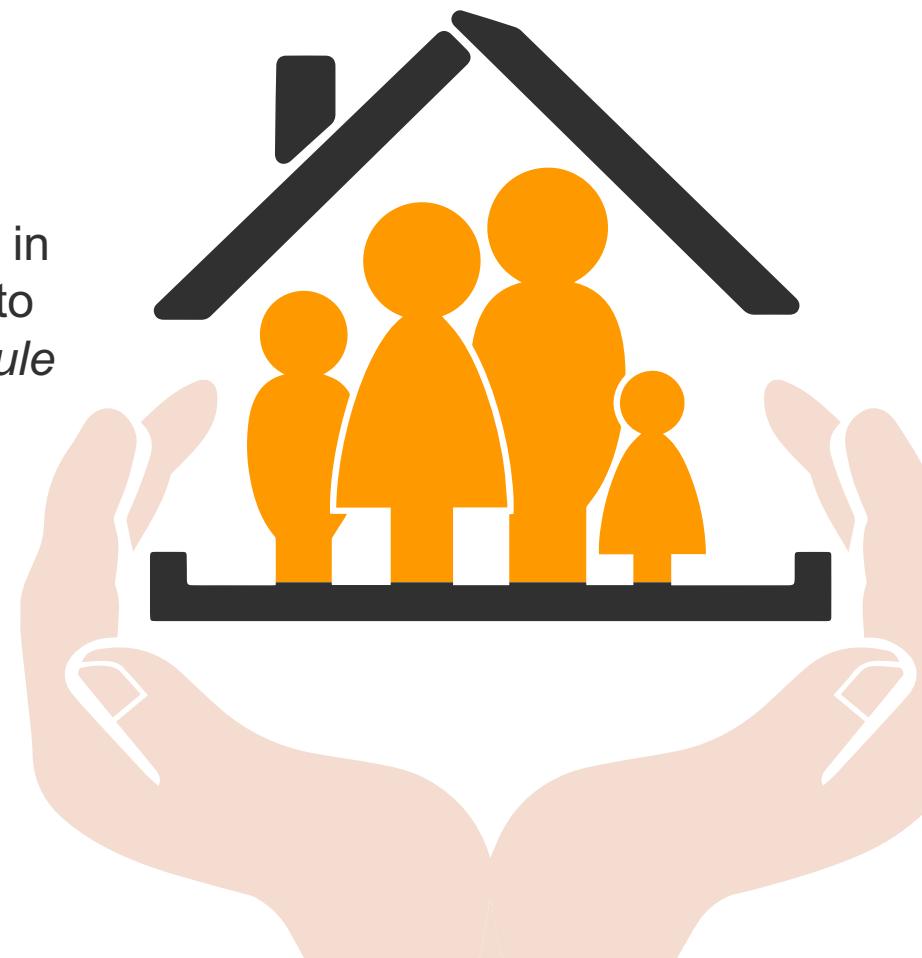
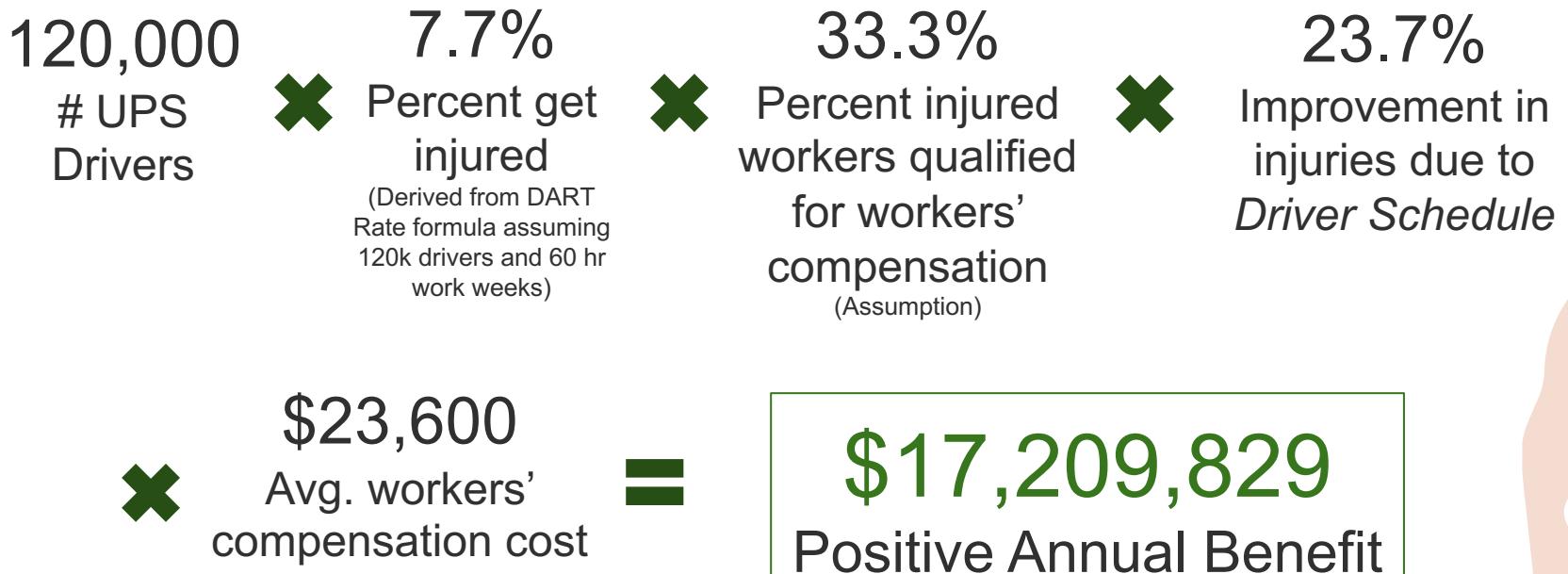


\$5,762,400
Total Annual Cost

Financial Model - Return

Annual Benefit of Driver Schedule:

1. Workers' Compensation Savings



Financial Model - Return

Annual Benefit of *Driver Schedule*:

2. Saved Labor Value from Driver Injury Prevention

120,000

UPS
Drivers



7.7%
Percent get
injured



2
Avg weeks
missed / driver
(Assumption)



60
Hours worked /
week
(Avg. weekly workload
of UPS driver)



23.7%
Improvement in
missed driver-hours
due to *Driver
Schedule*



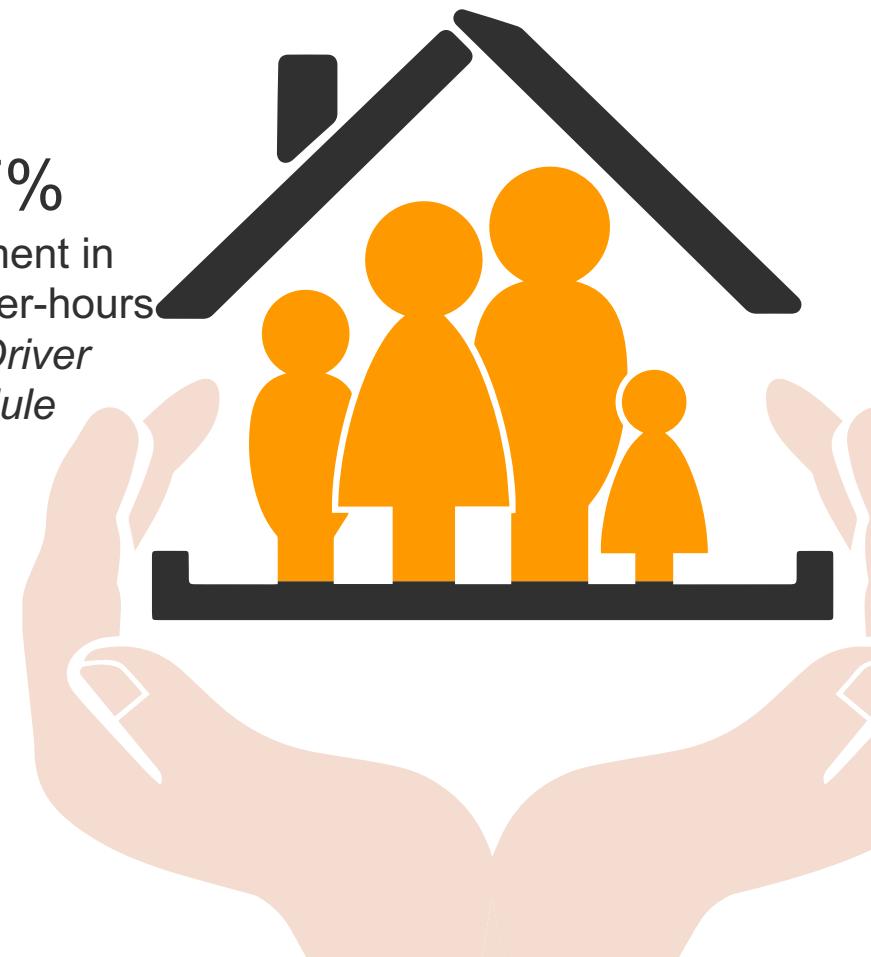
\$22 / Hr



Avg. Hourly Salary of
UPS Driver
(Glassdoor estimate)

\$5,781,283

Positive Annual Benefit



Financial Model

ROI and ROI Range

\$17,209,829
Return from Workers'
Compensation Savings



\$5,781,283
Return from Driver Injury
Prevention

\$5,762,400
Cost of *Driver Schedule*

=
**3X
ROI**

\$5,762,400
Cost of *Driver Schedule*

If the possible range of *DART Rate*
improvement from *Driver Schedule*
is from 15.0% to 33.0%, then **ROI**
can range from 153% to 456%.

Level	DART Rate Improvement from <i>Driver Schedule</i>	% Return - ROI
Optimistic	33.0%	456%
Average	23.7%	299%
Conservative	15.0%	153%

Financial Model

Future ROI Considerations

Additional potential positive value from *Driver Schedule* for future study:



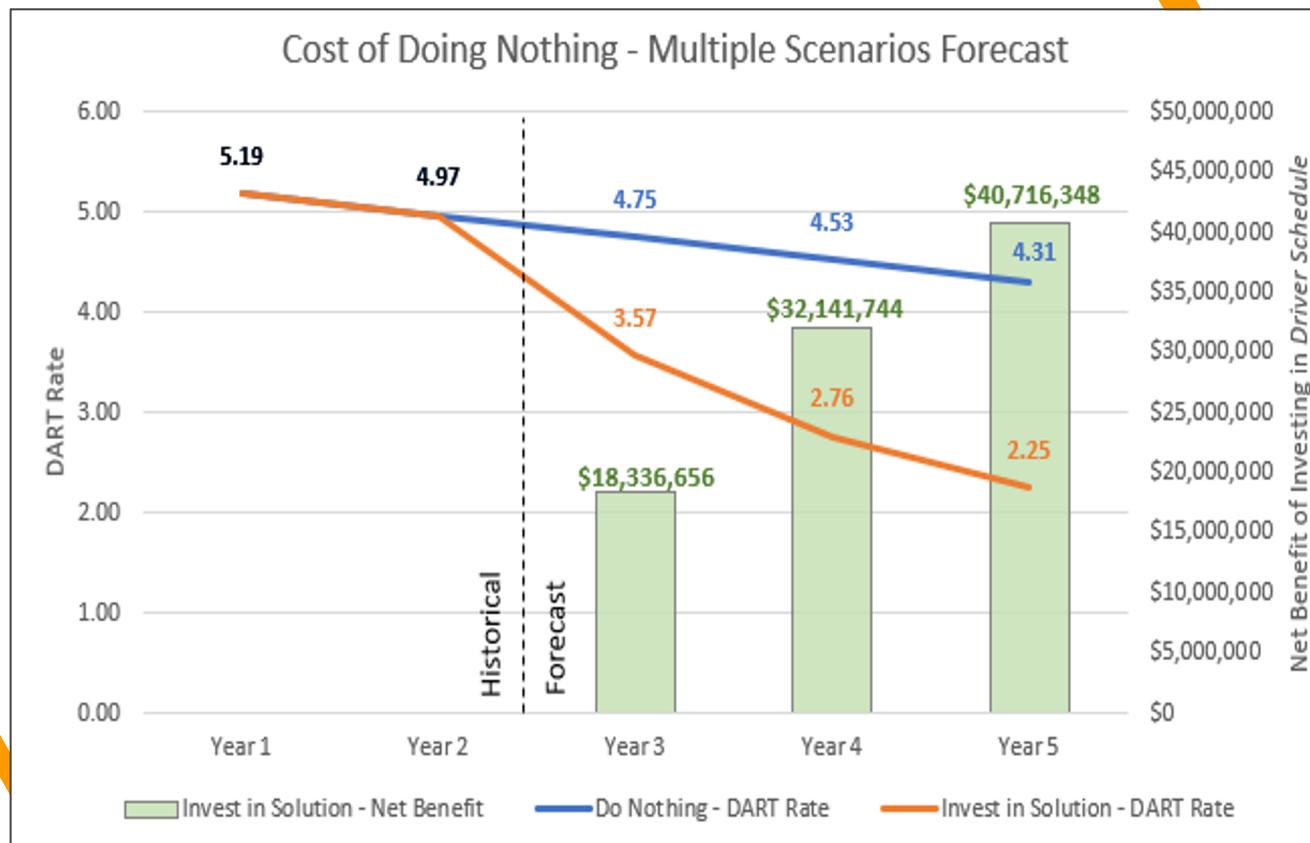
Auto Insurance Accident and
Insurance Premium Savings



Reduced Turnover Rate

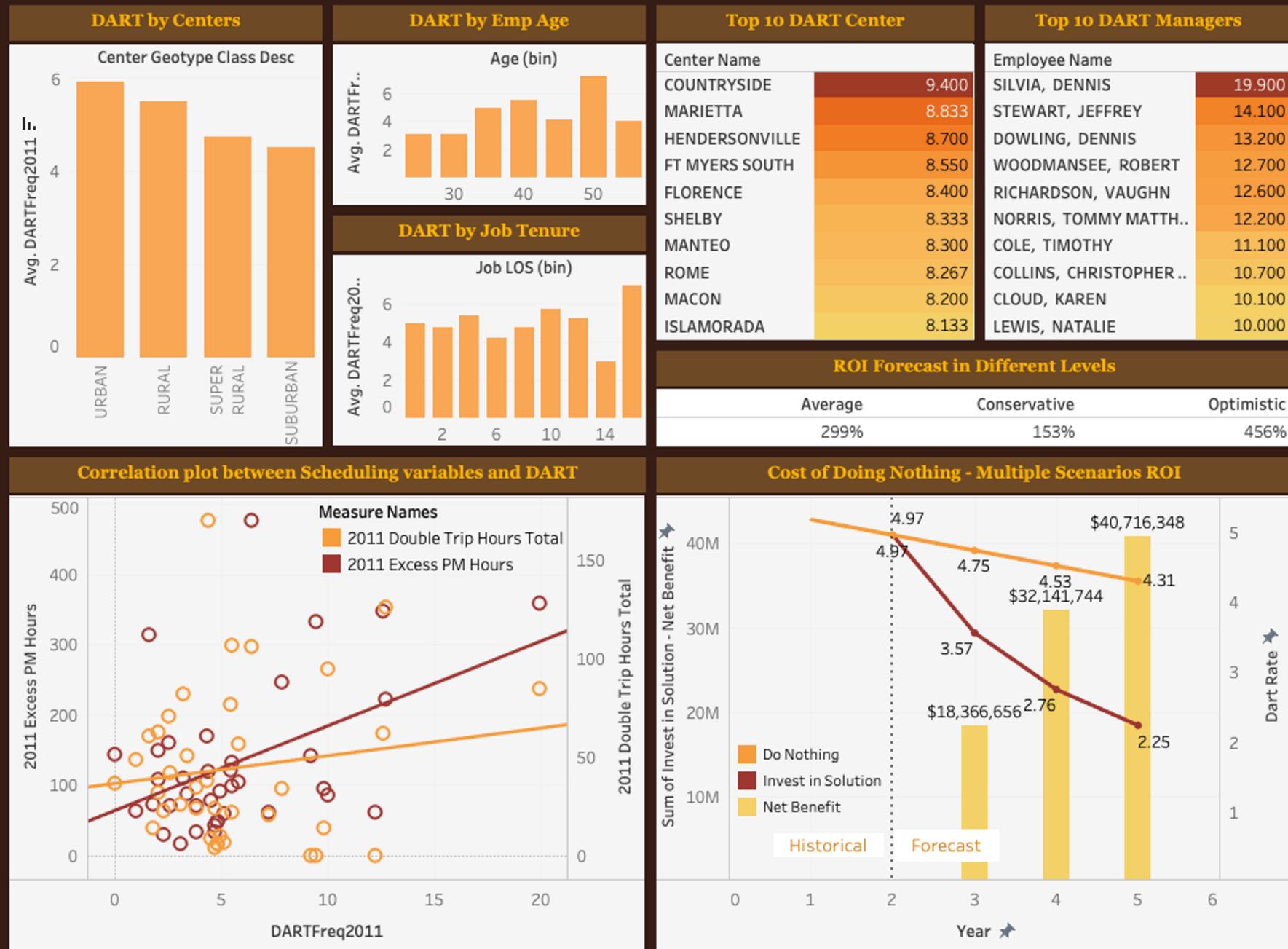


Cost of Doing Nothing Forecast



- 01 ➤ Natural -0.22 decline in DART Rate from Yr1 to Yr2 in historical data
- 02 ➤ Driver Schedule improves DART Rate -1.18 incrementally in first year after launch
- 03 ➤ Forecast assumes platform effectiveness decay rate of 50% (e.g. second year after launch will be half as effective as first year after launch, etc.)
- 04 ➤ In Yr3, investing in scheduling platform will have \$18.3MM net benefit. In Yr5, \$40.7MM net benefit.

DART Dashboard



Conclusion



3 Current Pain Points for the Company

Increasing demands, fierce competition and high turnover rate



Use DART as objective measure

DART rate is relevant to factors of injury frequency and number of auto accidents.
DART rate of UPS is above industry average



Solution to improve driver schedule

According to the data analysis, scheduling related factors show significant influence on DART rate.
Based on the results, we suggest UPS using Advanced Driver Scheduling Software in the future.



Great ROI Results

Based on the financial modeling, we calculate the potential cost and return. And the forecast ROI can range from 153% to 456%.



Thanks You