



# FEDEX BUSINESS CHALLENGE

## THE FINAL 50 FEET

A PRESENTATION BY TEAM FAB 5





## MEET OUR TEAM

### TEAM FAB 5



SAMI FELLER  
Data Analyst



MARY BOKEN  
Data Analyst



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Data Analyst

# OUTLINE OF TOPICS

## WHAT WE'LL DISCUSS

Opportunity Statement

1. Background
2. New Concept
3. Data Sources
4. High Level Operating Scenario
5. Enablers/ Hindrances to Desired Outcome
6. Potential ROI
7. Findings & Recommendations



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# OPPORTUNITY STATEMENT

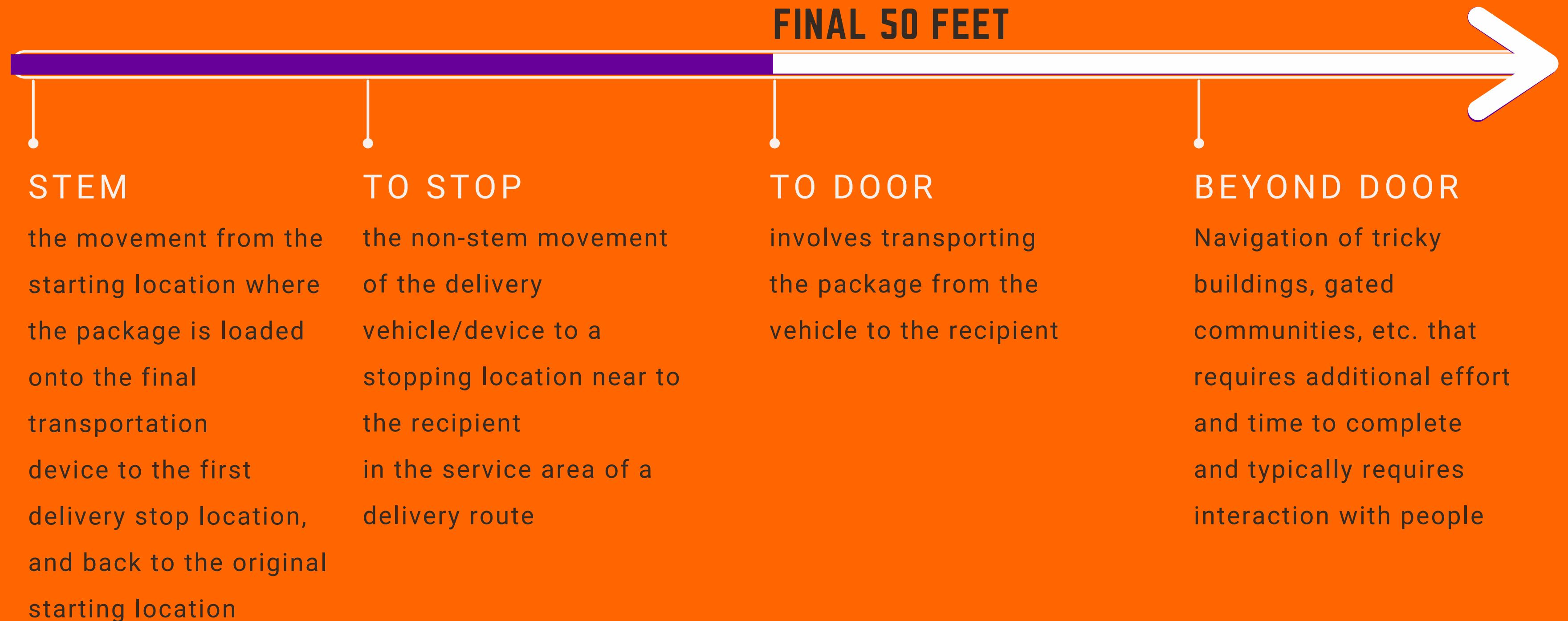
The Last Mile of the shipment lifecycle is considered the most expensive, accounting for 25-50% of the total logistics cost due to the high amount of time and assets required. We see opportunities, through innovation, to eliminate the labor/vehicle cost of the final 50 feet for self electing customers by implementing a new technology -

**PICK-UP NEAR YOU (PUNY)**

MARY, DAVID, AND SAMI



# BACKGROUND: THE LAST MILE



Background

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Data Sources

Operation Scenario

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Potential ROI

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# OUR FOCUS (FINAL 50 FEET)

WHAT OUR SOLUTION ADDRESSES:

## TO DOOR

- DEAL WITH SIGNATURE-REQUIRED GOODS OR SERVICES
- LEAVING A PACKAGE AT CUSTOMER-REQUESTED DELIVERY POINT
- ACCOMMODATE VARRYING PACKAGE SIZES AND WEIGHTS
- TRAVERSE STEPS AND PASS THROUGH GATES/FENCES
- IDENTIFY AND AVOID ANIMALS OR PERSONS
- PERFORM UNDER VARIOUS WEATHER CONDITIONS

## BEYOND DOOR

- NAVIGATING MULTI-TENANT RESIDENTIAL COMMUNITIES AND CORPORATE OFFICES
- PRESS CALL BUTTONS/ ENTER PASSCODES
- NAVIGATE STAIRS AND ELEVATORS
- CONDUCT MULTIPLE TRIPS FOR LARGE VOLUME STOPS
- ACCOMODATE CUSTOMERS FOR PACKAGES THAT REQUIRE SIGNATURES





# HUB NETWORK PROCESS

- The FedEx "Hub Network" is a system of 25 distribution centers located in or near major cities.
- When a package enters the hub, the shipping address is scanned and entered into the FedEx system.
- The package eventually reaches a truck heading to one or more destination hubs.
- Packages scheduled for local service go straight to a delivery vehicle



# OUR IDEA

## EXPANDING AND OPTIMIZING THE HUB NETWORK

- Packages must pass through these hubs anyways, so in order to elevate some of the "to door" and "beyond door" costs, we propose giving customers the option to self elect to retrieve packages at these locations
- 250 Million people a day request package tracking tells us people are anxious for the arrival of their package
- **Optimize Efficiency:** After reading reviews on yelp, reddit, etc. we think having these hubs serve as a catch all where customers are granted the option to come pick up their package will optimize efficiency
- **Minimize labor costs:** less employees required for pulling packages and putting them into lockers to be picked up versus the trucks and drivers that would perform to door and beyond door processes

FedEx Express® stations	1,950
Air Express hubs	13
FedEx Ground® hubs	39
FedEx Ground® operating facilities	>600
FedEx Freight® service centers	~370

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# NEW TECHNOLOGY: "PUNY (PICK UP NEAR YOU)

## WHAT IS IT?

An addition to the FedEx mobile application that allows customers to track their packages and allows customers to opt to pick up their packages at a hub, completely cutting out the last mile at a perceived convenience to them

## WHY WILL IT BE EFFECTIVE?

Speed is emphasized into today's market and this allows for flexibility in retrieving a package and the option to intercept it on its path to cut lead time

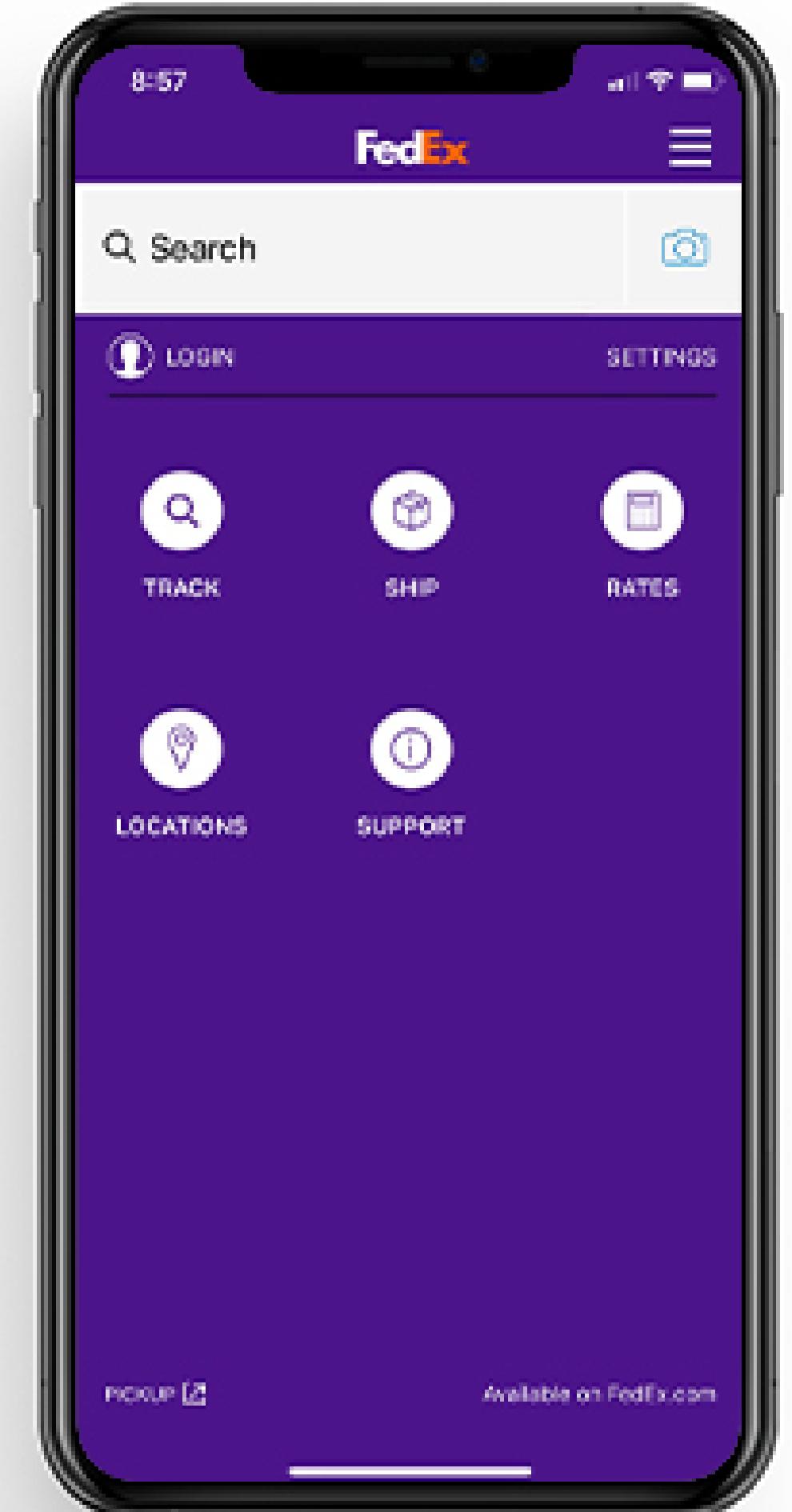
## WHAT IS THE GOAL?

Push FedEx to be more interactive with clients with a native mobile app to motivate customers to elect to pick up their package along the delivery lifecycle



**EXISTING FEDEX APP LAYOUT**

**OUR PLAN: SYSTEM UPGRADE TO  
HAVE APP ACCOMODATE "PUNY"**



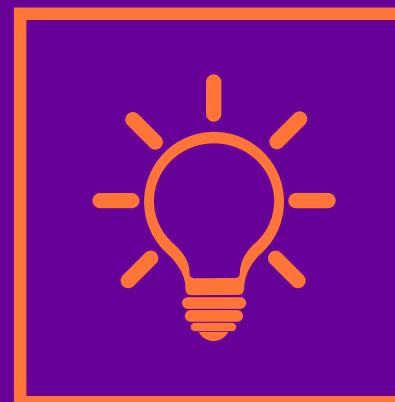
# FEATURES OF NEW TECHNOLOGY

**MAJOR BENEFITS THAT INCENTIVISES CUSTOMERS TO PICK UP AT HUBS**



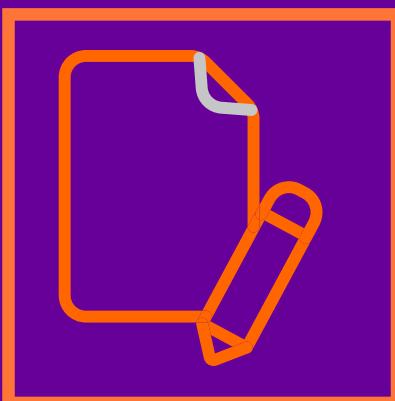
## Social

- Enable clients to connect and share with friends and family
- This is natural since packages are often sent from someone else



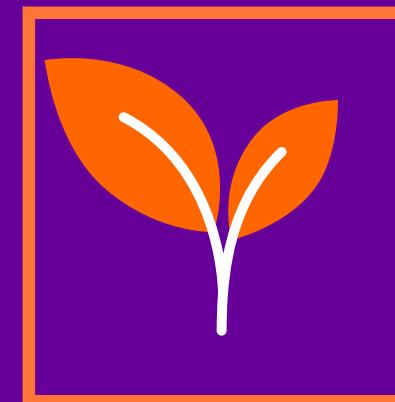
## Push Notifications

- Keep customers informed as to where package is and what hub it is passing through to motivate them to pick it up prior to last 50 feet



## Signature

- Allow customers to sign for packages from mobile device
- Don't have to wait to meet deliverer thus additional labor costs associated with signing are not incurred
- Allows so that packages going into lockers at hubs that require a signature can be signed for electronically

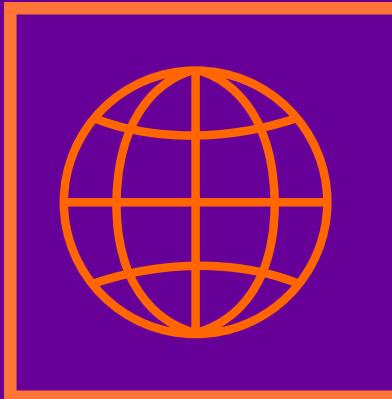


## Eco-City Movement

- Avoid Last 50 Feet, much less carbon dioxide emitted (FedEx Branding)
- Donate 1% of annual cost savings to plant trees

# FEATURES OF NEW TECHNOLOGY

MAJOR BENEFITS THAT INCENTIVISES CUSTOMERS TO PICK UP AT HUBS



## GPS Enabled

- Allows us to track when customer is on the way to hub to predict when it will be retrieved and optimize occupancy of packages in center



## Rewards

- Incorporate times a customer opts to pick up a package at the hub into FedEx's existing reward system
- Create points competition at the end of the year and name new planted trees with the top 50 winners (Millenials love competition)



## Camera Functionality

- Take photos to report damage packages, show exceptional service, etc. to create robust social forum and engage community

# PUNY BENEFITS:

1

## THEFT/ DAMAGE

- No risk of theft or damage if packages are left in secure lockers
- Customers who may be out of town can opt to have the package left somewhere safe from weather, theft, etc.

2

## SIGNING

- Allows customers the flexibility of not having to meet delivery man at a certain time to sign for a package
- Sign on mobile device once you arrive to locker and locker wont open until package is signed for

3

## LEAD TIME

- Customers can see when package makes to hub near them and can opt to go retrieve it earlier than it would be able to arrive to their door

4

## LABOR COSTS

- Completely eliminates to door and beyond door costs for each customer that opts to pick up at a hub

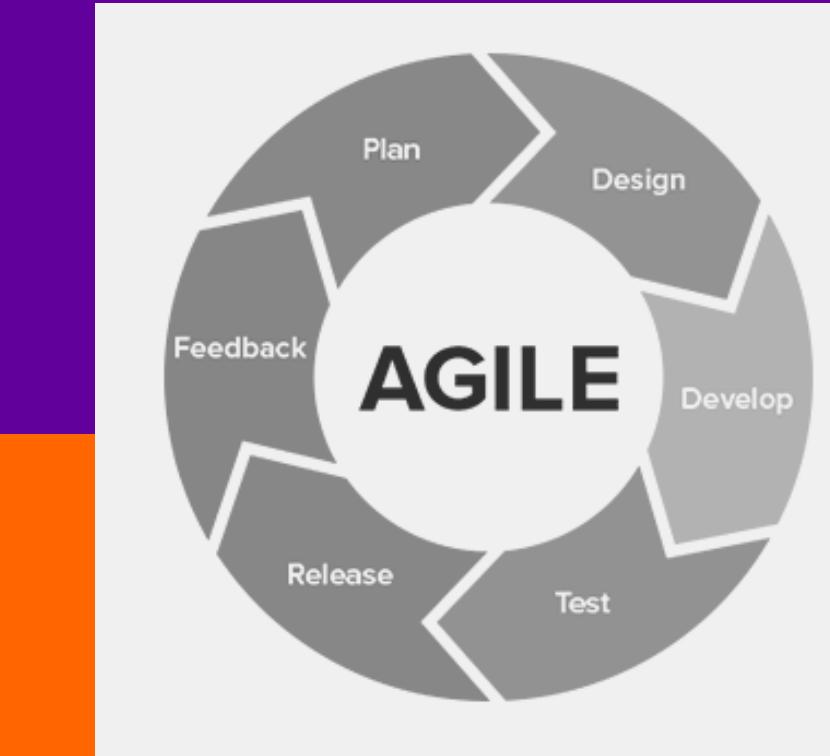


# Roll-out and Implementation Strategy



## PILOT PROGRAM

- Rollout with selected, small markets to decrease risk to sales and operations
- Understand the general demographic from small market so we know who to target as we expand this initiative



## AGILE METHODOLOGY

- Design and develop in sprints
- Exposed developing system prototype early and often to enhance user centricity of final product



## TESTING

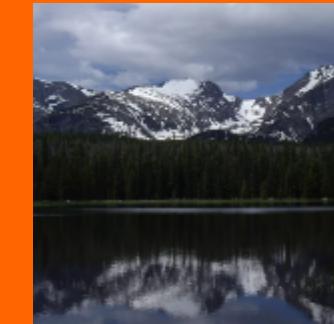
- User acceptance testing
- Integration testing with existing tracking systems, app, and other technologies



# DATA SOURCES

## US CENSUS DEMOGRAPHIC DATA

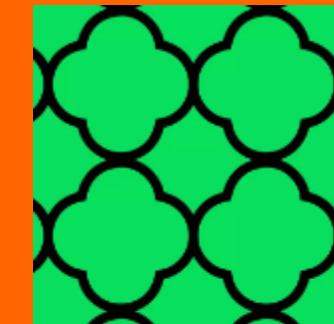
- Generate clusters of regions with similarity in terms of:
  - Population density
  - Diversity
  - Income
  - Employment
  - Transit type
- Based on success of the pilot study, FedEx can rollout the PUNY system in other regions in that cluster
- Target customers for PUNY based on cluster membership



### US Census Demographic Data

Demographic and Economic Data for Tracts and Counties

[kaggledatasets](#)



### US City Population Densities

Kaggle is the world's largest data science community with powerful tools and resources to help you achieve your data science goals.

[kaggledatasets](#)

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# DATA SOURCES

## CUSTOMER IN-APP DATA

### REWARDS SYSTEM

Collect data such as: location, age, gender, order frequency, favorite stores  
Use data to build predictive models for future customer targeting

### GPS DATA

Find the areas where customers have had highest adoption of PUNY  
Predict when/ where customers will choose hub-pickup to optimize space

### PHOTO DATA

Build image recognition models to predict future instances of damage and mitigate risks



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# OPERATING SCENARIO



★ FedEx SmartPost Headquarters

● FedEx SmartPost Hub Networks

1

## PILOT: ATLANTA SMARTPOST HUB

- Retrofit the Atlanta SmartPost Hub with key-code lockers so customers can have simple, contact-less pickups

2

## CUSTOMER TARGETING

- Special offer for customers who are receiving a delivery in Atlanta area
- When customers receive shipping update and the package will go through Atlanta SmartHub, offer the new app download

3

## DATA COLLECTION

- Track customer downloads and app usage to continuously improve the PUNY program

4

## ROLLOUT

- After optimizing the Atlanta PUNY program, begin to expand to other FedEx Smarthubs

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# SWOT ANALYSIS

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## Strengths

- Cost Saving: Eliminate Last 50 Feet. Saves 35%+ of total cost (including Labor and Vehicle) to help achieve FedEx annual EPS goal (10-15%).
- Marketing Branding: Dramatically decrease carbon dioxide emission, resonating with FedEx's CSR & Sustainability. Aligning with social trends and preferences
- Technology: Align with FedEx Growth Strategies adding convenience and flexibility to existing system
- Sustainability: Donate 1% of annual cost savings to economically sustainable initiatives

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## Weaknesses

- Labor: Eliminate Last 50 Feet will cause delivery people lose jobs. Employees might feel scared of losing jobs
- Cost: More customer information will be stored which might need larger data warehouse for storage
- Innovation: Early majority and late majority occupies 68% of population according to Diffusion of Innovations. People might need some time to adopt.

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## Opportunities

- Internal: Align with FedEx Growth Strategies goal and employees are ready to adopt innovation
- External:
  - Government partnerships: eco-city movement campaign is encouraged and supported
  - Customers: Millennials care more about CSRs and innovation. There will be more potential customers.
  - Existing Distribution Centers: 25 distribution centers located in or near major cities.

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## Threats

- Government regulation: Delivery people will lose jobs with automated locker system
- Employee Loyalty: Delivery people will lose jobs and other employees will get scared of losing jobs in the future
- Competitors: UPS can adopt this change as well
- Data overwhelming: Tremendous amounts of new data sources will become available and FedEx must be equipped to draw insights from new sources
- Customers: senior customers might find it hard to adopt need change. Training lessons will be helpful.

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## POTENTIAL ROI

# \$8.055 MILLION

Based on size of investment, amounts of returned, and investment length

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dations

# Potential Return of Investment



## SIZE OF INVESTMENT

- The development cost will only apply to new feature of the app \$50K

Assumption: the app costs \$100K to develop and one fifth of the development costs will be needed for an update

- Locker Installment:  $\$250 * 500 = \$125K$

Assumption: each hub will have 500 lockers

- Litigation and Legal: 100K  
Total Cost: 50k + 125K + 100K= 275K



## AMOUNTS OF RETURNED

- Cost Savings from Last 50 Feet Elimination: 35% of total delivery cost  
Total delivery cost:  $\$47,613 \text{ per driver} * 500 = \$23.8M$

$$35\% * \$23.8M = 8.33M$$



## INVESTMENT LENGTH

12 Month

SOURCE: FEDEX 2020 ANNUAL REPORT

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# CALCULATING POTENTIAL RETURN OF INVESTMENT

## REVENUE

	2020 <sup>(1)</sup>	2019 <sup>(1)</sup>	Percent Change
Consolidated revenue	<u>\$ 69,217</u>	<u>\$ 69,693</u>	(1)
Operating income (loss):			
FedEx Express segment	996	2,176	(54)
FedEx Ground segment	2,014	2,663	(24)
FedEx Freight segment	580	615	(6)
Corporate, other and eliminations	(1,173)	(988)	(19)
Consolidated operating income	2,417	4,466	(46)
Operating margin:			
FedEx Express segment	2.8%	5.8%	(300) bp
FedEx Ground segment	8.9%	13.0%	(410) bp
FedEx Freight segment	8.2%	8.1%	10 bp
Consolidated operating margin	3.5%	6.4%	(290) bp
Consolidated net income	<u>\$ 1,286</u>	<u>\$ 540</u>	138
Diluted earnings per share	<u>\$ 4.90</u>	<u>\$ 2.03</u>	141

The following table shows changes in revenue and operating results by reportable segment for 2020 compared to 2019 (in millions):

SOURCE: FEDEX 2020 ANNUAL REPORT

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# CALCULATING POTENTIAL RETURN OF INVESTMENT

## COST

	2020	2019
<b>Items affecting Operating Results:</b>		
Goodwill and other asset impairment charges	\$ (435)	\$ —
TNT Express integration expenses	(270)	(388)
Business realignment costs	—	(320)
Litigation and legal matters	—	(46)
	<u>\$ (705)</u>	<u>\$ (754)</u>
 <b>Item affecting Net Income:</b>		
Mark-to-market (“MTM”) retirement plans accounting adjustment, net of tax	<u>\$ (583)</u>	<u>\$ (2,981)</u>

SOURCE: FEDEX 2020 ANNUAL REPORT

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# FINAL RECOMMENDATIONS

## WHAT TO DO WITH THE DATA FROM THE PILOT STUDY?

### SUPERVISED LEARNING

Based on patterns in customers who have adopted the new pickup technology, target new customers

### UNSUPERVISED LEARNING

Use k-means clustering using demographic and location data to decide new regions to roll-out the system and where in regions the hubs should be built based on density of where target market lives/works

### CUSTOMER INSIGHTS

Learn which customers are using the technology to target them with offers, don't waste time on uninterested customers



**FedEx**

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# “THE WORLD ON TIME”

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