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Biometric Access System for MTA Services

MTA

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AGENDA

- Introduction
- Problem Statement
- Survey Data
- Risks
- Technology & Infrastructure
- Project Plan
- Financial Analysis
- Pilot Run
- Success Metrics

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Introduction

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Problem Statement

Introduction

A snapshot of the public transit industry in the US:

- Industry revenue - $74.9 billion
- Industry profit - $4.3 billion
- Annual growth rate 2.5% (2013-2018)
- Growth rate will be halved to 1.2% by 2023.

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Problem Statement

- “I lost my MetroCard” / "Swipe Again"
- Plastic waste
- Fare evasion
- Card dependent payments

Current systems

- Some systems use a hybrid of tokens and cards depending on type of passenger
- The swipe card is currently the standard at the MTA and a popular access tool across the globe
- Tap cards implementing NFC technology are slated to be the next all-in-one solution
- These cards use smart chips which also double as banking solutions
    - Insecure method of access
    - Still involves carrying a card
    - Currently can hold only small amounts of money
    - Loss can lead to a long wait for a replacement

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Proposal

- Transition from possession-based system to inherence-based system
- MTA should move to biometric as a step toward card-less system
- Convenient, secure and clean technology
- Improve degree of acceptance by means of a pilot project and gradual rollout

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Survey Data

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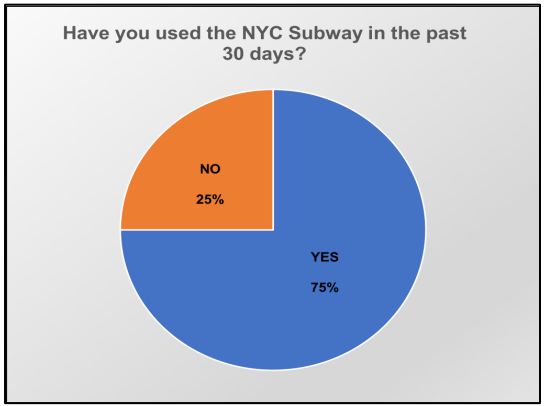
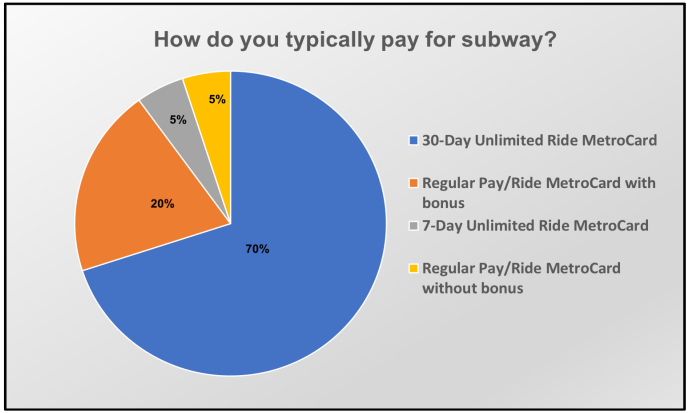
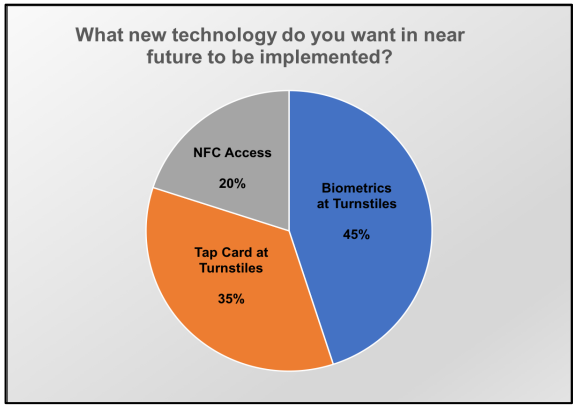
Risks

Survey Results







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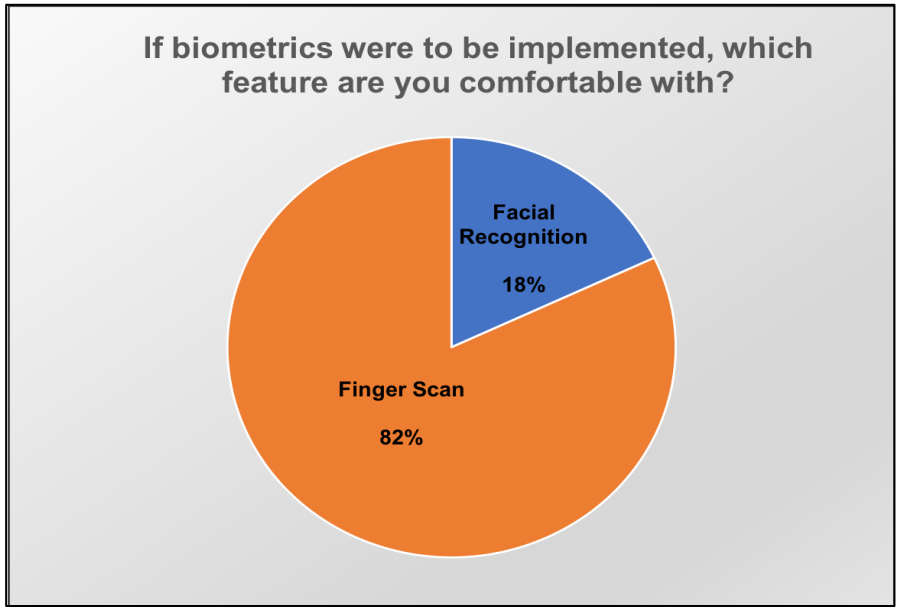
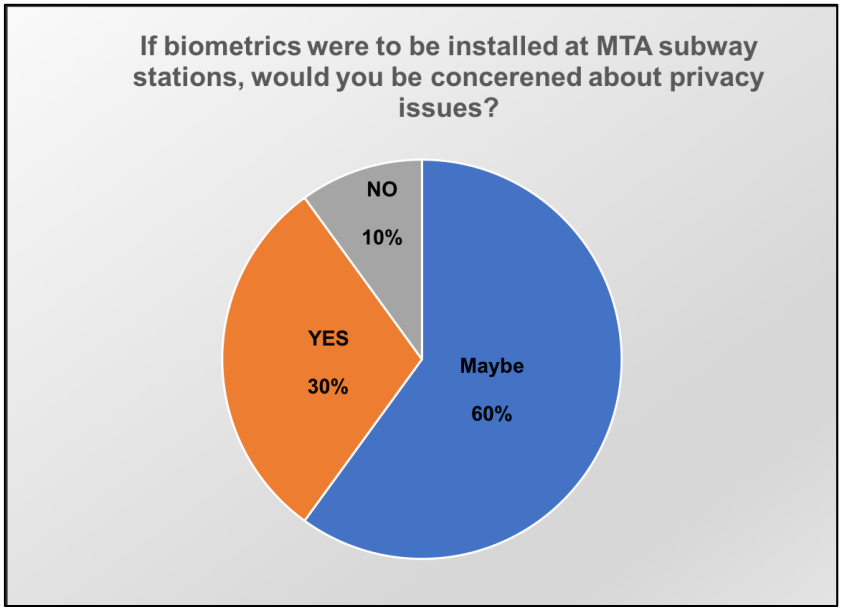

If biometrics were to be implemented, which feature are you comfortable with?
Facial Recognition
18%
Finger Scan
82%


If biometrics were to be installed at MTA subway stations, would you be concerened about privacy issues?
NO
10%
YES
30%
Maybe
60%

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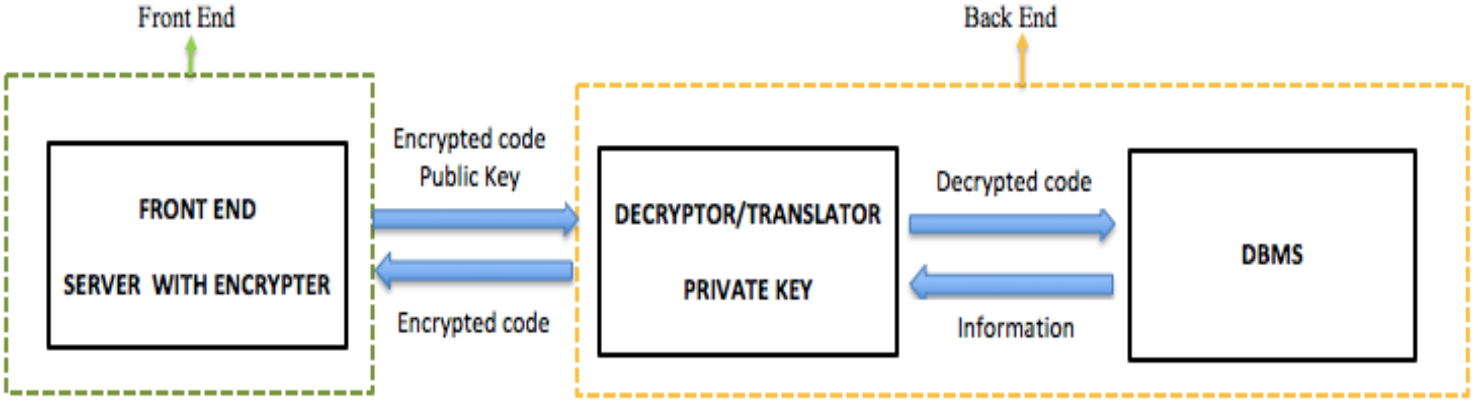
Risks

- Strategic Risks
  - Obsolescence of Biometrics
- Compliance Risks
  - GDPR
  - Current State Regulations
- Financial Risks
  - Quarterly Checkpoints
  - Evaluation at every $21 Million expenditure

- **Security Risks**



Mitigation Plan:

Cyber Security Insurance Plan

- **Cover legal defense expenses and liability expenses if they get sued by someone for data breach.**

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Technology & Infrastructure

- User registration process (Smartphone / MTA kiosk)
    - Full Name
    - Date of birth
    - Gender
    - Place of residence
    - Bank details
- A secure unique code generated at the end of the process to help register fingerprint at the kiosk
- First time fingerprint registration will take place only at the kiosk
- Using MTA Android/iOS application a user can recharge their MTA account.

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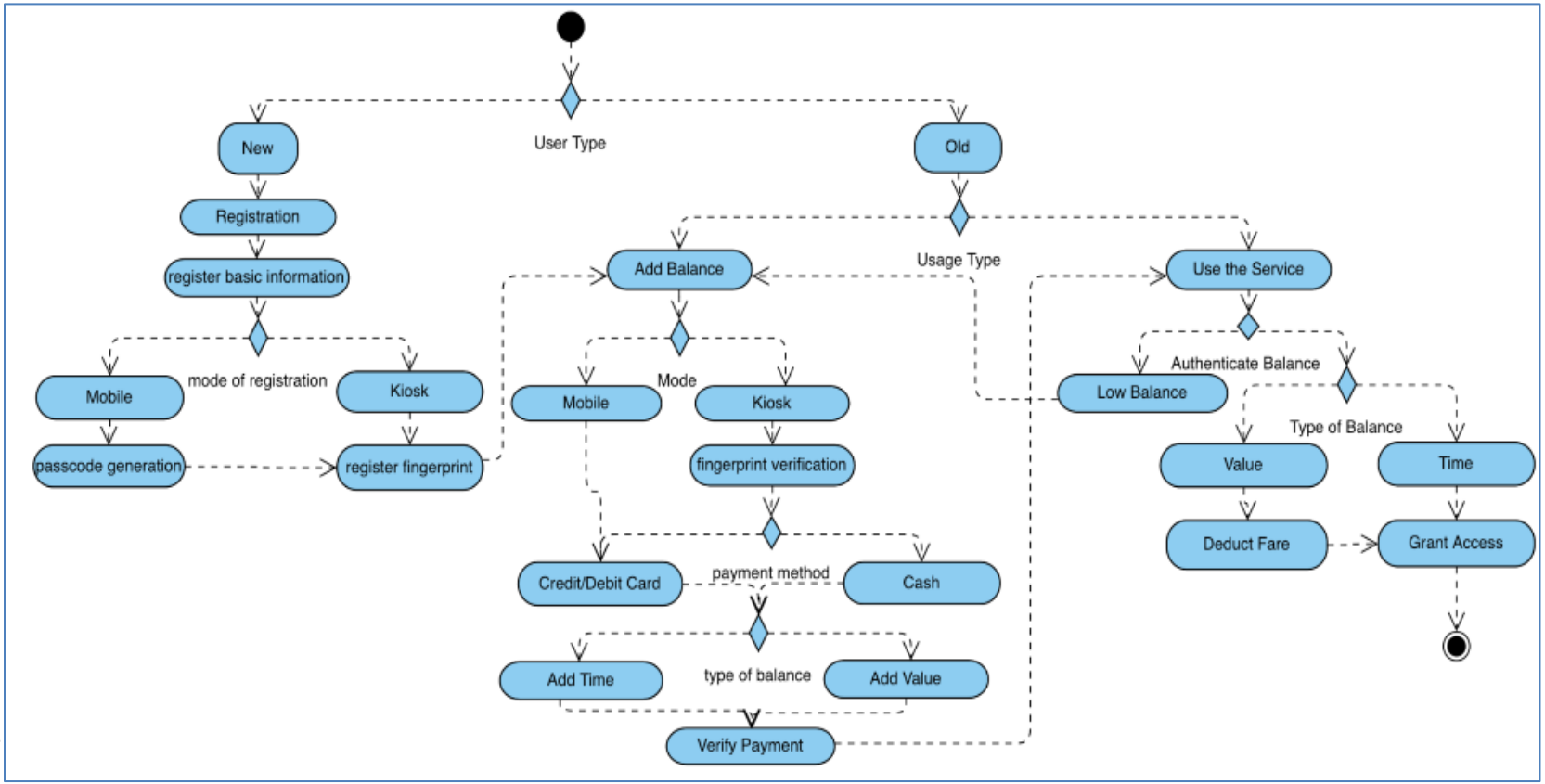
Activity Diagram



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Underlying Infrastructure

- The wire and wireless infrastructure will remain the same with the change at the user-end of card swipe device to fingerprint scanner.

- The network base for security and faster authentication of the system will require an upgrade to high speed optic fibers as compared to traditional network base.

- The distributed database system will require a change in the E-R schema of the system:
  - addition of a relation table - user information
  - User information linkage to the users travel history, balance history and current balance.
  - The unique code generated by the fingerprint scanner will act as a primary key.

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- Each fingerprint scanner will have a mathematical algorithm which reads the fingerprint and creates its equivalent unique code.

- At each instance, the scanner generates the code of the print and matches with the primary key of the user database

- This is followed by verifying the balance of the user.

- The authentication will take no more than 5 seconds.
    - Future plan - With the help of machine learning algorithms the authentication process can be made quicker.

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Project Plan
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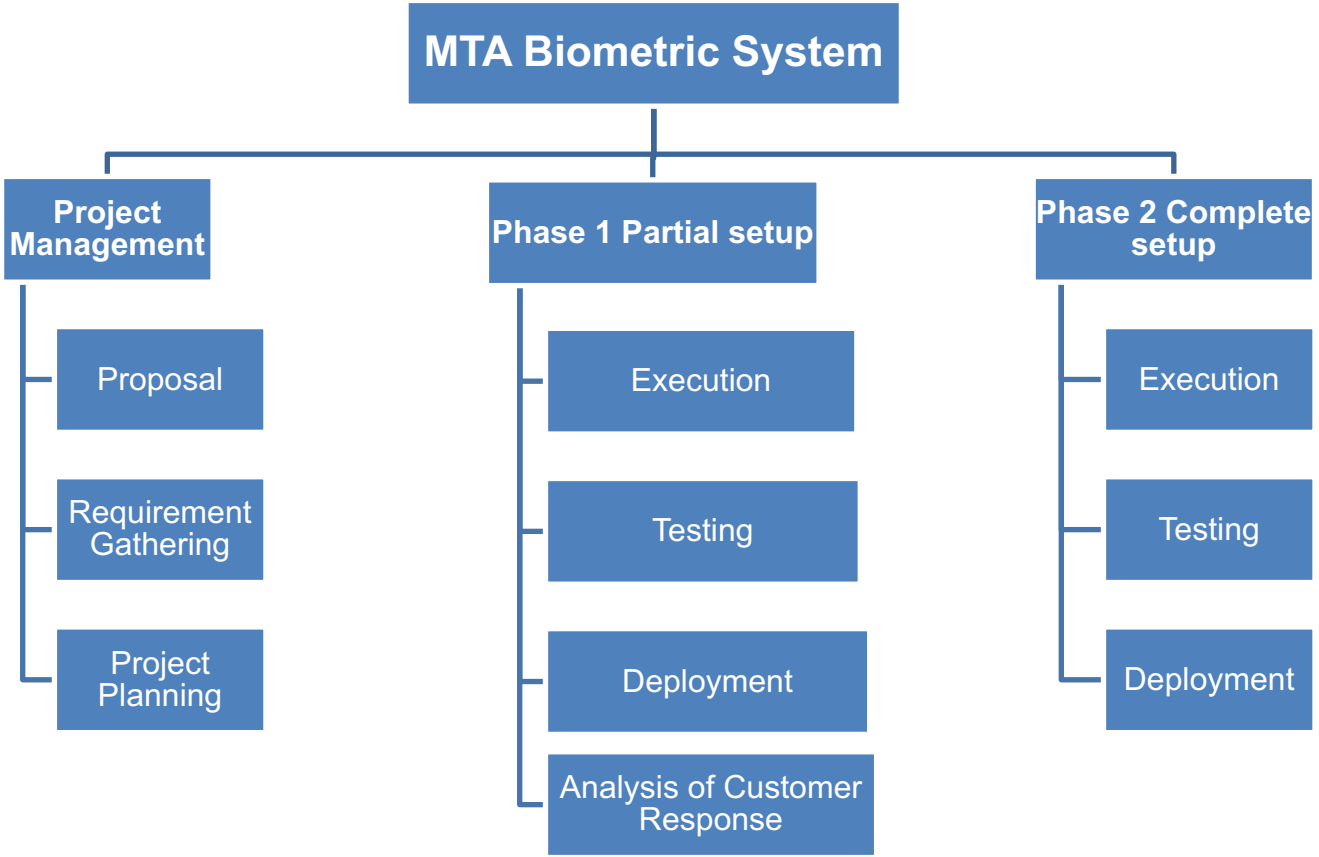
Financial Analysis


MTA Biometric System
Project Management
Proposal
Requirement Gathering
Project Planning
Phase 1 Partial setup
Execution
Testing
Deployment
Analysis of Customer Response
Phase 2 Complete setup
Execution
Testing
Deployment

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Financial Proposal

- Following assumptions are taken for cost estimation purpose:

- Total number of stations are **472**
- Total number of buses are **5700**
- Turnstiles per station **15**
- Kiosks per station **5**

- Installing a scanner will include following cost:

- Price of scanner
- Installation cost
- Miscellaneous costs

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Cost Calculations

Particulars	Amount
Cost of finger scanner machine	$499
Installation and maintenance cost of scanner machine	$5000
Per Unit Cost	**$5499**

Sr. No.	Particulars	Buses	Stations	
1.	Total Number	5700	472	
2.	Average Turnstiles/ATMs per station respectively	-	15	5
OVERALL SET-UP (Numbers)		5700	7080	2360
3.	Per Unit Cost ($)	5499	5499	5499
TOTAL INSTALLATION COST (Approx.) ($)		$31M	$39M	$13M
INSURANCE COST, Annually ($)		$24000		
TOTAL COST (Approx.)		**$84M**		

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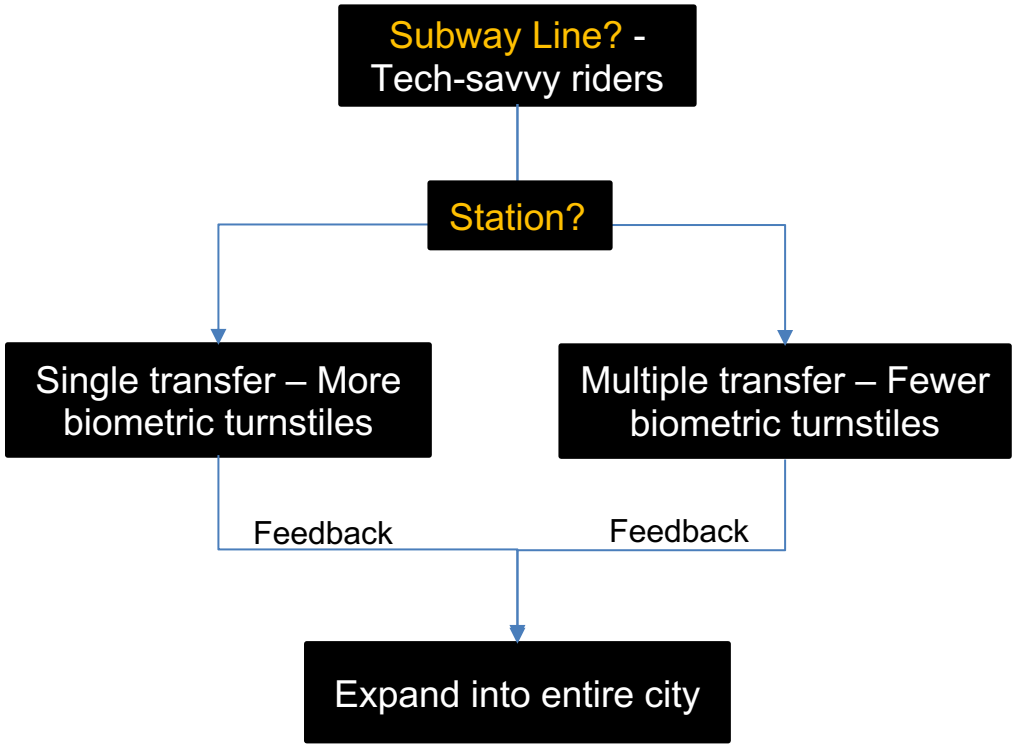
Pilot Run
&
Success Metrics

Pilot Run


Subway Line? -
Tech-savvy riders
Station?
Single transfer – More biometric turnstiles
Multiple transfer – Fewer biometric turnstiles
Feedback
Feedback
Expand into entire city

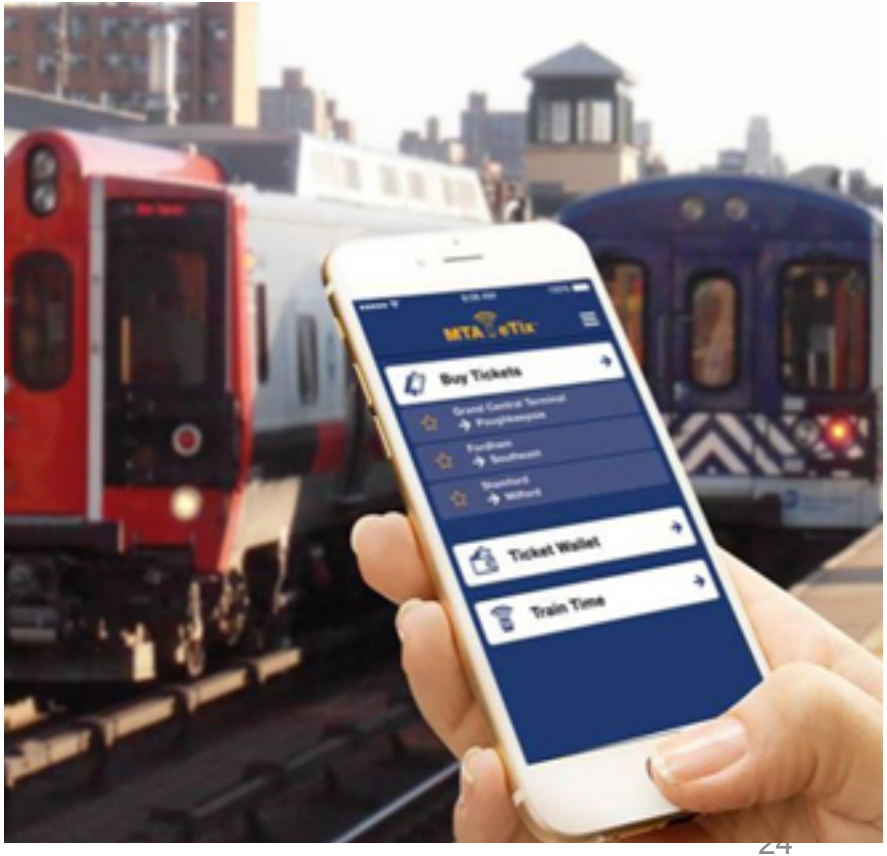
Success Metrics

1. Reduction of Plastic Waste - **200 tons** by 2022.

2. Increase in revenue
   - **+ $55 Million** (Avoid fare evasion)
   - **+ $10 Million** (Elude plastic MetroCards)

3. Increase in ridership by **2%** from 2022 onwards

4. Annual crime reduction by **20%** starting 2022.



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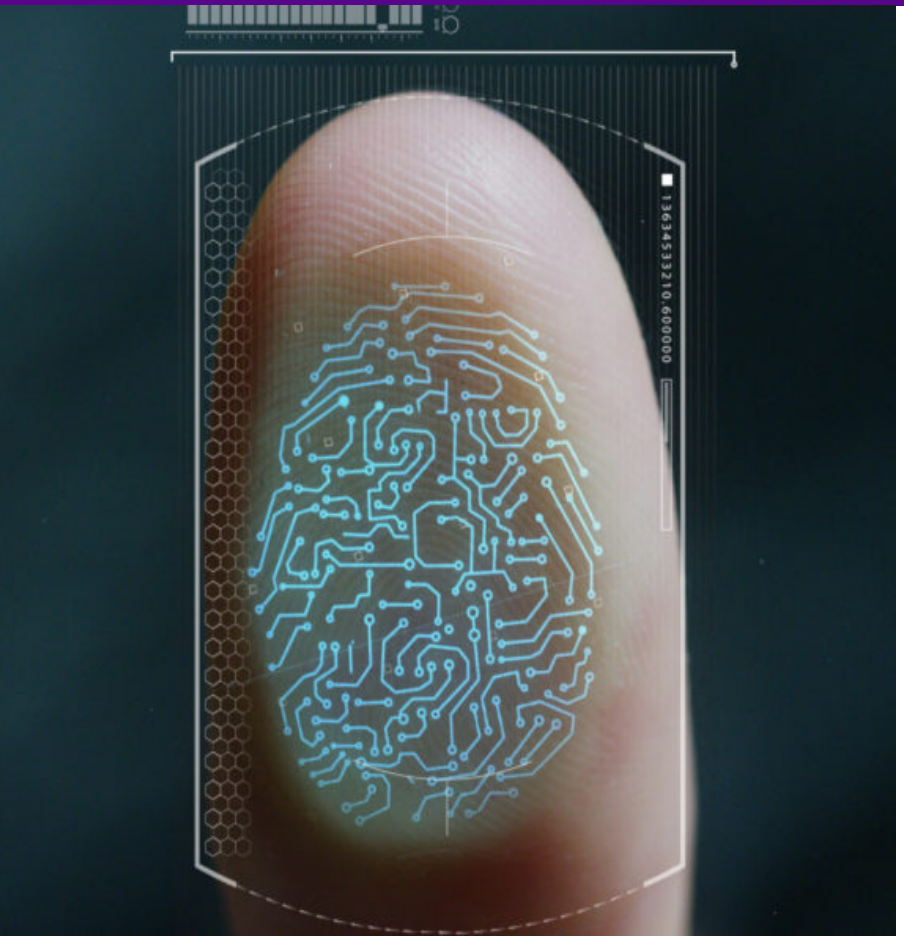

Longevity of Biometrics

- **Weak Alternatives**
  - Tap Cards
  - NFC using mobile phones
  - Multi Factor Authentication
- **Sustainability with biometric solution**

Finger Scanning

↓ Same Back-end

Facial Recognition


QUESTIONS
ANSWERS

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