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UK NATIONAL RAIL

**Understanding Customer Behavior to Guide
Data-driven Promotion Offerings**

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Executive Summary



Key Insights from Purchase Behavior

Ticket Type & Class

- Based on Ticket Type & Class usage, **7 customer profiles** are derived and build upon for recommendations

Purchase Behavior

- Online is the preferred purchase channel (**58.5%** of total sales)
- Station tickets tend to be higher in price on average, partly because higher price and longer distance tickets are more likely to be bought in person

Payment Method

- Credit Card is the preferred method for paying (**50.6%**), followed by Contactless (**42.8%**)
- Even though Debit Cards are used less frequently (**6.6%** of total purchases), when they are used, it's often for more expensive purchases

Purchase Window

- Advance travelers typically buy tickets **3 days** before their trip.
- Standard Medium-High range travelers are more mindful about their travel plan and book a bit earlier than First Class and short-distanced travelers

Key Insights from Travel Behavior

Trip Length

- **Short trips** are most common, followed by Very Short and Medium trips. Medium-Long trips are less frequent
- **Anytime travelers** have low price-sensitivity, high urgency, and prioritizes flexibility over price. They're also more prone to longer trips

Travel Day

- Advance ticket usage is consistent across weekdays & weekends, with a slight peak on Friday.
- Off Peak is popular on the weekends and later in the week.
- Anytime ticket usage peaks on Wednesday

Customer Profiles & Recommendations

These profiles are built upon additional **Purchase Behavior** (Buying Channel, Payment Method, Timing) and **Travel Behavior** (Trip Length, Travel Day) for recommendations

Updated Customer Segments	Characteristic	Recommendations
Budget-Conscious Travelers	<ul style="list-style-type: none">- Cost-aware travelers who plan ahead for the best deals, often for leisure or personal visits- High price sensitivity	<ol style="list-style-type: none">1. Price-saving deal Early-bird promos Price alerts for usual/popular routes Displaying Total Savings from utilizing Railcards & Discounts2. Route comparison tools
Frequent Commuters	<ul style="list-style-type: none">- Work Commuters- Mild price-sensitivity, but they need to make the trip anyway- Prioritize ease of purchase due to high frequency & repetitive routes	<ol style="list-style-type: none">1. Price-saving deal Bundle tickets Monthly pass for busy routes2. Ease of Purchase/ Convenience App push for quick tickets Auto-fill ticketing 1-click booking offers Notification reminder for frequently-travel routes -> Push them to purchase earlier & online for more travel frequency
Students	<ul style="list-style-type: none">- Similar to Budget-Conscious Travelers in their spending habits and the tendency to travel for personal/leisure trips- Yet, their travel need is that of a Commuter, but are not restricted only to Rush Hours or a 9-5 schedule, giving them more flexibility	<ol style="list-style-type: none">1. Specific Student Railcard/Discounts2. Ease of Purchase/ Convenience3. Price-saving deal Early-bird promos Price alerts for usual/popular routes

Customer Profiles & Recommendations

These profiles are built upon additional **Purchase Behavior** (Buying Channel, Payment Method, Timing) and **Travel Behavior** (Trip Length, Travel Day) for recommendations

Updated Customer Segments	Characteristic	Recommendations
Casual Weekend Travelers	- Travels for leisure, light planning, looks for flexibility and value	1. Weekend getaway bundles Returning trips Promo Popular Weekend Getaways Promo 2. Group/family ticketing offers 3. Price-saving deal Early-bird promos Price alerts for usual/popular routes
Last-minute Travelers	- Low price-sensitivity, high urgency - Prioritizes flexibility over price - Often business or urgent personal travel	1. Station promos & physical ad banners 2. Add-on amenity offers after purchase Lounge & Wifi upgrade Seat Upgrades 3. Time-based promotions & push notifications sensitive to busy days & routes Wednesday Promo

Customer Profiles & Recommendations

These profiles are built upon additional **Purchase Behavior** (Buying Channel, Payment Method, Timing) and **Travel Behavior** (Trip Length, Travel Day) for recommendations

Updated Customer Segments	Characteristic	Recommendations
Business Travelers	<ul style="list-style-type: none">- Low price-sensitivity- Values comforts, add-ons, seat reservations	<ul style="list-style-type: none">- Business travel rewards- Corporate subscription plan/loyalty program- Ease of Purchase/ Convenience- Add-on amenity offers after purchaseLounge & Wifi UpgradeSeat UpgradesQuiet areas
High-Spend Travelers	<ul style="list-style-type: none">- Low price-sensitivity- Conservative with high spending transaction & payment methods- Infrequent but high-value trips, possibly longer routes, or special occasions- Values comforts, add-ons, and seat reservations	<ul style="list-style-type: none">- Upgrade & upsells- Email offers for premium routesWeekend GetawaysLuxurious Vacation AwaitsPremium Service Trains- Seasonal or event-based travel ads- Ease of Purchase/ Convenience- Add-on amenity offers after purchaseLounge & Wifi UpgradeSeat UpgradesQuiet areas



2

Situational Overview

Analysis Overview



Challenges:

The company is facing growing competition from **short-haul flights** and **regional bus services**, which are challenging rail travel on both time and cost efficiency.

As part of an effort to stay competitive, the company plans to roll out a **new promotional program** offering ticket bundles and targeted discounts tailored to traveler needs for the upcoming Winter season.

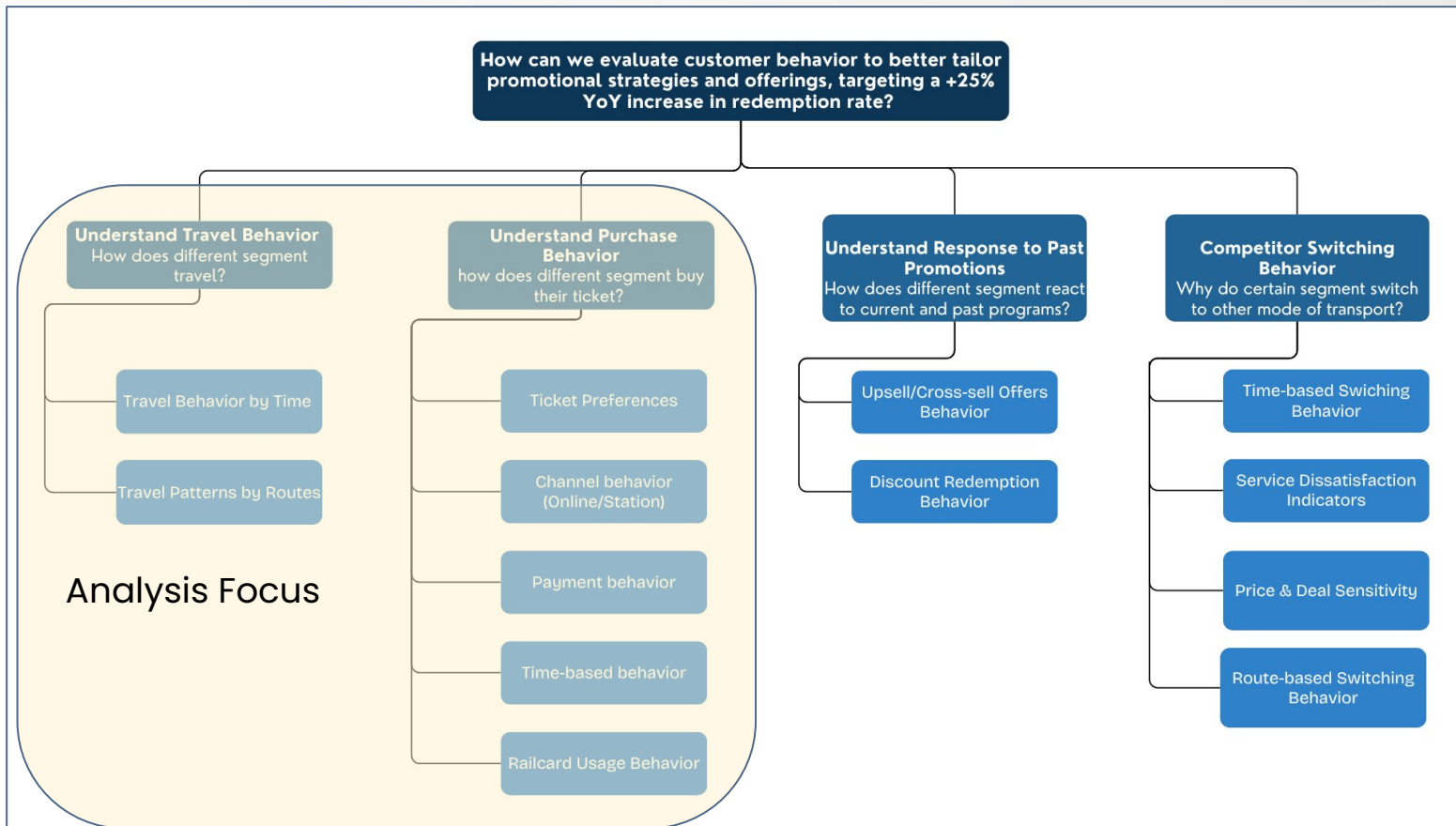
Roles:

As part of the Data & Analytics for the UK National Rail, you are tasked with understanding **customer behavior**, from purchasing patterns to travel preferences to inform the design of personalized offerings & strategies

The goal is to drive a **+25%** increase in redemption rate on the program's offers compared to last year's promotions, which targeted a mass audience.



Analysis Focus





Current Customer Segments Demographics



Commuters:

Daily travelers, especially in urban areas like London, Manchester, and Birmingham.

Students:

University and college students commuting between home and campus.

Leisure Travelers:

Tourists and families traveling during weekends and holidays.

Business Travelers:

Professionals attending meetings and events across cities.

Accessibility Groups

Elderly and disabled passengers requiring special assistance.

How to better understand these customer segments and their different needs?

National Rail's Key Channels & Offerings

Key Channels

Digital Platform

Official websites and Mobile apps

Physical Outlets

Station ticket offices and automated machines

Third-Party Retailers

Customer Service Centers

Key Offerings

Train Tickets

- First Class and Standard
- Anytime, Advance, Off Peak

Railcard Program

- Discount for eligible frequent travelers (Adults, Disabled, Senior)

Onboard Services

- Food & Beverage
- Wifi
- Lounge Access

Digital Services

- In-app real-time journey tracking
- In-app Promotions
- Surveys & Feedbacks

Understanding these Channels help the team to better tailor offerings across these products & services

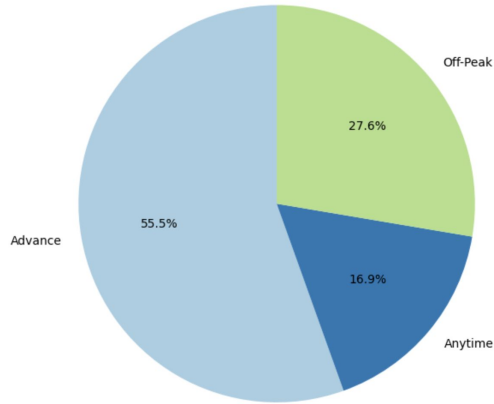
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Understanding Purchase Behavior

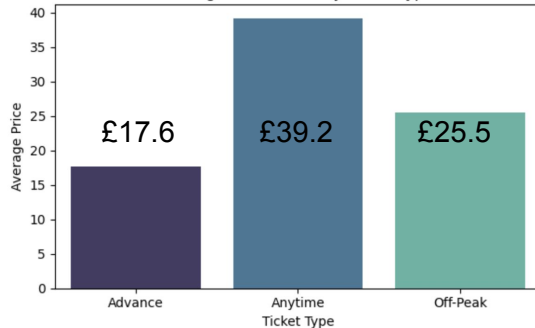
Overall Segmentation: *by Ticket Type*

Each ticket types are suitable for different travel needs, with Advance tickets being the cheapest and most popular option

Ticket Type Distribution by Volume



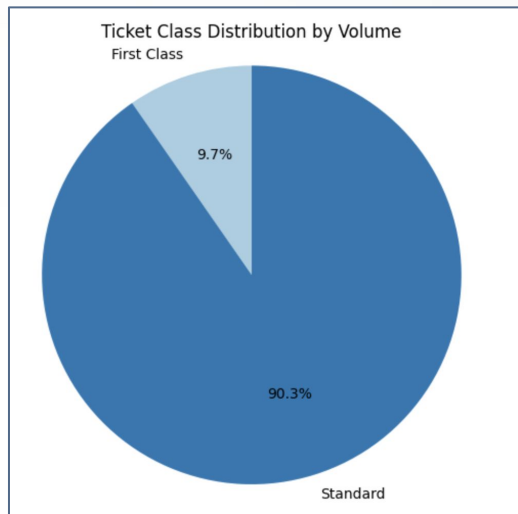
Average Ticket Price by Ticket Type



	Advance	Anytime	Off Peak
Characteristics	Cheapest Most Popular	Most Expensive Least Popular	Medium Price Mild Popularity
Behavior	– Plan ahead – Fixed travel initiaary	– Flexibility in departure time	– Flexibility and cost-saving
Appeal	Casual Travelers Budget-Conscious Travelers Frequent work commuters Students	Business Travelers Premium Travelers Last-minute Travelers	Casual Travelers Students

Overall Segmentation: *by Ticket Class*

First-class tickets take around 10% of total ticket volumes and 20% of ticket revenue

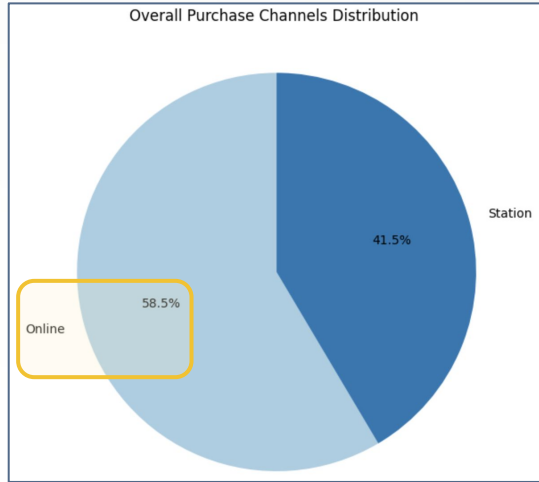


	Standard	First Class
Characteristics	Cost-saving High to mild price sensitivity	Premium Experience Little price sensitivity
Appeal	Casual Travelers Budget-Conscious Travelers Frequent Work Commuters Students	Business Travelers Premium Travelers Last-minute Travelers

Railcard travelers span across FC & Standard, as well as all ticket types

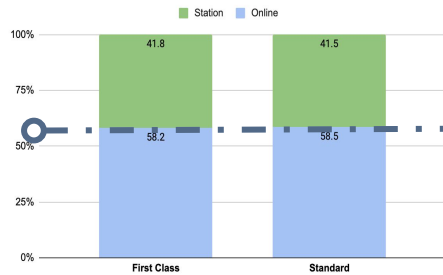
These 7 customer personas will be used throughout the analysis to build upon & derive recommendations

Overall Segmentation: *by Purchase Channel*

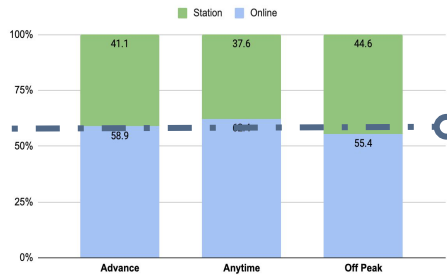


58.5%

Purchase Channel Distribution by Ticket Class



Purchase Channel Distribution by Ticket Class



Online is the preferred purchase channel.

- Approximately **58.5%** of tickets were bought online, and **41.5%** at stations.
- This is consistent across ticket class & types

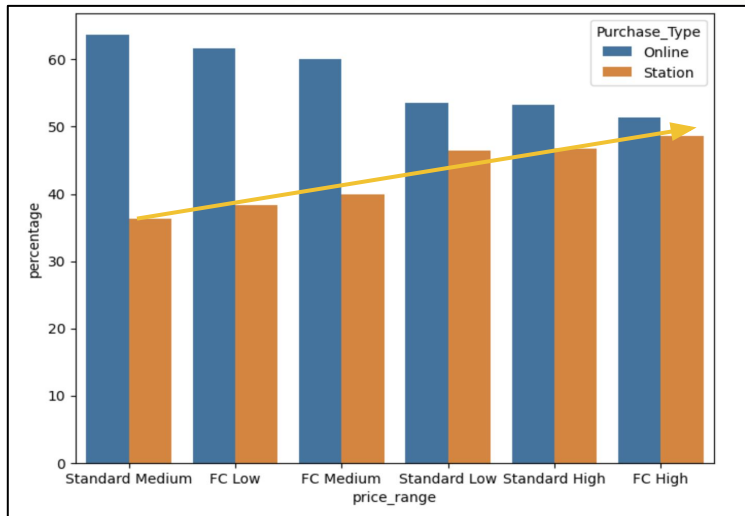
→ Provide incentives & discounts to further **incentivize digital-purchasing behavior** for better retargeting strategy

→ **Convenience** should be taken into account, utilizing one-click purchase/ routes reminders/ push notifications in App development

→ **User Research/ Testing** to better analyze the customer journey & touchpoints. Investigate funnel conversions rate to find out drop-off point

Deep-Dive: Station tickets tend to be higher in price on average

		Online	Station	% Difference of Station over Online
Overall		£20.7	£27.4	32%
Ticket Class	First Class	£44.7	£54.7	22%
	Standard	£18.1	£24.4	35%
Ticket Type	Advance	£15.5	£20.6	33%
	Anytime	£31.7	£51.6	63%
	Off Peak	£24.0	£27.4	14%



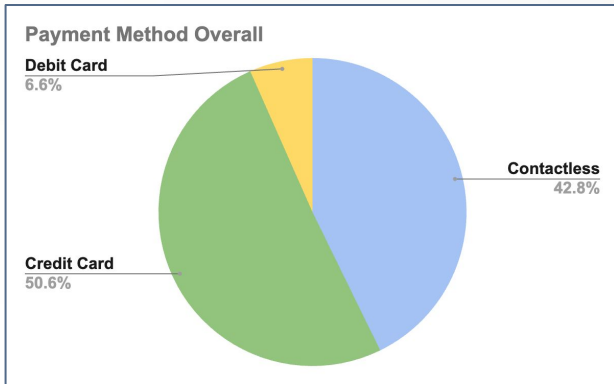
Station tickets tend to be higher in price on average

- Customers who buy at train stations pay a higher price on average
 - This trend is consistent across *ticket class*, *type*, *payment method*, and *price range*
- This difference in average ticket prices between online and station purchases is *statistically significant*

Higher-tier tickets are more likely to be bought in the station, as well as short & cheap trips

- Station only accounts for around 36% of Standard Medium tickets, but makes up of **49%** of FC High and **47%** for Standard High
- So does Standard Low, which usually accounts for short & quick trip (**46%** Station)

Overall Segmentation: *by Payment Method*



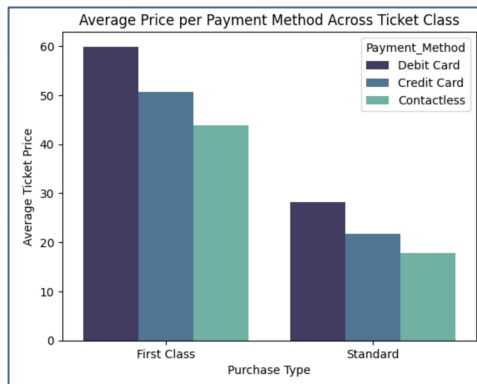
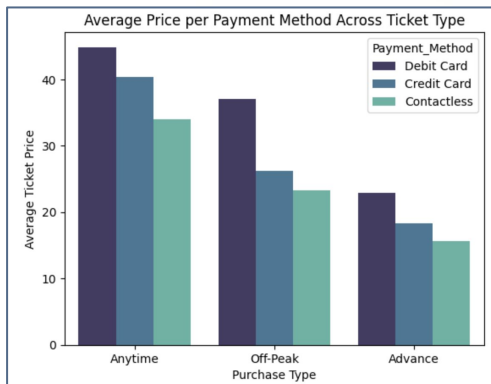
Payment Method	Average Ticket Price
Debit Card	£31.5
Credit Card	£24.5
Contactless	£20.3

Credit Card is the preferred method for paying (50.6%), followed by Contactless (42.8%), while Debit card usage is relatively small

- This is consistent across Station & Online purchases

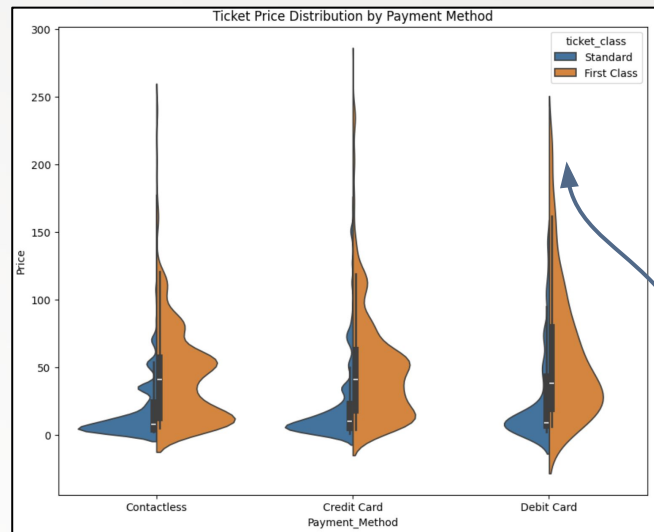
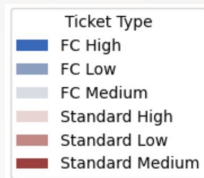
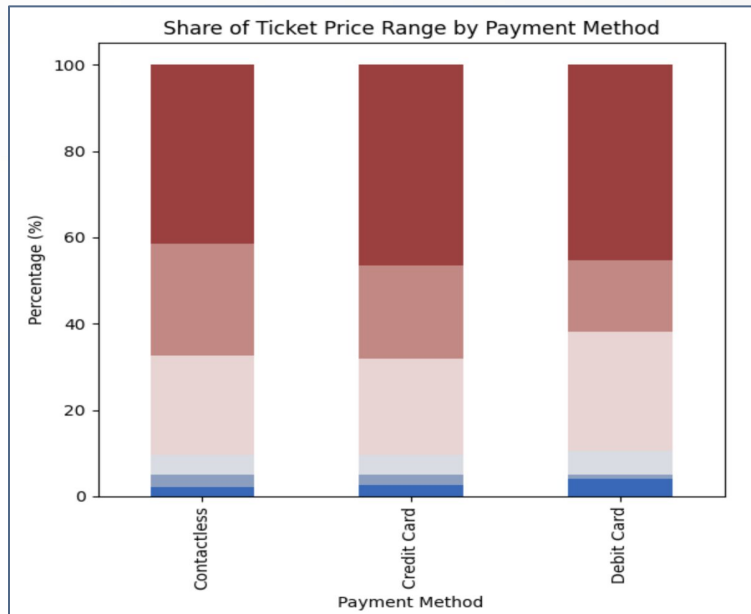
Debit card transactions seem to have a higher average ticket price than Others

- This is consistent across buying channels, ticket types, and classes



Deep Dive: Even though Debit Cards are used less frequently (6.6% of total purchases), when they are used, it's often for more expensive purchases

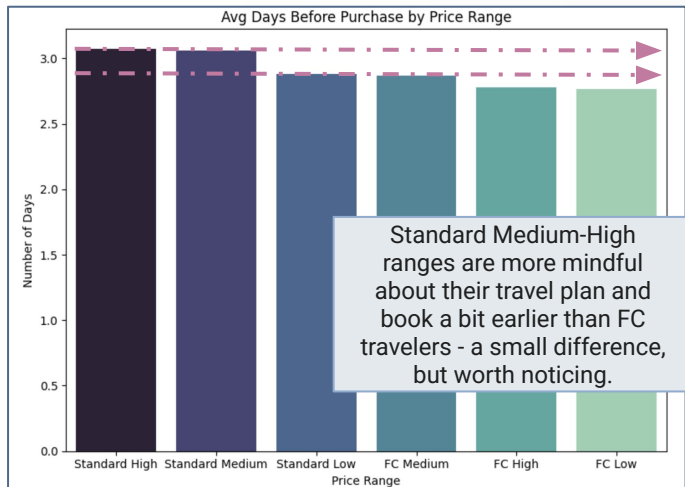
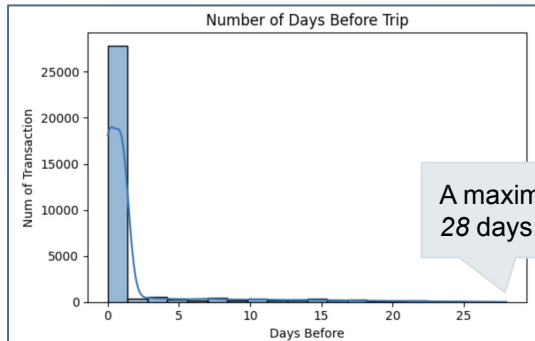
Deep-Dive: Debit Cards are used less frequently, but when they are used, it's often for more expensive purchases



Within the Debit Card group, **First Class High** and **Standard High** make up the largest share of transactions compared to other payment methods.

many transactions involving a debit card have **higher values** than the average, skewing the distribution to the right with this visible tail

Deep Dive: *Journey Proximity and Purchase Behavior*



Advance travelers typically buy tickets 3 days before their trip.

- No noticeable difference between online & station channels
- Anytime and Off-Peak tickets are purchased on the day of

Offerings Suggested: Price-saving deals like Early-bird promos and Price alerts for usual/popular routes

→ Push them to purchase earlier & online for higher travel frequency

Standard High and Medium are more prone to cost sensitivity.

- Standard Low and First Class travelers are approximate in their booking timing

→ **Standard High & Medium:** cost-sensitive travelers and are more proactive in their planning

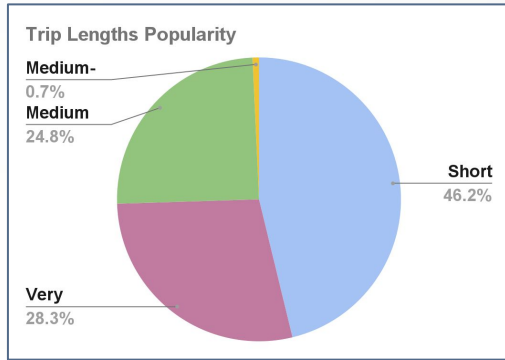
Standard Low: quick trip & cheaper price, no urgency

First Class: less prone to time-urgency or cost-sensitivity.

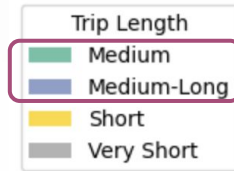
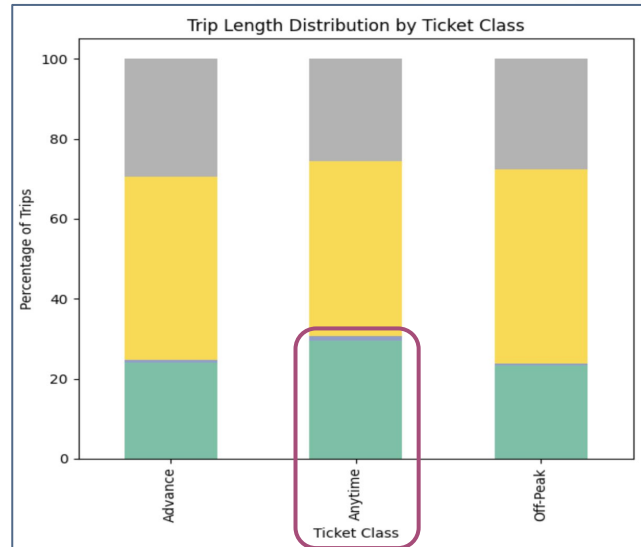
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Understanding Travel Behavior

Overall Segmentation: *by Trip Length*



Trip Length	
Very Short	Under 30 min
Short	Under 1.5 hour
Medium	Under 3 hours
Medium-Long	Under 4.5 hours



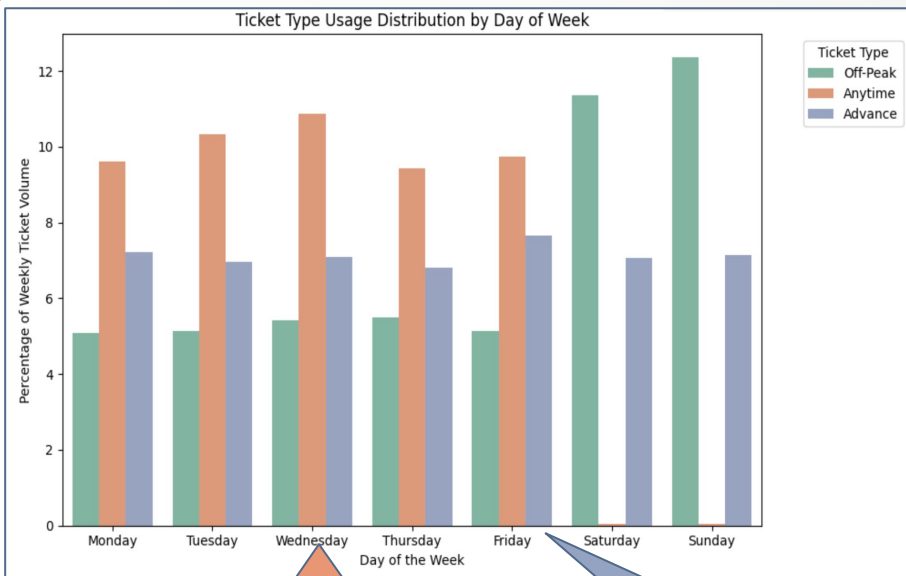
Short trips are the most common, followed by Very Short and Medium trips. Medium-Long trips are less frequent

- Consistent across ticket classes and most ticket types

Anytime travelers have low price-sensitivity, high urgency, and prioritizes flexibility over price. Also more prone to longer trips

- Anytime tickets have a relatively higher component of Medium & Medium-Long trips and substantially higher price points across all route lengths

Overall Segmentation: *by Travel Day of The Week*



Anytime: Wednesday is the most popular across the ticket classes

Advance: slight peak on Friday

	Advance	Anytime	Off Peak
Findings	Popular on weekends and later in the week	Almost no trips on the weekend, more popular for the weekdays.	Consistent use across weekdays & weekends
Characteristics	Appeal to all frequent travelers	Business trips Low price-sensitivity	Flexibility and Cost-saving
Appeal	Casual Travelers Budget-Conscious Travelers Frequent work commuters Students	Business Travelers Premium Travelers Last-minute Travelers	Casual Travelers Students Premium Travelers Last-minute Travelers

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Customer Profiles & Recommendations

Customer Profiles

Updated Customer Segments	Key Traits			Characteristic	Recommendations
	Ticket Class & Type	Purchase Channel, Paying Method, Timing	Trip Details		
Budget-Conscious Travelers	<ul style="list-style-type: none"> - Prefer Advance or Off-Peak - Standard 	<ul style="list-style-type: none"> - Buy tickets online - Price range in Standard Low/Medium/High - Book around 3 days in advance, can be higher - More likely to use Railcards 	<ul style="list-style-type: none"> - Route length varies 	<ul style="list-style-type: none"> - Cost-aware travelers who plan ahead for the best deals, often for leisure or personal visits - High price sensitivity 	<ol style="list-style-type: none"> Price-saving deal Early-bird promos Price alerts for usual/popular routes Displaying Total Savings from utilizing Railcards & Discounts Route comparison tools
Frequent Commuters	<ul style="list-style-type: none"> - Prefer Advance tickets - Standard 	<ul style="list-style-type: none"> - Both Online and Station - Price Range in Standard Low-Medium - Book tickets the day of, short notice, or some planning in less than 3 days 	<ul style="list-style-type: none"> - Very Short - Medium Routes (<1.5 hours) 	<ul style="list-style-type: none"> - Work Commuters - Mild price-sensitivity, but they need to make the trip anyway - Prioritize ease of purchase due to high frequency & repetitive routes 	<ol style="list-style-type: none"> Price-saving deal Bundle tickets Monthly pass for busy routes Ease of Purchase/ Convenience App push for quick tickets Auto-fill ticketing 1-click booking offers Notification reminder for frequently-travel routes <p>-> Push them to purchase earlier & online for more travel frequency</p>

Customer Profiles

Updated Customer Segments	Key Traits			Characteristic	Recommendations
	Ticket Class & Type	Purchase Channel, Paying Method, Timing	Trip Details		
Students	<ul style="list-style-type: none"> - Prefer Advance tickets or Off-Peak - Standard 	<ul style="list-style-type: none"> - Buy tickets online predominantly, tech-savvy - Price range in Standard Low/Medium/High - Book around 3 days in advance, can be higher, or on the day of 	<ul style="list-style-type: none"> - Route length varies, predominantly Very Short-Medium trips (<1.5 hours) 	<ul style="list-style-type: none"> - Similar to Budget-Conscious Travelers in their spending habits and the tendency to travel for personal/leisure trips - Yet, their travel need is that of a Commuter, but are not restricted only to Rush Hours or a 9-5 schedule, giving them more flexibility 	<ol style="list-style-type: none"> Specific Student Railcard/Discounts Ease of Purchase/ Convenience Price-saving deal <p>Early-bird promos Price alerts for usual/popular routes</p>
Casual Weekend Travelers	<ul style="list-style-type: none"> - Prefer Advance tickets or Off-Peak 	<ul style="list-style-type: none"> - Buy tickets online & at stations - Book around less than 3 days in advance or the day of - Price range in Standard Low/Medium/High 	<ul style="list-style-type: none"> - Route Length varies from Short to Medium-Long 	<ul style="list-style-type: none"> - Travels for leisure, light planning, looks for flexibility and value 	<ol style="list-style-type: none"> Weekend getaway bundles Group/family ticketing offers Price-saving deal <p>Returning trips Promo Popular Weekend Getaways Promo Early-bird promos Price alerts for usual/popular routes</p>

Customer Profiles

Updated Customer Segments	Key Traits			Characteristic	Recommendations
	Ticket Class & Type	Purchase Channel, Paying Method, Timing	Trip Details		
Last-minute Travelers	-Anytime/Off-Peak - Standard & First Class	- Buy at stations more - Buy ticket on the day of - Price range in Standard and First Class	- Frequent Medium-Medium Long routes than others	- Low price-sensitivity, high urgency - Prioritizes flexibility over price - Often business or urgent personal travel	<ol style="list-style-type: none"> Station promos & physical ad banners Add-on amenity offers after purchase Time-based promotions & push notifications sensitive to busy days & routes Lounge & Wifi upgrade Seat Upgrades Wednesday Promo
Business Travelers	-Anytime/Advance - First Class	- Use company's credit cards - Short booking window, high urgency	- Route Length from Short to Medium-Long, also frequent Medium-Medium Long routes than others	- Low price-sensitivity - Values comforts, add-ons, seat reservations	<ol style="list-style-type: none"> Business travel rewards Corporate subscription plan/loyalty program Ease of Purchase/ Convenience Add-on amenity offers after purchase Lounge & Wifi Upgrade Seat Upgrades Quiet areas

Customer Profiles

Updated Customer Segments	Key Traits			Characteristic	Recommendations
	Ticket Class & Type	Purchase Channel, Paying Method, Timing	Trip Details		
High-Spend Travelers	-Anytime/Advance/Off-Peak - First-class	- Debit Card for high-transaction	- Route Length from Short to Medium-Long	- Low price-sensitivity - Conservative with high spending transaction & payment methods - Infrequent but high-value trips, possibly longer routes, or special occasions - Values comforts, add-ons, and seat reservations	- Upgrade & upsells - Email offers for premium routes Weekend Getaways Luxurious Vacation Awaits Premium Service Trains - Seasonal or event-based travel ads - Ease of Purchase/ Convenience - Add-on amenity offers after purchase Lounge & Wifi Upgrade Seat Upgrades Quiet areas



Next Steps

Price-sensitivity Analysis

Testing each group's price sensitivity level and their reaction to each type of promotion strategies

K-means Clustering

To better refine & validate these segments, as well as further categorize new customers

A/B testing to test strategy effectiveness



Thank you!

Any questions?

