1. Introduction

TravelTide is a rapidly growing e-booking platform that specializes in providing an extensive range of flight and hotel options. Despite strong growth post-pandemic, the company seeks to improve **customer retention** and **loyalty** through data-driven insights. The dataset provided for this analysis includes user session logs, flight bookings, and hotel bookings. The goal is to examine how customers engage with TravelTide, measure key performance metrics, and assign tailored perks that enhance each customer's experience and boost long-term loyalty.

2. Objectives

- **Identify Key Behavioral Metrics:** Focus on understanding customer sessions, booking frequency, spending levels, discount usage, and cancellations.
- **Develop a Segmentation Approach:** Classify customers into meaningful groups that reflect their engagement and financial value to TravelTide.
- **Assign Targeted Perks:** Use business rules to assign relevant perks, thereby increasing satisfaction and potentially improving conversion.
- **Lay the Foundation for Ongoing Strategy:** Provide a framework that can be tested, refined, and scaled for future marketing and loyalty programs.

3. Rationale for the Metrics Created

A series of metrics was created or derived to capture different dimensions of customer behavior:

1. **Total Users:** Reflects the size of the active user base in the dataset. Establishes the scale of analysis.
2. **Average Session Duration:** Represents how long a user spends in each session, highlighting potential research-oriented behaviors or quick transactional patterns.
3. **Conversion Rate:** Shows the proportion of sessions resulting in bookings, indicating booking efficiency.
4. **Cancellation Proportion:** Demonstrates how often booked trips are canceled, revealing potential dissatisfaction or change in plans.
5. **Average Spend per Trip (Hotels):** Focuses on average spending, identifying high-revenue travelers.
6. **Average Flight Discount / Hotel Discount:** Illustrates discount usage and price sensitivity.
7. **Session Behavior Metrics (e.g., session_count, avg_page_clicks):** Captures overall engagement depth and frequency.

These metrics collectively provide a **360-degree view** of user engagement, purchasing behavior, and spending patterns, forming the basis for segmentation and perk assignment.

4. Customer Segmentation

A composite **Customer Score** was calculated for each user by combining metrics such as `total_trips`, `money_spend_hotel`, `session_count`, and `conversion_rate`. Based on these scores, each customer was assigned to one of six segments using the thresholds below:

```
IF [Customer Score] >= 95 THEN 'Ultra High-Value Customers'
ELSEIF [Customer Score] >= 85 THEN 'High-Value Loyal Customers'
ELSEIF [Customer Score] >= 70 THEN 'Frequent Engaged Customers'
ELSEIF [Customer Score] >= 50 THEN 'Moderate Customers'
ELSEIF [Customer Score] >= 30 THEN 'Low Engagement Customers'
ELSE 'At-Risk Customers'
END
```

Segmentation Rationale

- **Ultra High-Value Customers (≥95):** Represents top-tier users in terms of spend and engagement. Prime candidates for premium rewards.
- **High-Value Loyal Customers (85–94):** Maintains strong booking and revenue patterns but slightly below the ultra tier. Encouraging small enhancements may push them into the highest bracket.
- **Frequent Engaged Customers (70–84):** Displays regular bookings and decent engagement. Could respond well to upsell strategies.
- **Moderate Customers (50–69):** Occupies a middle ground; open to influence through standard loyalty perks.
- **Low Engagement Customers (30–49):** Exhibits occasional use or limited spend. Often benefits from targeted re-engagement discounts.
- **At-Risk Customers (<30):** Minimal engagement or spend. Likely to churn without significant incentives or introductory offers.

5. Perks: Project Approach and Rationale

A set of **travel-related perks** was defined to address various user needs and motivations, such as **priority boarding**, **lounge access**, **extra legroom seats**, **child-friendly offers**, and **discounts**. The hypothesis is that aligning perks with user preferences (e.g., families, high spenders, frequent flyers) increases overall satisfaction and repeat bookings.

Objective:

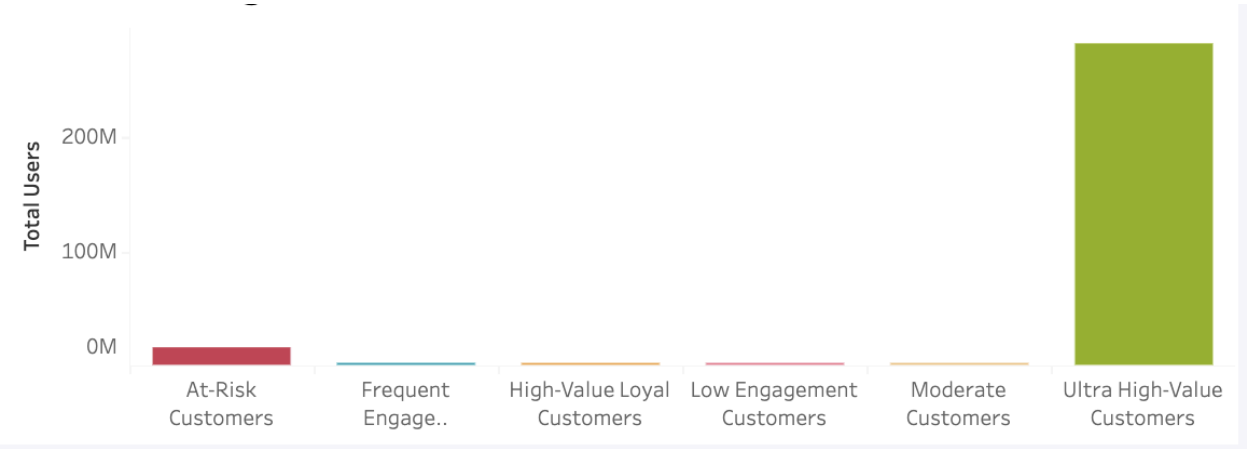
- Encourage loyal segments to maintain or elevate their spending patterns.
- Re-engage low-engagement or at-risk users with discounts or specialized incentives.

Assignment:

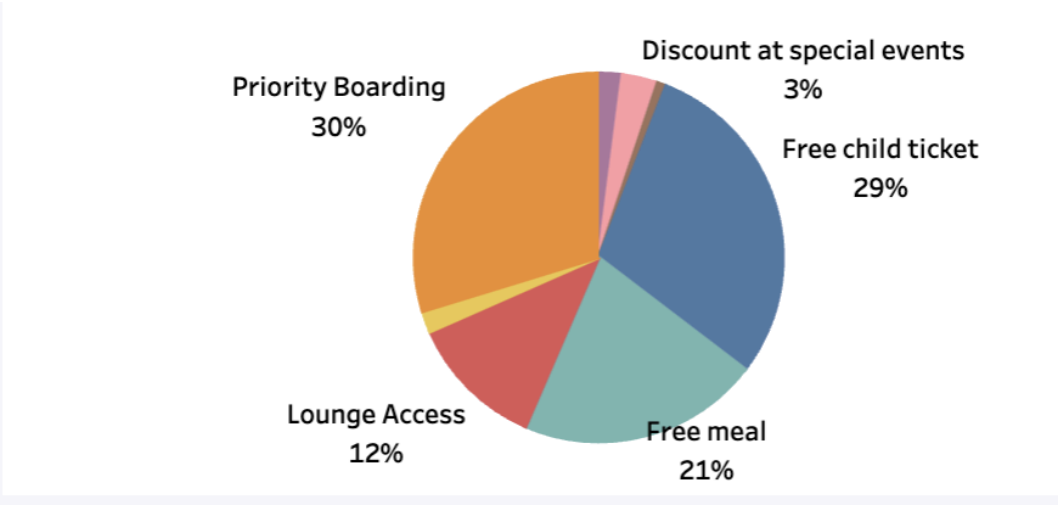
- Applied business rules (e.g., age, number of flights, total spend) to determine perk suitability. For example, users with multiple flights might value **extra legroom** or **fast-track security**, while family travelers might prefer a **free child ticket**.

6. Key Charts and Their Purpose

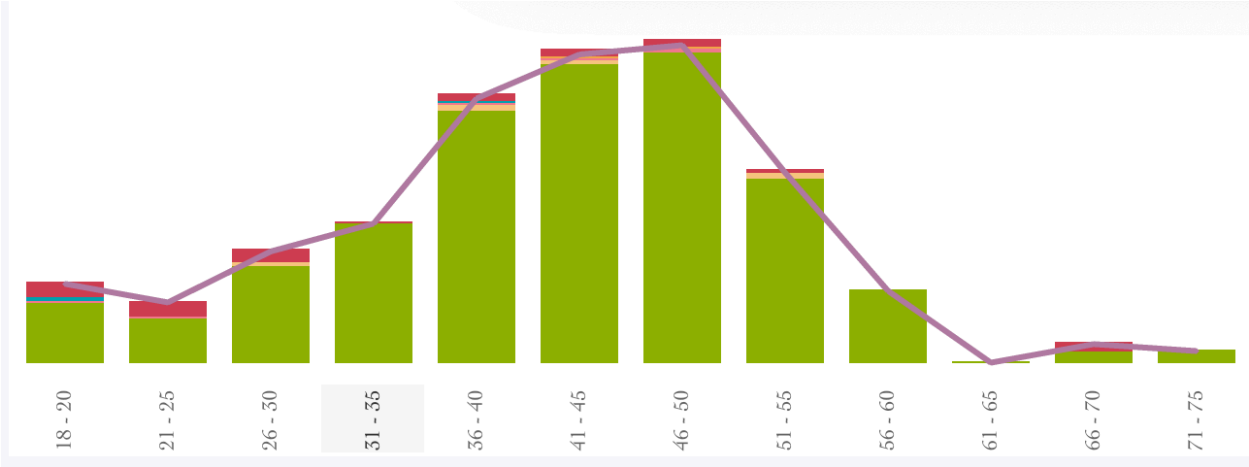
1. **Customer Segment Distribution (Bar Chart):**
   Depicts how many users fall into each of the six segments. Allows quick assessment of the overall distribution, informing where marketing focus might be needed.



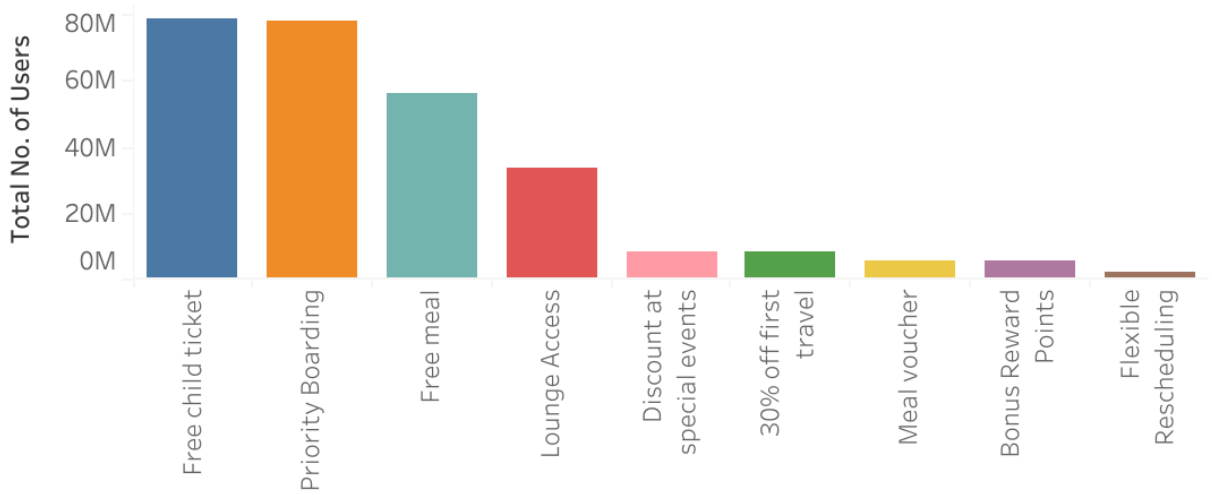
2. **Perk Utilization by Customers (Pie Chart):**
   Shows which perks are assigned most frequently. Highlights perk popularity and can guide decisions on resource allocation.



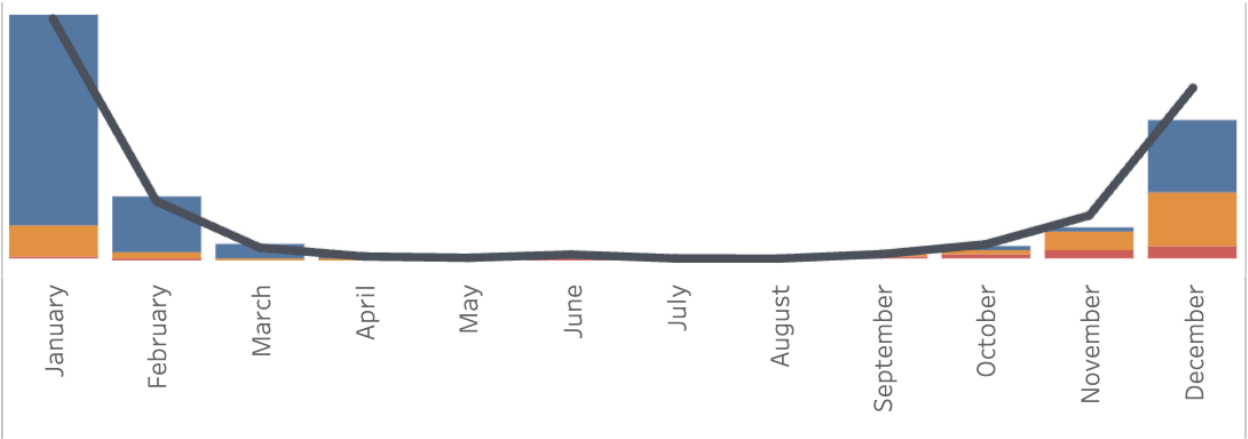
3. **Age & Segment User Distribution (Histogram + Overlaid Bar):**
   Illustrates how different age brackets align with specific segments. Offers insights into demographic patterns that may influence booking behaviors.



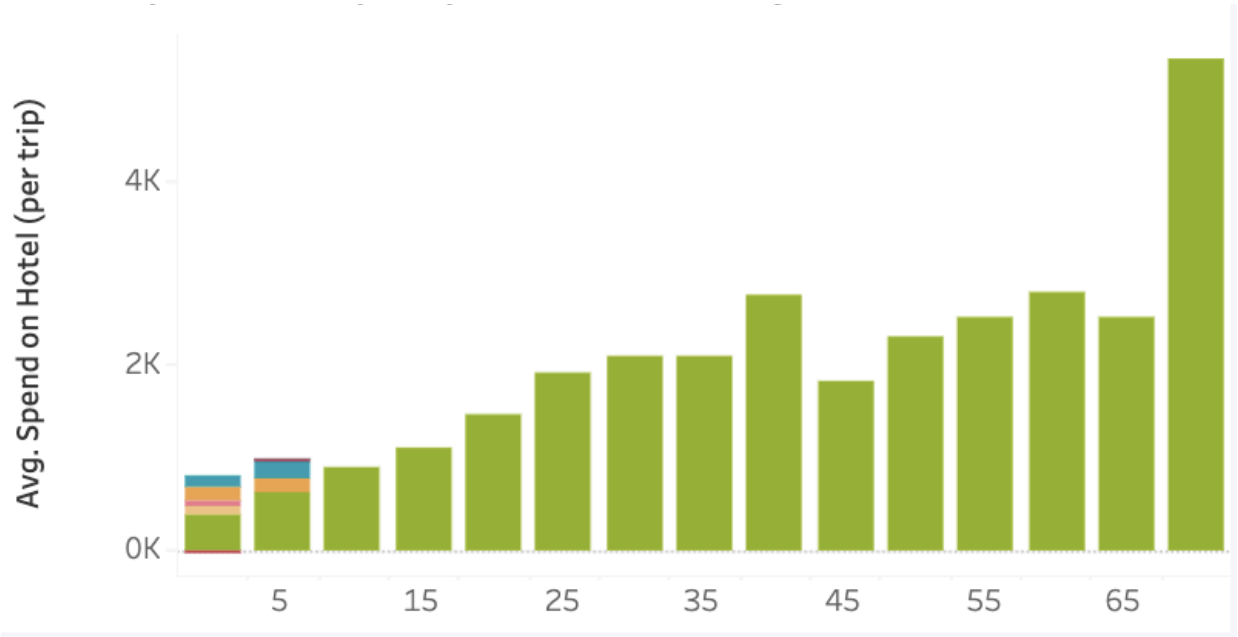
4. **Perk Usage by Gender (Side-by-Side Bar Chart):**
   Displays any difference in perk uptake among male vs. female users, potentially guiding targeted campaigns.



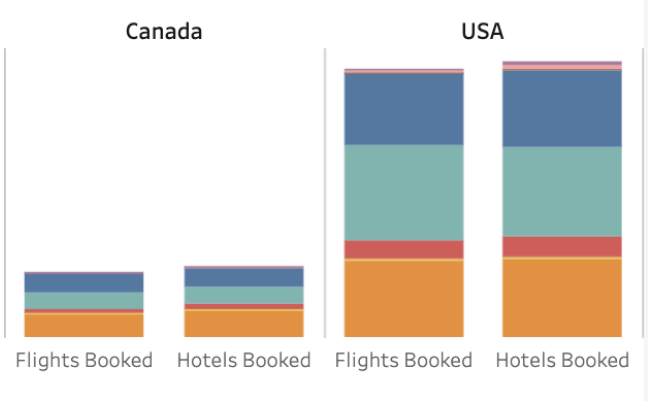
5. **Monthly Session Activity and Booking Trends (Line/Area Chart):**
   Highlights seasonality or monthly spikes in engagement, suggesting periods for special promotions or new perk rollouts.



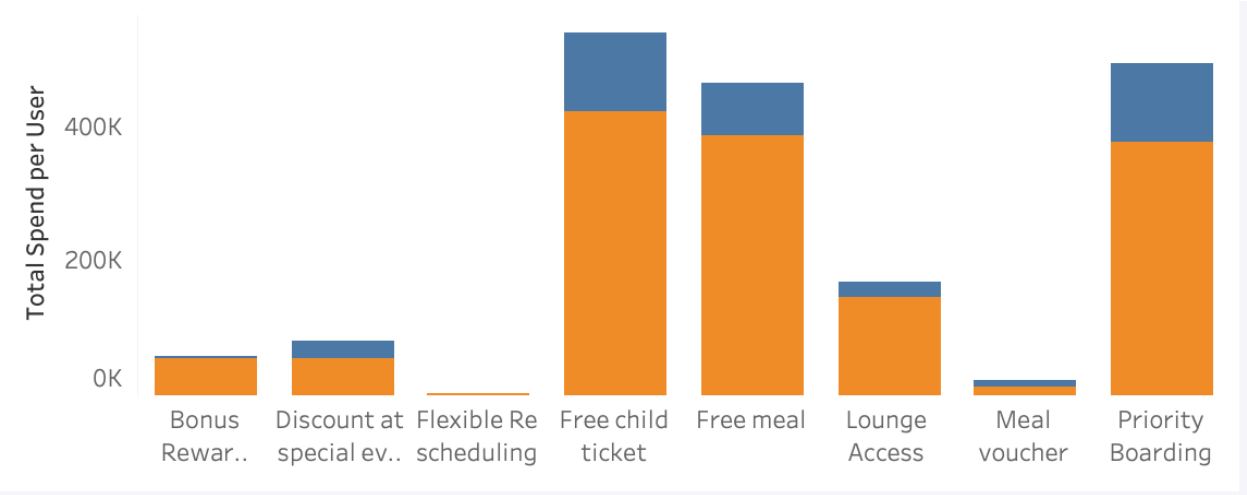
6. **Hotel Spend & Trip Impact (Dual Axis Bar Chart):**
   Demonstrates how perks might influence spending, especially for segments with longer stay durations or higher budgets.



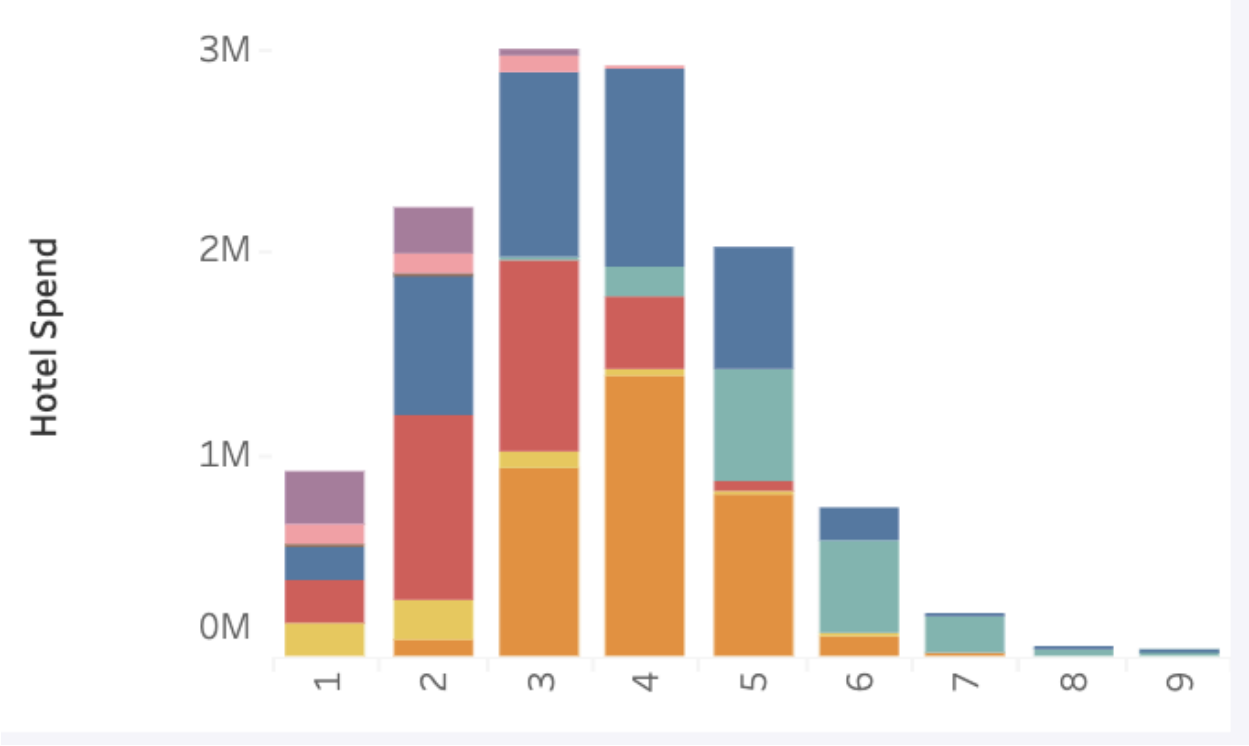
7. **Customer Booking Behavior by Type & Perk (Stacked Bar):**
   Breaks down how flights vs. hotels are booked alongside specific perks. Assists in identifying which perks correlate with multiple purchase types.



8. **Perks Utilization by Customer Segment and Country (Stacked Bar/Pie Chart):**
   Insight: Breaks down which perks are most prevalent within different segments and across countries. This helps in understanding regional preferences and tailoring localized marketing campaigns.



9. **Hotel Spend by Trip Count and Perk (Stacked Bar Chart):**
   Insight: Illustrates how hotel spending varies with the number of trips for each perk category, highlighting which perks are associated with higher revenue per trip.



Each visualization offers a **targeted insight** into user behavior or perk adoption, collectively addressing TravelTide's need to understand and improve customer loyalty.

7. Initial Observations and Outcomes

- **High-Value and Ultra High-Value Customers** generate a disproportionate share of revenue despite representing a smaller segment of the user base.
- **At-Risk Customers** show minimal bookings or high cancellation rates, suggesting a need for introductory discounts or more compelling offers.
- **Families (has_children = TRUE)** often appear in the moderate or frequent segments, indicating potential success in child-focused perks (e.g., free child ticket).
- **Conversion Rate** is lower than anticipated, highlighting potential friction points in the booking process or the need for timely discounts.
- **Cancellation Proportion** suggests some stability but leaves room to reduce cancellations further through flexible policies.

8. Limitations, Validation, and Future Strategy

1. **Limited Data Foundation:**
   This analysis is based on a subset of TravelTide's user data. Broader data (historical or cross-channel) could reveal additional insights.
2. **Testing and Validation:**
   - **A/B Tests** could measure the actual impact of different perks on conversions.
   - **Statistical Methods** (e.g., chi-squared tests) can verify if observed perk usage patterns are statistically significant.
3. **Data Expansion for Supervised Learning:**
   Labeling user outcomes (e.g., churn vs. retention) enables advanced predictive models to classify new users into segments.
4. **Customer Feedback Loop:**
   Surveys or user polls could confirm whether assigned perks align with actual preferences.
5. **Continuous Improvement:**
   - Regularly update the segmentation model to accommodate new behaviors or changing market conditions.
   - Reassess thresholds and perk rules as user demographics and travel trends evolve.