

# PedalPoint Bike Rider Performance Insights and Revenue Optimization

## Project Overview

**Client:** PedalPoint Company LTD

**Analyst:** David Abe

**Tools Used:** SQL Server Management Studio (SSMS), Power BI, Excel

**Dataset:** bike\_share\_yr\_0.csv, bike\_share\_yr\_1.csv, cost\_table.csv

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## About PedalPoint Company LTD

PedalPoint is a modern urban mobility platform that provides on-demand bike rentals through a flexible, pay-per-ride or membership model. We use real-time data to monitor rider activity, optimize operations, and improve pricing strategies.

PedalPoint supports both casual and registered riders across various seasons and times of day with a focus on efficient service delivery.

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## Business Objective

To create an interactive and visually intuitive dashboard that presents PedalPoint's core performance metrics for informed decision-making. The required metrics include:

**Key objectives include:**

- Hourly Revenue Analysis
- Riders' Profit and Revenue Trends
- Seasonal Revenue
- Rider Demographics

- Recommendation on raising prices next year
  - Provide a preliminary version Asap, also to provide an estimated timeline for completion
  - The dashboard should be designed using the company's color palette and structured for ease of navigation
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## Data Preparation

### SQL Server Integration and Merging

```
WITH bike_table AS
    (SELECT * FROM bike_yr_0
     UNION ALL
     SELECT * FROM bike_yr_1)
SELECT
    dteday, hr, weekday, mnth, season, B.yr, riders, rider_type, price, COGS,
    (riders * price) AS Revenue,
    (riders * price) - (cogs * riders) AS Profit
FROM bike_table B
LEFT JOIN cost_table C ON B.yr = C.yr;
```

### Steps Taken:

- Merged yearly bike data with cost table using SQL.
  - Imported into Power BI via SQL Server connection.
  - Validated data for accuracy, consistency, duplicates.
  - Adjusted data types accordingly.
  - Created a conditional Year column (0 = 2021, 1 = 2022).
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## Exploratory Data Analysis (EDA)

## Date Table

Created a dynamic Date Table to support time intelligence and ensure alignment with the company's data timeframe:

```
DateTable =  
ADDCOLUMNS(  
    CALENDAR(DATE(2021, 1, 1), DATE(2022, 12, 31)),  
    "Year", YEAR([Date]),  
    "MonthNumber", MONTH([Date]),  
    "MonthName", FORMAT([Date], "MMM"),  
    "Day", DAY([Date]),  
    "Weekday", WEEKDAY([Date], 1) - 1,  
    "WeekdayName",  
        SWITCH(  
            WEEKDAY([Date], 1),  
            1, "Sun", 2, "Mon", 3, "Tue",  
            4, "Wed", 5, "Thu", 6, "Fri", 7, "Sat"),  
    "WeekOfMonth",  
        INT((DAY([Date]) + WEEKDAY(DATE(YEAR([Date]), MONTH([Date]), 1), 1) - 2) / 7) + 1)
```

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## KPI Measures Implemented

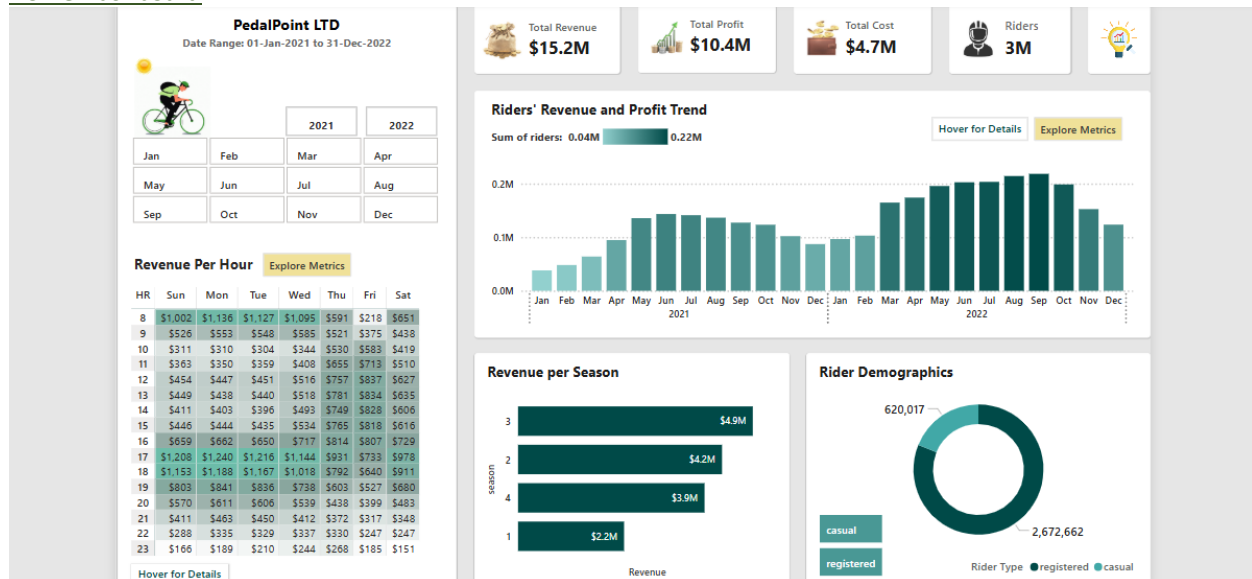
### Core DAX Measures:

- Total Revenue
- Total Profit
- Total Cost
- Total Riders
- Profit Margin
- Cost Margin
- Cost per Rider
- Profit per Rider
- Cost per Unit Profit

- Profit per Unit Cost
- Supporting Dax Measures for Trends and Calculation

## About Metrics and Business Questions Answered

### Home Dashboard



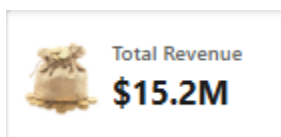
Summary about each KPI and objective Metrics implemented:

- **Total Revenue**

This metric represents the total income generated from bike rides by multiplying the number of riders by the price per ride. It reflects the gross earnings before subtracting operational costs. It is a primary indicator of business scale and growth over time.

Dax:

Total Revenue = `SUM(Query1[Revenue])`



- **Total Profit**

Total Profit is the net gain after subtracting the total cost (COGS) from total revenue. In this case, we already did the calculation inside SSMS to generate **Profit Column**. It shows how much money the company actually retains from its operations and is key to assessing the company's financial health.

Dax:

```
Total Profit = SUM(Query1[Profit])
```



- **Total Cost**

This reflects the cumulative operational expenses (Cost of Goods Sold) associated with each ride. It includes all costs tied to providing the service and is used to calculate profitability and efficiency.

Dax:

```
Total Cost = SUM(Query1[Revenue]) - SUM(Query1[Profit])
```

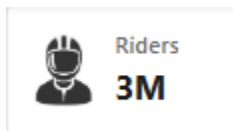


- **Total Riders**

This shows the total number of users who rented bikes over the selected period. It's a critical metric to evaluate customer reach, engagement, and demand trends.

Dax:

```
Total Rider = SUM(Query1[riders])
```

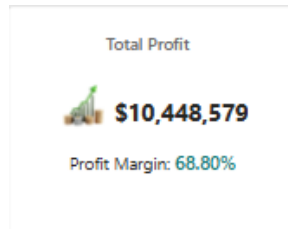


- **Profit Margin**

This ratio (Profit ÷ Revenue) expresses the percentage of revenue retained as profit. A high margin indicates efficient cost management and good pricing strategy. It remained stable at **68.8%** across both years in the analysis.

Dax:

```
Profit Margin = FORMAT(DIVIDE(SUM(Query1[Profit]), SUM(Query1[Revenue])), "0.00%")
```



- **Cost Margin**

Calculated as (Cost ÷ Revenue), this shows the portion of revenue consumed by **costs**. In this case, the cost margin hovered around **31.2%**, indicating strong operational efficiency.

Dax:

```
Cost Margin = FORMAT(DIVIDE([Total Cost], SUM(Query1[Revenue])), "0.00%")
```

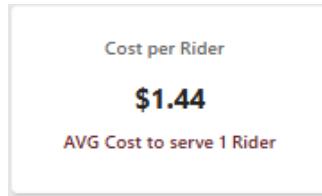


- **Cost per Rider**

The average cost incurred to serve each individual rider. This helps evaluate whether operations are scaling efficiently with rider growth.

Dax:

```
Cost per Rider = DIVIDE((SUM(Query1[Revenue]) - SUM(Query1[Profit])), SUM(Query1[riders]))
```

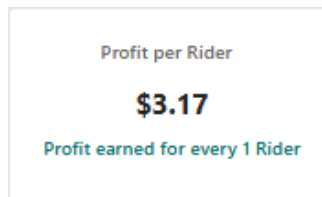


- **Profit per Rider**

The net earnings per rider after accounting for cost. It demonstrates how valuable each customer is to the business. Shows profit earned per user.

Dax:

```
Profit per Rider = DIVIDE(SUM(Query1[Profit]), SUM(Query1[riders]))
```

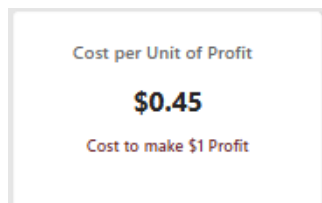


- **Cost per Unit Profit**

Shows how much cost is required to generate \$1 profit. A lower value indicates higher profitability. It remained stable at \$0.45, signaling operational consistency.

Dax:

```
Cost per Unit Profit = DIVIDE((SUM(Query1[Revenue]) - SUM(Query1[Profit])), SUM(Query1[Profit]))
```

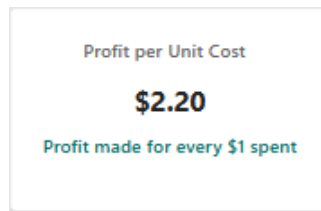


- **Profit per Unit Cost**

This reflects the profit earned per dollar spent. It's a profitability efficiency metric. A value of \$2.20 means every \$1 spent returns \$2.20 in profit. A strong indicator of business performance.

Dax:

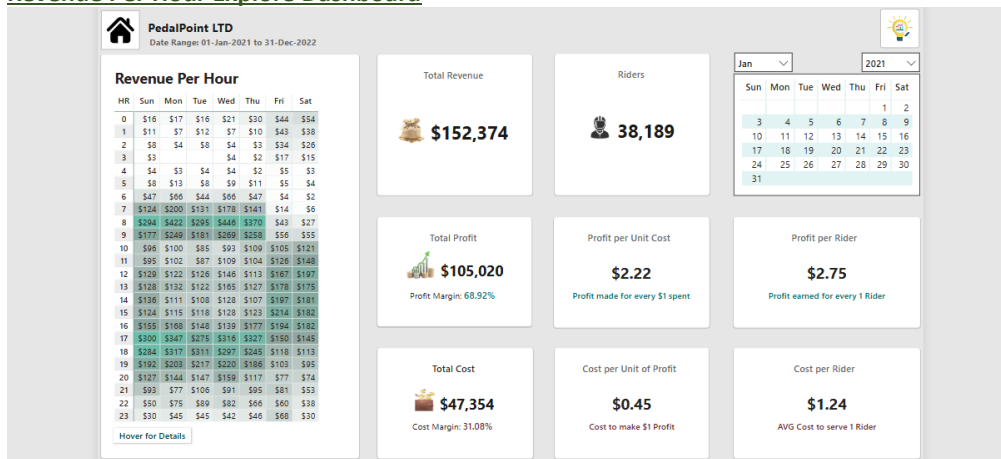
```
Profit per Unit Cost = DIVIDE(SUM(Query1[Profit]), (SUM(Query1[Revenue]) - SUM(Query1[Profit])))
```



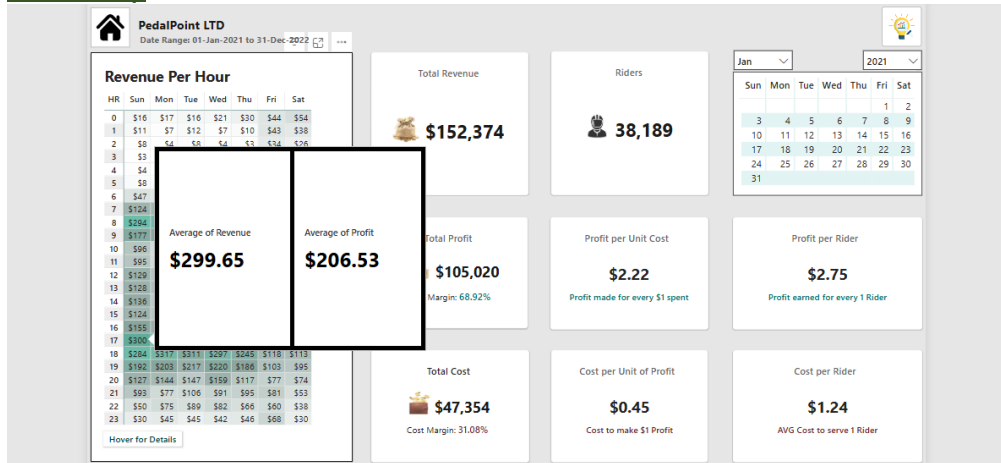
- Hourly Revenue Analysis

This analysis examines average revenue by hour across all days/months, offering insights into peak and low-performing hours. Profit per hour is also visualized through tooltips to support profitability evaluations alongside revenue.

### Revenue Per Hour Explore Dashboard



### With Tooltip

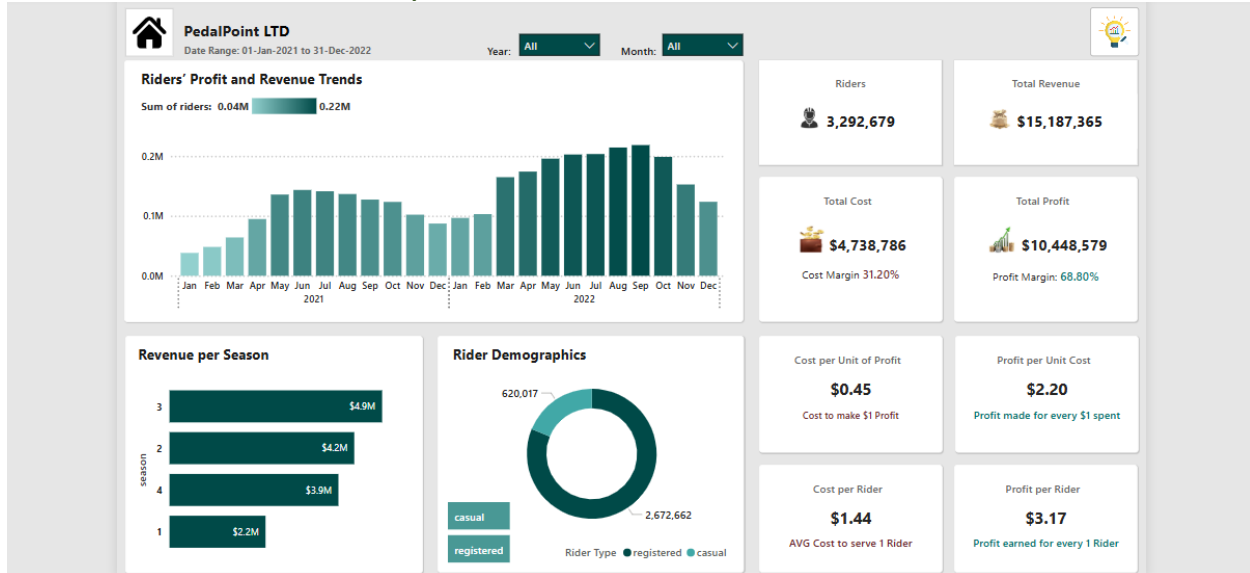




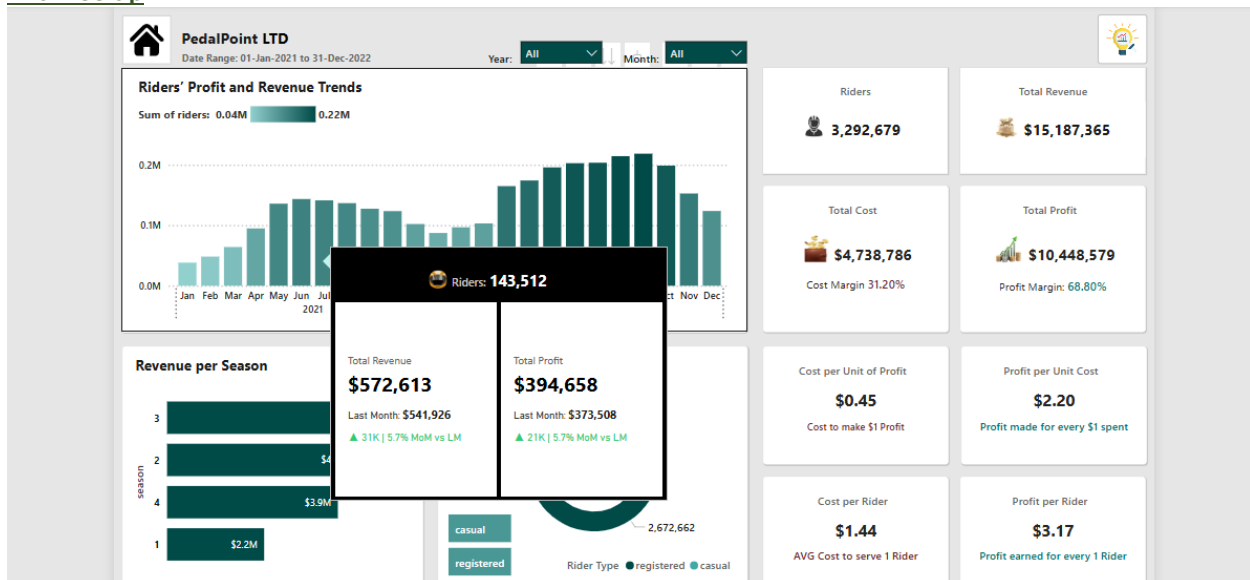
- **Riders' Profit and Revenue Trends**

Tracks how revenue and profit evolve over time on a monthly and yearly basis. Trends are visualized using column charts, with tooltips highlighting rider growth and month-over-month (MoM) changes. This helps the company evaluate business performance, identify seasonal fluctuations, and make informed strategic decisions.

### Riders' Profit and Revenue Trends Explore Dashboard

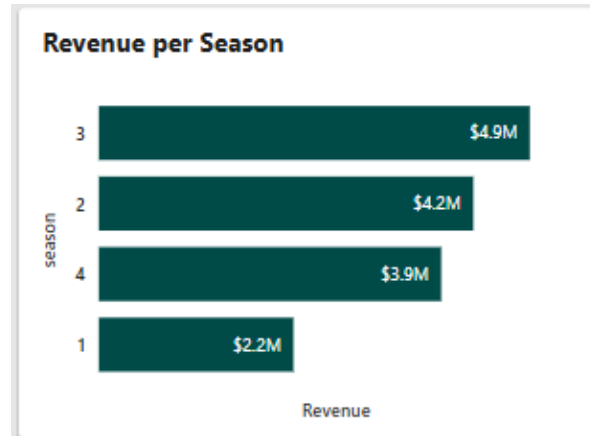


### With Tooltip



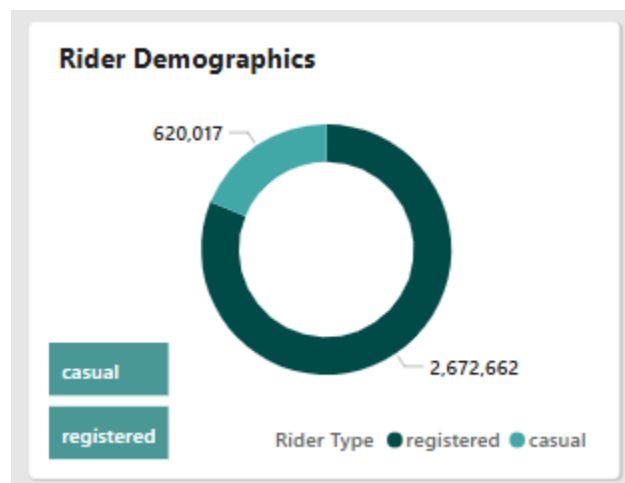
- **Seasonal Revenue**

Groups total revenue by seasons (1 to 4), enabling analysis of how weather or time of year affects usage. This reveals peak periods like Season 2 and 3, which generated nearly 60% of total revenue. It's key for planning seasonal promotions or pricing adjustments.



- **Rider Demographics**

Analyzes the distribution and behavior of rider types: Casual vs Registered. Registered riders made up 81% of the user base, signaling a strong loyal segment, while casual riders represent the remaining (19%).



## Growth and Efficiency Insights (2021–2022)

PedalPoint Data Snapshot				PedalPoint Efficiency and Price Recommendation	
Metric	2021	2022	Total	<b>Growth and Efficiency Insights (2021 -2022)</b>	
Total Revenue	\$4.96M	\$10.23M	\$15.19M	<b>1. Strong Revenue and Rider Growth</b>	
Total Profit	\$3.42M	\$7.03M	\$10.45M	• Revenue increased by <b>106%</b> from \$5M to over \$10M between 2021 and 2022.	
Total Cost	\$1.54M	\$3.20M	\$4.74M	• Riders increased by <b>65%</b> from 1.24M to 2.05M, showing strong demand growth and effective market expansion	
Total Riders	1.24M	2.05M	3.29M	<b>2. Stable Cost Efficiency</b>	
Cost per Unit Profit	\$0.45	\$0.45	\$0.45	• Cost per Unit Profit remained constant at <b>\$0.45</b> in both years, reflecting how the company maintained stable cost efficiency.	
Profit per Unit Cost	\$2.22	\$2.20	\$2.20	• Profit per Unit Cost ( <b>(\$2.22 vs \$2.20)</b> ) only slightly declined by <b>\$0.02</b> between 2021 and 2022, which indicate strong operational discipline and scalability.	
Cost per Rider	\$1.24	\$1.56	\$1.44	<b>Recommendation: Strategic Price Increase in 2023</b>	
Profit per Rider	\$2.75	\$3.43	\$3.17	Recommendation Breakdown and Justification Based on Data Insights:	
Cost Margin	31.08%	31.26%	31.20%	<b>1. Rider Demographics:</b>	
Profit Margin	68.92%	68.74%	68.80%	• Registered Riders : make up 81% (2,672,662) of the Total Base riders. These are the company's loyal and long-term users.	
				• Casual Riders : make up the remaining 19% (620,017). These users are less frequent and can be more price-tolerant.	
				<b>The Recommendation:</b>	
				• Apply full 7% increase to Casual riders only.	
				• Keep Registered rider pricing unchanged to protect loyalty and engagement.	

### Data Snapshot

PedalPoint Data Snapshot			
Metric	2021	2022	Total
Total Revenue	\$4.96M	\$10.23M	\$15.19M
Total Profit	\$3.42M	\$7.03M	\$10.45M
Total Cost	\$1.54M	\$3.20M	\$4.74M
Total Riders	1.24M	2.05M	3.29M
Cost per Unit Profit	\$0.45	\$0.45	\$0.45
Profit per Unit Cost	\$2.22	\$2.20	\$2.20
Cost per Rider	\$1.24	\$1.56	\$1.44
Profit per Rider	\$2.75	\$3.43	\$3.17
Cost Margin	31.08%	31.26%	31.20%
Profit Margin	68.92%	68.74%	68.80%

### Growth Insights

- 1. Strong Revenue and Rider Growth
  - Revenue increased by 106% from \$5M to over \$10M between 2021 and 2022.

- Riders increased by 65% from 1.24M to 2.05M, showing strong demand growth and effective market expansion

## 2. Stable Cost Efficiency

- Cost per Unit Profit remained constant at \$0.45 in both years, reflecting how the company maintained stable cost efficiency.
- Profit per Unit Cost ((\$2.22 vs \$2.20)) only slightly declined by \$0.02 between 2021 and 2022, which indicate strong operational discipline and scalability.

## 3. Strong Unit Profitability and Stable Margins Maintained During Expansion

Between 2021 and 2022:

- Cost per Rider increased from \$1.24 to \$1.56 (a 26% rise), reflecting the natural operational cost growth associated with a larger customer base.
- Profit per Rider also rose from \$2.75 to \$3.43 (a 25% gain), showing that profitability per customer improved despite higher servicing costs.
- At the same time, the overall Profit Margin remained highly stable around 69%, while the Cost Margin stayed consistent at 31% across both years. Reflecting strong operational discipline and scalable growth.

## 4. Strong Unit Economics Maintained

In a combined period of 2021–2022:

- For every \$1 spent on cost, it generated approximately \$2.20 in profit, reflecting highly efficient use of operational spending.
- With a cost of \$1.44 per rider and a corresponding profit of \$3.17 per rider, the business consistently delivered high returns on cost and strong profitability per customer, reinforcing the scalability and financial efficiency of its model.

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## Strategic Recommendation for 2023 Pricing

Recommendation Breakdown and Justification Based on Data Insights:

### 1. Rider Demographics

- Registered Riders: make up 81% (2,672,662) of the Total Base riders. These are the company's loyal and long-term users.
- Casual Riders: make up the remaining 19% (620,017). These users are less frequent and can be more price-tolerant.

**The Recommendation:**

- Apply full 7% increase to Casual riders only.
- Keep Registered rider pricing unchanged to protect loyalty and engagement.

## 2. Seasonal Demand

Revenue by season (Registered & Casual Riders):

- Season 1: \$2.2M
- Season 2: \$4.2M
- Season 3: \$4.9M
- Season 4: \$3.9M

Revenue by season (Registered Riders only):

- Season 1: \$1.9M
- Season 2: \$3.3M
- Season 3: \$3.8M
- Season 4: \$3.3M

*Season 2, Season 3 and Season 4 generate 85% of Registered riders' Total Revenue (\$12.3M). These are company's peak demand periods.*

### The Recommendation:

- Dynamic seasonal pricing. Apply 5-6% increase during Season 2, Season 3 and Season 4 for Registered rider types.
  - Leave pricing unchanged in Season 1.
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## What To Consider During This Stage?

### 1. Communication Strategy:

- Make sure pricing updates are communicated properly, especially to Registered Riders who are facing a seasonal increase for the first time.
- Offer loyalty rewards, bundle benefits, or advance notices to ease adoption.

### 2. Behavioral Monitoring:

- After implementation, monitor Registered Rider usage during peak seasons to track any negative reaction early (reduced rides, cancellation of memberships, etc.).
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## Timeline Estimate

Based on working day format:

**Day 1:**

- Merge datasets in SQL
- Import into Power BI
- Initial inspection

**Day 2:**

- Clean and transform in Power Query
- Create Date Table
- Validate types and structures
- Modelling

**Day 3-5:**

- Build KPIs & DAX Measures
- Design layout using brand colors
- Create metrics to answer business objectives

**Day 6:**

- Add interactivity, tooltips and other supporting dax measures
- Add visuals

**Day 7-10:**

- Polish dashboard
- Generate insights

**Day 10-12:**

- Final overall review
- Export visuals
- Deliver dashboard & documentation