Steel vs. Aluminum Wheels Consumer Research Study

Prepared For:
American Iron & Steel Institute Wheels Task Force

Prepared By:
Burke MARKETING RESEARCH

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Background and Objectives

- The American Iron & Steel Institute (AISI) is a trade association dedicated in part to increasing the use of iron and steel. Within AISI, the Automotive Applications Committee and the Wheels Task Force strive to maximize auto-makers’ use of Steel Wheels on new cars.

- Based on AISI’s knowledge, it is understood that auto-makers pay less for Steel Wheels than for comparable Aluminum Wheels. AISI’s belief is that if placing Steel Wheels in upgrade packages would generate as much revenue as do traditional Aluminum Wheels, auto-makers could make higher net profits by using Steel Wheels rather than Aluminum Wheels.

- The primary objective of this study is to estimate the relative value that Steel Wheels and Aluminum Wheels can add to a new vehicle. The study data will also help in gauging how Steel Wheels should be positioned within the array of available wheel offerings. And finally, the study is designed to increase understanding of consumers’ perceptions of Steel Wheels and Aluminum Wheels.
Study Methodology

- Data for this study were collected during interviews at permanent research facilities housed in selected malls nationwide. The interviews were conducted in the following cities:
  - Baltimore
  - Denver
  - Las Vegas
  - Minneapolis
  - San Francisco
  - Tampa
  - Boston
  - Fort Worth
  - Little Rock
  - New Orleans
  - Salt Lake City
  - Tulsa
  - Charlotte
  - Kansas City
  - Memphis
  - New York City
  - Tallahassee

- The data collection period was November-December 2000.

- Each respondent was screened on the mall to ensure that s/he met the study requirements (outlined on the following page). Respondents were then escorted to the research facility, where a professional interviewer conducted the interview. Interviews averaged roughly 25 minutes in length. Upon completion of the interview, each respondent was paid $3, as a small token of appreciation for their time.
Respondents were screened to ensure they met the following criteria:

- Age 18-69
- Currently in the market for a vehicle, or plan to obtain one during the next 18 months
- For this purchase, definitely/probably will consider Mid-size Sedan, Pick-up Truck, or Mini Van
- For this purchase, definitely/probably will shop for a new vehicle
- Will have joint or sole decision-making responsibility in obtaining the household’s next automobile
- Not competitively employed (automotive, research, advertising, PR)
- No automotive research study participation in the past 3 months
- Willing to participate

Each respondent was placed into one of three vehicle cells (Mid-size Sedan, Pick-up Truck, or Minivan), based on their intent to consider purchasing that type of vehicle.
In total, 308 interviews were conducted. The number of interviews conducted for each vehicle type was:

- Mid-Sized Sedan: 102
- Mini Van: 106
- Pick-up Truck: 100

Each interview included the respondent evaluating 2 of the 4 study wheels for the appropriate vehicle type. These 2 wheels were selected in advance by a rotation designed to ensure that each wheel design, material, and finish was evaluated an equivalent number of times across respondents. Each wheel image was labeled as Steel for one pricing activity and as Aluminum for another pricing activity, in order to isolate the impact of wheel material on perceived price/value for each respondent.
Respondent Profile – Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>58%</td>
</tr>
<tr>
<td>Female</td>
<td>42%</td>
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</table>

<table>
<thead>
<tr>
<th>Age</th>
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<tbody>
<tr>
<td>18-34</td>
<td>40%</td>
</tr>
<tr>
<td>35-49</td>
<td>32%</td>
</tr>
<tr>
<td>50-69</td>
<td>28%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Highest Education Completed</th>
<th></th>
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<tbody>
<tr>
<td>High School Diploma</td>
<td>46%</td>
</tr>
<tr>
<td>Some College</td>
<td>30%</td>
</tr>
<tr>
<td>College/Graduate Degree</td>
<td>24%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household Income</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$35K</td>
<td>35%</td>
</tr>
<tr>
<td>$35K-$60K</td>
<td>36%</td>
</tr>
<tr>
<td>&gt;$60K</td>
<td>23%</td>
</tr>
<tr>
<td>Refused</td>
<td>6%</td>
</tr>
</tbody>
</table>

Mean Income = $47K
Respondent Profile – Automotive

When in market for an automobile:
Currently 14%
Next 6 months 24%
Next 12 months 28%
Next 18 months 35%

Involvement in purchase of the automobile:
Sole responsibility 60%
Joint responsibility 40%
EXECUTIVE SUMMARY

- Steel Wheels performed at parity with Aluminum Wheels throughout this study. The data indicate that replacing traditional Aluminum Wheels with Steel Wheels in upgrade packages would not be expected to decrease package demand or revenue.

- Demand for upgrade packages was nearly identical with Steel Wheels and Aluminum Wheels. The maximum revenue and optimal price were also very similar for Steel Wheels and Aluminum Wheels.

- Across all wheels in this study, consumer rankings showed that Steel was either preferred to or at parity with Aluminum.

- Respondents clearly associated Steel Wheels with greater strength, weight, and safety. Respondents associated lower cost with Aluminum Wheels, perhaps in contrast to the perceived strength and safety of steel.
PricePoint® Evaluation
PricePoint® Technique

- This research project utilized Burke’s proprietary PricePoint® protocol, to address the research objectives. PricePoint® is a technique used to estimate demand (penetration) for a product across an entire RANGE of prices and identify the OPTIMAL price. PricePoint® combines Price Perceptions and Purchase Intentions.

- There are four key steps in the PricePoint® model:
  - **STEP 1:** Determination of consumers’ perceptions of expensive and inexpensive price points
  - **STEP 2:** Estimation of consumers’ trial probabilities at expensive and inexpensive price points
  - **STEP 3:** Creation of consumers’ individual demand curves across price points
  - **STEP 4:** Aggregation of demand curves to arrive at penetration estimates for all possible price points
PricePoint® Technique

**STEP 1: Determination of customers’ perceptions of expensive and inexpensive price points**

- Price perception questions: determine the prices at which respondents would consider the product to be inexpensive, expensive, and too expensive.

```markdown
Looking at this vehicle package, what price do you think is **inexpensive** enough for the package to be considered a bargain?

What price do you think is **expensive** for this package, but you would still consider buying it?

What price is **too expensive** for this package, such that you would not consider buying it?
```
PricePoint® Technique

STEP 2: Estimation of customers’ purchase probabilities at expensive and inexpensive price points

- For each customer, self-stated purchase intent is obtained for the price identified as a good value and the price identified as getting expensive:

  How likely would you be to buy this package at the price of (customer stated price)?

- Purchase intent is assumed to be zero at the price identified as “so expensive that you would not consider purchasing it.”
- Responses to the five-point purchase intent scale are converted to numerical usage probabilities using Burke’s proprietary algorithm for linking self-stated intent to actual behaviors.
**PricePoint® Technique**

**STEP 3:** Creation of customers’ individual demand curves across price points

- For each respondent, a demand curve is constructed that represents his or her likelihood of usage at different price points.

**STEP 4:** Aggregation of individual demand curves to arrive at penetration estimates for all possible price points

- Purchase probabilities are averaged across all respondents for each price point. The resulting average probabilities are used as demand estimates for all of the price points of interests.
- Demand is represented by weighted trial rates across the range of prices. PricePoint does not make any provision estimated volume of purchases in its calculation of demand.
- In order to more easily interpret the elasticity of the demand curve, revenue is calculated for each price point and included in the graphical output. The revenue value shown is revenue per 100 consumers.
AISI Steel Wheels

Standard Equipment
- Front Airbags
- Anti-Lock Power Brakes
- Daytime Running Headlamps
- Power Door Locks
- 4-speed Automatic Overdrive Transmission
- Air Conditioning
- 3.1L/V6 Engine
- Rear-seat Heat Ducts
- AM/FM Stereo
- Bolt-on Full Wheel Covers

Upgrade Package

Package Equipment
- Cruise Control
- Floor Mats
- AM/FM/Cassette Stereo
- Remote Keyless Entry
- Power Mirrors & Windows
- Bright Aluminum Wheels

Chevrolet Malibu
Base Price $17,000
**PricePoint® Technique – Truck Stimuli**

**Dodge Ram 1500 Regular Cab 2WD**

Base Price $17,500

**Standard Equipment**
- Next Generation Front Airbags
- 3.9L/V6 Engine
- Heavy-duty Shock Absorbers
- AM/FM Cassette Stereo
- 5-Speed Manual Transmission w/Overdrive
- Front & Rear Step-pad Bumpers
- Exterior Dual Remote Control Mirrors
- Variable Assisted Power Steering
- Removable Tailgate
- Steel Wheels with Center Caps

**Upgrade Package**

**Package Equipment**
- Cruise Control
- Trailer Hitch & Trailer Mirrors
- Sliding Rear Window
- Carpet, Cloth Upholstered Bench
- Tilt Steering Wheel
- Bright Aluminum Wheels
Ford Windstar
Base Price $21,500

Standard Equipment
- 2nd Generation Front Airbags
- 4-wheel Anti-Lock Brakes
- Power Door Locks, Mirrors & Windows
- Passenger-Side Sliding Door
- 4-Speed Automatic Overdrive Transmission
- Air Conditioning
- 3.8L/V6 Engine
- 7-Passenger Seating
- AM/FM Stereo
- Steel Wheels with Covers

Upgrade Package

Package Equipment
- Cruise Control
- Recline & Rollers on 2nd/3rd Row Benches
- AM/FM Stereo with Cassette
- Remote Keyless Entry
- Tilt Steering Wheel
- Bright Aluminum Wheel

AISI Steel Wheels
PricePoint® Findings – Overview

- The results of the PricePoint® research indicate that Steel Wheels are at least an equal substitution for traditional Aluminum Wheels in vehicle option packages.

- It is important to remember the following assumptions underlying all of the PricePoint results. The findings are based upon:
  - Selected vehicle types (Mid-Size Sedan, Pick-up Truck, MiniVan)
  - Respondents considering the make and model studied (Chevy Malibu, Dodge Ram, Ford Windstar)
  - Selected wheel designs and finishes
  - Hypothetical upgrade packages
  - Consumer intentions (not a guarantee of actual purchase behavior)
  - Consumers having awareness of and access to these vehicles/packages
  - Consumer feedback, without input of manufacturers or dealers
Overall, Steel Wheels performed at parity with Aluminum Wheels.

Demand (penetration) was equivalent for packages with Steel Wheels versus Aluminum Wheels. The mean inexpensive and expensive prices given by respondents were very similar for packages with Steel Wheels versus packages with Aluminum Wheels.

For both materials, revenue for the packages studied was maximized at a price roughly 7% above the Base Price. Across 300 consumers, this pricing could yield revenue of approximately $90,000 with Steel Wheels, or $1,300 per package sold (penetration of 69 packages). This pricing could yield approximate revenue of $85,000 for Aluminum, or $1,300 per package sold (penetration of 65 packages). Clearly, the two materials performed at parity.

In the package price range of $950-$1,700 steel showed slightly higher penetration than did aluminum. Virtually no differences in penetration are found at prices above or below this range.
For both Steel and Aluminum, relative revenue is maximized at a Package Price of roughly 7% above the MSRP for the Base Vehicle.
PricePoint® Findings – Total Respondents

At a Price 7% above MSRP, the packages studied could be expected to yield similar penetration.

<table>
<thead>
<tr>
<th>Steel</th>
<th>Aluminum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Penetration</td>
</tr>
<tr>
<td>$1,505</td>
<td>22.7%</td>
</tr>
<tr>
<td>$1,190</td>
<td>22.6%</td>
</tr>
<tr>
<td>$1,225</td>
<td>23.4%</td>
</tr>
</tbody>
</table>

Total Revenue: $89,725 for Steel, $84,529 for Aluminum

Note: While revenue is maximized at 7% above MSRP in total, this specific value does not represent the revenue maximization point across all vehicle types.
Respondents’ purchase intent and price perceptions were nearly identical when comparing the packages with Steel Wheels vs. Aluminum Wheels.

**Purchase Intent for Inexpensive Price**
(Total* Respondents)

<table>
<thead>
<tr>
<th>Intent</th>
<th>Aluminum</th>
<th>Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely Would</td>
<td>32%</td>
<td>34%</td>
</tr>
<tr>
<td>Probably Would</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Might or Might Not</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>Probably Would Not</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Definitely Would Not</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Mean Inexpensive Price*
- Aluminum = $1,182
- Steel = $1,195

**Purchase Intent for Expensive Price**
(Total* Respondents)

<table>
<thead>
<tr>
<th>Intent</th>
<th>Aluminum</th>
<th>Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely Would</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Probably Would</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Might or Might Not</td>
<td>25%</td>
<td>36%</td>
</tr>
<tr>
<td>Probably Would Not</td>
<td>36%</td>
<td>19%</td>
</tr>
<tr>
<td>Definitely Would Not</td>
<td>13%</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Mean Expensive Price*
- Aluminum = $1,627
- Steel = $1,660

* Using only those respondents analyzed in the PricePoint exercise (i.e., respondents with incomplete data were excluded.)

AISI Steel Wheels
Results examined by vehicle type are similar to those in total: Steel and Aluminum are virtually equal in terms of projected penetration and revenue.

Comparing results across vehicle types, Aluminum and Steel estimated penetration are nearly identical for the Sedan and Truck models. The Van results show a slight edge for Steel. One possible explanation for this difference may be in the contrasting needs and wants of different vehicle-type purchasers.

- While not the objective of this study, it may be possible that the criteria for evaluating option packages is different across vehicle types.
  - For example, it is plausible to suggest that MiniVan purchasers may desire features related to child safety. Based on the results of this study, Steel Wheels are more readily associated with safety and strength, than are Aluminum Wheels.
The optimal Sedan package price was very similar for Aluminum Wheels and Steel Wheels.
The optimal Truck package price was very similar for Aluminum Wheels and Steel Wheels.

Steel Relative Revenue Maximized at Price of $1,400

Aluminum Relative Revenue Maximized at Price of $1,500
PricePoint® Findings – Van

The optimal Minivan package price was very similar for Aluminum Wheels and Steel Wheels, with slightly higher demand and revenue for Steel Wheels.
Diagnostic Evaluation
Diagnostic Evaluation

In selecting a package, respondents indicated that the type of stereo, lock system, and upholstery were more important than the wheel material.

- CD vs. Cassette Stereo: 37% Extremely Important, 26% Very Important, 20% Somewhat Important, 17% Not At All Important
- Keyed vs. Keyless Entry: 33% Extremely Important, 28% Very Important, 22% Somewhat Important, 15% Not At All Important
- Leather vs. Cloth Upholstery: 27% Extremely Important, 30% Very Important, 24% Somewhat Important, 19% Not At All Important
- Steel vs. Aluminum Wheels: 25% Extremely Important, 31% Very Important, 23% Somewhat Important, 20% Not At All Important

Base = 308
Respondents were shown each of the 4 wheels studied for their respective vehicle type. Each wheel was labeled once with the true material and once with the opposite material, to isolate the effect of material. Respondents ranked the cards in order from their most preferred (rank=1) to the least preferred (rank=8).

The following charts show (for each wheel/material combination) which material respondents preferred, based on these rankings.
Respondents were significantly more likely to rank Steel higher than Aluminum, for 3 of the 4 Sedan Wheels. The fourth wheel showed parity with Aluminum.
Respondents were significantly more likely to rank Steel higher than Aluminum, for 1 of the 4 Truck Wheels. The other wheels showed parity with Aluminum.
Diagnostic Evaluation – Van Rankings

Respondents were significantly more likely to rank Steel higher than Aluminum, for 1 of the 4 Van Wheels. On the other three wheels, Steel was at parity with Aluminum.

<table>
<thead>
<tr>
<th>Preferred Material (Based on Rank Order)</th>
<th>Underlined = True Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>43% Bright Aluminum</td>
<td>57% Bright Steel</td>
</tr>
<tr>
<td>35% Bright Aluminum</td>
<td>65% Bright Steel</td>
</tr>
<tr>
<td>47% Painted Aluminum</td>
<td>53% Painted Steel</td>
</tr>
<tr>
<td>45% Painted Aluminum</td>
<td>55% Painted Steel</td>
</tr>
</tbody>
</table>
Respondents were notably more likely to pay more for Steel Wheels than Aluminum Wheels. Among those willing to pay more, the prices willing to be paid were not statistically different.

**Material For Which Willing to Pay More**
- Aluminum: 16%
- Steel: 43%
- Neither: 41%

**Additional Amount Willing to Pay**
- Average = $317
  - Base = 50
- Average = $330
  - Base = 131
The majority of respondents felt that Steel Wheels were heavier weight, and offered greater strength and safety. Perhaps because of this perception of “durability” or “quality”, a majority of respondents felt that Aluminum Wheels were lower priced.
Diagnostic Evaluation

- Across all sub-groups, Steel was thought to have greater strength and heavier weight. Among those willing to pay more for Aluminum, 7 in 10 felt that Steel is stronger; 8 in 10 felt Steel was heavier weight. Both Males and Females felt Steel Wheels have greater safety.

- Among both Males and Females, roughly half of the respondents associated Steel with an attractive finish; Males were more likely than Females to say Aluminum. The likelihood of saying Aluminum rose with income; the likelihood of saying Steel was higher among those with less education.

- Among both Males and Females, 4 in 10 respondents associated Steel with an attractive design; Males were more likely than Females to say Aluminum. Lower income respondents were more likely to say Steel.
Diagnostic Evaluation

Compared to Males, Females were more likely to perceive no difference in safety, attractive finish, and attractive design.

Females felt Steel offers better corrosion resistance, while Males leaned very slightly toward Aluminum.

Among respondents who would pay more for one material, respondents were more likely to associate that material with the individual wheel attributes. The exception was Lower Price, where respondents felt that the opposite material was lower priced, perhaps indicating a perception of inferior quality.
Recommendations
Recommendations

Based upon this study, we believe that using Steel Wheels in upgrade packages should not result in a decrease in package demand or revenue. As noted on Page 18, the research results are not intended to be an estimate of actual demand or revenue, but are based on assumptions of the research design. While the PricePoint results are not generally a forceful “WIN” for Steel, parity with Aluminum indicates that Steel Wheels can be a viable replacement for traditional Aluminum wheels.

We suggest that AISI consider including in their Public Relations efforts, messages directed toward educating the consumer. This communication can be accomplished both directly to the consumer via literature placed in dealerships, and indirectly by educating dealers themselves. In both cases, it is important for the consumer to SEE the designs and finishes available in both materials, as has been done in this study.
Recommendations

- While budget did not allow for interviews to be conducted for other vehicle types, AISI should consider this option. In doing so, the research will become even more inclusive of the new car market and the sample size will become increasingly robust.

- In designing the upcoming communication efforts, we strongly encourage AISI conduct to qualitative research. This research will be designed to understand consumers’ associations and thought patterns regarding wheel material and to anticipate which messages will resonate best in educating the consumer.
Appendix