ENSURING THE SAFETY OF ADVANCED DRIVER ASSISTANCE SYSTEMS (ADAS) IN AUTOMOBILES

AS WE HEAD TOWARDS AN AUTONOMOUS FUTURE

Robbie Elliott, Engineering Honors Capstone
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OVERVIEW

• **Background:**
  ✓ Problem
  ✓ Team
  ✓ Competing Values

• **Technology & Certification:**
  ✓ What is ADAS?
  ✓ Calibration
  ✓ Specification Methods

• **Current State:**
  ✓ Addressable Market
  ✓ Aftermarket Pricing
  ✓ Shop Survey
  ✓ Consumer Behavior

• **Value Creation Options:**
  ✓ Targets
  ✓ Target 1
  ✓ Target 2
  ✓ Target 3

• **Steps Forward**
  ✓ Recommendations
BACKGROUND
BACKGROUND: PROBLEM

The Automotive Aftermarket is struggling to service and safely return ADAS equipped vehicles to the road.

Many shops can't afford the equipment to profitably perform services on these vehicles. Growth is expected to explode leading to tremendous opportunity for those that step forward...
BACKGROUND: TEAM

Robbie Elliott
University of Michigan, Senior
Industrial & Operations Engineering

Jeff DeGraff
Ross School of Business, Professor
Dean of Innovation
**BACKGROUND: COMPETING VALUES**

**Collaborate:** Discover what customers want and what your own people want

**Create:** Identify trends and emerging technologies

**Control:** Understand standards and regulations

**Compete:** Consider competitors and opportunities to make money
New value creation is borne from the creative conflict between opposite corners of the framework.
TECHNOLOGY & CERTIFICATION
ADAS (Advanced Driver Assistance Systems) is a family of electronic technologies that enable automation of portions of vehicle operation. There are several functions that ADAS accomplishes, with safety being one of the primary focuses.
Sensors must be recalibrated in the event of repair or replacement. These repairs can require large targets that take up significant area in a workshop, requiring 4-wheel alignment with targets fixed to the floor:
CURRENT STATE
Part Failure Rate Assumption:
Of the failures that occur in the first 20 years (about 4%), most failures occur in the first year. There could be a wear-out mode that comes into play before a hundred years has elapsed, but no wear-out distribution is considered.

Electronic components, unlike mechanical assemblies, rarely have wear-out mechanisms that are significant before many decades of operation.
Total Addressable Market (TAM) was calculated by taking the vehicles in operation and determining number of ADAS equipped vehicles by year of age.

The total annual replacement rate is a conservative .53%. If ADAS components age more like Engine computers, the rate will be significantly higher.

Then, the Average cost of the ADAS system components repair for each of the ADAS type systems (Short range RADAR, Medium Range, Long Range, Cameras, etc.) was multiplied by the anticipated failure rate by year, based on the comparable component.
**CURRENT STATE: AFTERMARKET PRICING**

Studied 8 OEM's and surveyed dozens of models, pricing both the OEM electronic component with Aftermarket products from Advanced Auto Parts & AutoZone:

The chart shows a higher-than-expected variance by make for the acquisition of Aftermarket parts.

![Aftermarket Price Advantage of Electronic Parts](chart.png)
We surveyed over 450 independent aftermarket repair and collision shops throughout the United States and found that <15% of aftermarket shops service ADAS.

**CURRENT STATE: SHOP SURVEY**

Reason #1:
“Too expensive to acquire necessary hardware and software”
- Franks Auto Reconditioning

Reason #2:
“We are not at that point yet, but we are preparing for it because we know it's coming on all of the newer cars”
- Davis Auto Care

Reason #3:
“We just don’t see those types of cars yet”
- Affordable Automotive
Do you service ADAS?
- Collision: 35%
- Mechanical: 16%

Where do you send vehicles that require ADAS Services?
- Dealer: 75%
- Mobile Tech: 15%
- Other: 9%

Do you have a dedicated bay for ADAS?
- Yes: 43%
- No: 57%
CURRENT STATE: CONSUMER BEHAVIOR

- 45% of ADAS systems have been deactivated by the consumer
- 24% of ADAS equipped vehicles are driven in a less safe manner (IIHS study)
- ADAS equipped vehicles exhibit a higher total loss ratio in a collision versus non-equipped vehicles

[Chart showing consumer rationale for ADAS deactivation]

- 41% Perceived Not To Work
- 30% Not Needed / Used
- 41% Noises / Lights Distracting
VALUE CREATION OPTIONS
VALUE CREATION OPTIONS: TARGETS

**Target 1: Cost of ADAS Repairs**
- Part & equipment costs out of reach for most shops

**Target 2: Shop Competency in ADAS Service**
- Requires high skillset and not enough volume for in-house service

**Target 3: Consumer Usage of ADAS**
- Systems are deactivated & drivers drive less safe
VALUE CREATION OPTIONS: TARGET 1

Target 1: Cost of ADAS Repairs

Partnering with an experienced certification firm offers speed and risk mitigation, however, there are no clear precedents to offer confidence in a path forward.

Experimentation is critical prior to incorporation as a core strategic initiative as is the presence of a supportive regulatory framework.

-- Partnerships offer speed to market --
VALUE CREATION OPTIONS: TARGET 1

Target 1: Cost of ADAS Repairs

Open collaborative models for certification has potential merit as the lowest risk option but face the question of demand in the mechanical channel - which is uncertain given the National Sanitary Foundation (NSF) experience in the collision space.

-- Collaborative approaches offer sustained benefit --
VALUE CREATION OPTIONS: TARGET 2

Target 2: Shop Competency in ADAS Service

There is a market need for targeted certification training on ADAS technologies, and an opportunity to rethink how training is delivered to the working technician.

An out of the box thought at value creation that utilizes new technology in a new space and forges new dimensions of a relationship with shops.

-- Technology as leverage for the aftermarket --
The least risk, most complete way to accomplish certification adoption and resulting safety is through regulation. This path will take a significant amount of time and require years of effort to accomplish.

The aftermarket repairer and customer will likely only adopt certified repair parts and calibration if the repair must meet regulated levels of quality.

-- Safety often requires a “control” approach --
STEPS FORWARD
**RECOMMENDATIONS**

**Recommendation 1:** Pursuit of Regulatory Framework  
- Systems remain operational & not deactivated

**Recommendation 2:** Protect Vehicles via Inspections  
- Mandate that systems actually have to work after being installed

**Recommendation 3:** Certify Technicians to Service ADAS  
- Inspections will drive people to rely on aftermarket shops
THANKS & GO BLUE!!

ENGINEERING HONORS PROGRAM
UNIVERSITY OF MICHIGAN