



Self-driving Transportation Service Company Strategy Analysis

An analysis of the positioning of self-driving transportation service providers



The transportation service market is HUGE. Transportation service includes the service for passengers and the service for goods. The passenger transportation service is also called mobility service. From traditional automakers to the new self-driving software start-ups, everyone knows that transportation service, rather than auto manufacturing or software development, will be the most attractive market.

Traditional automakers and self-driving technology companies are entering the transportation service market.



On one hand, there are many cases showing that traditional automakers are building their mobility service arms. Daimler initiated its car2go in 2008, Ford acquired Chariot in 2016, GM acquired Sidecar in 2016 and built the new Maven, BMW launched its ReachNow in 2016, and VW strategically invested \$300M in Gett in 2016. Moreover, Ford envisions its future as the Most Trusted Mobility Company. On the other hand, self-driving software companies are also trying to enter the transportation service market: Zoox, Optimus Ride, and Voyage are entering the urban taxi market; TuSimple, Embark, and Starsky Robotics are entering the long-distance freight trucking market; Nuro, Udelv, and Starship are entering the local “last-mile” delivery market.

Self-driving transportation service companies vary in strategies: whom to deliver for, what to deliver, where to deliver, and how often to deliver.



Self-driving software companies have different strategies when entering the transportation service market. A group of companies deliver goods, and the rest deliver passengers. Within each of these groups, the companies have different strategies that vary in the content to deliver, the customers to deliver for, the place and distance to deliver, and the frequency and speed to deliver.

Companies that serve the high-frequency rigid demands with simple and low-cost solutions will have the largest potential and value.



Given the differences in strategies, companies will have different solutions. These solutions will vary in capacity, coverage, speed, storage environment, self-driving requirement, and business model. The difference in targeting markets means different potentials for different companies, while the difference in solutions means how fast these companies can realize their potentials. Those companies that serve the high-frequency rigid demands, such as food delivery and urban taxi, with a relatively simple and low-cost solution will have the highest value.



Automakers and self-driving technology companies are entering the transportation service market



 Non-passenger
Transportation

 Passenger
Transportation



Automakers

chariot
(Ford)


(Daimler)

MAVEN
(GM)

 ReachNow
(BMW)



Self-driving technology
Companies

 simple

 EMBARK

 STARSKYROBOTICS

 nuro

 udeltv

 STARSHIP

 ZO OX

 PTIMUS RIDE

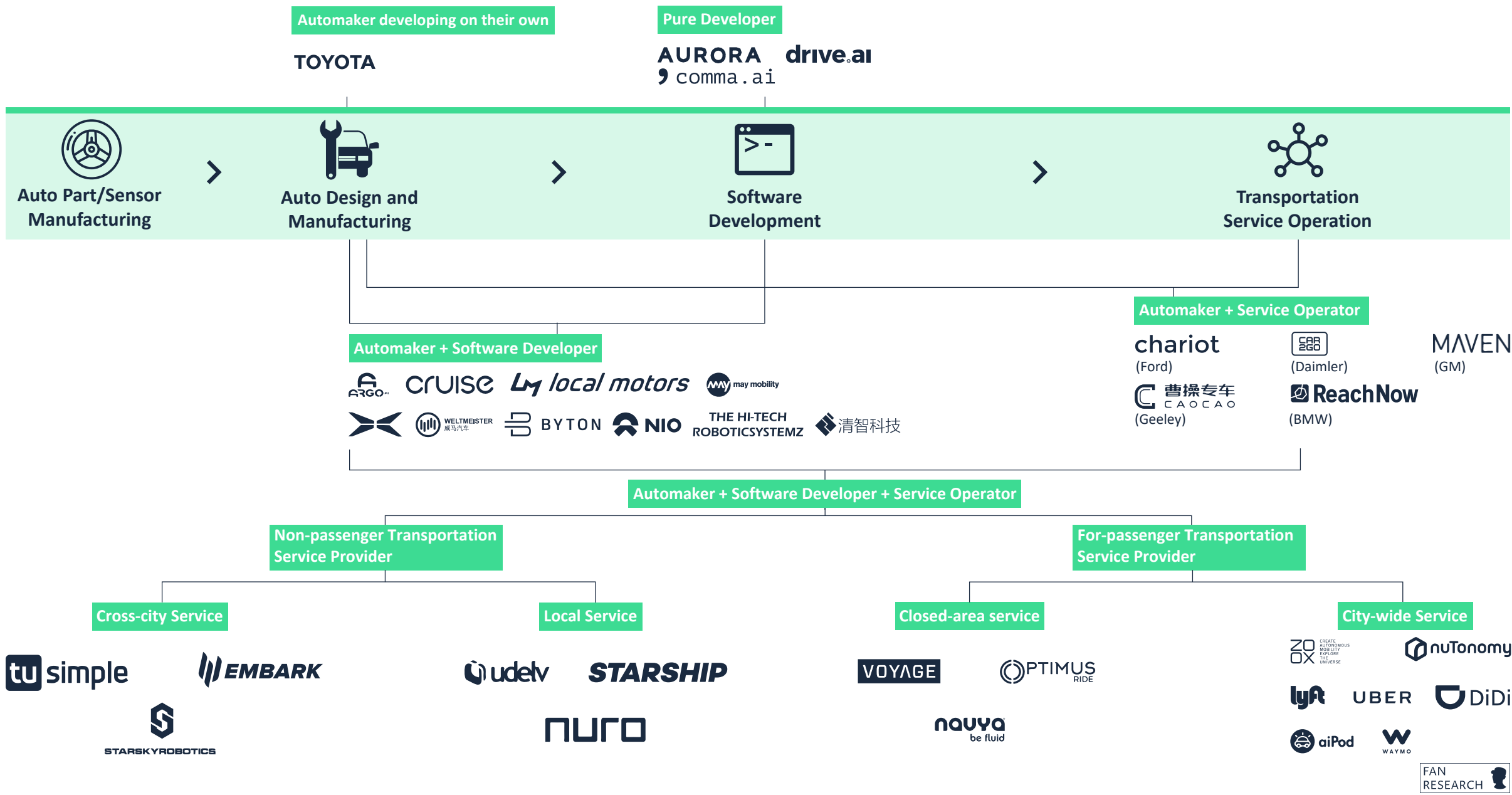
 VOYAGE

 may mobility

 aiPod

 local motors

TAXI Self-driving Industry Value Chain Integration and Positioning





Positioning in the Transportation Service Market – Solve Different Problems



Non-passenger
Transportation



For-passenger
Transportation



Whom to
deliver for



What to
deliver



Where to
deliver



How often to
deliver





Positioning in the Transportation Service Market – Solve Different Problems

Transportation Market Segmentation (Choose The Customers/Needs To Satisfy)

| | | | | | |
|----------------------|----------------------|--|---|--|--|
| Whom to deliver for | By Customer Type | Individual | Transportation service provider (e.g. SF Express, bus companies) | Transportation service operator (e.g. Uber, Didi, Hertz) | Non-transportation company (e.g. JD, Amazon, KFC, McDonalds) |
| | By Customer Size | Small (e.g. individuals, small business) | Medium (e.g. local grocery stores, local chain restaurants) | Large (e.g. global chain stores) | - |
| What to deliver | By Delivery Type | Passenger delivery (e.g. bus companies) | Non-passenger delivery (e.g. SF Express) | - | - |
| | By Delivery Category | Massive transit (e.g. urban bus, cross-city bus) | Shared mobility (e.g. Didi, Uber, shuttle) | Car rental (e.g. Hertz, Avis) | Private car |
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Positioning in the Transportation Service Market – Provide Different Solutions



Non-passenger
Transportation



For-passenger
Transportation



Safety



Coverage



Speed



Capacity



Storage
Environment



Self-driving
Technology



Business
Model





Positioning in the Transportation Service Market – Provide Different Solutions



Self-driving Transportation Service Solutions (Design The Products and Business To Satisfy The Customers/Needs)

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| Storage Environment | Interior design | Basic design | Special design (e.g. interior temperature, size.) | - | - |
| Self-driving Technology | Software solution | Basic solution for single scenario (e.g. solutions for closed community/free-way) | Advanced solution for complex scenario (e.g. solution for urban area) | - | - |
| Profitability | Business model | Software provider (e.g. Microsoft, Adobe) | Software + hardware provider (e.g. DJI, Apple) | Operating platform provider (e.g. Didi, Uber) | Delivery service provider (e.g. UPS, FEDEX) |



Example: a comparison between Nuro's, Udelv's, and Starship's strategies

Positionings of Nuro ■, Udelv ■, and Starship ■

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Solutions from Nuro ■, Udelv ■, and Starship ■

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They are different in...

Targeting customer groups and the pain points to resolve

- 1. Different types of customers.** Udelv primarily serve medium-sized local grocery stores, while Nuro and Starship are going to serve those local small businesses such as restaurants. The number of grocery stores will be smaller than that of the small restaurants. However, the transportation demand from each grocery store will be higher than that from a single restaurant. Given the smaller number of grocery stores, it might be easier for Udelv to acquire new customers and sustain customer relationships. Besides, the grocery stores will possibly have a higher requirement for user experience, as the value of each order to its customers will be higher.
- 2. Different categories of customers and pain points.** Udelv is going to help grocery stores deliver their orders to customers, while Nuro and Starship are going to help small local restaurants deliver their food. Given that the local grocery stores are facing strong competition from e-commerce, the transportation demand from the grocery stores will fall in the long run. However, the transportation demand from the local restaurants is a rigid demand with a high frequency.
- 3. Different distance to deliver.** Starship is helping with the last-mile delivery, while Nuro and Udelv are helping with the last 3-mile or 5-mile delivery. The difference in the delivery distance will result in different delivery modes: Starship will use a point-to-point delivery, while Nuro and Udelv will provide a one-to-multiple delivery that requires complicated route planning and operation management. The two types of delivery will also have different requirement for the batteries: Starship can use low-capacity batteries, while Nuro and Udelv will need high-capacity batteries.
- 4. Different delivery frequency.** Most households will buy groceries once or twice per week, while many people will call food delivery for more than twice per week. The higher frequency of demand means a larger market.
- 5. Different time requirement.** For grocery stores, their deliveries are not time-intensive. However, for small restaurants, they need to deliver the food to their customers in the shortest time. The higher time requirement means a higher requirement for the speed of the service and operation.

Solutions to address the pain points

- 1. Different coverage.** Due to the difference in deliver distance, the cars from the three companies will have different coverages. The coverage of Starship is around 3 KM, while that of Nuro and Udelv can be over 50 KM.
- 2. Different speed.** Due to the different requirement for time, the cars from the three companies run in different speeds. Particularly, as Udelv and Nuro are going to provide one-to-multiple service per trip, the two companies need to increase the speed to improve user experience. Starship does not have this incentive, as the speed change will not have a big impact on the delivery time for a 1-KM trip.
- 3. Different capacity.** As the three companies are going to deliver different types of goods that have different sizes, Udelv and Nuro will need a larger space for their cars than Starship. As Udelv is going to deliver grocery goods that are usually larger than food boxes, Udelv will have a higher demand for space than Nuro.
- 4. Different storage environment.** As the three companies are going to deliver different types of goods that have different requirements for storage, Nuro and Starship need to carefully design the interior space to keep the food clean and hot, while Udelv does not need to do much.
- 5. Different self-driving technology.** As the coverage and speed requirements vary from firm to firm, the three companies will have different requirements for their self-driving technology. The 1-KM delivery task along the sidewalk will be relatively easier than the 10-KM delivery in a completely urban transportation environment.
- 6. Different business model.** As the delivery task for Starship is relatively simple and does not need rich operation experience, Starship has a low-cost product that small businesses can buy and run their own fleets. Starship will make money by selling its hardware + software. However, this is not true for Udelv and Nuro, which are going to provide delivery service to their customers.

- — **Appendix**
- —
- — Positionings and solutions of different self-driving transportation service companies



Positioning Analysis of Nuro

 Self driving

Transportation Market Segmentation (Choose The Customers/Needs To Satisfy)

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Solution (Design The Products and Business)

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Positioning Analysis of Starship **STARSHIP**



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Positioning Analysis of Zoox



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| What to deliver | By Delivery Type | Passenger delivery (e.g. bus companies) | Non-passenger delivery (e.g. SF Express) | | - |
| | By Delivery Category | Massive transit (e.g. urban bus, cross-city bus) | Shared mobility (e.g. Didi, Uber, shuttle) | Car rental (e.g. Hertz, Avis) | Private car |
| | | Food delivery (e.g. small/chain restaurants) | Grocery delivery (e.g. small/chain grocery stores, online grocery stores) | Logistics (e.g. over-the-road cargo transportation) | - |
| Where to deliver | By Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| How often to deliver | By Frequency | Low (e.g. <=3 deliveries per person per week) | Medium (e.g. 3-7 deliveries per person per week) | High (e.g. >=7 deliveries per person per week) | - |
| | By Time Requirement | Intensive (e.g. food delivery) | Flexible (e.g. grocery delivery) | - | - |

Solution (Design The Products and Business)

| | | | | | |
|-------------------------|-------------------|---|---|---|---|
| Safety | Delivery type | Passenger delivery | Non-passenger delivery | - | - |
| Coverage | Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| Speed | Operation speed | Walking speed (e.g. <=9KM/H) | Normal speed (e.g. 10-60KM/H) | High speed (e.g. >=60KM/H) | |
| Capacity | Capacity | Small (e.g. <=100 Pounds, <=5 Passengers) | Medium (e.g. 100-1,000 Pounds, 6-25 Passengers) | Large (e.g. >=1,000 Pounds, >=25 Passengers) | - |
| Storage Environment | Interior design | Basic design | Special design (e.g. interior temperature, size.) | - | - |
| Self-driving Technology | Software solution | Basic solution for single scenario (e.g. solutions for closed community/free-way) | Advanced solution for complex scenario (e.g. solution for urban area) | - | - |
| Profitability | Business model | Software provider (e.g. Microsoft, Adobe) | Software + hardware provider (e.g. DJI, Apple) | Operating platform provider (e.g. Didi, Uber) | Delivery service provider (e.g. UPS, FEDEX) |



Transportation Market Segmentation (Choose The Customers/Needs To Satisfy)

| | | | | | |
|----------------------|----------------------|--|---|--|--|
| Whom to deliver for | By Customer Type | Individual | Transportation service provider (e.g. SF Express, bus companies) | Transportation service operator (e.g. Uber, Didi, Hertz) | Non-transportation company (e.g. JD, Amazon, KFC, McDonalds) |
| | By Customer Size | Small (e.g. individuals, small business) | Medium (e.g. local grocery stores, local chain restaurants) | Large (e.g. global chain stores) | - |
| What to deliver | By Delivery Type | Passenger delivery (e.g. bus companies) | Non-passenger delivery (e.g. SF Express) | | - |
| | By Delivery Category | Massive transit (e.g. urban bus, cross-city bus) | Shared mobility (e.g. Didi, Uber, shuttle) | Car rental (e.g. Hertz, Avis) | Private car |
| | | Food delivery (e.g. small/chain restaurants) | Grocery delivery (e.g. small/chain grocery stores, online grocery stores) | Logistics (e.g. over-the-road cargo transportation) | - |
| Where to deliver | By Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| How often to deliver | By Frequency | Low (e.g. <=3 deliveries per person per week) | Medium (e.g. 3-7 deliveries per person per week) | High (e.g. >=7 deliveries per person per week) | - |
| | By Time Requirement | Intensive (e.g. food delivery) | Flexible (e.g. grocery delivery) | - | - |

Solution (Design The Products and Business)

| | | | | | |
|-------------------------|-------------------|--|--|---|---|
| Safety | Delivery type | Passenger delivery | Non-passenger delivery | - | - |
| Coverage | Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| Speed | Operation speed | Walking speed (e.g. <=9KM/H) | Normal speed (e.g. 10-60KM/H) | High speed (e.g. >=60KM/H) | |
| Capacity | Capacity | Small (e.g. <=100 Pounds, <=5 Passengers) | Medium (e.g. 100-1,000 Pounds, 6-25 Passengers) | Large (e.g. >=1,000 Pounds, >=25 Passengers) | - |
| Storage Environment | Interior design | Basic design | Special design (e.g. interior temperature, size.) | - | - |
| Self-driving Technology | Software solution | Basic solution for single scenario (e.g. solutions for free-way scenario with a driver to supervise) | Advanced solution for complex scenario (e.g. solutions for free-way scenario with a remote virtual driver) | - | - |
| Profitability | Business model | Software provider (e.g. Microsoft, Adobe) | Software + hardware provider (e.g. DJI, Apple) | Operating platform provider (e.g. Didi, Uber) | Delivery service provider (e.g. UPS, FEDEX) |



Transportation Market Segmentation (Choose The Customers/Needs To Satisfy)

| | | | | | |
|----------------------|----------------------|--|---|--|--|
| Whom to deliver for | By Customer Type | Individual | Transportation service provider (e.g. SF Express, bus companies) | Transportation service operator (e.g. Uber, Didi, Hertz) | Non-transportation company (e.g. JD, Amazon, KFC, McDonalds) |
| | By Customer Size | Small (e.g. individuals, small business) | Medium (e.g. local grocery stores, local chain restaurants) | Large (e.g. global chain stores) | - |
| What to deliver | By Delivery Type | Passenger delivery (e.g. bus companies) | Non-passenger delivery (e.g. SF Express) | | - |
| | By Delivery Category | Massive transit (e.g. urban bus, cross-city bus) | Shared mobility (e.g. Didi, Uber, shuttle) | Car rental (e.g. Hertz, Avis) | Private car |
| | | Food delivery (e.g. small/chain restaurants) | Grocery delivery (e.g. small/chain grocery stores, online grocery stores) | Logistics (e.g. over-the-road cargo transportation) | - |
| Where to deliver | By Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
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Solution (Design The Products and Business)

| | | | | | |
|-------------------------|-------------------|--|--|---|---|
| Safety | Delivery type | Passenger delivery | Non-passenger delivery | - | - |
| Coverage | Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| Speed | Operation speed | Walking speed (e.g. <=9KM/H) | Normal speed (e.g. 10-60KM/H) | High speed (e.g. >=60KM/H) | |
| Capacity | Capacity | Small (e.g. <=100 Pounds, <=5 Passengers) | Medium (e.g. 100-1,000 Pounds, 6-25 Passengers) | Large (e.g. >=1,000 Pounds, >=25 Passengers) | - |
| Storage Environment | Interior design | Basic design | Special design (e.g. interior temperature, size.) | - | - |
| Self-driving Technology | Software solution | Basic solution for single scenario (e.g. solutions for free-way scenario with a driver to supervise) | Advanced solution for complex scenario (e.g. solutions for free-way scenario with a remote virtual driver) | - | - |
| Profitability | Business model | Software provider (e.g. Microsoft, Adobe) | Software + hardware provider (e.g. DJI, Apple) | Operating platform provider (e.g. Didi, Uber) | Delivery service provider (e.g. UPS, FEDEX) |



Positioning Analysis of Starsky Robotics



Transportation Market Segmentation (Choose The Customers/Needs To Satisfy)

| | | | | | |
|----------------------|----------------------|--|---|--|--|
| Whom to deliver for | By Customer Type | Individual | Transportation service provider (e.g. SF Express, bus companies) | Transportation service operator (e.g. Uber, Didi, Hertz) | Non-transportation company (e.g. JD, Amazon, KFC, McDonalds) |
| | By Customer Size | Small (e.g. individuals, small business) | Medium (e.g. local grocery stores, local chain restaurants) | Large (e.g. global chain stores) | - |
| What to deliver | By Delivery Type | Passenger delivery (e.g. bus companies) | Non-passenger delivery (e.g. SF Express) | | - |
| | By Delivery Category | Massive transit (e.g. urban bus, cross-city bus) | Shared mobility (e.g. Didi, Uber, shuttle) | Car rental (e.g. Hertz, Avis) | Private car |
| | | Food delivery (e.g. small/chain restaurants) | Grocery delivery (e.g. small/chain grocery stores, online grocery stores) | Logistics (e.g. over-the-road cargo transportation) | - |
| Where to deliver | By Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| How often to deliver | By Frequency | Low (e.g. <=3 deliveries per person per week) | Medium (e.g. 3-7 deliveries per person per week) | High (e.g. >=7 deliveries per person per week) | - |
| | By Time Requirement | Intensive (e.g. food delivery) | Flexible (e.g. grocery delivery) | - | - |

Solution (Design The Products and Business)

| | | | | | |
|-------------------------|-------------------|--|--|---|---|
| Safety | Delivery type | Passenger delivery | Non-passenger delivery | - | - |
| Coverage | Distance | Walkable level (e.g. <=3KM) | Community level (e.g. 4-10KM) | Urban level (e.g. 10-100KM) | Cross-city level (e.g. >=100KM) |
| Speed | Operation speed | Walking speed (e.g. <=9KM/H) | Normal speed (e.g. 10-60KM/H) | High speed (e.g. >=60KM/H) | |
| Capacity | Capacity | Small (e.g. <=100 Pounds, <=5 Passengers) | Medium (e.g. 100-1,000 Pounds, 6-25 Passengers) | Large (e.g. >=1,000 Pounds, >=25 Passengers) | - |
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| Profitability | Business model | Software provider (e.g. Microsoft, Adobe) | Software + hardware provider (e.g. DJI, Apple) | Operating platform provider (e.g. Didi, Uber) | Delivery service provider (e.g. UPS, FEDEX) |