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The Path to New Mobility

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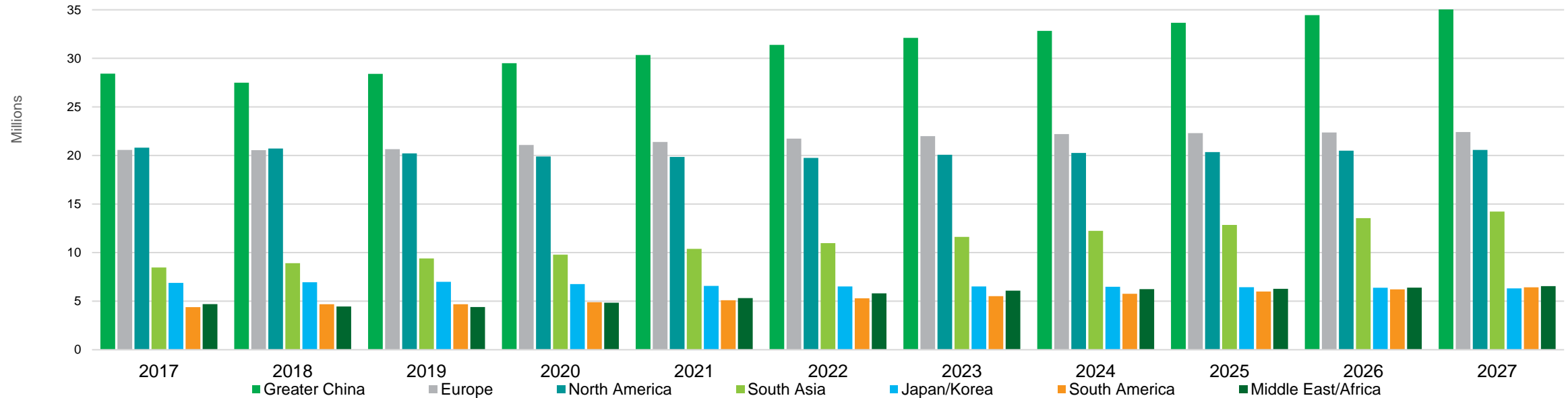
Today

- Sales Outlook
- The New Mobility Business
- The Path to New Mobility

Sales Outlook

Global auto sales: Growth in emerging markets

Global sales forecast

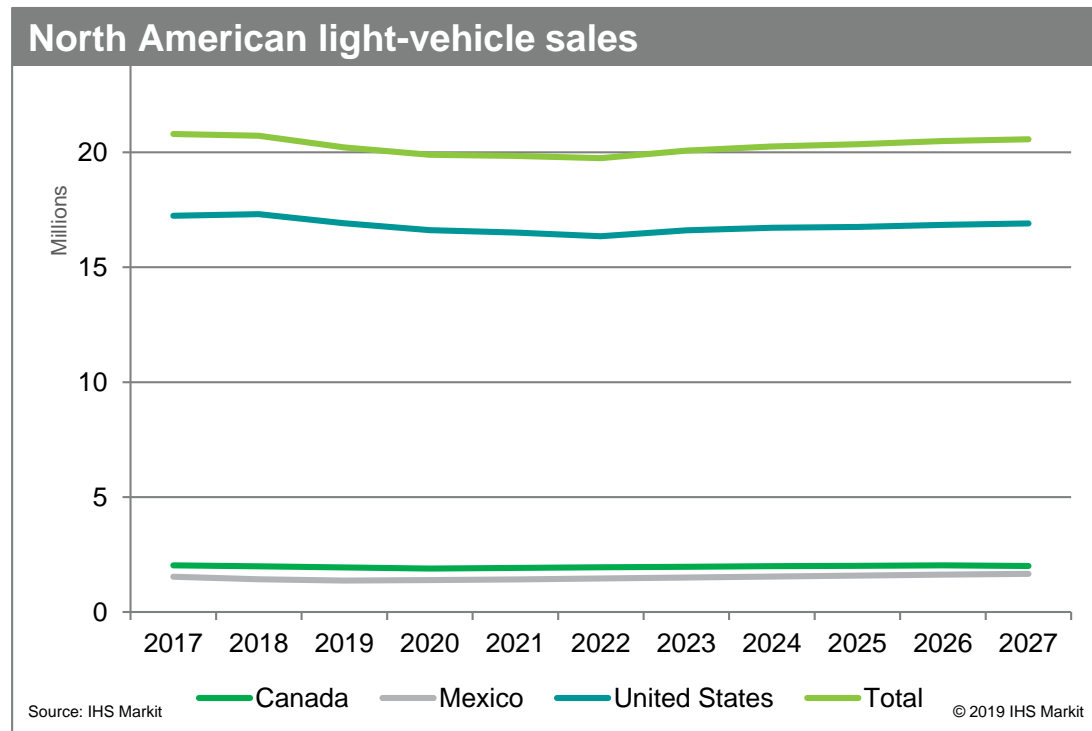


Source: IHS Markit

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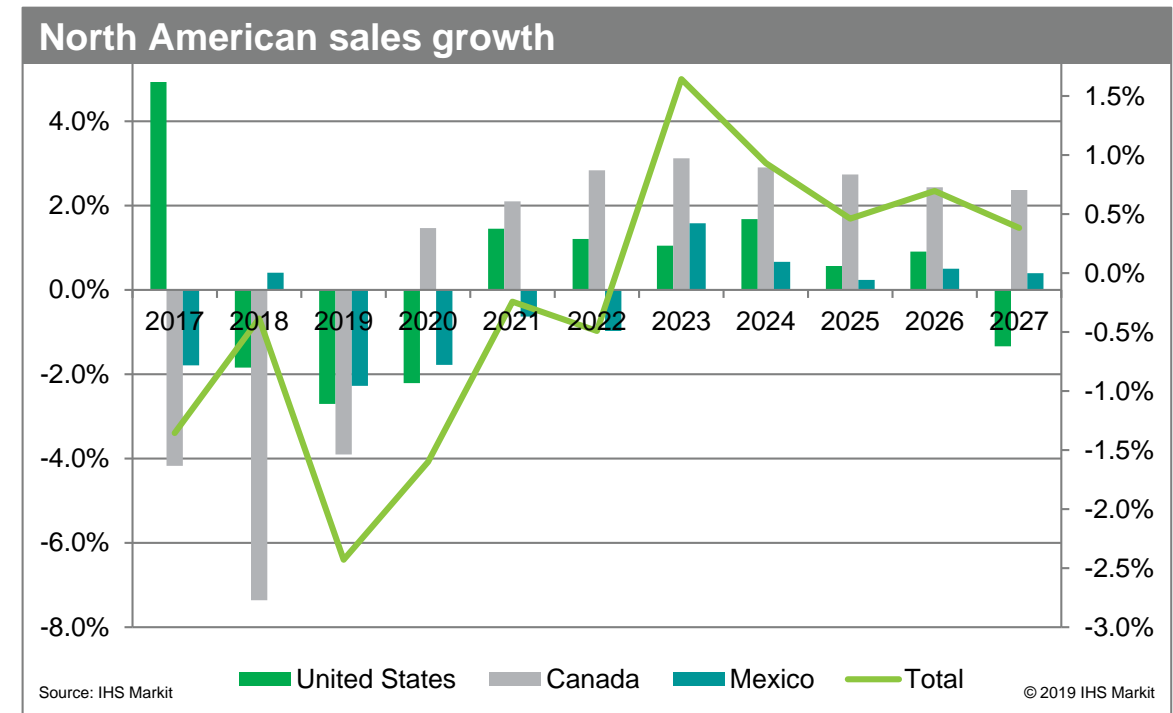


North American auto sales

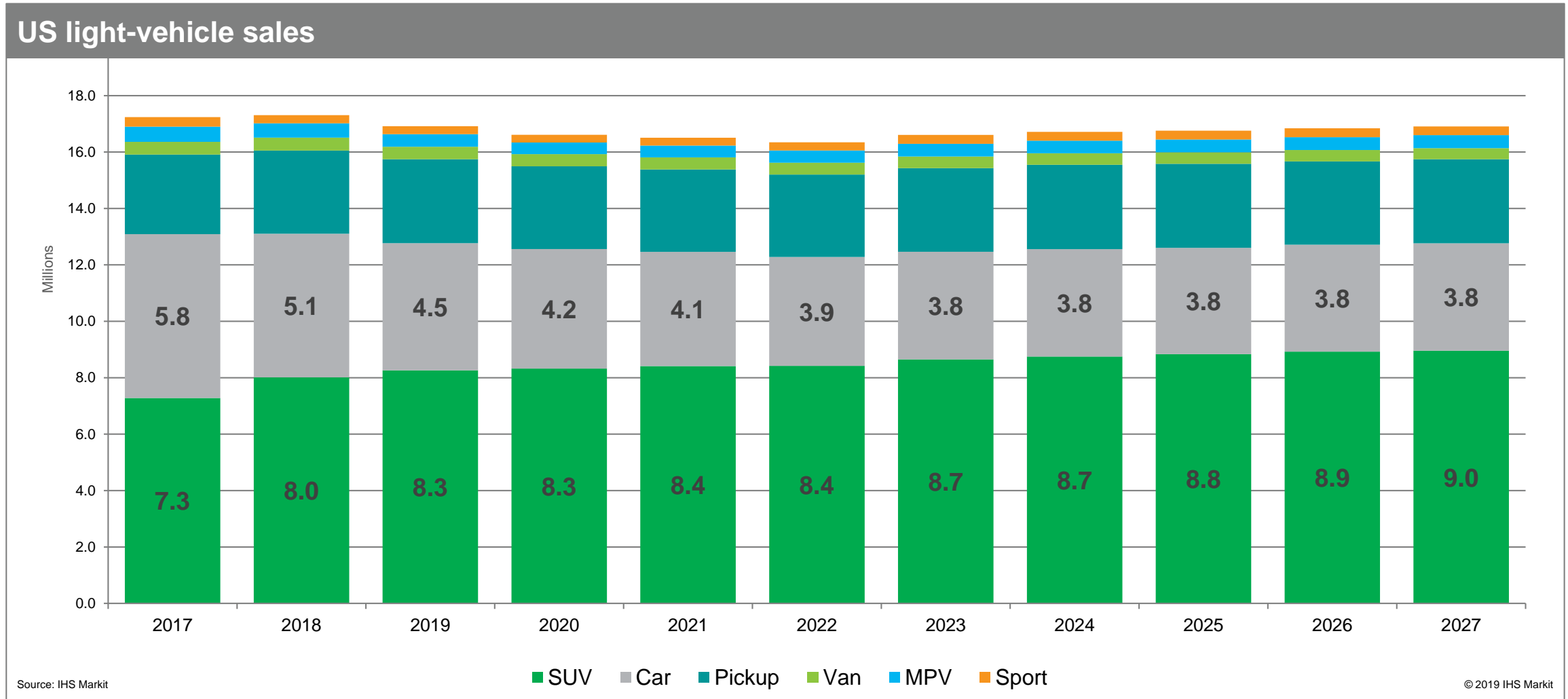


- US light-vehicle sales: Near term contraction to 16.3 mil in 2022; then return to growth
- Mexico impacted by election and trade uncertainties. Growth returns in 2020
- Canadian sales declined in 2018 after 8 yrs growth
- Region: 2.4% decline in 2019; growth in 2023

- Volume hovers around 20 million units
- Third largest region—behind China, Europe
- US remains second-largest market, behind China



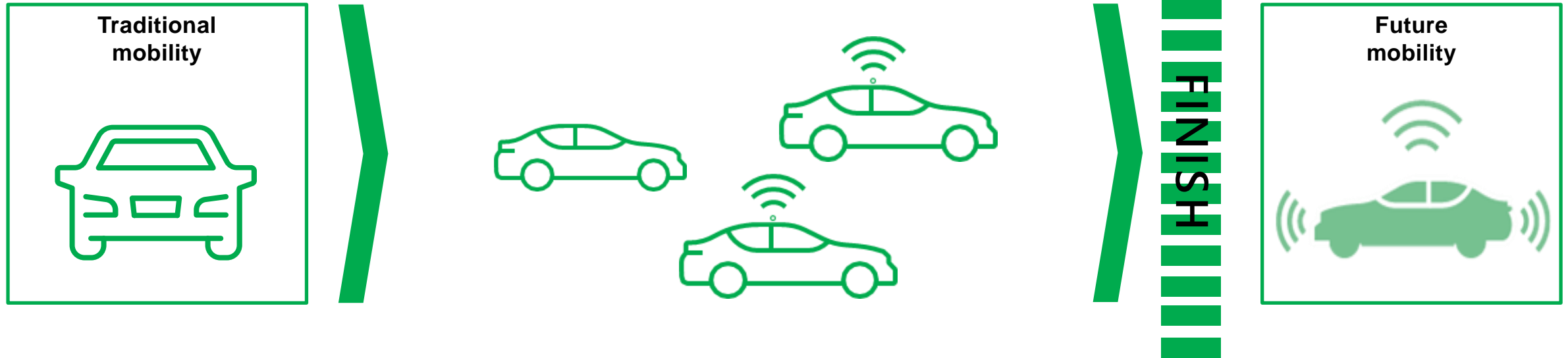
US market: Near term decline, strong volume



The New Mobility Business

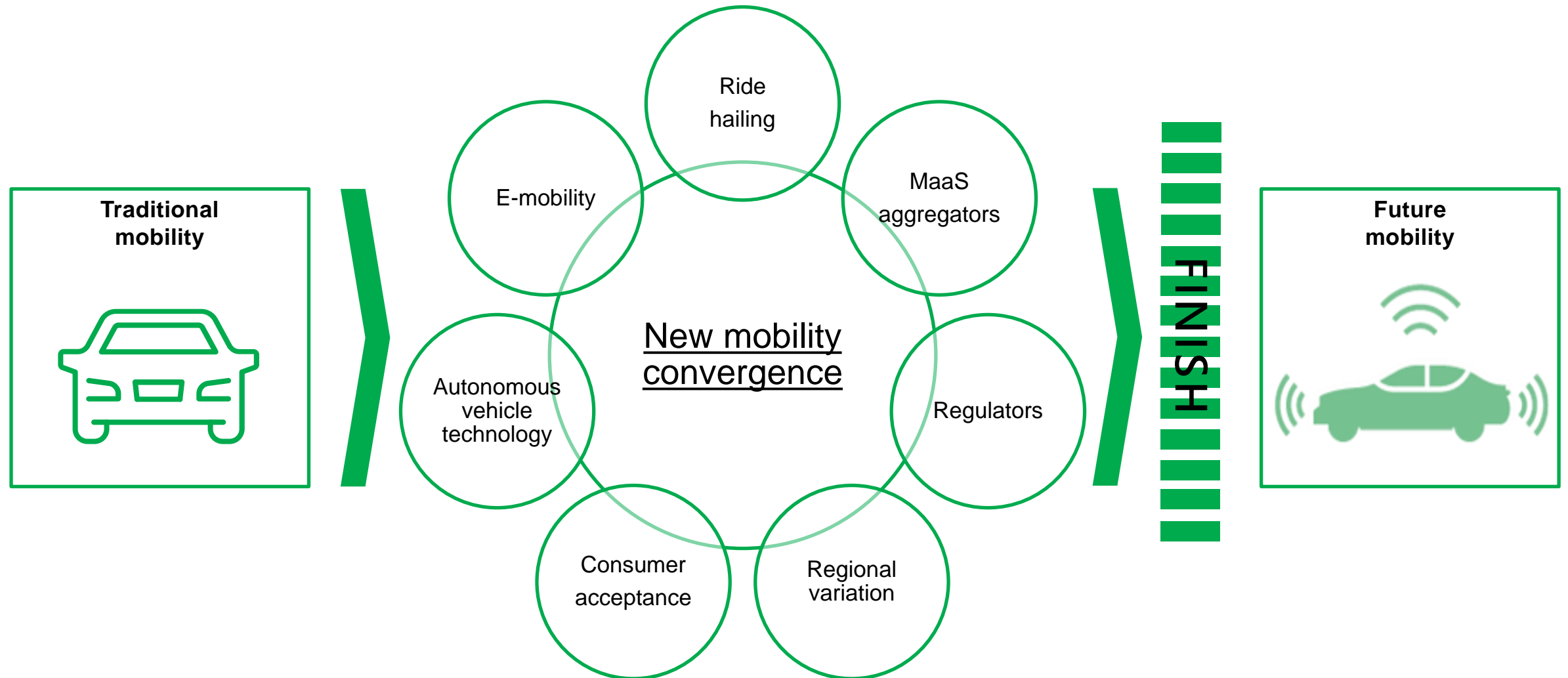
The “New Mobility Paradigm Shift”

A race to the finish?



The “New Mobility Paradigm Shift”

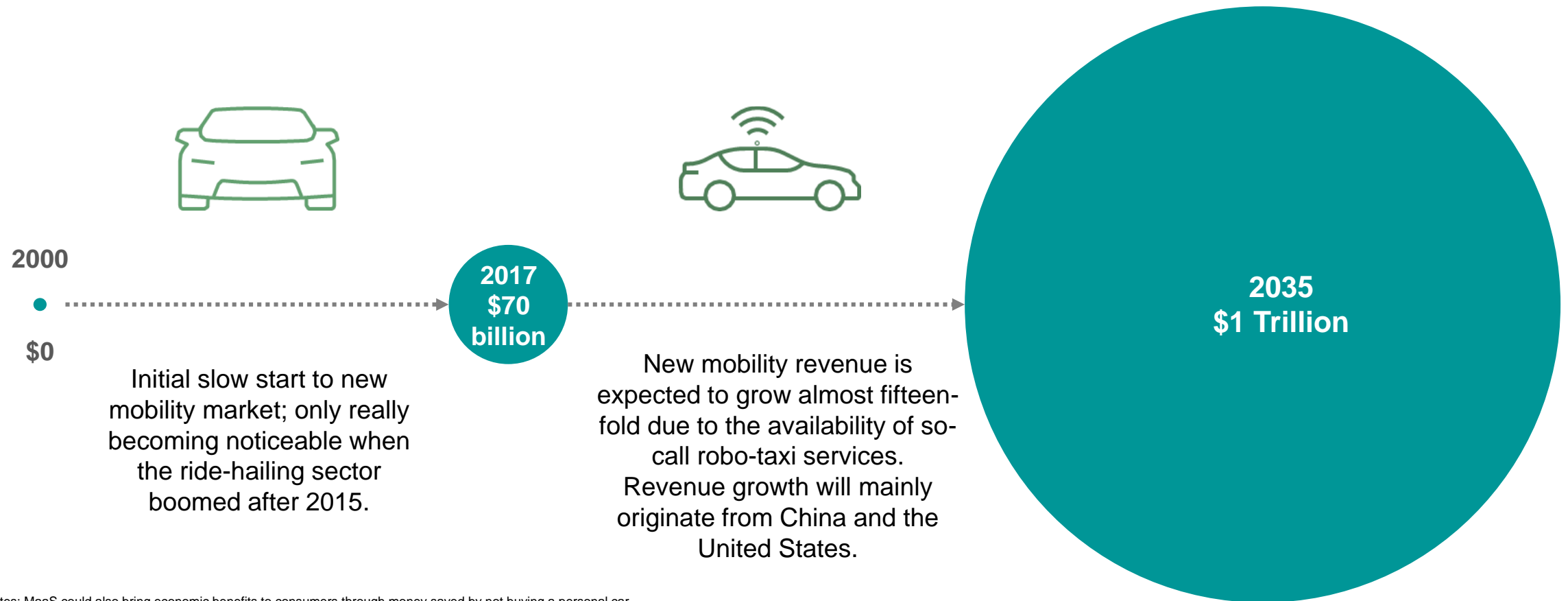
Or a need for a “reality-check?”



The mobility (r)evolution will take some time to materialize

Traditional Wall Street short-term focus on financial expectations needs to adapt

The value evolution of the new mobility market (revenue in US dollars)



Notes: MaaS could also bring economic benefits to consumers through money saved by not buying a personal car.
Source: IHS Markit

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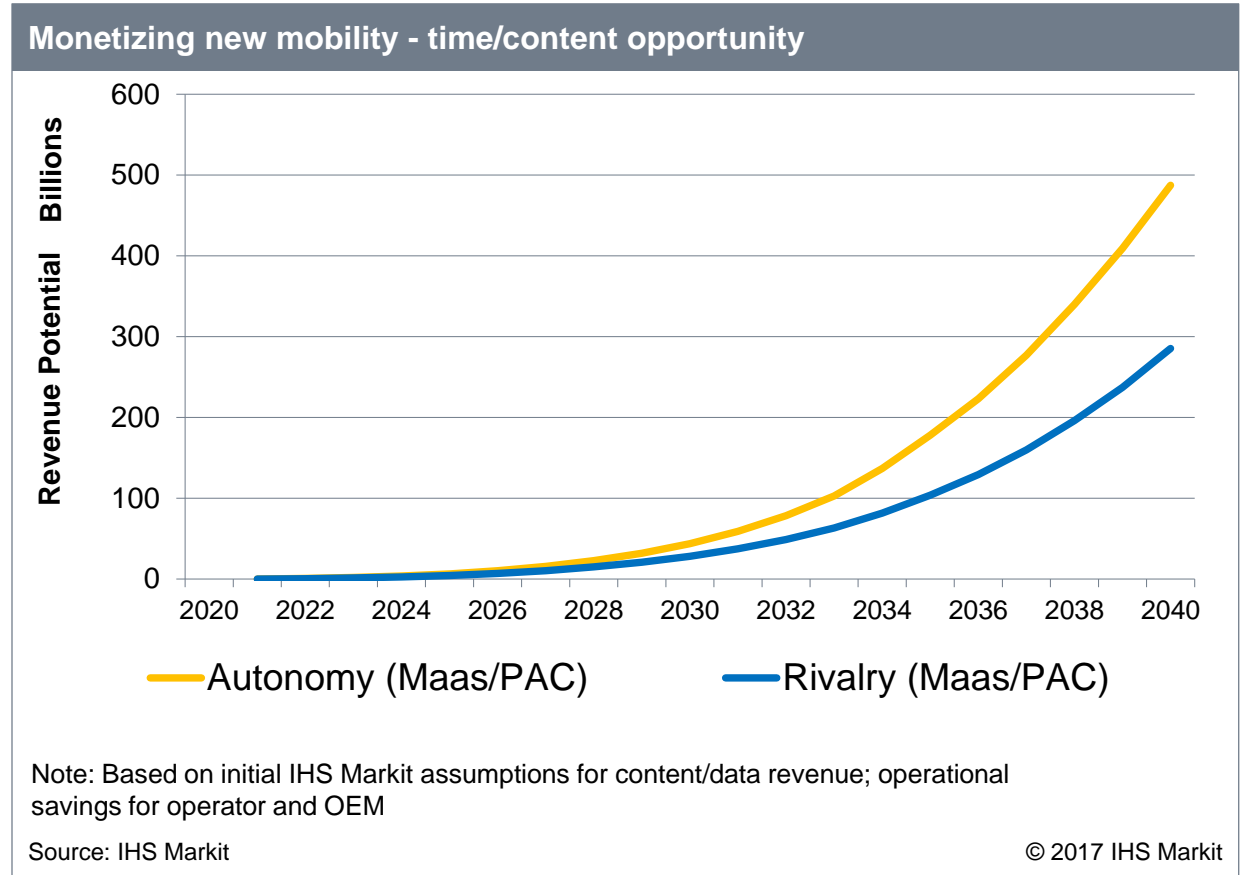
On an evolutionary trajectory

- The US market characteristics of low urban density, high average per capita mileage, and the “built-around-the-car” infrastructure will slow the pace of adoption and cap the potential long-term market size for new MaaS services. Eventually, L5-capable private autonomous cars will become a tough competitor for autonomous MaaS services.
- Cities face a difficult nexus of challenges, compounded by the quick advent of ride hailing. Hence city policymakers’ decisions will determine the adoption speed of new mobility.
- New mobility technology and consumer awareness/comfort need to further evolve before widespread adoption will occur in urban environments.
- The sudden “disruption” threat to our established mobility system has receded, turning the outlook more in-line with our base-case outlook.

While still of huge importance looking forward, the much lauded mobility revolution appears to be on an evolutionary trajectory.

Monetizing MaaS – time, data and content services

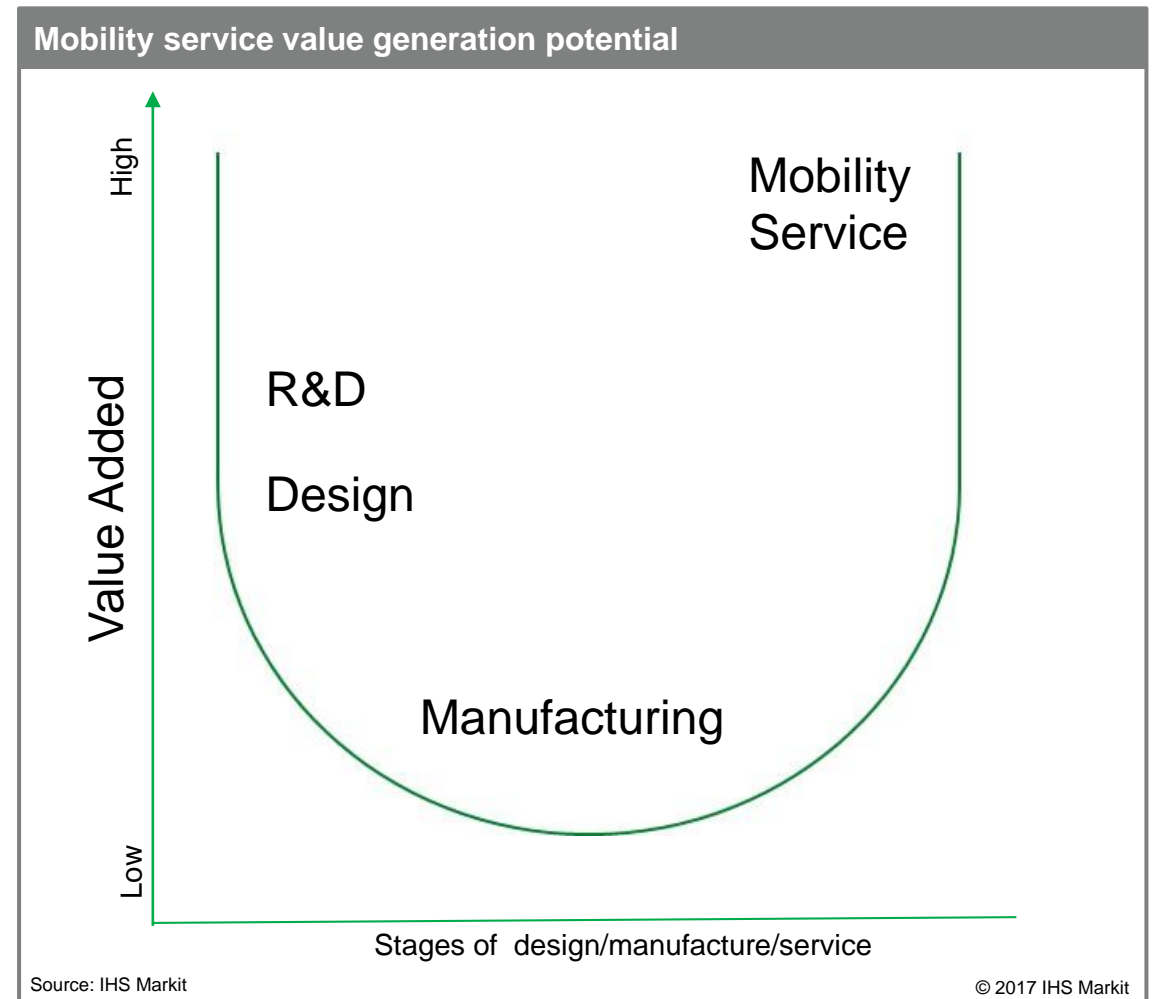
- New mobility is not just defined by business model and/or channels; it also is defined by the latent revenue of time spend in the car; as well as operational cost savings.
- How could this be monetized, and whom will benefit?
 - Operational cost savings for the OEM
 - Operational cost savings for the operator/owner
 - Revenue gains for operator/content provider
 - Revenue gains from data for 3th party
- Overall time/content assumptions include: lower warranty cost, OTA software savings, cybersecurity savings, connected car savings, video/non-video content revenue, remote diagnostics savings, and driver content revenue (telematics/premium fees/apps)



Mobility business: Where is the real value opportunity?

A conceptual look

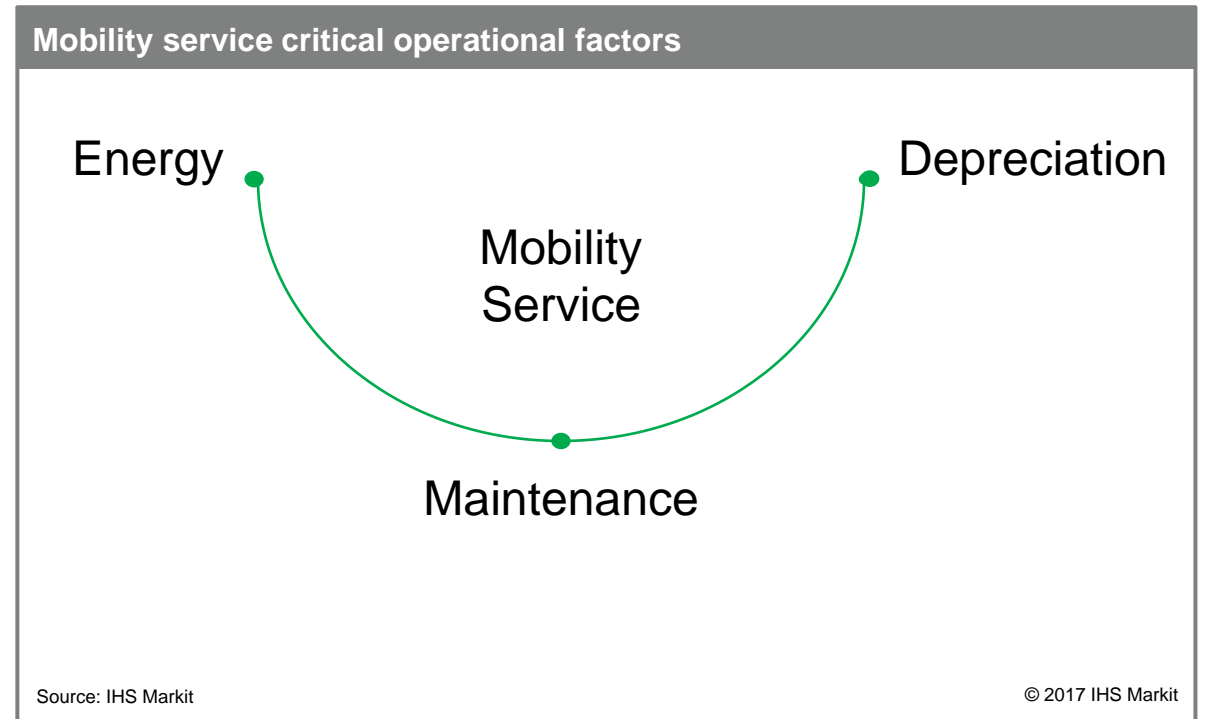
- Mobility service business models are not expected to generate much value at the vehicle conception and design stages.
 - Specialist research and design service could stand to benefit
 - New technology providers could also stand to benefit
- Conceptually it is also expected that hardly any value will be generated during the vehicle manufacturing stage; especially after a dedicated vehicle solution/architecture has been designed.
 - Build to print
 - Potentially an opportunity for flexible smaller scale specialists utilising 3D printing/additive manufacturing concepts
- Overall the mobility service business model is conceptually expected to generate the highest value at the actual operational service stage



Mobility business: What's critical to business success?

A conceptual look

- The mobility service business model is conceptually critically dependent upon three factors to optimize profitability
- **Energy:** The lowest cost energy usage solution to power the mobility service will be highly desirable
- **Maintenance:** Low maintenance cost and reduced downtime will be critical factors
- **Depreciation:** Longer useful life of the vehicle allows overall lower vehicle cost

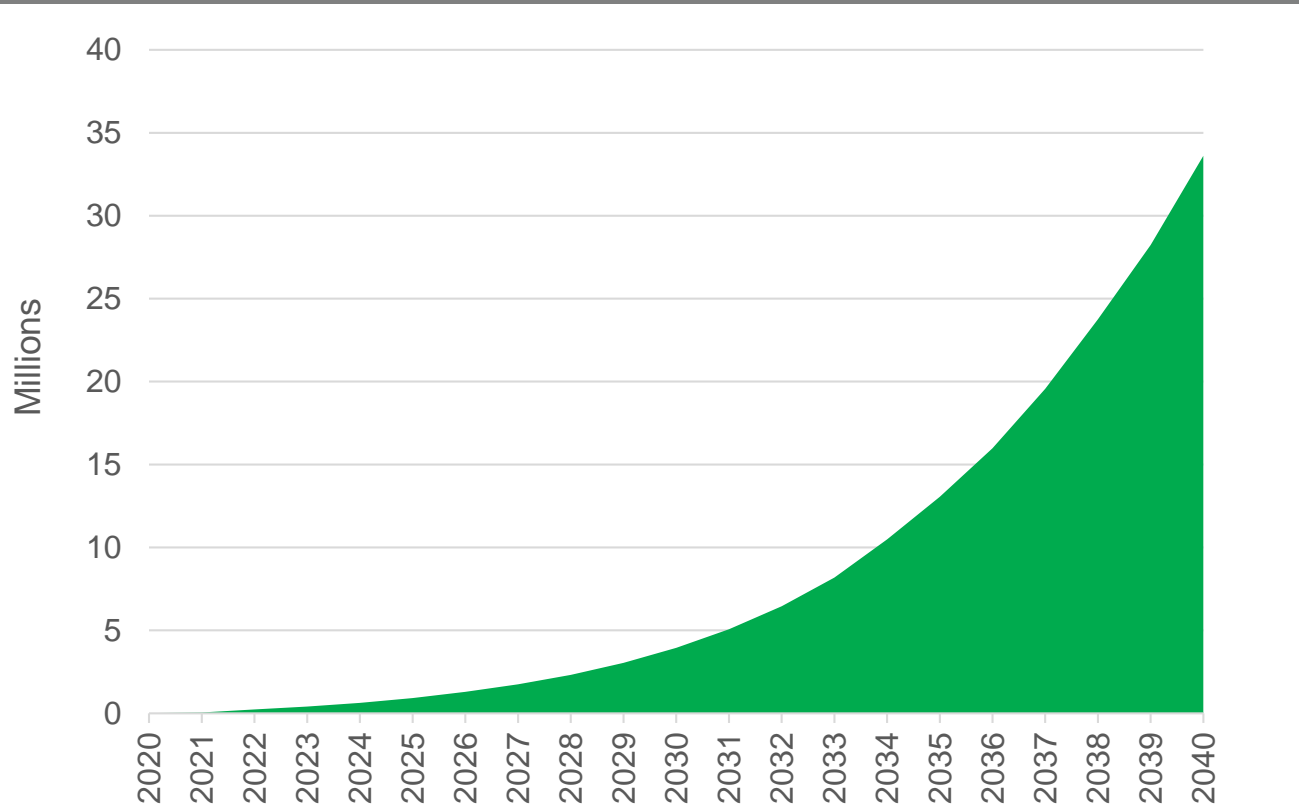


The Path to New Mobility

Autonomous vehicle growth steadily increases

Cautious early introductions expand through both shared mobility fleets

Global autonomous vehicle sales 2020–40



Source: IHS Markit

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- **33M in 2040** up from **51,000 in 2021**
- First production-line L4 autonomous vehicles in 2019, all deployed in mobility fleets
- Mobility services drive early volumes into fleets in China and the United States
- Ownership remains strong in Europe and the United States

Note: Autonomous is defined as SAE Level 4 or Level 5

The new automotive supply chain and an expanding ecosystem

- 1 Current Features
- 2 Future Features
- 3 Application Control
- 4 Supplier Sourcing
- 5 Cost
- 6 NCAP
- 7 Legislation
- 8 Consumer Adoption

OBJECTIVE: Con...

Research c...

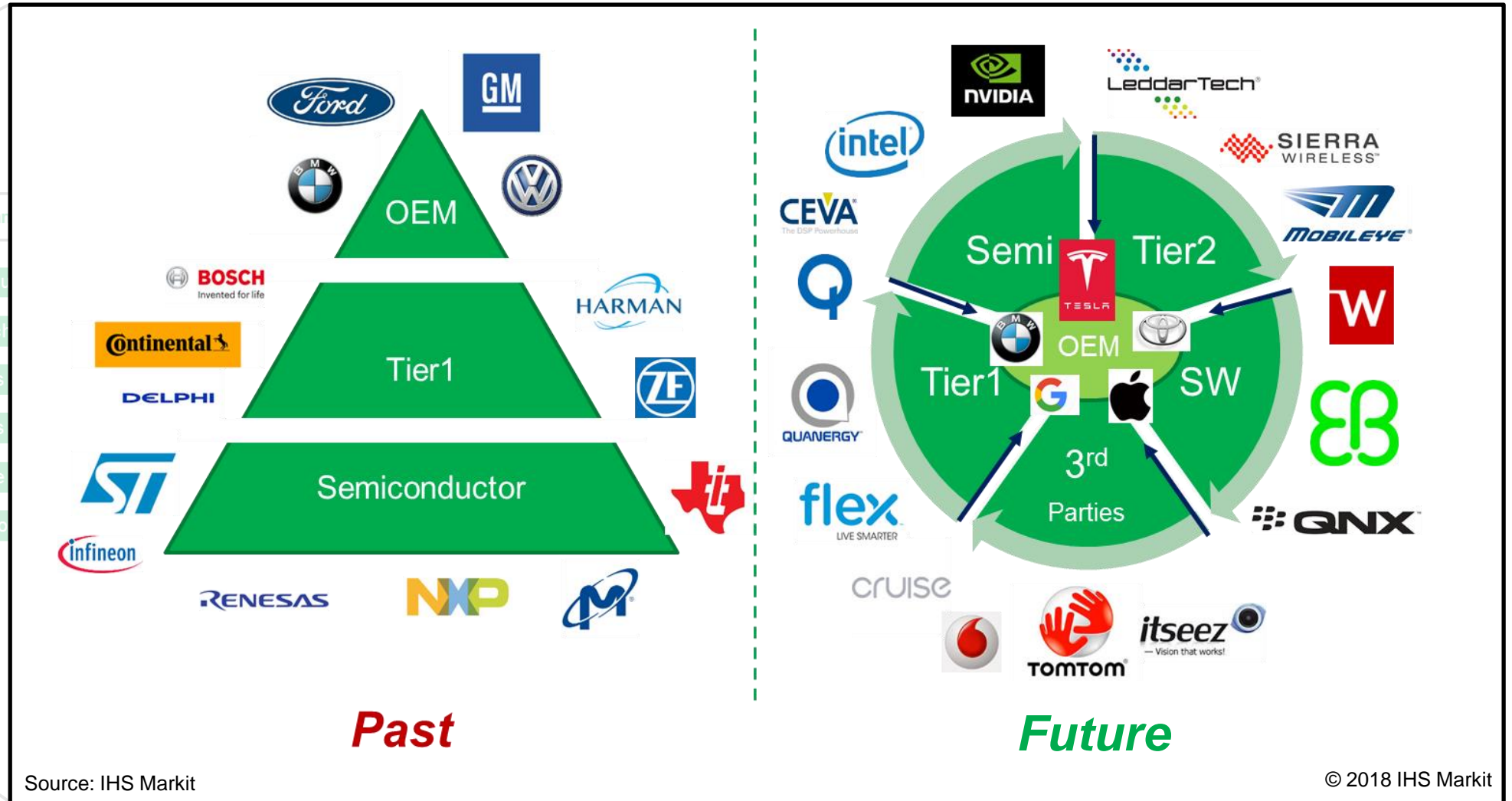
Research

Assess

Assess

Evaluate

Apply senso



New mobility paths: How will OEMs, tech companies reach commercialization?

All in

- Develop vehicle
- Develop autonomous drive system—either internal or through acquisition
- Develop connected car platform
- Develop mobility services model and business, also including partnerships
- Examples: GM, Ford

Partnerships

- Partnerships for developing autonomous drive system
- Independent commercialization, integration
- Example: Honda, BMW-Intel-Mobileye-FCA-Aptiv-Continental-Magna consortium

System development for MaaS

- Develop autonomous drive system
- Develop mobility services model, infrastructure
- Develop ability to integrate on any vehicle
- Use OEM for vehicle supply
- Commercialization of autonomous drive system, supply to others
- Examples: Waymo, Aptiv, potentially Amazon, Apple

Combinations

- Some OEMs are well along the way to independent development, adding select partnerships
- Example: Toyota, Daimler, BMW, Volkswagen

thank you!

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