March 26, 2019

APTIV

Autonomous Mobility Teach-In
Today’s Discussion

PRESENTATION

10:00 AM

AUTOMATED DRIVING ON THE SPECTRUM OF ACTIVE SAFETY
Aptiv uniquely positioned for success across each phase of deployment

COMMERCIALIZING AUTOMATED MOBILITY ON DEMAND (AMOD)
Deep understanding of technology and commercial roadmaps to deploy at scale, while maximizing return on investment

Q&A

11:00 AM

LUNCH & COMMAND CENTER DEMO

11:30 AM

Lunch, continued Q&A and opportunity to interact with Aptiv Mobility Cloud interface

NOON

CONCLUDE
This presentation, as well as other statements made by Aptiv PLC (the “Company”), contain forward-looking statements that reflect, when made, the Company’s current views with respect to current events, certain investments and acquisitions and financial performance. Such forward-looking statements are subject to many risks, uncertainties and factors relating to the Company’s operations and business environment, which may cause the actual results of the Company to be materially different from any future results. All statements that address future operating, financial or business performance or the Company’s strategies or expectations are forward-looking statements. Factors that could cause actual results to differ materially from these forward-looking statements are discussed under the captions “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the Company’s filings with the Securities and Exchange Commission. New risks and uncertainties arise from time to time, and it is impossible for us to predict these events or how they may affect the Company. It should be remembered that the price of the ordinary shares and any income from them can go down as well as up. The Company disclaims any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events and/or otherwise, except as may be required by law.

Forward Looking Statements
We are a global technology company that develops safer, greener and more connected solutions, which enable the future of mobility.
Aptiv Addressing Mobility’s Toughest Challenges

PROVIDING END-TO-END SOLUTIONS THAT ENABLE THE COMMERCIALIZATION OF NEW MOBILITY

Aptiv’s advanced technologies and deep systems knowledge across the brain and nervous system of the vehicle…

...allows us to conceive, specify and deliver solutions for some of our customers’ toughest challenges

POWER
Energize sensors and components

DATA
Transmission and processing throughout the vehicle

COMPUTE
Collect and process the information

SOFTWARE
Act on the information to enable functionality

ACTIVE SAFETY
Increasing levels of safety automation on the path to automated driving

HIGH VOLTAGE ELECTRIFICATION
Greater vehicle electrification for propulsion and performance

INFOTAINMENT & USER EXP
Improved in cabin experiences for greater comfort and productivity

Foundational elements for every vehicle solution
Traffic Fatalities Increasing After Years of Declines

ACTIVE SAFETY A CRITICAL NEXT STEP IN REDUCING VEHICLE FATALITIES

Source: NHTSA, World Health Organization, The Economist
Safety Automation

MARKET EVOLVING AS A CONTINUUM, RATHER THAN DISCRETE LEVELS

HARDWARE CONFIGURATION

LEVEL 0/1 LEVEL 2 LEVEL 2+ LEVEL 3- LEVEL 3+ LEVEL 4 LEVEL 5

BASE
- Adaptive Cruise
- Blind Spot Detect
- Forward Collision Warning
- AEB
  - Vehicles
  - Pedestrians

MID-RANGE
- Blind Spot Assist
- Lane Departure
- Lane Keep
- Auto High Beams
- Rear Exit Assist
- Rear Collision Warn
- Cross Traffic Warn
- Traffic Sign Rec
- AEB
  - Bicycles
  - Oncoming Traffic
  - Rear / Backup

PREMIUM
- AEB Intersection
- Auto Lane Change
- Auto Park Assist
- Surround View
- Highway Assist
- Front Cross Traffic Assist
- Traffic Jam Assist

AUTOMATED DRIVING
- Traffic Jam Pilot
- Highway Pilot
- Traffic Pilot
- Urban Pilot
- Mobility on Demand

EXAMPLE FUNCTIONALITY

LEVEL 3+
- AEB Intersection
- Auto Lane Change
- Auto Park Assist
- Surround View
- Highway Assist
- Front Cross Traffic Assist
- Traffic Jam Assist
- Traffic Jam Pilot
- Highway Pilot
- Traffic Pilot
- Urban Pilot
- Mobility on Demand
Active Safety Leading To Automated Driving

INVESTMENTS IN SOFTWARE, SENSING AND COMPUTE DRIVE BENEFITS TODAY AND IN THE FUTURE

DEMOCRATIZATION OF ACTIVE SAFETY
Base Active Safety functionality moving from premium vehicles to mass market platforms. Adoption driven by increased consumer awareness, scale-up improving affordability, and evidence of effectiveness driving rating agency and regulatory standards.

COMMERCIALIZATION OF AUTOMATED DRIVING
Mobility on Demand (AMoD) applications in geo-fenced areas represent initial deployments, helping provide more equitable access to mobility. Longer-term, convergence with OEM product and technology roadmap helps drive consumer introductions.

PERFORMANCE / COST SWEET SPOT
Maximizes the safety benefit while maintaining a system cost the customer can afford.
Automated Driving Investments

ACQUISITIONS OF AUTOMATED DRIVING SOFTWARE STACK PROVIDERS AND STRATEGIC INVESTMENTS IN SOLID STATE LiDAR COMPLEMENT EXISTING APTIV CAPABILITIES

SOFTWARE
STRATEGIC ACQUISITIONS OF AUTOMATED DRIVING SOFTWARE AND SUPPORTING TECHNOLOGY PROVIDERS

SOLID STATE LiDAR
STRATEGIC INVESTMENTS ENSURE ACCESS TO TECHNOLOGY WHILE ACCELERATING COMMERCIALIZATION
Today’s Presenters

Karl Iagnemma
President,
Aptiv Autonomous Mobility

Brandon Eldredge
Chief Financial Officer,
Mobility & Services Group
Urban Mobility

CHALLENGES by 2050

- +70% Of Population
- +40% Freight

- 5x Emissions
- 4x Cost
- 3x Travel time

BENEFITS of smart mobility automation to cities

- 87% Fewer Accidents
- 28% Fewer Vehicles
- 66% Lower Emissions
- 44% Fewer Parking Spaces
- 30% Shorter Travel Time

Source: Arthur D. Little, World Economic Forum, Boston Consulting Group and Aptiv Estimates
2015

1ST COAST-TO-COAST AUTOMATED DRIVE: 3400 MILES IN 99% AUTONOMOUS MODE
APTIV AND NUTONOMY INDEPENDENTLY SELECTED FOR WORLD’S FIRST PUBLIC AMOD RIDE-HAILING TRIAL ON CITY ROADS
DEMONSTRATED ADVANCED AUTOMATED DRIVING CAPABILITIES AT CES AND SHANGHAI AUTO SHOWS
Las Vegas Commercial Deployment Progress

- **First Commercial AMOD Deployment on Lyft Ride Hailing Network**
- **2,100+ Destinations Served**
- **75 Automated Vehicles**
- **40,000+ Paid Autonomous Rides**
- **1,000,000+ Autonomous Miles Traveled**
- **4.95 Star User Rating Out of 5**
- **9 Out of 10 Would Ride Again**

Year: 2018
Benefits Of Las Vegas Deployment

DEVELOPING APPROACH THAT ALLOWS APTIV TO QUICKLY AND EFFICIENTLY SCALE FUTURE DEPLOYMENTS

GAINING REAL-WORLD EXPERIENCE WITH GENERAL PUBLIC
• Improving understanding of support requirements for ongoing operations, to inform product roadmap and better serve mobility providers
• Identifying broader mobility ecosystem stakeholders, and act as an ambassador for the technology

DEVELOPING STANDARD OPERATING PROCEDURES FOR SEAMLESS INTEGRATIONS
• Clearly defining value chain roles and responsibilities, key touch points / handoffs and areas of integration
• Validating commercial model; proper allocation of trips (automated vs. manual) based on Operational Domain critical to optimizing network efficiency

SUPPORTING BROADER TECHNOLOGY AND IP DEVELOPMENT
• Command Center developing teleoperations capabilities which will be critical to deployment
• 30 vehicles on Lyft network, remaining fleet allows for testing and validation; ability to demonstrate application / first-use of IP in real-world deployment
2019 AD Milestones

CONTINUED PROGRESS TOWARDS COMMERCIAL DEPLOYMENT

NEXT GENERATION VEHICLE PLATFORM
Vehicle capable of driverless operation

- Integrated Aptiv Software Stack (ottomatika + nuTonomy)
- Modular code structure
- Mobility Cloud integration
- Drive-by-wire interface
- Redundant power brakes and steering gears
- Self-actuating doors
- Safety architecture with two redundant safety channels

EXPANDED DRIVING DIVERSITY
New city deployment…
… and a new region opened up for testing
# Aptiv Mobility Cloud

ENABLING MOBILITY PROVIDERS TO DEPLOY, DISPATCH, MONITOR AND SUPPORT A FLEET OF APTIV AVs

<table>
<thead>
<tr>
<th>Technical Capabilities</th>
<th>Key Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>STREAMING VIDEO</td>
<td><strong>DEPLOY</strong>&lt;br&gt;• Map resource updates&lt;br&gt;• AD software version control&lt;br&gt;• Launch workflow and fleet readiness</td>
</tr>
<tr>
<td>COMMAND &amp; CONTROL PIPING</td>
<td><strong>DISPATCH</strong>&lt;br&gt;• Vehicle dispatch and real-time routing&lt;br&gt;• Micro-dispatch (aka teleoperation)&lt;br&gt;• Optimization algorithms (demand, maintenance, etc.)</td>
</tr>
<tr>
<td>OTA</td>
<td><strong>MONITOR</strong>&lt;br&gt;• Historical fleet analytics (incl. utilization)&lt;br&gt;• Real-time monitoring &amp; diagnostics (AV and vehicle)&lt;br&gt;• Safety driver/operator monitoring</td>
</tr>
<tr>
<td>NOTIFICATIONS</td>
<td><strong>UX SUPPORT</strong>&lt;br&gt;• Automated rider HMI updates&lt;br&gt;• Cabin monitoring &amp; video conferencing&lt;br&gt;• User profiles (music, entertainment etc.)</td>
</tr>
<tr>
<td>AUTHORIZATION &amp; AUTHENTICATION</td>
<td></td>
</tr>
<tr>
<td>STREAMING TELEMATICS</td>
<td></td>
</tr>
</tbody>
</table>

**Example Interface**

![Example Interface](image-url)
Organizational Capabilities

INVESTMENTS INCREASING CAPABILITIES WHILE GENERATING SUBSTANTIAL INTELLECTUAL PROPERTY

LEVERAGING GLOBAL ACTIVE SAFETY CAPABILITIES

HEADCOUNT

+ 700

PATENTS Issued and Pending

240

• PLANNING
• PERCEPTION
• LOCALIZATION
• VEHICLE CONTROL
• OTA / DATA MANAGEMENT
• VEHICLE BUILD
• OTHER
Flexible And Scalable Approach To Software

LEVERAGING FULL APTIV CAPABILITIES

MODULAR APPROACH
Flexible software design allows tailored solution

ROBUST POLICY & PLANNING CAPABILITIES
Combined DNA from two full-stack automated driving teams

LEVEL 1 to LEVEL 5
SCALABLE PLATFORM
Seamless scalability from Active Safety to Automated Driving
Structured AI Approach

COMBINING THE BEST OF RULES BASED AND AI APPROACHES TO AUTOMATED DRIVING SOFTWARE DEVELOPMENT

EXPLAINABLE

- LAWS
- INTERPRETATION
- SPECIFICATION
- IMPLEMENTATION
- BEHAVIOR

START WITH RULES OF THE ROAD
- Rules organized hierarchically with some rules more important than others
- Potential rule violation quantified / weighted with regard to same priority rule

AI FILLS IN CORNER CASES
- Unique situations / cultural norms addressed through applied machine learning
- Avoids exhaustive description of rule combinations / region specific rewrites
Regulation Not Holding Back AV Deployment

OVERWHELMING SUPPORT FOR SAFE DEVELOPMENT AND DEPLOYMENT AT SCALE; PROACTIVE ENGAGEMENT HELPS ENSURE SMOOTH EXECUTION

UNDERSTAND KEY STAKEHOLDER REQUIREMENTS, AND MOBILITY CHALLENGES

**STAKEHOLDERS**
- Municipal and State Transit Authorities
- TNC Regulators
- High Interest Location Owners
- State and Municipal Legislators
- Law Enforcement

**OPPORTUNITIES**
- First Mile / Last Mile
- Public Transit Gaps
- Underserved Areas
- City / State Initiatives
- High Congestion Areas

Examples only, not an exhaustive list

MUNICIPAL SUPPORT ENABLES ACCESS TO INFRASTRUCTURE WHICH IMPROVES SERVICE

- DSRC FOR TRAFFIC LIGHT CONDITION MONITORING
- ACCESS TO BUS Lanes / Stops
- DESIGNATED PICK-UP & DROP-OFF (PuDo) LOCATIONS
Smart City Selection

DEPLOYMENTS EXECUTED ON A SELECTIVE CITY BY CITY BASIS TO MAXIMIZE RETURN ON INVESTMENT

MARKET SELECTION CRITERIA

DEMOGRAPHIC
- Ride Hailing Penetration And Driver Income
- Population Density
- Climate / Weather

OPERATIONAL DOMAIN
- Number Of Vehicles Required
- Traffic Speed, Corner Cases Encountered
- Similarities To Other Deployed Cities

INTANGIBLES
- Market Need / Opportunity To Address Transit Issues
- Alignment To City Strategy / Municipal Buy-In

DEEP UNDERSTANDING OF OPERATIONAL DOMAIN IMPACTS ON CITY DEPLOYABILITY
Commercializing Automated Driving

APPLYING DECADES OF EXPERIENCE IN AUTOMOTIVE GRADE SAFETY SOLUTIONS TO ADVANCE THE FUTURE OF MOBILITY

FOUNDATION
- DEEP VEHICLE SYSTEMS KNOWLEDGE
- CERTIFICATION AND TESTING EXPERTISE
- 30 YEARS OF SAFETY EXPERIENCE

DEVELOPMENT & TESTING
- OPTIMIZED, FAIL-SAFE ARCHITECTURE
- MODULAR, FAIL-SAFE SOFTWARE
- 1+ MILLION AUTOMATED MILES TRAVELED

COMMERCIALIZATION
- MULTIPLE PATHS TO MONETIZING INVESTMENTS
- COLLABORATIVE APPROACH TO ENABLING MOBILITY
- L1 to L5
Mobility Ecosystem
AMoD Requires Four Primary Roles

MOBILITY PROVIDERS NEED APTIV AUTOMATED DRIVING SOLUTIONS

- Software
- Sensors
- Compute platform
- Mobility cloud

- Vehicle development
- Vehicle production
- Automated driving system integration

- Vehicle ownership
- Vehicle financing
- Fleet management
  Cleaning, repair, charging, parking, insurance, etc.

- Consumer interface
- Demand fulfilment

Las Vegas Example

Automated Driving System

VEHICLE

Las Vegas Example

NEXT-GEN VEHICLE
(future)

BROADER ECOSYSTEM

(APTIV)

DATA MONETIZATION

Las Vegas Example

LAS VEGAS CASINOS

DATA CONSUMERS

Las Vegas Example

RTC

(LAS VEGAS STAKEHOLDERS AND REGULATORY BODIES)

Las Vegas Example

LVPD

APTIV

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example

Las Vegas Example
How Aptiv Makes Money

BUSINESS MODEL DRIVES HIGH MARGIN RECURRING REVENUE

TECHNOLOGY SALE
One-time sale of enabling tech into the vehicle such as sensors, and compute

SOFTWARE LICENSING
Autonomous driving stack including upgrades to performance and operational design domain

FLEET MONITORING
Support network operators through AV fleet performance analytic and teleoperations

DATA MONETIZATION
Enable data acquisition and monetization through edge processing and OTA

Customers

Sales Type

$ ONE-TIME SALE
When Will Autonomous Vehicles Arrive?

CONSISTENT, REALISTIC EXPECTATIONS FOR DEPLOYMENT – APTIV TIMELINE REMAINS UNCHANGED

Autonomous Vehicle Penetration

- **PERSONALLY OWNED VEHICLES**
- **MOBILITY PROVIDER FLEETS**

**2018**
- Pilots in multiple, thoughtfully selected cities

**2021 / 2022**
- Initial commercial deployments in geofenced locations

**2030+**
- Initial rollouts of personally owned automated vehicles

**2050**
- Slow, but steady increase as individuals purchase new vehicles
- Significant penetration of safety automation leads to traffic fatalities reduced by as much as 90%

Sources: Company and OEM Estimates, Boston Consulting Group, McKinsey & Company
# Automated Mobility Deployment Phases

**APTIV UNIQUELY POSITIONED FOR SUCCESS ACROSS EACH PHASE OF AD MATURITY**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Technology Demonstration</th>
<th>Greenfield Launches</th>
<th>Broader Adoption</th>
<th>OEM Convergence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Today</strong></td>
<td>Limited Capabilities</td>
<td>Small, But Viable</td>
<td>Rapid OD Expansion</td>
<td>Robust</td>
</tr>
<tr>
<td>Software Maturity</td>
<td>Manual interventions required for corner cases, necessitates a safety driver</td>
<td>Viable without a driver in limited geofenced areas, under strict operating conditions</td>
<td>Significant decrease in limitations increases operational domain.</td>
<td>Able to handle enough corner cases to make it viable for personal vehicle applications</td>
</tr>
<tr>
<td>Hardware Maturity</td>
<td>Not Fail-Safe</td>
<td>Expensive Fail-Safe</td>
<td>Auto Grade</td>
<td>OEM Standard</td>
</tr>
<tr>
<td>Safety Driver</td>
<td>Safety driver acts as the back-up in the event of a hardware failure</td>
<td>Leveraging industrial PC hardware, but sufficient to start driving launches, and beginning to scale</td>
<td>ASIL-D purpose built hardware is ready for deployment at scale</td>
<td>OEM vehicles come off the assembly line fully configured for automated driving</td>
</tr>
<tr>
<td>Competitive Landscape</td>
<td>Research</td>
<td>Initial Deployments</td>
<td>Mobility Scale-Up</td>
<td>Converging with OEMs</td>
</tr>
<tr>
<td>Many players dabble, but limited real world deployments. Compete for talent and capital, but little else.</td>
<td>Greenfield on a city-by-city basis. Compete based on smart deployment SOPs</td>
<td>Significant ramp-up in scale / speed of deployments. Compete based on robustness of operational domain.</td>
<td>OEM AD availability pushes point of AD systems competition earlier in the value chain</td>
<td></td>
</tr>
</tbody>
</table>
Automated Mobility Growth Plan

ON TRACK TO 2025 REVENUE TARGET

INVESTMENT
Strategically investing to establish leading position in automated mobility on demand; spend highly applicable to longer term Active Safety / AD OEM position

$ Millions
$58 $160 $180

REVENUE
Addition of new cities and expansion of operational domain capabilities drives increasing installed base generating high margin recurring revenue

$ Billions
$0.5B

TODAY
2022
2025
2030

RECURRING REVENUE
ONE-TIME SALE
Summary

AUTOMATED MOBILITY ON TRACK TO 2025 TARGETS
• Clear strategy for commercialization drives efficient capital deployment, avoids channel conflict
• Deep understanding of operational and regulatory impacts ensures smooth deployments

TECHNOLOGY CAPABILITIES DEVELOPING AS EXPECTED
• 2021 / 2022: Initial launches with mobility providers in geofenced locations
• 2025 - 2030: Improved capabilities, and scale-up of purpose built hardware drives OEM viability

LONGER TERM ROADMAP FOR CONVERGENCE WITH OEMs
• Automated Driving on the spectrum of Active Safety; investments today drive future benefits
• Aptiv’s end-to-end solutions enable the commercialization of new mobility