A Winning Combination
RISK FACTORS

• Statements in this presentation that refer to future plans and expectations are forward-looking statements that involve a number of risks and uncertainties. Words such as "anticipates," "expects," "intends," "goals," "plans," "believes," "seeks," "estimates," "continues," "may," "will," "would," "should," “could,” and variations of such words and similar expressions are intended to identify such forward looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements. Such statements involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements. Important factors that could cause actual results to differ materially from the company's expectations are set in Intel's earnings release dated April 26, 2018, which is included as an exhibit to Intel's Form 8-K furnished to the SEC on such date. Additional information regarding these and other factors that could affect Intel's results is included in Intel's SEC filings, including the company's most recent reports on Forms 10-K and 10-Q. Copies of Intel's Form 10-K, 10-Q and 8-K reports may be obtained by visiting our Investor Relations website at www.intc.com or the SEC's website at www.sec.gov.
AV TECH MUST BE SAFE, SCALABLE, AND RELEVANT TODAY

BUILDING BLOCKS (SINGLE EFFORT)

ECONOMIC SCALABILITY

VERIFIABLE SAFETY
## MULTIPLE LARGE ACCESSIBLE MARKETS

### ADAS (L1/L2)
- Next-gen safety beyond seatbelts / airbags
- ~80% of revenue, growing >40% per year, mid-$40 ASP.
- Currently 15% penetration of 90m annual auto production

### AFTERMARKET
- Collision avoidance retrofit onto vehicles already on road
- ~20% of revenue. Majority Israel...large opportunity ROW
- 1 billion vehicles on road globally

### CONSUMER-TARGETED AV (L2+/L3)
- Highway autonomous for consumer convenience
- EQ4, multiple cameras, mapping, planning / RSS. ASP up to $200
- 11 design wins with OEM's represent >50% share launch from '18

### FULLY AUTONOMOUS (L4/L5)
- Compete on Safety and Economic Scalability. 2x EQ5 plus IA.
- Primarily targeted at networked ride-share.
- 100-vehicle fleet in 2018, Aptiv launch in 2019, BMW / FCA launch in 2021. (More to come...)
2007
First camera/radar fusion

2008
First bundling of lane departure warning, intelligent high-beam, traffic sign recognition

2010–11
First pedestrian automatic emergency braking

2013
First camera-only adaptive cruise control and traffic jam assistant

2015–2016
First camera-only full auto braking (AEB)

2017–2018
First camera/fusion system for Level 3 (Audi A8*)

REM™ mapping launch: Two million vehicles collecting data by YE 2018

2010–11
First camera-only forward collision warning

2013
First camera-only AEB (partial braking)

2015–2016
First camera-only advanced adaptive cruise control (Nissan Pro-Pilot*)

2017–2018
EyeQ4® launch—L2+ and above with 11 OEMs
CONTINUING TO WIN IN ADAS (L0-L2)

27M
Systems shipped to date

30
Design wins in 2017
(2.5x vs 2016)

46%
Unit Growth in 2017

15
Launches in 2018
(2.5x vs 2017)
CONSUMER-TARGETED AV (L2+/L3)

A major leap in Adaptive Cruise & Lane-Keeping Support

Software: Computer Vision + Roadbook™ + Policy & RSS
Hardware: Tri-focal / 8mp camera + EyeQ®4 SoC
3 FACETS OF AUTOMATED DRIVING

SENSE
- Perception of the complete environment
- The raw material

PLAN
- Decision-making
- Analyze the raw material, and what action to take

ACT
- Execute the plan
- Control acceleration, braking, steering
ME/INTEL AUTONOMOUS DRIVING CORE ENGINES

Visual perception  Sensor Fusion  Dynamic mapping  RL-based Driving Policy  Compute platform

RSS
Two Ways to Do AV: Compute-Intensive vs. Economically Scalable

Compute Intensive through General Purpose processing

**Sense**
- HD Camera
- HD Radar
- HD Lidar

**High-level AI based sensor fusion**
- HD MAP with multisensor layers
- 360-degree environment model
- 3 cm of accuracy

**Plan**
- Trajectory planning
- Many possible trajectories
- Safety models using 5 seconds of whole scene prediction

**Act**
- Trajectory validation
- Actuation

Economically Scalable through Purpose-built processing

**Sense**
- Surround Computer Vision

**Low-level sensor fusion w/localization**
- Roadbook (REM)
- 10 cm of accuracy

**Plan**
- Trajectory planning
- Cautious Commands
- A few, simple, "semantically aligned" next 100 ms moves

**Act**
- Trajectory validation
- Responsibility Sensitive Safety
- Actuation

Non-Scalable Compute Stages

Cautious Commands

Responsibility Sensitive Safety
Harnessing the Power of Intel

Closed EyeQ®5

SOLUTION ARCHITECTURE

Fleet

Data Center

• 100 vehicles
• Data collection/validation, customer demonstration, scenario testing

Open EyeQ®5
Open compute platform with SDKs and Libraries

Intel Atom®

(INTEL ATOM®
SOC
(Trajectory
Validation &
Issuance)

EyeQ®5
(Vision)

EyeQ®5
(Fusion &
Policy)

Sensors

To actuators

• 250 Pb for Fleet support
• Validation and customer support

Intel

Intel

Intel

EyeQ®5
(Fusion &
Policy)
POWER OF CHOICE

AV Partnerships come in several forms

Turnkey: CV, mapping, fusion, driving policy, safety, MDC (2 x EQ®5 + Atom)
  • Demonstrated in 100 car fleet

Perception Turnkey: CV / Mapping (closed-EyeQ®5); Fusion / Driving Policy (open-EyeQ5)
  • Fusion and/or Policy software in collaboration with or solely by OEM/Tier-1

Open-compute + Libraries
SAFETY VALIDATION

How would you demonstrate that an automated vehicle is safe?
To demonstrate AV system safety, we would need to drive ~30 million miles, which equals human drivers. Over a year, 100 cars driving 24/7/365 would take 1.3 years. To build trust, we need to be better by 2-3 orders of magnitude. Not safe.

THE STATISTICAL APPROACH TO SAFETY

The more miles I drive, the safer I am

To demonstrate AV system safety\(^1\)

We would need to drive

100 cars driving 24/7/365 would take

99%-99.9% BETTER THAN HUMAN DRIVERS

\(~3\text{B}-30\text{B}~\text{MILES}\)

\text{BETWEEN 100-1000 YEARS}

Not just once: Every update of hardware & software

Not Safe

Not Affordable

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A BETTER SOLUTION: RESPONSIBILITY SENSITIVE SAFETY (RSS)

An open and transparent industry standard that provides verifiable safety assurance for AV decision-making

FORMALIZE
Human notions of safe driving

DEFINE
Dangerous situations and proper responses

AVOID
Causing and being involved in crashes

RSS is technology neutral starting point for the industry to formalize what it means for an AV to drive safely
Planning is how you get from point A to point B

RSS helps keep you safe along the way

**4 FACETS OF AUTOMATED DRIVING**

**PLAN**
- Analyze the raw material, and consider actions
- Propose a Decision

**RSS IS A PLANNING SAFETY SEAL**
AV SAFETY: AN ISSUE LARGER THAN ONE COMPANY

What are we doing

**INDUSTRY**
Engaging with customers, competitors and consortia to have an open dialogue on the safety assurance of AV's

**GOVERNMENT / NGO'S**
Understanding government and NHO expectations on transparency and measurable verification of AV's

**ACADEMIA**
RSS Research Centers at Universities in key geographic markets

**REAL WORLD**
Deploying RSS in our AV Fleet in some of the most challenging environments