

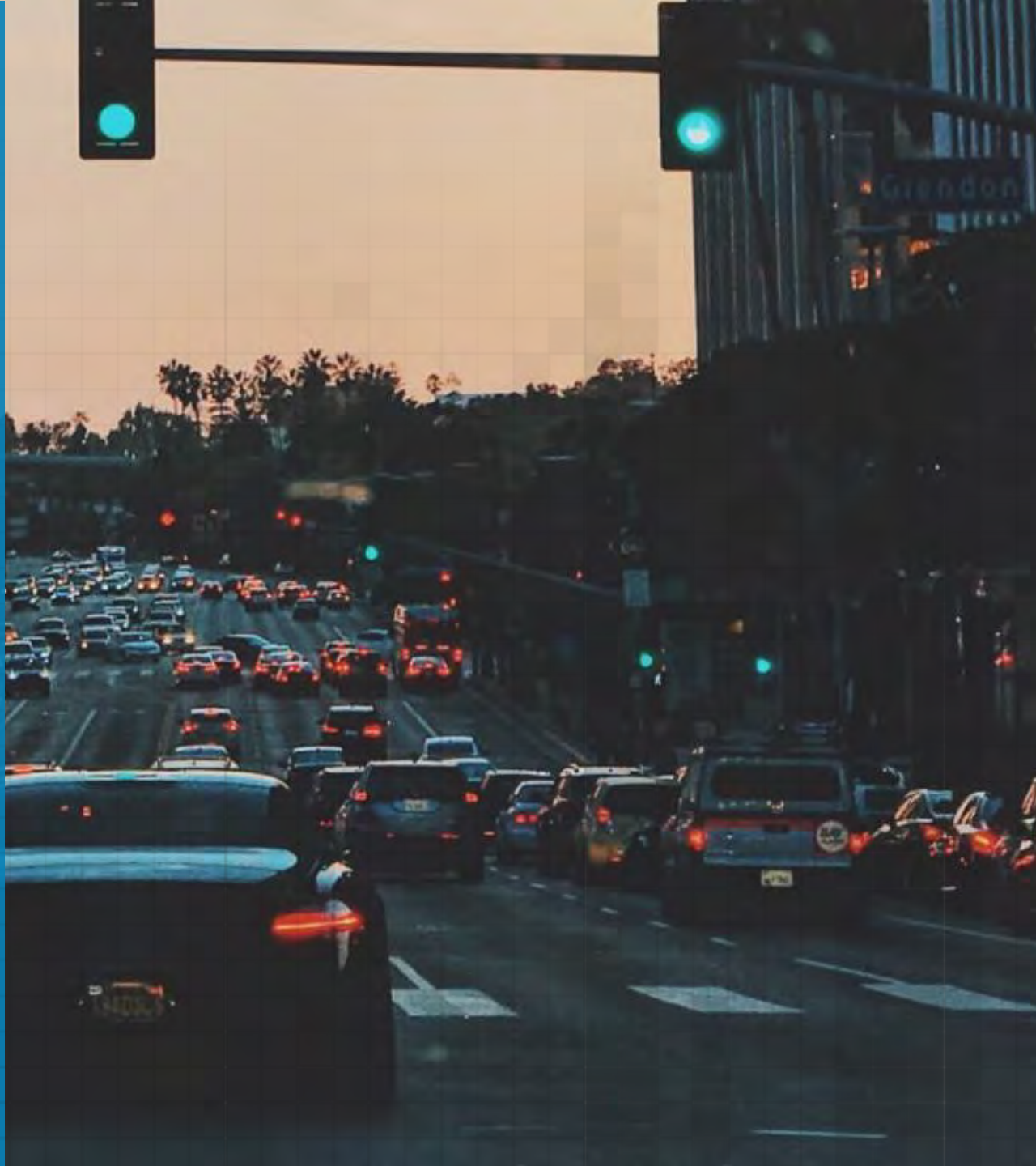


April 17, 2020

# Dougherty & Co. Virtual NDR Presentation

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# Forward-Looking Statements

This presentation contains forward-looking statements that are subject to many risks and uncertainties. All statements made in this presentation other than statements of historical facts are forward-looking statements, including, without limitation, statements regarding Ambarella's strategy, future operations, financial targets, future revenues, projected costs, prospects, plans and objectives for future operations, future product introductions, future rate of our revenue growth, the size of markets addressed by the company's solutions and the growth rate of those markets, technology trends, our ability to address market and customer demands and to timely develop new or enhanced solutions to meet those demands, our ability to achieve design wins, and our ability to retain and expand our customer and partner relationships.

In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential," or the negative of those terms, and similar expressions and comparable terminology intended to identify forward-looking statements. We have based forward-looking statements largely on our estimates of our financial results and our current expectations and projections about future events, markets and financial trends that we believe may affect our financial condition, results of operations, business strategy, short term and long-term business operations and objectives, and financial needs as of the date of this presentation. Although these forward-looking statements are based upon information available at the time the statements are made and reflect management's good faith beliefs, forward-looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause actual results, performance or achievements to differ materially from anticipated future results. Important factors that could cause actual results to differ materially from expectations are disclosed in Ambarella's annual reports on Form 10-K and quarterly reports and Form 10-Q filed with the Securities and Exchange Commission (the "SEC"), particularly in the sections titled "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations." You should not place undue reliance on forward-looking statements, which speak only as of the date on which they are made. We do not undertake to update or revise any forward-looking statements after they are made, whether as a result of new information, future events, or otherwise, except as required by applicable law. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this presentation may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

Before you invest, you should read the annual and quarterly reports and other documents Ambarella has filed with the SEC for more complete information about the company and its ordinary shares. Additional information will also be set forth in Ambarella's future quarterly and annual reports and other filings made with the SEC from time to time. You may access these documents for free by visiting EDGAR on the SEC web site at [www.sec.gov](http://www.sec.gov).

# Ambarella Overview

## Ambarella **is an artificial intelligence (“AI”) company**

- Ambarella developed over a 3 year period an AI processor architecture specifically optimized for video edge-endpoint applications. The integration of this deep neural network AI processor with the company’s state-of-the-art video processor yields a highly optimized computer vision (“CV”) system-on-a-chip (“SoC”)
- Nearly \$400 million cumulative investment into CV targeting automotive, security camera and other robotic applications
- The first 3 production CV SoCs were taped-out and sampled in C2018 with all three products in production
- Three “waves” of CV revenue anticipated; professional security cameras, consumer security cameras and automotive cameras

## Founded 2004, IPO (NASDAQ: AMBA) 2012

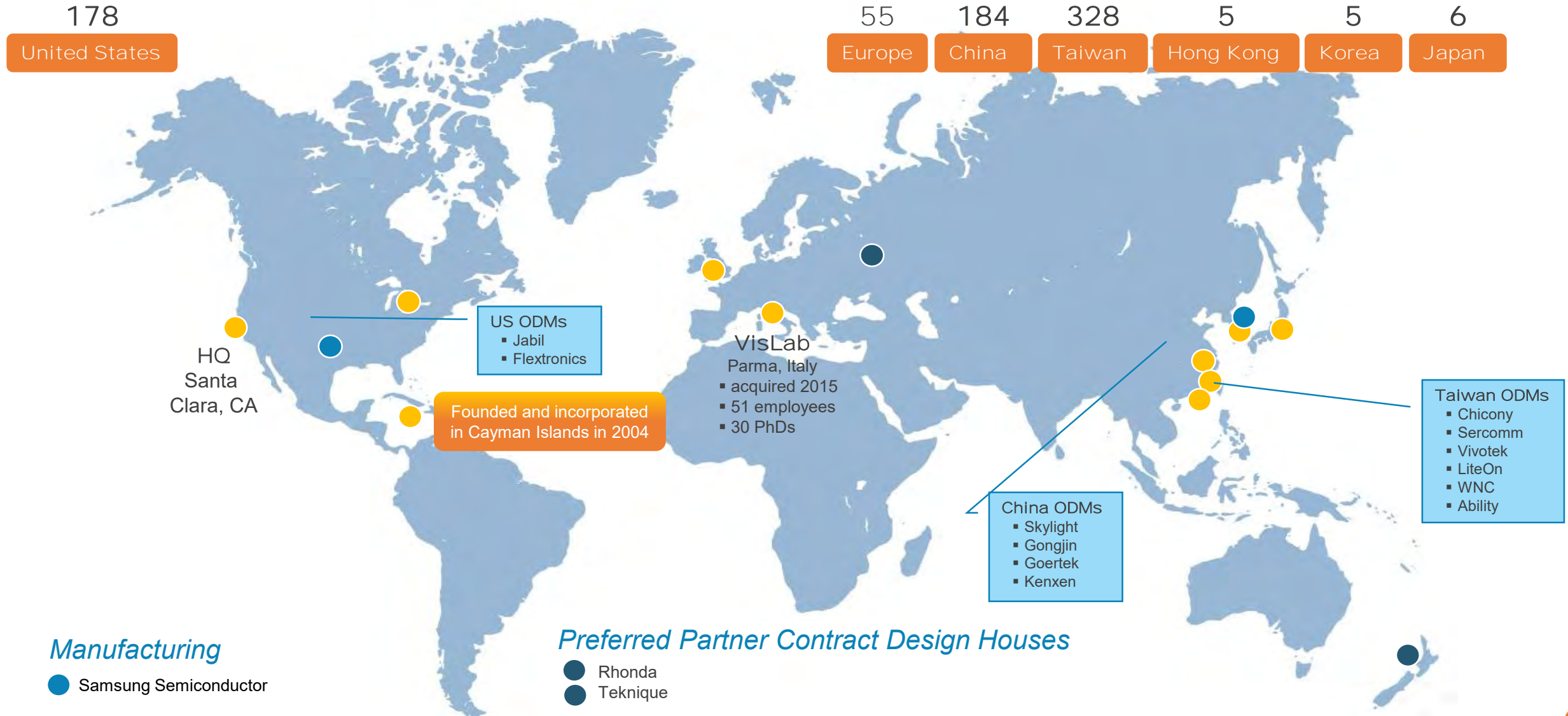
- Focused on video applications, always with the premise that video is a special type of data requiring an optimized chip architecture
- Initially targeted consumer electronics and security cameras for low-power and high-resolution human viewing applications
- More than 270 million cameras enabled to-date

## Strong and liquid balance sheet

- \$405 million cash and marketable securities and no debt exiting Q4 F2020 (January 31, 2020)
- Positive operating cash flow
- Returned \$175 million to shareholders via stock repurchases in the last 3+ years

# Global Footprint

761 Employees Across US, Asia, and Europe





# Ambarella's Computer Vision System-on-a-Chip

*Leveraging 15 Years of Video Processing Expertise with a New and Proprietary AI Processor*

15 years of  
Video and  
Image  
Processing  
Experience

## **Programmable Computer Vision Platform**

with Optimized Coprocessor Acceleration



Video  
Compression



Image  
Processing








CVflow Deep  
Neural Network AI  
processor

**NEW**

CVflow architecture  
introduced in F2019  
after 3 years in  
R&D

# Scalable Computer Vision Portfolio

AI in the Camera - Superior Performance per Watt and Performance per Dollar

						
		CV25 – Mainstream	CV22 – Mid Range		CV2 – High End	
			CV22	CV22FS (ASIL-B)	CV2	CV2FS (ASIL-B)
Availability		Announced January 2019	Announced January 2018	Announced January 2020	Announced March 2018	Announced January 2020
		Mass production revenue July 2019	Mass production revenue December 2018	TBA	Production	TBA
Samsung low power 10nm process						
Computer Vision	Video Processing	Up to 3x cameras*	Up to 2x cameras*	Up to 3x cameras*	Up to 6x cameras* and stereo support	Up to 3x cameras* and stereo support
		8 megapixel sensors at 15 frames per second**	8 mega pixel sensors at 30 – 60 frames per second**			
	AI Processing	CVflow Deep Neural Network AI Processor (software tools port from TensorFlow, Caffe, ONNX, etc.)				
		½ of CV22 AI (CVflow)	Baseline (CVflow)		4x CV22 AI (CVflow)	2x CV22 AI (CVflow)

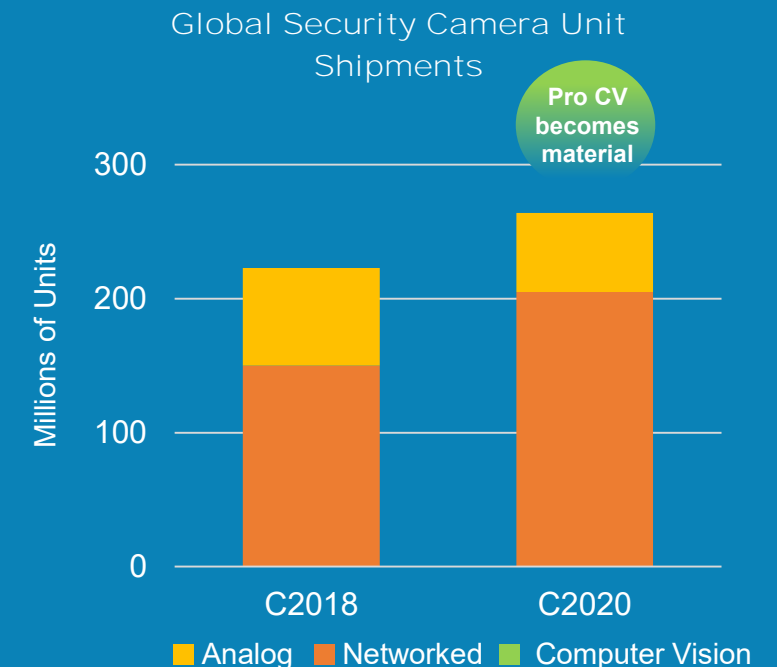
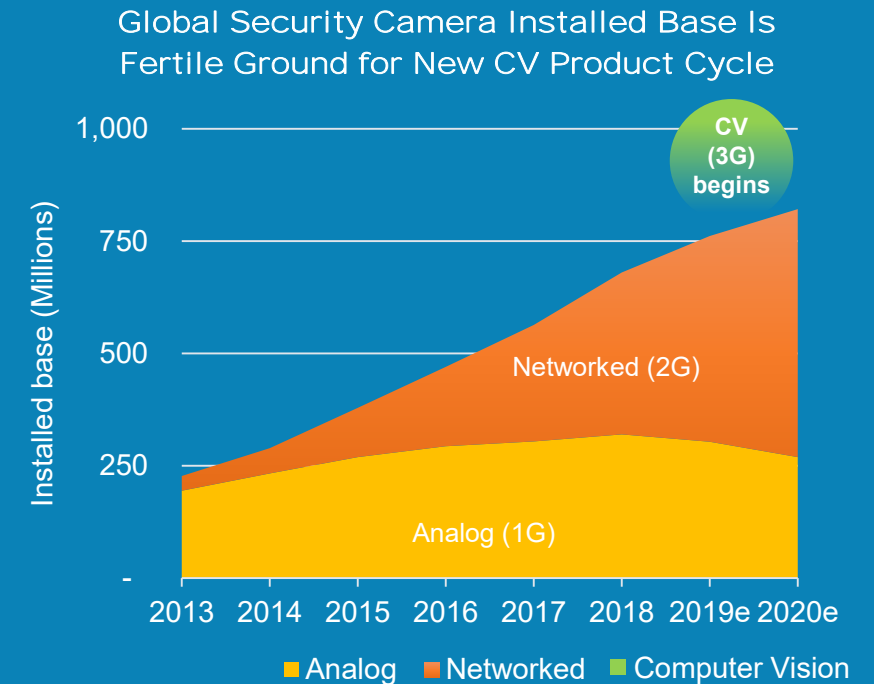
\*additional cameras can be supported using external SERDES

\*\*video processing trade-offs available between frames-per-second, resolution, and the number of cameras supported

# Security Camera Market

60%-65% *fiscal 2020 total revenue*

- Security camera revenue driven by enterprise, smart city and home spending
  - A majority from the professional security camera market
    - Primarily driven by enterprise and public spending (e.g. smart cities)
  - 3<sup>rd</sup> party research firms anticipate premium growth in the home security market
    - Primarily driven by household spending for durable goods
- ~750 million security camera global installed base in C2019
  - Ambarella has historically served the networked camera market
    - Human viewing for security applications
  - Ambarella's now also addresses the computer vision (CV) market
    - Human viewing and machine sensing for security applications (new product cycle with incremental ASP)
    - Machine sensing for many non-security applications (100% incremental)
- Global security camera unit shipments around 210 million in C2018
  - Computer vision and networked cameras expected to grow while analog shrinks



# Ambarella's Global Security Camera Footprint

*Enabling Most Major Enterprise, Smart City and Consumer Security Camera Companies*

## Professional Security

*Enterprise — Retail — Smart Cities — ITS — Smart Parking*



## Consumer Security

*Home Security — Smart Home Automation — Delivery Services*





# Automotive Camera System Target Markets

~15%-20% fiscal 2020 total revenue

Ambarella	Recorders		Forward-Facing ADAS	eMirrors		In-Cabin		Surround		Part-time & Full-time Autonomous
<u>2018 SAM</u> <u>2025 SAM</u>	<u>~\$300M</u> <u>~\$500M</u>		<u>\$1B+</u> <u>\$1.5B</u>	<u>&lt;\$10M</u> <u>&lt;\$250M</u>		<u>&lt;\$50M</u> <u>~\$500M</u>		<u>&lt;\$100M</u> <u>~\$250M</u>		<u>~\$100M</u> <u>~\$2.5B</u>
Ambarella F2020 Revenue	Majority of auto revenue today		New	New		New		New		New
Products (Examples)	A12, H22	CV25	CV22, CV22FS CV2, CV2FS	A12, H22	CV22 CV22FS	S5	CV22, CV22FS, CV2 CV22FS	A12, H22	CV22	CV2 CV2FS
Applications Human Vision (HV) and/or Machine Sensing(MS)	HV  Event Reconciliation	HV & MS  L0 ADAS	Machine Sensing  L0-L3 ADAS	Human Viewing	HV & MS  L0-L4 ADAS	Human Viewing	HV & MS  L0-L5 ADAS and PT/FT AD	Human Viewing	HV & MS  L0-L3 ADAS	Machine Sensing L2+ L3 L4 L5
Selected Partners and Engagements	OEM+T1 BAIC, DENSO, Geely, JVC, Honda, Nissan, SAIC, Toyota  Aftermarket Finedigital, Garmin, Nextbase, Thinkware		OEM+T1+T2 Hella Maxieye Momenta StradVision  Aftermarket Broadmann17 Minieye	OEM+T1 BAIC Gentex ZF	T1 Korea Japan ZF	Aftermarket Roadefend	Baolong Eyesight Eyeris Mercedes-Benz Readsense Stradvision ZF	Longhorn ZF	US OEM	

# Ambarella's Global Automotive Footprint

*OEM, Tier 1's, and Tier 2's*

## Computer Vision

*(Video Processor and AI Processor "CVflow")*



Mercedes-Benz  
Vans. Born to run.



**Longhorn**  
Automotive



OEM



## Human Viewing

*(Video Processor only)*

**DENSO TEN**

**Longhorn**  
Automotive



**TOYOTA**



Mercedes-Benz



**INV'O**

**ROADEFEND**  
径卫视觉

**JVC**



**HONDA**

**GENTEX**

# VisLab: 25+ Years of CV Technology Development Focused on Autonomous Driving Applications

- Acquired in 2015, spun-out from the University of Parma (Italy) in 2009
- Recognized globally for computer vision software expertise applied to autonomous vehicle applications
- Set worldwide milestones for autonomous driving, participating in multiple DARPA challenges
- Consistent track record of innovation



1993-1994  
Fully manual



Prometheus ADAS  
demo on closed track



Mille Miglia 2000+km  
on Italian highways  
94% autonomous  
steering



TerraMax 2004-2007  
Fully autonomous



DARPA Grand 132  
miles off-road 100%  
AV, driverless

DARPA Urban driving  
100% AV, driverless

VIAC 15km cross-  
continent drive  
100% AV following

Porter 2009-now  
4 fully autonomous  
electric vehicles



BRAiVE 2008-now  
Fully autonomous



PROUD 13km  
in Parma,  
100% AV



DEEVA 2014  
Fully Autonomous  
with 13 stereo  
camera systems



VW Tiguan 2017 4K sensors




EVA  
Embedded Vehicle  
Autonomy



# Competitive Landscape is Fragmented

*Ambarella's video processing expertise scales across multiple markets*

 Ambarella	Security Cameras		Automotive Cameras					
	Professional	Consumer	Recorders	Forward-Facing ADAS	eMirror	In-Cabin	Surround	PT/FT Autonomous
Ambarella	✓	✓	✓	✓	✓	✓	✓	✓
HiSilicon (Huawei)	✓	✓ China only	✓ Aftermarket					
Mobileye (Intel)				✓ (SW from Mobileye+SoC from STM="black box")				✓ DNN starts with EyeQ5
Movidius (Intel)	✓							
Nvidia	(Server based architectures)							✓ central AI processing
NXP				✓	No DNN for AI processing	✓	✓	
Qualcomm	✓	✓	✓					
Renesas				✓	✓	✓	✓	✓
SigmaStar		✓						
Texas Instruments				✓	✓	✓	✓	✓
Xilinx				✓	✓	✓	✓	✓
(IP Cores) Cadence, CEVA, etc.	✓	✓		✓ Incomplete solution				✓
(Others)	AMLogic, Fullhan, Ingenic, Will, Socionext, (Custom ASICs)		AIT, Novatek, iCatch (Custom ASICs)					(Custom ASICs)

# “Other” Revenue – Mostly “Consumer Discretionary”

*15%-20% fiscal 2020 total revenue*

- ~150% of Ambarella’s revenue decline between F2017 and F2019 was driven by “Other”
  - Business mix shifting...
    - ... away from consumer discretionary driven markets
    - ... to consumer durable, enterprise capital expenditure and government investments
- “Other” revenue expected to decline in dollars and as a percent of revenue over the next 2-3 years
- With a few exceptions, computer vision is not critical to “Other”
  - Some segments such as **police body cameras** and **commercial drones** are expected to adopt CV and remain attractive but relatively small market opportunities
- **Sports/action cameras, consumer drones, and AR/VR** markets have not come close to achieving market growth expectations and are relatively small opportunities

	C2016 (F2017)	C2017 (F2018)	C2018 (F2019)	C2019 (F2020)	
Security Cameras	35%-40%	45%-50%	60%-65%	60%-65%	focus market
Auto	10%-15%	10%-15%	15%-20%	15%-20%	focus market
Subtotal	45%-55%	55%-65%	75%-85%	75%-85%	focus market
Other	50%-55%	35%-40%	15%-20%	15%-20%	non focus
Total Revenue	\$310	\$295	\$228	\$229	



# Emerging Opportunities

*Includes consumer, enterprise and public applications*

## Robotics platform announced at CES 2020

- Robotic software development kit (“SDK”) is a unified software infrastructure targeting automated guided vehicles (AGV), consumer robots, industrial robots and other emerging Industry 4.0 applications
- Provides access and acceleration for common robotic functions including stereo, object detection, key points tracking, occupancy grid, visual odometry

## Robots for assistance, cleaning, delivery service, surveillance, warehouse, etc.

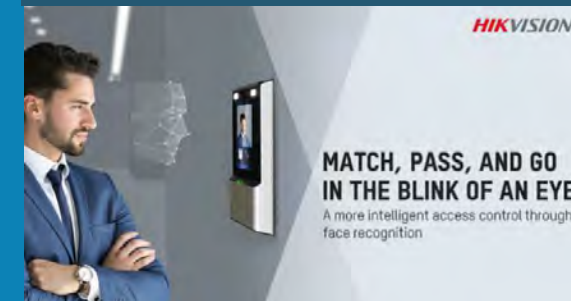
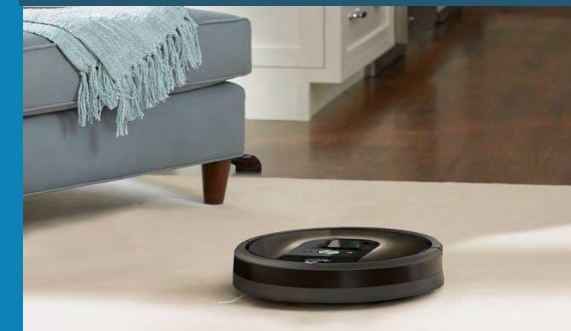
- Potential customer examples: Amazon, Alibaba, Baidu, Dyson, LG, iRobot, Segway, Walmart

## Machine vision applications include barcode reading, defect inspection and other manufacturing related applications

- Potential customer examples: Basler, Cognex, Fanuc, Keyence, Omron

## Access control and building automation

- Potential customer examples: Assa Abloy, Amazon, Honeywell, Schneider, Siemens



# Q4 F2020 (January 2020) Earnings Call Recap

Over 18 customer and partner engagements announced



10 Automotive customers/partners  
OEM, T1, and aftermarket  
3 CV and 7 videoprocessing



7 Security customers/partners  
3 professional and 4 smart home  
3 CV and 4 video processing



1 Other customer/partner  
1 sports camera  
1 video processing

	Market	Application	Customer/Partner	Product	AMBA	Comments
1	Auto	Active safety and viewing	ZF	Surround View Visualization	CV and Video Processing SoCs	"ZF is working with Ambarella on the next generation of intelligent viewing platforms for surround view visualization, driver monitoring stand-alone vision processing, and e-mirror solutions for the passcar and commercial vehicle markets." "The CVflow SoC's combination of high-quality imaging and advanced AI processing enables ZF to offer a wide range of viewing and interior sensing applications." (ZF VP ADAS)
2	Auto	Active safety and viewing	ZF	Driver Monitoring		
3	Auto	Active safety and viewing	ZF	E-Mirror		
4	Auto	FF ADAS-OEM	Maxieye	OEM is Yutong, IFVS-500	CV22AQ	Yutong is China's leading bus/coach OEM. Maxieye the tier 1
5	Auto	Recorder-OEM	INVO	OEM is LiXiang, One EV	S2LM	EV based on tier 1 INVO system, recorder with full HD recording
	Auto	eMirror-OEM	Gentex	OEM Aston Martin Super Legatta		Rear / side view cameras to improve driver view. Prototype
6	Auto	Recorder-AM	Garmin	Tandem	A12A	2 camera for front and inside a car, with night vision
7	Auto	Recorder-AM	Nextbase	622GW	H22	4K video at 30fps with stabilization, super-slow motion, night vision, and Alexa
8, 9, 10	Auto	Recorder-AM	Thinkware	QXD-3k, -mini, -Quantum	H22	3 models, QXD with 2 channel full HD, SFF and Quantum with 4K quad HD
11	Security	Professional	Vivotek	FE9382-V2	CV SoC	Outdoor 6MP fisheye smart IR with intrusion, crowd, and loitering detection
12	Security	Professional	Pelco	Sarix Enhanced S3	CV SoC	Critical infrastructure for enterprise and smart cities
13	Security	Professional	Motorola	H5M	VP SoC	Small footprint cost-effective camera for outdoor use, with unusual motion detection
14, 15, 16	Security	Home	ADT	ADT Blue (3 cameras)	S5L + S2L	3 DIY home cameras: indoors, outdoors, and doorbell
17	Security	Home	SIMToo	Simcam 1S	CV25	Facial recognition, pet and vehicle detection, auto-tracking and Alexa support
18	Other	Sports camera	Insta360	OneR	H22	Sports camera with 5.7K resolution, 360° capture or 4Kp60 wide angle

\*Partners announcing and/or demonstrating AI software on Ambarella's AI CV SoCs in Q4 included Anyvision (retail analytics), AWS (cloud tools), Broadmann17 (ADAS), Lumentum/ON (3D sensing/access control), Sensetime (ADAS) and StradVision (ADAS)

\*\*Ambarella generated CV revenue in F2020 from >100 unique customers ordering engineering parts, evaluation kits and/or development boards

\*\*\*Customer and partner engagements may not successfully materialize into revenue and, even if it does, the timing and amount of revenue generated can vary significantly

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# Q4 F2020 (January 2020) Review and Q1 Outlook

## *(Q4 F2020 reported March 3, 2020)*

- Geopolitical and now public health factors cause uncertainty to be high with a wide range of potential outcomes
  - COVID-19 risks are bringing additional levels of uncertainty to both demand and supply, this is in addition to the already high level of geopolitical risk factors
  - On October 15, 2019 we provided an update on the impact to our business from the Entity List published on October 9<sup>th</sup>. This brought clarity to some trade issues, but we continue to see a wide variety of geopolitical risks outstanding, including foreign policy, trade and IP matters. Factors potentially disruptive to our business include
    - potential export regulations on advanced technologies
    - potential for customers in China to take actions to reduce their dependence on U.S. components that could be subject to new geopolitical developments
    - changes to tariffs and/or the Entity List
    - market share shifts between our customers
    - supply chain issues
  - Our largest competitor in the security camera SoC market, HiSilicon, a unit of Huawei, is facing headwinds of their own
- Q1 F2021 (April, 2020) Outlook
  - The midpoint of our Q1 revenue guidance range of \$52.0 to \$57.0 million is above the sell-side analyst consensus expectation of \$49.9 million as of March 3rd
  - We anticipate all markets to decline seasonally, with the exception of the home security market where we are seeing strong and broad-based demand
  - We estimate Q1 gross margin between 57.5% to 59.5%
- Q4 F2020 (January, 2020) Results
  - Revenue of \$57.2 million was slightly above the mid-point of our guidance range of \$55.0 million to \$59.0 million and in-line with consensus, with auto and security camera seasonally down and “Other” revenue up sequentially
  - Non-GAAP EPS of \$0.14 and positive operating cash flow of \$4.1 million
  - No stock was repurchased under an existing authorization of \$50.0 million in place through June 2020





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