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9 Attorneys for WAYMO LLC

10 UNITED STATES DISTRICT COURT
 11 NORTHERN DISTRICT OF CALIFORNIA
 12 SAN FRANCISCO DIVISION

13 WAYMO LLC,
 14 Plaintiff,
 15 vs.
 16 UBER TECHNOLOGIES, INC.;
 OTTOMOTTO LLC; OTTO TRUCKING
 17 LLC,
 18 Defendants.

CASE NO. 3:17-cv-00939-WHA
FIRST AMENDED COMPLAINT
1. VIOLATION OF DEFEND TRADE SECRETS ACT
2. VIOLATION OF CALIFORNIA UNIFORM TRADE SECRET ACT
3. PATENT INFRINGEMENT
4. VIOLATION OF CAL. BUS & PROF. CODE SECTION 17200
DEMAND FOR JURY TRIAL

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1 Plaintiff Waymo LLC (“Waymo”), by and through its attorneys, and for its Complaint
2 against Uber Technologies, Inc. (“Uber”), Ottomotto LLC, and Otto Trucking LLC (together,
3 “Otto”) (collectively, “Defendants”), hereby alleges as follows:

4 **I. INTRODUCTION**

5 1. This is an action for trade secret misappropriation, patent infringement, and unfair
6 competition relating to Waymo’s self-driving car technology. Waymo strongly believes in the
7 benefits of fair competition, particularly in a nascent field such as self-driving vehicles. Self-
8 driving cars have the potential to transform mobility for millions of people as well as become a
9 trillion dollar industry. Fair competition spurs new technical innovation, but what has happened
10 here is not fair competition. Instead, Otto and Uber have taken Waymo’s intellectual property so
11 that they could avoid incurring the risk, time, and expense of independently developing their own
12 technology. Ultimately, this calculated theft reportedly netted Otto employees over half a billion
13 dollars and allowed Uber to revive a stalled program, all at Waymo’s expense.

14 2. Waymo developed its own combination of unique laser systems to provide critical
15 information for the operation of fully self-driving vehicles. Waymo experimented with, and
16 ultimately developed, a number of different cost-effective and high-performing laser sensors
17 known as LiDAR. LiDAR is a laser-based scanning and mapping technology that uses the
18 reflection of laser beams off objects to create a real-time 3D image of the world. When mounted
19 on a vehicle and connected to appropriate software, Waymo’s LiDAR sensors enable a vehicle to
20 “see” its surroundings and thereby allow a self-driving vehicle to detect traffic, pedestrians,
21 bicyclists, and any other obstacles a vehicle must be able to see to drive safely. With a 360-degree
22 field of vision, and the ability to see in pitch black, Waymo’s LiDAR sensors can actually detect
23 potential hazards that human drivers would miss. With a goal of bringing self-driving cars to the
24 mass market, Waymo has invested tens of millions of dollars and tens of thousands of hours of
25 engineering time to custom-build the most advanced and cost-effective LiDAR sensors in the
26 industry. Thanks in part to this highly advanced LiDAR technology, Waymo became the first
27 company to complete a fully self-driving trip on public roads in a vehicle without a steering wheel
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1 and foot pedals. Today, Waymo remains the industry's leader in self-driving hardware and
2 software.

3 3. Waymo was recently – and apparently inadvertently – copied on an email from one
4 of its LiDAR component vendors. The email attached machine drawings of what purports to be an
5 Uber LiDAR circuit board. This circuit board bears a striking resemblance to Waymo's own
6 highly confidential and proprietary design and reflects Waymo trade secrets. As this email shows,
7 Otto and Uber are currently building and deploying (or intending to deploy) LiDAR systems (or
8 system components) using Waymo's trade secret designs. This email also shows that Otto and
9 Uber's LiDAR systems infringe multiple LiDAR technology patents awarded to Waymo.

10 4. Waymo has uncovered evidence that Anthony Levandowski, a former manager in
11 Waymo's self-driving car project – now leading the same effort for Uber – downloaded more than
12 14,000 highly confidential and proprietary files shortly before his resignation. The 14,000 files
13 included a wide range of highly confidential files, including Waymo's LiDAR circuit board
14 designs. Mr. Levandowski took extraordinary efforts to raid Waymo's design server and then
15 conceal his activities. In December 2015, Mr. Levandowski specifically searched for and then
16 installed specialized software onto his company-issued laptop in order to access the server that
17 stores these particular files. Once Mr. Levandowski accessed this server, he downloaded the
18 14,000 files, representing approximately 9.7 GB of highly confidential data. Then he attached an
19 external drive to the laptop for a period of eight hours. He installed a new operating system that
20 would have the effect of reformatting his laptop, attempting to erase any forensic fingerprints that
21 would show what he did with Waymo's valuable LiDAR designs once they had been downloaded
22 to his computer. After Mr. Levandowski wiped this laptop, he only used it for a few minutes, and
23 then inexplicably never used it again.

24 5. In the months leading to the mass download of files, Mr. Levandowski told
25 colleagues that he had plans to set up a new, self-driving vehicle company. In fact, Mr.
26 Levandowski appears to have taken multiple steps to maximize his profit and set up his own new
27 venture – which eventually became Otto – before leaving Waymo in January 2016. In addition to
28 downloading Waymo's design files and proprietary information, Mr. Levandowski set up a

1 competing company named “280 Systems” (which later became Otto) before he left, under the
2 pretense that 280 Systems would not compete with Waymo.

3 6. A number of Waymo employees subsequently also left to join Anthony
4 Levandowski’s new business, downloading additional Waymo trade secrets in the days and hours
5 prior to their departure. These secrets included confidential supplier lists, manufacturing details
6 and statements of work with highly technical information, all of which reflected the results of
7 Waymo’s months-long, resource-intensive research into suppliers for highly specialized LiDAR
8 sensor components.

9 7. Otto launched publicly in May 2016, and was quickly acquired by Uber in August
10 2016 for \$680 million. (Notably, Otto announced the acquisition shortly after Mr. Levandowski
11 received his final multi-million dollar compensation payment from Google.) As was widely
12 reported at the time, “one of the keys to this acquisition[] could be the LIDAR system that was
13 developed in-house at Otto.”

14 8. Uber’s own attempts to develop self-driving cars started earlier in February 2015
15 with the announcement of a strategic partnership with Carnegie Mellon University and the
16 creation of the Uber Advanced Technologies Center in Pittsburgh. Reports attribute Uber CEO
17 Travis Kalanick’s interest in this technology to a ride in a Google, now Waymo, self-driving car.
18 Uber’s CEO has described self-driving cars as “existential” to the survival of his company.¹ He
19 told reporters: “the entity that’s in first, then rolls out a ride-sharing network that is far cheaper or
20 far higher-quality than Uber’s, then Uber is no longer a thing.” However, by March 2016 reports
21 surfaced that the partnership between CMU and Uber had “stalled.”

22 9. Meanwhile, Waymo had devoted seven years to research and development. It had
23 amassed nearly one and a half million miles of self-driving experience on public roads and billions
24 of miles of test data via simulation. By May 2015, Waymo had also designed and built, from the
25 ground up, the world’s first fully self-driving car without a steering wheel and foot pedals. These
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27 ¹ Biz Carson, “Travis Kalanick on Uber’s bet on self-driving cars: ‘I can’t be wrong,’” *Business*
28 *Insider*, Aug. 18, 2016, available at <http://www.businessinsider.com/travis-kalanick-interview-on-self-driving-cars-future-driver-jobs-2016-8>.

1 vehicles were equipped with Waymo’s own in-house hardware and sensors, including its
2 uniquely-designed LiDAR.

3 10. Instead of developing their own technology in this new space, Defendants stole
4 Waymo’s long-term investments and property. While Waymo developed its custom LiDAR
5 systems with sustained effort over many years, Defendants leveraged stolen information to
6 shortcut the process and purportedly build a comparable LiDAR system in only nine months. As
7 of August 2016, Uber had no in-house solution for LiDAR – despite 18 months with their faltering
8 Carnegie Mellon University effort – and they acquired Otto to get it. By September 2016, Uber
9 represented to regulatory authorities in Nevada that it was no longer using an off-the-shelf, or
10 third-party, LiDAR technology, but rather using an “[i]n-house custom built” LiDAR system. The
11 facts outlined above and elaborated further in this complaint show that Uber’s LiDAR technology
12 is actually Waymo’s LiDAR technology.

13 11. In light of Defendants’ misappropriation and infringement of Waymo’s LiDAR
14 technology, Waymo brings this Complaint to prevent any further misuse of its proprietary
15 information, to prevent Defendants from harming Waymo’s reputation by misusing its technology,
16 to protect the public’s confidence in the safety and reliability of self-driving technology that
17 Waymo has long sought to nurture, and to obtain compensation for its damages and for
18 Defendants’ unjust enrichment resulting from their unlawful conduct.

19 **II. PARTIES**

20 12. Plaintiff Waymo LLC is a subsidiary of Alphabet Inc. with its principal place of
21 business located in Mountain View, California 94043. Waymo is a self-driving technology
22 company with a mission to make it safe and easy for people and things to move around. Waymo
23 LLC owns all of the patents, trade secrets, and confidential information infringed or
24 misappropriated by Defendants.

25 13. Defendant Uber Technologies, Inc. (“Uber”) is a Delaware company with its
26 principal place of business at 1455 Market Street, San Francisco, California.

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1 14. Waymo is informed and believes that Defendant Ottomotto LLC (f/k/a 280
2 Systems Inc.) is a Delaware limited liability company with its principal place of business located
3 at 737 Harrison Street, San Francisco, California.

4 15. Waymo is informed and believes that Defendant Otto Trucking LLC (f/k/a 280
5 Systems LLC) is a limited liability company with its principal place of business located at 737
6 Harrison Street, San Francisco, California.

7 16. Waymo is informed and believes that Uber acquired Defendants Ottomotto LLC
8 and Otto Trucking LLC in approximately August 2016.

9 17. Waymo is informed and believes that each Defendant acted in all respects pertinent
10 to this action as the agent of the other Defendant, carried out a joint scheme, business plan or
11 policy in all respects pertinent hereto, and that the acts of each Defendant are legally attributable
12 to each of the other Defendants.

13 **III. JURISDICTION, VENUE & INTRADISTRICT ASSIGNMENT**

14 18. This Court has subject matter jurisdiction over Waymo's claims for patent
15 infringement pursuant to the Federal Patent Act, 35 U.S.C. § 101 *et seq.* and 28 U.S.C. §§ 1331
16 and 1338(a). This Court has subject matter jurisdiction over Waymo's federal trade secret claim
17 pursuant to 18 U.S.C. §§ 1836-39 *et seq.* and 28 U.S.C. §§ 1331 and 1343. The Court has
18 supplemental jurisdiction over the state law claim alleged in this Complaint pursuant to 28 U.S.C.
19 § 1367.

20 19. As set forth above, at least one Defendant resides in this judicial district, and all
21 Defendants are residents of the State of California. In addition, a substantial part of the events or
22 omissions giving rise to the claims alleged in this Complaint occurred in this Judicial District.
23 Venue therefore lies in the United States District Court for the Northern District of California
24 pursuant to 28 U.S.C. §§ 1391(b)(1) and (2).

25 20. A substantial part of the events giving rise to the claims alleged in this Complaint
26 occurred in the City and County of San Francisco. For purposes of intradistrict assignment under
27 Civil Local Rules 3-2(c) and 3-5(b), this Intellectual Property Action will be assigned on a district-
28 wide basis.

1 **IV. FACTUAL ALLEGATIONS**

2 **A. Google Pioneers The Self-Driving Car Space**

3 21. Google was the first major U.S. technology firm to recognize the transformative
4 potential and commercial value of vehicle automation, which promises to make transportation
5 safer, cleaner, more efficient, and more widely available.

6 22. Google initiated its self-driving car project in 2009. Before long, Google’s self-
7 driving cars had navigated from the Bay Area to Los Angeles, crossed the Golden Gate Bridge,
8 drove the Pacific Coast Highway, and circled Lake Tahoe, logging over 140,000 miles – a first in
9 robotics research at the time.

10 23. Google made its self-driving car project public in 2010, with the following
11 announcement: “Larry and Sergey founded Google because they wanted to help solve really big
12 problems using technology. And one of the big problems we’re working on today is car safety
13 and efficiency. Our goal is to help prevent traffic accidents, free up people’s time and reduce
14 carbon emissions by fundamentally changing car use. So we have developed technology for cars
15 that can drive themselves.”

16 24. In 2014, Google unveiled its own reference vehicle, a two-door fully autonomous
17 car without pedals or a steering wheel. A year later, this prototype made the first ever fully self-
18 driving trip in normal traffic on public roads.

19 25. In 2016, Google’s self-driving car program became Waymo, a stand-alone
20 company operating alongside Google and other technology companies under the umbrella of
21 Alphabet Inc.²

22 26. To date, Waymo’s fleet of self-driving vehicles has logged over 2.5 million miles
23 in autonomous mode on public roads. Measured in time, that equates to over 300 years of human
24 driving experience. And in 2016 alone, Waymo’s systems logged over a billion miles of
25 simulated driving, a feat made possible by Waymo’s in-house simulator and the power of
26 Google’s massive data centers.

27 _____
28 ² Further references to “Waymo” refer to the self-driving car project from its inception in
2009 to the present.

1 27. Waymo uses the data collected from these real-world and simulated miles to
2 (among other things) constantly improve the safety of its system, including its hardware and
3 sensors. This focus on testing and safety has allowed Waymo’s self-driving cars to become
4 increasingly capable and robust, with less need for human intervention. As just one illustration of
5 this, the rate of Waymo’s safety-related disengagements has fallen from 0.8 disengagements per
6 thousand miles in 2015 to 0.2 disengagements per thousand miles in 2016, representing a four-fold
7 improvement in Waymo’s self-driving technology in just 12 months. Today, Waymo believes its
8 self-driving cars are the safest on the road.

9 **B. Waymo Develops Its Own Proprietary LiDAR System Tailored For Mass-**
10 **Marketed Self-Driving Cars**

11 28. Self-driving cars must be able to detect and understand the surrounding
12 environment. With respect to this aspect of vehicle automation, LiDAR – or “Light Detection
13 And Ranging” – uses high-frequency, high-power pulsing lasers to measure distances between one
14 or more sensors and external objects.

15 29. LiDAR hardware built for autonomous vehicles is typically mounted on the
16 exterior of a vehicle and scans the surrounding environment (sometimes in 360 degrees) with an
17 array of lasers. The laser beams reflect off surrounding objects, and data regarding the light that
18 bounces back to designated receivers is recorded. Software analyzes the data in order to create a
19 three-dimensional view of the environment, which is used to identify objects, assess their motion
20 and orientation, predict their behavior, and make driving decisions.

21 30. LiDAR systems are made up of thousands of individual hardware and software
22 components that can be configured in virtually limitless combinations and designs. LiDAR
23 systems adapted for use in self-driving cars became commercially available in approximately
24 2007. Today, most firms in the self-driving space purchase LiDAR systems from third-party
25 providers.

26 31. Waymo, on the other hand, uses *its own* LiDAR systems that are carefully tailored
27 – based on Waymo’s extensive research and testing – for use in fully autonomous vehicles in
28 which there is no driver intervention required. Waymo’s proprietary LiDAR systems improve the

1 ability of self-driving cars to navigate safely in all environments, including city environments and
2 highly unusual driving scenarios.

3 32. Moreover, by designing its own LiDAR systems, Waymo has driven down costs, a
4 well-known barrier to commercializing self-driving technology. Waymo's improved LiDAR
5 designs are now less than 10% of the cost that benchmark LiDAR systems were just a few years
6 ago, and Waymo expects that mass production of their technology will make it even more
7 affordable.

8 33. One way that Waymo pioneered LiDAR systems with improved performance at
9 lower cost was by innovating a design that, in part, uses a single lens – rather than multiple sets of
10 lenses – to both transmit and receive the collection of laser beams used to scan the surrounding
11 environment. This design greatly simplifies the manufacturing process by eliminating the need to
12 painstakingly align pairs of transmit and receive lenses, with even a slight mis-calibration of a lens
13 pair affecting the accuracy of the system. Waymo was awarded a patent on its design in 2014:
14 United States Patent No. 8,836,922 (“the '922 patent”) entitled “Devices and Methods for a
15 Rotating LiDAR Platform with a Shared Transmit/Receive Path.” United States Patent No.
16 9,285,464 (“the '464 patent”), with the same title, was awarded in 2016.

17 34. Another way that Waymo improved the performance and lowered the cost of
18 LiDAR systems for autonomous vehicles was by simplifying the design of the laser diode firing
19 circuit that is at the heart of any LiDAR system. Waymo invented a design that elegantly
20 simplified the circuit to control the charging and discharging paths of the lasers compared to the
21 more complicated circuit designs otherwise used by the industry. Waymo obtained a patent on
22 this aspect of its LiDAR design in 2016: United States Patent No. 9,368,936 (“the '936 patent”)
23 entitled “Laser Diode Firing System.”

24 35. As one more example of how Waymo fundamentally advanced LiDAR systems for
25 use in autonomous vehicles, Waymo developed a simplified design for “pre-collimating” (or
26 making parallel) the light output of each laser diode separately before the beams are combined.
27 The increased compactness of this design increases the resolution of the overall LiDAR system.
28 Waymo was awarded a patent on this aspect of its design in 2015: United States Patent No.

1 9,086,273 (“the ’273 patent”) entitled “Microrod Compressions of Laser Beam in Combination
2 with Transmit Lens.”

3 36. While patenting these fundamental advances in LiDAR technology, Waymo also
4 accumulated confidential and proprietary intellectual property that it uses in the implementation
5 and manufacture of its LiDAR designs to optimize performance, maximize safety, and minimize
6 cost. Waymo also created a vast amount of confidential and proprietary intellectual property via
7 its exploration of design concepts that ultimately proved too complex or too expensive for the
8 mass market; Waymo’s extensive experience with “dead-end” designs continues to inform the
9 ongoing development of Waymo’s LiDAR systems today. The details actually used in Waymo’s
10 LiDAR designs as well as the lessons learned from Waymo’s years of research and development
11 constitute trade secrets that are highly valuable to Waymo and would be highly valuable to any
12 competitor in the autonomous vehicle space.

13 37. Waymo’s substantial and sustained investment in LiDAR technology over nearly
14 seven years – and the intellectual property that resulted – have made Waymo’s current LiDAR
15 technology the most advanced in the industry. It is unparalleled in performance and safety in all
16 driving environments, including in the most challenging city environments. Yet it is more than
17 90% cheaper than prior benchmark systems, a key driver toward mass market adoption. For these
18 reasons and others, Waymo’s LiDAR technology and the intellectual property associated with it
19 are some of Waymo’s most valuable assets.

20 **C. Uber Is Late To Enter The Self-Driving Car Market**

21 38. Whereas Waymo began developing its self-driving cars in 2009, on information
22 and belief, Uber’s first serious foray into automation was not until six years later when – in
23 February 2015 – Uber announced a partnership with Carnegie Mellon University. According to
24 public reports of the partnership, Uber hired at least 40 CMU faculty members, researchers, and
25 technicians – including the former head of CMU’s National Robotics Engineering Center – to help
26 jump-start an Uber vehicle automation program.

27 39. By early 2016, Uber had hired hundreds of engineers and robotics experts to
28 support the original team from Carnegie Mellon. But the research and development process was

1 slow.³ And with respect to LiDAR technology, Uber’s program appeared to rely solely on a third-
2 party, off-the-shelf LiDAR system manufactured by Velodyne Inc. (the HDL-64E). On
3 information and belief, Uber’s program did not make any significant advances toward designing or
4 manufacturing its own LiDAR technology for improved performance or lower cost.

5 40. Thus, although Uber came to view its entry into the self-driving car space as an
6 “existential” imperative,⁴ as of mid-2016, Uber remained more than five years behind in the race
7 to develop vehicle automation technology suitable for the mass market.

8 **D. Unbeknownst To Waymo, Anthony Levandowski Lays The Foundation For**
9 **Defendants To Steal Waymo’s Intellectual Property Rather Than Compete**
10 **Fairly In The Autonomous Vehicle Space**

11 41. While Uber’s partnership with CMU was floundering, Waymo was continuing to
12 develop its next-generation proprietary LiDAR technology. But, unbeknownst to Waymo at the
13 time, Waymo manager Anthony Levandowski was also secretly preparing to launch a competing
14 vehicle automation venture – a company named “280 Systems,” which later would become Otto.

15 42. By November 2015, an internet domain name for the new venture had been
16 registered. And by January 2016, Mr. Levandowski had confided in some Waymo colleagues that
17 he planned to “replicate” Waymo’s technology at a Waymo competitor. As Waymo would later
18 learn, Mr. Levandowski went to great lengths to take what he needed to “replicate” Waymo’s
19 technology and then to meet with Uber executives, all while still a Waymo employee.

20 43. On December 3, 2015, Mr. Levandowski searched for instructions on how to access
21 Waymo’s highly confidential design server. This server holds detailed technical information
22 related to Waymo’s LiDAR systems, including the blueprints for its key hardware components,
23 and is accessible only on a need-to-know basis.

24 44. On December 11, 2015, Mr. Levandowski installed special software on his Waymo
25 laptop to access the design server. Mr. Levandowski then download over 14,000 proprietary files

26 ³ Heather Somerville, “After a year, Carnegie Mellon and Uber research initiative is stalled,”
Reuters, Mar. 21, 2016, available at [http://www.reuters.com/article/us-uber-tech-research-
idUSKCN0WN0WR](http://www.reuters.com/article/us-uber-tech-research-idUSKCN0WN0WR).

27 ⁴ Max Chafkin, “Uber’s First Self-Driving Fleet Arrives in Pittsburgh This Month,”
Bloomberg, Aug. 18, 2016, available at [http://www.bloomberg.com/news/features/2016-08-
18/uber-s-first-self-driving-fleet-arrives-in-pittsburgh-this-month-is06r7on](http://www.bloomberg.com/news/features/2016-08-18/uber-s-first-self-driving-fleet-arrives-in-pittsburgh-this-month-is06r7on).

1 from that server. Mr. Levandowski's download included 9.7 GBs of sensitive, secret, and
2 valuable internal Waymo information. 2 GBs of the download related to Waymo's LiDAR
3 technology. Among the downloaded documents were confidential specifications for each version
4 of every generation of Waymo's LiDAR circuit boards.

5 45. On December 14, 2015, Mr. Levandowski attached a removable media device (an
6 SD Card) to the laptop containing the downloaded files for approximately eight hours.

7 46. On December 18, 2015, seven days after Mr. Levandowski completed his
8 download of confidential Waymo information and four days after he removed the SD Card, he
9 reformatted the laptop, attempting to erase any evidence of what happened to the downloaded
10 files. After wiping the laptop clean, Mr. Levandowski used the reformatted laptop for a few
11 minutes and then never used it again.

12 47. Around the same time, Mr. Levandowski used his Waymo credentials and security
13 clearances to download additional confidential Waymo documents to a personal device. These
14 materials included at least five highly sensitive internal presentations containing proprietary
15 technical details regarding the manufacture, assembly, calibration, and testing of Waymo's LiDAR
16 sensors.

17 48. After downloading all of this confidential information regarding Waymo's LiDAR
18 systems and other technology and while still a Waymo employee, Waymo is informed and
19 believes that Mr. Levandowski attended meetings with high-level executives at Uber's
20 headquarters in San Francisco on January 14, 2016.

21 49. The next day, January 15, 2016, Mr. Levandowski's venture 280 Systems – which
22 became OttoMotto LLC – was officially formed (though it remained in stealth mode for several
23 months). On January 27, 2016, Mr. Levandowski resigned from Waymo without notice. And on
24 February 1, 2016, Mr. Levandowski's venture Otto Trucking was officially formed (also
25 remaining in stealth mode for several months).

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1 **E. Otto Continues To Misappropriate Waymo’s Intellectual Property After Its**
2 **Public Launch With Mr. Levandowski At The Helm**

3 50. Otto publicly launched in May 2016 with the stated goal of developing hardware
4 and software for autonomous vehicles.

5 51. In July 2016, a Waymo supply chain manager resigned from Waymo and joined
6 Otto. This supply chain manager was one of several Waymo employees who had spent many
7 months vetting a particular vendor that Waymo ultimately engaged to provide manufacturing
8 services for its self-driving car technology. The vendor’s identity and its work for Waymo was
9 and is confidential: Waymo and the vendor entered into a confidentiality agreement that precludes
10 either party from disclosing the existence of their business relationship.

11 52. Approximately a month before the supply chain manager resigned and despite his
12 confidentiality obligations to Waymo, he downloaded from Waymo’s secure network Waymo’s
13 confidential supply chain information and other confidential manufacturing information, including
14 Statements of Work (or SOWs) for particular components – all of which reflected the results of
15 Waymo’s months-long, resource-intensive research into suppliers for highly specialized LiDAR
16 sensor components.

17 53. Also in July 2016, a certain Waymo hardware engineer resigned. On the same day
18 that he resigned from Waymo, and despite his confidentiality obligations to Waymo, this engineer
19 downloaded from Waymo’s secure network three files containing confidential research into
20 various potential hardware vendors for highly specialized LiDAR components and manufacturing
21 services. On information and belief, this hardware engineer left Waymo to join Otto.

22 54. In the same time period that these former Waymo employees were downloading
23 Waymo’s confidential information regarding its manufacturing and hardware vendors and
24 resigned, Otto contacted the most-extensively vetted (and confidential) Waymo vendor and
25 attempted to order manufacturing services for LiDAR components similar to those the vendor
26 provides to Waymo.

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1 **F. After Only Six Months Of Official Existence, Otto Is Acquired By Uber For**
2 **More Than Half A Billion Dollars**

3 55. In August 2016, shortly after Mr. Levandowski received his final multi-million
4 dollar payment from Google, Uber announced a deal to acquire Otto. Otto's purchase price was
5 reported as \$680 million, a remarkable sum for a company with few assets and no marketable
6 product. As *Forbes* reported at the time, "one of the keys to this acquisition[] could be the LIDAR
7 system that was developed in-house at Otto."⁵

8 56. In recognition of the central role of Otto's technology within Uber, Uber named
9 Otto co-founder Mr. Levandowski as its vice president in charge of Uber's self-driving car project.
10 Uber rechristened Otto's existing San Francisco office as Uber's new self-driving research and
11 development center.

12 **G. Waymo Verifies Its Growing Suspicion That Otto And Uber Stole Its**
13 **Intellectual Property**

14 57. The sudden resignations from Waymo, Otto's quick public launch with Mr.
15 Levandowski at the helm, and Uber's near-immediate acquisition of Otto for more than half a
16 billion dollars all caused Waymo grave concern regarding the possible misuse of its intellectual
17 property. Accordingly, in the summer of 2016, Waymo investigated the events surrounding the
18 departure of Waymo employees for Otto and ultimately discovered Mr. Levandowski's 14,000-
19 document download, his efforts to hide the disposition of those documents, and the downloading
20 of other Waymo confidential materials by Mr. Levandowski and other former Waymo employees.

21 58. Then, in December 2016, Waymo received evidence suggesting that Otto and Uber
22 were actually using Waymo's trade secrets and patented LiDAR designs. On December 13,
23 Waymo received an email from one of its LiDAR-component vendors. The email, which a
24 Waymo employee was copied on, was titled OTTO FILES and its recipients included an email
25 alias indicating that the thread was a discussion among members of the vendor's "Uber" team.
26 Attached to the email was a machine drawing of what purported to be an Otto circuit board (the

27 ⁵ Sarwant Singh, "Uber Acquiring Otto Could Be the Lead Domino: Autonomous Vehicles to
28 Spur M&A Activity," *Forbes*, Aug. 24, 2016, available at
<http://www.forbes.com/sites/sarwantsingh/2016/08/24/uber-acquiring-otto-could-be-the-lead-domino-autonomous-vehicles-to-spur-ma-activity/#337f0c0f65ae>.

1 “Replicated Board”) that bore a striking resemblance to – and shared several unique characteristics
2 with – Waymo’s highly confidential current-generation LiDAR circuit board, the design of which
3 had been downloaded by Mr. Levandowski before his resignation.

4 59. The Replicated Board reflects Waymo’s highly confidential proprietary LiDAR
5 technology and Waymo trade secrets. Moreover, the Replicated Board is specifically designed to
6 be used in conjunction with many other Waymo trade secrets and in the context of overall LiDAR
7 systems covered by Waymo patents.

8 60. With greatly heightened suspicion that Otto and Uber were actually using Waymo’s
9 intellectual property for their own purposes (and to Waymo’s detriment), Waymo endeavored to
10 find a way to confirm whether Defendants were using Waymo’s patented and trade secret LiDAR
11 designs. Ultimately, Waymo received such confirmation in response to a public records request it
12 made to the Nevada Governor’s Office of Economic Development and Department of Motor
13 Vehicles on February 3, 2017.

14 61. Among the documents Waymo received on February 9, 2017 in response to that
15 request were submissions made by Otto to Nevada regulatory authorities. In one such submission,
16 dated less than one month after the Otto acquisition and while Uber was refusing to publicly
17 identify the supplier of its LiDAR system,⁶ Otto privately represented that it had “developed in
18 house and/or currently deployed” an “[i]n-house custom built 64-laser” LiDAR system. This was
19 the final piece of the puzzle: confirmation that Uber and Otto are in fact using a custom LiDAR
20 system with the same characteristics as Waymo’s proprietary system.

21 **H. Waymo Has Been, And Will Be, Severely Harmed By Defendants’**
22 **Infringement Of Waymo’s Patents And Misappropriation Of Waymo’s**
Confidential And Proprietary Trade Secret Information

23 62. Waymo developed its patented inventions and trade secrets at great expense, and
24 through years of painstaking research, experimentation, and trial and error. If Defendants are not
25 enjoined from their infringement and misappropriation, they will cause severe and irreparable
26 harm to Waymo.

27 _____
28 ⁶ Mike Murphy, “This is the week self-driving cars became real,” *Quartz*, Sept. 17, 2016,
available at <https://qz.com/780606/this-is-the-week-self-driving-cars-became-real/>.

1 orientation of optical elements that are used to manipulate and modify laser beams that are
2 transmitted and detected by Waymo's current generation LiDAR system. Waymo's trade secret
3 information further includes the resolution profile that is achieved through its proprietary
4 positioning and orientation of laser diodes and optical elements in its current generation LiDAR
5 system, and the know-how associated with using the resolution profile to accurately detect objects
6 in the environment. Another example of Waymo's trade secrets is the rate at which the current
7 generation LiDAR system pulses and fires the laser diodes into the environment, and the know-
8 how associated with using the pulse rate and fire rate to accurately detect objects in the
9 environment. None of these trade secrets is disclosed in any published Waymo patents or patent
10 applications.

11 68. Waymo's asserted trade secrets are different than Waymo's asserted patent rights.
12 By way of example, only: (i) Waymo's asserted patents relate to a prior generation of Waymo's
13 proprietary LiDAR designs, whereas Waymo's trade secrets include elements for subsequent and
14 as of today un-patented and confidential LiDAR designs; and (ii) Waymo's trade secrets include
15 specific parameters and measurements for Waymo's LiDAR designs that are not disclosed in any
16 asserted Waymo patents. Examples of trade secret information that is not covered or disclosed by
17 any asserted Waymo patents include the specific parameters or measurements for vertical beam
18 spacing, distribution of beam elevations and orientations, the beams' field of view measurements,
19 the pitch or orientations between diodes, pitch measurements for optical cavities, pulse rates, and
20 fire rates for beam returns.

21 69. Waymo's confidential, proprietary, and trade secret information relates to products
22 and services used, sold, shipped and/or ordered in, or intended to be used, sold, shipped and/or
23 ordered in, interstate or foreign commerce.

24 70. Waymo has taken reasonable measures to keep such information secret and
25 confidential.

26 71. Waymo has at all times maintained stringent security measures to preserve the
27 secrecy of its LiDAR trade secrets. For example, Waymo restricts access to confidential and
28 proprietary trade secret information to only those who "need to know." That is, employees

1 working on projects unrelated to self-driving cars have not had and do not have access to
2 Waymo's schematics, supply chain information, or other categories of confidential and proprietary
3 information. All networks hosting Waymo's confidential and proprietary information have been
4 and continue to be encrypted and have at all times required passwords and dual-authentication for
5 access. Computers, tablets, and cell phones provided to Waymo employees are encrypted,
6 password protected, and subject to other security measures. And Waymo secures its physical
7 facilities by restricting access and then monitoring actual access with security cameras and guards.

8 72. Waymo also requires all employees, contractors, consultants, vendors, and
9 manufacturers to sign confidentiality agreements before any confidential or proprietary trade
10 secret information is disclosed to them. Every outside vendor and manufacturer that has received
11 confidential and proprietary trade secret information related to Waymo's LiDAR technology has
12 executed at least one written non-disclosure agreement. As a further precaution, Waymo
13 purchases the components for its LiDAR systems from numerous, different vendors and conducts
14 the final assembly in-house at Waymo. As a result, no single Waymo vendor has full knowledge
15 of Waymo's proprietary LiDAR systems.

16 73. Due to these security measures, Waymo's confidential and proprietary trade secret
17 information is not available for others in the automated vehicle industry – or any other industry –
18 to use through any legitimate means.

19 74. Waymo's confidential, proprietary, and trade secret information derives
20 independent economic value from not being generally known to, and not being readily
21 ascertainable through proper means by, another person who could obtain economic value from the
22 disclosure or use of the information.

23 75. In violation of Waymo's rights, Defendants misappropriated Waymo's
24 confidential, proprietary and trade secret information in the improper and unlawful manner as
25 alleged herein. Defendants' misappropriation of Waymo's confidential, proprietary, and trade
26 secret information was intentional, knowing, willful, malicious, fraudulent, and oppressive.
27 Defendants have attempted and continue to attempt to conceal their misappropriation.

28

1 diodes and optical elements in its current generation LiDAR system, and the know-how associated
2 with using the resolution profile to accurately detect objects in the environment. Another example
3 of Waymo's trade secrets is the rate at which the current generation LiDAR system pulses and
4 fires the laser diodes into the environment, and the know-how associated with using the pulse rate
5 and fire rate to accurately detect objects in the environment. None of this information is disclosed
6 in any published Waymo patents or patent applications, and the information has actual or potential
7 independent economic value from not being generally known to the public or other persons who
8 could obtain economic value from their disclosure or use.

9 81. Waymo's asserted trade secrets are different than Waymo's asserted patent rights.
10 By way of example, only: (i) Waymo's asserted patents relate to a prior generation of Waymo's
11 proprietary LiDAR designs, whereas Waymo's trade secrets include elements for subsequent and
12 as of today un-patented and confidential LiDAR designs; and (ii) Waymo's trade secrets include
13 specific parameters and measurements for Waymo's LiDAR designs that are not disclosed in any
14 asserted Waymo patents. Examples of trade secret information that is not covered or disclosed by
15 any asserted Waymo patents include the specific parameters or measurements for vertical beam
16 spacing, distribution of beam elevations and orientations, the beams' field of view measurements,
17 the pitch or orientations between diodes, pitch measurements for optical cavities, pulse rates, and
18 fire rates for beam returns.

19 82. Waymo has undertaken efforts that are reasonable under the circumstances to
20 maintain the secrecy of the trade secrets at issue. These efforts include, but are not limited to, the
21 use of passwords and encryption to protect data on its computers, servers, and source code
22 repositories, the maintenance of a Code of Conduct that emphasizes all employees' duties to
23 maintain the secrecy of Waymo's confidential information, and the use of confidentiality
24 agreements and non-disclosure agreements to require vendors, partners, contractors, and
25 employees to maintain the secrecy of Waymo's confidential information.

26 83. Defendants knew or should have known under the circumstances that the
27 information misappropriated by Defendants were trade secrets.

28

1 90. The '922 patent, entitled "Devices and Methods for a Rotating LIDAR platform
2 with a Shared Transmit/Receive Path," was duly and lawfully issued on September 16, 2014. A
3 true and correct copy of the '922 patent is attached to this Complaint as Exhibit A.

4 91. Waymo is the owner of all rights, title, and interest in the '922 patent, including the
5 right to bring this suit for injunctive relief and damages.

6 92. The '922 patent is valid and enforceable.

7 93. Defendants have infringed, and continue to infringe, literally and/or through the
8 doctrine of equivalents, one or more claims of the '922 patent, including but not limited to claim
9 1, pursuant to 35 U.S.C. § 271(a), by making, using, selling, offering to sell, and/or importing
10 within the United States, without authority, certain LiDAR devices ("Accused LiDAR Devices").

11 94. On information and belief, the Accused LiDAR Devices, such as those using the
12 Replicated Board, comprise a LiDAR device with a single lens that transmits light pulses
13 originating from one or more light sources and receiving light pulses that are then detected by one
14 or more detectors. Defendants infringe at least claim 1 of the '922 patent for at least the following
15 reasons:

16 95. Defendants' Accused LiDAR Devices are LiDAR devices.

17 96. On information and belief, Defendants' Accused LiDAR Devices have a lens
18 mounted to a housing, wherein the housing is configured to rotate about an axis and has an interior
19 space that includes a transmit block, a receive block, a transmit path, and a receive path, wherein
20 the transmit block has an exit aperture in a wall that comprises a reflective surface, wherein the
21 receive block has an entrance aperture, wherein the transmit path extends from the exit aperture to
22 the lens, and wherein the receive path extends from the lens to the entrance aperture via the
23 reflective surface.

24 97. On information and belief, Defendants' Accused LiDAR Devices have a plurality
25 of light sources in the transmit block, wherein the plurality of light sources are configured to emit
26 a plurality of light beams through the exit aperture in a plurality of different directions, the light
27 beams comprising light having wavelengths in a wavelength range.

28

1 103. The '464 patent, entitled "Devices and Methods for a Rotating LIDAR platform
2 with a Shared Transmit/Receive Path," was duly and lawfully issued on March 15, 2016. A true
3 and correct copy of the '464 patent is attached to this Complaint as Exhibit B.

4 104. Waymo is the owner of all rights, title, and interest in the '464 patent, including the
5 right to bring this suit for injunctive relief and damages.

6 105. The '464 patent is valid and enforceable.

7 106. Defendants have infringed, and continue to infringe, literally and/or through the
8 doctrine of equivalents, one or more claims of the '464 patent, including but not limited to claim
9 1, pursuant to 35 U.S.C. § 271(a), by making, using, selling, offering to sell, and/or importing
10 within the United States, without authority, the Accused LiDAR Devices.

11 107. On information and belief, the Accused LiDAR Devices, such as those using the
12 Replicated Board, comprise a LiDAR device with a single lens that transmits light pulses
13 originating from one or more light sources and receiving light pulses that are then detected by one
14 or more detectors. Defendants infringe at least claim 1 of the '464 patent for at least the following
15 reasons:

16 108. Defendants' Accused LiDAR Devices are LiDAR devices.

17 109. On information and belief, Defendants' Accused LiDAR Devices have a lens
18 mounted to a housing, wherein the housing is configured to rotate about an axis and has an interior
19 space that includes a transmit block, a receive block, a transmit path, and a receive path, wherein
20 the transmit block has an exit aperture, wherein the receive block has an entrance aperture,
21 wherein the transmit path extends from the exit aperture to the lens, wherein the receive path
22 extends from the lens to the entrance aperture, and wherein the transmit path at least partially
23 overlaps the receive path in the interior space between the transmit block and the receive block.

24 110. On information and belief, Defendants' Accused LiDAR Devices have a plurality
25 of light sources in the transmit block, wherein the plurality of light sources are configured to emit
26 a plurality of light beams through the exit aperture in a plurality of different directions, the light
27 beams comprising light having wavelengths in a wavelength range.

28

1 111. On information and belief, Defendants' Accused LiDAR Devices have a plurality
2 of detectors in the receive block, wherein the plurality of detectors are configured to detect light
3 having wavelengths in the wavelength range.

4 112. On information and belief, Defendants' Accused LiDAR Devices have a lens that is
5 configured to receive the light beams via the transmit path, collimate the light beams for
6 transmission into an environment of the LIDAR device, collect light comprising light from one or
7 more of the collimated light beams reflected by one or more objects in the environment of the
8 LIDAR device, and focus the collected light onto the detectors via the receive path.

9 113. Defendants' infringement of the '464 patent has been willful and deliberate because
10 Defendants knew or should have known about the '464 patent and their infringement of that patent
11 but acted despite an objectively high likelihood that such acts would infringe the patent. On
12 information and belief, at least three of the individuals who developed the Accused LiDAR
13 Devices are named inventors of the '464 patent who – while Waymo employees, and on behalf of
14 Waymo, which owns the '464 patent – were involved in the conception and/or reduction to
15 practice of the '464 patent and have had knowledge of the patent since it issued in March 2016.

16 114. As the direct and proximate result of Defendants' conduct, Waymo has suffered
17 and, if Defendants' conduct is not stopped, will continue to suffer, severe competitive harm,
18 irreparable injury, and significant damages, in an amount to be proven at trial. Because Waymo's
19 remedy at law is inadequate, Waymo seeks, in addition to damages, temporary, preliminary, and
20 permanent injunctive relief. Waymo's business operates in a competitive market and will continue
21 suffering irreparable harm absent injunctive relief.

22 **FIFTH CAUSE OF ACTION**

23 **Infringement of Patent No. 9,368,936**
24 **(Against All Defendants)**

25 115. Waymo incorporates all of the above paragraphs as though fully set forth herein.

26 116. The '936 patent, entitled "Laser Diode Firing System," was duly and lawfully
27 issued on June 14, 2016. A true and correct copy of the '936 patent is attached to this Complaint
28 as Exhibit C.

1 117. Waymo is the owner of all rights, title, and interest in the '936 patent, including the
2 right to bring this suit for injunctive relief and damages.

3 118. The '936 patent is valid and enforceable.

4 119. Defendants have infringed, and continue to infringe, literally and/or through the
5 doctrine of equivalents, one or more claims of the '936 patent, including but not limited to claim
6 1, pursuant to 35 U.S.C. § 271(a), by making, using, selling, offering to sell, and/or importing
7 within the United States, without authority, the Accused LiDAR devices.

8 120. On information and belief, Defendants' Accused LiDAR Devices, such as those
9 using the Replicated Board, comprise a laser diode firing circuit for a LiDAR device, which
10 utilizes an inductor and a charging capacitor, where both the charging and discharge path are
11 controllable via a single transistor and gate signal. Defendants infringe at least claim 1 of the '936
12 patent for at least the following reasons:

13 121. On information and belief, Defendants' Accused LiDAR Devices have a voltage
14 source.

15 122. On information and belief, Defendants' Accused LiDAR Devices have an inductor
16 coupled to the voltage source, wherein the inductor is configured to store energy in a magnetic
17 field.

18 123. On information and belief, Defendants' Accused LiDAR Devices have a diode or
19 equivalent coupled to the voltage source via the inductor.

20 124. On information and belief, Defendants' Accused LiDAR Devices have a transistor
21 configured to be turned on and turned off by a control signal.

22 125. On information and belief, Defendants' Accused LiDAR Devices have a light
23 emitting element coupled to the transistor.

24 126. On information and belief, Defendants' Accused LiDAR Devices Circuit Boards
25 have a capacitor coupled to a charging path and a discharge path, wherein the charging path
26 includes the inductor and the diode, and wherein the discharge path includes the transistor and the
27 light emitting element.

28

1 134. Defendants have infringed, and continue to infringe, literally and/or through the
2 doctrine of equivalents, one or more claims of the '273 patent, including but not limited to claim
3 1, pursuant to 35 U.S.C. § 271(a), by making, using, selling, offering to sell, and/or importing
4 within the United States, without authority, the Accused LiDAR Devices.

5 135. On information and belief, Defendants' Accused Lidar Devices, such as those using
6 the Replicated Board and the Uber Custom LiDAR described in Uber's Nevada regulatory filing,
7 comprise a LiDAR device with a single lens that both (i) collimates the light from one or more
8 light sources to provide collimated light for transmission into an environment of the LiDAR
9 device, and (ii) focuses the reflected light onto one or more photodetectors, and with cylindrical
10 lenses associated with each laser diode that pre-collimate the uncollimated laser beam.

11 Defendants infringe at least claim 1 of the '273 patent for at least the following reasons:

12 136. On information and belief, Defendants' Accused LiDAR Devices are LiDAR
13 devices.

14 137. On information and belief, Defendants' Accused LiDAR Devices have at least one
15 laser diode, wherein the at least one laser diode is configured to emit an uncollimated laser beam
16 comprising light in a narrow wavelength range, wherein the uncollimated laser beam has a first
17 divergence in a first direction and a second divergence in a second direction, and wherein the first
18 divergence is greater than the second divergence.

19 138. On information and belief, Defendants' Accused LiDAR Devices have at least one
20 cylindrical lens, wherein the at least one cylindrical lens is configured to pre-collimate the
21 uncollimated laser beam that has a third divergence in the first direction and a fourth divergence in
22 the second direction, wherein the third divergence is less than the fourth divergence and the fourth
23 divergence is substantially equal to the second divergence.

24 139. On information and belief, Defendants' Accused LiDAR Devices have at least one
25 detector, wherein the at least one detector is configured to detect light having wavelengths in the
26 narrow wavelength range.

27 140. On information and belief, Defendants' Accused LiDAR Devices have an objective
28 lens, wherein the objective lens is configured to (i) collimate the partially collimated laser beam

1 for transmission into an environment of the LiDAR device and (ii) focus object reflected light onto
2 the at least one detector, wherein the object-reflected light comprises light from the collimated
3 laser beam in the environment of the LiDAR device.

4 141. Defendants' infringement of the '273 patent has been willful and deliberate because
5 Defendants knew or should have known about the '273 patent and their infringement of that patent
6 but acted despite an objectively high likelihood that such acts would infringe the patent. At least
7 one individual who developed the Accused LiDAR Devices is a named inventor on the '273 patent
8 who – while a Waymo employee, and on behalf of Waymo, which owns the '273 patent – was
9 involved in the conception and/or reduction to practice of the '273 patent and therefore has had
10 knowledge of the patent since it issued in July 21, 2015.

11 142. As the direct and proximate result of Defendants' conduct, Waymo has suffered
12 and, if Defendants' conduct is not stopped, will continue to suffer, severe competitive harm,
13 irreparable injury, and significant damages, in an amount to be proven at trial. Because Waymo's
14 remedy at law is inadequate, Waymo seeks, in addition to damages, temporary, preliminary, and
15 permanent injunctive relief. Waymo's business operates in a competitive market and will continue
16 suffering irreparable harm absent injunctive relief.

17 **SEVENTH CAUSE OF ACTION**

18 **Violation of California Bus. & Prof. Code § 17200**
19 **(Against All Defendants)**

20 143. Waymo incorporates all of the above paragraphs as though fully set forth herein.

21 144. Defendants engaged in unlawful, unfair, and fraudulent business acts and practices.
22 Such acts and practices include, but are not limited to, misappropriating Waymo's confidential and
23 proprietary information.

24 145. Defendants' business acts and practices were unlawful as described above.

25 146. Defendants' business acts and practices were fraudulent in that a reasonable person
26 would likely be deceived by their material misrepresentations and omissions. Defendants have
27 acquired and used Waymo's confidential and proprietary trade secret information through material
28 misrepresentations and omissions.

1 DATED: March 10, 2017

QUINN EMANUEL URQUHART & SULLIVAN,
LLP

2
3 By /s/ Charles K. Verhoeven

4 Charles K. Verhoeven
5 Attorneys for WAYMO LLC
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