

Levels of Automation
WORKBOOK
Version 11.12

NAME: _____

LOCATION: _____

TIME: _____

DATE: _____

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ACTIVITY #1

Please carefully read the description below.

WB1. Which of these two perspectives comes closest to your own?

Place a check mark next to the one you most agree with.

	<p>Some people say that it's safer when the human driver is in complete control of all the vehicle functions. They trust themselves more than technology, and say that technology software could be hacked, or that they can't fully relax in a vehicle where the computer assists with certain driving tasks.</p>
	<p>Others say that vehicles in which drivers are assisted by a computer are safer. Technology can react more quickly and reliably than people can, technology can be rigorously tested in a wide range of situations before they are allowed on vehicles, and new and better technology is on the horizon.</p>

---STOP!---

DESCRIPTION #1

Please carefully read the description below.

Advanced driver assistance systems in today's motor vehicles are already helping to save lives and prevent injuries.

A number of today's new motor vehicles have technology that helps drivers avoid drifting into adjacent lanes or making unsafe lane changes, or that warns drivers of other vehicles behind them when they are backing up, or that brakes automatically if a vehicle ahead of them stops or slows suddenly, among other things. These and other technologies use a combination of hardware (sensors, cameras, and radar) and software to help vehicles identify certain safety risks so they can warn the driver to act to avoid a crash. They are the precursor and building blocks to more futuristic technological vehicle safety advancements.

The continuing evolution of automotive technology aims to deliver even greater safety benefits and – one day – deliver **automated driving systems** that can handle the whole task of driving when we don't want to or can't do it ourselves.

---STOP!---

DESCRIPTION #2

Please carefully read the description of the different levels of automation on this page.

Level 0	You are driving and have access to driver support features that are limited to warnings and momentary assistance (vehicle offers blind spot warning, lane departure warning and/or emergency braking).
Level 1	You are driving and have access to driver support features that provide steering OR brake acceleration to support the driver (vehicle offers lane centering, adaptive cruise control but they work independently).
Level 2	You are driving and have access to driver support features that provide steering AND brake acceleration to support the driver (vehicle offers lane centering and adaptive cruise control at the same time).
Level 3	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. Additionally, when the feature requests, you must drive.
Level 4	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. You are not required to take over driving.
Level 5	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under all conditions.

---STOP!---

ACTIVITY #2.1: Progression from Level 0 – 1

Please answer the questions on this page at the moderator’s instruction.

LEVELS:

Level 0	You are driving and have access to driver support features that are limited to warnings and momentary assistance (vehicle offers blind spot warning, lane departure warning and/or emergency braking).
Level 1	You are driving and have access to driver support features that provide steering OR brake acceleration to support the driver (vehicle offers lane centering, adaptive cruise control but they work independently).

How comfortable would you be moving from driving a Level 0 vehicle to Level 1 vehicle? *Please circle one.*

1 2 3 4 5 6 7 8 9 10

**Not at all
comfortable**

**Extremely
comfortable**

---STOP!---

ACTIVITY #2.2: Progression from Level 1 – 2

Please answer the questions on this page at the moderator’s instruction.

LEVELS:

Level 1	You are driving and have access to driver support features that provide steering OR brake acceleration to support the driver (vehicle offers lane centering, adaptive cruise control but they work independently).
Level 2	You are driving and have access to driver support features that provide steering AND brake acceleration to support the driver (vehicle offers lane centering and adaptive cruise control at the same time).

How comfortable would you be moving from driving a Level 1 vehicle to Level 2 vehicle? *Please circle one.*

1 2 3 4 5 6 7 8 9 10

**Not at all
comfortable**

**Extremely
comfortable**

---STOP!---

ACTIVITY #2.3: Progression from Level 2 – 3

Please answer the questions on this page at the moderator’s instruction.

LEVELS:

Level 2	You are driving and have access to driver support features that provide steering AND brake acceleration to support the driver (vehicle offers lane centering and adaptive cruise control at the same time).
Level 3	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. Additionally, when the feature requests, you must drive.

How comfortable would you be moving from driving a Level 2 vehicle to Level 3 vehicle? *Please circle one.*

1 2 3 4 5 6 7 8 9 10

**Not at all
comfortable**

**Extremely
comfortable**

---STOP!---

ACTIVITY #2.4: Progression from Level 3 – 4

Please answer the questions on this page at the moderator’s instruction.

LEVELS:

Level 3	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. Additionally, when the feature requests, you must drive.
Level 4	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. You are not required to take over driving.

How comfortable would you be moving from driving a Level 2 vehicle to Level 3 vehicle? *Please circle one.*

1 2 3 4 5 6 7 8 9 10

**Not at all
comfortable**

**Extremely
comfortable**

---STOP!---

ACTIVITY #3

Please carefully read the description of levels of automation on this page. For each level, think about features and technologies along with any keywords or phrases that should be used in defining that level and making it clear how it is different from other levels.

LEVEL	DESCRIPTION	DEFINING FEATURE & TECHNOLOGY AND KEYWORDS & PHRASES	What would you call it?
Level 0	You are driving and have access to driver support features that are limited to warnings and momentary assistance (vehicle offers blind spot warning, lane departure warning and/or emergency braking).		
Level 1	You are driving and have access to driver support features that provide steering OR brake acceleration to support the driver (vehicle offers lane centering, adaptive cruise control but they work independently).		
Level 2	You are driving and have access to driver support features that provide steering AND brake acceleration to support the driver (vehicle offers lane centering and adaptive cruise control at the same time).		
Level 3	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. Additionally, when the feature requests, you must drive.		
Level 4	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. You are not required to take over driving.		
Level 5	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under all conditions.		

you

---STOP!---

DESCRIPTION #3

Please take a moment and read through the table of names and descriptions. As you read through the names and descriptions, I want you to think about how well the name fits with the description and if there is anything need to make it a better fit.

NAME	DESCRIPTION
No Automation	You are driving and have access to driver support features that are limited to warnings and momentary assistance (vehicle offers blind spot warning, lane departure warning and/or emergency braking).
Driver Assistance	You are driving and have access to driver support features that provide steering OR brake acceleration to support the driver (vehicle offers lane centering, adaptive cruise control but they work independently).
Partial Automation	You are driving and have access to driver support features that provide steering AND brake acceleration to support the driver (vehicle offers lane centering and adaptive cruise control at the same time).
Conditional Automation	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. Additionally, when the feature requests, you must drive.
High Automation	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met. You are not required to take over driving.
Full Automation	You are NOT driving when the automated driving features are engaged – even if you are seated in the driver’s seat. These features can drive the vehicle under all conditions.

DESCRIPTION #4

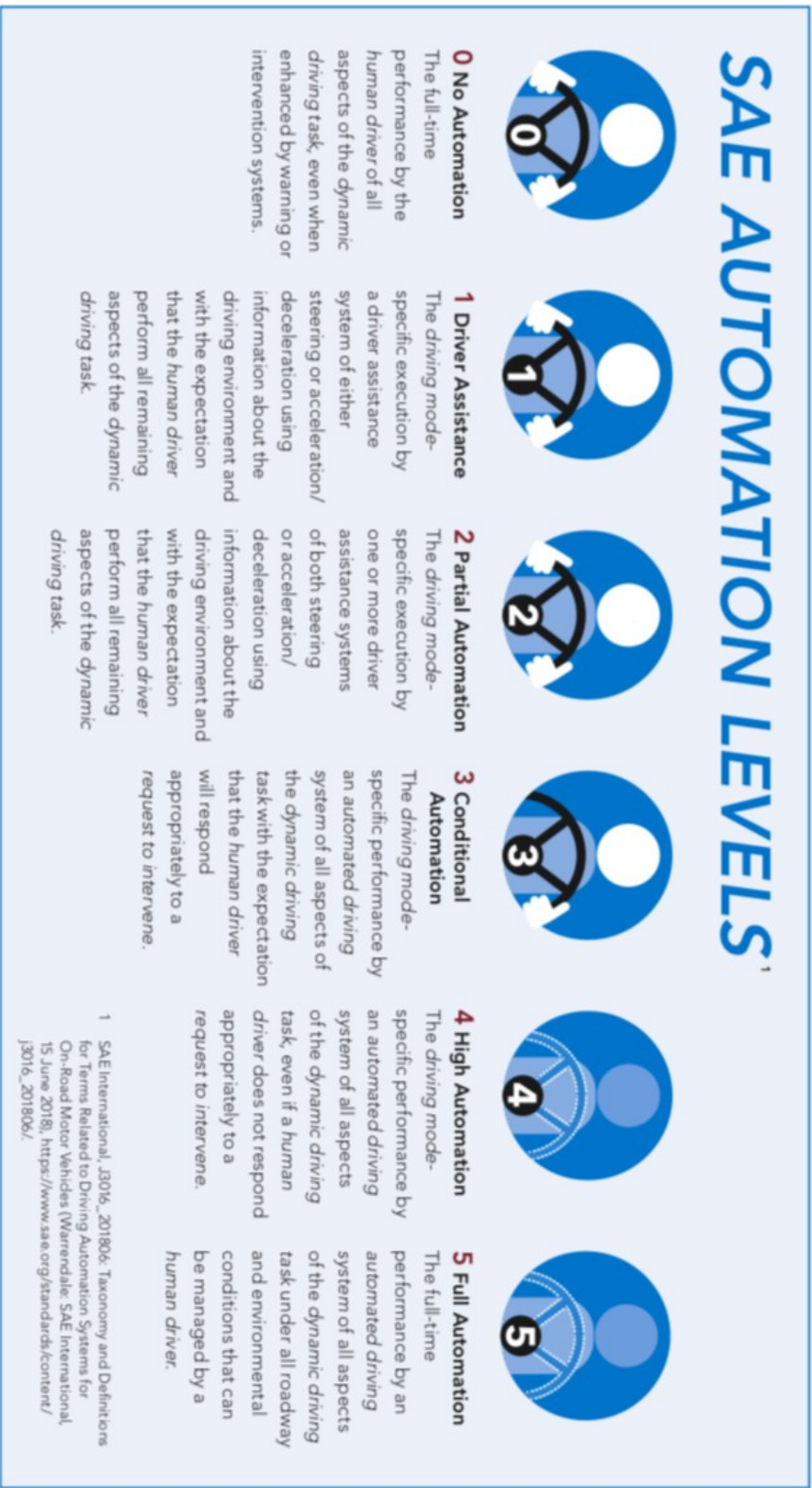


SAE J3016™ LEVELS OF DRIVING AUTOMATION

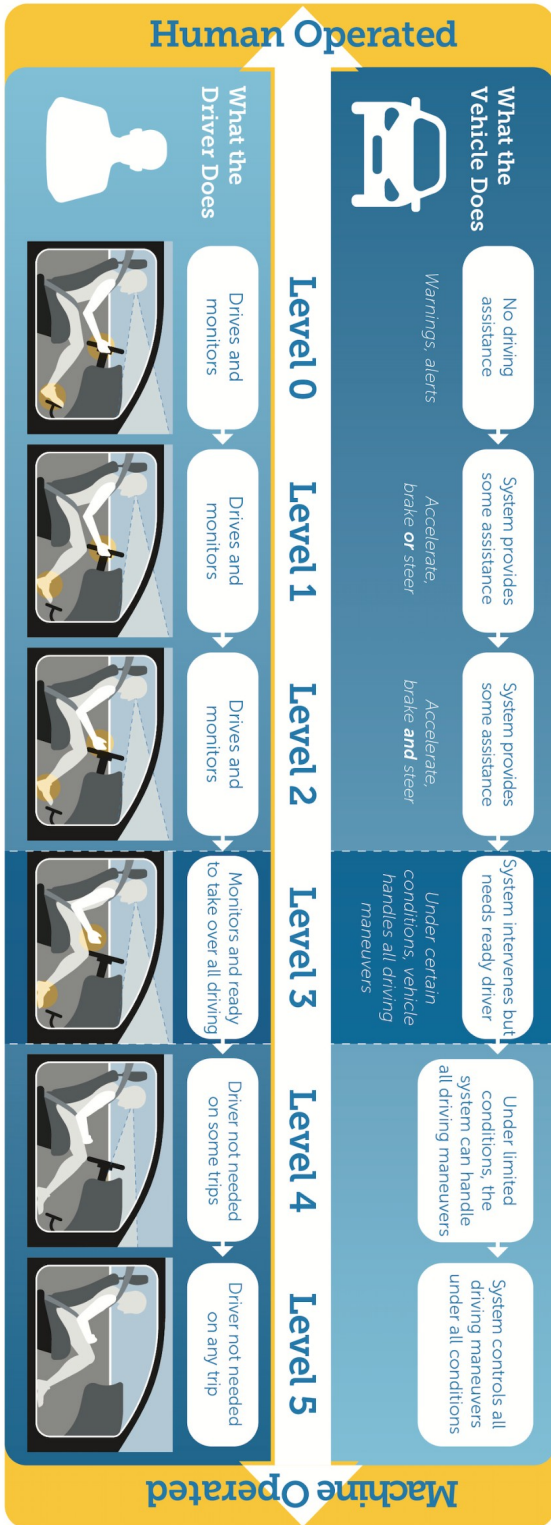
	SAE LEVEL 0	SAE LEVEL 1	SAE LEVEL 2	SAE LEVEL 3	SAE LEVEL 4	SAE LEVEL 5
<p>What does the human in the driver's seat have to do?</p>	<p>You are driving whenever these driver support features are engaged - even if your feet are off the pedals and you are not steering.</p>	<p>You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety.</p>	<p>You are not driving when these automated driving features are engaged - even if you are seated in "The driver's seat".</p>	<p>When the feature requests, you must drive.</p>	<p>These automated driving features will not require you to take over driving.</p>	<p>This feature can drive the vehicle under all conditions.</p>
<p>What do these features do?</p>	<p>These features are limited to providing warnings and momentary assistance.</p>	<p>These features provide steering OR brake/acceleration support to the driver.</p>	<p>These features provide steering AND brake/acceleration support to the driver.</p>	<p>These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met.</p>	<p>This feature can drive the vehicle under all conditions.</p>	<p>This feature can drive the vehicle under all conditions.</p>
<p>Example Features</p>	<ul style="list-style-type: none"> • automatic emergency braking • blind spot warning • lane departure warning 	<ul style="list-style-type: none"> • lane centering OR • adaptive cruise control 	<ul style="list-style-type: none"> • lane centering AND • adaptive cruise control at the same time 	<ul style="list-style-type: none"> • traffic jam chauffeur 	<ul style="list-style-type: none"> • local driverless taxi • pedals/steering wheel may or may not be installed 	<ul style="list-style-type: none"> • same as level 4, but feature can drive everywhere in all conditions

For a more complete description, please download a free copy of SAE J3016: https://www.sae.org/standards/content/J3016_201806/

DESCRIPTION #5



DESCRIPTION #6



ACTIVITY #4

When thinking about the different levels of automation, do you tend to...

Circle one

- A) think about your vehicle overall operating at a certain level or
- B) think about the different types of advanced driver assistance systems equipped in your vehicle that allow it to operate at a certain level?

Why do you say that?

---STOP!---

ACTIVITY #5

Please read carefully and answer the question on this page.

Thinking back about everything we discussed this evening, please turn to the last page in your workbook and indicate which of these two perspectives is closest to your own:

- **[HUMANS ARE SAFER]** Some people say that it's safer when the human driver is in complete control of all the vehicle functions. They trust themselves more than technology, and say that technology software could be hacked, or that they can't fully relax in a vehicle where the computer assists with certain driving tasks.
- **[TECHNOLOGY IS SAFER]** Others say that vehicles in which drivers are assisted by a computer are safer. Technology can react more quickly and reliably than people can, technology can be rigorously tested in a wide range of situations before they are allowed on vehicles, and new and better technology is on the horizon.

Please circle one.

1. DEFINITELY FEEL **HUMANS ARE SAFER**
2. SOMEWHAT FEEL **HUMANS ARE SAFER**
3. SOMEWHAT FEEL **TECHNOLOGY IS SAFER**
4. DEFINITELY FEEL **TECHNOLOGY IS SAFER**

---STOP!---