



## **OVERVIEW**

## What is Toyota Teammate™?

Toyota Teammate<sup>™1</sup> is a suite of advanced driver assistance systems available on the 2022MY Toyota Mirai Limited, which includes Advanced Drive² and, standard on Mirai Limited, Advanced Park.³ Based on the Teammate Mobility Concept, this technology is built around the philosophy that people and vehicles can work in partnership to achieve safe, convenient, and efficient mobility.

## What is Advanced Drive?

Advanced Drive<sup>2</sup> is a system which uses high definition (HD) map data and detection information from various sensors to provide steering, acceleration, and deceleration support on highways and expressways, under the supervision of the driver. It can also maintain the vehicle within the lane, follow other vehicles, change lanes, negotiate certain roadway interchanges and traffic jams, and overtake slower vehicles.

Advanced Drive Overview: https://youtu.be/w4LT0Z7mLRs

View the following video for a more detailed introduction to Advanced Drive.

Toyota Teammate™ Advanced Drive - In Car Introduction: <a href="https://youtu.be/WUGiB9Anrkk">https://youtu.be/WUGiB9Anrkk</a>

## Is Advanced Drive an automated or autonomous driving system?

No, Advanced Drive assists the driver by providing information and driving assistance according to traffic and certain roadway conditions interpreted by the system sensors and HD map data. The system also monitors the driver's attentiveness, posture and connection with the steering wheel, and may disengage the feature if the driver is not found to be attentive. Driving safely is the sole responsibility of the driver, and the driver should not overly rely on the system.

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## REQUIRED OPERATING CONDITIONS

## Where can I use **Advanced Drive?**

Advanced Drive<sup>2</sup> is only available on mapped, limited access roadways.

## What is a limited access roadway?

A limited access roadway has on and off ramps, does not have stop lights, and is a divided roadway on which traffic in the opposing direction is separated by a barrier or other median.

### What is a mapped roadway?

Advanced Drive relies on HD map data. Certain roadways or portions of roadways may not have current HD map data. In these areas where HD map data is not available, Advance Drive will also not be available. Visit <u>www.Toyota.com/Mirai/Teammate</u> to view an interactive map showing which roadways are supported with HD map data.

### What other operating conditions are required for Advanced Drive to be enabled?

Advanced Drive uses a variety of sensor inputs including cameras, radar and LiDAR. These sensors must be able to detect certain conditions of the roadway, traffic and even the condition of the driver.

## What is the driver monitor system, and how does it work?

The driver monitor system attempts to determine if the driver meets several conditions consistent with a driver who is alert and well positioned to perform the driving task. A camera facing the driver is used to determine the direction the driver is facing and whether their eyes are open or closed. A touch sensitive steering wheel sensor is used to determine if the steering wheel is being held. If the system is not able to detect the condition of the driver or the driver appears to not be paying attention, an audible alert will sound and a message will be displayed to warn the driver.

#### Why would the system not be able to detect the driver?

If the driver is improperly positioned or aligned with the camera, wearing certain sunglasses, a certain type of mask, or eye patch, or there is an obstruction on or in front of the driver's face such as the driver holding an object between their face and the driver monitor camera.

Is a navigation destination required for Advanced Drive to function?

A navigation destination is not required. If no destination is set, Advanced Drive<sup>2</sup> will proceed on a roadway if the system operating conditions are met. Setting a destination in the Navigation system may provide additional route support including lane changes for an upcoming exit or interchange, and highway-to-highway mergers. Regardless of a set destination, HD map data is required for Advanced Drive to function and is separate from the navigation system.



# Where or when should Advanced Drive not be used?

Vehicle, environment, and traffic conditions should be considered before engaging Advanced Drive.<sup>2</sup> The following are examples of conditions in which Advanced Drive should not be used.

#### Vehicle:

If the windshield is fogged or cracked;

If the sensors are covered by water, snow, dirt or debris;

If the vehicle is excessively loaded;

If the tires are worn, incorrectly inflated or not the original size;

If the vehicle wheels are misaligned;

If a compact spare tire is installed;

If tire chains are installed;

If driving in an emergency or flex lane;

If there is significant damage to the bumper or other areas of the vehicle that might affect stability;

If towing.

## **Environment/weather:**

If there is strong wind or inclement weather such as rain, fog, snow, sandstorms, etc.

#### **Traffic:**

When traffic is constantly accelerating/decelerating, when traffic is heavy, or if the road has sharp curves, is slick, has steep slopes or sharp changes in grade.

# How will I know when I can use Advanced Drive?

When all operating conditions are met and the Advanced Drive<sup>2</sup> system has initialized, the Advanced Drive indicator icon will be illuminated on the multi-information display (MID) and the message "Advanced Drive READY" will be displayed on the instrument cluster and Head-Up Display (HUD).

### Advanced Drive Icon

### Advanced Drive READY message on the instrument cluster





## Will Advanced Drive work in high-occupancy vehicle (HOV) or Express lanes?

If the lane is part of the HD map data, and all operating conditions are met, Advanced Drive will function in HOV and Express lanes. However, the driver must manually steer the vehicle to enter and exit these lanes.

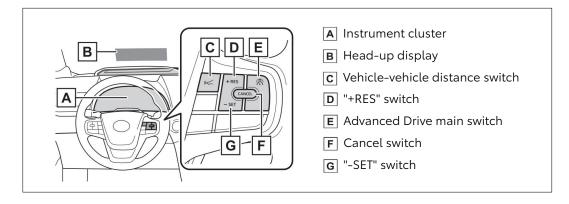
Advanced Drive cannot determine if driving in that lane is allowable (for example, if lane use requires more than one person in the vehicle). It is the driver's responsibility to judge if these lanes may be used.



## SYSTEM OPERATION

## How do I engage Advanced Drive?

Advanced Drive² must first be turned ON in the multi-information display (MID) menu. Once on a mapped, limited access roadway, with the operation conditions met, Advanced Drive will begin initializing. Once initialized a message will be displayed that states "Advanced Drive READY". Pressing the Advanced Drive main switch on the right side of the steering wheel will activate Advanced Drive. If the switch is pressed and the required conditions for Advanced Drive are not met, Lane Tracing Assist (LTA)⁴ and Full-Speed Dynamic Radar Cruise Control (DRCC)⁵ will be activated and the cruise control set speed set to the vehicle's current speed. If the required operating conditions for Advanced Drive are met while LTA & DRCC are engaged, a prompt may be displayed on the MID asking the driver if they want to switch to Advanced Drive. The driver must use the meter control switches on the left side of the steering wheel to select "Yes" to enable Advanced Drive in this condition.



View the following video for more information on the settings and controls of Advanced Drive. Toyota Teammate™ Advanced Drive - Settings and Controls: <a href="https://youtu.be/Sago4yVHxhA">https://youtu.be/Sago4yVHxhA</a>

While Advanced
Drive is engaged, am
I still able to steer,
brake or accelerate?

Yes, the driver is always able to control the vehicle through steering, braking or accelerator input.

If the brake pedal is depressed, Advanced Drive<sup>2</sup> will be canceled much like how cruise control is canceled when the brake pedal is depressed.

If operating in hands-free Advanced Drive, and the accelerator pedal is pressed, the system will prompt the driver to hold the steering wheel until returning to the set speed. If there has been no brake application, the system will return to the set speed when the driver is no longer pressing the accelerator pedal.

If there is a significant amount of steering wheel input, the system will assume the driver is taking control and Advanced Drive will disengage.

How do I stop the prompts and turn off Advanced Drive?

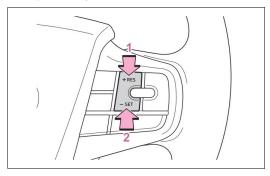


# How do I adjust the settings related to Advanced Drive?

Settings for driver alerts related to the Advanced Drive<sup>2</sup> system and Overtaking Settings can be adjusted from the MID menu using the meter control switches on the left side of the steering wheel.

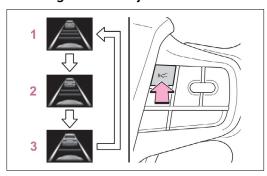
The set speed and following distance can be adjusting using the switches on the steering wheel just like during Dynamic Radar Cruise Control operation.

## **Set Speed Adjustment**



- 1 Increase set vehicle speed
- 2 Decrease set vehicle speed

## **Following Distance Adjustment**



- 1 Long
- 2 Medium
- 3 Short

## HANDS-FREE OPERATION

When will hands-free driving be available?

If all operating conditions of Advanced Drive<sup>2</sup> are met, and the system detects that the driver is looking ahead, hands-free operation may be allowed. This will be indicated by a blue theme of the Advanced Drive display on the instrument cluster. The driver is responsible for safe driving and must always be prepared to take control.

#### **Head-Up Display Gray Theme**



## Head-Up Displaay Blue Theme (hands-free)



## **Instrument Cluster Gray Theme**



#### Instrument Cluster Blue Theme (hands-free)



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Under what circumstances is the driver required to return their hands to the steering wheel? When is hands-free operation not available?

During regular operation of Advanced Drive,<sup>2</sup> the system will periodically request that the driver hold the wheel. Once the driver holds the wheel, and if all operating conditions are still met, hands-free operation may resume.

Assisted lane changes require the driver to hold the wheel.

When the operating conditions of Advanced Drive are no longer met, hands-free operation will also not be available.

When the vehicle speed exceeds the speed limit by a certain amount, the system will require the driver to keep their hands on the wheel.

If the driver monitor system cannot detect the driver, hands-free operation will be canceled.

## **TROUBLESHOOTING**

If all operating conditions appear to be met, why would Advance Drive not Initialize?

Advanced Drive<sup>2</sup> must be turned on in the settings menu accessed in the MID.

The roadway may not be included in the HD map data or the roadway does not match the HD map data.

White lines must be detected on both sides of the vehicle.

The vehicle position within the lane must be near the center position of the lane as it is mapped in the HD map data. Significant bias to one side of the lane or the other may prevent initialization.

The driver does not meet the required Driver Monitor System conditions.

The current driving speed is outside the system's operating range.

Driving near a merging lane or in extremely wide or narrow lanes may prevent the system from detecting the road lines.

If the roadway has sharp curves, steep grades or long slopes.

Snow mode is turned on.

TRAC or VSC are turned off.

The windshield wipers are set at high speed.

Why will the system not initialize in an area where road construction appears completed?

To ensure safe driving, the recertification of a mapped road may not occur until some time after the construction is completed. In these instances, the HD map data may not be available and would prevent Advanced Drive<sup>2</sup> initialization.



## What would cause Advanced Drive to not work properly or not engage?

Advanced Drive<sup>2</sup> uses a variety of sensor inputs including cameras, radar and LiDAR, as well as HD Map information. Conditions that impact any of these inputs may result in Advanced Drive not functioning. This may include the following:

Road or weather conditions (fog, precipitation, extreme temperatures, etc)

Any sensor obstructions including things like snow or ice accumulation

Proximity to strong radio waves or electrical noise, such as a power plant or broadcasting stations

Accessories such as stickers or window tinting, or overhanging cargo, such as roof mounted skis or surfboard

### Why did Advanced Drive not brake appropriately when I was following another vehicle?

Certain vehicles or trailers may not be correctly detected. This includes vehicles or trailers with high ground clearance or very low ground clearance, such as a flat, unloaded trailer. Additionally, the system may not detect when a vehicle suddenly cuts into the lane between your vehicle and a preceding vehicle.

### Why did Advanced Drive not provide braking or alert me to an object in the road?

Advanced Drive only detects vehicles on the roadway. Objects such as boxes, road cones, tires or debris are not detected by the Advanced Drive system. Similarly, road damage such as pot holes or cracks are not detected. In these instances, the driver must control the brakes and steering to avoid objects in the roadway. It is important for the driver to always pay attention and be ready to take control.

Why does Advanced Drive system operation not match the surrounding conditions as observed by the driver? Advanced Drive<sup>2</sup> relies on HD map data. If the actual road condition differs from the map data, such as in an area of recent road construction, the system may not operate or may not operate correctly. It is important for the driver to always pay attention and be ready to take control.

Why does Advanced Drive not follow a destination I've set in the Dynamic Navigation? Dynamic Navigation<sup>6</sup> must be enabled through the menus of the center display for Advanced Drive<sup>2</sup> to link to a route set in the Navigation system. If Advanced Drive is activated immediately after the destination has been set, it may not yet be linked to the navigation system. Other conditions that may cause Advance Drive to not link would be if route guidance has already started with a separate navigation app, if the map data has not been updated, or if the system is still searching for the route.



## What would cause Advanced Drive to end or no longer be available?

If the necessary operating conditions of the system are no longer met, which includes availability of HD map data and the sensors' ability to detect road and traffic conditions, the system will prompt the driver to take control. Also, if Advanced Drive<sup>2</sup> with a Dynamic Navigation<sup>6</sup> route is ending, such as at an off ramp, Advanced Drive will end.

#### Additional conditions that can cause Advanced Drive to end:

If the system detects that the driver is not attentive through the driver monitor system, the driver will receive a prompt to take control and Advanced Drive may deactivate.

If the driver depresses the brake pedal

If there is significant steering or accelerator pedal input from the driver

If the driver monitor system is unable to detect the driver's condition, which can result if the driver is wearing a certain type of mask, certain sunglasses or there are other obstructions to the driver's face.

#### What occurs when Advanced Drive ends or is no longer available?

The system will prompt the driver to take control in several ways. If the system anticipates that Advanced Drive will end due to an upcoming area of roadway in which HD map data is not available or the conclusion of an Advanced Drive assisted navigation route, a notification on the MID will indicate that manual control will resume at the specified distance. If the required operating conditions of the Advanced Drive system are no longer met which are not related to anticipated HD map data unavailability, the driver will be alerted to take control.

#### How will I know when to take control?

There will be an audible alert as well as a message and icon displayed in the MID (multi-information display) and Head-up Display. If no action is taken, the seatbelt will vibrate as additional cue to alert the driver. When prompted to take control, the driver must either brake or apply the accelerator while holding the steering wheel to identify to the system that the driver has taken control. Alert settings can be adjusted in the Advanced Drive settings menu within the MID.

#### Why does the vehicle slow down when I am prompted to take control?

As a safety precaution, until the system recognizes driver input through the brake or accelerator pedal, the vehicle will decelerate and may come to a complete stop. Once at a complete stop, the system will activate the hazard lights to warn other motorists the vehicle is coming to a stop.



## LANE CHANGES

# How does the system support lane changes?

Advanced Drive<sup>2</sup> can offer support in lane changes in a few different scenarios. When an Advanced Drive assisted lane change is about to occur, the system will prompt the driver to hold the steering wheel and check the blind spot in the direction of the lane change. The driver monitor system will verify the driver has looked to the side of the vehicle and has contact with the steering wheel. If the system determines conditions are safe for a lane change and there is sufficient space in the adjacent lane, it will steer the vehicle to perform the lane change and will resume the set speed if there is sufficient distance from preceding traffic.

During an assisted lane change the driver must allow the system to turn the steering wheel. If the driver firmly holds the steering wheel in a straight driving position or steers against or in excess of the assisted steering rotation, the system will assume the driver is overriding the assisted lane change and the lane change will be canceled. The driver must always pay attention to traffic and roadway conditions, as safe driving is always the responsibility of the driver.

## Example of head-up display prompting driver to check blind spot



## Example of instrument cluster display prompting driver to check blind spot



#### What type of lane changes can be assisted by Advanced Drive?

Advanced Drive can support changing lanes to overtake slower traffic, moving out of the fast lane when not passing, changing lanes to prepare for a merger or exit, or driver-initiated lane change requests. Certain system initiated assisted lane changes will be preceded by a message to the driver asking if they want to proceed with the lane change. In these instances, the driver must choose "YES" using the meter control switches on the steering wheel to proceed with the assisted lane change.

#### Will Advanced Drive allow for hands-free lane changes?

All lane changes require the driver to have contact with the steering wheel, and the system will prompt the driver to "Hold Steering Wheel". Unless corrective steering needs to be initiated by the driver, it will not be necessary for the driver to steer the vehicle, only to have contact with the steering wheel. Wearing gloves, holding the spokes of the steering wheel or using a steering wheel knob may cause the system to not be able to detect that the driver has contact with the steering wheel.

## How do I initiate an Advanced Drive assisted lane change?

Advanced Drive must be turned on and engaged. To initiate the lane change the driver must press and hold the turn signal lever for approximately 1 second or more in the direction of the lane change. An assisted lane change will not be initiated if the turn signal lever is completely engaged.

#### Why would an assisted lane change not be completed?

All required operating conditions for the Advanced Drive system must be met, and the system must detect safe traffic conditions for the lane change. If roadway or traffic conditions cannot be confirmed by the system, or HD map data is unavailable, Advanced Drive will not assist in the lane change. In this instance, lane changes must be completed by the driver.

## **CONNECTIVITY, PRIVACY & UPDATES**

# Does the system require a subscription?

Yes, the system requires a bundled subscription to the following services: Safety Connect<sup>\*</sup>,<sup>7</sup> Destination Assist,<sup>8</sup> Dynamic Navigation,<sup>6</sup> and Advanced Drive<sup>2</sup> System Service. A 3 year trial subscription is included with the vehicle.

## How much will the required bundled subscription cost?

Subscription to these services should be close to \$24 per month. However, the actual renewal cost may differ at the time of renewal.

# Does Advanced Drive require updates, and how often?

Advanced Drive is capable of Over-the-Air (OTA) updates, and occasional software updates may be issued. These updates may address various items related to the system. When a software update is available a notification will be displayed on the center display and certain updates may require the driver to initiate the update process. Specific update information can be found at <a href="Toyota.com/Owners">Toyota.com/Owners</a>.

## Does the vehicle/ system record data from the vehicle?

Various operational data, including sensor detection information and system operation status, are recorded while driving and for several seconds before and after certain events such as a collision or collision-like scenarios. This collected data may be retrieved when the vehicle is brought to a Toyota dealer.

## Why is this data collected?

Collected data is used for research and development of vehicle technologies and safety systems. Also, this data may be used for collision analysis, malfunction diagnosis, or to provide customer support.

#### Are images from the vehicle cameras recorded?

No in-vehicle sounds, or images are recorded or transmitted. The driver monitor camera does not record images. The forward-facing, exterior camera used to support Advanced Drive<sup>2</sup> will record images in certain events such as a collision or collision-like scenarios.

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## **DISCLOSURES**

1. Do not overly rely on Teammate's Advanced Drive and Advance Park capabilities and use in accordance with applicable laws. Advanced Drive is not an automated driving system. Driver is responsible for safe driving, must pay attention to surroundings and be prepared to take full control at all times. When using the hands-free feature of Advanced Park, always pay attention to the vehicle's surroundings. Before operating Teammate functions, refer to Owner's Manual for additional instructions and limitations. **2.** Advanced Drive is not an automated driving system. The driver is responsible for safe driving and must not overly rely on the system. Always pay attention to your surroundings and be prepared to take full control at all times. Use this system in accordance with applicable laws. Before operating, refer to Owner's Manual for additional instructions and limitations. 3. Do not overly rely on Advanced Park and use only in accordance with applicable laws. When parking using the hands-free feature, always pay attention to the vehicle's surroundings. Before operating, refer to Owner's Manual for additional instructions and limitations. 4. The Lane Tracing Assist (LTA) lane centering function is designed to read visible lane markers and detect other vehicles under certain conditions. It is only operational when DRCC is engaged. Not available on vehicles with manual transmissions. See Owner's Manual for additional limitations and details. 5. Dynamic Radar Cruise Control (DRCC) is designed to assist the driver and is not a substitute for safe and attentive driving practices. System effectiveness is dependent on many factors including road, weather and traffic conditions. See Owner's Manual for additional limitations and details. 6. Dynamic Navigation depends on factors outside of Toyota's control, including an operative telematics device, a cellular connection, GPS signal, and the availability of a compatible wireless network, without which system functionality and availability may be limited or precluded. Services not available in every city or roadway. Use common sense when relying on information provided. Service may vary by vehicle and region. Registration is required. Subscription required after trial. Terms of Use apply. Data charges may apply. See Owner's Manual and https://www.toyota.com/connected-services for additional limitations and details. To learn about Toyota's Connected Services data collection, use, sharing and retention practices, please visit https://www.toyota.com/privacyvts/. The Dynamic Navigation trial period is at no extra cost and begins on the original date of purchase or lease of a new vehicle. Paid subscription required after trial to access the service. 7 Safety Connect depends on factors outside of Toyota's control, including an operative telematics device, a cellular connection, GPS signal, and the availability of a compatible wireless network, without which system functionality and availability may be limited or precluded, including access to response center and emergency support. Stolen vehicle police report required to use Stolen Vehicle Locator. Automatic Collision Notification activates only in limited circumstances. Requires app download/registration and subscription after trial (if applicable). Service subject to change at any time without notice. Terms of Use apply. Service may vary by vehicle and region. See usage precautions and service limitations in Owner's Manual and https://www.toyota.com/connected-services/ for additional details. To learn about Toyota's connected services data collection, use, sharing and retention practices, please visit https://www.toyota.com/privacyvts/. The Safety Connect trial period (if applicable) is at no extra cost and begins on the original date of purchase or lease of a new vehicle. Subscription required after trial to access the service. 8. Destination Assist depends on factors outside of Toyota's control, including an operative telematics device, a cellular connection, GPS signal, and the availability of a compatible wireless network, without which system functionality and availability may be limited or precluded. Use common sense when relying on this information. Service may vary by vehicle and region. Registration required. Subscription required after trial. Services subject to change at any time without notice. Terms of Use apply. Data charges may apply. See Owner's Manual and Toyota.com/connected-services for additional limitations and details. To learn about Toyota's Connected Services data collection, use, sharing and retention practices, please visit https://www.toyota.com/privacyvts/. The Destination Assist trial period is at no extra cost and begins on the original date of purchase or lease of a new vehicle. Paid subscription required after trial to access the service.

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