



TRANSPORTATION ENGINEERING DIVISION FACT SHEETS

Left-Turn Signal Controls and Displays (Page 1 of 3)

What are the different types of signalized left-turn controls and displays?

Why can I only turn left on a green arrow at some intersections?

Why does the green arrow get displayed at so many different times?

Why do some intersections have flashing yellow left-turn arrows and others don't?

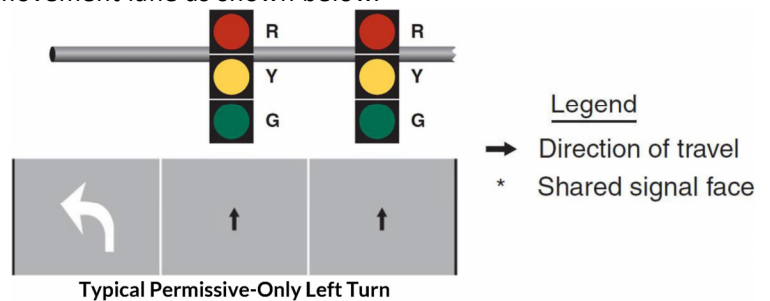


What are the different types of signalized left-turn controls and displays?

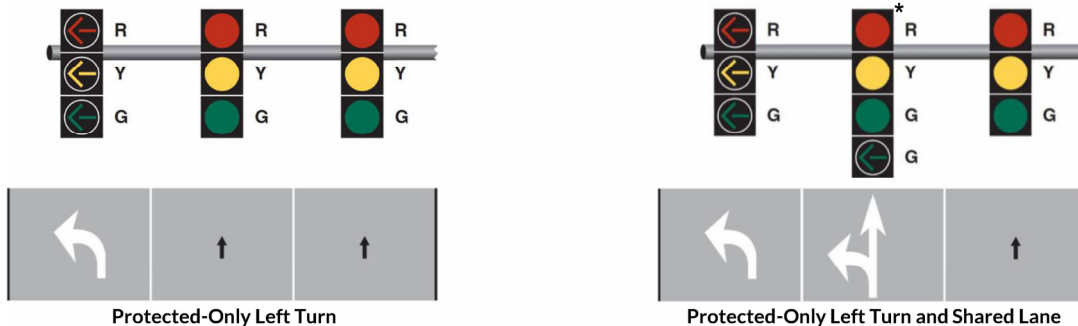
Where permitted, left-turn movements at intersections under traffic signal control are executed under one of three control modes: permissive-only, protected-only or protected/permissive. A time-of-day combination of protected/permissive and protected-only modes may also be utilized.

The permissive-only mode allows left-turn movements to be made when a circular green indication is displayed. Under the permissive-only mode the left-turning motorist must yield to oncoming traffic and/or pedestrians. The circular green indication is typically displayed over the adjacent through movement lane as shown below.

The permissive-only mode is typically used where turn volumes and/or opposing through volumes are relatively low, where speeds are relatively low, where there is only one or two opposing through lanes, and where left-turning motorists have adequate visibility of oncoming traffic to turn safely. Advantages of the permissive-only mode include reduced intersection delay and stops.



The protected-only mode only allows left-turn movements to be made when a green left arrow indication is displayed. The green left arrow is followed by a yellow arrow and a red arrow or red ball indication. The left-turn display is typically placed directly in front of the left-turning vehicle and an exclusive left-turn lane. The protected green arrow phase may either precede or follow the circular green phase for the through movement. If a protected-only left-turn is allowed from a shared left-turn/through lane concurrent with the through movement, the signal display over that lane will include a circular green indication in addition to the green left arrow indication.



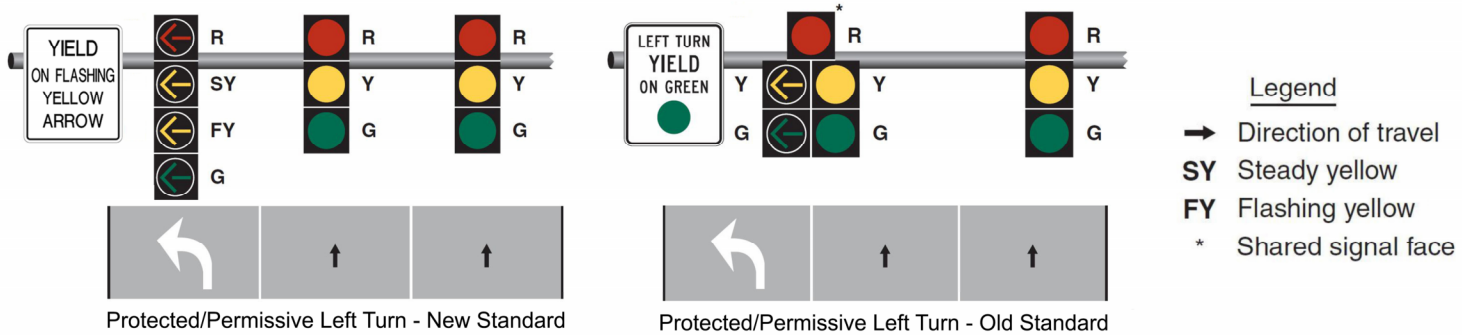
The protected-only mode is typically used where turn volumes and/or opposing through volumes are relatively high, where speeds are relatively high, where there are two or more turn lanes, where there are two or more opposing through lanes, and where left-turning motorists have *inadequate* visibility of oncoming traffic to turn safely. The protected-only mode reduces the potential for conflicts and crashes between left-turning vehicles and opposing traffic, and between left-turning vehicles and pedestrians.



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Left-Turn Signal Controls and Displays (Page 2 of 3)

The protected/permissive mode incorporates both the permissive and protected modes. The protected mode may either follow or precede the permissive mode. The current standard for implementing the protected/permissive mode is with a four-section signal display that includes a flashing yellow arrow for the permissive mode, and a steady green arrow for the protected mode. The four-section signal display is positioned directly in front of the left-turning motorist and an exclusive left-turn lane. The previous standard for the protected/permissive mode, which some intersections are still utilizing, was a five-section “dog-house” display that incorporated a circular green for the permissive mode.



The protected/permissive mode is typically used where it is determined that permissive left-turns can be made safely, but where there is also the need to provide a protected mode to adequately serve left-turn demands. In some cases, the protected/permissive mode may be limited to certain times of the day when permissive left-turns are determined to be safe, and the protected-only mode is instituted during other periods. Relative to the permissive-only mode, the protected/permissive mode can reduce crash potential, increase left-turn capacity, and reduce left-turn delay. Relative to the protected-only mode, the protected/permissive mode can reduce both left-turn delay and overall intersection delay by allowing permissive left-turns when they are safe to execute.

Why can I only turn left on a green arrow at some intersections?

Intersection approaches operate under the protected-only left-turn mode where it has been determined that permissive mode left-turns are not safe to execute. This is often the case on higher volume six-lane streets with speed limits of 45 mph or more. It is also the case where there are multiple turn lanes, and where left-turning motorists have inadequate visibility of oncoming traffic to turn safely. In some cases, a protected-only mode may be implemented at certain times of the day when permissive left-turns are not considered safe. This is typically during higher volume periods. As traffic demands increase and more permissive mode left-turn movements occur during the yellow change interval, the potential for crashes can increase.



Why does the green arrow get displayed at so many different times?

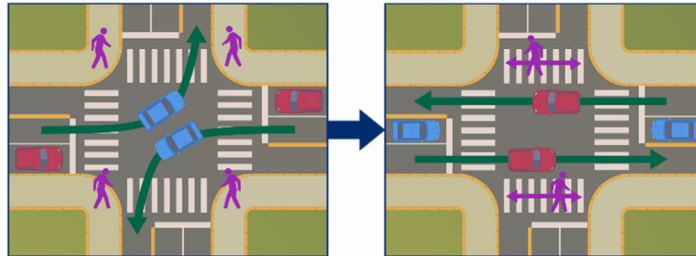
As previously noted, protected green arrow indications may precede the circular green (lead phasing) or follow it (lag phasing). Where both opposing left-turns have leading arrow phases the sequence is known as dual-leading left-turn phasing, and if both have lagging arrows it is dual-lagging left-turn phasing. Where one is leading and one is lagging it is lead/lag left-turn phasing. In the case of lead/lag left-turn phasing, the green arrow left-turn phases are concurrent with adjacent through phases. This can also occur with dual-leading and dual-lagging left-turn phasing when one of the left-turn phases is omitted due to lack of demand, or when one left-turn phase is longer than the other. The different sequences of left-turn phases are shown graphically on the following page.

The type of left-turn phasing sequence implemented is based on several considerations and can vary by time of day. Considerations include the volume of left-turning and opposing through traffic, coordination with other traffic signals, queuing impacts of both left-turn and through movements, and intersection geometry and efficiency factors.

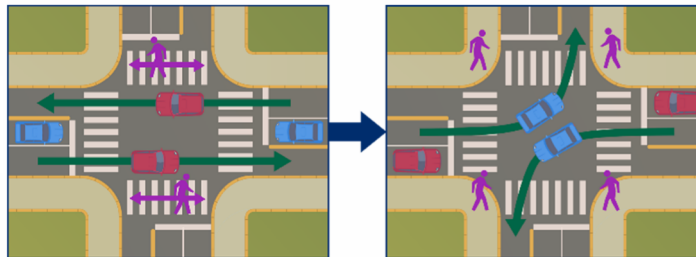


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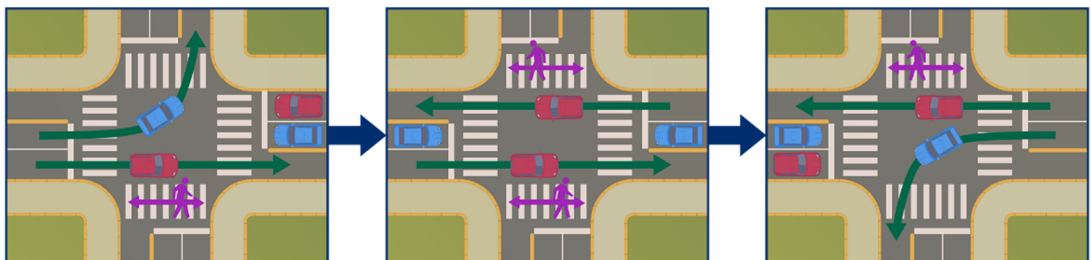
Dual-Leading Left Turns:



Dual-Lagging Left Turns:



Lead/Lag Left Turns:



Why do some intersections have flashing yellow left-turn arrow and others don't?

Flashing yellow left-turn arrows are absent on intersection approaches that operate in protected-only and permissive-only modes, and on approaches using the previous standard for the protected/permissive mode. As previously noted, the current standard for implementing the protected/permissive mode is with a four-section signal display that includes a flashing yellow arrow for the permissive mode. The previous standard for the protected/permissive mode is a five-section “dog-house” display that incorporates a circular green for the permissive mode.

Most but not all dog-house displays have been upgraded to the current standard. Conversions continue as existing equipment is replaced and reconstructed, and as funding permits. A national study conducted for the Federal Highway Administration demonstrated that the new flashing yellow arrow standard for the protected/permissive left-turn mode reduces crash potential, increases capacity, and provides greater traffic management flexibility.

Want More Information?

This flyer is for general purposes only. For more information, please contact the city of Las Vegas Department of Public Works, Transportation Engineering Division at (702) 229-6331 or <https://seeclickfix.com/las-vegas>

NOTE: The **Manual on Uniform Traffic Control Devices (MUTCD)** is used throughout the country as the standard by which traffic control decisions are made. Nevada Revised Statute 484A.430 requires its use for placement of all traffic control devices. Find the **complete MUTCD** at <https://mutcd.fhwa.dot.gov/>, or scan the QR code.



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