

August 13, 2000

LANE DISCIPLINE IN MULTI-LANE ROUNDABOUTS

Roundabouts are a good alternative to traffic signal installation in a variety of instances. However, when traffic volumes are high such that multiple lanes are needed on one or more of the intersection approaches, roundabouts are a less attractive solution. This is because the use of a roundabout under multi-lane conditions requires much more driver judgment than when only 2 lane roads are involved. In fact, most US drivers (unlike their foreign counterparts) do not understand the lane use rules that are associated with multi-lane roundabouts. This is true because American drivers are not exposed to multi-lane roundabouts during either driver training or during their domestic driving experience.

By examining the example multi-lane roundabout shown in Figure 1 an understanding can be gained of the "lane discipline" required for safe operation. In this example, three of the four legs of the roundabout (the north, south and west) have multiple-lane approaches. Much like a signalized intersection, pavement arrows (sometimes combined with supplemental lane use signing) show the allowable movements that can be made from a given lane. At a standard 4-leg multi-lane roundabout like the one shown in Figure 1, pavement arrows have the following meaning:

right arrow:	must exit 1/4 of the way around the roundabout
thru arrow:	must exit 1/2 of the way around the roundabout
left arrow:	must exit 3/4 of the way around the roundabout
combination right/thru arrow:	can exit 1/4 or 1/2 of the way around the roundabout
combination left/thru arrow:	can exit 1/2 or 3/4 of the way around the roundabout
combination left/thru/right arrow:	can exit anywhere around the roundabout

Just as you wouldn't think of going straight from a left turn only lane at a signalized intersection, those familiar with multi-lane roundabouts wouldn't think of exiting 1/2 of the way around the roundabout if they entered the roundabout via a lane containing a left turn pavement arrow.

Figures 2 through 5 graphically depict the allowable movements that can be made from each leg of our example roundabout. By carefully reviewing these figures, someone that is unfamiliar with multi-lane roundabout operation can begin to understand the "lane discipline" nuances.

Notice how the number of receiving lanes on each leg must be compatible with the pavement arrow designations on all other approaches. For example, the east leg of this intersection only has a single receiving lane. Consequently, the south approach cannot have the lane designations shown for the north approach (a double left) or an accident could easily occur as motorists from two circulating lanes within the roundabout try to force their way into one receiving lane. For the same reasons, the west approach cannot use the lane designation shown for the south approach. Once again, this is analogous to a signalized intersection. One wouldn't think of having a double left turn lane on the main street with only one receiving lane on the side street!

When using a multi-lane roundabout, motorists should use their turn signals just as they would at a

signalized intersection. If a motorist intends on travelling 1/4 of the way around the roundabout then the right turn signal should be used upon entering the roundabout, and if the motorist intends on travelling 3/4 of the way around the roundabout then the left turn signal should be used. This allows other drivers entering the roundabout to gauge the intentions of motorists already in the roundabout - motorists they must yield to.

Once the "lane discipline" rules of multi-lane roundabouts is learned (and obeyed) by all motorists, then these roundabouts can safely carry substantial volumes of traffic. However, if only a few of the motorists using the roundabout don't understand this lane discipline, then the clear potential exists for someone to exit the roundabout from the wrong lane and cause a sideswipe accident. An example of this is shown in Figure 6.

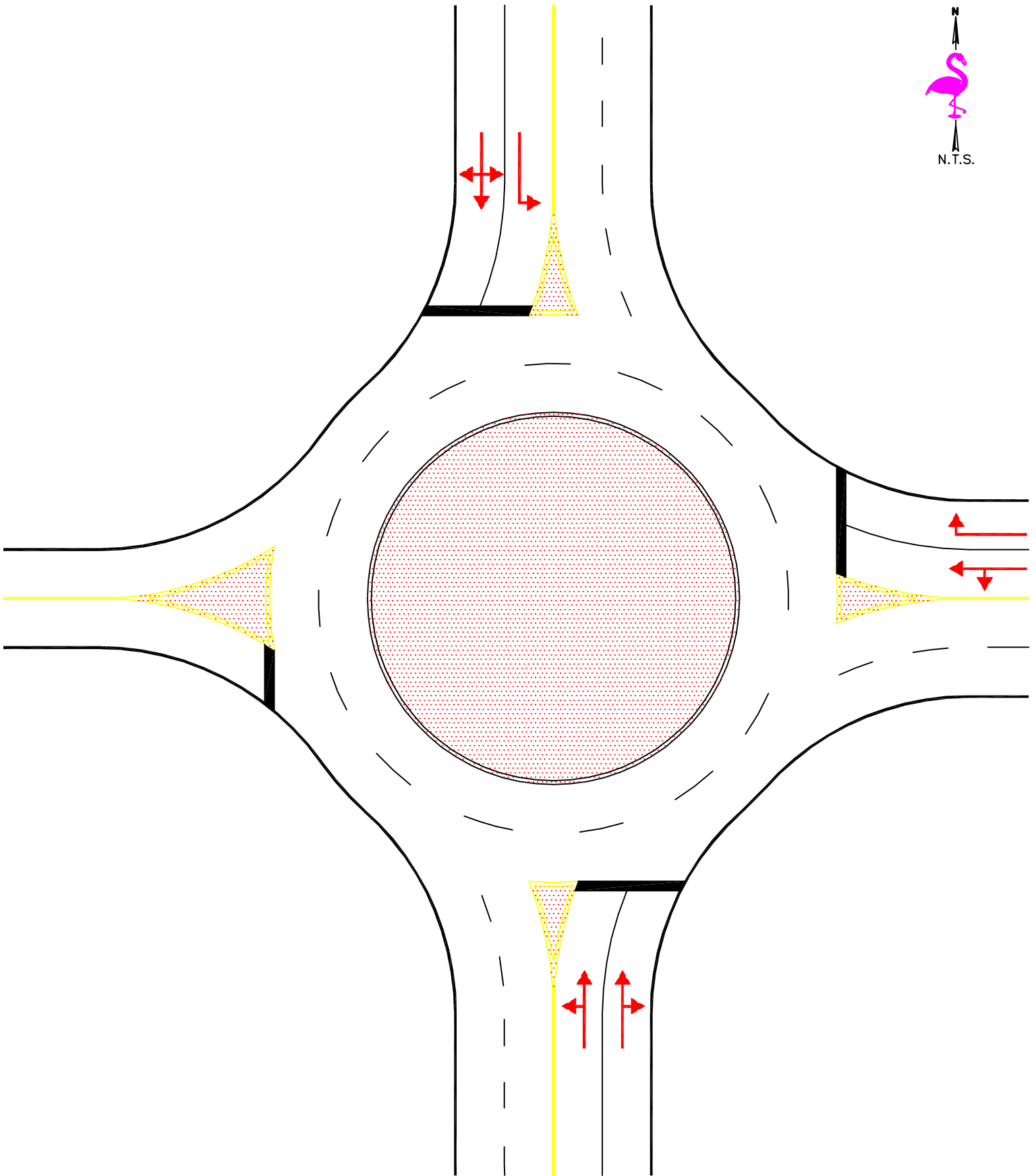


FIGURE 1

MULTI-LANE ROUNDABOUT EXAMPLE

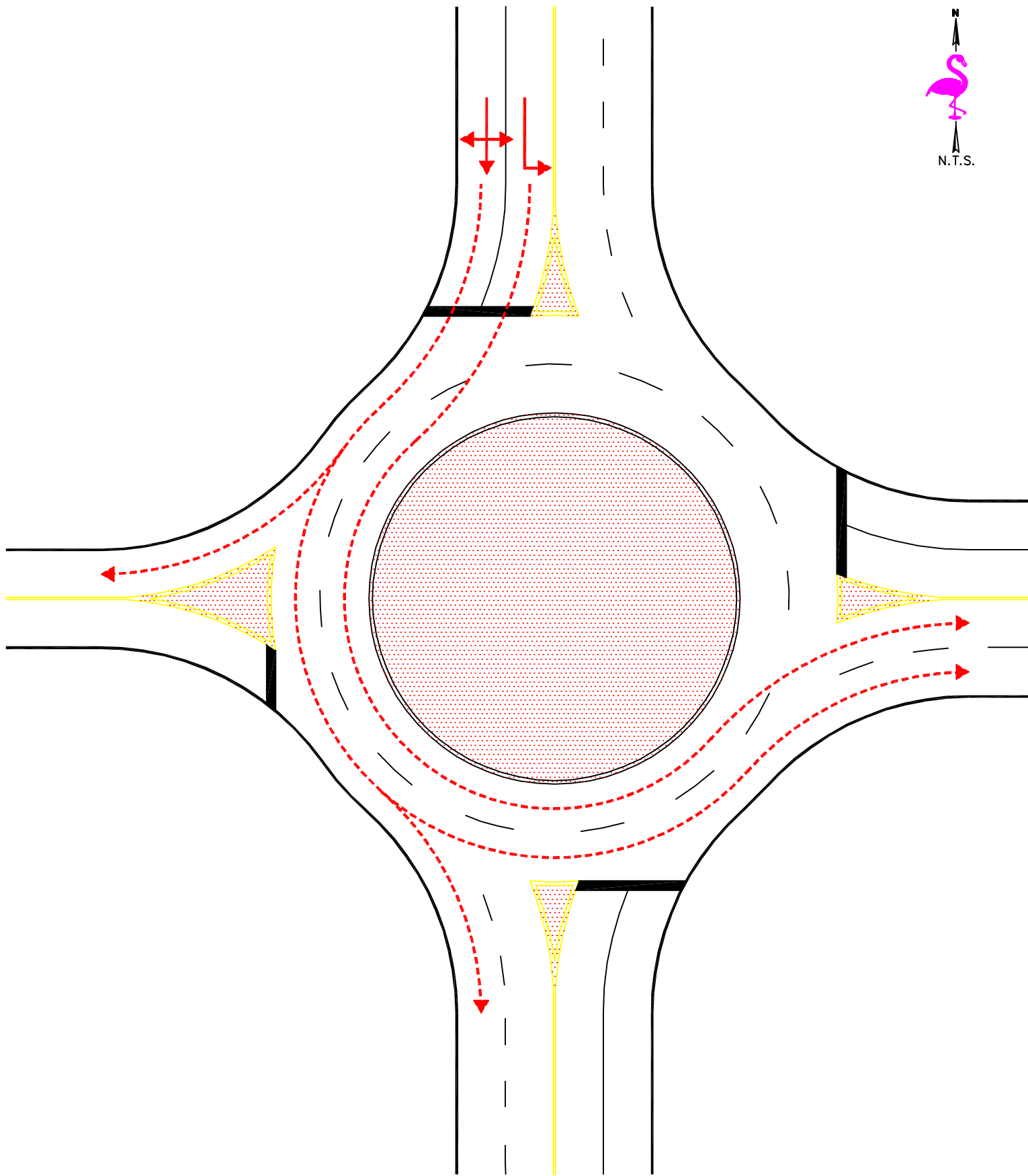


FIGURE 2

NORTH APPROACH MOVEMENTS

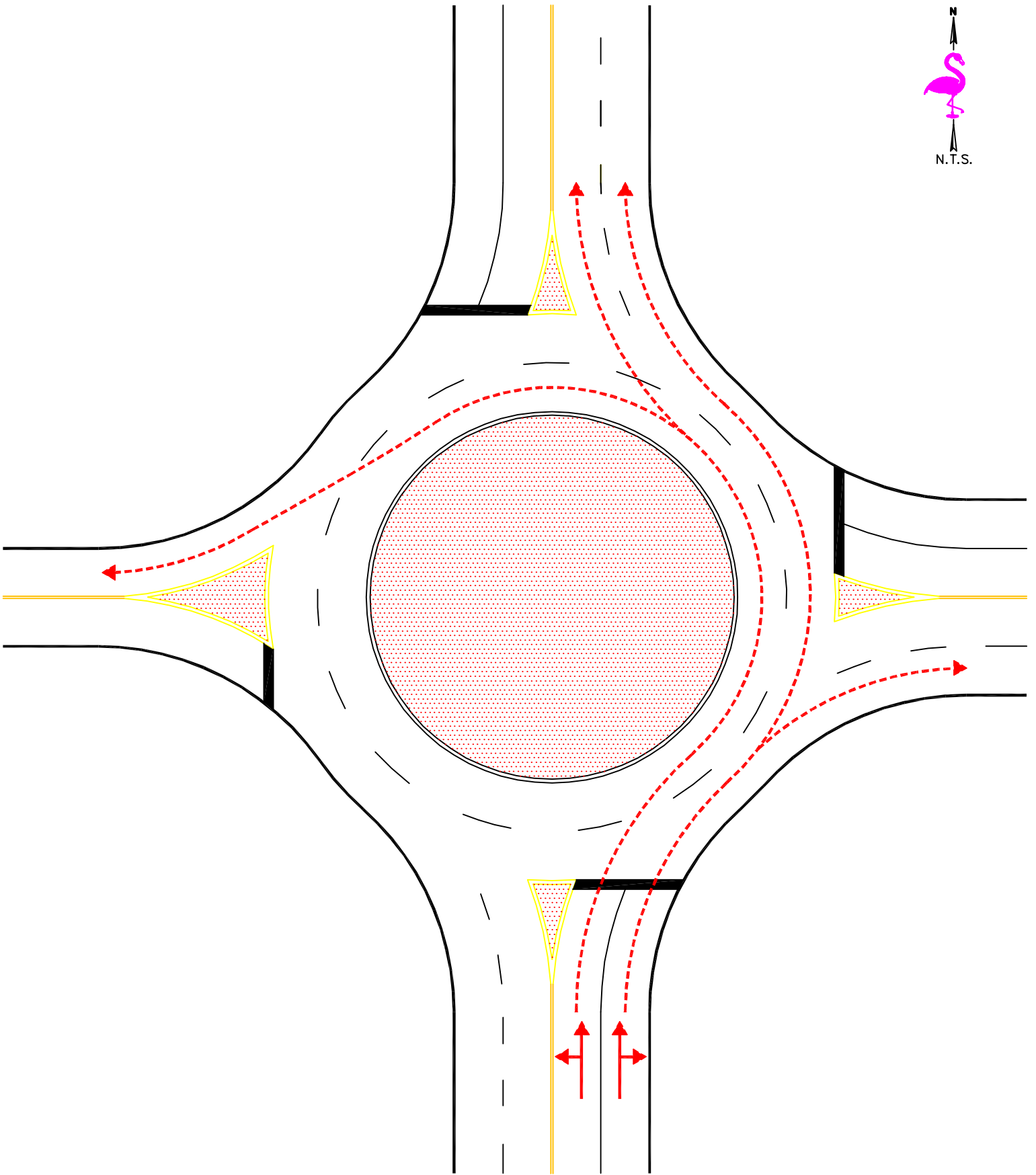


FIGURE 3

SOUTH APPROACH MOVEMENTS

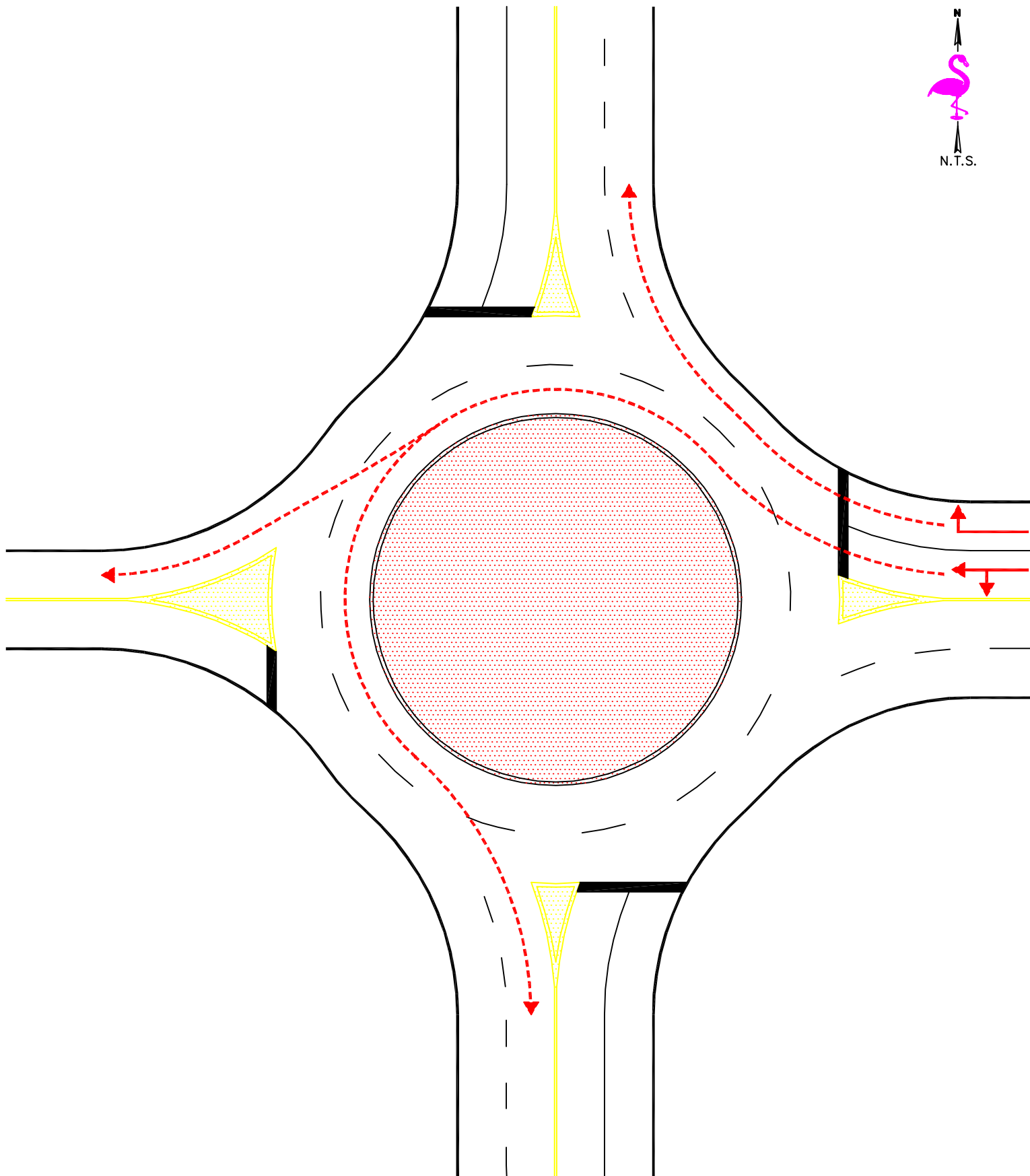


FIGURE 4

WEST APPROACH MOVEMENTS

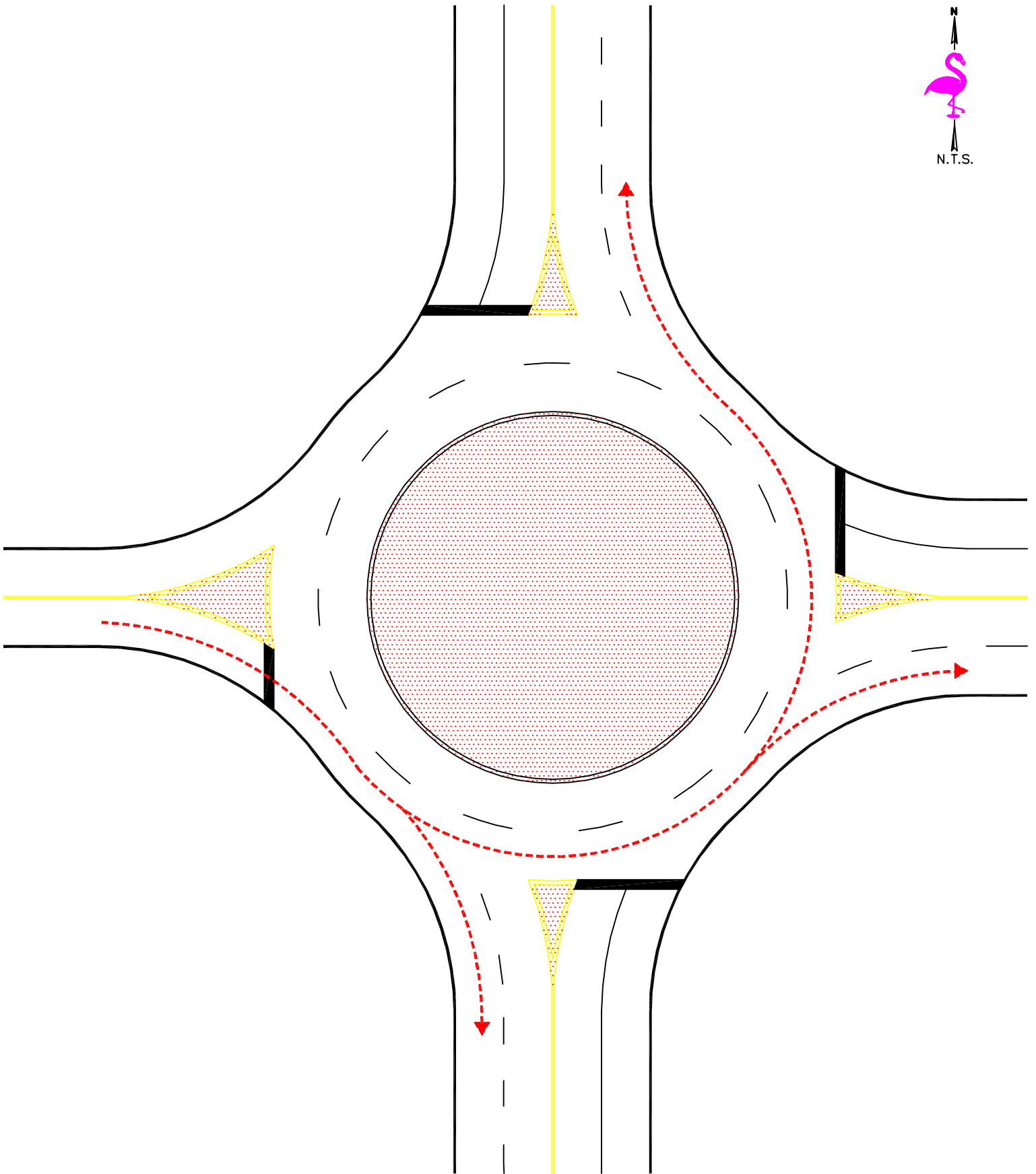


FIGURE 5

EAST APPROACH MOVEMENTS

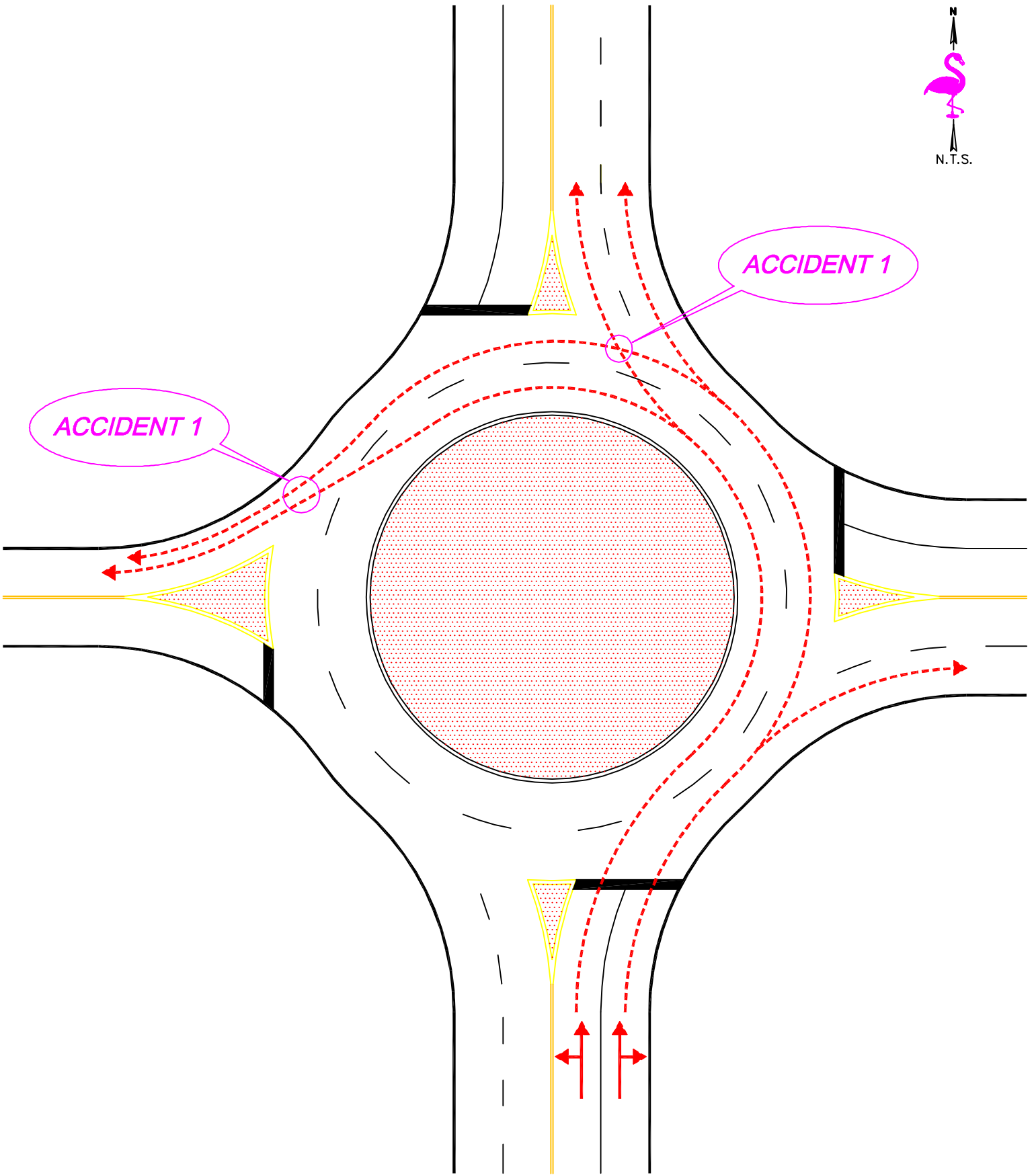


FIGURE 6

INCORRECT LANE DISCIPLINE