



Echelon



Conceptual rendering of an echelon

The echelon was named after the U.S. Navy Flight Demonstrating Team's "echelon" formation

What is an echelon?

- A grade-separated intersection design where one approach on both roadways is elevated to create a pair of intersections
- Both intersections are signalized and operate like conventional one-way street intersections
- There are no free-flow movements
- The echelon uses retaining walls to elevate half of the roadway, while the other half continues at-grade
- All pedestrian sidewalks and crosswalks are at-grade; however, a staircase or ramp may be required in some locations due to retaining walls or other obstacles

When should an echelon be considered?

- At intersections with heavy traffic where main and side street traffic volumes are similar
- At locations where an at-grade conventional intersection is not sufficient for the amount of traffic
- At intersections where there is limited right-of-way to expand

What are the benefits of an echelon?

- **Improved safety:** Reduces the number of points where vehicles cross paths and decreases the potential for angle crashes
- **Increased efficiency:** Each intersection operates with only two traffic signal phases, which allows the intersection to handle a greater volume of traffic
- **Shorter wait times:** Fewer traffic signal phases means less time stopping at the intersection
- **Cost savings:** The echelon can have a narrower cross section and may be more cost effective than constructing a traditional diamond interchange

What are innovative intersections?

Intersection designs where traffic movements are modified to improve safety, reduce delay, and increase efficiency.

Visit www.virginia-dot.org/innovativeintersections to learn more.





INNOVATIVE INTERSECTIONS

Navigating an Echelon

The echelon uses retaining walls to elevate half of the roadway **1**, while the other half continues at-grade **2**

 Pedestrians use marked crosswalks to safely cross the intersection at-grade

 Depending on their level of comfort, cyclists may navigate the intersection using vehicle or pedestrian paths

 Some right and left turns use ramps to move between the elevated and at-grade portions of the roadway. Motorists on these ramps merge with through traffic to complete their movements

The two intersections (**1** and **2**) are signaled and operate like conventional one-way street intersections

NOT TO SCALE

Note: For simplicity, only left and right turns on to or off of ramps are shown. All other traffic follows similar routes to a conventional intersection.