**Harmelink Guide**



**Roadway Design Division**

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# Left-Turn Storages for Two-Lane Highways

The Harmelink Table is a table that expresses when there is a warrant or need for a left-turn storage lane based on the following factors: opposing vehicle volume (VPH), approaching vehicle volume (VPH), and the percentage of left-turning vehicles. The following figures shown below are an expansion of this table. Using the same factors, they determine the minimum required storage length that needs to be used for each of the left-turn storage lanes at unsignalized intersections.

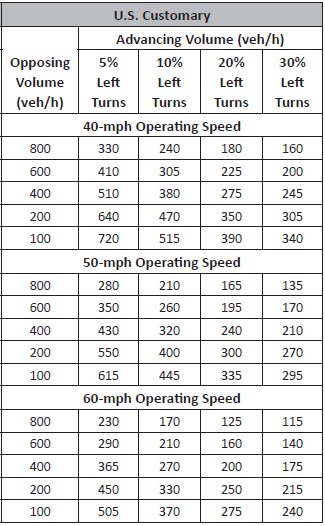


Table 1: Harmelink Table for Two-Lane Highways

## Harmelink Charts – 40 mph

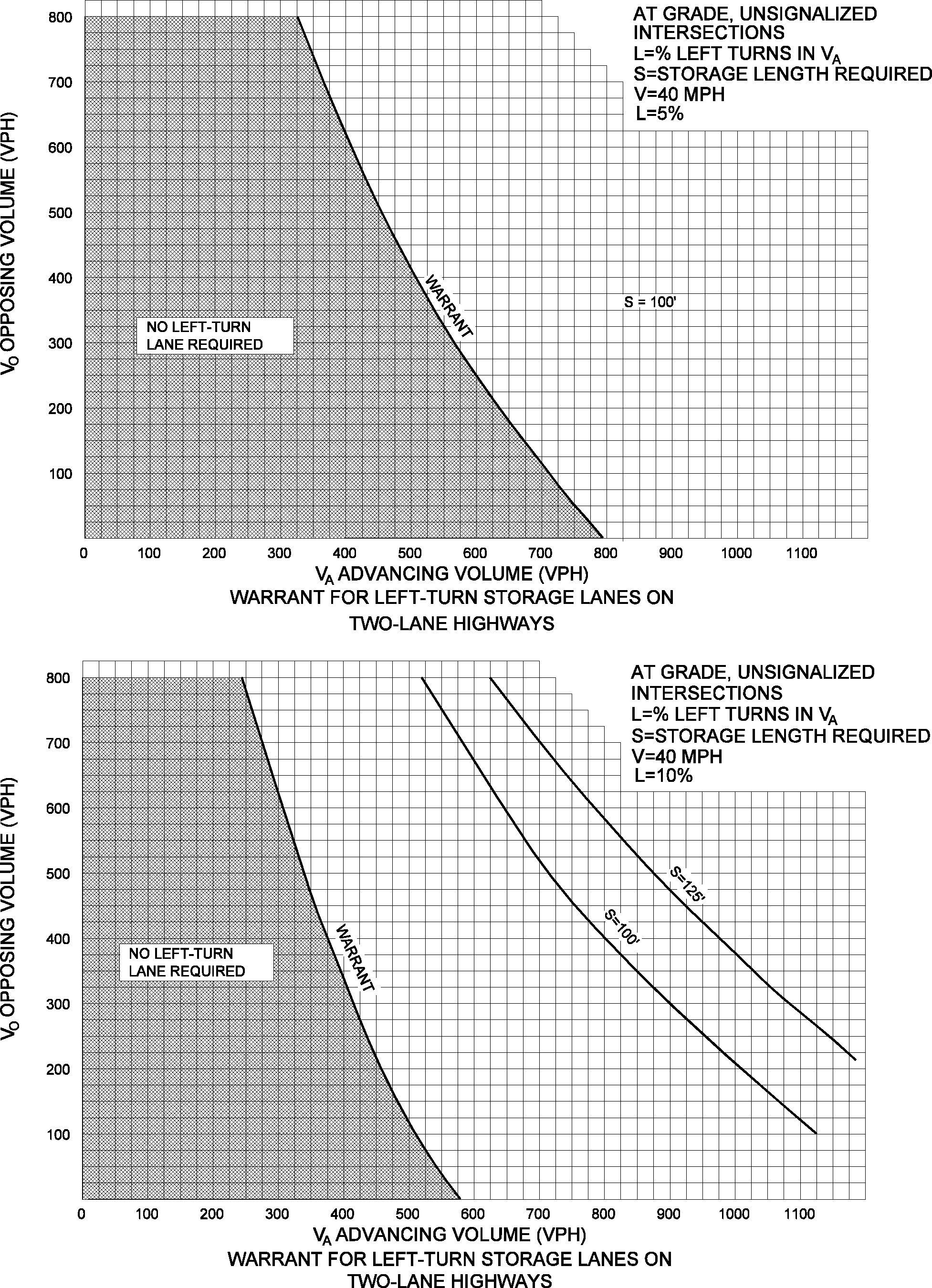


Figure 1

Warrant for 5% Left-Turn Storage Lanes at 40 mph

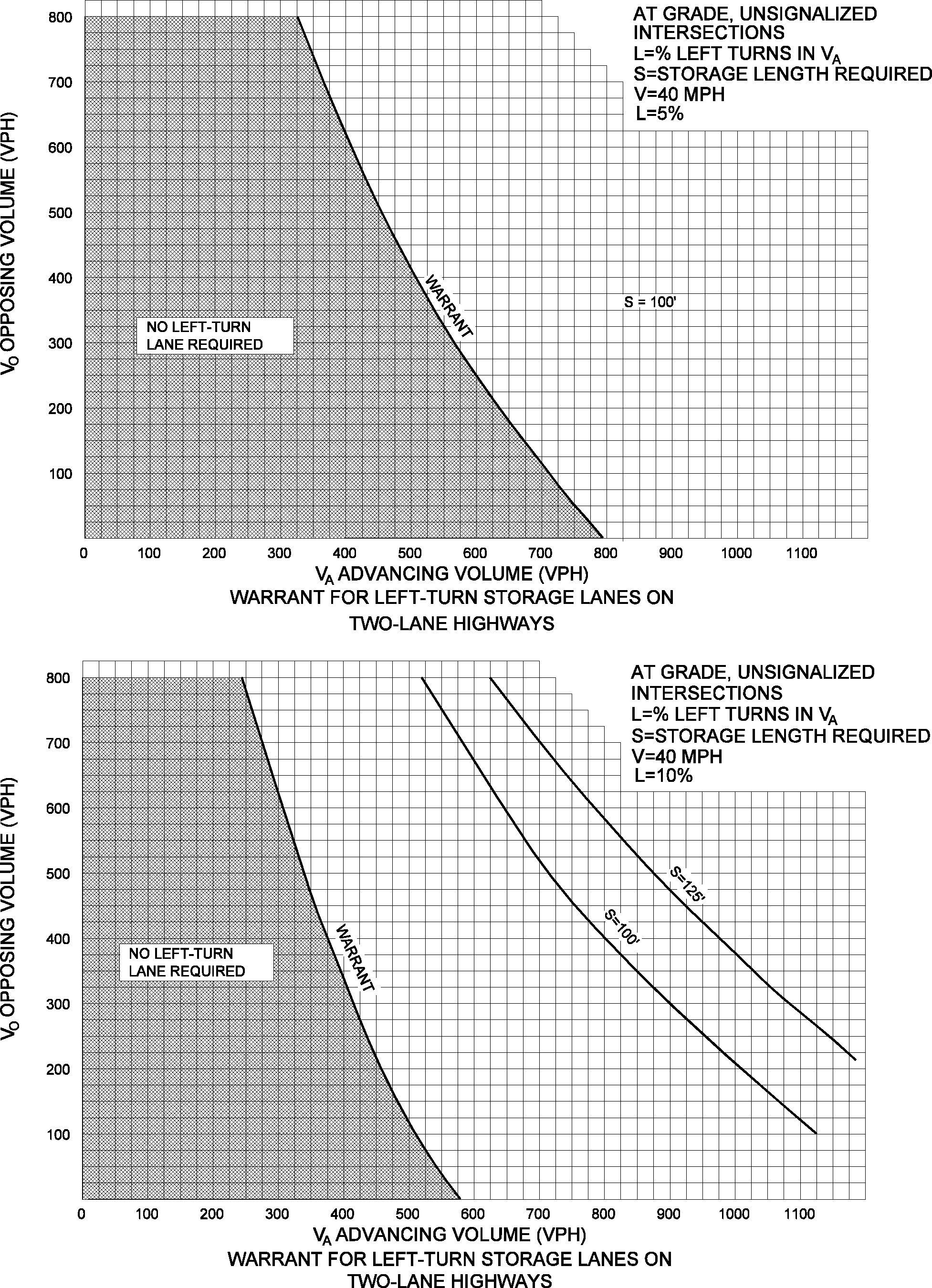


Figure 2

Warrant for 10% Left-Turn Storage Lanes at 40 mph

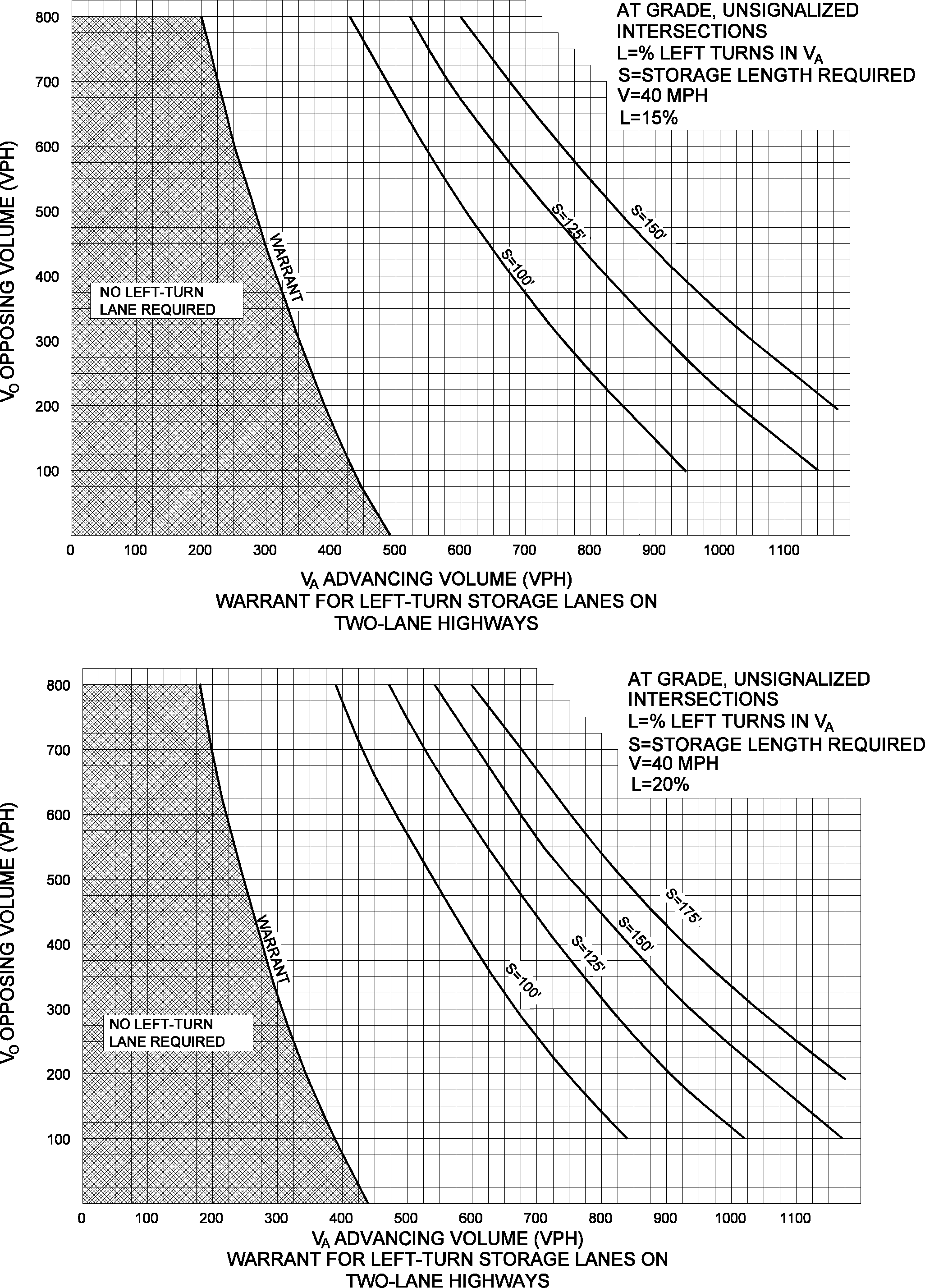


Figure 3

Warrant for 15% Left-Turn Storage Lanes at 40 mph

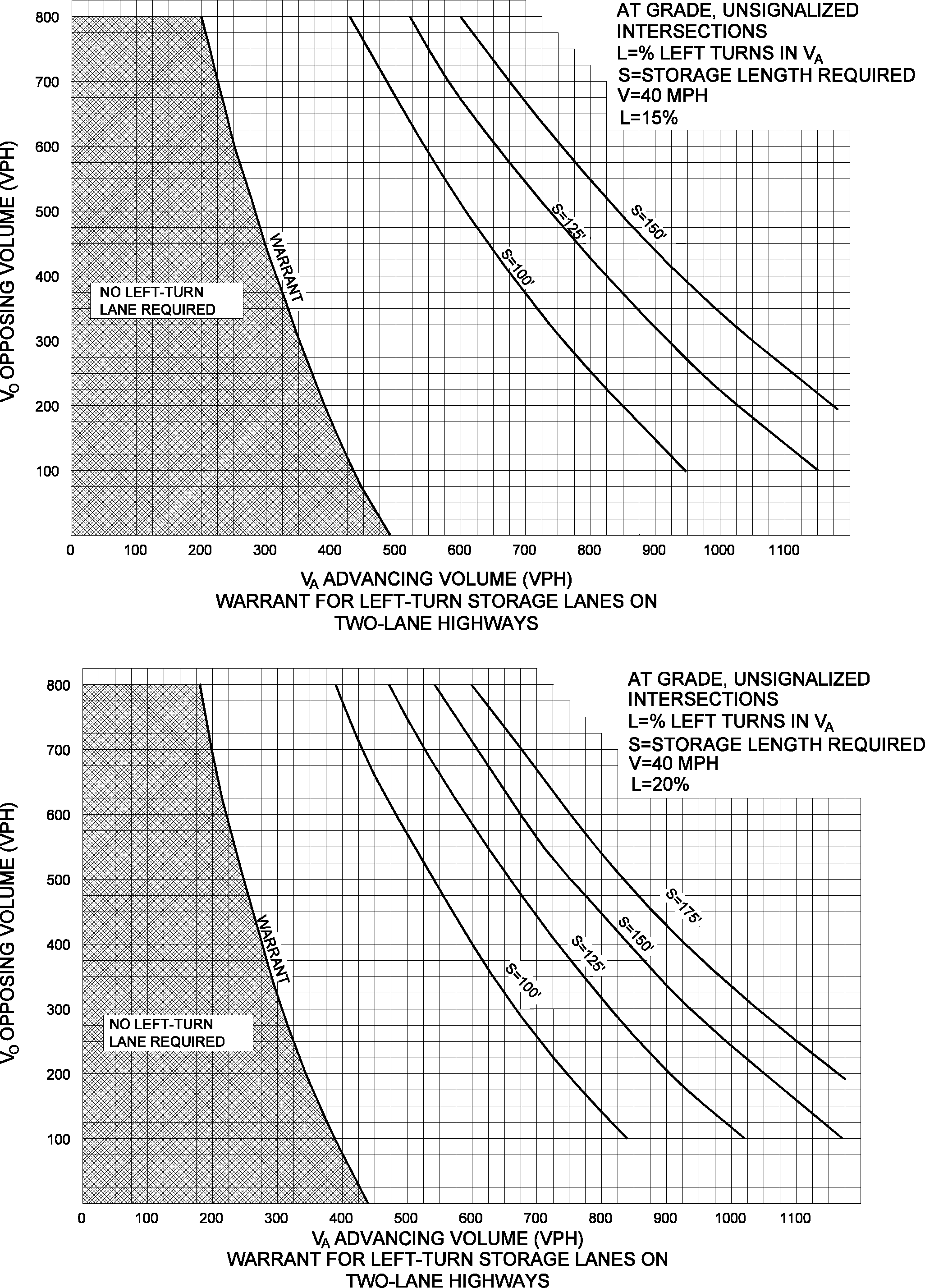


Figure 4

Warrant for 20% Left-Turn Storage Lanes at 40 mph

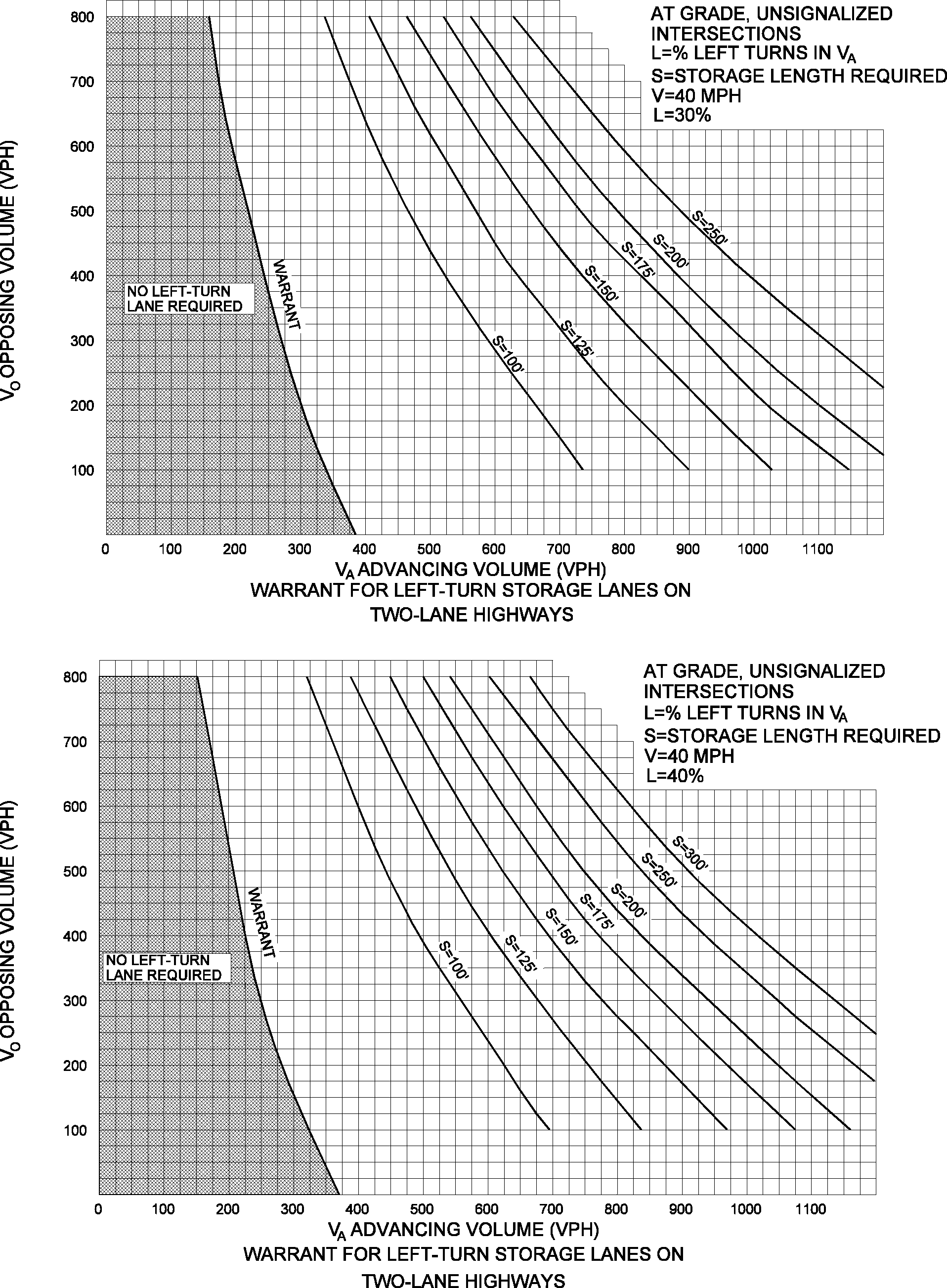


Figure 5

Warrant for 30% Left-Turn Storage Lanes at 40 mph

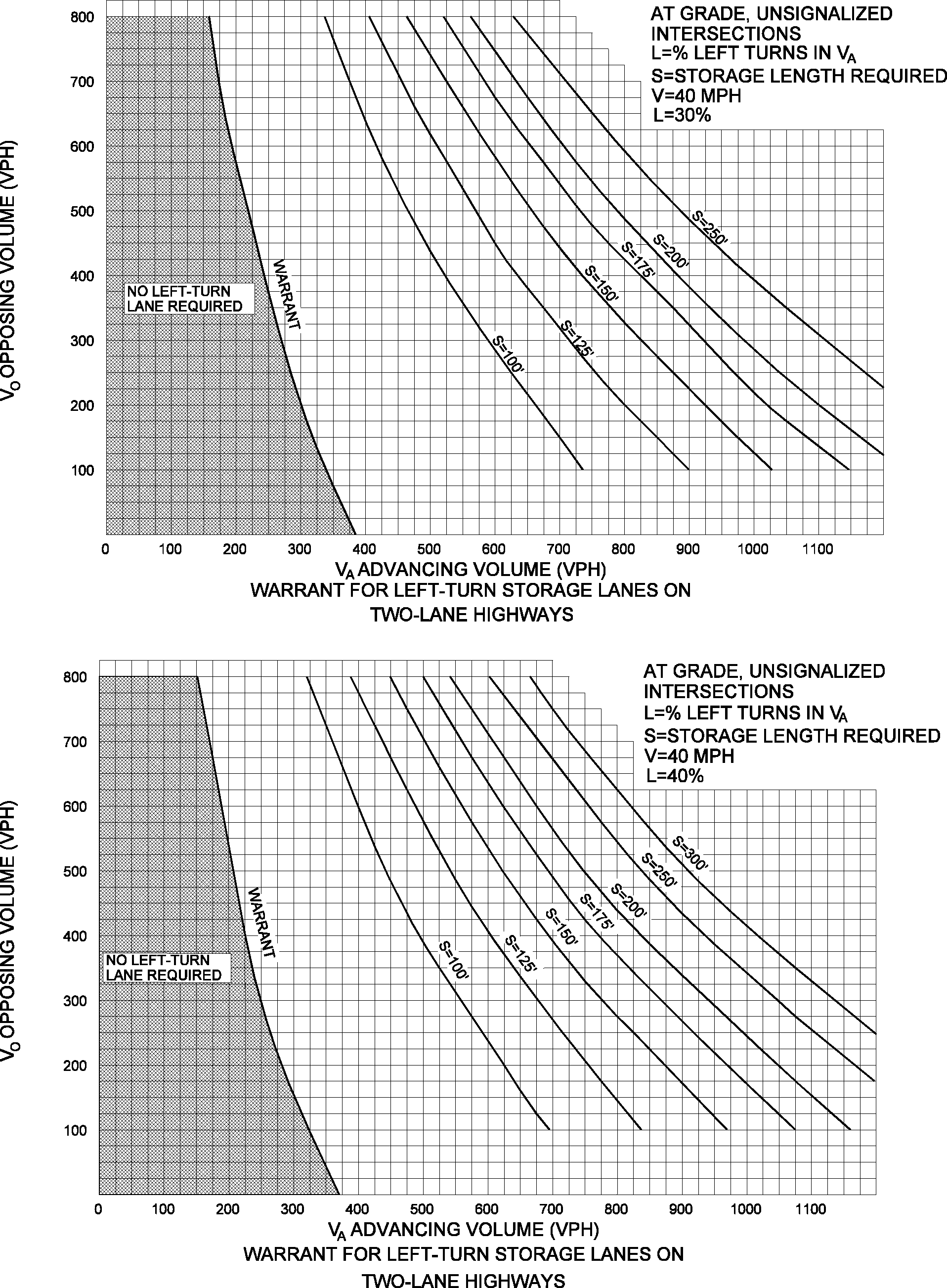


Figure 6

Warrant for 40% Left-Turn Storage Lanes at 40 mph

## Harmelink Charts – 50 MPH

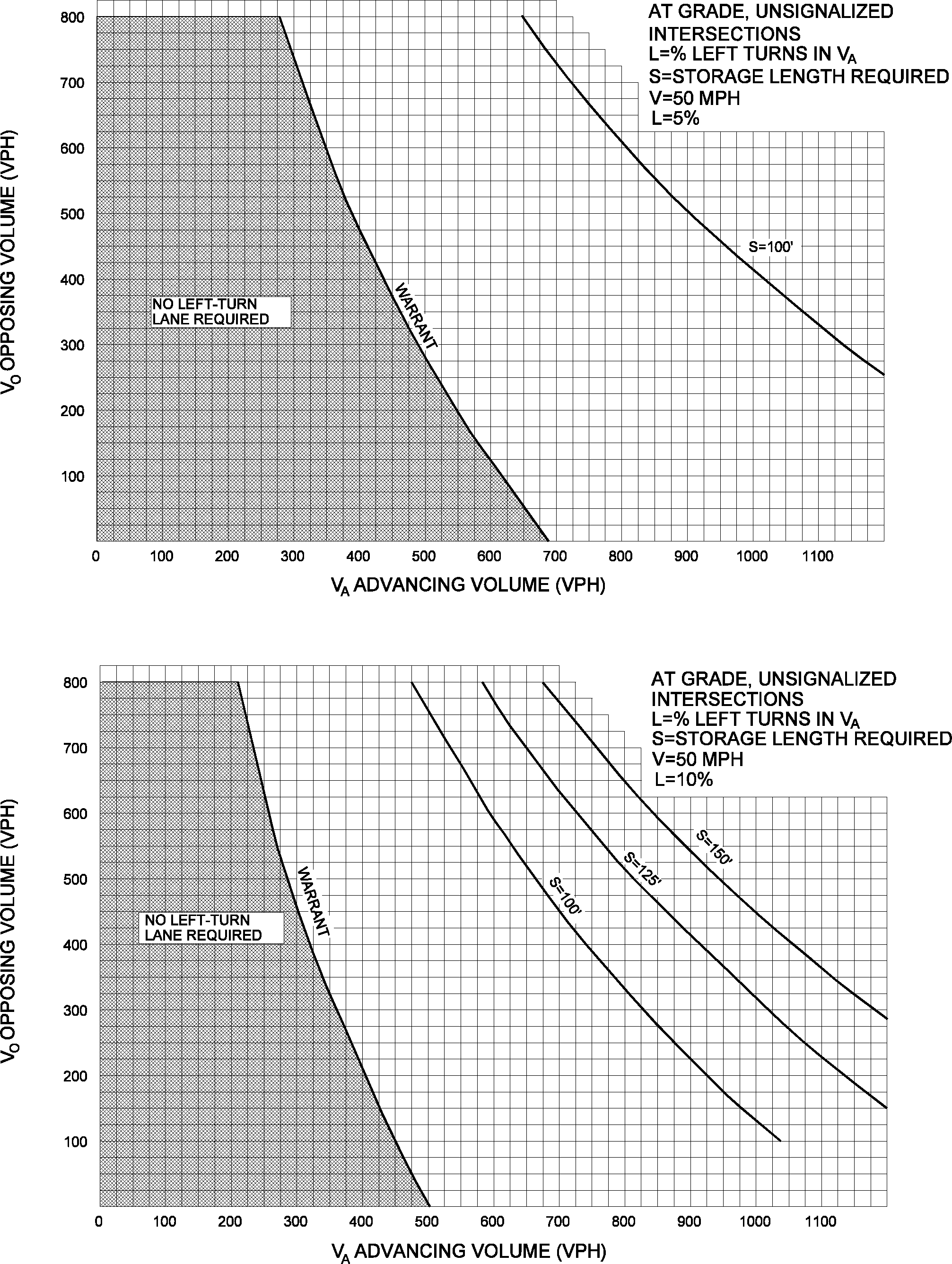


Figure 7

Warrant for 5% Left-Turn Storage Lanes at 50 mph

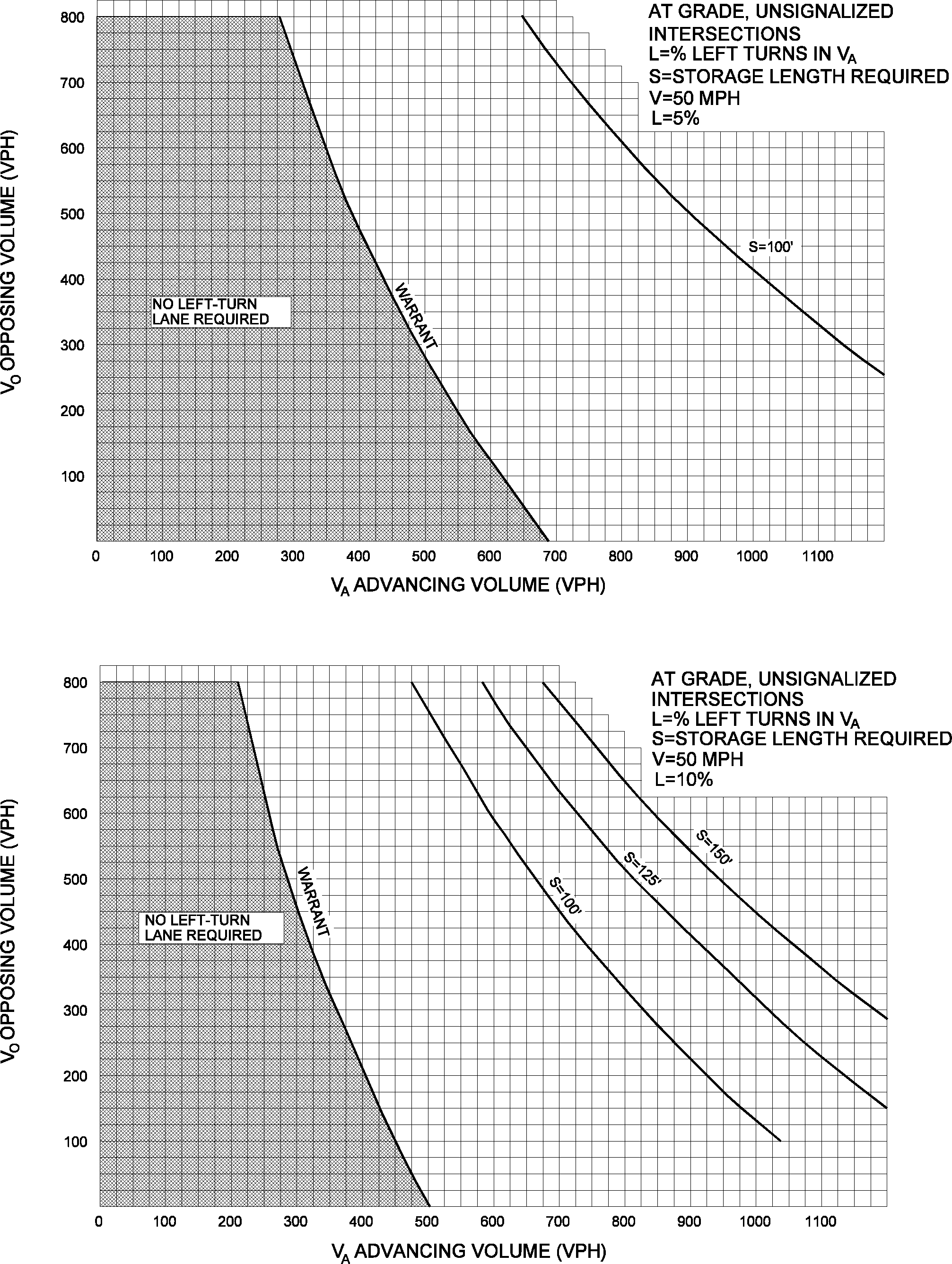


Figure 8

Warrant for 10% Left-Turn Storage Lanes at 50 mph

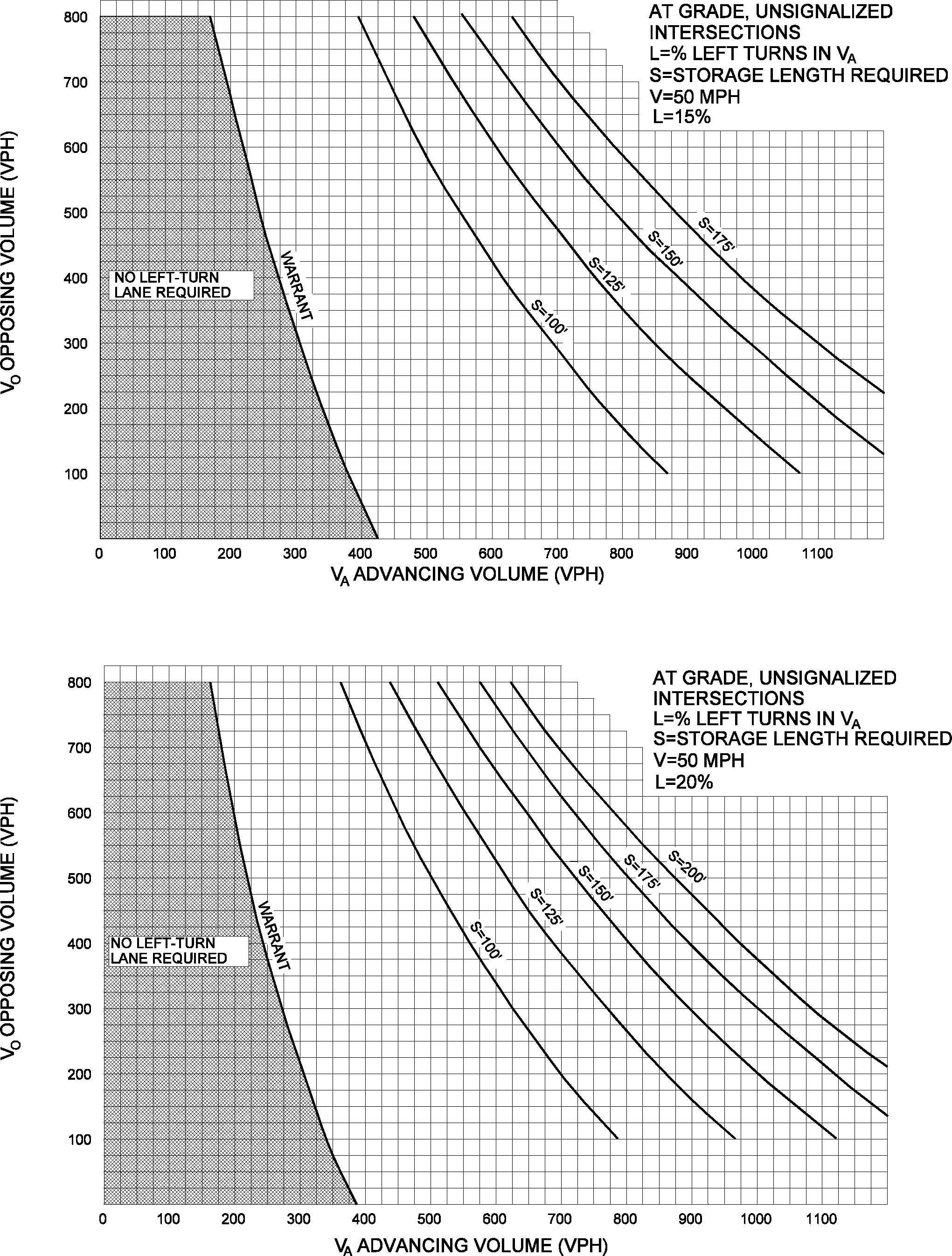


Figure 9

Warrant for 15% Left-Turn Storage Lanes at 50 mph

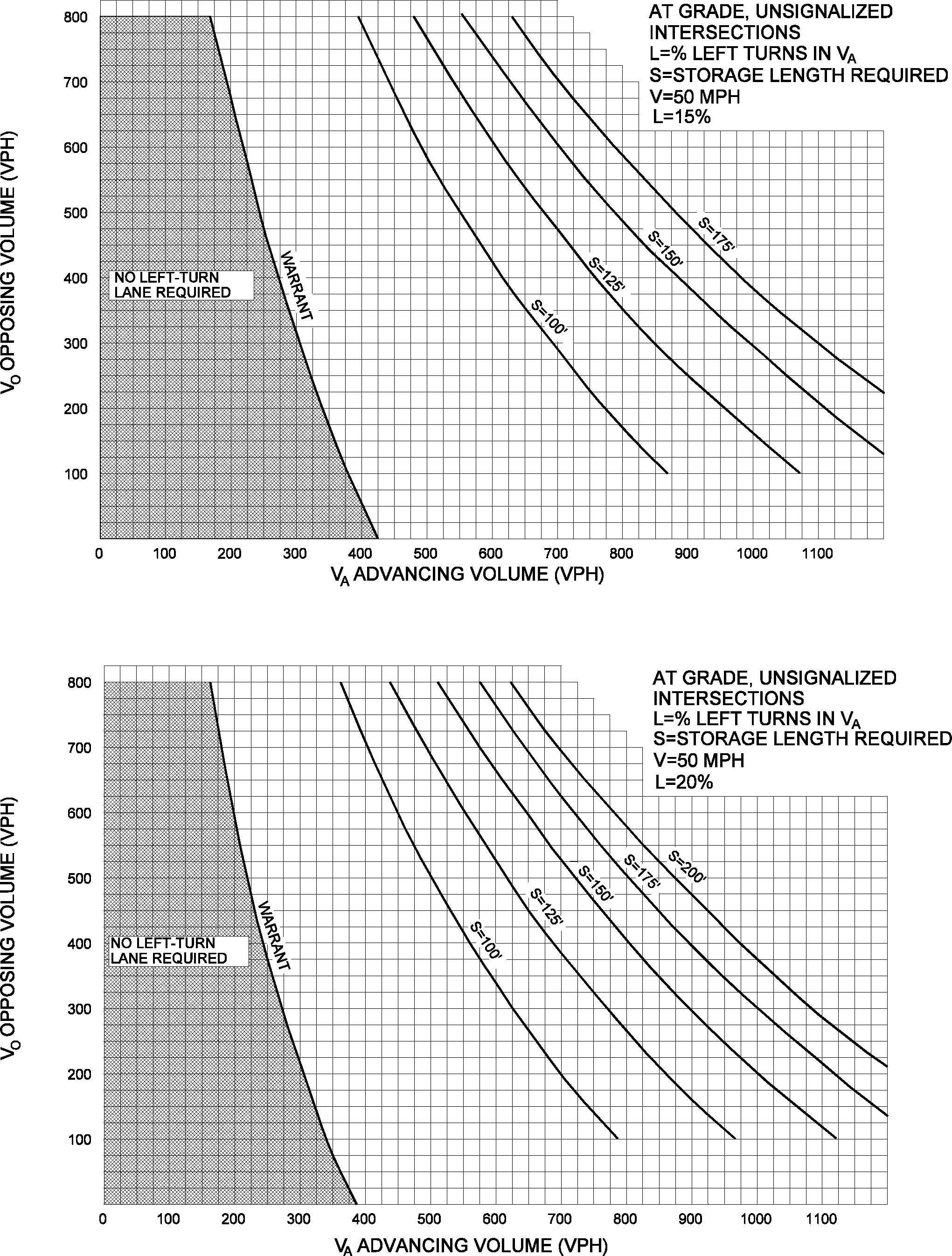


Figure 10

Warrant for 20% Left-Turn Storage Lanes at 50 mph

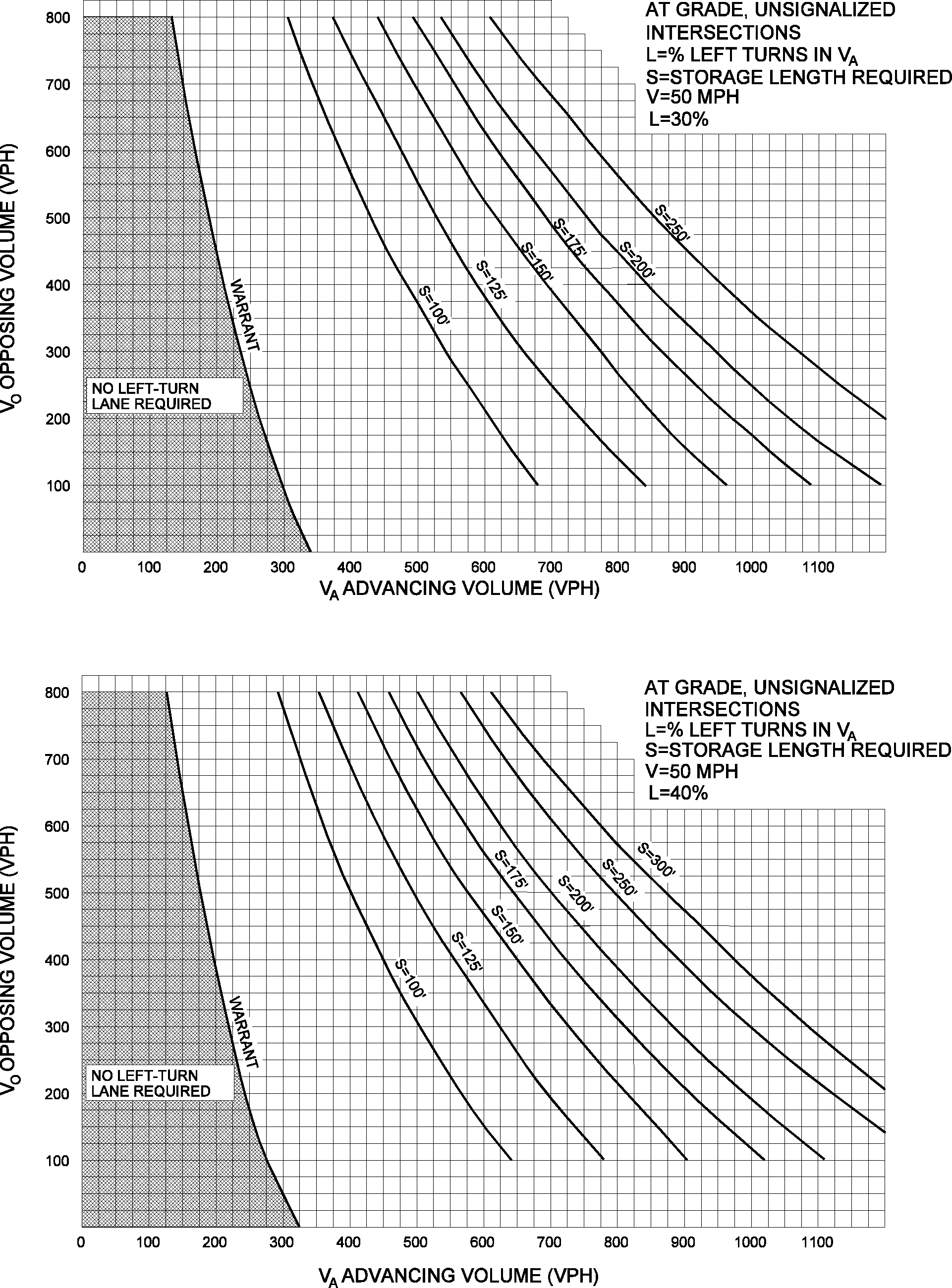


Figure 11

Warrant for 30% Left-Turn Storage Lanes at 50 mph

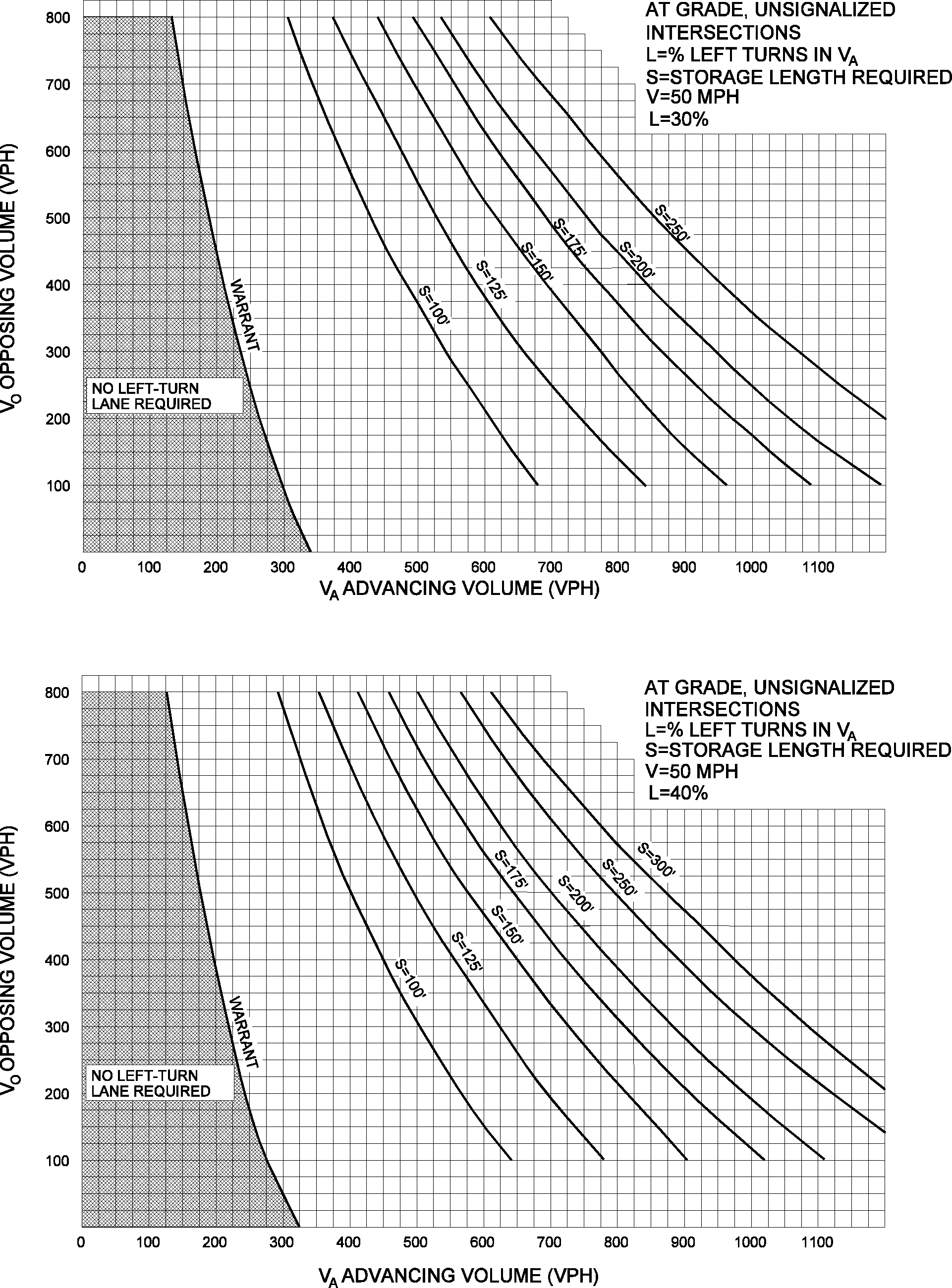


Figure 12

Warrant for 40% Left-Turn Storage Lanes at 50 mph

## Harmelink Charts – 60 MPH

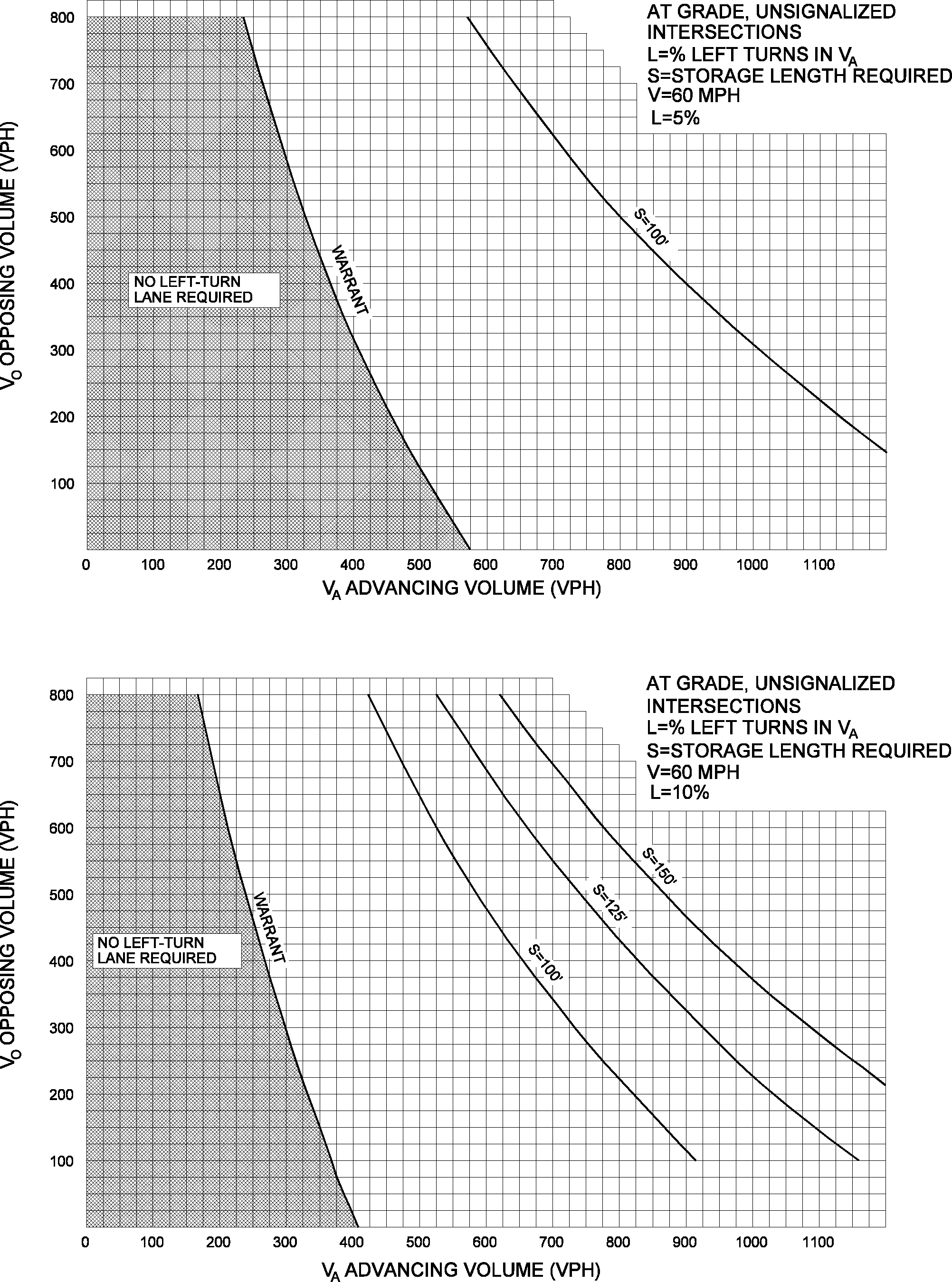


Figure 13

Warrant for 5% Left-Turn Storage Lanes at 60 mph

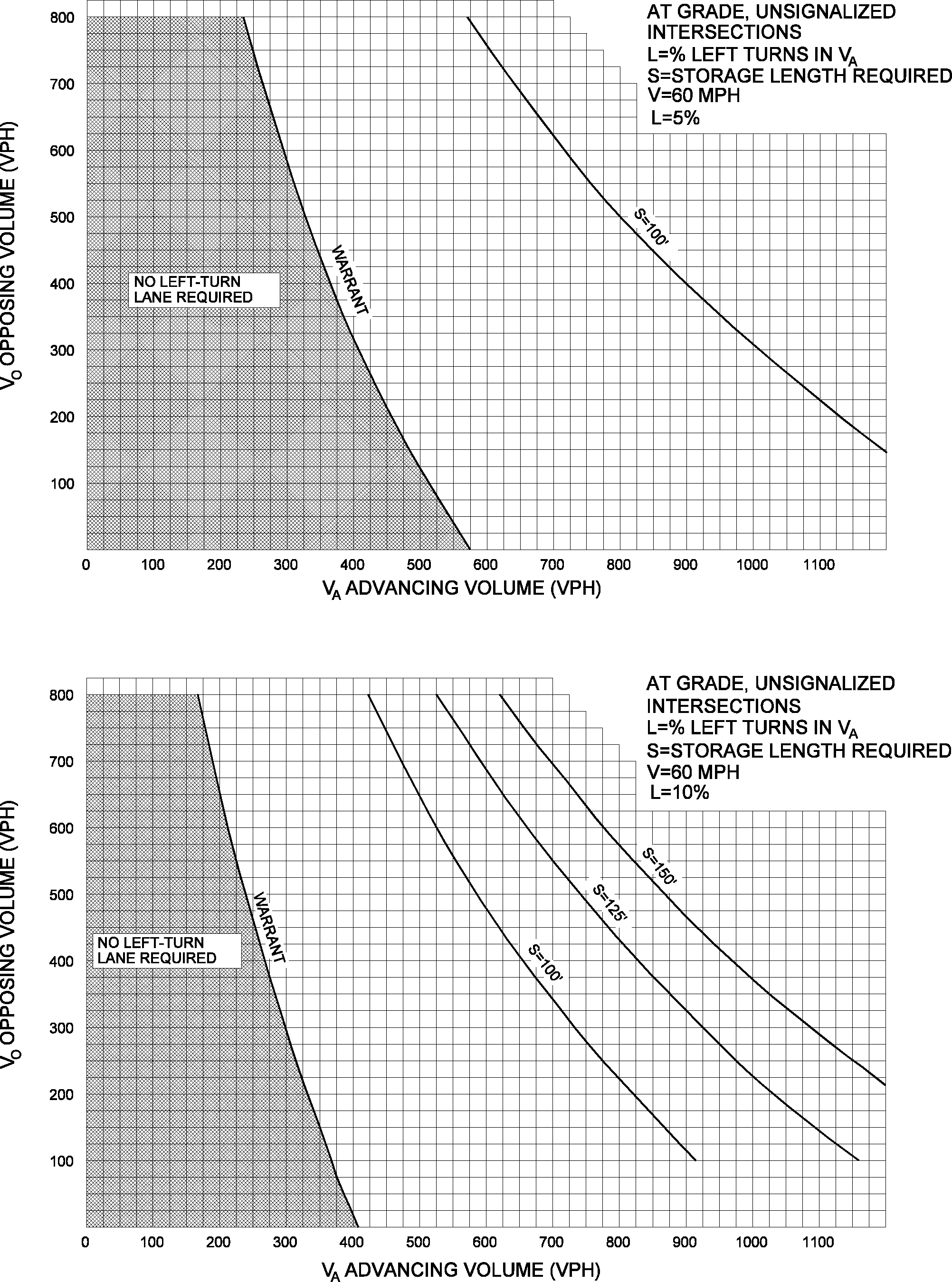


Figure 14

Warrant for 10% Left-Turn Storage Lanes at 60 mph

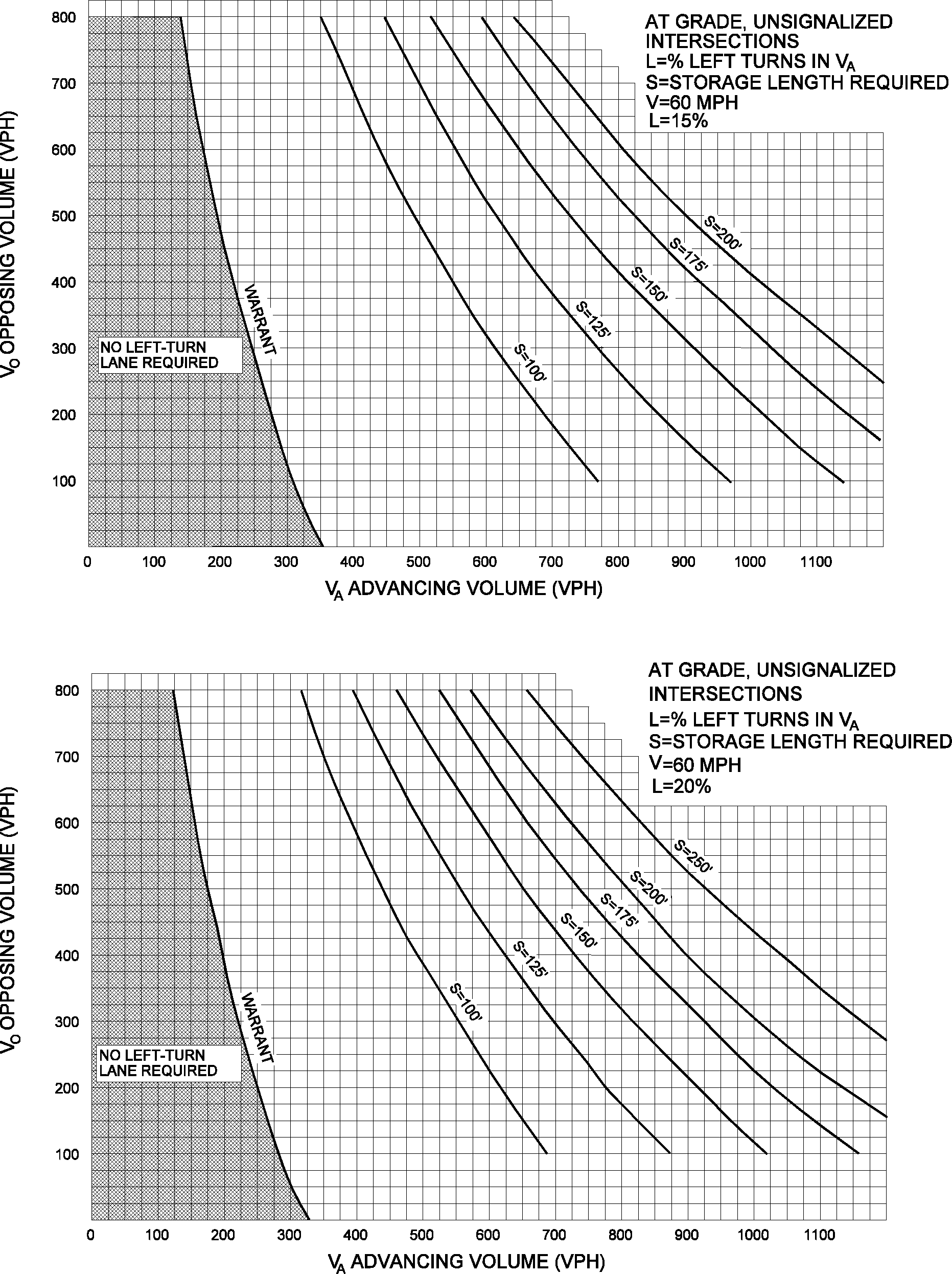


Figure 15

Warrant for 15% Left-Turn Storage Lanes at 60 mph

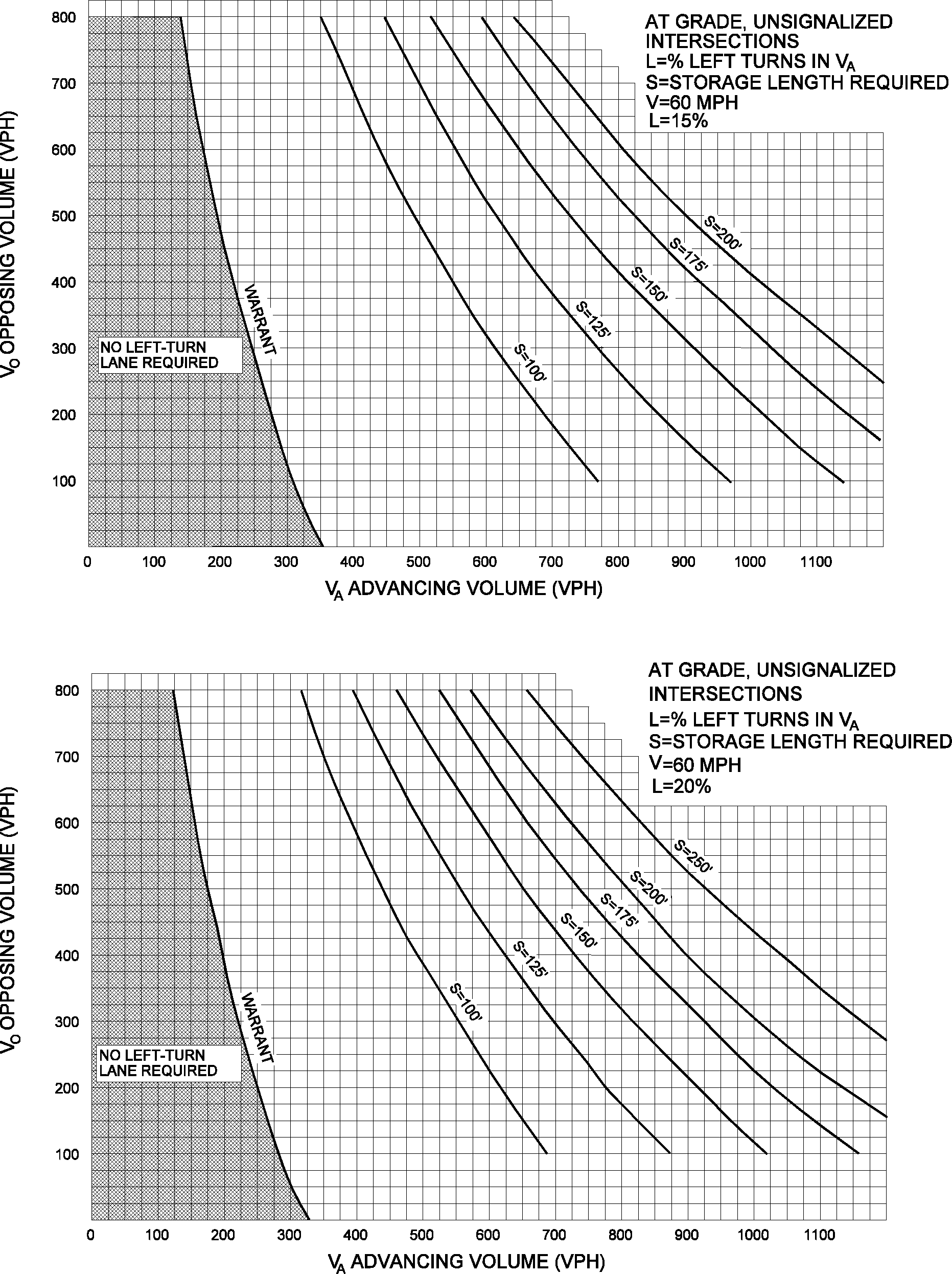


Figure 16

Warrant for 20% Left-Turn Storage Lanes at 60 mph

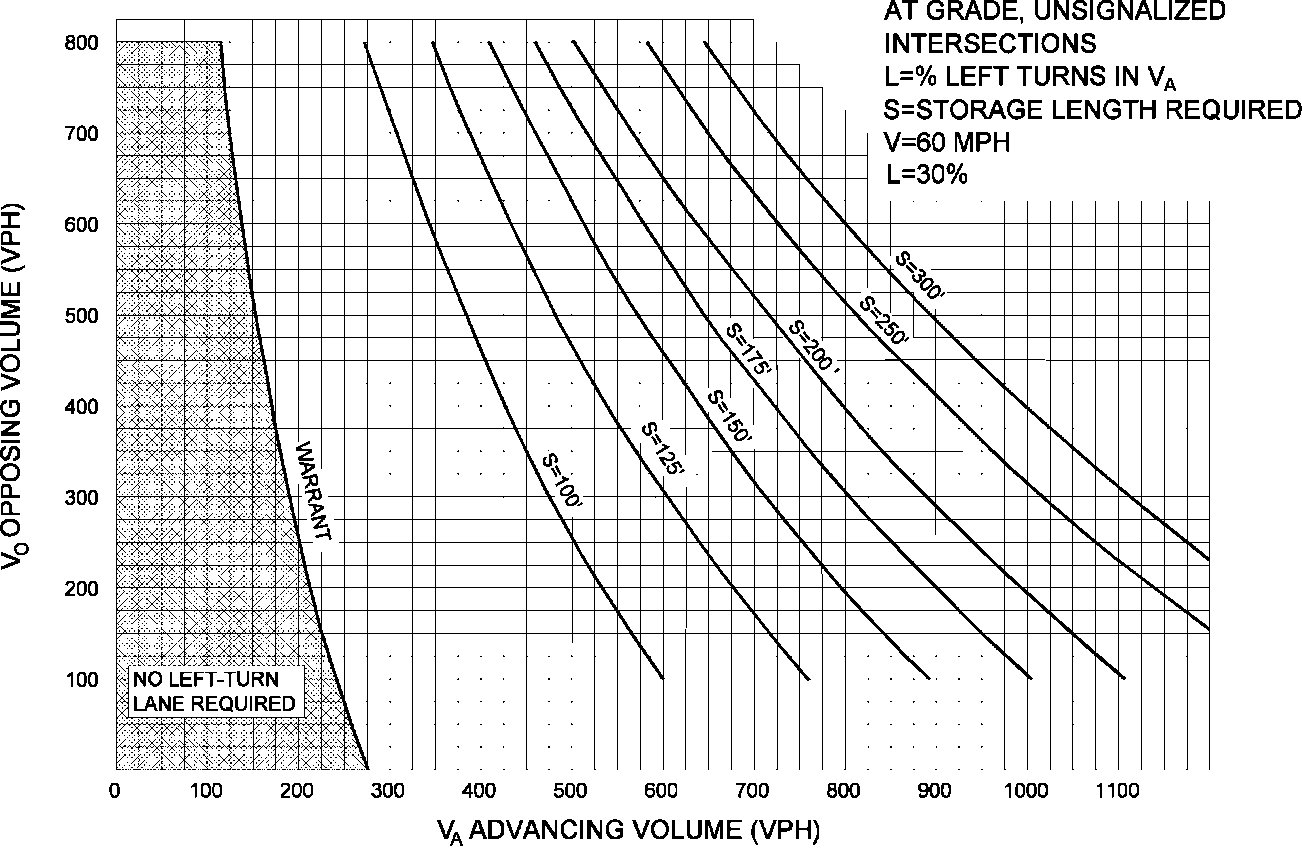


Figure 17

Warrant for 30% Left-Turn Storage Lanes at 60 mph

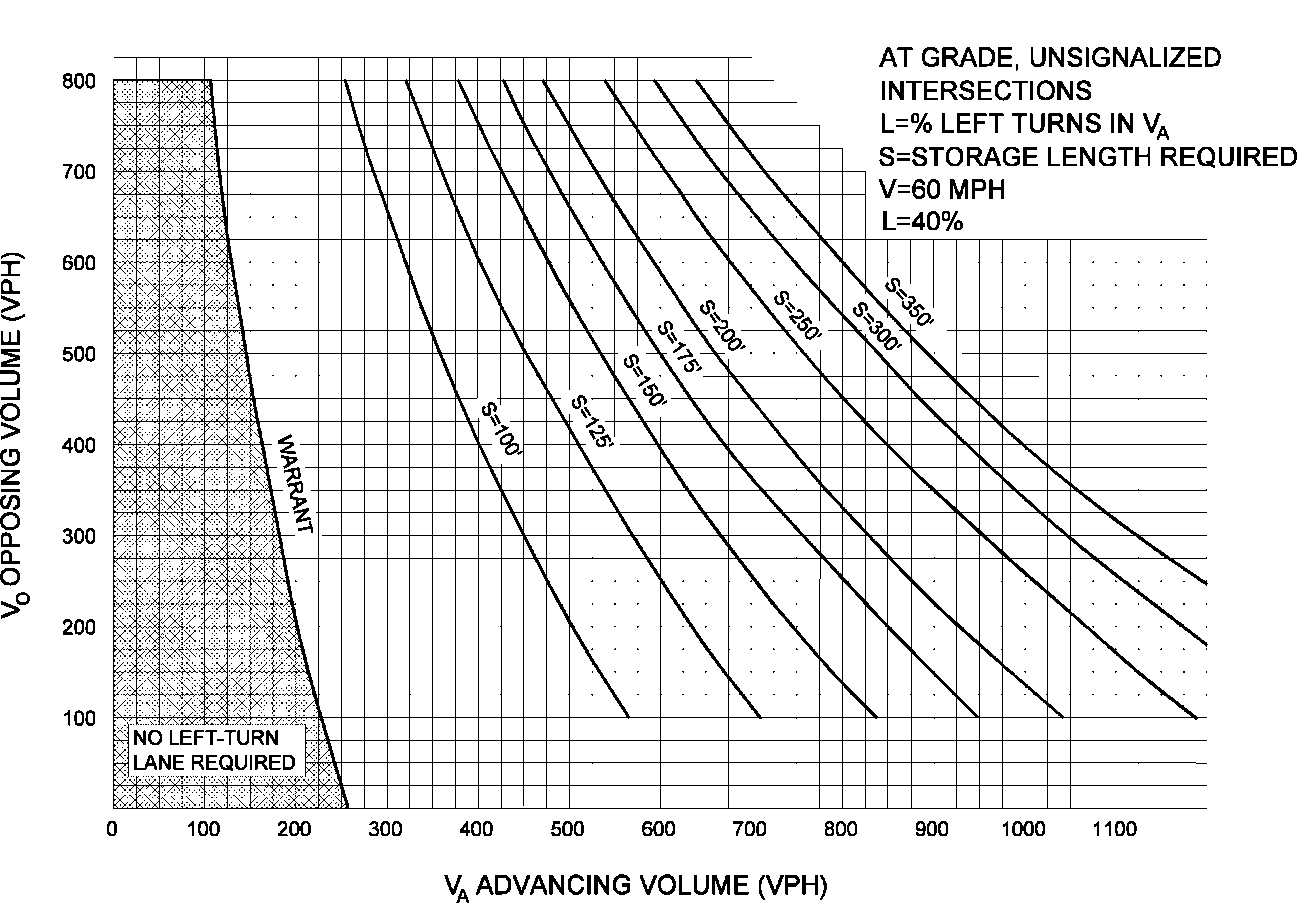


Figure 18

Warrant for 40% Left-Turn Storage Lanes at 60 mph

# Left-Turn Storages for Four-Lane Highways

The following figure below shows the warrants and storage lengths for an Undivided and Divided Four-Lane Highway.

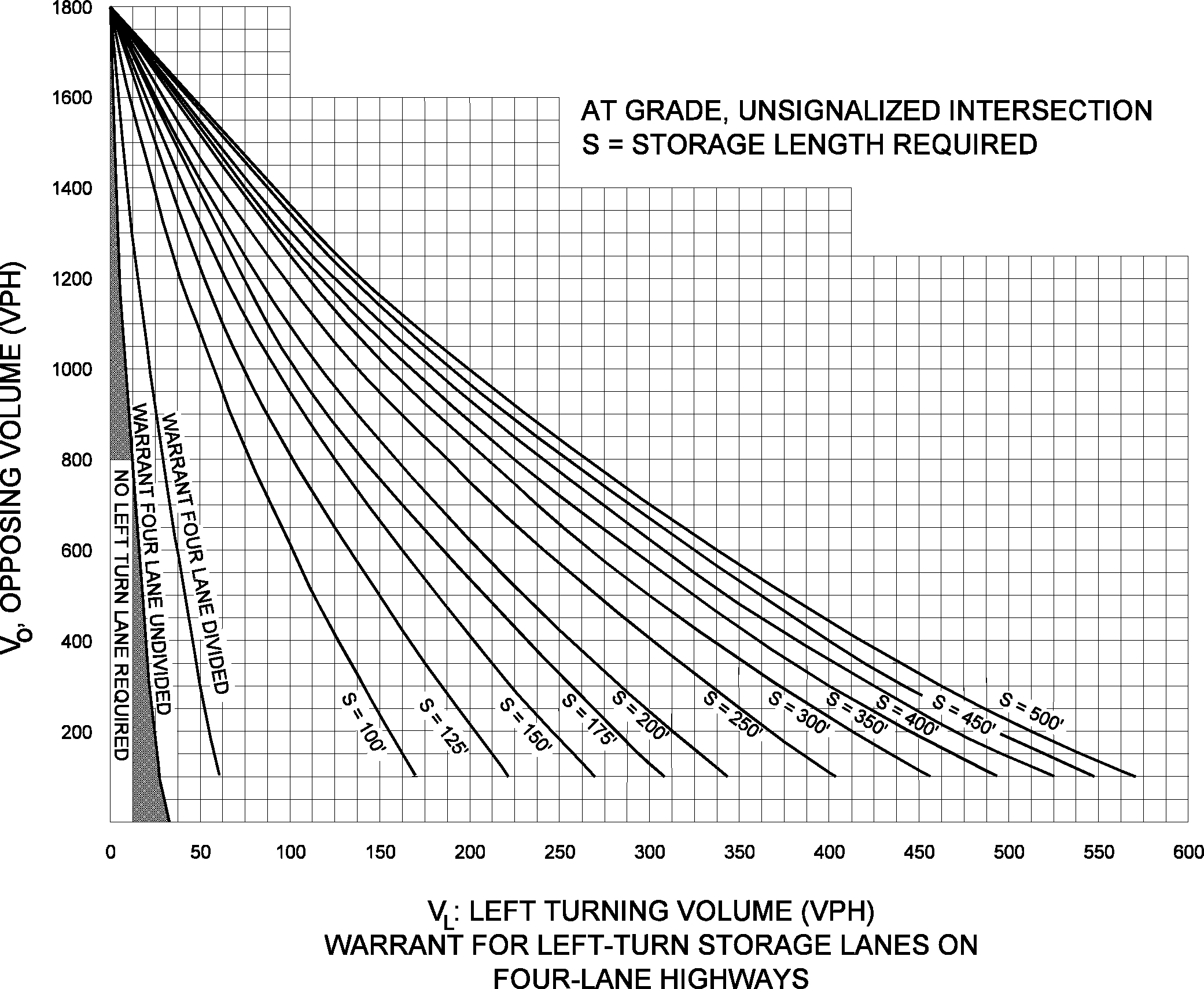


Figure 19

Warrant for Left-Turn Storage Lanes on Four-Lane Highways

#### References

<http://onlinepubs.trb.org/Onlinepubs/hrr/1967/211/211-001.pdf>

[*A Policy of Geometric Design of* *Highways and Streets 2011*](https://bookstore.transportation.org/item_details.aspx?id=1917)