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# NPR 751 Calculating Minimum Warning Time

## Introduction

Minimum Warning Time (MWT) is the minimum time required for a Lookout or an Automatic Track Warning System (ATWS) to warn workers on track about approaching rail traffic.

MWT must be calculated using three key components:

- the See time or Detect time:
  - a minimum of two seconds for the time it might take a Lookout to see approaching rail traffic (See time), or
  - a minimum of seven seconds for the time it might take an ATWS to detect approaching rail traffic (Detect time).
- the Move time is the time taken for all workers to move themselves and their equipment to a safe place, and
- the Safe time is the time all workers and equipment are in a safe place before rail traffic enters the worksite, a minimum of ten seconds.

 **Note**

An additional five seconds warning time must be added to the MWT if using an additional Lookout.

Protection Officers must use an approved Minimum Warning Time Calculator, Sighting Distance Calculator or Sighting Distance Table when determining:

- the sighting distance required by a Lookout, or
- the distance an ATWS sensor must be placed from the worksite.

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If a track speed or a MWT is not listed in the following table use the next highest value shown.

| Maximum track speed km/h | Sighting distance in metres to provide minimum warning time of: |        |        |        |        |        |        |
|--------------------------|---|--------|--------|--------|--------|--------|--------|
|                          | 15 sec  | 20 sec | 25 sec | 30 sec | 35 sec | 40 sec | 45 sec |
| 160                      | 670   | 890    | 1115   | 1335   | 1560   | 1780   | 2000   |
| 150                      | 625   | 835    | 1045   | 1250   | 1460   | 1670   | 1875   |
| 140                      | 585   | 780    | 975    | 1170   | 1365   | 1560   | 1750   |
| 130                      | 545   | 725    | 905    | 1085   | 1265   | 1445   | 1625   |
| 125                      | 525   | 695    | 870    | 1045   | 1220   | 1390   | 1565   |
| 120                      | 500   | 670    | 835    | 1000   | 1170   | 1335   | 1500   |
| 115                      | 480   | 640    | 800    | 960    | 1120   | 1280   | 1440   |
| 110                      | 460   | 615    | 765    | 920    | 1070   | 1225   | 1375   |
| 105                      | 440   | 585    | 730    | 875    | 1025   | 1170   | 1315   |
| 100                      | 420   | 560    | 695    | 835    | 975    | 1115   | 1250   |
| 95                       | 400   | 530    | 660    | 795    | 925    | 1060   | 1190   |
| 90                       | 375   | 500    | 625    | 750    | 875    | 1000   | 1125   |
| 85                       | 355   | 475    | 595    | 710    | 830    | 945    | 1065   |
| 80                       | 335   | 445    | 560    | 670    | 780    | 890    | 1000   |
| 70                       | 295   | 390    | 490    | 585    | 685    | 780    | 875    |
| 60                       | 250   | 335    | 420    | 500    | 585    | 670    | 750    |
| 50                       | 210   | 280    | 350    | 420    | 490    | 560    | 625    |
| 40                       | 170   | 225    | 280    | 335    | 390    | 445    | 500    |
| 30                       | 125   | 170    | 210    | 250    | 295    | 335    | 375    |
| 25                       | 105   | 140    | 175    | 210    | 245    | 280    | 315    |
| 20                       | 85  | 115    | 140    | 170    | 195    | 225    | 250    |
| 15                       | 65  | 85     | 105    | 125    | 150    | 170    | 190    |

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## Calculating Minimum Warning Time

### *Protection Officer*

1. Calculate the required:
  - See Time or Detect Time, and
  - Move Time, and
  - Safe Time.
2. Add the three numbers to give the MWT.
3. Add five seconds to the MWT if an additional Lookout is used.

## Calculating Minimum Sighting Distance

### *Protection Officer*

1. Establish the maximum track speed for the affected portion of track.
2. An approved sighting distance calculator or sighting distance table to calculate the MSD.

 **Warning**

As the duration of MWT increases, the accuracy of sighting distance becomes more critical. Protection Officers must take care when estimating MSD.

## Related Documents

NPR 711      *Using Lookouts*

NPR 752      *Using Automatic Track Warning Systems*