**Prerequisite 1 for Chapter 7**

**Optimal Locations in 1D** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Use the map below to determine where to build a new Fedhex distribution warehouse along I-20.**

 **Mile 11**

**Mile 5 Mile 30**

 **Mile 24 Mile 36**

**Bremen**

**5 truckloads**

**Winston**

**7 truckloads**

 **Mile 46 Mile 57**

**Tallapoosa**

**Villa Rica**

**15 truckloads**

**27 truckloads**

**Six Flags Area**

**20 truckloads**

**Atlanta**

**30 truckloads**

**Douglasville**

**10 truckloads**

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| --- | --- | --- | --- | --- |
| City | Mile Marker | Distance from Optimal Location (miles) | Weight (truckloads) | Cost (miles)  |
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| **Minimum Total Cost** |  |

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| City | Weight  | Cumulative Weight  |
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1. What is the total weight of the system?

 What would be the median weight of the system?

 Where is the optimal location for the new Fedhex warehouse?

What would be the minimum amount of miles driven with the chosen optimal location?

1. Fedhex is thinking of including an additional stop in Lithia Springs at mile 40. If Lithia Springs adds an additional 14 truckloads, what would be the optimal location and minimum miles driven?

 **Mile 11**

Lithia Springs

14 truckloads

**Mile 5 Mile 30**

 **Mile 24 Mile 36**

**Bremen**

**5 truckloads**

 **Mile 40**

**Winston**

**7 truckloads**

 **Mile 46 Mile 57**

**Tallapoosa**

**Douglasville**

**10 truckloads**

**Villa Rica**

**15 truckloads**

**27 truckloads**

**Six Flags Area**

**20 truckloads**

**Atlanta**

**30 truckloads**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| City | Mile Marker | Distance from Optimal Location (miles) | Weight (truckloads) | Cost (miles)  |
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| **Minimum Total Cost** |  |

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| City | Weight  | Cumulative Weight  |
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1. Bremen just had a boom in population growth and will need an additional 30 truckloads. Where would be the optimal location and minimum miles driven?

 **Mile 11**

**Mile 5 Mile 30**

 **Mile 24 Mile 36**

**Bremen**

**35 truckloads**

 **Mile 40**

**Winston**

**7 truckloads**

 **Mile 46 Mile 57**

**Tallapoosa**

**Douglasville**

**10 truckloads**

**Villa Rica**

**15 truckloads**

**27 truckloads**

**Six Flags Area**

**20 truckloads**

**Atlanta**

**30 truckloads**

Lithia Springs

14 truckloads

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| City | Mile Marker | Distance from Optimal Location (miles) | Weight (truckloads) | Cost (miles)  |
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| **Minimum Total Cost** |  |

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| --- | --- | --- |
| City | Weight  | Cumulative Weight  |
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