1

 4

 2

 3

7

4

6

5

3

2

 2 3

 4

2

 4

 4

 2

 3 2 3

 3

12

11

9

8

10

 2 3

 4 5

 2

 3

Figure 5.41

The U.S. Department of Transportation (DOT) is planning to build a new interstate to run from Detroit, Michigan, to Charleston, South Carolina. Several different routes have been proposed. They are summarized in Figure 5.41, where node 1 represents Detroit and node 12 represents Charleston. The number on the arcs indicates the estimated construction costs of the various links (in millions of dollars). It is estimated that all of the routes will require approximately the same total driving time to make the trip from Detroit to Charleston. Thus, the DOT is interested in identifying the least costly alternative.

1. **Formulate an LP model to determine the least costly construction plan.**
2. **Use Solver to determine the optimal solution to this problem.**