**TASK 8: COMPETITION**

**In-class investigation**

**Unit 3**

**Topic 3.3: Graphs and networks**

**Course-related information**

The concepts and skills developed in this investigation relate to the following dot points within the WA Mathematics Applications syllabus:

3.3.1 demonstrate the meanings of, and use, the terms: graph, edge, vertex, loop, degree of a vertex, subgraph, simple graph, complete graph, bipartite graph, directed graph (digraph), arc, weighted graph, and network

3.3.2 identify practical situations that can be represented by a network, and construct such networks

3.3.3 construct an adjacency matrix from a given graph or digraph and use the matrix to solve associated problems

**Background information**

Students should have background knowledge of matrices and bipartite graphs. They should be able to determine adjacency matrices, draw bipartite graphs and connect these two representations. Familiar terminology should include nodes, elements, digraphs, leading diagonals, edges, matrix addition.

**Task conditions**

This task consists of an in-class investigation for which students might need 40 – 55 minutes to complete. Students will not need access to technology for this investigation. This investigation should be completed without reference to any notes.