National Rail - Solution

The right answer is Dalmuir. Shutting it down would cut off 14 stations.

Using the branch of mathematics called graph theory[1], we can find the answer very quickly, and we can also prove[2] that our answer is correct. Keep reading if you are interested to know how.

First note that, if the station is in a loop, shutting it down wouldn't cut off any other stations. In fact, all the other stations would still be connected, as trains could just go the other way around the loop.

Hence, the station which would cause most disruption lies on one of the branches sticking out.

Now, to find the answer to our question, we only need to find out which branch contains most stations. This is the branch containing Dalmuir.

The station which would cut off most stations if it were shut, is the one lying at the beginning of the branch, which is Dalmuir.

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[1] In advanced Mathematics, the term *graph* denotes a collection of points joined together by lines. A train route map is an example of a graph. Here the points represent the stations and the lines represent connections. *Graph theory* is the branch of mathematics studying graphs. We use concepts from graph theory any time we need to study networks and connections.

[2] A proof in Mathematics is a solid logical argument, that no one would be able to dismiss. It is based on logic steps rather than empirical observation.

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