











**Table 4. Numerical Experiment Result**

Scenario	Without Disruption			With Disruptions Total Cost			
	Best Route	Total Cost	Transportation Time Average/Container	Best Route	Total Cost	Transportation Time Average/Container	
(Unimoda)	60	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$15,754.08	187.55	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$15,754.08	187.55
	50	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$15,813.43	188.25
	45	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$15,853.02	188.73
	37	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$15,938.62	189.75
	26	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$16,142.34	192.17
	24	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$16,199.45	192.85
	16	-	-	-	0-11-6-3-2-1-0;0-12-14-15-8-4-0;0-10-5-0;0-7-9-13-0	\$16,570.62	197.3
	7	-	-	-	0-10-6-3-2-0;0-12-14-4-11-1-0;0-9-5-8-15-0;0-7-13-0	17,436.3	207.3131
	3	-	-	-	0-10-6-3-2-0;0-12-14-4-11-1-0;0-9-5-8-15-0;0-7-13-0	17,436.3	207.3131
	0	-	-	-	0-10-6-3-2-0;0-12-14-4-11-1-0;0-9-5-8-15-0;0-7-13-0	17,436.3	207.3131
(Multimoda)	60	0-1-2-13-8-5-4-3-2;0-1-2-14-16-17-10-6-2;0-1-2-12-7-2;0-1-2-9-11-15-2	\$14,484.56	540.48	-	-	-

## 5. Conclusion

This paper discusses the logistics strategy (routing) that should be taken when disruption occurs. The utilization of modal flexibility will have an impact on the total time produced longer than those using only one mode because there are several additional processes in it. However, the costs incurred are more minimal. Moreover, when there is disruption on the highway lane, there is a possibility that the total costs incurred are also higher. So in this case, when there is a disruption in the highway, a multimodal strategy is the best strategy that produces the most minimal total costs. But when the decision maker in making a decision is based on the total time needed for the delivery process, the unimodal strategy still results in a lower total time compared to the multimodal.

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