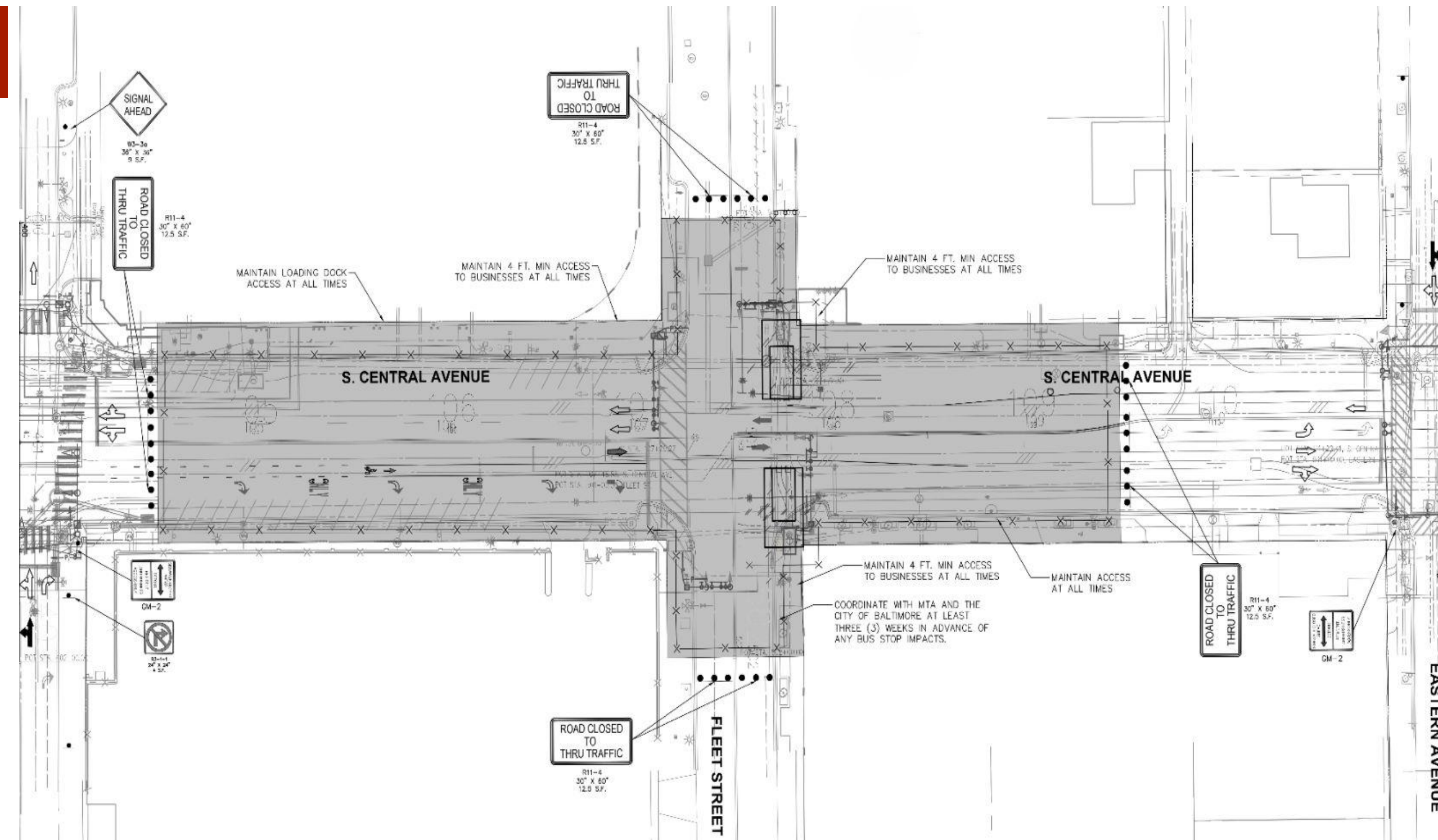


Project Description

When Allan Myers worked on the Central Avenue Design-Build project in 2017, construction had to be done in many different phases on the Fleet St and S Central Ave intersection to maintain traffic flow, which could have delayed the project's completion unnecessarily. Since the project has been completed, we are looking back and assessing if it would be more valuable to cause major impact for a shorter period of time using a full detour as opposed to minor impact for a longer period of time using multiple phases.

Maintenance of Traffic

- Maintain minimum of 4 feet of sidewalk at all times for pedestrian access to storefronts
- Wind/dust screen on chain link fences to block construction visuals and can hang advertisements for businesses
- Traffic detoured to surrounding streets (Aliceanna St, S Exeter St, Eastern Ave, S Eden St)
- Exeter St converted to temporary two-way street
- Temporary traffic signals placed at Aliceanna St and S Exeter St intersection
- Temporary rumble strips added on Fleet St to force vehicles to slow down to safer speeds as they approach work zone



Simulation

A simulation of both the existing traffic conditions and our proposed MOT plan was created using VISSIM software. The table below shows how our full detour plan affects the vehicle delay in each intersection for both AM and PM vehicle data:

Intersection Name	AM Change to Delay (Seconds)	PM Change to Delay (Seconds)
Eastern Ave and S Exeter St	11.13	4.91
Eastern Ave and S Central Ave	-46.74	-16.79
Eastern Ave and S Eden St	79.69	12.8
Eastern Ave and S Caroline St	-2.21	14.43
Fleet St and S Exeter St	-15.92	-9.64
Fleet St and S Central Ave	-88.82	-22.35
Fleet St and S Eden St	-1.29	-1.16
Fleet St and S Caroline St	-24.26	-7.15
Aliceanna St and S Exeter St	27.86	36.18
Aliceanna St and S Central Ave	-50.35	-12.28
Aliceanna St and S Eden St	-43.81	9.73
Aliceanna St and S Caroline St	-39.09	60.70

Safety

Below are safety matrixes for the baseline conditions and our proposed design:

Original Contract (Phased Detour)			
Risk	Likelihood	Impact	Risk Rating
Operation of Heavy Machinery	4	5	20
Suspended Loads	4	4	16
Moving Nearby Traffic	4	4	16
Nearby Pedestrians	3	4	12
Material Delivery Problems	3	2	6

Our Proposed Design (Full Closure)			
Risk	Likelihood	Impact	Risk Rating
Operation of Heavy Machinery	3	5	15
Suspended Loads	3	4	12
Moving Nearby Traffic	3	3	9
Nearby Pedestrians	2	2	4
Material Delivery Problems	2	2	4

Our full closure design enhances safety by:

- Separating work zone from the public
- Less change in traffic pattern over duration of project
 - More time for public to get used to new traffic pattern

Survey

We surveyed along Georgia Ave and Bonifant St in Silver Spring as they faced similar conditions due to the Purple Line construction.

- **71.4%** preferred a full detour over no road closure
 - **90%** of those who preferred detour wanted faster project completion
- **21%** worry for the long-term health of small businesses with the Purple Line construction timeline

Schedule and Cost

Duplicate activities on the baseline project schedule could be combined to save time with a full closure. With a shortened schedule, costs will be saved on the contractors' and owner's end.

	Original	Full Detour
Days of Work	625	526
Result	Reduction of 99 Days	

With the costs of crew and delay from detours and the benefits of increased worker safety and days saved, we calculated a B/C ratio of 1.238, which is favorable.

Crew Cost	\$2,630,000.00	Improved Safety	\$2,937,800.00
Delay Cost	\$57,834.37	Days Saved	\$389,664.00
Total Costs	\$2,687,834.37	Total Benefits	\$3,327,464.00
B/C Ratio	1.238		

Conclusion

A full closure of the S Central Ave and Fleet St intersection would be more beneficial to stakeholders as it would reduce overall project costs, increase safety for workers and residents, and allow construction to be streamlined to complete the project faster. Based on our findings, we recommend that a full detour approach be considered for similar urban reconstruction projects.