
WooBus

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The Problem

- Students can't afford to go to downtown Worcester
- Ride-Hailing services are typically required to get around the city without a car

Why It Exists

- Students don't have a cost effective way to get around during the evening/night
- WRTA buses typically don't run past 5pm

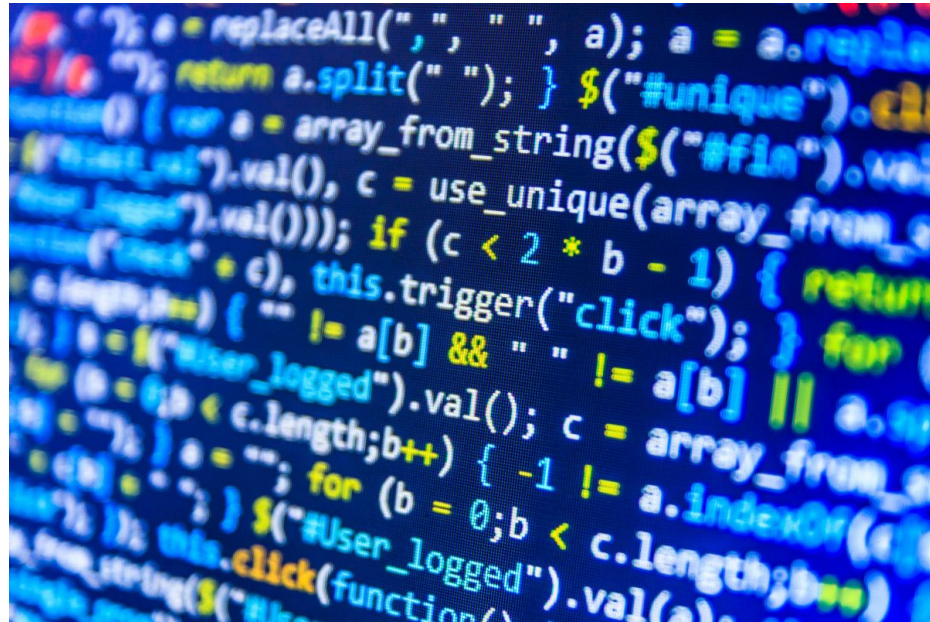
The Solution

- Establish new bus routes that more effectively connect Worcester schools to points of interest in the area
- Extend bus run times to cater to college students



Creating our Solution

- Google Distance Matrix API
- Prim's Algorithm
- K Means
- Google Directions Services



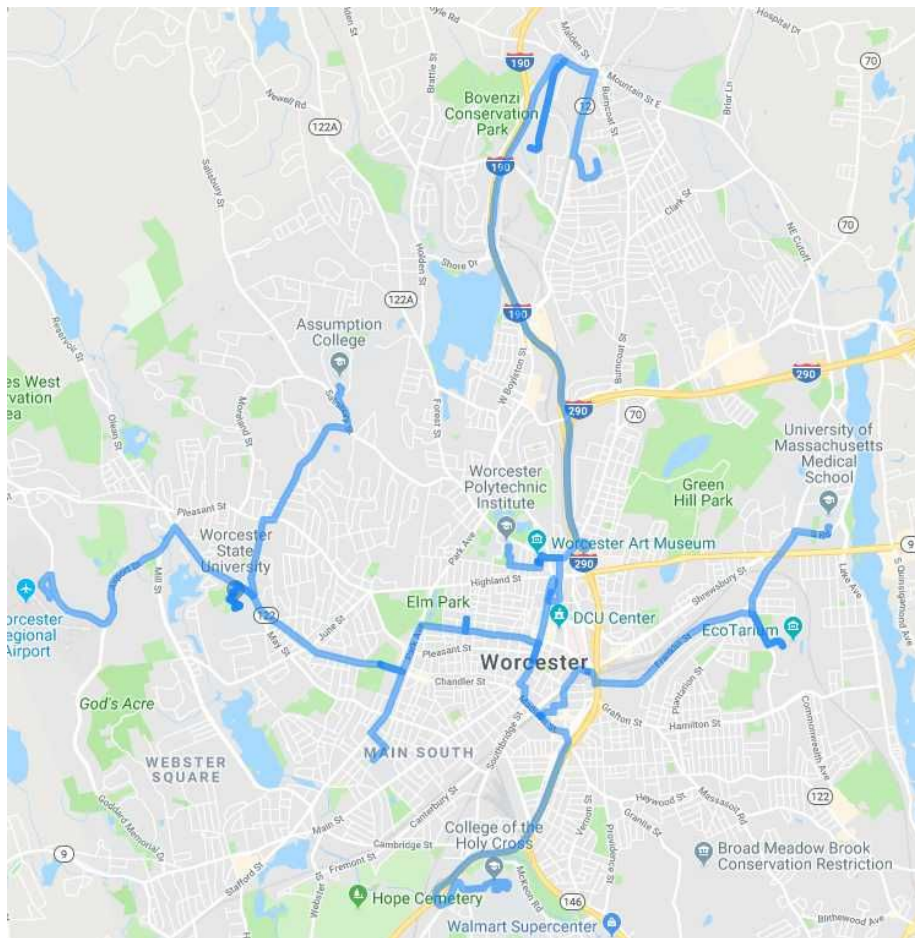
Duration Adjacency Matrix

WPI	0	880	775	854	780	530	861	504	413	550	639	962	838	607	664	818	326
Umass Medical	759	0	1146	821	1051	931	788	806	581	715	553	1358	816	978	650	410	589
Worcester State	567	1099	0	945	458	403	1103	514	613	621	831	425	1077	288	613	1061	594
Holy Cross	713	890	948	0	633	966	923	722	535	594	563	1039	899	731	442	738	624
Clark	587	1051	432	566	0	629	1056	362	565	428	615	594	1032	247	396	845	597
Assumption	381	928	409	902	621	0	830	445	461	598	687	591	822	416	680	866	374
Quinsigamond	695	782	1010	863	1067	760	0	794	698	762	648	1192	443	894	692	864	635
Becker	255	772	520	725	347	478	851	0	286	236	524	732	827	254	303	646	318
MCPHS	318	617	705	571	571	567	681	310	0	185	357	917	658	498	359	525	224
Commons	394	727	648	635	445	634	796	251	253	0	287	858	772	377	172	507	292
Train Station	481	716	786	634	543	722	798	407	306	207	0	1014	774	514	226	496	379
Airport	822	1354	472	1041	630	611	1293	768	867	876	1101	0	1285	558	882	1292	837
Movie Theatre	735	812	1024	847	1107	774	422	835	620	747	633	1206	0	934	676	848	615
Foley Stadium	444	972	270	751	264	436	980	272	486	355	542	498	961	0	323	772	471
Ball Park	430	667	588	438	385	682	675	307	287	179	218	815	652	316	0	448	416
Sundial Plaza	714	453	1120	688	871	993	962	735	536	535	356	1259	990	848	526	0	651
WAM	163	618	604	592	558	439	639	264	121	245	377	815	615	435	360	556	0

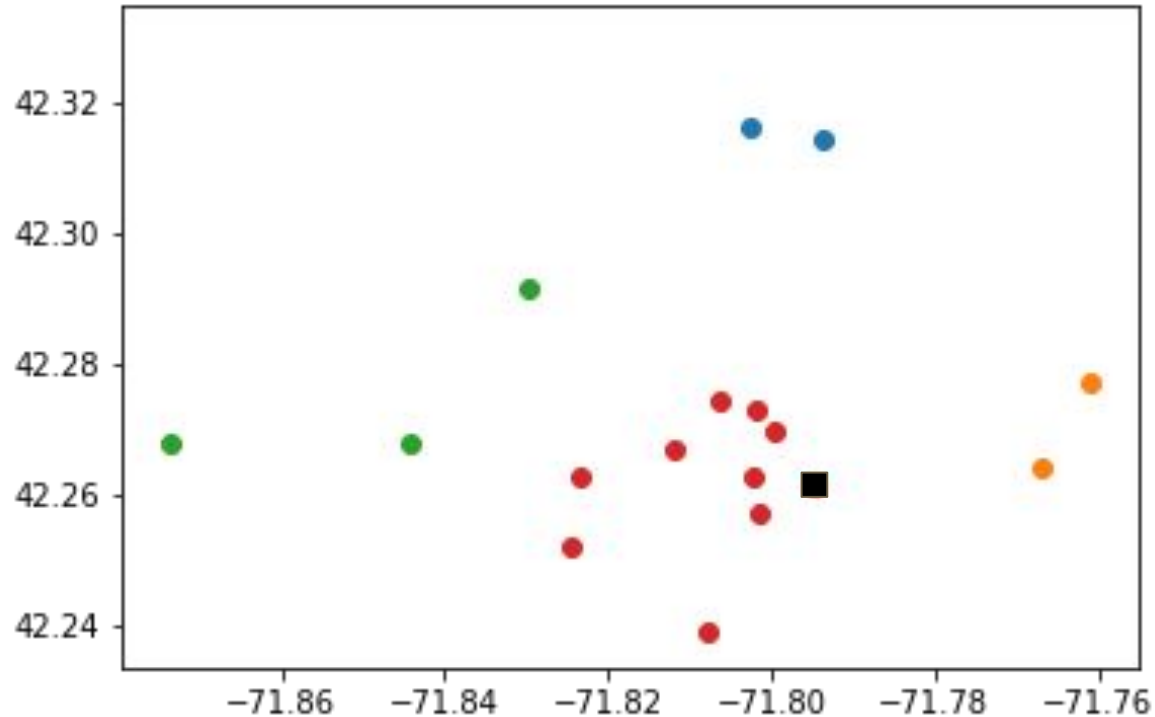
Prim's Minimum Spanning Tree

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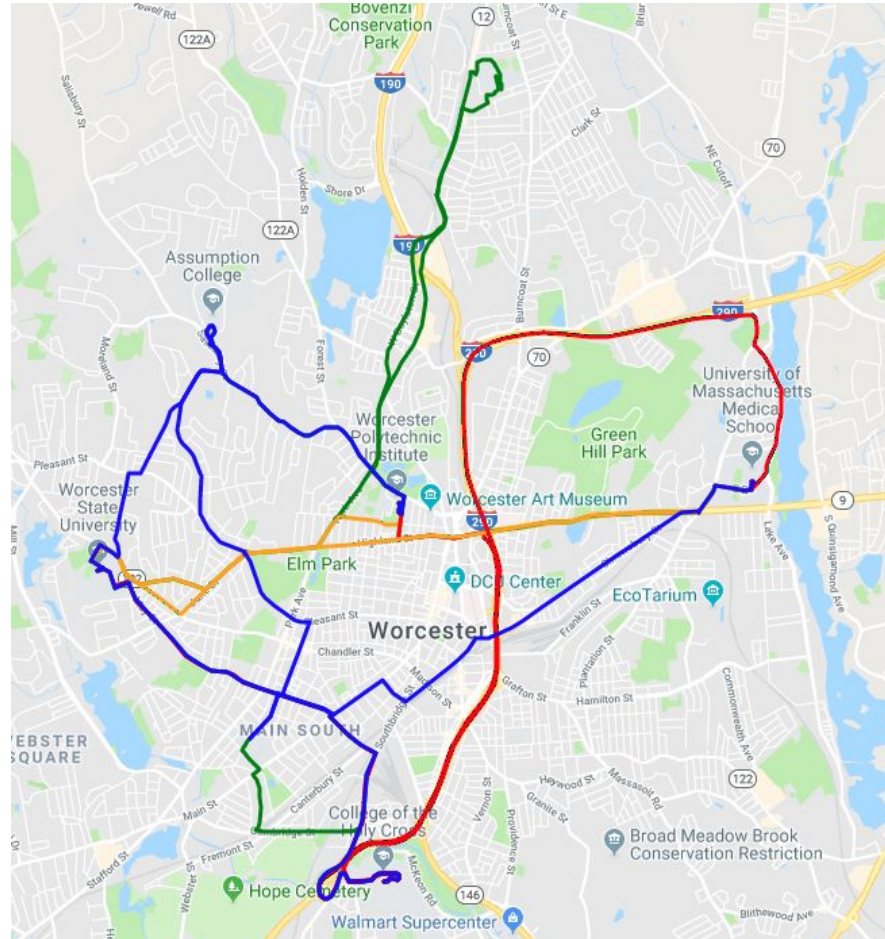
Bus Route



Unsupervised Machine Learning (k-Means)



Bus Route Take 2



Next Steps

- Finding the actual popular spots
- Using traffic data
- We don't know the volume of people
- In general: more data