

## 1.0 Background

The intersection of Saifi is one of the most important and traversed intersection in the country, being the gate to the downtown area from Charles Helou highway to Downtown Beirut and towards Charles Malek Avenue. In addition, it is surrounded by major traffic generators and attractors, including Al Nahar, Martyrs' Square, Gemayzeh Street, European Union building, Touch (mobile) building and central business district (CBD). The northbound direction serves traffic from Charles Malek and General Fouad Chehab Bridge. The westbound direction serves traffic from Charles Helou highway. The eastbound direction serves traffic from Martyrs Square. A background image is shown in Figure 1.



Figure 1 – Saifi intersection layout

The intersection operates with high volumes almost every hour throughout the day. Not to mention, during peak hours, the AM (7:00 am to 12:00 pm) and PM (4:00 pm to 7:00 pm), the intersection is completely clogged with flows much higher than the intersection capacity.

As of now, the intersection is operating as “unsignalized” – sometimes a policeman is stationed at the intersection to conduct traffic during the day. The policeman’s role is essential to maintain operations and movement

through this intersection, knowing that during peak hours traffic reaches a complete gridlock at this location. In addition, the operations of the two nearby intersections of Georges Haddad and Nahar (under construction now), along with Charles Helou highway congestion, have a direct impact on operations at this intersection, due to proximity and high volumes.

## 2.0 Purpose and Scope

The purpose of this report is to assess existing traffic conditions of the Saifi intersection before and after operating the traffic lights and compare the safety and level of service. Intersection turning movement counts were collected during good weather on a regular weekday. Traffic was counted hourly throughout the entire day.

Traffic turning movement counts are summarized in Tables 1, for every approach. Counts were collected in 20-min increments to account for peak hour factor and then summed for the hour, as shown in Table 1. During the PM peak, the exits from the intersection are completely congested leading to less flow going through the intersection, as shown in red in Table 1.

**Table 1:** hourly traffic flows at Saifi intersection

Thursday Feb02, 17	NB				EB			WB			Total
	L	T	R	Total	T	R	Total	L	T	Total	
All day											
1:30-2:30	120	129	450	699	150	9	159	282	411	693	1551
5:00-6:00	12	16	224	252	88	0	88	128	328	456	796
6:30-7:30	68	140	976	1184	584	32	616	932	1644	2576	4376
8:30-9:30	366	543	954	1863	663	66	729	1047	1899	2946	5538
10:30-11:30	489	435	1260	2184	665	25	690	1242	1445	2687	5561
12:00-13:00	258	378	1275	1911	705	36	741	1101	1275	2376	5028
13:20-14:20	204	404	1488	2096	1032	20	1052	728	1188	1916	5064
15:00-16:00	192	411	1194	1797	975	57	1032	801	1173	1974	4803
16:00-17:00	264	395	1554	2213	1113	31	1144	946	1343	2289	5646
17:00-18:00	191	386	712	1289	612	36	648	513	1255	1768	3705
19:00-20:00	207	366	1143	1716	670	30	700	1017	1509	2526	4942
21:00-22:00	192	348	987	1527	564	21	585	627	864	1491	3603

## 3.0 Existing Traffic Conditions

Figures 2 to 6 below clearly demonstrate the standard Lebanese drivers' behavior, with little respect to other motorists and the mentality of fighting to guarantee personal time savings, irrespective of the overall good. When high

flows reach the intersection given such behavior, the intersection will reach a complete gridlock and eventually no one will move; specifically if the policeman is not present. Staff at the Traffic Management Center (TMC) have observed operations at this intersection before the traffic lights are turned on, noting the presence of many pedestrians, as this intersection is the gate to the central business district.



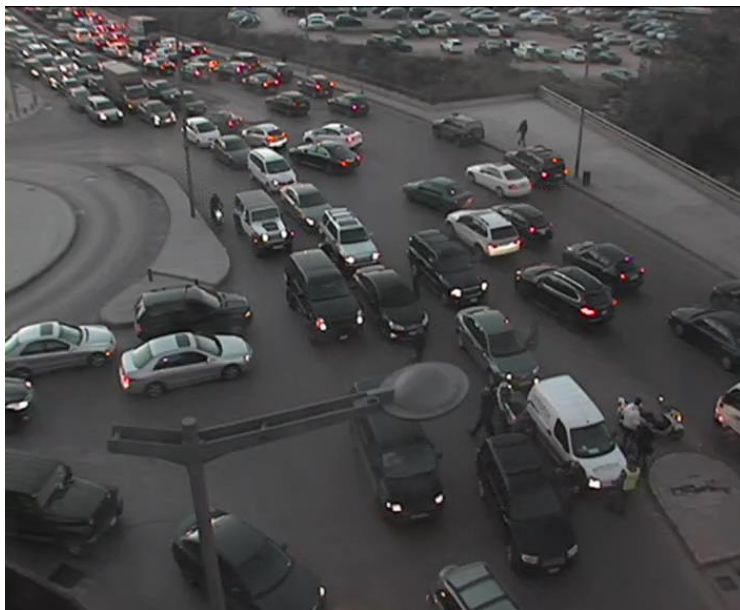
*Figure 2 – Saifi intersection behavior without traffic lights at 15:45*



*Figure 3 – Saifi intersection behavior without traffic lights at 17:07*



*Figure 4 – Saifi intersection at the time of an accident at 08:07*



*Figure 5 – Saifi intersection operations while a people quarrel the right to pass at 17:11*





*Figure 6 – Saifi intersection behavior without traffic lights at 17:46*

As such, traffic lights are necessary to secure safety of all drivers and, more importantly, the safety of pedestrians. The traffic lights are necessary to legally grant the right-of-way (ROW) to motorists to cross the intersection and allow fair treatment of all drivers from different approaches. In addition, once the intersection at Nahar is completed, the only way to operate both intersection and maintain the flow into the CBD is by having both of those intersections coordinated and synchronized for best efficiency. A traffic light is definitely crucial at this location.

## **4.0 Operation Plans**

After analyzing the hourly traffic counts at the intersection, different operations plans were devised to accommodate the changing flows throughout the day and from the three approaches. The seven operations plans are listed below starting from midnight hours and covering all peaks.

- Plan 01: From 12:00 am - 5:30 am
- Plan 02: From 5:30 am - 6:30 am
- Plan 03: From 6:30 am - 9:00 am
- Plan 04: From 9:00 am - 12:30 pm
- Plan 05: From 12:30 pm - 7:00 pm
- Plan 06: From 7:00 pm - 9:00 pm
- Plan 07: From 9:00 pm - 12:00 am

Weekday Period	Direction/ Approach			Cycle
	From Georges Haddad	From Nahar	From Charles Helou	
12:00 am - 5:30 am	20	15	25	60
5:30 am - 6:30 am	25	20	45	90
6:30 am - 9:00 am	30	25	65	120
9:00 am - 12:30 pm	35	25	60	120
12:30 pm - 7:00 pm	35	35	50	120
7:00 pm - 9:00 pm	30	25	65	120
9:00 pm - 12:00 am	25	18	37	80

## 5.0 Conclusion

The operation of this intersection using a traffic signal is crucial to safely move motorists and pedestrians through this wide intersection. With a traffic signal, coordination and synchronization of the cycles and flows through nearby intersections are possible, allowing higher and more efficient flows into and out of the CBD. Even though the traffic signal is not expected to increase flows through the intersection, it is definitely needed to organize the high flows and maintain civility and fairness while crossing this intersection. For it to function even better and compel people to follow the rules, a full intersection pavement and road marking is required, such as median separation lines, stop bars and pedestrian crosswalks, as shown in the attached Appendix A.