

City of Alexandria, Virginia

Traffic and Parking Board

DATE: June 25, 2018

DOCKET ITEM: #13

ISSUE: Consideration of a request to install a High Intensity Activated crossWalk (HAWK) signal at the intersection of Franklin Street and Alfred Street

REQUESTED BY: T&ES Staff

LOCATION: Franklin Street and Alfred Street

STAFF RECOMMENDATION: That the Board makes a recommendation to City Council to:

1. Install a High Intensity Activated crossWalk (HAWK) signal at the intersection of Franklin Street and Alfred Street; and,
2. In the future convert the HAWK signal into a regular traffic signal if the intersection meets the MUTCD Warrants for a traffic signal.

BACKGROUND: Franklin Street is a one-way street going eastbound and serves as a major entry point to Old Town. Alfred Street is two-way and runs parallel to Patrick Street. Staff has received and continues to receive requests from residents to improve the uncontrolled crossing of Franklin Street at Alfred Street. In 2015 staff installed curb extensions, high visibility crosswalks and signage to improve this crossing however, pedestrians continue to face challenges because of the high traffic volume and number of travel lanes. Additionally, there is a bus stop on the south side of Franklin Street that is challenging to access without a controlled crossing.

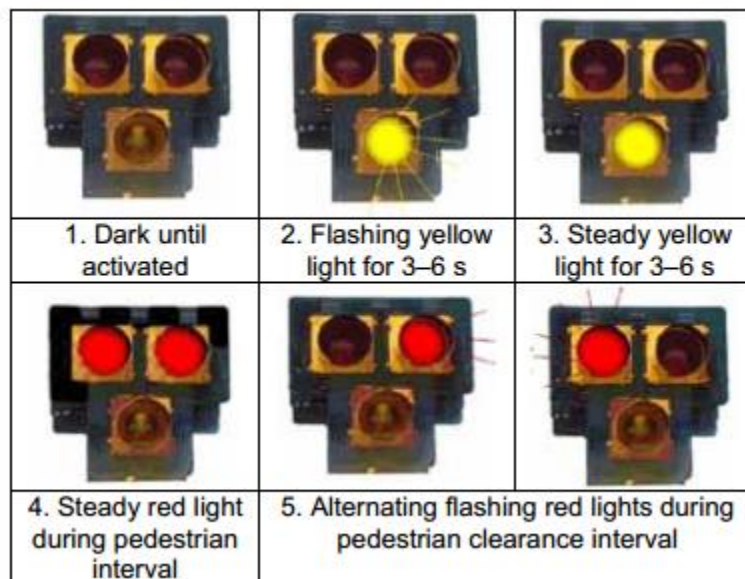
DISCUSSION: During the Route 1 South planning process, comments regarding safety concerns at the intersection of Franklin and Alfred Streets were a constant theme. While staff has implemented measure to improve crossings at this location in the past, the speed of vehicles turning right from Route 1 onto Franklin Street continues to be an issue. Because of the continued community concerns, wide street width and volume of traffic, staff is recommending additional measures be taken to provide a safe crossing.

Staff conducted a traffic signal warrant analysis for this intersection in 2016 (Attachment 3). This intersection did not meet the Manual on Uniform Traffic Control Devices (MUTCD) warrants for traffic signal installation at this time. While the pedestrian volumes were also not high enough to meet the warrants for a HAWK signal, staff recommends this measure as the best option for creating a safer crossing for pedestrian while not creating backs up and delays that could occur with a full signal and create unsafe conditions along Route 1. The surrounding area

is expected to see considerable redevelopment in the next few years and traffic volume will likely increase. At that point, if this intersection meets the warrants for a full traffic signal, the City would upgrade the infrastructure to provide the necessary equipment. The proposed HAWK signal will be designed and constructed in a manner to allow conversion into a full traffic signal if needed in the future. Complete Street funds have been identified for the construction of this signal as part of the Vision Zero Program and the near-term safety and mobility commitments made in the Route 1 South Small Area Plan.

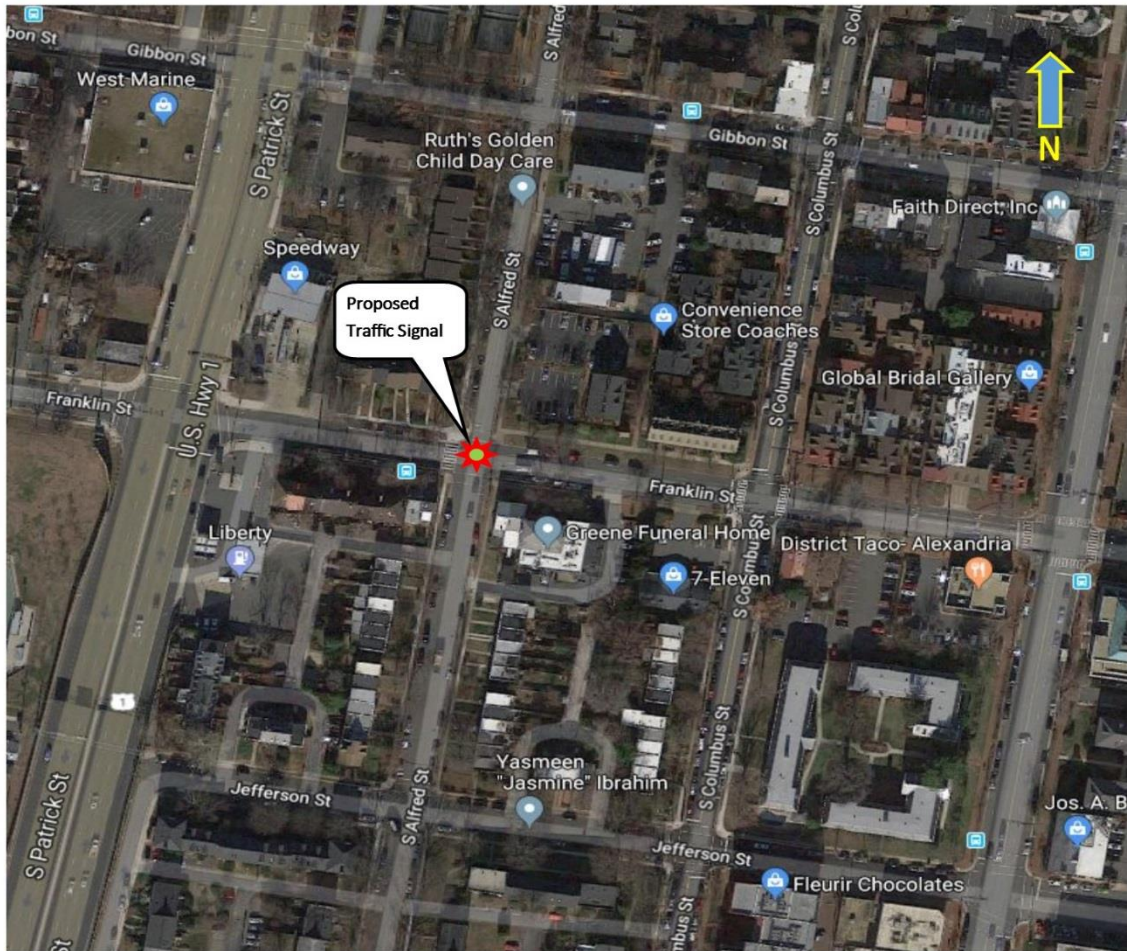
The intersection of Franklin Street and Alfred Street is 275 feet from Route 1. The proposed signal will be pedestrian actuated to prevent long queues of traffic from extending into Patrick Street. The HAWK is a Federal Highway Administration approved signal-beacon designed to help pedestrians safely cross busy streets. The unit is dark until it is activated by a pedestrian. When pedestrians want to cross the street, they press a button that activates the warning flashing yellow on the major street. After a set amount of time, the indication changes to a solid yellow light to inform drivers to prepare to stop. The device then displays a dual solid red light for drivers on the major street and a walking person symbol (symbolizing WALK) for the pedestrians. The beacon then displays an alternating flashing red light, and pedestrians are shown a flashing upraised hand (symbolizing DONT WALK) with a countdown display advising them of the time. Examples of a phase sequence can be seen below in Figure 1.

Figure 1



The City currently has three other HAWK signals in operation.

ATTACHMENT 1: Overhead View, Franklin Street and Alfred Street



ATTACHMENT 2: Street View, Franklin Street and Alfred Street



ATTACHMENT 3: Traffic Signal Warrant Analysis

DATE: September 20, 2016

ISSUE: Consideration of a request to install a traffic signal at the intersection of Franklin Street and Alfred Street

LOCATION: Intersection of Franklin Street and Alfred Street

STAFF RECOMMENDATION: Staff recommends against signal installation

DISCUSSION:

Franklin Street is two lanes and is one-way in the eastbound direction. Alfred Street carries two-way traffic and is one lane in both directions. Parking is allowed on both streets on both side of the road. The intersection operates with two-way stop controls on Alfred Street. Staff visited this intersection and found sight distance to be adequate, however, larger vehicles parked could obstruct sight distance.

Last year a curb extension was installed on the north-west corner of the intersection in response to pedestrian concerns over the safety of the crossing Franklin Street.

A warrant analysis was conducted as follows:

WARRANTS:

Warrant 1, Eight-Hour Vehicular Volume:

The Eight-Hour Vehicular Volume warrant is intended for intersections where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The traffic volume on all approaches of the major street is considered in combination with the traffic volume on the higher volume approach of the minor side street. The volumes considered on the main and minor street are for the same eight hours. Franklin Street is one-way and has two lanes approaching this intersection. Alfred Street is two-way and has one approach lane in each direction. The volume of traffic on Franklin Street meets the eight-hour volume requirement however the volume on Alfred Street falls short. Table 4C-1 in the MUTCD requires a minimum traffic volume of 150 vehicles per hour (VPH) on the side street (Alfred Street) to meet the eight-hour warrant. During the peak eight hours the Alfred Street approaches to the intersection don't even meet this requirement for one hour. The table below shows the peak eight-hour traffic volume.

Peak Hour Traffic Volumes

Time	Franklin Volume	Alfred Volume
7:00 – 8:00	1439	38
8:00 – 9:00	1467	50
9:00 – 10:00	1410	46
10:00 - 11:00	909	60
16:00 - 17:00	718	53
17:00 - 18:00	765	125
18:00 – 19:00	810	130
19:00 – 20:00	727	57

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112
Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Warrant 2, Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of the intersecting traffic is the principal reason for installing a traffic signal. The traffic volume for the minor street must be at least 80 vehicles per hour for each of any four hours on the higher volume minor-street approach. Alfred Street only had volumes above this threshold for three hours. See Figure 4C-1 from the MUTCD below.

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

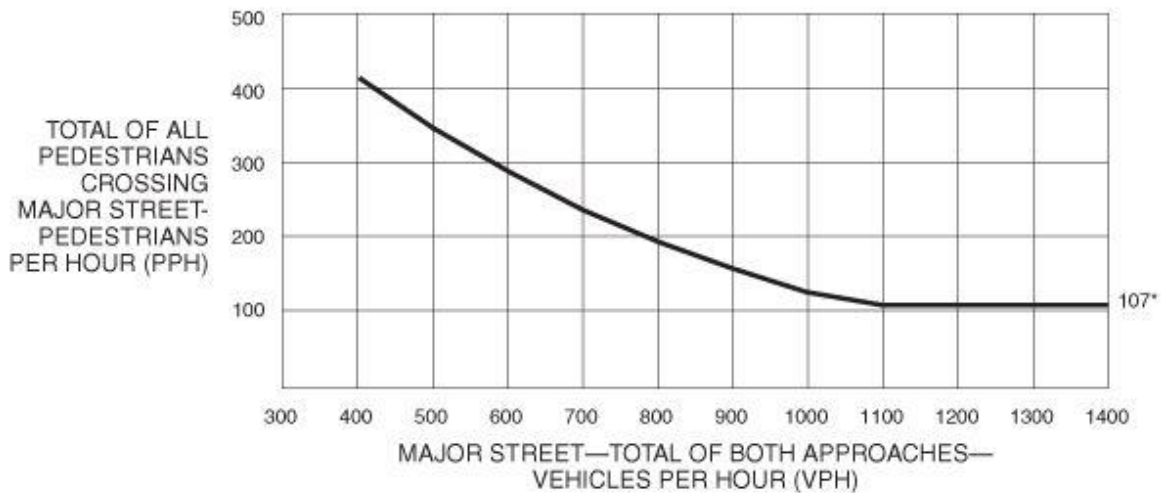
Warrant 3, Peak Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour on the average day, the minor-street traffic suffers undue delay when entering or crossing the major street. This warrant is only applied in unusual cases, such as office complexes or other facilities that discharge large number of vehicles over a short period of time. This warrant does not apply at this intersection.

Warrant 4, Pedestrian Volume

The Pedestrian Volume warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay crossing the major street. The minimum number of pedestrians crossing the major street would need to be 107 per hour to meet this warrant. The count data found 12 pedestrians per hour to be the maximum number of pedestrians crossing the major street per hour during the study. This is 11 percent of the volume required to meet this warrant. The Pedestrian Four-Hour Volume requirements are shown in Figure 4C-5 below.

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



*Note: 107 pph applies as the lower threshold volume.

Warrant 5, School Crossing

The School Crossing warrant is intended for application where the principal reason for considering a traffic signal is to accommodate school children. Although this intersection is four blocks away from Lyles-Crouch Elementary School, it is not on a primary walking route to the school, so this warrant is not met.

Warrant 6, Coordinated Signal System

Progressive movement in a coordinated signal system sometimes necessitates installing traffic signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles. The adjacent traffic signals on Franklin Street are too close to this intersection to require platooning. This warrant is not met.

Warrant 7, Crash Experience

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reason to consider installing a traffic signal. To meet this warrant an engineering study must find that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce crash frequency; and
- B. Five or more reported crashes, of the types susceptible to correction by a traffic signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
- C. For each of any 8 hours on an average day, the vehicles per hour given in both the 80 percent columns of condition A in Table 4C-1, or the VPH in both the 80 percent columns of condition B in Table 4C-1 exists on the major street and the higher volume minor street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major street and minor street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

The Police Accident database indicates that over the past five years there have been a total of 12 crashes susceptible to correction by a traffic signal for an average of 2.4 crashes per year. This intersection does not meet the Crash Experience warrant. The table below shows the reported crashes for this intersection over the past five years.

Five Year Crash History for Franklin St and Alfred St

Alexandria Police Accident Listing Report

Date Range: 11/21/2011 To 11/21/2016

Time Range: 0000 To 2400

Geography: Intersection - FRANKLIN ST AND S ALFRED ST

* Other parameters may be limiting the results

Total Accidents: **23**

Case#	Accident Date	Accident Time	Location	Day	Event #1
111155413	28-Dec-11	1435	FRANKLIN ST & S ALFRED ST	Wednesday	ANGLE
112100848	07-Jan-12	1017	FRANKLIN ST & S ALFRED ST	Saturday	ANGLE
112105823	14-Feb-12	0821	FRANKLIN ST & S ALFRED ST	Tuesday	SIDESWIPE - SAME DIRECTION
112116096	25-Apr-12	1815	FRANKLIN ST & S ALFRED ST	Wednesday	SIDESWIPE - SAME DIRECTION
112125992	29-Jun-12	0558	FRANKLIN ST & S ALFRED ST	Friday	SIDESWIPE - SAME DIRECTION
112133428	15-Aug-12	0945	FRANKLIN ST & S ALFRED ST	Wednesday	ANGLE
112139690	26-Sep-12	0859	FRANKLIN ST & S ALFRED ST	Wednesday	ANGLE
113123741	17-Jun-13	0222	FRANKLIN ST & S ALFRED ST	Monday	ANGLE
113132663	13-Aug-13	0910	FRANKLIN ST & S ALFRED ST	Tuesday	ANGLE
113137372	12-Sep-13	0815	FRANKLIN ST & S ALFRED ST	Thursday	ANGLE
113138112	17-Sep-13	0815	FRANKLIN ST & S ALFRED ST	Tuesday	SIDESWIPE - SAME DIRECTION
113143988	28-Oct-13	0730	FRANKLIN ST & S ALFRED ST	Monday	SIDESWIPE - SAME DIRECTION
113149856	10-Dec-13	1728	FRANKLIN ST & S ALFRED ST	Tuesday	ANGLE
114103626	30-Jan-14	0825	FRANKLIN ST & S ALFRED ST	Thursday	SIDESWIPE - SAME DIRECTION
114124274	18-Jun-14	0823	FRANKLIN ST & S ALFRED ST	Wednesday	ANGLE
114125603	26-Jun-14	0725	FRANKLIN ST & S ALFRED ST	Thursday	
114130946	28-Jul-14	1819	S ALFRED ST & Y FRANKLIN ST	Monday	
115100968	08-Jan-15	0533	FRANKLIN ST & S ALFRED ST	Thursday	HEAD ON
115131352	23-Jun-15	2030	FRANKLIN ST & S ALFRED ST	Tuesday	FIXED OBJECT IN ROAD
115141352	23-Jun-15	2030	FRANKLIN ST & S ALFRED ST	Tuesday	FIXED OBJECT IN ROAD
115179600	18-Nov-15	0840	FRANKLIN ST & S ALFRED ST	Wednesday	ANGLE
116119139	18-Mar-16	1232	FRANKLIN ST & S ALFRED ST	Friday	ANGLE
116137525	28-May-16	1345	FRANKLIN ST & S ALFRED ST	Saturday	ANGLE

Warrant 8, Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network. To meet this warrant an intersection would need to have a total of at least 1,000 vehicles per hour entering during the peak hour of a typical weekday and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2 and 3 during an average weekday. This intersection does not meet this warrant.

Warrant 9, Intersection Near a Grade Crossing

The Intersection Near a Grade Crossing signal warrant is intended for use at a location near a grade railroad crossing. There are no railroad crossings in the vicinity of this intersection, so this warrant is not met.

RECOMMENDATIONS:

Based on the warrants contained in the MUTCD, traffic signal installation is not warranted at this intersection. Staff acknowledges that this intersection can be challenging for pedestrians and motorists to cross during the morning peak period. All-way stop signs are not recommended because this intersection does not meet the MUTCD warrants for all-way stop signs. In addition, installing all-way stop controls would back up traffic on Franklin Street during the morning peak and there is a concern that the queue of traffic will extend back into Route 1. There are two other traffic signals within 300 feet of this intersection which provide a signalized crossing of Franklin Street.

The adjacent intersection, Franklin Street and Columbus Street, has a traffic signal yet has the same number of crashes as the Franklin Street and Alfred Street intersection over the past five years. In fact, Franklin Street and Columbus Street has 45 percent more angle crashes than Franklin Street and Alfred Street. The intersection of Franklin Street and Columbus Street is very similar to the intersection Franklin Street and Alfred Street. Based on this comparison, installing an unwarranted traffic signal at the intersection of Franklin Street and Alfred Street may not improve safety.

ATTACHMENT 4: HAWK Warrants

Figure 4F-1. Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways

