CCM-101

# City of Cambridge

O-12.

**IN CITY COUNCIL**
February 11, 2002

MAYOR SULLIVAN

ORDERED: That the City Manager be and hereby is requested to instruct the Director of Traffic, Parking and Transportation to provide a report to the City Council on traffic signals at the following intersections:

- Brookline Street and Massachusetts Avenue;
- Walden Street and Massachusetts Avenue; and
- Green Street, Western Avenue and River Street.

In City Council February 11, 2002.
Adopted by the affirmative vote of nine members.
Attest:- D. Margaret Drury, City Clerk.

A true copy;

ATTEST:- D Margaret Drury

D. Margaret Drury
City Clerk

**SEE CONSENT AGENDA ITEM #5.**

# What percentage of pedestrians push the button and wait for the walk phase?

Installing a signal has been discussed as one option for improving pedestrian safety in Huron Village. It is important to note that in order for a signal to improve safety, it has to be used correctly. Motorists must stop for the red light and pedestrians have to push the button and wait for the walk phase before crossing the street.

The City has done extensive data collection at various locations around the city to determine how many pedestrians will push the button and wait for the walk phase to cross the street. What the data tells us is really common sense. Pedestrians are more likely to use the push button and wait for the walk signal on streets that have higher traffic volumes. As the volume on streets increases, the number of gaps in traffic decreases and it is more difficult for pedestrians to cross the street safely without waiting for the walk phase. At high volume locations (e.g. Garden Street), pedestrians are more willing to wait for the light to change before crossing the street. Even here a third of the pedestrians did not wait for the light. At low volume locations (e.g. Oxford Street), pedestrians can find adequate gaps in traffic to safely cross the street and will not wait for the light to change.

| Street | Daily Volume of Traffic | % of Pedestrians that use walk phase |
|---|---|---|
| Oxford Street | 8,000 | 2-5% |
| Huron Avenue | 10,000 | 8-21% |
| Mt. Auburn Street | 12,000 | 38% |
| Garden Street | 28,000 (4 lanes of traffic) | 64% |

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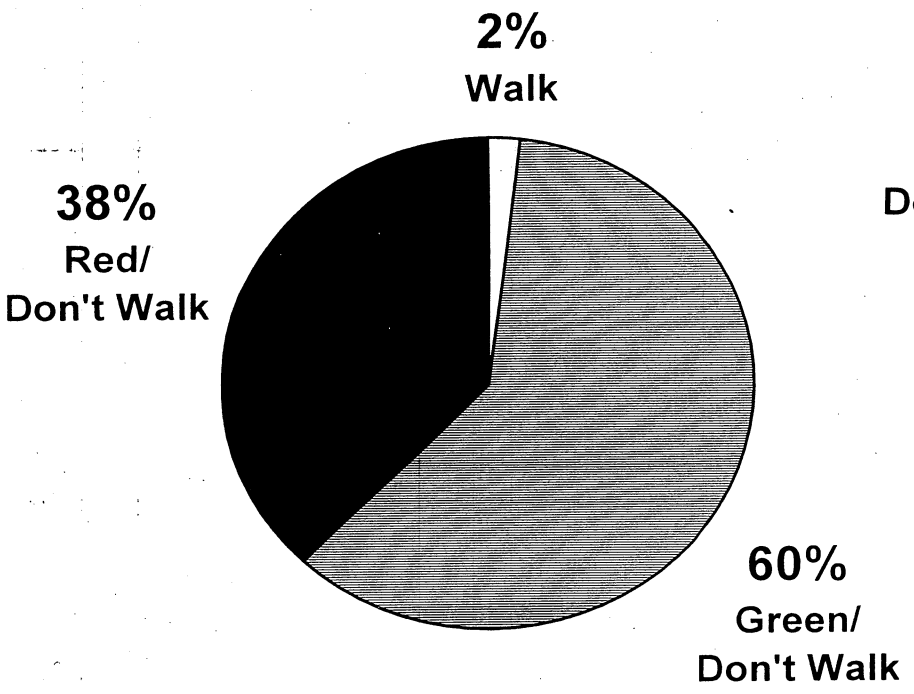
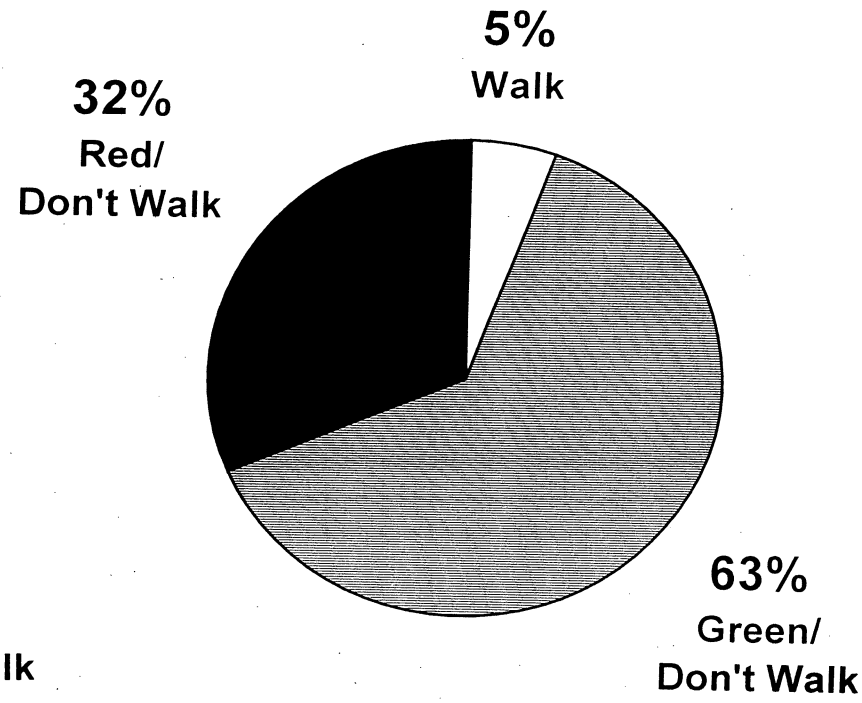
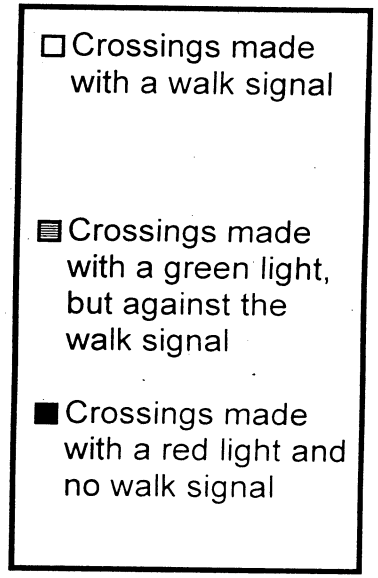
## Oxford Street & Everett Street Pedestrian Crossings



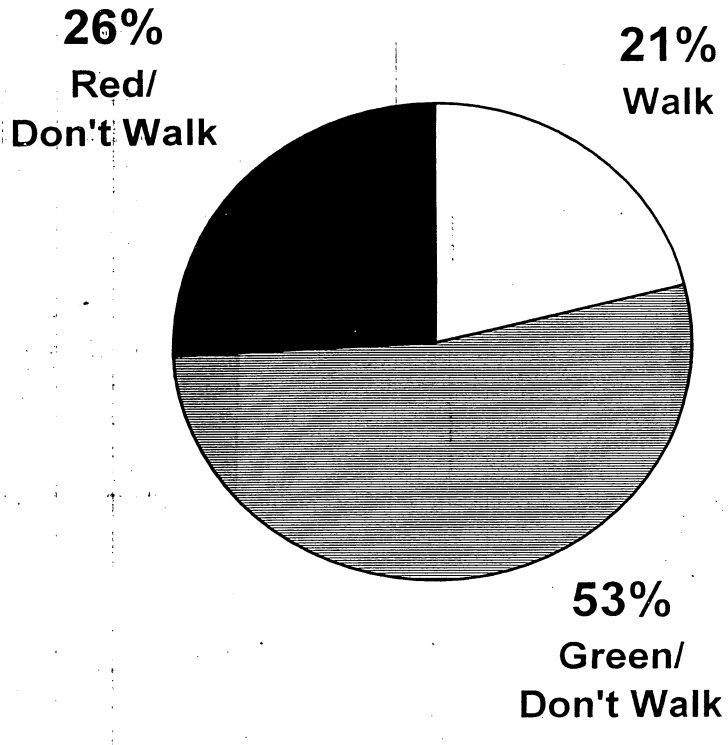

## Oxford Street & Sacramento Street Pedestrian Crossings



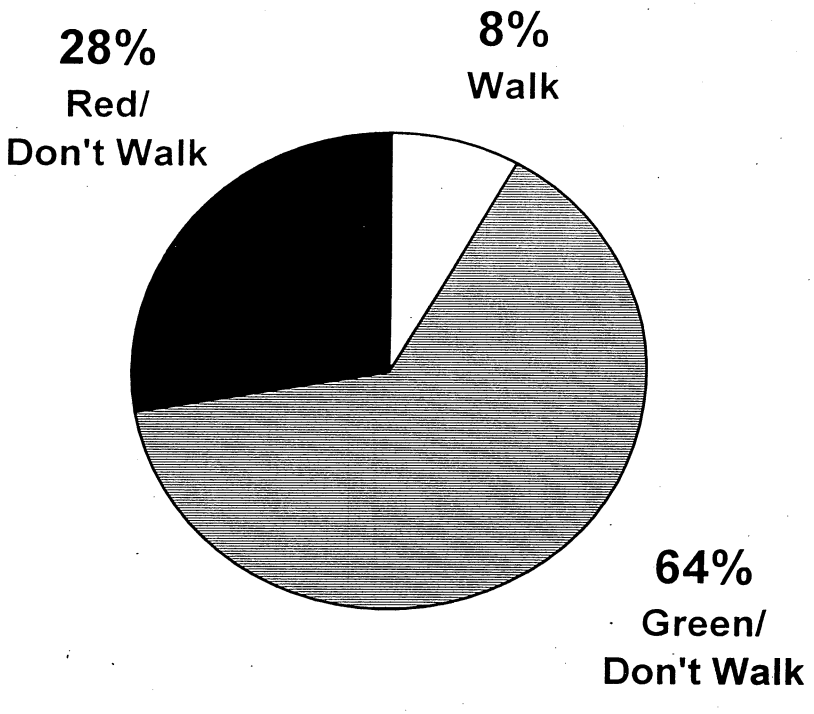




Very few pedestrians use the walk phase on Oxford Street ( 2-5%). It is a narrow street with fairly light traffic (8,000 vehicles per day) that gives pedestrians adequate gaps to cross the street without waiting for the walk phase. The pedestrians are dominated by college students who are probably the least inclined pedestrians to wait for a walk phase.

## Huron Avenue & Lakeview Avenue Pedestrian Crossings



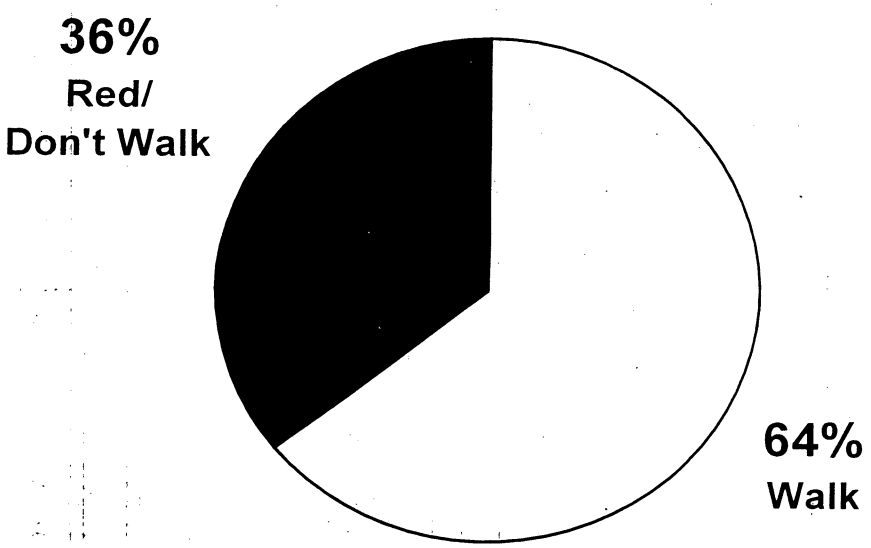

## Huron Avenue & Reservoir Street Pedestrian Crossings



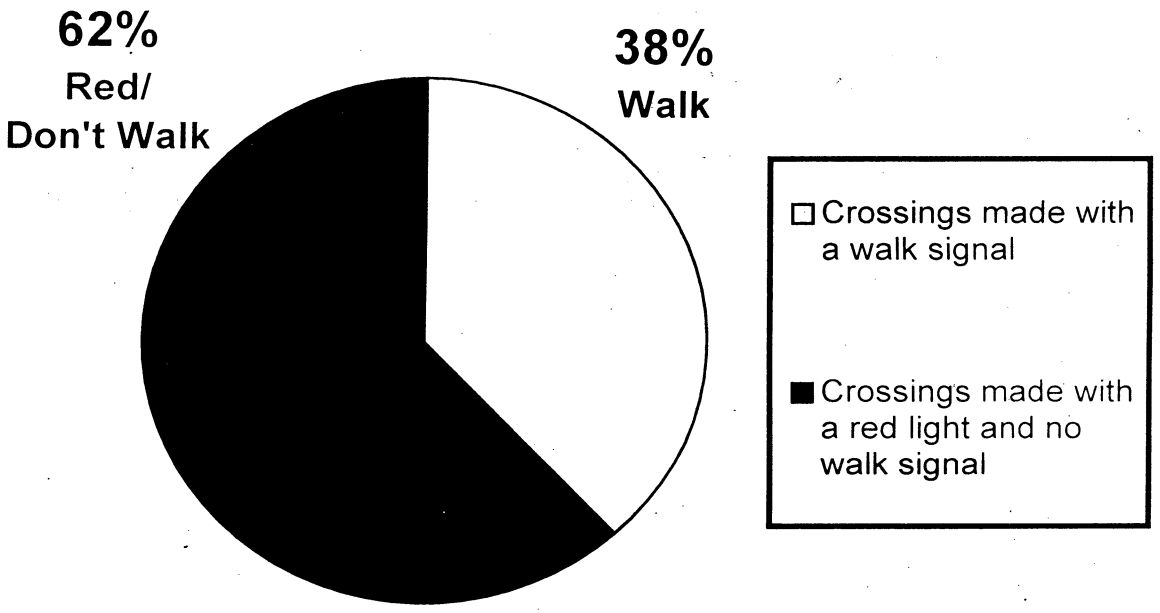

A higher percentage of pedestrians use the walk phase at Lakeview Avenue than at Walden Street (21% vs. 8%). At Lakeview Avenue, Huron Avenue traffic is not as frequently stopped for the side street traffic. So, if a pedestrian is waiting to cross Huron Avenue at Lakeview Avenue, unless a car approaches on Lakeview Avenue, the only way to stop traffic is to push the button and wait.

The other issue that came up in public discussion is that at least one of the push buttons at reservoir was broken. The broken button has been corrected.

## Garden Street & Appian Way Pedestrian Crossings




## Mount Auburn Street at the Hospital Pedestrian Crossings




The signal on Huron Avenue would operate similarly to these signals. The walk phase would come up **only** after a pedestrian has pushed the button.

64% of pedestrians cross Garden Street with the walk phase as compared to 38% on Mount Auburn Street. This follows directly from the amount of traffic on and width of these streets. Garden Street is also a 4-lane road as opposed to a 2-lane road. Garden Street has two times as much traffic as Mount Auburn Street (28,000 vs. 12,000 vehicles per day). It is extremely difficult to cross Garden Street without a signal.

Huron Avenue has less traffic than either of these streets (10,000 vehicles per day). Therefore, we would not expect a significantly higher compliance rate than 38%.

In response to concerns raised about pedestrian safety in Huron Village, the Department did an analysis of several signalized intersections in the City. The results of those studies showed several things. The percentage of pedestrians who wait and cross with the walk light improves as the vehicle volume increases. For example, on Oxford Street where the volume is only 8,000 vehicles per day only 2 to 5% of pedestrians used the walk light, but at Garden Street where the volume is 28,000 vehicles per day, 64% of pedestrians used the walk phase. At four signalized locations with exclusive walks between 53% and 64% of pedestrians walked as if the signal was concurrent. The percentage that waited for the walk phase was as low as 2% and no higher than 28%.

Every urban community faces the same challenge as pedestrians and vehicles compete for time and space at an intersection. Other municipalities use a combination of concurrent (some with LPI) and exclusive phasing, depending on which is appropriate for the volumes at those intersections. For example, the intersection of Harvard and Beacon Streets in the Coolidge Corner neighborhood of Brookline uses concurrent phasing with LPI. This location is very similar to Massachusetts Avenue and Prospect Street in Central Square, with comparable vehicle volumes and extraordinarily high pedestrian volumes. Brookline has used concurrent phasing with LPI there with few safety problems.

The Department continues to review their policies to identify areas for improvement. The current signal operation is described in the Department's signal policy. The Department has been making pedestrian improvements to signals since the policy was articulated in 1997. In the next years, new studies will be performed to measure pedestrian and vehicle behavior at signalized intersections. We will use what we learn to improve our policies and operations.

Very truly yours,

Robert W. Healy
City Manager

RWH/mec
Attachments

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CITY OF CAMBRIDGE • EXECUTIVE DEPARTMENT

*Robert W. Healy, City Manager* *Richard C. Rossi, Deputy City Manager*

February 11, 2002

To The Honorable, The City Council:

In response to Awaiting Report Item No. 02-01, regarding a report on traffic signals at intersections in the City that have combined pedestrian walk cycles and green lights for cars, Traffic, Parking & Transportation Director Susan Clippinger reports the following:

The pedestrian walk in a traffic signal can be operated as exclusive or concurrent. Exclusive is a separate pedestrian phase where all cars are stopped. It increases the time the pedestrians have to wait for a walk light, but eliminates the conflict between vehicles and pedestrians. An exclusive walk may double the wait over a concurrent walk.

With concurrent operation the walk is available at the same time the parallel traffic has a green light. A turning vehicle is required by state law to yield to the pedestrian.

In establishing signal operations in the City, both the needs of the vehicles and of the pedestrians are considered. The Department seeks to increase safety and reduce delay. For the pedestrian operation, the Department is reducing delay in order to decrease the number of pedestrians crossing illegally in front of through cars who have a green light. Pedestrians will not wait if the wait is too long or if the gaps in the through traffic are too big.

The change from exclusive to concurrent makes a substantial reduction in pedestrian delay. To offset the possible reduction in safety that may result from this change, we use LPI (leading pedestrian interval). LPI gives the pedestrian a 3 to 5 second head start so that he or she is well within the crosswalk before the light turns green. This dramatically increases the likelihood that turning vehicles will yield to the pedestrians. LPI combines the efficiency of concurrent phasing and the safety of exclusive phasing and represents an excellent compromise.

This operation is consistent with the guidelines in the MUTCD (Manual on Uniform Traffic Control Devices). Of the 121 signalized intersections in the city, 30 have concurrent walks and 22 of those also have LPI.

795 Massachusetts Avenue, Cambridge, Massachusetts 02139
Voice: 617.349.4300 Fax: 617.349.4307 TTY: 617.349.4242 Web: www.ci.cambridge.ma.us

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**Consent Agenda #5**

**Awaiting Report Item Number 02-01**, regarding a report on traffic signals at intersections that have combined pedestrian walk cycles and green lights for cars.

**In City Council February 11, 2002**

**PLACED ON FILE**
See Order #12