

CID Associates, Inc.
September 3, 1996

TRANSPORTATION IMPROVEMENT PLAN

Existing Conditions

Mount Auburn and Arlington Streets Intersection. This location is a four-way signalized intersection serving both local and area-wide traffic. Mount Auburn Street has a variable width right-of-way in the vicinity of the intersection, widening on the north side approaching Arlington Street. Mount Auburn Street is a four lane, two way street, with two lanes in each direction.

The westbound approach on Mount Auburn Street has a 55 foot wide pavement, with two approach lanes. Due to the heavy left turn volume during peak hours, the left lane functions as a defacto left turn lane. The westbound approach has an 11 foot wide sidewalk on the south side and a variable planting strip widening to 24 foot wide with an 8 foot paved sidewalk on the north side.

The eastbound Mount Auburn Street approach has a 57 foot wide pavement. There are two travel lanes on the eastbound side of Mount Auburn Street. The approach transitions by eliminating parking and adding a short right lane at the stop line. Due to the short length of the right turn lane, the length of the vehicle queue that forms at the stop line during peak hours prevents all vehicles desiring to turn right from accessing the right turn lane. Accordingly, the level-of-service analysis evaluates the approach as two lanes. To account for the effect of the short right turn lane, the right turn volume is modified, allocating 20 percent of the turns as "right turn on red" This is an analytical technique only, not an actual proposal to allow turns on red. There is an 8½ foot wide sidewalk on the south side and a variable width sidewalk/planting strip having a total width of 35 feet on the north side.

North of the intersection, Arlington Street is a two lane, two-way roadway, with a 33½ foot wide pavement. There are 8 foot wide sidewalks on both sides. There is one 15 foot wide approach lane southbound.

Particularly during the morning peak hour, the southbound approach on Arlington Street carries a large volume of traffic. For the Existing Case, the southbound weekday AM peak hour traffic volume is 775 vehicles. For the Reuse Case, it is forecast to be 864 vehicles. Accommodating these traffic volumes in one lane is a key factor which causes the intersection to operate at Level-of-Service F under both the Existing and Reuse Cases.

The existing traffic signal equipment includes poles and mast arms on the northeast and northwest corners. Each has three 3 lens signal heads and two ped heads. There are post mounted signals on the southeast and southwest corners. Each has one 3 lens signal head and two ped heads. In addition to the pole and mast arm, there is also a post with two 3 lens signal heads on the northwest corner of the intersection.

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There are pedestrian crosswalks on all four legs of the intersection and ped buttons on the traffic signal posts.

The intersection was observed to operate on a 70 second cycle length under peak conditions. The westbound approach on Mt. Auburn Street receives a 10 second advance green. This is followed by a 20 second phase during which both approaches on Mt. Auburn Street are allocated green time. The third phase allocates 31 seconds of green time to the northbound and southbound approaches on Arlington Street.

Arlington and Grove Streets Intersection. Grove Street intersects with Arlington Street about 350 feet south of Mount Auburn Street. Between Grove and Mount Auburn Streets, Arlington Street has a variable width right-of-way and variable width pavement. There is a 7½ foot wide sidewalk on the east side. On the west side there is a 6 foot wide sidewalk, with a 4 foot wide planting strip behind the sidewalk.

There is a double yellow centerline approximately in the center of the pavement. The northbound approach functions as two lanes, with a short right-turn lane forming a third lane at the stop line during peak hours. Due to the short length of the de-facto right turn lane, it is not considered in the capacity analysis. There is one lane southbound travel lane with a parking lane beginning about 120 feet south of the intersection.

Although there is sufficient width for two lanes to form northbound, there are no lane lines guiding drivers to form two lanes. Accordingly, the approach probably does not function at optimum capacity.

The Grove and Arlington Street intersection is an unsignalized "Wye" intersection. Wye intersections are found on low volume rural roads, however, the geometry is not suited to accommodate the traffic volumes that use the intersection. The acute intersection angle and the lack of stop signs promote vehicle conflicts which contribute to accident potential.

Under existing traffic volumes, vehicles using the intersection of Mount Auburn Street and Arlington Street experience delays. During both the AM and PM peak hours, the capacity of the intersection is exceeded and the intersection operates at Level-of Service F. Because the intersection fails now, improvements should be implemented, even if the 705 Mount Auburn Street Reuse Project were not proposed.

Transportation Improvement Plan

The proposed Transportation Improvement Plan has been developed with the goal of upgrading area-wide roadway and intersection operations. The following improvements are recommended:

- Reconstruct Arlington Street to provide two approach lanes southbound, consisting of one shared left-through lane and one shared through-right lane. Provide a pavement transition northbound, tapering from 20 foot plus a 1 foot shoulder to 12 foot plus a 1 foot shoulder.

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- Restrict parking as required to provide three approach lanes on Mount Auburn Street westbound, consisting of an exclusive left turn lane, one through lane and one shared through-right lane.
- Provide pavement markings to delineate two lanes on Arlington Street northbound, consisting of one shared left-through lane and one shared through-right lane. Eliminate parking to provide two southbound lanes away from Mount Auburn Street.
- Restrict parking as required to provide three approach lanes on Mount Auburn Street eastbound, consisting of an exclusive left turn lane, one through lane and one shared through-right lane.
- Provide new traffic signal equipment including 4 post and mast arm assemblies, controller, vehicle detectors, and provisions for interconnecting and coordinating signals at nearby intersections on Mount Auburn and Arlington Streets.

Mount Auburn and Arlington Streets Intersection. Reconstructing Arlington Street will require widening the pavement from approximately 33½ to 36 feet to provide a 1 foot wide shoulder and two 11 foot wide lanes southbound and one 12 foot wide lane plus a 1 foot wide shoulder northbound. Just north of the intersection the pavement will transition from 44 feet wide to 36 feet wide, accommodating a taper of 20 to 12 feet in the northbound travel lane. Implementing this taper will require using land presently serving as part of the gasoline service station parking area for sidewalk purposes. The strip of land required varies from 0 to about 6 feet in width.

New traffic signal equipment required, includes two pole and 25 foot mast arm assemblies on the northwest and southeast corners, with three 3 lens signal heads. Two pole and 20 foot mast arm assemblies are required on the northeast and southwest corners. New vehicle detectors and a new controller are required to allow the intersection to effectuate fully actuated operation.

There are other signalized intersections within a half mile of the Mount Auburn and Arlington Streets intersection. Due to their proximity, it is appropriate to provide for interconnection of these intersections as a basis for implementing coordinated signal operations. The specific requirements for interconnection will be determined by detailed analysis performed as part of final design of the intersection improvements. As a minimum, it is appropriate to provide hard wire interconnections between the Mount Auburn and Arlington Streets intersection and the following locations:

- The Mount Auburn Street and Kimball Road/Bigelow Avenue Intersection
- The Arlington Street and Nichols Avenue Intersection
- The Arlington and Belmont Streets Intersection

The traffic signal will operate in a fully actuated mode. A four phase cycle is proposed. Under the first phase an advance green is provided for all westbound movements on Mount Auburn Street. This is followed by green allowing all movements on Mount Auburn Street, both eastbound and westbound. Next an advance green is given to all movements on Arlington Street

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northbound. Finally, green time is given to all movements northbound and southbound on Arlington Street. Concurrent pedestrian crossings are proposed.

Arlington and Grove Streets Intersection. New pavement markings will be provided to delineate two northbound lanes approaching Mount Auburn Street and two southbound lanes. To implement this lane usage, parking will be eliminated between Grove and Mount Auburn Streets.

New pavement markings will be provided to delineate an exclusive left turn lane for northbound traffic. This will allow vehicles to turn left without delaying northbound through traffic. Two lanes will be provided on Arlington Street eastbound to facilitate right turns. A raised island will be provided separating the right and left turn lanes on Arlington Street eastbound.

Striated concrete pavement will be provided to separate and delineate eastbound and westbound movements on Arlington Street and to indicate the point of divergence for southbound traffic. Raised islands were considered in this location, but are not considered to be feasible due to the path required for truck turns from Grove Street northbound to Arlington Street.

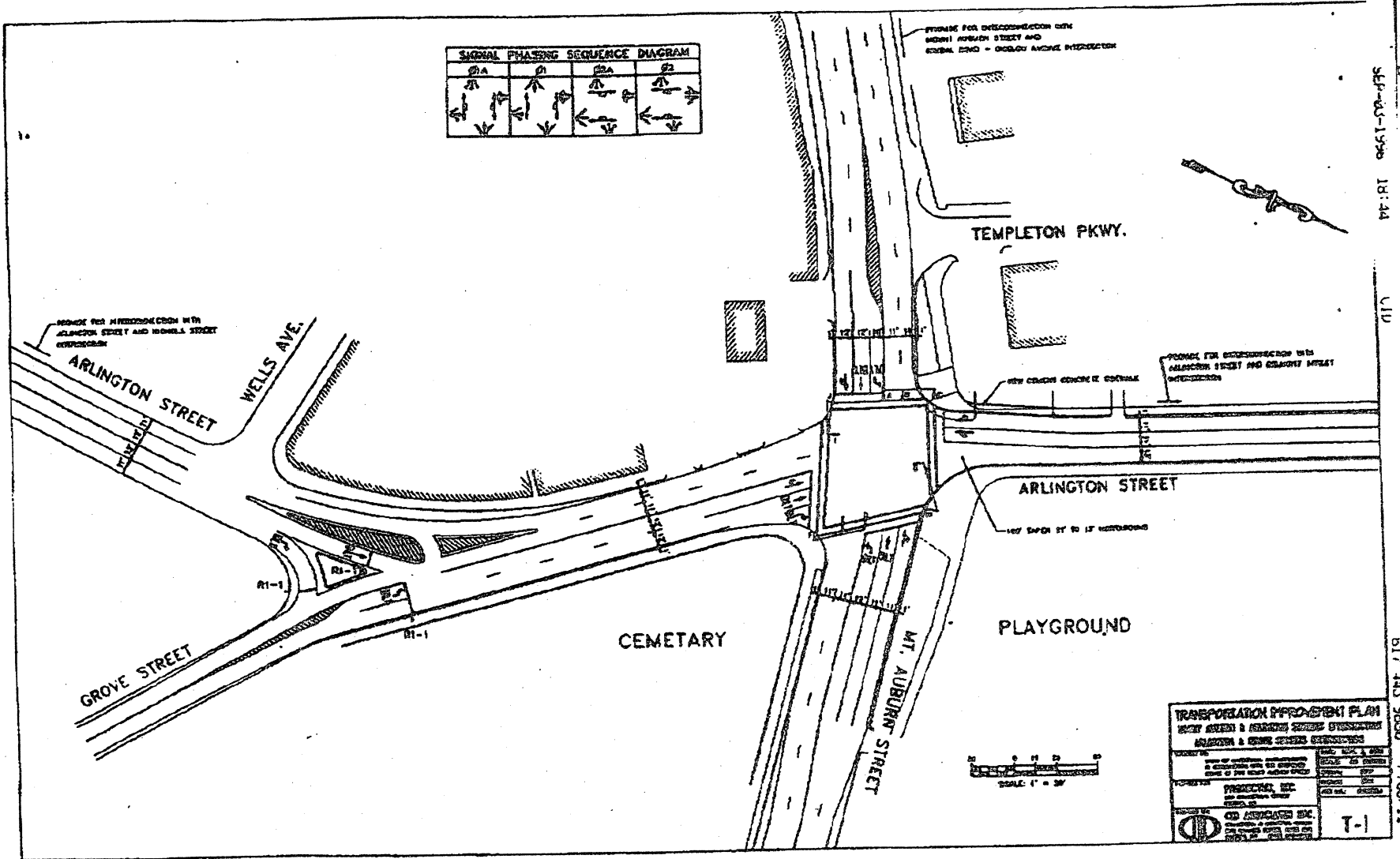
Stop signs will be provided for vehicles approaching from Arlington Street eastbound and from Grove Street northbound. Requiring northbound traffic on Grove Street to stop prior to entering the intersection responds to concerns expressed by the Police Department and will encourage lower speed on Grove Street.

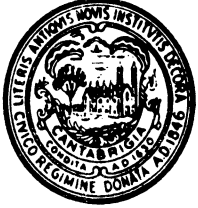
Level of Service

Under existing conditions, the Mount Auburn and Arlington Streets intersection operates over capacity (LOS F) during both the Existing Case and the Reuse Case for the AM and PM Peak Hours. If no intersection improvements are provided, the intersection will continue to operate at Level of Service F under the Reuse Case.

The Transportation Improvement Plan described above, will significantly increase the capacity of the intersection and upgrade the future Level of Service. Upon implementation of the Transportation Improvement Plan, the Level-of-Service at the intersection will be upgraded from the existing Level-of-Service F to Level-of-Service D during the AM peak hour. Overall intersection delay will be 31.4 seconds. During the PM peak hour the existing Level-of-Service F will be upgraded to Level-of-Service C. Overall intersection delay will be 16.0 seconds.

Channelization of the Grove and Arlington Streets intersection will not alleviate the delay experienced by vehicles turning left from Arlington Street. However provision of the northbound left turn lane will minimize delays to northbound through traffic and provision of a right turn lane on Arlington Street will minimize delays for vehicles turning right. The new channelization, pavement markings, and signage will minimize vehicle conflicts and encourage the formation of two northbound lanes approaching Mount Auburn Street.





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13.

EXECUTIVE DEPARTMENT
ROBERT W. HEALY
City Manager

RICHARD C. ROSSI
Deputy City Manager

June 1, 1998

To The Honorable, The City Council:

In response to Awaiting Report Item No. 4, regarding a report on whether Watertown is providing traffic mitigation measures for the former Western Electric Plant on Mt. Auburn Street, please be advised of the following:

The Watertown Department of Community Development and Planning requested a traffic report from the developer of 705 Mt. Auburn Street, Tufts Association Health Plan Facility. A series of traffic mitigation measures were developed and are being implemented. A copy of the Transportation Improvement Plan is attached.

Very truly yours,

Robert W. Healy
City Manager

RWH/mec

Consent Agenda #13

3915

A report on whether Watertwon is
providing traffic mitigation measures
for the former Western Electric
Plant on Mt. Auburn Street.

In City Council June 1, 1998

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