Appendix A

Supplemental Project Information

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1.0 Summary

1.1 Project Description

Lowe's Home Centers, Inc. is proposing the construction of a 153,063± square foot (sf) retail store including a 31,204± sf garden center on an approximate 12.4 acre site on Highland Avenue (Route 107) in Salem, Massachusetts. In addition, Walmart is proposing to raze the existing 109,460± sf mixed retail facility (includes 97,000± sf Walmart) to expand the total facility by 42,732± square feet to a total of 152,192± square feet. The existing Walmart parcel includes approximately 14.1 acres of land. The proposed Walmart expansion will include an additional 3± acres of land for a total of 17.1 acres. The combined Lowe's and Walmart portions of the project will include 305,255± sf of building, 991 parking spaces, circulation driveways and landscaping. Figures 1 and 2 show the site location on a USGS Map and an Aerial Site View, respectively.

The project is proposed on land currently owned by Camp Lion, the City of Salem, and the Highland Avenue Limited Partnership. The existing Walmart store is located on the Highland Avenue Limited Partnership parcel. The Lowe's project will be located on land owned by Camp Lion and the City. The Walmart expansion will be situated on the existing Highland Avenue Limited Partnership property and will include portions of the Camp Lion property. Figure 3, the Existing Conditions Plan shows the existing property ownership and site features.

The portion of the Site that is currently owned and occupied by Camp Lion contains structures and an access driveway that support a summer day camp. The Project includes improvements to the Camp facilities and the realignment of the existing driveway. Lowe's will be responsible for preparing a rough graded, stabilized areas in support of the future construction of a 9,900± sf building, approximately 50 parking spaces, a pool area, and a recreation field. The improvements will be constructed by the Camp at a future date.

The City of Salem owned parcel will become part of the Lowe's property. The City will be provided a portion of the existing Camp Lion property to construct a municipal water tower. Construction of the water tower will be coordinated with the overall project construction schedule. Access to the tower parcel will be provided through the project site.

The project site abuts an existing Meineke Car Care Center. A small expansion of the Meineke building is proposed as part of the project. The expansion will include a storage area and an additional service bay. Minor improvements to the layout of the parking are also proposed.

See Figure 4, the Aerial Site Plan Rendering, for the location of all project features.

This EENF assesses the impacts associated with individual site layouts, including Lowe's, Walmart, Camp Lion, the water tower parcel, and Meineke, and discusses the cumulative impacts based on the full build out of all facilities including the future camp and water tower.

Access to and egress from the project site is currently provided via a signalized driveway and two right-in/right-out driveways on Highland Avenue. An internal cross connection is also provided to the adjacent retail parcel to the north. As proposed, the existing signalized driveway will be closed and relocated further south on Highland Avenue to the location of the existing southerly right-in/right-out driveway. The existing right-in/right-out driveway on the northern end of the property will be reconstructed to provide better vehicle access. The existing internal cross connections with the parcel to the north will be maintained in the future condition. Water and sewer service will be provided to the site by connection to the municipal system. The camp parcel is currently accessed through a right-in/right-out site driveway at the southern property boundary on Highland Avenue. This driveway will be re-configured to accommodate the proposed site improvements. The location of the site access on Highland Avenue will be maintained. Water and sewer service to the camp property will continue to be provided through connection to the municipal system. The water tower site will be accessed through the proposed signalized site driveway on Highland Avenue. The water supply to the tank will be obtained through connection to the municipal system.

2.0 Existing Environment

2.1 Lowe's Site Description

The Lowe's portion of the site consists of two parcels of land totaling approximately 12.4 ± acres. The parcels that will make up the Lowe's property are currently owned by Camp Lion and the City of Salem. The Camp Lion portion of the site is used as a children's summer day camp. The Camp site is improved with a one story lodge building constructed in 1970 and a two story house currently used as the camp office. Other features of the camp include a swimming pool and picnic table areas. The site also contains existing radio and cell towers and associated gravel access drives. Portions of the Camp have been cleared for outdoor recreation uses. The remainder of the site consists of a paved parking area west of the lodge and wooded areas in all directions surrounding the lodge. The lodge is serviced by water, electricity and telephone. The administration building is serviced by municipal sewer, water electricity, and telephone. An intermittent stream, located on the eastern portion of the Camp Lion property, originates in a large bordering vegetated wetland system to the north and flows in a southeasterly direction under the existing Camp Lion access driveway and into a bordering vegetated wetland system along the southern property line. The City of Salem property is wooded and unimproved. The project location is zoned Business Park Development (BPD) and Business Highway (B2). The western most portion of the property is zoned Residential Conservation (RC). No work is proposed in the RC zone.

The existing ground surface slopes steeply upward to the west from the property boundary at Highland Avenue to a topographic high at the proposed location of the City of Salem water tower. The portions of the site developed for the existing Camp are gently sloped. The undeveloped areas consist of exposed bedrock faces and surfaces, large rock outcroppings, and wooded areas. Exposed bedrock faces, up to 40 feet in height, are present along the southeast and central portions of the site. Based on topography, the groundwater is anticipated to flow along the bedrock surface toward the east and southeast towards wetlands east of Highland Avenue. Land use in the vicinity of the site is mixed and includes residential, commercial and wooded properties. Refer to Figures 2 and 3 which show the existing site features.

A preliminary geotechnical investigation has been completed for the proposed Lowe's parcel. A majority of the site is comprised of exposed and shallow bedrock. Other areas of the site are overlain by granular fill consisting of fine to coarse sand with some fines and gravel beneath the top soil and pavement. These layers were generally shallow, approximately 4-5 feet below ground surface, and underlain by bedrock. The extensive bedrock on site provides limited to no infiltration of stormwater. Although stormwater does permeate through the initial soil layer in areas where bedrock is not located at the surface, it is eventually intercepted by the underlying bedrock, preventing infiltration.

2.2 Walmart Site Description

Currently, the Walmart site consists of one parcel of land totaling approximately 14.06 acres located at 450 Highland Avenue, Salem. A portion of the Camp Lion parcel will be added to the Walmart parcel to facilitate the expansion of the store. According to assessor's information, the property is owned by Highland Avenue Shopping Center Limited Partnership and is currently zoned Business Park Development (BPD).

The property currently contains an existing 109,460± sf retail building which includes the Walmart and abutting retail uses, with a total of 379 parking spaces. The existing site is currently served by two site driveways that connect to Highland Avenue, as well as a cross connection which connects to the abutting retail use to the north. The existing main site driveway is a signalized intersection with Highland Avenue, with a secondary site access drive located to the south. This secondary driveway is a right-in/right-out drive due to the existing raised median within Highland Avenue. The site is gently sloped throughout the parking lot, including the grades to the rear with an approximate grade change totaling 3-4 feet of rise from the front to the back of the property. At the extent of the existing paved and developed portions of the property the grades are steeply sloped upward with exposed ledge.

The north, south and western edges of the existing development consist of rock ledge faces which were created during the original store construction and resulted from the required cuts to the land. The undeveloped portions of the property to the north, south and west, are heavily wooded, with the vast majority of the soils classified as Chatfield-Hollis-Rock outcrop complex, with extensive amounts of ledge expected underlying the surface. Surrounding land uses include

a vacant tract of land and the existing Meineke car care facility to the south, several commercial uses across Highland Avenue to the east, a retail plaza directly north with an existing condominium/townhouse complex abutting to the northwest, and the existing Camp Lion facility to the west. The majority of the project site is developed with existing impervious pavement and building structures. The existing property is currently served by public utilities including municipal sewer and water services. It is further noted that the existing site sewer line is connected to the City sewer main within Highland Avenue by means of an existing lift station. Refer to Figures 2 and 3 which show the existing site features.

2.3 Overall Topography, Geology, Soils & Vegetation

Topography. Based on a topographic ground survey, elevations on site slope sharply upward from east to west. The ground surface elevation varies from elevation 110 feet to elevation 200 feet (City of Salem datum = 4.36 feet below NGVD 1929). Existing grades vary significantly across the site due to the undulating nature of the bedrock surface.

Geology. According to a geotechnical investigation of the project area completed in October of 2008 and a review of the Bedrock Geologic Map of Massachusetts, the site is predominantly comprised of bedrock with limited portions of the site overlain by naturally occurring soils or urban fill.

Soils. The Natural Resources Conservation Service Web Soil Survey of Essex County indicates that the soils at the Site consist of urban land, Chatfield-Hollis-Rock outcrop complex, Scituate fine sandy loam, and Paxton-urban land complex. The Site is mainly comprised of Chatfield-Hollis-Rock outcrop complex. Urban soils are generally areas where the majority of the land is covered with impervious surfaces such as buildings and pavement. Urban soils are highly variable due to removal or placement of fill materials during development.

Based on preliminary geotechnical investigations adjacent to the existing Walmart facility, granular fill, which consists of fine to coarse sand with some fines and gravel, was encountered beneath the topsoil and pavement. This fill was shallow, approximately 4-5 feet below ground surface, and underlain by bedrock.

Vegetation. The majority of the Camp Lion and City of Salem parcels is wooded and/or contains ledge. The natural community consists mainly of white pine – oak forest. Natural Heritage and Endangered Species Program (NHESP) mapping indicated there are no areas labeled as bio-map or habitats or bio-maps supporting natural landscapes.

The majority of the Walmart parcel is developed with the existing store and associated parking. The area proposed for the expansion is predominantly heavily wooded and also includes exposed ledge and rock outcroppings. NHESP mapping indicated there are no areas labeled as bio-map or habitats or bio-maps supporting natural landscapes.

2.4 Wetlands and Wildlife

2.4.1 Lowe's

Wetlands - The majority of wetlands on the Camp Lion and City of Salem parcels were delineated by AECOM Inc. (see Appendix C). A portion of the delineation was approved by the Salem Conservation Commission in January 2009 under an Order of Resource Area Delineation (ORAD). The remainder of the wetland delineation will be included as part of the Notice of Intent application that will be filed with the City of Salem Conservation Commission. The wetland resource areas on the project site include bordering vegetated wetlands and intermittent stream and bank (Figure 5). The wetland areas are identified as Bordering Vegetated Wetlands A and B, which is associated with the intermittent stream; Bordering Vegetated Wetland Area C, a small wetland along the northerly side of the Camp Lion access road; and Area D, which is a larger wetland which is at the head of the intermittent stream. Area E is located at the downstream discharge point of the intermittent stream. Bordering Vegetated Wetland F is a large Palustrine Scrub-shrub seep wetland to the northwest of the proposed Walmart redevelopment area. Area G is a wetland located on the west side of the existing Camp Lion facilities along the Lynn town line. Wetland Area H is a small bordering vegetated wetland system located to the northwest of the project.

Bordering Land Subject to Flooding- The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the City of Salem, Massachusetts (Community-Panel No.s 250102 0005 B, revised August 5, 1985 and Panel 0004 indicates that no portion of the site (including Lowe's, Walmart, Camp and Tower) is located within the 100 year flood zone.

Wildlife - The United States Fish and Wildlife Service (USFWS) was contacted regarding the presence of federally-listed threatened or endangered species or critical habitat located on or in the vicinity of the Site. A response from the USFWS dated October 6, 2008 indicated that no federally-listed or proposed, threatened or endangered species or critical habitat is known to occur in the project area. Preparation of a biological assessment or further consultation with the USFWS under Section 7 of the Endangered Species Act is not required. The findings of the USFWS are valid from one year of the date of the letter. A copy of the USFWS letter is provided in Appendix D.

The MassGIS on-line data base was reviewed for the presence of Priority Habitats of Rare Species, impacts to which would require a permit under the Massachusetts Endangered Species Act. The site is not located within a Priority Habitat of Rare Species and the project will not be subject to review by the Massachusetts Division of Fisheries and Wildlife- Natural Heritage and Endangered Species Program (NHESP) under the Massachusetts Endangered Species Act.

2.4.2 Walmart

Wetlands - The majority of wetlands on the Camp Lion and City of Salem parcels were delineated by AECOM Inc. (see Appendix C). A portion of the delineation was approved by the Salem Conservation Commission in January 2009 under an Order of Resource Area Delineation (ORAD). The remainder of the wetland delineation will be included as part of the Notice of Intent application that will be filed with the City of Salem Conservation Commission. The wetland resource areas on the project site include bordering vegetated wetlands and intermittent stream and bank (Figure 5). The wetland areas are identified as Bordering Vegetated Wetlands A and B, which is associated with the intermittent stream; Bordering Vegetated Wetland Area C, a small wetland along the northerly side of the Camp Lion access road; and Area D, which is a larger wetland which is at the head of the intermittent stream. Area E is located at the downstream discharge point of the intermittent stream. Bordering Vegetated Wetland F is a large Palustrine Scrub-shrub seep wetland to the northwest of the proposed Walmart redevelopment area. Area G is a wetland located on the west side of the existing Camp Lion facilities along the Lynn town line. Wetland Area H is a small bordering vegetated wetland system located to the northwest of the project.

Bordering Land Subject to Flooding- The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the City of Salem, Massachusetts (Community-Panel No.s 250102 0005 B, revised August 5, 1985 and Panel 0004 indicates that no portion of the site (including Lowe's, Walmart, Camp and Tower) is located within the 100 year flood zone.

Wildlife - The USFWS was contacted regarding the presence of federally listed threatened or endangered species or critical habitat located on or in the vicinity of the site. Based on information available and provided on October 2, 2008, no federally-listed or proposed threatened or endangered species or critical habitat under the jurisdiction of the USFWS are known to occur in the project areas. Preparation of a biological assessment or further consultation with the USFWS under Section 7 of the Endangered Species Act is not required. A copy of the letter from USFWS is provided in Appendix D.

2.5 Historical and Archaeological Resources

2.5.1 Lowe's

A letter was sent to the MHC on August 20, 2008 requesting a review of the site to determine if there are any known sites or structures of historical, cultural or archaeological significance within or in the vicinity of the site. On September 9, 2008 the Massachusetts Historical Commission determined that there are neither recorded historic or archaeological sites nor properties listed in the State Register of Historic Places within the project site. A copy of the correspondence from MHC is included in Appendix D.

2.5.2 Walmart

A letter was obtained from the MHC relative to the Walmart site on October 23, 2008 with findings consistent with the above and a copy is included in Appendix D.

2.6 Storm Water Management

2.6.1 Lowe's Site

The Camp Lion parcel to be improved by Lowe's does not contain any stormwater management features. The majority of the existing site is undeveloped and is densely wooded. The developed portion of the Site contains two small buildings and associated paved parking areas. Most of the undeveloped portion of the site flows overland through an existing intermittent stream to an existing wetland system located along the southern property boundary or overland onto paved surfaces along Highland Avenue and into the closed drainage system. The municipal system drains through a 30 inch pipe and discharges to the east side of Highland Avenue. The intermittent stream (Wetlands A and B) flows southerly through the central portion of the site to a wetland system located along the south property boundary (Wetland E). The intermittent stream is partially culverted under the existing camp access drive. A drainage divide on the site conveys the remaining runoff to the north eventually into Spring Pond.

2.6.2 Walmart Site

The northern part of the property is currently developed with a 109,460± sf building containing a 97,000± sf Walmart and abutting in line retail stores. Including the buildings and parking areas, there are approximately 9.7 acres of impervious surface within the 21.2 acre (46% impervious) watershed that drains to the Highland Avenue drainage system. As shown on the Existing Conditions Plan (Figure 3) the entire developed part of the Walmart site lies in the low point between two ledge slopes. The whole area drains toward Highland Avenue, where the runoff is intercepted by the Highland Avenue drainage system which passes under the road through a 30 inch pipe and discharges on the east side of the road. The undeveloped west portion of the site consists mainly of wooded rocky slopes with large areas of exposed ledge which drain from high points to the north and south toward a low point in the middle.

2.6.3 Water Tower Site

The water tower site is undeveloped and heavily wooded. The site is located at the approximate topographic high of the project site. As such, stormwater runoff drains from the site to the north, south, east, and west. The portion of the site draining to the north flows overland to existing Wetland Area F. This wetland system continues to drain off-site in a northwesterly direction. Stormwater runoff draining to the south and west is collected in the existing intermittent stream (Wetland Areas A and B) and flows to an existing wetland system (Wetland Area E) located at

the southeast corner of the Project limits. This wetland system ultimately discharges to the existing City of Salem municipal stormwater collection system located in Highland Avenue.

2.7 Traffic

The project site is bounded by Highland Avenue to the east, undeveloped land to the south and west, and a retail development to the north. Access to and egress from the Walmart portion of the site is currently provided via a signalized driveway on Highland Avenue and two right-in/right-out driveways. An internal cross connection is also provided with the adjacent retail parcel to the north. A right-in/right-out driveway along Highland Avenue is provided for Meineke. As proposed, the signalized site driveway will be closed and relocated further south on Highland Avenue to the location of the existing southerly right-in/right-out site driveway. The existing right-in/right-out driveway on the northern end of the property will be reconstructed to provide better accessibility and meet current state design standards. Current access to the Meineke and the Camp Lion site along Highland Avenue to the south of the site will be maintained and improved to meet current state design standards. The existing internal cross connection with the parcel to the north will be maintained as part of the project. A right-turn in and right-turn out only cross connection will also be provided to the existing Meineke located along the proposed main site driveway. The site location in relation to the surrounding roadways is shown on the map on Figure 1. The complete Traffic Impact and Access Study is provided in Appendix E.

2.7.1 Geometrics and Traffic Control

Evaluation of the traffic impacts associated with the proposed Wal-Mart and Meineke expansion and the Lowe's Home Improvement Warehouse development involves the description and quantification of existing roadway and traffic conditions in the area. In preparing this study for the proposed development, the following intersections have been analyzed and evaluated:

- Highland Avenue (Route 107) at Ravenna Avenue and Barnes Road – City of Salem
- Highland Avenue at Olde Village Drive – City of Salem
- Highland Avenue at Walmart north driveway and Clark Street – City of Salem
- Highland Avenue at Walmart main (signalized) driveway – City of Salem
- Highland Avenue at Walmart south driveway – City of Salem
- Highland Avenue at Meineke driveway (462 Highland Avenue) – City of Salem
- Western Avenue (Route 107) at Fays Avenue – City of Lynn

A description of each roadway and the geometric and traffic control characteristics of each of these intersections are provided below, followed by quantification of existing traffic volumes, accident history, vehicle speeds, and sight distance.

Study Area Roadways

The jurisdictional responsibility and classification of each study area roadway is listed in Table 1. As shown, Highland Avenue is under MassDOT jurisdiction while Western Avenue, Ravenna Avenue, Barnes Road, Olde Village Drive, Clark Street, and Fays Avenue are under local jurisdiction.

Table 1 Roadway Classification and Jurisdictional Responsibility

Roadway	Roadway Classification	Responsible Agency
Highland Avenue (Route 107)	Urban Principal Arterial	MassDOT
Western Avenue (Route 107)	Urban Principal Arterial	Local Jurisdiction (City of Lynn)
Ravenna Avenue	Local Road	Local Jurisdiction (City of Salem)
Barnes Road	Local Road	Local Jurisdiction (City of Salem)
Olde Village Drive	Local Road	Local Jurisdiction (City of Salem)
Clark Street	Local Road	Local Jurisdiction (City of Salem)
Fays Avenue	Local Road	Local Jurisdiction (City of Lynn)

Study Area Intersections

Highland Avenue at Ravenna Avenue and Barnes Road

Highland Avenue, Ravenna Avenue, and Barnes Road intersect to form a four-way intersection under actuated signal control. The Highland Avenue northbound and southbound approaches each consist of a 12-foot wide exclusive left-turn lane, a 13-foot wide through lane, and a 12-foot wide shared through/right-turn lane. Directional travel on Highland Avenue is separated by a raised median with guardrail. The Ravenna Avenue eastbound approach consists of a 16-foot wide general-purpose travel lane with no pavement markings separating directional flow. The Barnes Road westbound approach consists of a 12-foot wide general-purpose travel lane with no pavement markings separating directional flow. The posted speed limit on Highland Avenue is 45 miles per hour (mph) at this intersection. Sidewalks are provided along the east side of Highland Avenue and a crosswalk is striped across the Highland Avenue southern leg. Land use in the vicinity of the intersection consists of residential homes.

Highland Avenue at Olde Village Drive

Olde Village Drive intersects Highland Avenue from the west to form a three-way intersection under actuated signal control. The Highland Avenue northbound approach consists of a 13-foot wide exclusive left-turn lane and two 12-foot wide through lanes. The Highland Avenue southbound approach consists of a 12-foot wide through lane and a 12-foot wide shared

through/right-turn lane. Directional travel on Highland Avenue is separated by a raised median with guardrail. The Olde Village Drive eastbound approach consists of 30-foot wide general-purpose travel lane. Directional travel on Olde Village Drive is separated by a raised median island at the intersection. The posted speed limit on Highland Avenue is 45 mph. Sidewalks are provided along both sides of Highland Avenue and along the south side of Olde Village Drive. There are no crosswalks provided in the vicinity of the intersection. Land use in the vicinity of the intersection consists of a retail plaza (400 Highland Place), a self storage facility, residential homes, and vacant land.

Highland Avenue at Walmart North Driveway and Clark Street

Highland Avenue is intersected by the Walmart north driveway from the west and Clark Street from the east to form two unsignalized T-type intersections separated along Highland Avenue by a raised median with guardrail. The Highland Avenue northbound and southbound approaches each consist of a 12-foot wide through lane and a 12-foot wide shared through/right-turn lane. The Wal-Mart north driveway consists of a 20-foot wide right-in/right-out driveway under STOP-sign control. There are no pavement markings separating directional travel on the Wal-Mart north driveway. The Clark Street westbound approach consists of a 19-foot wide travel lane and only allows right turns to and from the side street roadway. Directional flow on Clark Street is separated by a faded double yellow centerline. The posted speed limit on Highland Avenue is 35 mph in the northbound direction and 45 mph in the southbound direction. Sidewalks are present along the east side of Highland Avenue and no crosswalks are provided in the vicinity of the intersection. Land use in the vicinity of the intersection consists of Wal-Mart, Dunkin' Donuts, a retail plaza (400 Highland Place), and residential homes.

Highland Avenue at Walmart Main (Signalized) Driveway

The Walmart main driveway intersects Highland Avenue from the west to form a T-type intersection under actuated signal control. The Highland Avenue northbound approach consists of a 12-foot wide exclusive left-turn lane and two 12-foot wide through lanes. The Highland Avenue southbound approach consists of two 12-foot wide through lanes and an 11-foot wide exclusive right-turn lane. Directional travel on Highland Avenue is separated by a median with guardrail. The Walmart main driveway eastbound approach consists of a 27-foot wide lane that is used as an exclusive left-turn lane and an exclusive right-turn lane. Directional travel on the Walmart main driveway eastbound approach is separated by a raised median island at the intersection. The posted speed limit on Highland Avenue is 35 mph in the northbound direction and 45 mph in the southbound direction. Sidewalks are present along the east side of Highland Avenue. Land use in the vicinity of the intersection consists of Wal-Mart and Uncle Bob's Self-Storage facility.

Highland Avenue at Walmart South Driveway

Highland Avenue is intersected by the Walmart south driveway from the west to form an unsignalized T-type intersection. The Highland Avenue northbound approach consists of two

12-foot wide through lanes. The Highland Avenue southbound approach consists of a 12-foot wide through lane and a 12-foot wide shared through/right-turn lane. Directional flow along Highland Avenue is separated by a raised median with guardrail. The Walmart south driveway consists of a 30-foot wide right-in/right-out driveway under STOP-sign control. There are no pavement markings separating directional travel on the Walmart south driveway. The posted speed limit on Highland Avenue is 35 mph in the northbound direction and 45 mph in the southbound direction. Sidewalks are present along the east side of Highland Avenue and no crosswalks are provided in the vicinity of the intersection. Land use in the vicinity of the intersection consists of Walmart, commercial businesses, and the Meineke Car Care Center.

Highland Avenue at Meineke Driveway (462 Highland Avenue)

Highland Avenue is intersected by the Meineke driveway from the west to form an unsignalized T-type intersection. The Highland Avenue northbound approach consists of two 12-foot wide through lanes. The Highland Avenue southbound approach consists of a 12-foot wide through lane and a 12-foot wide shared through/right-turn lane. Directional flow along Highland Avenue is separated by a raised median with guardrail. The Meineke driveway is 26 feet wide and is under STOP control. There are no pavement markings separating directional travel on the Meineke driveway. The posted speed limit on Highland Avenue is 35 mph in the northbound direction and 45 mph in the southbound direction. Sidewalks are present along the east side of Highland Avenue and no crosswalks are provided in the vicinity of the intersection. Land use in the vicinity of the intersection consists of Walmart, commercial business, and the Meineke Car Care Center.

Western Avenue at Fays Avenue

Fays Avenue intersects Western Avenue from the west to form a T-type intersection under actuated signal control. The Western Avenue northbound approach consists of a 12-foot wide exclusive left-turn lane and an 11-foot wide through lane. The Western Avenue southbound approach consists of a 16-foot wide general-purpose travel lane. Directional travel on Western Avenue is separated by a painted median and a double yellow centerline. The Fays Avenue eastbound approach consists of a 15-foot wide general-purpose travel lane. There are no pavement markings separating directional travel on Fays Avenue. The posted speed limit on Western Avenue is 35 mph. Sidewalks are provided along both sides of Western Avenue and Fays Avenue. Crosswalks are striped across the Western Avenue north leg and Fays Avenue. Land use in the vicinity of the intersection consists of residential homes.

2.7.2 Traffic Volumes

Base traffic conditions within the study area were developed by conducting manual turning movement counts (TMCs), vehicle classification counts, and automatic traffic recorder (ATR) counts in May and June 2008. The TMCs and vehicle classification counts were performed at the study area intersection locations during the weekday AM peak period (7:00 to 9:00 AM), the weekday PM peak period (4:00 to 6:00 PM), and the Saturday midday peak period (11:00 AM to

2:00 PM). The ATR counts were conducted along Highland Avenue adjacent to the site to collect both weekday and Saturday daily traffic volumes as well as vehicle speed measurements. Since historical traffic volume data along roadways in the vicinity of the site have shown a slight decrease in traffic volumes over the past few years the counts collected are used in the study to represent current existing traffic volumes. All traffic-count data are provided in the Appendix.

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the traffic-count data needed to be adjusted to account for this fluctuation, seasonal and historical traffic-volume data were reviewed from nearby MassDOT Permanent Count Stations.[1] This information revealed that May traffic volumes are approximately 3 to 4 percent higher than annual average-month conditions and June traffic volumes are approximately 3 to 12 percent higher than annual average-month conditions. Therefore, the May and June traffic counts were used as collected to provide a conservative (higher than average) analytical framework. This further supports the use of the collected traffic volumes to represent existing 2009 traffic conditions. The MassDOT seasonal adjustment data are provided in the Appendix E.

Table 2 summarizes the existing daily and peak-hour traffic volumes along Highland Avenue. Figures 2 through 4 graphically depict the 2009 Existing weekday AM, weekday PM, and Saturday midday peak-hour traffic flow networks, respectively.

Table 2 Existing Traffic-Volume Summary

Location/Time Period	Daily Volume (vpd) [a]	Peak-Hour Volume (vph) [b]	K Factor [c]	Directional Distribution [d]
Highland Avenue adjacent to the site:				
Weekday	26,360	2,062	7.8	51% SB
Saturday	25,310	2,031	8.0	53% NB

[a] Vehicles per day.
[b] Vehicles per hour.
[c] Percent of average daily traffic occurring during the peak hour.
[d] SB = southbound; NB = northbound.

2.7.3 Traffic Accidents

Accident data for the study area intersections were obtained from MassDOT for the most recent three-year period available (between 2004 and 2006). These data were supplemented with accident data from the Salem Police Department (between 2005 and 2007) to verify the accuracy of the MassDOT data. Based on a review of the available accident data, the MassDOT data

[1] *MassDOT 2006 Traffic Volumes;* Permanent Count Station 35 located on Route 128, north of Brimbal Avenue in Beverly; and Permanent Count Station 550 located on Route 1, north of Lowell Street in Peabody.

appears to be consistent with the Salem Police Department data. A summary of the accident data at the study area intersections is provided in Table 3.

In addition to the accident summary, incident occurrence should be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the accident rates were calculated for each study area intersection and compared with the statewide and district-wide (MassDOT District 4) averages. An intersection accident rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). For unsignalized intersections, the statewide average is 0.66 acc/mev and the district-wide average is 0.63 acc/mev. For signalized intersections, the statewide average is 0.87 acc/mev and the district-wide average is 0.88 acc/mev. A comparison of the calculated accident rate to these averages can be used to establish the significance of accident occurrence and whether or not potential safety problems exist. All crash rate worksheets are provided in the Appendix E.

Table 3 **Accident Summary**

Location	Number of Accidents			Severity [a]			Accident Type [b]						Percent During	
	Total	Average per Year	Accident Rate [c]	PD	PI	F	CM	RE	HO	FO	Ped	Other	Commuter Peak [d]	Wet/Icy Conditions
Highland Avenue at Ravenna Avenue and Barnes Road	7	2.3	0.21	5	2	0	2	1	0	2	0	2	43%	57%
Highland Avenue at Olde Village Drive	18	6.0	0.55	11	7	0	1	6	0	2	0	9	17%	39%
Highland Avenue at and Clark Street	2	0.7	0.06	1	1	0	1	1	0	0	0	0	0%	50%
Highland Avenue at Walmart driveways [e]	24	8.0	0.77	18	5	1	4	7	0	2	0	11	42%	25%
Highland Avenue at Meineke driveway	0	0.0	0.00	0	0	0	0	0	0	0	0	0	0%	0%
Western Avenue at Fays Avenue	10	3.3	0.33	6	4	0	4	6	0	0	0	0	30%	30%

Source: Salem Police Department and MassDOT Traffic Operations Safety Management System for the Western Avenue and Fays Avenue intersection.
[a] PD = property damage only; PI = personal injury; F = fatality.
[b] CM = cross movement/angle; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian.
[c] Measured in accidents per million entering vehicles.
[d] Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.
[e] Accident data did not distinguish between the Walmart north, main, and south driveways.

The intersection of Highland Avenue at Olde Village Road has experienced, on average, six accidents per year, of which, approximately 61 percent (11 of 18) resulted in property damage only. Approximately 33 percent (6 of 18) of the reported accidents involved rear-end-type collisions, and approximately 11 percent (2 of 18) involved a collision with a fixed object. Approximately 17 percent (3 of 18) of the reported accidents occurred during the weekday commuter peak period, and approximately 38 percent (7 of 18) occurred under wet/icy roadway conditions. This intersection has experienced an accident rate of 0.55, which is lower than the district-wide and statewide averages for signalized intersections. There were no fatalities reported at this intersection during the times periods studied. Based on the accident history data, there does not appear to be a safety concern at this location.

The intersections of Highland Avenue and the Walmart driveways have experienced, on average, eight accidents per year; however, the accident data did not distinguish between the three existing Walmart driveways. Approximately 75 percent (18 of 24) of the reported accidents resulted in property damage only and approximately 29 percent (7 of 24) involved rear-end-type collisions. Approximately 42 percent (10 of 24) of the reported accidents occurred during the weekday commuter peak period, and approximately 25 percent (6 of 24) occurred under wet/icy roadway conditions.

Although the Walmart driveway intersections with Highland Avenue were considered as one location, the data revealed an accident rate of 0.77 which is lower than the district-wide and statewide averages for signalized intersections. There was one fatality on Highland Avenue at the Walmart main driveway on June 13, 2007. The accident occurred when a vehicle traveling in the Highland Avenue southbound right-turn only lane continued to travel southbound on Highland Avenue and collided with another vehicle in the southbound through lane. Accordingly, additional signage is proposed as part of the development project to provide advance lane use signs to better define the intersection geometry. This will inform drivers prior to the intersection on which lane to travel.

The remaining study area intersections have experienced, on average, three accidents or less per year. No fatalities were reported at these intersections during the time periods studied, and the accident rates are lower than the district-wide and state-wide averages. Based on the accident history data, there does not appear to be a safety concern at these locations.

2.7.4 Vehicle Speeds

Speed measurements were conducted along Highland Avenue by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time is recorded using ATRs over a 24-hour period, thereby also recording travel speeds during non-peak hours when vehicle speeds are not affected by platooning. Dividing the elapsed time by the measured distance between checkpoints derives the speed. The results of the speed measurements are summarized in Table 4.

Table 4 Observed Travel Speeds [a]

Location/Direction	Posted Speed Limit	Median Speed	85th Percentile Speed [b]
Highland Avenue adjacent to the site:			
Northbound	35	40	46
Southbound	45	31	41

[a] In miles per hour (mph).
[b] Speed at, or below which 85 percent of all observed vehicles travel.

As shown, the median speeds on Highland Avenue were found to be 40 and 31 mph with 85th percentile speeds of 46 and 41 mph for northbound and southbound travel, respectively. Speeds in the southbound direction were observed to be below the posted speed limit of 45 mph for Highland Avenue. However, vehicles traveling northbound on Highland Avenue were observed to be traveling at speeds in excess of the posted speed limit of 35 mph.

2.7.5 Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway locations to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[2] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Executive Office of Transportation (EOT) and the EOEEA require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is on either an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level.

[2] *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

For signalized intersections, the first vehicle stopped on one approach should be visible to the driver of the first vehicle stopped on each of the other approaches. However, both proposed site driveways were evaluated as unsignalized intersections to provide a conservative (worst case) comparison. For sight distance to traffic signals, all efforts should be made to meet the minimum sight distance recommendations based on the 85th percentile speeds.

The available SSD and ISD at the proposed site driveway locations were measured and compared to minimum requirements as established by AASHTO. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted as presented in the *Vehicle Speeds* section. Based on the posted speed limit and the observed speeds, the SSD and ISD requirements at the two proposed site driveways were calculated. The required minimum sight distances for each speed are compared to the available distances, as shown in Table 5.

As indicated in Table 5, available sight distances at the proposed site driveways exceed the minimum and desirable SSD and ISD requirements for safe operation based on both the posted and desirable travel speeds. To ensure the safe and efficient flow of traffic to and from the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground or set back sufficiently from the edge of the roadways so as not to inhibit the available sight lines.

Table 5 **Site Distance Summary**

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required[a]	Measured	Minimum Required[b]	Desirable[c]
Highland Avenue at North Site Driveway:					
North of intersection	570	395	600	395	430
Highland Avenue at Main Site Driveway:					
North of intersection	570	360	600+	360	465
South of intersection	600	375	600+	375	465
Highland Avenue at Meineke Driveway:					
North of intersection	500+	360	500+	360	465

[a]Values based on AASHTO requirements for posted speed limit of 45 mph in the southbound direction and the observed 85th percentile speed (46 mph) in the northbound direction.
[b]Values based on AASHTO requirements for SSD.
[c]Values based on AASHTO ISD guidelines for posted speed limit of 35 mph northbound and 45 mph southbound on Highland Avenue.

2.7.6 Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) provides bus service in the study area via Bus Routes 450 and 456. Bus Route 450 begins at the Salem Depot, travels south along Route 107, and ends at Haymarket Station and/or Wonderland Station. Bus Route 450 runs between 4:50 AM and 1:27 AM on weekdays, between 6:05 AM and 12:49 AM on Saturdays, and between 7:45 AM and 12:15 AM on Sundays. Bus Route 456 begins at the Salem Depot, travels south along Route 107 and Route 129, and ends at Central Square in Lynn. Bus Route 456 runs between 7:00 AM and 4:16 PM on weekdays. Both Bus Routes 450 and 456 stop at the existing Walmart site. The public transportation information is provided in Traffic Impact Study provided in Appendix E.

2.8 Air Quality

A greenhouse gas (GHG) air quality analysis was conducted for the project based on the Executive Office of Energy and Environmental Affairs' (EOEEA) Greenhouse Gas Emissions Policy and Protocol to address the Project's impacts on climate change. While the existing Walmart store on the site generates CO_2 emissions, the understanding of GHG mitigation measures for the project is simplified by assuming the existing condition has no CO_2 emissions. The effectiveness of GHG mitigation is measured in the analysis by comparing the Preferred and Mitigation Alternatives to the Base Case, which assumes the project is constructed according to the October 18, 2008 7th Edition of the MA Building Code that adopted the International Energy

Conservation Code (IECC) 2006 with the 2007 Supplement. The Greenhouse Gas Analysis is provided in Appendix F.

2.9 Utilities

Existing City water and sewer mains are located in Highland Avenue, adjacent to the site. Gas, electric and telephone service is also located immediately adjacent to the site. The existing Walmart, abutting on-site retail users and the Meineke to the south are all served by a public off-site sewage lift station owned and operated by the City of Salem.

2.10 Land Use and Zoning

Land Use. The project site consists of both developed and undeveloped land. The developed portion of the site includes the existing Camp Lion buildings and facilities, Walmart retail store, Meineke Car Care Center, paved parking and loading areas, and access drives. The undeveloped areas consist of exposed bedrock surfaces that are moderately to heavily wooded. The developed land use in the vicinity of the Site is mixed and includes residential and commercial properties.

Zoning. The project is comprised of a parcel assemblage of land currently owned by Camp Lion, the City of Salem, and Highland Avenue Shopping Center Limited Partnership. The Camp Lion parcel is zoned Business Park Development (BPD) and Residential Conservation (RC). The project does not include any portion of the property within the RC zoning district. The Walmart parcel is also zoned Business Park Development (BPD). The City of Salem and Meineke parcels are zoned Business Highway (B2). On January 8, 2009, the Salem City Council voted to include the BPD district as an allowed zoning classification for use within a Planned Unit Development (PUD) district. The camp and retail uses are permitted within the PUD.

3.0 Project Description and Impacts

The following section discussed the Lowe's, Walmart, Camp Lion, City of Salem Water Tower, and Meineke project elements. A small expansion of the existing Meineke building is proposed as part of the project. The expansion will house a storage area and an additional service bay. Minor improvements to the layout of the parking are also proposed. Impacts associated with the Meineke expansion are minimal and are outlined in Table 8. The overall site improvements are shown on Figure 4.

3.1 Lowe's Site Plan

The Lowe's site plan has been designed to minimize impacts to the natural resource areas and the other undeveloped portions of the site. The Lowe's building is 121,859± sf, with an attached Garden Center of approximately 31,204± sf, half of which will be under a roof or shade structure. The total building square footage will be 153,063± sf (including garden center). The Lowe's building is sited perpendicular to Highland Avenue, facing Walmart, with the store entrance facing north. The site will be accessed through the proposed signalized site driveway located on Highland Avenue. This driveway will also be utilized for the new Walmart store and

as access to the City of Salem water tower. There will be 378 parking spaces constructed for the Lowe's store, all of which will be located between the store and the site driveway.

The proposed elevations associated with the Lowe's development have been designed to minimize land disturbances and bedrock cuts. Cut material required as part of the Lowe's project is expected to be used to the maximum extent practicable as fill material for both the Lowe's construction and as part of the Camp improvements. The Lowe's building will be elevated approximately 37 ft above the proposed Walmart facility. The Lowe's development is expected to utilize the existing utilities available in Highland Avenue for service to the proposed building. Utility main extensions are not anticipated at this time. Figure 6 shows the Lowe's Site Plan on the Layout and Materials Plan.

3.2 Walmart Site Plan

The Walmart expansion has been designed to primarily utilize the previously developed areas of the site. The proposed Walmart building will be 152,192± sf. The building will be laid out to face Highland Avenue, consistent with the existing site plan configuration. The site will be accessed through the proposed signalized site driveway located on Highland Avenue. There will be 613 parking spaces in the Walmart parking lot, primarily located between the store and Highland Avenue. The proposed project involves the demolition of 109,460± sf of existing retail which includes the Walmart building and two abutting retail stores.

The new Walmart store location and elevations are designed to be a balanced site in itself (with the Walmart tract being independent from the Lowe's tract), resulting in the new Walmart facility elevated approximately 13 feet above the existing building finished floor elevation. The proposed redevelopment is expected to utilize existing utility infrastructure in place and therefore utility main extensions and improvements are not anticipated at this time. Figure 6 shows the Layout and Materials Plan.

3.3 Lowe's and Walmart Egress

The Project's main vehicular access will be from a signalized site driveway on Highland Avenue. The existing signalized site access currently serving the Walmart shopping center will be closed and relocated to the proposed location. The main access will be shared by Lowe's, Walmart and any required City water tank maintenance vehicles. This driveway will be signalized and will require roadway widening and intersection improvements. An additional access location for Walmart will be at the northerly end of the site with a right-in/right-out driveway at Highland Avenue. This driveway will be reconfigured to provide better vehicle access. The existing internal cross connection with the parcel to the north will be maintained as part of the project. Based on this plan, all delivery vehicles will access the site via the signalized and right-in/right-out entrances.

3.4 Camp Lion Site and Egress

Future Camp improvements to be constructed by Camp Lion will include a 9,900± sf building, approximately 50 parking spaces, a pool area, and a recreation field. Lowe's will be responsible for preparing a rough graded and stabilized area in support of the future building, parking area

and recreation field. Utility stubs will be brought to within five feet of the future building location. As part of the Lowe's construction, the existing Camp access driveway will be realigned to provide access to the future Camp facilities. The location of the existing Camp driveway intersection with Highland Avenue will be maintained. Figure 7 shows the future Camp Lion site layout.

3.5 Water Tower Site and Egress

The City of Salem intends to construct a municipal water tower within a portion of the Camp Lion parcel located immediately west of the Lowe's and Walmart projects at the highest point on the property. The City will be responsible for constructing the tower at a future date. Construction of the water tower will be coordinated with the overall project construction schedule. The tower will be served by a service driveway which will be accessed from the signalized site driveway. A small gravel turnaround is provided for maintenance vehicles and is located at the end of the driveway. Utility services will be brought in to the proposed tower location. Figure 8 shows the future water tower site layout.

3.6 Traffic

Future conditions were derived by projecting existing volumes to the year 2014, representing a five-year design horizon consistent with MassDOT and EOEEA guidelines. The future No-Build peak-hour traffic volumes were developed by applying a 1.0 percent compounded annual growth rate to the existing volumes and by adding traffic associated with six specific development projects that are planned to be constructed within the five-year design horizon.

As proposed, the existing Walmart store will be expanded to 152,192± square feet, the existing Meineke will be expanded up to 6,084± square feet, and a 121,859± square foot Lowe's Home Improvement Warehouse building with a 31,204± square foot garden center will be constructed. Access to the Walmart and Lowe's portion of the site will be provided via two driveways on Highland Avenue; a right-in/right-out driveway on the north side of the property and a full access/egress signalized driveway on the south side. The internal cross connection with the parcel to the north will also be maintained and a right-in/right-out cross connection will be provided for the Meineke along the proposed site driveway. The existing Meineke and Camp Lion facility driveways along Highland Avenue will also be improved to meet current state design standards

The proposed redevelopment project is expected to generate an additional 5,960 total vehicle trips (2,980 entering and 2,980 exiting) on a weekday. During the critical peak hours, the proposed development is expected to generate 118 additional vehicle trips (72 entering and 46 exiting) during the weekday AM peak hour, 583 additional vehicle trips (286 entering and 297 exiting) during the weekday PM peak hour, and 752 additional vehicle trips (391 entering and 361 exiting) during the Saturday midday peak hour. Due to the effect of *pass-by* traffic (traffic that is already on the adjacent roadway), the development will increase *new* vehicles trips on roadways leading beyond the study area during the weekday AM, weekday PM, and Saturday midday peak hours, respectively. The most significant increases will occur along Highland Avenue in the range of 38 to 282 vehicles per hour, which represents on average, one to five

additional vehicles every minute during the peak hours. Smaller increases are expected during all other times.

The main signalized site driveway will be relocated further south to the location of the existing southerly right-turn in/right-turn out driveway. The existing main site driveway will be closed, reducing the number of curb cuts along Highland Avenue. The proposed intersection will be widened to include additional turn lanes, provide signalized control to existing uses along Highland Avenue, and provide an additional location for Highland Avenue southbound traffic to U-turn to travel northbound. The existing northerly right-in/right-out driveway will be modified to meet current state design standards. The southbound travel lanes along Highland Avenue past the main site driveway will be realigned to improve the existing merge area from two lanes to one. Additional signage will be added along Highland Avenue to better define the intersection geometry as well as indentify the merge area. With the implementation of the improvements described, the intersection and merge area are expected to operate at acceptable levels and vehicle queue lengths are not expected to exceed the available storage lengths.

Under No-Build conditions, deficiencies are expected at the intersection of Western Avenue and Fays Avenue during the weekday PM peak hour independent of the proposed project. To mitigate the project's traffic impact at this location and address existing operational deficiencies, an exclusive right-turn lane is proposed on the Western Avenue southbound approach to Fays Avenue. In addition, the existing traffic signal equipment will be upgraded and traffic signal timing changes are proposed to increase the amount of "green time" provided to the Western Avenue approaches during each signal cycle. The combination of these measures will mitigate the traffic impact of the project and improve the intersection operations over the No-Build condition.

3.7 Wetlands

3.7.1 Lowe's

Wetland resource areas impacted by project activities will include the relocation of an existing intermittent stream and associated bordering vegetated wetlands and bank. Wetland Areas A, B and C will be directly impacted by the project. There will be no direct impacts to the remaining Wetland Areas D through H. Impacts within Wetland Areas A through C include a total of 633 linear feet of Bank and 4,585 square feet of bordering vegetated wetland. The stream traverses the site flowing from northwest to southeast connecting Wetland Areas D and E. The intermittent stream will be relocated and continue to provide the conveyance of runoff from the wetland system D to the north to the downstream wetland E along the property line. Currently, the stream runs through a region of moderate to steep slopes, shallow bedrock, and frequent rock outcroppings. It is culverted beneath the existing Camp access road and discharges through a steep, rock lined channel to a wetland system located along the southern property boundary. Figure 9 shows the wetland impacts associated with the project.

Impacts to wetlands are subject to a permit under the Massachusetts Wetlands Protection Act and City of Salem Wetlands Ordinance. A Notice of Intent will be filed with the Salem Conservation Commission. The wetlands also qualify as Waters of the US and will be subject to Section 404 of the Clean Water Act administered by the United States Army Corps of Engineers (US ACOE).

Applications for a Section 404 permit from the ACOE and a Section 401 Water Quality Certificate from MA DEP will be filed for wetland impacts.

Although the proposed project will alter 633 linear feet of Bank to the intermittent stream, the proposed replication will meet or exceed the Massachusetts Wetlands Protection Act General Performance Standards set forth in 310 CMR 10.54 (4)(a) and (c). A detailed description discussing how the proposed project meets the General Performance Standards is outlined below:

310 CMR 10.54(4) General Performance Standard (for Inland Bank).
(a) Where the presumption set forth in 310 CMR 10.54(3) is not overcome, any proposed work on a Bank shall not impair the following:

1. the physical stability of the Bank;

The current bank consists of a mucky organic layer ranging from approximately two to ten inches throughout the intermittent stream corridor. Areas were the Bank has a shallow mucky layer, or lack of, typically has exposed or shallow bedrock. Portions of the existing Bank are stable and portions of the Bank are unstable (or dynamic) as a result of the low flow volumes or short flow duration. Longer seasonal flow durations or volumes typically result in stability and a well defined channel. Flows are typically seen only in spring runoff and other limited periods such as major storm events within this first order stream. The watershed size also confirms the low volume input for the intermittent stream. During the Abbreviated Notice of Resource Area Determination (ANRAD) process, the watershed was found to be limited to 0.026 square miles. Leaf and debris also act to create Bank conditions along this channel where a well defined Bank is not present by forming deposits during storm events at the edge of the channel and then acting to retain lower seasonal flows. These areas were seen to be unstable and most likely shift over time with larger spring flood events. Root networks associated with the tree and shrub layers act to hold or stabilize the more stable sections of stream Banks throughout many parts of the corridor.

The proposed Banks of the replicated section of intermittent stream were designed to provide well defined stable Banks. The Banks along with the intermittent channel will be provided with 12-inches of hydric soil. The hydric soil will require a minimum of 50% organic content to recreate conditions found in the field which typically is a mucky organic layer as described above. The Banks will be stabilized with tree saplings, shrubs, and an herbaceous seed mix (see Mitigation Plan Figure 10 for details). This will allow for root networks to develop, hold, and stabilize the Bank. The stream bottom and Bank will be temporarily stabilized with continuous jute netting to prevent erosion before herbaceous seeds germinate and tree and shrub root networks develop. Jute netting is commonly sold in 12.5-foot wide rolls that can accommodate a continuous cross-section from stream bottom through Bank limits to allow for a seamless stream protection without seams or overlaps with the exception of roll ends. The stream and Bank will then have approximately two seasons of erosive protection to allow for permanent stabilization to take hold and before the jute netting biodegrades. As a result of the above measures, the replicated stream section will provide for stable Banks throughout the proposed corridor and will meet the physical stability performance standard of Bank.

2. the water carrying capacity of the existing channel within the Bank;

The Detailed Wildlife Habitat Study and Intermittent Stream Mitigation plans indicate the existing stream width and proposed stream layout. The intermittent stream is generally small, ranging from approximately 3 to 4-feet wide on average with some sections only 2-feet wide. When the stream is running it has shallow flows of 1 to 3 inches, including average pool depths. Temporary pools are established by leaf debris from high flows or significant storm events on this high gradient stream. The proposed replicated stream will provide for a channel width that meets or exceeds the current width averages (see mitigation plan typical stream cross-section). In addition, the stream will provide for similar pools, runs and riffles throughout the length of the mitigation area (see overview section in mitigation plans for micropools and sinuosity). The more well defined Banks, along with midstream low flow channel pools, and high flow side pools have been enhanced by creating more depth and size which will create enhanced water holding capacity. During the site visit in March 2009, low flow channel pools were seen to be the only remaining water within the stream corridor. These pools were holding approximately 2 to 3-inches of water. The proposed micropools and well defined Banks will allow for a minimum depth of 6-inches in micropools and the stream will exceed the channels holding capacity during seasonal flows. The replicated stream section will meet or exceed the water carrying capacity of the existing channel during low flow and high flow conditions as a result.

3. ground water and surface water quality;

The proposed stream will not create additional turbidity or discharge additional Total Suspended Solids to the downstream resource areas. As indicated above, the enhanced pool design will act to hold more flow volumes and increase residence time. As a result, there will be greater amounts of limited suspended solids leaving the surface water before reaching downstream areas. In addition, sections of the steam have been designed to allow for more gradual slopes. This will result in decreased velocities, reduced erosive potentials, and will add to the protection of surface water quality. The depth to bedrock is shallow or exposed throughout the current stream corridor, which limits infiltration to allow groundwater recharge. Similar conditions will exist throughout the proposed stream corridor. The proposed stream replication area will also discharge back into the existing stream prior to the downslope wetland. The surface water and groundwater quality will be similar or slightly improved from current conditions as a result.

4. the capacity of the Bank to provide breeding habitat, escape cover and food for fisheries;

This first order stream dries up for the majority of the year and the stream bed would not be suitable for supporting an abundance of food sources for terrestrial upland species. Fish are not present in the stream or wetland stream complex in this region. Upstream migration potential of fish is also prevented as the final discharge of this wetland system enters into the catch basin grate located in Highland Avenue. The stream Banks also have no undercuts or other areas where wildlife could use for cover with the exception of limited areas having some woody debris. In the replicated stream corridor, tree stumps and logs will be placed on the Banks along

with woody debris across the stream bed to allow for retaining and enhancing the wildlife habitat. Due to the relatively steep microtopography resulting in no level or low lying areas that could hold water for a significant period of time, there is little potential for prolonged open water or pools adjacent to or within the Bank in this intermittent stream that could potentially support successful breeding of most amphibians. As a result the replicated stream section will retain or enhance the capacity of the Bank to provide habitat.

> *5. the capacity of the Bank to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

As indicated above, the Bank along this section of intermittent stream has limited characteristics that provide important habitat functions. The Banks and associated stream and Bordering Vegetated Wetland areas of the replication area will be provided with small to large woody debris, including several hollow tree and stump sections. In addition, hard structure stability solutions (i.e. rip-rap) will not be used along the Bank corridor for erosion measures. As a result, the stream channel has the capabilities to naturally shift or meander in sections over time. This allows for maintaining habitat quality such as preventing the potential for small mammal migration that traditional measures such as riprap can potentially cause.

The performance standards provided at 310 CMR 10.54(4)(b) do not apply to the project. Nonetheless, the following General Performance Standards at 310 CMR 10.54(4)(c) maybe applicable as described below.

> *(c) Notwithstanding the provisions of 310 CMR 10.54(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.*

According to the latest updated information from the Massachusetts Natural Heritage & Endangered Species Program (MANHESP), as provided on MassGIS, there are no Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife, including certified vernal pools, or associated habitats within the project site or abutting properties as is indicated on the map provided in the Wetland Report provided in Appendix C.

In the proposed condition, the alignment of the stream will be reconfigured to accommodate the site improvements. It will incorporate both low and active flows and a shelf to establish permanent wetland plantings associated with the replicated bordering vegetated wetland system. It will be culverted under the relocated camp access road and will continue to discharge via rock lined channel to the same wetland system as in the existing condition. A cross section of the proposed relocated intermittent stream is included on Figure 10 – Proposed Wetland Mitigation Area.

In addition to the stream relocation, portions of the truck turnaround, realigned Camp access driveway and the rear drive aisle of Lowe's will be located within the 100 foot buffer zone to the bordering vegetated wetlands located immediately off site to the south. All work proposed within wetlands jurisdiction, including the stream relocation and buffer zone work will be included in a Notice of Intent to be filed with the Salem Conservation Commission.

For the federal wetlands, the project will require a Section 404 Permit from the U.S. ACOE and a Section 401 permit from the MassDEP.

3.7.2 Walmart

The proposed limits of disturbance associated with the Walmart development maintain an approximate distance of 110 feet from the Wetland Area F, located to the west of the proposed detention basin. It is further noted that this bordering vegetated wetland system is located upgradient from the detention basin at an elevation approximately 20 feet higher. Therefore, there are no impacts to wetlands or other resource areas subject to protection under the MA WPA and the City of Salem Wetlands Ordinance associated with the Walmart expansion.

3.7.3 Camp Lion

The Camp Lion improvements to be implemented by Lowe's will include grading and establishment of a rough graded, stabilized area for the future building and parking area construction. The work to be performed by Lowe's in conjunction with the preparation of the rough graded, stabilized areas are proposed within the 100 foot buffer zone and will be permitted in the Notice of Intent filing with the Salem Conservation Commission.

3.7.4 Water Tower Site

Portions of the access road leading to the water tower are located within the 100 foot buffer zone to Bordering Vegetated Wetlands. Work within the 100 foot buffer zone will be included in a Notice of Intent to be filed with the Salem Conservation Commission. The tower itself, to be constructed by the City of Salem at a future date, is not located within any wetland resource areas or the 100 foot buffer zone as it is currently designed.

3.8 Stormwater Management

Lowe's and Walmart will each have separate storm water management systems with the exception of drainage structures located within the common driveway; the runoff from the driveway system will convey stormwater to the existing municipal system within Highland Avenue. The systems will be constructed and maintained by each retailer as discussed in the following sections. The location of the stormwater management systems are shown on Figure 11.

3.8.1 Lowe's

The Lowe's development will include the construction of a 153,063± sf Lowe's store, parking facilities, and associated circulation drives. A comprehensive storm water management system has been designed to treat storm water and control peak runoff rates and volumes. In post development, stormwater will be pre-treated prior to discharge. Stormwater runoff will be conveyed from collection points to the "treatment train" through a closed system. The storm drain pipes have been sized to adequately convey the 25 year storm event. A 15 inch minimum pipe diameter having a minimum slope of 0.005 ft/ft will be utilized for the Lowe's site.

The stormwater management system will include a "treatment train" consisting of source control, deep sump, hooded catch basins, mechanical stormwater treatment structures, and a sediment forebay to treat stormwater prior to discharge. A description of each link in the "treatment train" to address the rate, quantity, and quality of stormwater runoff from the project is as follows:

- *Source Control* is a comprehensive source control program which includes regular pavement sweeping, catch basin cleaning, and regular maintenance of all dumpsters, compactors, and loading areas.
- *Deep Sump, Hooded Catch Basins* trap debris, sediments, and floating contaminants before stormwater is conveyed to the closed piping network and the additional downstream treatment measures.
- *Water Quality Structures* remove suspended particles (TSS) from the runoff through the employment of hydrodynamic separation.
- *Above Ground Stormwater Detention* to provide peak flow attenuation and additional TSS removal through the use of a sediment forebay.

One above ground stormwater detention basin and sediment forebay is proposed to treat and detain stormwater runoff from the Lowe's roof, parking and access drives, and the water tower service drive; the basin will be located to the south of the Lowe's building. Stormwater runoff from Lowe's roof bypasses the sediment forebay and drains directly into the extended dry detention basin. The sediment forebay has been designed to hold the water quality volume below the invert of the stone weir such that the 2-year storm does not overtop the bench of the stone weir. The detention basin has approximately 100,282± cubic feet (2.30 acre-feet) of storage and has been designed to pass the 100 year storm event without over topping. Approximately 1 foot of freeboard is provided above the calculated 100 year water surface elevation. An emergency spillway is included at the southeast corner of the basin. The overflow elevation is set above the calculated 100 year elevation.

A multi-stage outlet control structure will be used to control discharge from the basin to the existing wetland system located along the southeast property boundary. The outlet control has been designed to approximate the existing rate of runoff to the wetlands.

USDA soil mapping indicates that the site is primarily comprised of "B" soil types. A preliminary geotechnical investigation has been completed for the proposed Lowe's parcel. The majority of the site is comprised of exposed and shallow bedrock. Other areas of the site are overlain by granular fill consisting of fine to coarse sand with some fines and gravel beneath the

top soil and pavement. These layers were generally shallow, approximately 4-5 feet below ground surface, and underlain by bedrock. The extensive bedrock on site provides limited to no infiltration of stormwater. Although stormwater does permeate through the initial soil layer in areas where bedrock is not located at the surface, it is eventually intercepted by the underlying bedrock, preventing infiltration. The bedrock surfaces both exposed and shallow, severely limit the site's ability to infiltrate stormwater and make the implementation of stormwater infiltration features technically infeasible. Although a hydrologic soil group "D" classification could be applied to the on-site soils; a hydrologic soil group "C" has been used in the design of the stormwater management system which results in a more conservatively sized system.

The extent of proposed impervious surfaces has been minimized as much as possible. The proposed parking provides less than is required by zoning and in the prototypical configuration for Lowe's. One thousand twenty one (1,021) parking spaces are required per the City of Salem zoning ordinance, 378 parking spaces are provided. The prototypical Lowe's building requires 424 parking spaces. Loading access drives to the side and rear of the store have also been reduced from the prototypical configuration. Side access drives are prototypically 35 ft. in width. They have been reduced to 30 ft. and 25 ft. in the proposed site plan. The rear loading drive is typically 47'. It has been reduced to 35 ft. in the proposed condition.

Through the incorporation of these reductions, the overall square footage of impervious surface has been significantly reduced. The Impervious Surface Comparison provided on Table 6 below summarizes the impervious surface associated with the zoning compliant, prototypical, and preferred alternatives.

Table 6 Lowe's Impervious Surface Comparison

Site Plan Configuration	Total Impervious Surface (sf)
Zoning Compliant	581,000±
Lowe's Prototypical 103K Wide	417,000±
Lowe's Preferred Alterative	403,000±

The proposed stormwater management system complies with all aspects of the Massachusetts DEP Stormwater Management Regulations as described below:

Standard #1 – Untreated Storm Water

No point discharges of untreated storm water to resource areas are proposed. Storm water quality control for the project includes street sweeping, deep sump/hooded catch basins, infiltration basins and water quality structures. All points of discharge are designed to prevent erosion through the incorporation of velocity dissipation devices including rip-rap aprons.

Standard # 2 – Post-Development Peak Discharge Rates

DEP standards state that controls must be developed for the 2-year and 10-year, 24-hour storm events. The 100-year, 24-hour storm event must also be evaluated in order to demonstrate that there will not be increased flooding impacts off-site.

Storm water management controls were developed for the 2-, 10-, 25-, 50-, and 100-year 24-hour storm events. For all the analyzed storm events, there will be no increase in peak discharge rates as a result of the project.

Standard # 3 – Recharge to Groundwater

The site provides limited to no recharge to groundwater under the existing condition as a result of extensive bedrock. Meeting the requirement for recharge volume will be technically infeasible due to the presence of shallow ledge throughout the site as previously described.

Standard # 4 – 80% Total Suspended Solids Removal

Best Management Practices (BMPs) will be used to provide water quality. The following BMPs will be provided on-site: roadway sweeping, deep sump/hooded catch basins, water quality structures utilizing hydrodynamic separation, sedimentation forebay, and extended dry detention basins. The incorporation of these BMPs will achieve a cumulative TSS removal rate of approximately 91% which exceeds the 80% DEP requirement.

Standard # 5 – Higher Pollutant Load

The project is classified as one that will generate higher pollutant loads and therefore subject to the requirements of Standard 5 including pretreatment of storm water. Pretreatment of the storm water with water quality inlets, deep sump catch basins, and a sedimentation forebay will achieve a minimum TSS removal rate of 44% prior to discharge into the extended dry detention basin. In addition, the stormwater quality structures proposed as part of the Lowe's stormwater management system will be sized to accommodate the equivalent water quality flow rates for 1.0 inch of runoff.

Standard # 6 – Protection of Critical Areas

The project is not located in a critical area as defined by the MA DEP.

Standard # 7 – Redevelopment Projects

The Lowe's portion of the Project does not qualify as a redevelopment project.

Standard # 8 – Erosion/Sediment Control During Construction

Since the project will result in the disturbance of greater than one acre of land and results in the discharge of stormwater to a surface water of the US or a municipal separate storm system leading to surface waters of the US, it will requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Large and Small Construction Activities. The Construction General Permit (CGP) authorizes the discharge of storm water from construction activities.

A SWPPP will be prepared and include site specific temporary and permanent erosion and sedimentation control practices including silt fence between the limit of work and wetland resource areas, stabilized crushed stone construction entrances, temporary sedimentation traps and swales to manage stormwater runoff during construction, stabilization of all disturbed areas, site specific construction sequencing plans showing best management practices for each phase of construction and the implementation of temporary sedimentation basin(s) and diversion ditches to manage storm water runoff during construction.

Standard # 9 – Operation/Maintenance Plan

An Operation and Maintenance Plan has been developed in accordance with the Stormwater Management Standards and is included as part of the drainage analysis and provided in the Drainage Report, see Appendix G.

Standard # 10 – Illicit Discharges

The proposed stormwater system is designed to convey only stormwater and allowable non-storm discharges (firefighting water, landscape irrigation, air conditioning condensate, etc.) and will not contain any illicit discharges from prohibited sources.

The complete drainage study for the Lowe's portion of the Project can be found in Appendix G. Figure 11 – Grading and Drainage Plan depicts the proposed stormwater management system.

3.8.2 Walmart

The Walmart development will include the construction of a 152,192± sf Walmart retail store, parking facilities, and associated circulation drives. A comprehensive storm water management system has been designed to treat storm water and control peak runoff rates and volumes. In post development, all stormwater will be pre-treated prior to discharge.

The stormwater management system will include a "treatment train" consisting of source control, deep sump, hooded catch basins, mechanical stormwater treatment structures, and a sediment forebay to treat stormwater prior to discharge. A description of each link in the "treatment train" to address the rate, quantity, and quality of stormwater runoff from the project is as follows:

- *Source Control* is a comprehensive source control program which includes regular pavement sweeping, catch basin cleaning, and regular maintenance of all dumpsters, compactors, and loading areas.
- *Deep Sump, Hooded Catch Basins* trap debris, sediments, and floating contaminants before stormwater is conveyed to the closed piping network and the additional downstream treatment measures.
- *Water Quality Structures* remove suspended particles (TSS) from the runoff through the employment of hydrodynamic separation.
- *Above Ground Stormwater Detention* to provide peak flow attenuation and additional TSS removal through the use of a sediment forebay.

All of the developed portions of the site currently drain to Highland Avenue and the proposed storm drainage system, including the detention basin, will ultimately drain to Highland Avenue. The undeveloped portion of the site to the west will continue to drain to the west. Post-development flow rates will be less than pre-development runoff rates and a detailed analysis is provided in the Drainage Report in Appendix G.

An above grade detention basin with 63,300 cubic feet (1.45 acre-feet) of storage is proposed in the natural swale area behind the proposed Walmart. The detention basin will take advantage of

the natural contours to provide storage in this area and will avoid disturbance within the 100-foot regulated BVW buffer. A swale is proposed above the north side of the basin to divert runoff from the hill above away from the detention basin towards its natural point of discharge to the west. The basin will drain through a multi-stage outlet structure that will discharge to pipes leading through the Walmart parking lot to the Highland Avenue drainage system. An emergency spillway is provided above the computed 100 year water surface elevation, and the top of the basin berm will provide more than one foot of freeboard above the 100 year water surface elevation. A pipe outlet will be provided through the west side of the basin to provide runoff to the off-site wetlands to the west. This outlet pipe has been sized to discharge enough water to approximate existing conditions at the wetlands.

Due to the high amount of ledge, it is anticipated that the required recharge will not occur within the basin, and will have to be drained by bleeder pipes to avoid a permanent standing water condition. A closed storm sewer system will capture runoff from parking areas and discharge it to the existing Highland Avenue storm sewer system. The storm sewer system has been sized to adequately convey the 25 year design storm with a minimum pipe size of 12" and minimum pipe slope of 0.5%.

Water quality at the site will be in accordance with Massachusetts DEP's Stormwater Management Standards, and will incorporate the use of street sweeping, water quality units and further TSS removal within the detention basin. The combination of these treatments will result in a total suspended solids removal rate of over 80%. The project meets all applicable DEP Stormwater Handbook standards and should have no adverse impacts on the surrounding environment. The following section describes the project's conformance with the Massachusetts DEP's current Stormwater Management Standards, as of January 2, 2008.

The extent of proposed impervious surfaces has been minimized as much as possible. The proposed parking provides less than is required by zoning and less than preferred by prototypical configuration for Walmart. Walmart's preferred parking ratio is 5.0/1,000 and would require a total of 761 spaces at this store location. Approximately eight hundred fifty one (851) parking spaces are required per the City of Salem Zoning Ordinance and 613 parking spaces are provided. The perimeter parking layout is non-prototypical for Walmart and has been designed to maximize parking and reduce paved surfaces by parking the perimeter. Lastly, the total number of cart corrals provided (8 total) is non-prototypical for Walmart where 14 would normally be required.

Through the incorporation of these reductions, the overall square footage of impervious surface has been significantly reduced. The Impervious Surface Comparison in Table 7 below summarizes the impervious surface associated with the zoning compliant, prototypical, and preferred alternatives.

Table 7 Walmart Impervious Surface Comparison

Site Plan Configuration	Total Impervious Surface (sf)
Zoning Compliant Parking	533,385±
Walmart Prototypical Parking	507,020±
Walmart Preferred Alterative	470,448±

Standard #1- Untreated Storm Water

Runoff from proposed impervious surfaces will be treated for stormwater quality prior to discharge through swirl-type separators. Further water quality treatment will be achieved within the detention basin.

Standard #2: Post Development Peak Discharge Rates

Runoff rates for the pre-development and post-development conditions were calculated for the 2-year, 10-year, 25-year and 100-year 24-hour storm events. These calculations are provided in Appendix D of the drainage report provided in Appendix G. As summarized in previous sections of this report, there will be no increase in stormwater runoff rates from the site for the 2, 10, 25, and 100 year storms, as required by City and State regulations.

Standard #3: Recharge to Groundwater

Due to the presence of shallow ledge throughout the site, meeting recharge requirements is not possible. However, please note that the existing project area contains approximately 9.7 acres of impervious area. Only the runoff from new impervious areas is to be recharged. A bleeder drain pipe will be provided in the detention basin to ensure that the forebay drains. The proposed detention basin provides an adequate recharge volume, as demonstrated in the calculations included in Appendix G. However, due to underlying ledge conditions, full recharge may not occur.

Standard #4: 80% TSS Removal

The proposed Best Management Practices for this site provide for at least 80% TSS removal and consist of a "process train" which includes both nonstructural and structural techniques. In every case, street cleaning and deep sump catch basins are used to reduce pollutant loading.

The TSS removal rate will be at least 80%. The 80% TSS removal rate is based on information available for the swirl-type water quality units, as approved by MassDEP.

Standard #5: Land Use with Higher Potential Pollutant Loads

The proposed project is considered a land use with "Higher Potential Pollutant Loads", and as such has been designed in accordance with the Massachusetts Stormwater Handbook.

Standard #6: Protection of Critical Areas

The site does not contain, nor directly discharge to any critical areas, as defined by the Department of Environmental Protection.

Standard #7: Redevelopment Projects

While the site may be considered a partial redevelopment project, all applicable stormwater management standards have been met, with the exception of groundwater recharge for the reasons noted above.

Standard #8: Erosion/Sediment Control During Construction

An erosion and sediment control plan has been developed for this project implementing at a minimum: silt fence, a crushed stone construction exit, catch basin inlet protection, and provisions for stabilizing disturbed areas. A Stormwater Pollution Prevention Plan will be prepared in support of a Notice of Intent filing with the EPA for coverage under the NPDES Construction General Permit.

Standard #9: Operation/Maintenance Plan

An Operation and Maintenance Plan developed in accordance with the Stormwater Management Standards will be provided.

Standard #10: Illicit Discharges

The proposed stormwater system will convey only stormwater and allowable non-storm discharges (firefighting water, landscape irrigation, air conditioning condensate, etc.) and will not contain any illicit discharges from prohibited sources.

3.8.3 Camp Lion

The camp improvements include rough grading and stabilization of select areas which will be built upon by the Camp at a future date. Although the camp design and construction of future facilities will be completed by others, the stormwater improvements anticipated as part of the Camp project are presented in the drainage report.

The Camp Lion portion of the project will include the construction of a 9,900± sf building, approximately 50 parking spaces, access drive, parking area and associated circulation drives, recreation field and a pool area. For purposes of the full site build-out an above ground detention basin was designed to accommodate and attenuate post development conditions based on the future build- out. The Camp will be responsible for final design and construction of the system in accordance with Mass DEP Stormwater Regulations.

3.8.4 Water Tower Site

Stormwater runoff from the developed areas of the City of Salem water tower parcel will be directed to stone lined swales along either side of the tower access road, collected in a closed drainage system, and routed through a stormwater quality unit and sediment forebay prior to discharge into the Lowe's extended dry detention basin located to the south of the Lowe's development.

3.9 Utility Services

For all proposed project facilities, including Lowe's, Walmart, Camp Lion and the Water Tower, existing City water and sewer mains are located in Highland Avenue, adjacent to the site. Gas, electric and telephone service is also located immediately adjacent to the site. The project is served by a public off-site sewage lift station owned and operated by the City of Salem. A one-time Sewer Connection Compliance Certification will be filed for the project for a new sanitary sewer connection from a facility not listed in 314 CMR 7.17(2)(c) that results in a discharge greater than 15,000 gallons per day and less than 50,000 gallons per day. The project does not meet or exceed any of the review thresholds related to wastewater under 301 CMR 11.03(5). Proposed utility connections are shown on Figure 12.

3.9.1 Lowe's

Based on the DEP Regulations 310 CMR 15.000, State Environmental Code Title V (Title V), approximately 7,653± gallons per day are projected for the Lowe's sewage generation and water usage. Based on actual water consumption rates, the water usage for a typical Lowe's Home Centers is approximately 1,500 gallons per day, on average. Existing City water and sewer mains are located in Highland Avenue. The existing sewer mains connect to the City of Salem municipal lift station. Lowe's will tie into these mains as part of the site improvements. Gas, electric and telephone services are also located either on or immediately adjacent to the site.

3.9.2 Walmart

Existing City water and sewer mains are located in Highland Avenue, adjacent to the site. Gas, electric and telephone service is also located immediately adjacent to the site. The existing Walmart, abutting on-site retail users and the Meineke to the south are all served by a public off-site sewage lift station owned and operated by the City of Salem. Based on Title V requirements, the current uses generate a total water supply demand of approximately 5,500± gallons per day (gpd), with a similar sewer generation rate. The estimated total water supply demand and sewer generation for the new facility is approximately 9,200 gpd.

3.9.3 Camp Lion

The new Camp facilities will obtain water and sewer utility services through connection into the municipal system located in Highland Avenue. The existing Camp utility connections will be utilized to the maximum extent practicable. Gas, electric, and telephone services are located on or immediately adjacent to the site. Based on Title V estimates, the existing Camp has a water and sewerage usage of approximately 51± gpd. The estimated total water supply demand in the future condition is 129± gpd.

3.9.4 Water Tower Site

The City of Salem water tower will be supplied through a connection into the existing water main located in Highland Avenue. Electric and telephone connections will be provided through

connection to the services located in Highland Avenue as well. Utilities will be stubbed to the tank pad as part of the overall project improvements. The design of the water tank is being completed by others on behalf of the City.

3.10 Wetland Impacts

The Lowe's and Walmart projects will result in different impacts in terms of wetlands as discussed in the following sections. The traffic and air quality impacts, analyses and mitigation were developed for both retailers in single documents and are described in the following Sections; supporting analyses are provided in Appendices E and F.

3.10.1 Lowe's

The majority of the Lowe's site is undeveloped and specific impacts and mitigation include altering the resource areas associated with an intermittent stream including 4,585 sf of Bordering Vegetated Wetland, and 633 linear feet of Bank associated with Wetland Areas A through C. Proposed mitigation will include restoration of 5,008 sf of BVW, and 986 linear feet of Bank. See Figure 9 for the location of wetland impacts and Figure 10 for the mitigation featuring the relocated stream. A Notice of Intent (NOI) will be filed with the Salem Conservation Commission for this work.

In terms of federal jurisdiction, the project is subject to a Section 404 permit. A permit to fill the wetlands will be filed with the US Army Corps of Engineers. In support of the ACOE permit, an Individual Water Quality Certificate from Mass DEP may be required and will be filed as well if applicable.

3.10.2 Walmart

For the Walmart redevelopment, there are no impacts to wetland resource areas. The proposed limits of disturbance associated with the Walmart development maintain an approximate buffer of 110 feet from the wetland system located to the west of the proposed detention basin. It is further noted that this bordering vegetated wetland system is located upgradient from the detention basin at an elevation approximately 20 feet higher. Therefore, there are no impacts to wetlands or other resource areas subject to protection under the MA WPA and the City of Salem Wetlands Ordinance associated with the Walmart expansion.

3.10.3 Camp Lion

The Camp Lion improvements to be implemented by Lowe's include grading and establishment of a rough graded area for the future building and parking area. The work to be performed by Lowe's will be located within Wetland Area G (See Figure 5). This work will be included in the NOI filing.

3.10.4 Water Tower Site

Portions of the access road leading to the water tower are located within 100 feet of Bordering Vegetated Wetlands. Buffer zone work will be included in a single Notice of Intent to be filed with the Salem Conservation Commission for the entire project build-out. The tower itself (to be constructed by the City of Salem at a future date) is not located within any wetland resource areas or the buffer zone. The City of Salem owned parcel will be included as part of the proposed project. Construction of the water tower will be coordinated with the overall project construction schedule.

3.11 Lowe's and Walmart Traffic

The proposed redevelopment project is expected to generate an additional 5,960 total vehicle trips (2,980 entering and 2,980 exiting) on a weekday. During the critical peak hours, the proposed development is expected to generate 118 additional vehicle trips (72 entering and 46 exiting) during the weekday AM peak hour, 583 additional vehicle trips (286 entering and 297 exiting) during the weekday PM peak hour, and 752 additional vehicle trips (391 entering and 361 exiting) during the Saturday midday peak hour. Due to the effect of *pass-by* traffic (traffic that is already on the adjacent roadway), the development will increase *new* vehicles trips on roadways leading beyond the study area during the weekday AM, weekday PM, and Saturday midday peak hours, respectively. The most significant increases will occur along Highland Avenue in the range of 38 to 282 vehicles per hour, which represents on average, one to five additional vehicles every minute during the peak hours. Smaller increases are expected during all other times.

3.11.1 Camp Lion Traffic

It is assumed that the relocation of the Camp Lion facilities will maintain existing traffic volumes in the study area. A complete traffic impact and access study is included in Appendix E.

3.11.2 Water Tower Traffic

The proposed water tower will be accessed occasionally by service/maintenance vehicles. No additional traffic is anticipated.

3.12 Lowe's and Walmart Air Quality

A single greenhouse gas (GHG) air quality analysis was conducted for both Lowe's and Walmart based on the Executive Office of Energy and Environmental Affairs' (EOEEA) Greenhouse Gas Emissions Policy and Protocol to address the Project's impacts on climate change. Carbon dioxide (CO_2) emissions were quantified for: (1) the Base Case corresponding to the October 18, 2008 7th Edition of the MA Building Code that adopted the International Energy Conservation Code (IECC) 2006 with the 2007 Supplement, (2) the Preferred Alternative, which includes some energy saving design features, and (3) the Mitigation Alternative, which includes additional energy savings elements. For purposes of the GHG study only, the Mitigation

Alternative was selected. The Mitigation Alternative assumes Lowe's proposed Greenhouse Gas Commitments, previously communicated to the MEPA Office and has been incorporated into the Preferred Alternative. The Mitigation Alternative reduces the Project's total direct and indirect stationary source energy-related emissions of CO_2 by 8.7% compared to the Base Case. Mitigation measures for transportation emissions include a number of transportation demand management (TDM) strategies and roadway improvements for the Project. These measures will improve traffic operations, reduce Project generated vehicle trips, and reduce Project-related motor vehicle CO_2 emissions by 2%. Overall, mitigation measures in the Mitigation Alternative, as adopted by the Project Proponent, are expected to reduce the Project's total CO_2 emissions (stationary source plus transportation) by 8.4% compared to the Base Case. The list of GHG mitigation commitments is found in the Greenhouse Gas Analysis provided in Appendix F.

Table 8 Cumulative Project Impacts-Preferred Alternatives

	Lowe's	Walmart	Camp Lion	Municipal Water Tower Site	Meineke	TOTALS
Existing parking	0	379	30[1]	0	4	413
Proposed parking	378	613	50	0	6	1,047
Existing impervious surface (Acres)	0	7.8±	0.2±	0	0.3±	8.3±
Proposed impervious surface (Acres)	9.3±	10.8±	1.4±	0.2±	0.4±	22.1±
Existing building SF	0	109,460±	4,167±	0	3,084±	116,711±
Proposed building SF	153,063±	152,192±	9,900±	0	5,624±	320,779±
Impacts to BVW	4,585	0	0	0	0	4,585
Impacts to Bank	633	0	0	0	0	633
Existing ADT	0	7,130	0[2]	0[2]	202	7,332
Proposed ADT	4,054	9,012	0[2]	0[2]	226	13,292
Existing water usage (gpd)	0	5,475±	51±	0	450±	5,976±
Proposed water usage (gpd)	7,653±	9,200±	129±	0	600±	17,582±
Existing sewage generation (gpd)	0	5,475±	51±	0	450±	5,976±
Proposed sewage generation (gpd)	7,653±	9,200±	129±	0	600±	17,582±

[1] Existing parking is undefined. Count is based on number of vehicles present at time of site visit and additional potential available parking.
[2] See traffic impact and access study included in Appendix E.

4.0 Alternatives Analysis

4.1 Lowe's

Alternative layouts were considered by Lowe's to accommodate the proposed building program and associated parking. The preferred layout (see Figure 13-Preferred Site Plan Alternative) was selected based on a review of these alternatives and a combination of factors including complying with local zoning, minimizing environmental impacts, providing market-demanded parking, and economic return. Other alternatives considered included the No Build, the inclusion of the larger building prototype, and smaller prototype alternatives.

Determining a Specific Market. Lowe's has chosen to develop a store in Salem, Massachusetts to support the current expansion program that Lowe's has been conducting over the past several years nationally and in Massachusetts. Lowe's reviews many factors when determining in which markets it wishes to build new stores. Population, households and income are some of the market factors the company will review to assess the viability of a market. Lowe's will also review how new stores affect the existing store base that currently serves markets around the new location. The company's goal is to maximize market share as a whole without cannibalizing sales from other locations. This insures that Lowe's investment in the market achieves the proper returns.

When Lowe's identified the Camp Lion site as a potential future location for its retail operations, it then conducted a extensive market research study to insure the viability of the site. The company will determine the amount sales and market penetration the location will capture. At the same time, Lowe's studies where open Lowe's locations in the area may or may not be capturing sales in the area. The company's goal is to capture market share without transferring sales from other locations, therefore maximizing its return on investment.

Lowe's two closest stores to the Salem location are Saugus, MA and Danvers, MA, approximately 6 miles to the southeast and 5 miles to the northwest, respectively. Based on what Lowe's believes from its market research, and based on what Lowe's already knows from its existing sales from the locations referenced above, the Salem, MA location is a viable location for a future Lowe's Home Improvement store.

Selecting a Specific Community. Since the optimum location for the Lowe's store is south of the Danvers store and east/northeast of the Saugus location, the obvious choice becomes Salem. Salem serves as the shopping hub for neighboring communities such as Lynn, Swampscott, Marblehead, and portions of Peabody and Beverly.

Selecting a Specific Corridor in Salem. Highland Avenue (Route 107) provides direct access to abutting communities to the north and south. Access to Route 107 is readily available for the region's dense populations and provides connection to major arterials serving neighboring cities and towns. Furthermore, Route 107 represents Salem's major retail corridor and is already home to a number of major national retailers.

4.2 Development Program Requirements & Considerations

Prototype Building Program. The Lowe's prototypical building program includes a 169,112± square foot retail building (137,933± square foot retail and 31,179± square foot garden center); 552 parking spaces, parking and circulation driveways, and associated site improvements.

A prototypical Lowe's site development program provides access to the site along each of the perimeter drives. Truck access/egress is limited to these drives to minimize disruption of store operations. Perimeter access drives are significantly wider than the circulation drives associated with the interior of the parking field and are designed to accommodate the large turning movements associated with these vehicles. Customer traffic is allowed to filter from the main accesses through the lower limits of the parking field towards the store. This method of traffic distribution eliminates the need to funnel all vehicles through the front of the store and into a pedestrian heavy environment. Although strongly discouraged, access to the parking field can be limited to the front of the store where site conditions do not allow for an alternate means of access/egress.

Site Selection Process Factors. Identifying specific sites begins with the cataloging of available property. Availability is based on those parcels which have been identified for sale or lease, as well as unlisted properties. This includes both individual parcels and smaller parcels which could be assembled to meet the acreage criteria. The following sections discuss the deciding factors that were considered during the site selection process in order of importance.

Economic Considerations. Once the available properties are identified, these potential sites are assessed for their cost basis to determine if they can meet Lowe's minimum economic return-on-investment (ROI). The cost basis is the purchase price and the cost to develop the property.

The remaining potential sites are then cross-referenced against natural resource constraints, topography, zoning classification and infrastructure (existing roadway improvements, access, water, sewer, etc.).

4.3 Zoning

Lowe's first identifies those areas where retail development is allowed by right or at least by special permit. Those parcels requiring zoning changes are considered, however, this option is the least appealing in terms of timing and public resistance. The areas identified in the Highland Avenue corridor are zoned Business Highway (B-2) and Business Park Development (BPD) where retail is allowed by right or through inclusion with a planned unit development. The remaining zoning in the area consists of a mix of residential and industrial zones. In summary, both B-2 and BPD were identified as potential parcel development areas.

The selected site is currently zoned BPD and B-2. Retail is an allowed use through inclusion with a planned unit development. The Lowe's site is being included in a planned unit development with the proposed Walmart, Camp Lion improvements, City of Salem water tower, and existing Meineke. Figure 14 – City of Salem zoning depicts the zoning districts within the City of Salem.

4.4 Availability

Availability is based on those parcels which have been identified for sale, as well as those unlisted properties. This includes both individual parcels and smaller parcels which could be assembled to meet the acreage criteria. The selected site is available for purchase and meets the minimum acreage requirement necessary for a Lowe's retail store.

4.5 Access & Visibility

Site access requirements include proximity and immediate access to major transportation routes and visibility from those routes. Major access roadways such as Highland Avenue are preferred for truck access routes in lieu of travel through secondary residential streets. The availability of existing roadway infrastructure, including traffic signals, acceleration/deceleration lanes, and dedicated turn lanes are also considered. Access from both directions of the major roadways is considered. Existing traffic volumes and potential trip generation to the destination site are reviewed. Potential off site improvements to facilitate access to the site, including roadway widening, modifications to existing traffic signals or the need for new traffic signalization are evaluated.

In terms of visibility, the site must be visible from a marketing standpoint. The site must be immediately visible from the road or highway from which the site will be accessed. Furthermore, visibility from all major routes encompassing the anticipated means of access/egress to and from the roadway network providing direct access to the site is strongly preferred. Visibility from these roads is critical as it establishes Lowe's presence in the market.

The preferred site has direct, signalized access to Route 107 and is located within Salem's major retail corridor. Route 107 has a large existing traffic volume and infrastructure to support the roadway improvements necessary to support the project. The site will provide Lowe's with excellent visibility from Route 107 and will greatly assist in establishing Lowe's market presence.

4.6 Site Acreage

A prototypical Lowe's Home Improvement Center requires approximately 12 to 15 acres of land to accommodate the building footprint, loading facilities, circulation drives, grading, parking, and stormwater management facilities. Acreage is sometimes assembled through the consolidation of more than one parcel. Pre-developed sites are also considered during the site selection process, provided they meet the site acreage requirements. This site provides approximately 12.4 acres through an assemblage of parcels. Although this is on the smaller end of the necessary area for a Lowe's store, it adequately accommodates the Lowe's building program while minimizing the impact to the surrounding undeveloped portions of the site.

4.7 Utilities

Research is performed to determine the availability of supporting infrastructure, including water, sewer, gas, and electric services. The immediate availability of utilities within the public right-of-way is preferred. However, utilities located within a feasible proximity to the site that may be extended for the purposes of development are also considered. In addition to availability, the ability of these utilities to adequately service and meet the demands of a prototypical Lowe's Home Improvement store is also studied. Pre-developed and partially developed (existing roadway and infrastructure) sites are also highly desirable. The capacity and available fire pressure of the existing water mains and available flow capacity in existing sewers are analyzed to determine if supplemental fire capacity or further utility upgrades will be required. The availability of public gas and electric services are reviewed to determine the need for private on-site services.

The utility suppliers for the Highland Avenue corridor in Salem, Massachusetts were contacted to determine the availability of existing utility infrastructure to serve the project. Utility service for water, municipal wastewater, power, gas, and telephone exists within Highland Avenue and appears to have ample capacity to serve the proposed development.

4.8 Wetlands

All lots under consideration were reviewed for the presence of federal, state and local jurisdictional wetlands through a GIS desk top survey of the National Wetlands Inventory and the Massachusetts Fresh Water Wetlands mapping. The wetland mapping was supplemented by plans on record at City Hall. Approximate wetland boundaries are shown on Figure 15 – Alternative Site Considerations.

4.9 Floodplain

Floodplain information is obtained from GIS based information and Federal Emergency Management Agency (FEMA) maps. Specifically, the 100-year flood zone is reviewed for potential flooding issues and impact on the proposed development. Lowe's site development and selection criteria does allow for construction in the floodplain provided that the proposed building slab elevation is a minimum of 1.5 feet above the 100-year floodplain elevation and the extent of the 100-year floodplain does not encroach within 100 feet of the building.

4.10 Site Selection

Lowe's considered 5 total site locations in the Salem market within the Route 107 corridor, including the site selected for the current proposal. Figure 15 – Alternative Site Considerations depicts the sites considered in Salem's Route 107 corridor. The Table below provides a brief description of the alternate site considered for the Lowe's of Salem and the reason(s) for them being removed from additional consideration.

Table 9 Alternative Site Considerations

Site Identification	Reason(s) for exclusion from additional consideration
Site A	Existing gas station located at the corner of Swampscott Road and Highland Avenue, not large enough for Lowe's building program
Site B	Portions of property are zoned residential, not large enough for Lowe's building program
Site C	Not large enough for Lowe's building program, portions of the property are zoned residential
Site D	Not available for sale, not large enough for Lowe's building program, significant wetlands

4.11 Lowe's Site Layout Alternatives

Several alternative layouts were considered by Lowe's to accommodate their building program for this specific site. The Preferred Alternative proposed was selected based on a review of the various alternatives as well as several factors which include zoning conformance, minimizing environmental impacts, providing parking ratios required by the tenant and economic return. The below Summary Table of Alternatives features the no build "do nothing" alternative, the Preferred Alternative (the proposed project), and the 117K alternative. Each alternative is described in greater detail below.

Alternatives featuring various forms of layout scenarios have been considered and marketed for the development. Given the site's location fronting along heavily traveled Highland Avenue with an existing signalized intersection in place and the site's zoning, the logical site development features retail or commercial uses. Due to the joint development nature of this project, a shared common access driveway with a new upgraded signalized intersection and associated roadway improvements is an attractive and essential mitigation measure.

For the purposes of this EENF, four alternatives have been analyzed:

- No-Build Alternative
- Prototypical 103K Alternative
- Preferred Site Plan Alternative, which is the project as proposed
- Larger Prototype Alternative (117K), featuring one of Lowe's' largest prototype stores

4.11.1 No-Build Alternative

The Lowe's site currently consists of separate parcels owned by Camp Lion and the City of Salem. The developed portion of the site contains the existing Camp site improvements. The Camp facilities are aging and are inadequate to serve the needs of the camp. The buildings are small and in need of maintenance, the parking is sparse and undefined, and the site topography and heavily wooded areas provided limited opportunity for outdoor recreation. The remainder of the site is undeveloped. With the no-build alternative the existing Camp would remain intact. The Camp would continue to be underserved by the existing facilities. There would be no changes to existing topography or utilities.

There are significant disadvantages of the no-build alternative. A no-build scenario does not take full advantage of a large parcel in a heavily traveled retail corridor specifically identified by the City for this type of development. Furthermore, this project presents a considerable economic development opportunity in a community that is very much in need of positive economic growth. The project will provide a net increase the City's economic tax base and will create new jobs. Additionally, the Camp will not be able to improve their facilities and will continue to operate in buildings in need of upgrades and maintenance.

The advantages to the no-build alternative include no disturbance or alteration of the existing topography and no impacts to wetlands. There will be no need for mitigation associated with the potential impacts discussed in previous sections of this report.

4.11.2 Prototypical 103K Alternative

The smallest viable Lowe's building prototype for the Salem market is the 103K building. The prototypical 103K Alternative includes a 152,328± sf building (including 31,384± sf garden center) and 412 parking spaces. The 412 parking spaces represent slightly less than the standard number of parking spaces included with this building. In an effort to further reduce impervious coverage, Lowe's developed a modified version of the prototypical 103K building and parking configuration. The modifications resulted in the Preferred Site Plan Alternative. A site plan incorporating a prototypical 103K building configuration is included as Figure 16.

4.11.3 Preferred Site Plan Alternative

The Preferred Site Plan Alternative, which reflects the current site plan proposal, represents a modified 103K prototype with a 153,063± sf building and 378 parking spaces. This building is smaller than the 117K Alternative and similar in square footage when compared to the Prototypical 103K Alternative. However, the building components have been reconfigured and the parking condensed to reduce the overall impervious coverage and to minimize disturbance to previously undeveloped areas. The overall impact to the abutting wetland system is significantly reduced when compared to the 117K alternative. The Preferred Site Plan Alternative is shown in Figure 13.

The Preferred Site Plan Alternative incorporates non-prototypical Lowe's building and parking configurations. The parking count associated with the preferred alternative is less than in the Lowe's 103K and 117K Alternatives.

The Preferred Site Plan Alternative incorporates the smallest modified Lowe's building prototype that will meet the demands of the market while maintaining the economic viability of the project. The existing roadway infrastructure along the site frontage will be improved and will include a shared signalized access with the Walmart development.

The Lowe's development will also benefit Camp Lion by presenting them with an opportunity to substantially upgrade their existing facilities, an opportunity that may not otherwise be afforded to them without the Lowe's project.

The project is consistent with the City's plan for development along Route 107. As discussed above, this project represents a very important piece of the continued economic growth for the City of Salem. New construction jobs and full-time positions will be created as a result of the project and additional tax revenues will be generated for the City.

In terms of minimization and avoidance to wetlands, the intermittent stream traverses the parcel in a northeast / southwest orientation and any development of this nature would result in direct unavoidable impacts to the stream and its associated banks and bordering vegetated wetlands. Consideration of a smaller prototype would result in similar direct impacts to the stream in excess of 500 linear feet of bank and impacts to bordering vegetated wetlands of the same magnitude as the Preferred Site Plan Alternative. A site layout using the smaller prototype is included as Figure 17.

4.11.4 Larger Prototype Alternative (117K)

The larger Lowe's prototype alternative development program reviewed for the site considered a building with an approximate 117,000± sf of sales floor with loading areas, offices, and garden center for a total of 169,112± sf. This building requires 1,128 parking spaces per the City of Salem zoning ordinance. A site layout plan was prepared for the site using the larger prototype.

The larger prototype alternative results in similar type impacts to those discussed in previous sections of this report. These impacts, however, are larger in scale than those resulting from the preferred site plan configuration. Additional impervious surfaces would be required for parking and loading to support the store, additional wetland impacts would be incurred as a result of the larger development footprint, additional traffic would be generated, and a slightly higher demand would be placed on utilities. Additional stormwater infrastructure would be required to properly collect and attenuate stormwater runoff. The larger development footprint would result in greater land disturbances, including additional blasting and earthwork. This alternative presents certain advantages as well. The larger building is consistent with adjacent land uses in the corridor and the zoning for this section of the City. It would also generate additional tax revenue.

In terms of impacts to wetlands, over 5,000 sf of Bordering Vegetated Wetlands would be impacted in conjunction with this alternative and would not be permitted under the Wetlands Protection Act. As a result, the larger prototype was eliminated from further consideration. A site layout using the larger prototype is included as Figure 18. A summary of Lowe's development alternatives is presented in Table 10.

Table 10 Summary of Lowe's Development Alternatives

	No-Build Alternative	Larger Prototype Alternative 117K	Prototypical 103K Alternative	Preferred Site Plan Alternative
Impervious Area (acres)	0	11.0±	9.6±	9.3±
Building Area (sf)	0	169,112±	152,328±	153,063±
Traffic (trips/day)	0	4,292	3,604	4,054
No. of parking spaces	0	519	412	378
Overall Wetland Impact BVW (sf)	0	19,629	4,585	4,585
Bank (lf)	0	656	633	633

4.12 Walmart Site Layout Alternatives

Several alternative layouts were considered by Walmart to accommodate their expansion and redevelopment program for this site location. The alternative proposed was selected based on a review of the alternatives as well as several factors which include zoning conformance, minimizing environmental impacts, providing parking ratios required by the tenant and economic return. The below Summary Table of Alternatives features the no build "do nothing" alternative, the preferred alternative (the proposed project), an expansion alternative and the 184K alternative. Each alternative is described in greater detail below.

Alternatives featuring various forms of layout scenarios have been considered and marketed for the development. Given the site's location fronting along heavily traveled Highland Avenue with an existing signalized intersection in place and the site's zoning, the logical site development features retail or commercial uses. Due to the joint development nature of this project, a shared common access driveway with a new upgraded signalized intersection and associated roadway improvements is an attractive and essential mitigation measure.

For the purposes of this ENF, three alternatives have been analyzed:

- No-Build Alternative
- The Preferred Alternative, which is the project as proposed
- The 184K Alternative, featuring a larger Walmart prototype store

The various components (i.e. traffic, water use, impervious area, etc.) of each alternative are summarized in a table following the descriptions of each alternative below.

4.12.1 No-Build Alternative

The site is currently owned by the Highland Avenue Shopping Center Limited Partnership and contains the existing non-conventional Walmart store with other small additional retail uses. Under the no-build alternative, the site would remain as-is with a poorly laid out parking lot and a store in need of site upgrades and maintenance. There would be no changes to existing topography, traffic, or utilities.

The advantages of this alternative are that there will be no alteration of the existing topography, and no need for mitigation of potential impacts noted in other sections of this report. Disadvantages of this alternative would be the under-utilization of a sizeable tract of land in this heavily traveled corridor, in an area specifically zoned by Salem to encourage the type of commercial development that is proposed in the preferred alternative. Subsequently, this would result in a loss of revenue for the City and no new construction related and full-time jobs would be created associated with the redevelopment. Assuming the Walmart were to remain in-place as it exists today with its own independent signalized intersection, the Lowe's development would likely not be feasible at this site if the Walmart did not rebuild. This is due to the fact that an additional new site driveway independently installed for the Lowe's would require a signal and median cut, which due to the spacing and separation distance from the current Walmart signal location, Mass Highway would never allow.

4.12.2 Preferred Alternative

The proposed project will result in the impacts described in this report, including topographic alterations, rock removal, development of lands abutting wetlands, minor changes in area traffic patterns, and negligible utility impacts. The advantages of this alternative are the signalization and roadway network upgrades, a shared signalized intersection with the Lowe's development, fewer parking spaces and less drainage infrastructure needed when compared to the 184K Alternative and a site with a higher grade elevation resulting in a balanced earthwork site (requiring far less construction vehicles entering to and from the site). This higher Walmart site grade elevation also lends to far less earthwork and rock removal required for the Lowe's development due to the site connectivity and shared access driveway and site interconnection. This alternative will also result in increased revenue for the City of Salem, new construction related jobs, new additional full-time positions associated with a larger store, land use consistent with City zoning that provides necessary services to the community, and high value development that places little impact on municipal services.

4.12.3 184K Alternative

Given the commercial nature of the surrounding area, the site zoning and the extensive traffic in the area, the most reasonable site development alternatives feature an increase in the intensity of retail and commercial uses.

The 184K Alternative results in the impacts similar to those described in this report, however it includes significantly more topographic alterations, an unbalanced earthwork site, additional development of lands abutting wetlands and potential wetland filling, additional changes in area traffic patterns and slightly higher utility impacts. This alternative also yields far more

impervious area, requiring more natural resources to construct additional drainage infrastructure and additional retention areas. The advantages of this alternative are the increased revenue for the City of Salem, land use consistent with City zoning that provides necessary services to the community, and high value development that places little impact on municipal services.

4.12.4 Summary Table of Alternatives

Table 11 summarizes the three alternatives considered.

Table 11 Summary of Alternatives Considered For Walmart

	No-Build Alternative	Preferred (Proposed) Alternative	184K Alternative
Impervious Area	7.9± Ac.	10.9± Ac.	16.2± Ac.
Building Area	109,500± sf	152,192± sf	184,109± sf
Traffic (trips/day)	7,130	9,012	10,186
Parking (# of spaces)	379	613	991
Wetlands	0	0	0

NOTE: The No-Build Alternative includes existing accessory retail uses, where the Preferred (Proposed) and 184K Alternative only includes Walmart retail.

5.0 Mitigation

5.1 Wetlands

For the Lowe's Project, there will be one replication area, instead of several, in order to maximize the success of the mitigation process. The mitigation area for the bordering vegetated wetlands and intermittent stream will be located in close proximity and in the same watershed to the impacted areas. Currently, the existing stream and BVW has limited infiltration due to shallow and exposed bedrock and quickly distributes flows to support the large open water wetland down slope. Instead of culverting the stream and providing traditional BVW mitigation options (i.e. additional BVW next to a wetland basin at higher mitigation ratios), the stream and associated BVW will be re-routed through a highly constrained shallow ledge and outcrop region (typical of the existing stream and surrounding area) and replicated in-kind to protect the

interests of the Act. The replication design provides for a 1:1 ratio of BVW mitigation as compared to typical higher ratios. By replicating the same BVW area along the new stream channel it is felt that saturation levels will be more approximately matched throughout the year to that of the existing BVW to the stream and a higher success rate for establishment will result. In addition, matching the quick distribution of surrounding watershed runoff including upper wetland basin overflow volumes to the receiving open water wetland down slope will prevent potential impacts by helping to retain flow distribution timeframes per volume. By replicating the same stream and BVW ratio along the shallow bedrock terrain, flows from the wetland and stream will quickly be distributed to the down slope open water wetland and will approximate the impacted stream characteristics. A significant amount of cost will be associated with the removal of ledge outcrops and underlying bedrock throughout the proposed corridor of the intermittent stream to approximate characteristics of the existing channel. However, it is felt that the magnitude of the proposed project does warrant the cost associated with the stream section relocation.

Figure 10 provides the location and type of proposed wetland mitigation.

The proposed Banks of the replicated section of intermittent stream were designed to provide well defined stable Banks. The Banks along with the intermittent channel will be provided with 12-inches of hydric soil. The hydric soil will require a minimum of 50% organic content to recreate conditions found in the field which typically is a mucky organic layer as described above. The Banks will be stabilized with tree saplings, shrubs, and an herbaceous seed mix. This will allow for root networks to develop, hold, and stabilize the Bank. The intermittent stream bottom and Bank will be temporarily stabilized with continuous jute netting to prevent erosion before herbaceous seeds germinate and tree and shrub root networks develop. Jute netting is commonly sold in 12.5-foot wide rolls that can accommodate a continuous cross-section from stream bottom through Bank limits to allow for a seamless stream protection without seams or overlaps with the exception of roll ends. The intermittent stream and Bank will then have approximately two seasons of erosive protection to allow for permanent stabilization to take hold and before the jute netting biodegrades. As a result of the above measures, the replicated stream section will provide for stable Banks throughout the proposed corridor and will meet the physical stability performance standard of Bank.

The relocated intermittent stream will be designed to outlet from the same stream location as the existing channel just prior to the impact area. The flow will travel to the new access road where it will be culverted to the other side, similar to existing conditions. The intermittent stream will then flow adjacent to the proposed access road to the new Camp Lion facilities where it will eventually flow back into the remaining section of stream just prior to Wetland Area E. The intermittent stream has been designed to allow for similar characteristics as the impacted section. This includes the introduction of micropools and riffle areas, woody debris, the relocation of sections of hollow trees and associated low lying areas to accommodate hydrologic connections for bordering vegetated wetlands. These characteristics are indicated in the mitigation drawing in detail with associated tree and shrub planting tables, cross-section of stream layout, overview of typical stream micropool and riffles design, and associated planting layout. As a result, the stream relocation and associated bordering vegetated wetland replication design will allow for approximately 5,000 square feet of BVW and in excess of 633 linear feet of Bank. The wetland

mitigation plans and a detailed wildlife habitat analysis will be included in the Notice of Intent to be filed with the Salem Conservation Commission.

For the Walmart redevelopment, there are no impacts to wetland resource areas and therefore no mitigation is proposed relative to the WPA.

5.2 Construction Term Stormwater Pollution Prevention

Storm Water Pollution Prevention Plan. The proposed project will result in the disturbance of greater than one acre of land and results in the discharge of stormwater to a surface water of the US or a municipal separate storm system leading to surface waters of the US, it will require the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the EPA's General Permit for Storm Water Discharges from Large and Small Construction Activities.

Lowe's and Walmart are committed to designing and implementing construction term erosion control plans that exceed the minimum requirements established by the EPA's Construction General Permit (CGP). Lowe's and Walmart have each established a National SWPPP development criteria with specific guidance to the design engineers to develop SWPPPs that are more stringent than the minimum requirements set forth in the CGP including: the frequency of required inspections; frequency and nature of monitoring and reporting; mandatory subcontractor training and certification; requirements to achieve final stabilization and monthly training of on-site personnel. The SWPPP criteria are established in the project specifications and provided to all contractors in the bid specifications. In addition, preconstruction training is mandatory and provided by Lowe's and Walmart Project Management to the general site contractor to ensure that the contractor is aware of their responsibilities prior to the start of construction. The individual SWPPP's developed for each portion of the project will include site specific temporary and permanent stabilization practices and temporary and permanent structural practices in accordance with the Construction General Permit.

5.3 Lowe's Operation Term Stormwater Management

An Operation & Maintenance Plan has been developed for this project, and is included in the Drainage Report in Appendix G. The responsible party for maintaining these items and facilities shall be Lowe's. The key components of the Plan include:

The stormwater management system will be the overall responsibility of Lowe's. The General Contractor will appoint a Project Manager who will be responsible during construction. The respective store managers will be responsible for operation and maintenance of the storm water management system during store operations.

Schedule for Inspection and Maintenance after Construction:

- *Deep Sump/Hooded Catch basins & Water Quality inlets:* Catch basins and water quality inlets will be inspected on a quarterly basis. Collection of accumulated sediment and hydrocarbons will be accomplished by means of vacuum pumping. Disposal of

accumulated sediment and hydrocarbons will be performed in accordance with applicable local, state and federal regulations.

- *Sediment Forebays:* After construction, the sediment forebays will be inspected after every major storm for the first few months to ensure proper stabilization and function. Thereafter, they will be inspected monthly. Collection of accumulated sediment should be performed four times per year and when sediment depth is between 3 to 6 feet.

- *Extended Dry Detention Basins:* After construction, the extended dry detention basins will be inspected after every major storm for the first few months to ensure proper stabilization and function. Thereafter, they will be inspected twice per year. The outlet control structure should be examined for evidence of clogging or outflow release greater than design flow at least twice per year. The upper-stage, side slopes, embankment, and emergency spillway should be mowed twice per year. Collection of accumulated sediment should be performed at least once every five years.

- *Stormwater Quality Units:*

    - Inspection: During the first year of operation frequent inspections of the rate of accumulated sediment volume within the grit chamber will be performed. Based on this an appropriate maintenance plan will be established. After the first year, the inspection schedule will be reviewed and modified based on the information from the inspections. At a minimum, inspections will be performed twice per year (spring and fall).

    - The Stormwater Quality units will be cleaned when inspections reveal that the sediment level has accumulated within 12-18" of the dry weather water surface elevation; as per the manufacture's recommendation. Any hazardous material spill will be cleaned immediately.

    - Cleaning: Stormwater Quality units will be cleaned out with a vacuum truck. Cleanout should be done in dry weather conditions when no flow is entering the system.

- *Trash Removal:* The parking lot will be inspected on a frequent basis to remove any trash accumulation.

- *Street sweeping:* Street sweeping will occur at least twice a year, once coinciding with the end of the winter sanding season and once during the late fall.

The entire storm water management system, including piping, catches basins, manholes, and other BMPs will be cleaned prior to final site acceptance. Sediment and debris will be removed and disposed of in a safe and legal manner. The overall storm water management system will be inspected periodically by the Lowe's Store Manager to ensure that all systems are operating properly.

5.4 Walmart Operation Term Stormwater Management

An Operation & Maintenance Plan has been developed for this project, and is included in the Drainage Report in Appendix G. The stormwater management system on the Walmart parcel will be the overall responsibility of Walmart Stores, Inc. The General Contractor will be responsible during construction and the respective store managers will be responsible for operation and maintenance of the storm water management system during store operations.

Schedule for Inspection and Maintenance after Construction:

- *Deep Sump/Hooded Catch basins:* Catch basins and inlets will be inspected on a bi-annual basis. Collection of accumulated sediment and hydrocarbons will be accomplished by means of vacuum pumping. Disposal of accumulated sediment and hydrocarbons will be performed in accordance with applicable local, state and federal regulations.

- *Detention Basins:* After construction, the detention basins will be inspected after every major storm for the first few months to ensure proper stabilization and function. Thereafter, they will be inspected monthly. The outlet control structure should be examined for evidence of clogging or outflow release greater than design flow at least twice per year. The upper-stage, side slopes, embankment, and emergency spillway should be mowed twice per year. Collection of accumulated sediment should be performed at least once every five years.

- *Stormwater Quality Units:*

    - Inspection: During the first year of operation frequent inspections of the rate of accumulated sediment volume within the grit chamber will be performed. Based on this an appropriate maintenance plan will be established. After the first year, the inspection schedule will be reviewed and modified based on the information from the inspections. At a minimum inspections will be performed twice per year (spring and fall).

    - The Stormwater Quality units will be cleaned when inspections reveal that the sediment level has accumulated within 12-18" of the dry weather water surface elevation; as per the manufacture's recommendation. Any hazardous material spill will be cleaned immediately.

    - Cleaning: Stormwater Quality units will be cleaned out with a vacuum truck. Cleanout should be done in dry weather conditions when no flow is entering the system.

- *Trash Removal:* The parking lot will be inspected on a regular basis to remove any trash accumulation.

- *Street sweeping:* Street sweeping will occur at least twice a year, once coinciding with the end of the winter sanding season and once during the late fall.

The entire storm water management system, including piping, catch basins, manholes, and other BMPs will be cleaned prior to final site acceptance. Sediment and debris will be removed and disposed of in a safe and legal manner. The overall storm water management system on the Walmart parcel will be inspected periodically by the Walmart Store Manager to ensure that all systems are operating properly.

5.5 Waste Management

5.5.1 Construction Term Lowe's and Walmart

According to MGL Ch 40 Sec 54, every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by section 150 A of Chapter 111. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed of as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate. The contractor will be responsible for securing the building permits for demolition activities.

Air Pollution

Dust suppression and dust control measures shall be employed during building demolition and construction so that no visible dust emissions leave the Site for the duration of the work. The primary suppression methods include the application of water to site soil or the use of other dust control measures such as the application of calcium chloride. In evaluating the effectiveness of dust control measures for a particular activity, weather conditions such as wind speed and direction will be considered.

There will be a concerted effort to identify the maximum amount of demolition and construction debris which can be reused and/or recycled. This approach greatly reduces the costs associated with direct disposal, a common goal for both the developer and contractor. For the Walmart demolition, hazardous building materials which require special handling and disposal will be identified. Walmart will also seek a Beneficial Use Determination for the on site reuse of coated or painted concrete and brick. Uncoated concrete and brick will be reused in accordance with DEP's asphalt, brick, and concrete (ABC) reuse policy. Through these two programs, the project intends to reuse nearly all of the concrete and brick on site. In addition during the bid process, the contractor will identify those components which can be recycled and/or reused on site, including steel and other metals. The remaining debris which cannot be recycled or reused including wall board, wood and aluminum will be disposed of in accordance with Massachusetts DEP Solid Waste Regulations.

Walmart and their contractors are committed to reusing and/or recycling the maximum amount of waste. The proponent and contractor will implement a waste management plan that includes diverting construction waste that can be reused and/or recycled from landfill disposal. The goal of the construction waste management plan will be to reuse/recycle at least 50% of the waste.

Construction and Demolition (C & D) Recycling:

The goal of Walmart's Construction and Demolition (C&D) program is to capture and recycle the metals, woods, floor and ceiling tiles, concretes, asphalts and other materials generated as part of Walmart's demolition and construction process. Prior to the site demolition activities required at this location, Walmart will contract with a waste management company to fully research all locations where construction activities will occur and provide a system specially designed to provide the widest possible range of materials recovery options for the new Salem store location, including the particular type of construction. The waste management company will work with each general contractor and Walmart construction project manager to ensure full engagement.

5.5.2 Operation Term Waste Management

5.5.2.1 Lowe's Waste Management and Social Responsibility

The proposed redevelopment will integrate numerous sustainable design components that will serve to avoid or minimize potential environmental impacts.

ENERGY STAR®: Lowe's earned honors from the EPA and the Department of Energy's ENERGY STAR® award for the sixth year in a row (2003-2008).

SmartWay Transport Partner: In October 2008, Lowe's earned the second Environmental Excellence Award from the U.S. EPA SmartWay℠ Transport Partnership. Lowe's was recognized for their leadership in conserving energy and lowering greenhouse gas emissions through effective use of transportation and freight delivery system. To earn the award, Lowe's implemented initiatives that resulted in reduced carbon dioxide emissions and less overall highway congestion. These included increasing shipping by rail; instituting a more efficient process for inbound and outbound freight deliveries; increasing efficiency of truckload shipments allowing more products to be shipped on fewer trailers, and continuing to use a higher percentage of SmartWay carriers.

Lowe's maintains a recycling program at each store and recycled items include rechargeable batteries, scrap metal, cardboard, and wooden pallets. In 2007, Lowe's recycled the following:

- 140,000 tons of cardboard
- 76 tons of shrink wrap at distribution centers
- 141 tons of scrap metal
- 233,000 fluorescent bulbs
- 8 million wood pallets

In an effort to reduce waste, Lowe's shipping and packaging materials such as shrink wrap are removed at the distribution centers which reduce the amount of packaging materials delivered to each store. The majority of goods are either packed in cardboard or stacked on wooden pallets. The cardboard is baled at each store and picked up for recycling by a vendor. The pallets are stored in a trailer and picked up for recycling (in most cases resold) by a vendor. In addition to cardboard and pallets, Lowe's maintains a Rechargeable Battery Program with 85% of stores participating. The batteries are collected from customers and stored inside the store in boxes. The batteries are picked up by a vendor and recycled. Those items which are not recyclable are stored in metal hopper bins, compacted and transferred to waste containers for pick up and off site disposals by a waste hauler.

Returned products slated for recycling, including white goods, are stored in the rear of the building in a fenced in area, or stored in a trailer located along the rear of the building. The trailer contents are picked up by a vendor who removes and recycles the merchandise as scrap metal.

According to the DEP, items restricted for disposal, transfer for disposal and contracting for disposal of certain hazardous and recyclable items at solid waste facilities in Massachusetts include the following:

Recyclable Paper: All paper, cardboard, and paperboard products (except tissue paper, toweling, paper plates and cups, wax-coated cardboard and other low-grade paper products). All cardboard and paperboard products are baled, stored and removed by an outside vendor for recycling.

Glass Containers: Glass bottles and jars. The ban does not cover light bulbs, Pyrex cookware, plate glass, drinking glasses, windows, windshields and ceramics. This is not applicable to the operation of a Lowe's store.

Metal Containers: Aluminum, steel or bi-metal beverage and food containers. The recycling of aluminum cans is at the discretion of store employees.

Single Resin Narrow-Necked Plastics: A soda bottle is narrow-necked but a yogurt container is not. The recycling of plastics is at the discretion of store employees.

Leaves & Yard Waste: Leaves, grass clippings, weeds, garden materials, shrub trimmings, and brush one-inch or less in diameter (excluding diseased plants). – Each Lowe's site is maintained by a landscape company and all waste associated with landscape care is removed from the site by the landscape contractor.

Batteries: Lead-acid batteries used in motor vehicles or stationary applications.- not applicable to Lowe's operations, however Lowe's does have a Rechargeable Battery Recycling Program which began in 2004 and has collected more than 207,000 pounds of rechargeable batteries from customers. The equipment requiring batteries including forklifts are serviced by an outside vendor and items such as batteries, tires, fluids, etc are serviced and disposed of off site by the vendor.

White Goods: Appliances employing electricity, oil, natural gas or liquefied petroleum gas. These include refrigerators, freezers, dishwashers, clothes washers, clothes dryers, gas or electric ovens and ranges, and hot water heaters. White good items targeted for removal from the store are stored in trailers at the rear of the building, picked up and recycled by an outside vendor.

Whole Tires: Motor vehicle tires of all types (Incinerators and transfer stations can accept whole tires. Shredded tires are not restricted). Not applicable to Lowe's operations.

Cathode Ray Tubes: Any intact, broken or processed glass tube used to provide the visual display in televisions, computer monitors and certain scientific instruments. Not applicable to Lowe's operations.

Generally, hazardous waste including cleaning products, pesticides, paints, solvents etc. is often the result of a spill during the shipping process or during stocking or customer purchasing. Absorbent pads used for spill cleanup which are available in spill kits located within the store. Some of the items, including cleaning products are used in the general maintenance of the store. Those that cannot be used on site are bagged, tagged, logged and inventoried, then transferred to a tray or shelf within a caged area at the rear of the store. The caged area is enclosed by an overhead structure to prevent mixing with stormwater runoff. In addition, a barrel is placed beneath the shelf as secondary containment in case of a leak. The materials are then removed for disposal by an outside vendor. All Lowe's employees are trained in spill prevention and clean-up.

Each Lowe's store maintains an inventory of pallet recycling and a percentage weight of cardboard recycling and provides an efficiency report to corporate on an annual basis. The inventory is part of the much larger company wide recycling effort with an emphasis on increasing the nationwide recycling effort. Further information regarding these initiatives can be found at www.lowes.com/socialresponsibility.

5.5.2.2 Walmart Waste Management and Social Responsibility

The proposed redevelopment will integrate numerous sustainable design components that will serve to avoid or minimize potential environmental impacts. Walmart is taking many efforts to achieve their goal to be supplied 100 percent by renewable energy and to create zero waste. Walmart is constantly working towards cutting out waste in the operations and supply chain to save companies and to save millions of dollars every year by reducing the amount of natural resources consumed as well as the overall impact on the environment. The following is a summary of some of the key components that Walmart will implement at this store location:

Recycling

Plastic: Loose plastic is unruly and hard to collect for recycling, so Walmart has implemented an innovative solution called the "Super Sandwich Bale." Like a sandwich, the plastic is pressed between two stacks of cardboard then bundled for transportation. Walmart has introduced this process into all of its stores and so far, it is estimated that they have diverted more than 182 million pounds of plastic from landfills.

Cardboard: In the past three years, more than 25 billion pounds of cardboard from the back of Walmart stores and distribution centers have been sent to paper mills across the United States and Asia to be recycled into new paper products. By recycling this cardboard, Walmart saved approximately 216 million trees.

Miscellaneous: The Super Sandwich Bale can process 32 recyclable items, including aluminum cans, plastic hangers, plastic water and soda bottles, office paper, paperback books and other recyclable items. Using this technique, Walmart has diverted 18.9 million pounds of plastic hangers, 12.4 million pounds of office paper and 1.3 million pounds of aluminum from going to landfills.

Electronics: Walmart's Electronics Network is working with various organizations, government agencies, suppliers and other interested companies to develop and sell environmentally friendly and energy-efficient electronics. They are also seeking solutions to the growing problem of E-waste (electronic waste) by offering recycling services to its customers.

In 2007, Walmart released the metrics for their "Electronics Scorecard" that will rate their suppliers' products on energy efficiency, durability, the ease and ability to upgrade, compliance with the European RoHS directive, end-of-life solutions and packaging size. Beginning in 2008, the scorecard will be available to suppliers for initial product entries. Some electronics contain hazardous materials such as lead, mercury and cadmium. To reduce the amount of dangerous materials that end up in customers' homes, Walmart encourages all of their suppliers to adhere to strict standards under the European Restriction on Hazardous Substances (RoHS). This directive eliminates the use of six hazardous materials in electronics, including those listed above. Currently, many of Walmart's electronics are RoHS compliant, including all of their laptops and computers. Walmart has also partnered with Toshiba America Information Systems, Inc. to offer the first RoHS laptop sold on the retail market in the United States.

In 2006, Walmart began hosting E-waste "Take Back" days in their parking lots across the United States, and have hosted several throughout 2007. Walmart's Take Back days enabled them to collect more than 1.75 million pounds of unwanted electronics to be sent to certified recyclers rather than landfills.

Electricity is a valuable commodity that requires other energy sources, such as oil and coal, to produce. Walmart is working with suppliers to develop more energy-efficient product models for the same price. Walmart sells Energy Star electronics and is educating customers to unplug electronics when not in use in order to reduce "phantom energy consumption."

Cell phones and ink cartridges for printers are two of Walmart's most frequently purchased items in the electronics department. These two items are also recyclable. Walmart places prepaid mail-in recycling bags for cell phones and ink cartridges in the electronics department within the store. Using these bags, customers can mail phones and cartridges to certified recycling center for processing at no cost.

Reuse

The store will include a program that allows customers to purchase reusable bags. This program offers two different types of reusable bags with prices starting at just 50 cents a piece. By making reusable bags accessible and affordable to all of its customers, Walmart has sold enough bags to eliminate the need for more than 1.5 billion disposable bags.

The store will sell black reusable bags, which are offered to its customers for $1 each. These black bags are made with recycled polyethylene terephthalate (RPET) plastic generated from soda or water bottles. Customers can expect each bag to last approximately two years with regular use, and each bag will hold merchandise weighing up to 35 lbs. Estimates show that each black reusable bag will eliminate the need for at least 150 plastic disposable bags over its lifetime. When it wears out, customers can return the bag to any local Walmart store for recycling. Walmart then combines the worn bags with the rest of the used plastic generated by its stores into the super sandwich bales, where it will be bundled and sent to a certified recycler for processing.

The other option available is to purchase a blue reusable bag, offered for 50 cents each. These blue bags are made from non-woven polypropylene, manufactured from a by-product of oil refining. Each blue bag will last approximately six months with regular use and will hold merchandise weighing up to 22 lbs. One blue reusable bag will eliminate the need for up to 75 disposable bags over its lifetime. Like the black bag, this bag also can also be recycled when it has worn out.

Recycled Products and Waste Stream

Walmart has performed a waste stream audit to analyze and identify areas for improvement. With these results, they are streamlining their practices and running their business more efficiently, while helping the environment by cutting down on unnecessary waste.

Materials and Finishes

Cement manufacturing requires a chemical conversion of limestone that creates greenhouse gases and requires very high kiln temperatures (+1,500 degrees). Fly ash, a waste product of coal-fired electrical generation, and slag, a waste product of steel manufacturing, can replace a percentage of cement in concrete. The construction of the new Walmart store will include approximately 15-20 percent replacement of cement with fly ash or a 25-30 percent replacement with slag in its concrete mixes. By incorporating these materials, the new construction will reduce the amount of a natural resource (limestone) needed to build the store and will replace a material that creates large amounts of greenhouse gases with a waste product that would otherwise be sent to a landfill.

The store construction will include base cabinets, wall cabinets and counters which are manufactured from particle board and medium-density fiberboard. These materials are waste products from sawmills.

The store construction will include baseboards which are manufactured from 100 percent recycled plastic, made mostly from unused diaper scraps. This product can also be recycled as part of the closed-loop recycling program.

The store construction will also include Non-Reinforced Thermoplastic Panels (NRP) in lieu of Fiber Reinforced Plastic (FRP) sheets on the walls of its kitchen areas. FRP contains fiberglass and therefore cannot be recycled. NRP can be recycled, has better impact resistance and, like FRP, is easy to keep clean.

The store will feature exposed concrete floors to reduce surface applied flooring materials. This approach eliminates the need for most chemical cleaners, including wax strippers and propane-powered buffing. This flooring system will consist of concrete slabs which are integrally colored.

Building construction specifications for the store will specify the use of an environmentally friendly concrete form release agent. A form release agent is a product sprayed on concrete forms to allow ease of removal after the concrete has set. The Walmart design specifies a release agent which contains a natural plant-based oil extracted from a renewable resource. It is non-petroleum based, non-toxic and a biodegradable agent.

The paint products that will be specified for the store interior and exterior paint coatings will be better performing, which contain lower VOC content limits when compared to conventional paint. The use of this paint reduces the volatile organic compounds (VOCs) by approximately 40 percent. The updated paint schedule that Walmart will implement takes advantage of ongoing improvements in paint technology requiring fewer types of paint products.

The paint for this store will be purchased by Walmart Stores, Inc. Walmart purchases paint products globally, ensuring quality and durability, and enabling Walmart and its contractors to better estimate the amount of paint required for the store. As part of the waste reduction initiative, the paint products will be primarily purchased in 55 gallon drums and 275 gallon totes, substantially reducing the number of one gallon and five gallon buckets. These plastic buckets are filled from the drums and totes and then returned to the paint supplier for cleaning and reuse, a process conducted through Walmart's construction waste program.

Walmart is working diligently toward achieving its sustainability goals by striving to build more energy efficient buildings while reducing their environmental footprint, and helping its customers save money and live better. For information about Walmart's sustainability initiatives, please visit: www.walmartstores.com/sustainability.

5.6 Noise Mitigation

Lowe's and Walmart

The project proponents are committed to minimizing the impacts of noise during construction. The vicinity currently has substantial ambient noise levels associated with traffic along the abutting state roadway, Route 107 (aka Highland Avenue). There are residences located in the

site vicinity, however, these are located only to the northwest of the proposed Walmart development and are separated by a buffer.

However, reasonable efforts will be undertaken to minimize impacts of noise associated with construction efforts and will include the items detailed below:

- Equipment will not needlessly idle on site during construction.
- Enclosures or barriers will be provided on equipment that operate continuously.
- Equipment used throughout construction will be maintained properly with a particular attention put to proper operation of equipment mufflers.

5.7 Traffic Mitigation

Mitigation measures considered desirable to improve roadway system deficiencies are proposed and discussed below as they relate to the impacts of the proposed project and other developments within the study area. A description of the proposed mitigation measures is provided below along with capacity and queue analyses to document the effects of the mitigation measures.

5.7.1 Highland Avenue at the Site Driveways

As part of the proposed site redevelopment, the existing main signalized site driveway will be relocated further south to the location of the existing southerly right-turn in/right-turn out driveway. The curb cut at the location of the existing main site driveway will be closed, thereby reducing the number of curb cuts along Highland Avenue.

Although acceptable service levels are expected at the main site driveway under the Build (without improvements) condition during the analyzed peak hours, the Highland Avenue northbound left-turn lane is expected to operate at LOS E during the Saturday midday peak hour with queue lengths extended beyond the available storage length. In addition, the expected queue length for vehicles turning left out of the main site driveway onto Highland Avenue is also expected to extend beyond the available storage length without improvements. Accordingly, to address these issues, the proposed signalized site driveway intersection with Highland Avenue will be widened to include additional turn lanes.

The relocated driveway will be located opposite an existing commercial driveway providing signalized access/egress to this use which is currently not provided. A Highland Avenue exclusive southbound left-turn lane will be constructed providing access into the commercial site as well as allow U-turn movements which are currently not allowed at the existing signalized site driveway location. With a high percentage of truck traffic using the storage facility along Highland Avenue, the inclusion of this U-turn movement into the signal control will provide increased safety to the corridor.

On the Highland Avenue northbound approach to the proposed signalized site driveway location, the roadway will be widened to provide two exclusive left-turn lanes into the site. The storage length for this movement will also be extended as part of the project. The site driveway

approach will be modified to provide an exclusive left-turn lane, a shared left-turn/through lane, and an exclusive right-turn lane. The storage length of the main site driveway approach will also be extended as part of the proposed project. All left turns at this intersection will be protected movements only, which will allow these movements to be made without conflicting traffic. The Highland Avenue southbound travel lanes beyond the site driveway will be realigned to improve the weave area from two lanes to one. Additional signage will be installed to better define the lane usage on Highland Avenue and site driveway approaches as well as the southbound merge.

Current access to the Meineke and the Camp Lion site along Highland Avenue to the south of the site will be maintained and improved to meet current state design standards. A right-turn in and right-turn out only cross connection will also be provided to the existing Meineke located along the proposed main site driveway. All driveways will be designed in accordance with current local and state standards.

5.7.2 Western Avenue at Fays Avenue

Under No-Build conditions, the intersection of Western Avenue at Fays Avenue is expected to operate at capacity during the weekday PM peak hour with the Western Avenue southbound approach operating at LOS E. Deficiencies are expected to continue with the addition of site traffic without intersection improvements. To mitigate the project's traffic impact at this location and address existing operational deficiencies, an exclusive right-turn lane is proposed on the Western Avenue southbound approach to Fays Avenue. In addition, the existing traffic signal equipment will be replaced and traffic signal timing changes are proposed to increase the amount of "green time" provided to the Western Avenue approaches during each signal cycle. The combination of these measures will mitigate the traffic impact of the project and improve the intersection operations over the No-Build condition.

5.7.3 Analysis Results with Mitigation

Level-of-service and queue analyses were completed at the intersection of Highland Avenue and the main site driveway as well as at the intersection of Western Avenue and Fays Avenue, assuming implementation of the recommended traffic mitigation measures. The results of these analyses under 2014 Build Mitigated conditions are summarized in Table 13. All analysis worksheets are provided in the Appendix.

With the implementation of the improvements described at the intersection of Highland Avenue and the main site driveway, the intersection is expected to operate at an overall LOS B or better during the analyzed peak hours will all lane groups operating at LOS D or better. Vehicle queue lengths are not expected to exceed the available storage lengths with the implementation of the proposed mitigation measures. The existing northerly right-in/right-out site driveway is expected to operate at LOS B during the analyzed peak hours.

With the implementation of the improvements described at the intersection of Western Avenue and Fays Avenue, the intersection is expected to operate at an overall LOS C or better during the analyzed peak hours with all lane groups operating at LOS D or better. Vehicle queue lengths are not expected to exceed the available storage lengths with the implementation of the proposed mitigation measures.

Table 12 **Intersection Capacity Analysis Summary – With Mitigation**

Intersection/Peak Hour/Lane Group	2014 No-Build				2014 Build				2014 Build Mitigated			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Highland Avenue at Walmart Main Driveway												
Weekday AM:												
Walmart main driveway EB left-turns	0.40	35.0	D	27/38	0.55	35.4	D	46/55	0.37	34.9	C	24/35
Walmart main driveway EB left-turns/throughs	--	--	--	--	--	--	--	--	0.37	34.9	C	25/36
Walmart main driveway EB right-turns	0.01	24.6	C	0/5	0.05	21.4	C	1/9	0.05	33.3	C	0/12
Self-Storage driveway WB approach	--	--	--	--	--	--	--	--	0.05	38.5	D	1/9
Highland Avenue NB left-turns	0.48	36.4	D	29/61	0.54	35.0	C	49/88	0.38	35.2	D	25/46
Highland Avenue NB throughs	0.48	3.0	A	77/125	0.49	3.6	A	90/154	0.58	8.6	A	76/315
Highland Avenue SB left-turns	--	--	--	--	--	--	--	--	0.25	25.6	C	5/12
Highland Avenue SB throughs	0.41	1.8	A	10/25	0.44	2.6	A	14/28	0.46	3.2	A	6/38
Highland Avenue SB right-turns	0.03	0.0	A	0/0	0.02	0.2	A	1/1	0.02	0.0	A	0/0
Overall Intersection	**0.47**	**4.1**	**A**	--	**0.50**	**6.1**	**A**	--	**0.52**	**9.3**	**A**	--

Weekday PM:												
Walmart main driveway EB left-turns	0.55	40.8	D	51/92	0.77	43.5	D	140/213	0.58	38.9	D	76/141
Walmart main driveway EB left-turns/throughs	--	--	--	--	--	--	--	--	0.58	38.9	D	88/154
Walmart main driveway EB right-turns	0.05	26.1	C	5/26	0.31	17.9	B	64/114	0.14	34.6	C	60/120
Self-Storage driveway WB approach	--	--	--	--	--	--	--	--	0.06	44.0	D	5/24
Highland Avenue NB left-turns	0.56	40.7	D	56/102	0.80	47.6	D	133/265	0.60	39.0	D	75/118
Highland Avenue NB throughs	0.38	2.6	A	66/112	0.41	5.4	A	109/156	0.47	9.4	A	128/292
Highland Avenue SB left-turns	--	--	--	--	--	--	--	--	0.16	27.7	C	11/24
Highland Avenue SB throughs	0.52	2.6	A	24/40	0.73	11.7	B	321/321	0.66	8.0	A	194/349
Highland Avenue SB right-turns	0.06	0.1	A	0/0	0.08	1.6	A	3/3	0.08	0.0	A	9/30
Overall Intersection	**0.53**	**5.7**	**A**	--	**0.75**	**15.1**	**B**	--	**0.62**	**15.1**	**B**	--

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

Table 12 (Continued) Intersection Capacity Analysis Summary – With Mitigation

Intersection/Peak Hour/Lane Group	2014 No-Build				2014 Build				2014 Build Mitigated			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Highland Avenue at Walmart Main Driveway *Saturday Midday:*												
Walmart main driveway EB left-turns	0.64	34.8	C	87/141	0.83	39.5	D	183/368	0.66	34.8	C	85/148
Walmart main driveway EB left-turns/throughs	--	--	--	--	--	--	--	--	0.66	34.8	C	102/172
Walmart main driveway EB right-turns	0.02	16.0	B	0/13	0.29	10.5	B	61/119	0.16	28.2	C	68/129
Self-Storage driveway WB approach	--	--	--	--	--	--	--	--	0.05	38.8	D	4/229
Highland Avenue NB left-turns	0.62	34.2	C	82/136	1.01	78.1	E	214/380	0.66	33.2	C	90/140
Highland Avenue NB throughs	0.44	4.6	A	93/154	0.48	8.2	A	131/144	0.47	7.6	A	74/139
Highland Avenue SB left-turns	--	--	--	--	--	--	--	--	0.05	9.8	A	9/30
Highland Avenue SB throughs	0.59	6.9	A	42/128	0.88	22.8	C	272/272	0.75	15.3	B	200/315
Highland Avenue SB right-turns	0.12	2.4	A	0/0	0.15	4.3	A	25/25	0.12	0.2	A	36/79
Overall Intersection	**0.60**	**9.2**	**A**	--	**0.90**	**24.3**	**C**	--	**0.69**	**17.2**	**B**	--

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

Table 12 (Continued) Intersection Capacity Analysis Summary – With Mitigation

Intersection/Peak Hour/Lane Group	2014 No-Build				2014 Build				2014 Build Mitigated			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Western Avenue at Fays Avenue[e]												
Weekday AM:												
Fays Avenue EB approach	0.48	32.5	C	50/93	0.50	33.2	C	48/80	0.63	44.9	D	58/104
Western Avenue NB left-turns	0.09	9.9	A	31/62	0.09	10.4	B	17/64	0.09	8.4	A	25/61
Western Avenue NB throughs	0.91	13.7	B	170/394	0.92	15.9	B	144/349	0.90	12.2	B	242/574
Western Avenue SB throughs/right-turns	0.96	32.4	C	404/661	0.96	33.9	C	370/694	--	--	--	--
Western Avenue SB throughs	--	--	--	--	--	--	--	--	0.87	19.9	B	374/678
Western Avenue SB right-turns	--	--	--	--	--	--	--	--	0.02	5.7	A	8/46
Overall Intersection	**0.86**	**22.1**	**C**	--	**0.88**	**23.9**	**C**	--	**0.87**	**16.6**	**B**	--
Weekday PM:												
Fays Avenue EB approach	0.41	29.0	C	43/77	0.54	31.0	C	60/130	0.68	48.0	D	48/99
Western Avenue NB left-turns	0.22	28.9	C	45/93	0.22	28.9	C	50/101	0.27	36.3	D	40/75

Western Avenue NB throughs	0.78	6.7	A	202/537	0.85	9.5	A	245/618	0.81	7.1	A	145/389
Western Avenue SB throughs/right-turns	1.08	64.1	E	1,150/2,180	1.19	106.1	F	1,241/2,300	--	--	--	--
Western Avenue SB throughs	--	--	--	--	--	--	--	--	1.02	42.6	D	309/608
Western Avenue SB right-turns	--	--	--	--	--	--	--	--	0.05	3.6	A	17/80
Overall Intersection	**1.00**	**36.7**	**D**	--	**1.10**	**59.0**	**E**	--	**0.99**	**26.1**	**C**	--
Saturday Midday:												
Fays Avenue EB approach	0.48	30.7	C	62/114	0.63	36.1	D	64/103	0.67	46.5	D	73/122
Western Avenue NB left-turns	0.20	15.2	B	34/72	0.20	27.9	C	32/65	0.23	19.6	B	39/79
Western Avenue NB throughs	0.79	7.2	A	184/375	0.89	12.5	B	462/1,035	0.86	10.4	B	192/375
Western Avenue SB throughs/right-turns	1.00	38.1	D	492/841	1.12	78.5	E	1,698/1,887	--	--	--	--
Western Avenue SB throughs	--	--	--	--	--	--	--	--	0.97	31.0	C	406/701
Western Avenue SB right-turns	--	--	--	--	--	--	--	--	0.06	4.9	A	36/113
Overall Intersection	**0.93**	**22.7**	**C**	--	**1.06**	**44.4**	**D**	--	**0.94**	**21.0**	**C**	--

[a] Volume-to-capacity ratio
[b] Average control delay in seconds per vehicle
[c] Level of service
[d] Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle)
[e] Since volume to capacity ratios are at or exceed 1.00 at this location, the SimTraffic modeling program was used to determine queue lengths.

5.7.4 Transportation Demand Management Measures

In recognition of the existing and future traffic demands on the study area roadway system, a number of Transportation Demand Management (TDM) measures are proposed and will be implemented by the proponent to help reduce the number of single occupant vehicles (SOV) traveling to and from the site and to encourage the use of alternative modes of transportation to reach the site and better manage the traffic generated by the project. Retail uses generally do not lend themselves well to TDM strategies since most of the traffic generated is customer related, rather than employee trips. However, in an effort to maximize employee vehicle occupancy and thereby reduce the vehicular demand to the site, TDM strategies are being considered by the proponent that include ridesharing, public transportation, bicycling, and pedestrian travel. These strategies are discussed below:

- Investigate the feasibility of creating a local Transportation Management Association (TMA) with other nearby businesses, as there is no TMA currently serving the project area.
- Provide secure bicycle racks/storage.
- Provide promotions to increase participation in all TDM practices, post and distribute announcements and newsletters regarding available TDM programs to employees, and provide materials that publicize the economic and environmental benefits of the available TDM practices.
- Investigate a ride-matching program (carpool/vanpool) to assist employees to find appropriate carpool and vanpool matches. This program would be coordinated with MassRides (formerly Caravan for Commuters, Inc.). This organization operates a commuter hotline, a vanpool program, and a computerized ride-match program.
- Act as a resource and provide MBTA bus schedules and other up-to-date information about the program's services.
- Provide staggered work shifts to reduce peak period traffic volumes. The resulting decrease in peak period traffic congestion may result in reduced vehicle emissions from increased travel speeds and reduced delays (idling emissions) at intersections.
- Promote the establishment and use of direct deposit of employee paychecks.
- Provide on-site food service within Walmart for employees and customers of both Lowe's and Walmart.
- Advocate the use of the internet and shop-by-phone as shopping alternatives for the project.
- Encourage suppliers to schedule their deliveries during weekday afternoon non-peak hours to reduce traffic congestion during busy periods.
- Construction sidewalks, marked crosswalks, pedestrian traffic signals, lighting, and landscaping to encourage pedestrian use within the project.

5.8 Air Quality

MEPA has established a GHG Emissions Policy and Protocol[2] which requires a quantified analysis of carbon dioxide (CO_2) emissions resulting from both "direct" (i.e. stack emissions) and "indirect" sources (i.e. vehicle travel and generation of supplied electricity). The Greenhouse Gas Analysis report is provided in Appendix F. The project will commit to the following six (6) site design mitigation measures (see Appendix F for details):

1. Sustainable Development Principles
2. Protect Open Space on the Project Site
3. Conserve and Restore Natural Areas On-Site
4. Minimize Building Footprint
5. Design Project to Support Alternative Transportation
6. Design Water Efficient Landscaping

The project will commit to the following 19 building design and operation mitigation measures (see Appendix F for details):

1. Seal, Leak Test and Insulate HVAC Supply Ducts
2. Energy Management Systems
3. Install Higher-Efficiency HVAC Systems
4. Energy Efficient Windows and Building Envelope
5. Install Energy Efficient Interior Lighting
6. Maximize Interior Day-Lighting (Skylights)
7. Incorporate Motion Sensors in Lighting
8. Use Energy Efficient Exterior Lighting
9. Use Highly-Reflective, Cool Roofing Materials
10. Waste Heat Recovery
11. Energy STAR Appliances and Products
12. Purchase Renewable Energy
13. Use Water Conserving Fixtures
14. Provide Storage and Collection of Recyclables in Building Design
15. Conduct Building Commissioning to Ensure Energy Performance
16. Use Building Materials with Recycled Content, Building Materials that are Manufactured within the Region, Use Rapidly Renewable Building Materials, and Use Low-VOC Building Materials
17. Lowe's Energy Awareness Delivers Savings (LEADS) Program
18. Operations Waste Management Program
19. Demolition and Construction Materials Recycling
20. Provide Solar-Ready Roof Space for Future Third-Party PV System

The project will commit to the following 17 transportation mitigation measures (see Appendix F for details):

1. Develop Multi-Use Paths To and Through Site
2. Size Parking to Meet, Not Exceed, Local Parking Requirements

3. Develop a Parking Management Program to Minimize Parking Requirements
4. Provide On-Site Food Service
5. Provide Bicycle Storage
6. Appoint an ETC and Distribute Ridesharing/Transit Information
7. Roadway and Signalization Improvements to Improve traffic Flow
8. Internet Shopping
9. Preferential Parking
10. Form a Transportation Management Association
11. Offer Alternative Work Schedules
12. Rideshare Program
13. Direct Deposit for Employees
14. EPA SmartWay
15. No-Idling Truck Zones
16. Guaranteed Ride Home
17. Locate New Buildings Near Transit

6.0 Sustainable Design Features

Mitigation measures regarding sustainable design are discussed in the following sections.

6.1 Lowe's Prototypical Sustainable Design Elements

The following is a list of LEED sustainable design items that the Lowe's current prototype building and construction program qualifies for without modifications. It is important to note that all stores are unique in their ability to incorporate the listed LEED criteria and/or additional sustainable elements due to location and financing structure.

Sustainable Sites: Construction Activity Pollution Prevention – Erosion and Sedimentation control (SWPPP). Lowe's National Storm Water Pollution Prevention Program is committed to designing and implementing construction term erosion control plans that exceed the minimum requirements established by the EPA's Construction General Permit (CGP).

Sustainable Sites: Heat Island Effect, roof credit is achieved through the reduction of the heat island effect by using a white-colored thermoplastic olefin (TPO) membrane roofing.

Sustainable Sites: Light pollution credit is achieved by minimizing light trespass from the building and the site.

Water Efficiency: water use reduction credit is achieved through the use of low-flow plumbing with sensors. In addition, there is no irrigation system proposed for the Salem store.

Energy & Atmosphere: fundamental commissioning of the building energy system prerequisite is achieved through post construction building commissioning program.

Energy & Atmosphere: minimum energy performance prerequisite achieved through Lowe's automated Energy Management System of lighting and HVAC system.

Energy & Atmosphere: fundamental refrigerant management prerequisite is achieved through the reduction in the use of CFC-based refrigerants in HVAC&R equipment.

Energy & Atmosphere: optimize energy performance credit is achieved through the reduction in energy demand.

Energy & Atmosphere: enhanced refrigerant management credit is achieved through reducing the use of ozone depleting refrigerants.

Energy & Atmosphere: measurement and verification credit is achieved through the evaluation of building and/or energy performance.

Energy & Atmosphere: green power credit is achieved through the purchase of a portion of electricity demand from renewable sources.

Materials & Resources: storage and collection of recyclables prerequisite is achieved by providing adequate space within the building design for recyclables as well as implementing a recycling program.

Materials & Resources: regional materials credit is achieved through procurement of local building materials.

Indoor Environmental Quality: minimum Indoor Environmental Quality performance prerequisite is achieved by designing ventilation systems to meet or exceed the minimum outdoor air ventilation rates.

Indoor Environmental Quality: Environmental Tobacco Smoke Control prerequisite is achieved with a "no smoking" policy established by Lowe's.

Indoor Environmental Quality: outdoor air delivery monitoring credit is achieved by monitoring the ventilation system for carbon dioxide levels to sustain occupant comfort.

Indoor Environmental Quality: thermal comfort credit (design) is achieved by designing the HVAC system and building envelope to provide for comfortable thermal environment for building occupants.

Indoor Environmental Quality: thermal comfort (verification) credit is achieved by assessing and calibrating over a set amount of time the building's thermal comfort levels.

6.2 Lowe's Project Specific Sustainable Design Elements

The following sustainable elements will be implemented into the Salem store:

Site Design

A site specific Storm Water Pollution Prevention Plan (SWPPP) is prepared for all Lowe's stores. Lowe's has established a National SWPPP Program which requires more stringent requirements than those set forth in the EPA Construction General Permit including: the frequency of required inspections; frequency and nature of monitoring and reporting; mandatory subcontractor training and certification; requirements to achieve final stabilization and monthly training of on-site personnel.

Reduce storm water rate and quantity to limit disruption and pollution of natural water flows: Storm water management controls were developed for the 2-, 10-, 25-, 50-, and 100-year 24-hour storm events. For all the analyzed storm events, there will be no increase in peak discharge rates as a result of the project. As far as quality, best management practices will be provided and will include roadway sweeping, deep sump/hooded catch basins, water quality structures utilizing hydrodynamic separation, sedimentation forebay, and extended dry detention basins. The incorporation of these BMPs will achieve a cumulative TSS removal rate of 91 percent.

Eliminate landscape irrigation through a selection of drought tolerant and low water use species.

Bicycle facilities will be constructed to promote the use of bicycles for both employees and customers.

Building Design

Install high-efficiency HVAC system.

Use of insulation on the roof to minimize heat loss.

Reduced heat island effect with use of white-colored thermoplastic olefin (TPO) membrane roofing.

Incorporate motion sensors and lighting in office space to reduce energy consumption.

Install partial skylights at the Garden Center to reduce electrical usage for lighting.

Display lighting, garden center lighting, site lighting, site signage, and security lighting are controlled by photo-sensors and/or time of day scheduling.

Use low-flow plumbing systems in lavatories including sensor controlled hands free sinks and lavatory units.

Use of exposed interior structures to conserve a significant amount of finished material consumed.

Construction and Building Operations

Fit construction equipment with mufflers or other regulatory-required emissions control devices.

Use of ultra-low sulfur diesel fuel for off road construction vehicles.

Recycle steel and concrete (as appropriate).

Energy efficiency through the use of Building Energy Management System.

Environmental Tobacco Smoke Control achieved through the no smoking policy established by Lowe's.

Indoor air quality achieved by meeting the ASRAE Ventilation for Acceptable Indoor Air Quality requirements.

Product Sales and Services

Lowe's offers the following sustainable products to customers:

ThermaStar Doors and Windows

EnergyStar qualified appliances

FSC Certified Wood

Lowe's SmartWay Transport Partnership Program

Lowe's currently implements a program to reduce energy usage associated with trucking operations through a corporate wide SmartWay Transport Partnership with the EPA, which is a collaborative effort between the EPA and the freight industry to increase energy efficiency while reducing greenhouse gases and air pollution. Three primary components of the Program include reducing all unnecessary engine idling and increasing the efficient use of rail and intermodal operations.

Green Power Purchasing Program

Lowe's purchases green power that is generated from renewable resources such as solar, wind, geothermal, biomass and biogas, as well as low-impact hydropower. Lowe's allocates 2% of green power purchasing credit to each store nationwide, including Massachusetts. If the opportunity to purchase green power is available in Salem, it will be bought by store operations.

Lowe's Energy Management Program

Lowe's currently implements an energy management system to reduce energy use at each store; the program includes:

Operating sales floor lighting using a computer program coordinated to the store's hours of operation.

Setting display lights to shut off 15 minutes after store closing.

Using photo-sensors and store operating hours to control the garden center lights and using them only when needed.

Use of photo-sensors and store operating hours to control store signs, parking lot lights and security lights.

Energy Star Partnership

Lowe's has earned three top honors available to retailers in its partnerships with the U.S. Environmental Protection Agency and the U.S. Department of Energy. In November 2009, the EPA awarded Lowe's the 2009 WaterSense® Retail Partner of the Year Award and the 2009 SmartWay℠ Transport Partnership Environmental Excellence Award. Together with the 2009 ENERGY STAR® Retail Partner of the Year Award Lowe's received in March 2009, the awards honor the company for its industry-leading strategies to reduce its environmental impact and for educating consumers about how to reduce their own.

In past years, Lowe's has been named the "Energy Star Retail Partner of the Year" by the US EPA in 2003, 2004 and 2005 and has won the "Energy Star Award for Excellence in Retail Commitment" for six consecutive years.

Lowe's Energy Awareness Delivers Savings (LEADS)

In February 2008 Lowe's introduced an energy awareness program (LEADS) to all of their employees in an effort to reduce GHG emissions and water waste. The LEADS program is an informational program designed to increase energy and water awareness to Lowe's store managers, management teams and sales associates. The objective is to increase energy and water utilization efficiency by encouraging employees to embrace "best practices." Improving operating efficiency (such as refraining from leaving overhead doors open for extended periods of time) can significantly reduce energy and water consumption and associated costs, saving Lowe's millions in heating and cooling expenses.

Under the energy awareness program, Lowe's benchmarks all stores regarding their energy use and water usage. Energy usage is weather and calendar normalized and stores' current performances are compared to their historic performances as well as other stores. Participating store are provided with LEADS energy savings documents, including a checklist (includes times of energy consuming opportunities, which are translated into energy reduction results), educational material, factoids and associated reports. Each participating store will determine the electrical and water maintenance issues and report any energy anomalies on site. A complete energy and water consumption analysis will be performed and baseline consumptions and trends of each store will be recorded and compared against the benchmarks to monitor the progress of the program's success.

From March 2008 through June 2008, Lowe's has documented an energy savings of 3.4%, which equals a reduction of approximately 180 billion BTUs. This savings exceeds the benchmark, which was set at 2% energy reduction in FY 2008. A revised benchmark of 5% in energy

reduction has been set for FY 2009. The water use tracking is still undergoing some development modifications where a specific target for water is being formulated for FY 2009.

For more information on Lowe's corporate initiatives, Lowe's publishes an annual Social Responsibility Report, go to www.lowes.com/socialresponsibility.

6.3 Walmart Prototypical Sustainable Design Elements

The proposed redevelopment will evaluate numerous sustainable design alternatives that can serve to avoid or minimize potential environmental impacts. Walmart is taking many efforts to achieve their goal to be supplied 100 percent by renewable energy and to create zero waste. Walmart is constantly working towards cutting out waste in the operations and supply chain to save companies and to save millions of dollars every year by reducing the amount of natural resources consumed as well as the overall impact on the environment. To move Walmart towards its goals, they have created several Sustainable Value Networks including the Sustainable Buildings network. This program helps design and build more energy-efficient and water-efficient stores that reduce greenhouse gas emissions with no detrimental impacts to the shopping experience for customers. Through a process of experimenting, piloting, and implementing new building technologies, Walmart is improving their new store prototype, retrofitting existing stores and building more efficient stores. The following are some of the components which are implemented in their current domestic building program.

As of January 2007, Walmart's largest store prototypes for newly constructed stores were 6.9 percent more efficient than the most stringent of all U.S. energy codes, California Title 24. This includes all operating systems and building components.

Lighting:

The new building is expected to include a daylight harvesting system. By integrating dimmable T-8 fluorescent lamps, electronic continuous dimming ballasts, computer-controlled daylight sensors, and approximately one skylight for every 1000 square feet, Walmart takes full advantage of natural daylight. While barely noticeable to customers, members and associates, this program saves a substantial amount of energy. By using dimmable T-8 fluorescent lamps, Walmart is able to reduce energy consumption by 15-20 percent compared to the older T-12 or HID systems.

Daylight harvesting can reduce up to 75 percent of the electric lighting energy used in a store during daylight hours. Each daylight harvesting system saves an average of 800,000 kWh per year, which is enough energy to power 73 single family homes (11,020 kWh average annual usage) for an entire year. The new store will include occupancy sensors in most non-sales areas. The occupancy sensors automatically turn the lights off when the space is unoccupied. These areas include, but are not limited to restrooms, break rooms and offices.

Walmart illuminates exterior building signage, many refrigerated food cases and all freezer cases with light emitting diodes (LEDs). LED technology can provide a 52 percent more energy efficient operation than fluorescent illumination. The total energy savings with LED lighting is

more than 59,000 kWh per year for an average store (with enough energy to power five single family homes for an entire year). The lifespan of LED lights is projected to be at least six years beyond conventional lighting, which must be replaced, on average, every three years. This life expectancy allows for a significant reduction in re-lamping and maintenance costs. Additionally, LED's contain no mercury or lead, perform well in the cold and produce less heat than fluorescent bulbs; heat which otherwise must be compensated for by the refrigeration equipment.

Compared to ASHRAE 90.1-2001 (American Society of Heating, Refrigerating, and Air Conditioning Engineers), Walmart's expected lighting system for this store is 49 percent more efficient than the baseline minimum. ASHRAE 90.1 is considered the benchmark for compliance with the Energy Policy Act of 2005. Compared to ASHRAE 90.1-2004, the Walmart lighting system is 38 percent more efficient than the baseline minimum.

Energy Management System:

The Walmart store will feature a centralized Energy Management System (EMS) to monitor and control the heating, air conditioning, refrigeration and lighting systems from Walmart's corporate headquarters in Bentonville, Arkansas. The EMS enables Walmart to constantly monitor and control energy usage, analyze refrigeration temperatures, observe HVAC and lighting performance, and adjust system levels from a central location 24 hours per day, seven days a week.

HVAC:

Walmart utilizes one of the industry's most efficient heating, ventilating and air-conditioning (HVAC) units available. Per ASHRAE 90.1-2004, retail stores' HVAC equipment is required to achieve an overall minimum Energy Efficiency Ratio (EER) value of 10.3. The new store will include HVAC equipment which has an overall EER value of 12.6, well above the standard.

Dehumidification:

Walmart will implement a dehumidification system in the store, which adds to the comfortable indoor environment while using less energy. Lower humidity allows the refrigeration system to operate more efficiently and mitigates condensation on refrigerated glass doors.

Refrigeration:

The refrigeration system proposed utilizes a non-ozone-depleting refrigerant. The refrigeration equipment and compressors will be located on the ground outside of the store, immediately adjacent to the exterior wall which abuts the grocery component of the store. By placing the refrigeration equipment closer to the refrigerated cases, this will reduce the amount of copper refrigerant piping, insulation, potential for leaks and refrigerant charge needed.

Heat Reclamation:

The store is expected to include a heat reclaim system which reclaims waste heat from on-site refrigeration equipment to supply 70 percent of the hot water needs for the store.

Water Conservation:

The restroom sinks will feature sensor-activated 1/2 gallon per minute high-efficiency faucets. These faucets regulate water flow and reduce water usage by 78 percent compared to mandated 1992 EPA Standards. Electronic sensors regulate a maximum 10 second run time per cycle. It is estimated this technology allows users to adequately wash their hands using less than one pint of water. In addition, water turbines are built into the faucet. During use, water flow through this turbine generates the electricity needed to operate the sensors.

The store will also feature high-efficiency urinals that use only 1/8 of a gallon (one pint) of water per flush. This fixture yields 87 percent water savings per flush versus conventional one gallon per flush urinals. The store will also include high-efficiency toilets that use 1.28 gallons of water per flush. The fixture yields a 20 percent reduction in water usage over current mandated 1992 EPA Standards of 1.6 gallon per flush fixtures. Automatic flush valves on the toilets have water turbines similar to the low-flow faucets, which generate the power required to activate the flush mechanism. These turbines save energy and save material by eliminating the need for electrical conduits and wiring otherwise required to power automatic flush valve sensors.

It is estimated that these water conservation measures will reduce the overall water consumption in the store by 17 percent, when compared to the 2005 baseline stores.

6.4 Walmart Project Specific Sustainable Design Elements

The following sustainable elements will be implemented into the Salem store:

Site Design

A site specific Storm Water Pollution Prevention Plan (SWPPP) will be prepared and filed with the Environmental Protection Agency (EPA). Walmart has established an elaborate SWPPP Program which requires more stringent requirements than those set forth in the EPA Construction General Permit including: the frequency of required inspections; frequency and nature of monitoring and reporting; mandatory subcontractor training and certification; requirements to achieve final stabilization and monthly training of on-site personnel.

Conserve and restore natural areas on site: The new store grades have been raised significantly and designed as a balanced site in an effort to reduce the amount of required grading and excavation at the project limits.

Reduce storm water rate and quantity to limit disruption and pollution of natural water flows: The construction of the new store will entirely replace the existing storm drain system which provides no pretreatment of suspended solids. The new system will achieve a minimum composite 80% TSS removal rate. Post development stormwater rates will be less than predevelopment rates per DEP Stormwater Policy.

Landscape irrigation use will be eliminated through a selection of drought tolerant and low water use species.

Bicycle facilities will be constructed to promote the use of bicycles for both employees and customers.

Building Design

Installation of high-efficiency HVAC system with Energy Management System (EMS) to monitor & control heating, air conditioning, refrigeration and lighting systems.

Installation of a dehumidification system, which provides a comfortable environment while using less energy. Lower humidity allows the refrigeration systems to operate more efficiently.

Installation of refrigeration equipment which utilizes non-ozone depleting refrigerants.

Reclamation of heat produced from on-site refrigeration equipment to supply approximately 70% of the hot water needs.

Daylight Harvesting System: Integration of dimmable fluorescent lamps, electronic continuous dimming ballasts and computer controlled daylight sensors. Installation of motion occupancy sensor lighting in non-sales areas (i.e. offices, restrooms and break rooms) to reduce energy consumption.

Installation of approximately one (1) skylight per 1,000 square feet to reduce electrical usage for lighting.

Installation of low-flow plumbing systems in lavatories including sensor controlled hands-free sinks and lavatory units. These systems utilize water turbines which generate the power required to activate the water/flush mechanism.

Construction and Building Operations

Building and site demolition will be performed through Walmart's Construction and Demolition (C&D) program, which recycles all non-hazardous metals, woods, floor and ceiling tiles, concretes, asphalts and other materials generated, to the greatest extent practicable.

Fit construction equipment with mufflers or other regulatory-required emissions control devices.

Utilization of ultra-low sulfur diesel fuel for off-road construction vehicles.

Recycle steel and concrete (as appropriate).

Utilization of fly ash in concrete mix design to reduce amount of cement required.

Installation of interior cabinets & counters which consist of recycled particle board and fiberboard materials.

Installation of baseboards manufactured from 100 percent recycled materials.

Installation of exposed concrete flooring to reduce surface applied flooring cleaners/materials.

Utilization of a natural, plant based concrete form release agent, which is a non-petroleum based, non-toxic and biodegradable agent.

Utilization of interior and exterior paints with lower VOC contents.

Higher energy efficiency through the use of a building Energy Management System (EMS).

Environmental Tobacco Smoke Control achieved through a no smoking policy.

Indoor air quality achieved by meeting the ASRAE Ventilation for Acceptable Indoor Air Quality requirements.

7.0 Permit Review

7.1 Local, State and Federal Permits

The following lists the federal, state and local approvals required for the proposed project.

Table 13 Permit Review

Permit/Approval	Agency	Status
Federal		
Authorization to Discharge under NPDES Construction General Permit	U.S. Environmental Protection Agency	To be filed prior to start of construction
ACOE 404 Permit	US ACOE	To be filed
State		
Access Permit	MassDOT	To be filed
Signal Permit	MassDOT	To be filed
Section 401 Water Quality Certificate	MA DEP	To be filed
Beneficial Use Determination (BUD)	MA DEP	To be filed
Sewer Connection Compliance Certification		
Local		
Order of Conditions	Salem Conservation Commission	Notice of Intent to be Filed
Order of Resource Area Delineation	Salem Con Com	Issued 01/23/09
Approval for inclusion of the Business zoning district as allowed zone within a Planned Unit Development (PUD) District	Salem Town Council	Approved 01/08/09
Salem Approvals including Site Plan Approval	City of Salem and Salem Planning Board	To be filed
Building Permit	Salem Building Department	To be filed

FIGURES