WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS & PLANNERS

December 10, 2018

Honorable Mayor
Members of the City Council
City of Salem, Or

RE: Stormwater for Kuebler Shopping Center

Dear Members of the City Council

This responds to objections about the stormwater drainage system which will support the Kuebler Gateway Shopping Center site plan. Refer to the attached Stormwater Standards Map. Only 2.1 acres of the property requires a new storm drainage system. There is an existing stormwater detention and water quality system that has already been constructed as part of the subdivision decision SUB 14-01 that encompasses the 7.32 acres to the west.

At the time of the original Salem Clinic development we were constructing stormwater quality and detention facilities for the entire western portion of the site not knowing when the shopping center pads located on the western 7.3 acres of the site might develop as we were in the midst of a recession. With this in mind, that applicant wanted to protect their investment in the built stormwater infrastructure on the western portion of the site, the applicant worked with the City to establish a stormwater management plan that incorporated water quality treatment and green stormwater infrastructure that exceeded the standard in place at the time. Attached is the city's 2014 subdivision decision (SUB 14-01) approving the subdivision for 7.32 acres of property to the west. As you can see, it approved the construction of the stormwater drainage system that captures and treats stormwater for each of the subdivision lots created on that 7.32 acres, to the approved Stormwater Management Plan standards, exceeding the standards at the time that subdivision was approved. The entire detention and stormwater quality system for this site has already been installed on the 7.32 acre property except for the future green stormwater infrastructure required for 50% of the roof runoff of the future buildings. This stormwater system will adequately capture and treat all stormwater from that property exceeding the standards of the Pre-2014 Stormwater Standards. The approval of the subdivision stormwater management plan for the future build out of the western portion of the site is allowed under current Salem Revised Code (SRC) Section 71.080 (c).

The rest of the property (2.1 acres) is subject to the city's 2014 storm standards and a comprehensive storm system has been designed to capture and treat storm water from that property, which is shown in the proposed site plan papers.

3841 Fairview Industrial Dr. S.E., Suite 100, Salem, Oregon 97302
Phone: (503) 585-2474 Fax: (503) 585-3986

Evidence that the proposed storm water drainage system for the 18.4 acres "meets and exceeds the City requirements for stormwater quality treatment and detention" can be found in the Dowl Drainage Report dated November 11, 2018; supplemental Dowl Memorandum dated November 28, 2018 and Dowl Preliminary Drainage Report April 23, 2018.

Sincerely,

WESTECH ENGINEERING, INC.

W. Josh Wells, P.E.

WJW
Enc

- Subdivision Approval, SUB 14-01
- Stormwater Standards Map

NOTICE OF DECISION

PLANNING DIVISION
555 LIBERTY ST. SE, RM 305
SALEM, OREGON 97301
PHONE: 503-588-6173
FAX: 503-588-6005

CITY OF Salem AT YOUR SERVICE

Si necesita ayuda para comprender esta informacion, por favor llame 503-588-6173

DECISION OF THE PLANNING ADMINISTRATOR

SUBDIVISION CASE NO. SUB14-01

APPLICATION NO. : 13-119992-LD

NOTICE OF DECISION DATE: MARCH 21, 2014

REQUEST: A subdivision to divide 7.32 acres into 6 lots ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet), with a Class 2 Adjustment to:

1) Allow the number of flag lots within the subdivision to exceed 15 percent;
2) Allow more than 4 lots to be served by a flag lot accessway; and
3) Allow the length of the flag lot accessway to exceed 400 ft.

The property is zoned CO (Commercial Office) and CR (Commercial Retail) and is located at 2521 and 2531 Boone Road SE (Marion County Assessor's Map and Tax Lot Numbers: 083W11D/600 and 083W12C/702).

APPLICANT: M & T PARTNERS, INC.

LOCATION: 2521 & 2531 BOONE RD SE

CRITERIA: Salem Revised Code Chapters 63 and 250

DECISION: The Planning Administrator **GRANTED** Subdivision Case No. SUB14-01 subject to the following conditions of approval prior to final plat approval, unless otherwise indicated:

Condition 1. Design sewer and water systems to serve each lot.

Condition 2: Show all necessary access and utility easements on the plat and provide appropriate documentation of infrastructure maintenance agreements as approved by the Public Works Director and required by SRC 70.100.

Condition 3: Stormwater infrastructure provided to serve new development within the subdivision shall comply with the applicant's stormwater management plan.

The rights granted by the attached decision must be exercised or extension granted by the following dates or this approval shall be null and void:

Tentative Subdivision Plan: April 8, 2016
Class 2 Adjustment: April 8, 2016

A copy of the decision is attached.

Application Deemed Complete: January 23, 2014
Notice of Decision Mailing Date: March 21, 2014
Decision Effective Date: April 8, 2014

State Mandate Date: May 23, 2014

Case Manager: Bryce Bishop, Planner II, bbishop@cityofsalem.net

This decision is final unless written appeal from an aggrieved party is filed with the City of Salem Planning Division, Room 305, 555 Liberty Street SE, Salem OR 97301, **no later than 5:00 p.m., APRIL 7, 2014.** The appeal must state where the decision failed to conform to the provisions of the applicable code section, SRC Chapters 63 and 250. The appeal must be filed in duplicate with the City of Salem Planning Division. The appeal fee must be paid at the time of filing. If the appeal is untimely and/or lacks the proper fee, the appeal will be rejected. The Planning Commission will review the appeal at a public hearing. After the hearing, the Planning Commission may amend, rescind, or affirm the action, or refer the matter to staff for additional information.

The complete case file, including findings, conclusions and conditions of approval, if any, is available for review at the Planning Division office, Room 305, City Hall, 555 Liberty Street SE, during regular business hours.

http://www.cityofsalem.net/planning

BEFORE THE PLANNING ADMINISTRATOR
OF THE CITY OF SALEM
(SUBDIVISION PLAT NO. 14-01)

Si necesita ayuda para comprender esta información, por favor llame 503-588-6173

http://www.cityofsalem.net/planning

IN THE MATTER OF THE APPROVAL OF TENTATIVE SUBDIVISION PLAN NO. 14-01; 2521 & 2531 BOONE ROAD SE	))))	**FINDINGS AND ORDER MARCH 21, 2014**

REQUEST

To divide approximately 7.32 acres into 6 lots ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet), with a Class 2 Adjustment to:

1) Allow the number of flag lots within the subdivision to exceed 15 percent;
2) Allow more than 4 lots to be served by a flag lot accessway; and
3) Allow the length of the flag lot accessway to exceed 400 ft.

The property is zoned CO (Commercial Office) and CR (Commercial Retail) and is located at 2521 and 2531 Boone Road SE (Marion County Assessor's Map and Tax Lot Numbers: 083W11D/600 and 083W12C/702).

DECISION

The tentative partition plan is **APPROVED** subject to the applicable standards of the Salem Revised Code, the findings contained herein, and the following conditions prior to final plat approval, unless otherwise indicated:

Condition 1: Design sewer and water systems to serve each lot.

Condition 2: Show all necessary access and utility easements on the plat and provide appropriate documentation of infrastructure maintenance agreements as approved by the Public Works Director and required by SRC 70.100.

Condition 3: Stormwater infrastructure provided to serve new development within the subdivision shall comply with the applicant's stormwater management plan.

PROCEDURAL FINDINGS

On December 20, 2013, an application for tentative subdivision plan was filed proposing to divide property located at 2521 and 2531 Boone Road SE (Attachment 1) into 6 lots. The proposed subdivision included a request for a Class 2 Adjustment to allow more than 15 percents of the lot within the subdivision to be flag lots, to allow more than four lots to be served by a flag lot accessway, and to allow the length of the flag lot accessway to exceed 400 feet.

After additional information was provided by the applicant, the application was deemed complete for processing on January 23, 2014. Notice to surrounding property owners was mailed pursuant to Salem Revised Code (SRC) requirements on January 23, 2014. Notice was posted on the subject property pursuant to SRC requirements on January 24, 2014.

SUBSTANTIVE FINDINGS

1. Salem Area Comprehensive Plan (SACP)

Land Use Plan Map: The subject property is designated "Commercial" on the Salem Area Comprehensive Plan (SACP) Map.

Urban Growth Policies: The subject property is located inside the Salem Urban Growth Boundary and inside the corporate city limits.

Growth Management: The subject property is located outside of the City's Urban Service Area. Pursuant to the Urban Growth Management requirements contained under SRC Chapter 66, an Urban Growth Area (UGA) Development Permit Preliminary Declaration is required when property is located outside the boundaries of the Urban Service Area. On September 7, 2012, UGA Preliminary Declaration No. 12-11 was issued identifying the public facilities required for development of the subject property.

2. Zoning

The southern portion of the subject property is zoned CO (Commercial Office) and the northern portion of the subject property is zoned CR (Commercial Retail). The zoning of surrounding properties is as follows:

North: Across Kuebler Boulevard SE, RA (Residential Agriculture) and RS (Single Family Residential)
South: Across Boone Road SE, RA (Residential Agriculture) and RS (Single Family Residential)
East: CR (Commercial Retail)
West: Across Battle Creek Road SE, CN (Neighborhood Commercial) and RM2 (Multiple Family Residential)

3. Natural Features

Trees: The City's tree preservation ordinance (SRC Chapter 68) establishes requirements for the preservation of heritage trees, significant trees *(Oregon white oaks 24 inches or more in diameter)*, trees and native vegetation within riparian corridors, and trees on lots or parcels 20,000 square feet or greater in size. The tree preservation ordinance defines "tree" as, "any living woody plant that grows to 15 feet or more in height, typically with one main stem called a trunk, which is 10 inches or more dbh, and possesses an upright arrangement of branches and leaves." There are no trees on the subject property.

Pursuant to SRC Chapter 68.100(a), tree conservation plans are required in conjunction with development proposals involving the creation of lots or parcels to be used for the construction of single family or duplex dwelling units, if the development proposal will result in the removal of trees. The tree preservation ordinance defines "tree" as, "any living woody plant that grows to 15 feet or more in height, typically with one main stem called a trunk, which is 10 inches or more dbh, and possesses an upright arrangement of branches and leaves."

Because there are no trees on the subject property and because the proposed subdivision is not for the purpose of creating lots to be used for the construction of single family dwelling units or duplex dwelling units, a tree conservation plan is not required.

Wetlands: Grading and construction activities within wetlands are regulated by the Oregon Department of State Lands (DSL) and US Army Corps of Engineers. State and Federal wetlands laws are also administered by the DSL and Army Corps, and potential impacts to jurisdictional wetlands are addressed through application and enforcement of appropriate mitigation measures.

The Salem-Keizer Local Wetland Inventory (LWI) does not identify any wetlands or waterways on the subject property. Therefore, there are no impacts related to jurisdictional wetlands or waterways as a result of the proposed subdivision and development of the property.

Landslide Susceptibility: The City's landslide hazard ordinance (SRC Chapter 69) establishes standards and requirements for the development of land within areas of identified landslide hazard susceptibility. According to the City's adopted landslide hazard susceptibility maps, the subject property contains 2 mapped landslide hazard susceptibility points. There are 3 activity points associated with the proposed development activity, a subdivision. Pursuant to the requirements of SRC Chapter 69, the cumulative total of 5 points between those associated with the land and those associated with the proposed development activity indicates a moderate landslide risk and therefore a geologic assessment is required. As part of the previous development approvals for the subject property, a geologic assessment was submitted and approved for the subject property in conformance with SRC Chapter 69.

4. Site Analysis and Parcel Layout

The subject property is approximately 7.32 acres in size. The southern portion of the property that is zoned CO is currently developed with two office buildings. The northern portion of the property that is zoned CR is currently undeveloped.

The tentative plan proposes to divide the property into six lots (Attachment 2) ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet).

The two existing office buildings, and the parking serving them, are located on proposed Lots 5 and 6. Lots 5 and 6 are zoned CO. The remaining four lots within the subdivision, proposed Lots 1 through 4, are undeveloped. Lots 1 through 4 are zoned CR.

Vehicular access to the lots within the subdivision will be taken from a proposed flag lot accessway off Boone Road SE.

Lot Area and Dimensions: The minimum lot area requirements of the CO zone are established under SRC 150.070. The minimum lot area requirement for non-residential uses is 6,000 square feet. Minimum lot dimension requirements for non-residential uses within the CO zone are not specified. However, the subdivision code, under SRC 63.145(a) and (b), establishes minimum lot dimension requirements that apply when minimum lot dimension standards are not otherwise specified in the zone. SRC 63.145(a) and (b) require a minimum lot width of 40 feet and a minimum lot depth of 70 feet. Lot depth cannot exceed 300 percent of the average lot width.

The CO zoned lots within the subdivision, proposed Lots 5 and 6, are approximately 102,191 and 67,474 square feet in size. The proposed lots exceed minimum lot area and dimension requirements and therefore conform to applicable lot area and dimension standards.

The minimum lot area and dimension requirements of the CR zone are established under SRC 152.070. Pursuant to this section, there are no minimum lot area or dimension requirements in the CR zone, except for the minimum street frontage requirement of SRC 130.260. SRC 130.260 requires all lots, except those used for single family dwellings, to have a minimum street frontage of 16 feet.

The CR zoned lots within the subdivision, proposed Lots 1 through 4, range from approximately 34,630 to 40,075 square feet in size. The proposed lots exceed minimum lot area, dimension, and frontage requirements and therefore conform to the applicable standards.

Flag Lots: The subdivision code, under SRC 63.155(d), allows flag lots to be created within subdivisions when the lots are created in conformance with the flag lot standards set forth in SRC 63.295. The subdivision code defines a flag lot as, "a lot or parcel that is set back from the street at the rear or at the side of another lot or parcel, with vehicular access to the street provided by an accessway." Based on the definition of "flag lot," the proposed subdivision includes four flag lots (Lots 1, 2, 3, and 4) These lots are flag lots because they are setback from Boone Road SE, located behind proposed Lots 5 and 6, and accessed by a flag lot accessway.

SRC 63.295(a) limits the maximum number of flag lots within a subdivision to 15 percent of the proposed lots. The four proposed flag lots within the subdivision exceed the 15 percent maximum. In order to address this issue, the applicants have submitted a Class 2 Adjustment with the subdivision seeking approval to exceed the 15 percent maximum. The analysis of the requested Class 2 Adjustment for conformance with the applicable approval criteria is included in Section 10 of this report.

Flag Lot Accessway: SRC 63.295(d) and Table 63-1 establish standards for flag lot accessways serving flag lots. Vehicle access to the lots within proposed subdivision will be provided by a flag lot accessway off Boone Road SE. Because the proposed flag lot accessway serves more than 4 lots and is greater than 400 feet in length, the applicants have submitted a Class 2 Adjustment with the subdivision seeking approval to allow more than four lots to be served by the flag lot accessway and to allow it to be greater than 400 feet in length. The analysis of the requested Class 2 Adjustment for conformance with the applicable approval criteria is included in Section 10 of this report.

Setbacks and Lot Coverage Requirements: Proposed Lots 5 and 6 are zoned CO. Within the CO zone, a minimum 12-foot setback is required for buildings, accessory structures, and parking areas adjacent to a street. A minimum 5-foot setback is required for buildings and accessory structures adjacent to interior side and rear property lines, unless a greater bufferyard setback is required under

SRC Chapter 132. Maximum lot coverage within the CO zone is 60 percent. The setbacks and lot coverage for the existing development located on proposed Lots 5 and 6 conform to the setbacks and lot coverage requirements of the CO zone.

Proposed Lots 1 through 4 are zoned CR. Within the CR zone, a minimum 5-foot setback for buildings and accessory structures, and a minimum 6-10 foot setback for parking areas, is required adjacent to a street. Setbacks for buildings, accessory structures, and parking areas adjacent to interior side and rear property lines are based on the bufferyard requirements of SRC Chapter 132. The CR zone does not establish a maximum lot coverage requirement. Future development of Lots 1 through 4 will be reviewed for conformance with the applicable setback and lot coverage requirements of the CR zone at the time of Site Plan Review for development of the proposed lots.

All of the lots within the proposed subdivision are of a size and configuration that is suitable to accommodate the development of uses permitted in the zone in conformance with the applicable standard of the Salem Revised Code.

5. Neighborhood Association Comments

The subject property is located within the boundaries of the South Gateway Neighborhood Association. The neighborhood association was notified of the proposed application and provided comments that are included as Attachment 3.

In summary, the neighborhood association explains that they are in support of the application under the condition that all site and street improvement conditions which accompanied the original approval remain in force and that the improvements occur using the same time period restrictions as if the property had not been subdivided. The neighborhood association expressed their commitment that improvements to Kuebler Boulevard between Commercial Street and I-5 should be completed no later than the future improvements to the I-5/Kuebler interchange.

Staff Response: As indicated in comments provided by the City's Public Works Department (Attachment 4), Urban Growth Area (UGA) Development Permit Preliminary Declaration 12-11 was approved for the subject property on September 7, 2012. The preliminary declaration establishes requirements for each development phase, including boundary and off-site transportation improvements, consistent with the conditions of Zone Change 09-3 and CPC/ZC 06-6. Approval of the proposed subdivision does not affect the timing of construction of the required improvements.

6. Citizen Comments

Property owners within 250 feet of the subject property were mailed notification of the proposed application. Notice of the proposed application was also posted on the subject property. One comment was received from an area property owner expressing concern about the addition of four retail buildings being served by one access point on Boone Road and that further deferral of required improvements imposed by the final approval for Comprehensive Plan Change/Zone Change Case No. 06-6 would in their opinion reverse the City Council's decision on the Comp. Plan/Zone Change.

Staff Response: As part of the conditions of approval for Comprehensive Plan Change/Zone Change Case No. 06-6, Kuebler Boulevard is required to be widened and a right-in access from Kuebler Boulevard provided. This project is expected to reduce the amount of traffic using Boone Road by providing access to the development from Kuebler. On September 7, 2012, Urban Growth Area (UGA) Development Permit Preliminary Declaration 12-11 was approved for the subject property establishing requirements, including boundary and off-site transportation improvement requirements, for each development phase consistent with the conditions of Zone Change 09-3 and CPC/ZC 06-6. Compliance with the Preliminary Declaration for Urban Growth Area (UGA) Development Permit No. 12-11 remains a requirement for development of the subject property.

7. City Department Comments

A. The Fire Department reviewed the proposal and indicated they have no objections to it.

B. The Police Department reviewed the proposal and indicated that they have no comments.

C. The Public Works Department reviewed the proposal and provided comments pertaining to requirements for streets, storm drainage, water, and sanitary sewer services. Comments from the Public Works Department are included as Attachment 4.

8. Private Service Provider Comments

Portland General Electric (PGE) reviewed the proposal and indicated that development costs are determined by current tariff and service requirements and that easements are required for all underground electrical.

9. Criteria for Granting a Subdivision

Salem Revised Code (SRC) Chapter 63.046(b) and 63.051 set forth the criteria that must be met before approval can be granted to a subdivision request. This staff report addresses the approval criteria of SRC 63.046 (decision of the Planning Administrator for a Subdivision) and evaluates the considerations of SRC 63.051 (Purpose of Tentative Plan Review; Requirements and Conditions).

The following subsections are organized with approval criteria shown in **bold**, followed by findings of fact upon which the Planning Administrator's decision is based. The requirements of SRC 63.051 are addressed within the specific findings which evaluate the proposal's conformance with the criteria of SRC 63.046. Lack of compliance with the following criteria is grounds for denial of tentative plan or for the issuance of conditions of approval to more fully satisfy the criteria.

A. SRC 63.046(b)(1): Approval does not impede the future use of the remainder of the property under the same ownership, or adversely affect the safe and healthful development of the remainder or any adjoining land or access thereto.

Finding: The proposed subdivision divides the 7.32 acre property into 6 lots with no remainder. Property to the east of the subject property is currently undeveloped. As indicated in the written statement provided by the applicant's representative (Attachment 5), development of the subject property and development of the commercially zoned property to the east of the subject property will be coordinated with regards to building placement, driveway access, parking and circulation, internal utility infrastructure, and public improvements. Conditions of approval established in connection with Comprehensive Plan Change/Zone Change Case No. 06-6 and Zone Change Case No. 09-3 ensure that development of the subject property, and the undeveloped property to the east, is coordinated with regards to on-site and off-site improvements. As indicated in the applicant's statement, because these requirements are incorporated into the subdivision design, the future use of the subject property will not be impeded and the safe and healthful development of remaining adjoining commercial land to the east, and access to it, will not be adversely affected.

The proposed lots within the subdivision are also of sufficient size and dimension to permit future development of uses allowed within the zone. Approval of the subdivision does not impede future use of the subject property or access to abutting properties. This criterion is met.

B. SRC 63.046(b)(2): Provisions for water, sewer, streets, and storm drainage facilities comply with the city's public facility plan.

Finding: The Public Works Department reviewed the proposal for compliance with the City's public facility plans pertaining to the provision of water, sewer, streets, and storm drainage facilities. While SRC Chapter 63 does not require submission of facility construction plans prior to tentative subdivision plan approval, it is the responsibility of the applicant to design and construct adequate city water, sewer, transportation, and storm drainage facilities to serve the proposed lots prior to final plat approval without impeding service to the surrounding area. The applicant shall construct improvements to the specifications of the Public Works Department memo dated March 21, 2014 (Attachment 4).

A summary of existing improvements are as follows:

Streets: The subject property is bordered by Kuebler Boulevard SE, Battle Creek Road SE, and Boone Road SE. Kuebler Boulevard is designated as a parkway with the Salem Transportation System Plan (TSP). The standard for a parkway is an 80-foot-wide improvement within a minimum 120-foot-wide right of way. Kuebler Boulevard is currently improved with a varied turnpike pavement

section within a varied right-of-way of 150 to 180 feet in width. The intersection with Battle Creek Road has a signal.

Battle Creek Road is designated as a minor arterial street within the TSP. The standard for this classification of street is a 46-foot-wide improvement within a 72-foot-wide right-of-way. Battle Creek Road was recently improved as a condition of UGA Phase 1 to provide a varied improvement up to 56 feet in width within a 72-foot-wide right-of-way.

Boone Road is designated as a collector street within the TSP. The standard for this classification of street is a 34-foot-wide improvement within a 60-foot-wide right-of-way. Boone Road was recently improved as a condition of UGA Phase 1 to provide a varied improvement up to 58 feet in width within a varied right-of-way of 60 feet to 78 feet in width.

Water: The Salem Water System Master Plan identifies the subject property as being located within the S-2 water service level. The Public Works Department indicates that there is a 12-inch water main located in Battle Creek Road, a 10-inch water main located in Kuebler Boulevard, and 24-inch and 30-inch water lines located in Boone Road.

Sanitary Sewer: The Public Works Department indicates that there is an 8-inch public sewer line located at the southeast corner of the subject property and no sewer available in Kuebler Boulevard and Battle Creek Road.

Storm Drainage: The Public Works Department indicates that there is a drainage ditch in Battle Creek Road along the full frontage of the subject property, a drainage ditch in Kuebler Boulevard adjacent to the subject property, and an 18-inch storm main located in Boone Road SE.

On September 7, 2012, Urban Growth Area (UGA) Development Permit Preliminary Declaration 12-11 was approved for the subject property establishing requirements for each development phase consistent with the conditions of Zone Change 09-3 and CPC/ZC 06-6. Boundary and off-site transportation improvements are specified in the preliminary declaration. The proposed subdivision does not create transportation impacts that warrant boundary street or off-site improvements at this time. Transportation improvements for future building projects will be addressed in Site Plan Review decisions consistent with the appropriate provisions of UGA 12-11, ZC 09-3, and CPC/ZC 06-6.

On January 1, 2014, new stormwater requirements contained under SRC Chapter 71 became effective. Because the proposed subdivision was submitted prior to the effective date of the new requirements, provisions for stormwater management on the site are subject to the requirements of the SRC prior to the adoption of the new stormwater standards. As part of the proposed subdivision, the applicants submitted a stormwater management plan to manage stormwater in conformance with the stormwater standards applicable at the time the subdivision application was submitted. As specified in SRC 71.080(c), because the applicant submitted the stormwater management plan as part of the subdivision prior to the effective date of the new stormwater standards, the proposed subdivision and future Site Plan Review applications for development of the lots within the subdivision shall comply with the applicant's stormwater management plan instead of the stormwater requirements that became effective on January 1, 2014.

As indicated by the Public Works Department, water, sewer, and stormwater infrastructure is available to serve the proposed development. To ensure the adequate provision of water, sewer, streets, and storm services to the subject property, the following conditions of approval shall apply:

Condition 1: Design sewer and water systems to serve each lot.

Condition 2: Show all necessary access and utility easements on the plat and provide appropriate documentation of infrastructure maintenance agreements as approved by the Public Works Director and required by SRC 70.100.

Condition 3: Stormwater infrastructure provided to serve new development within the subdivision shall comply with the applicant's stormwater management plan.

C. 63.046(b)(3): The tentative plan complies with all applicable standards of the Salem Revised Code, including the Salem zoning ordinance, unless a variance or adjustment has been obtained.

Finding: The Salem Revised Code (SRC), which includes the Salem Zoning Code, implements the Salem Area Comprehensive Plan land use goals, and governs development of property within the city limits. The subdivision process reviews development for compliance with City standards and requirements contained in the Subdivision Code, Zoning Code, the Salem Transportation System Plan (TSP), and the Water, Sewer, and Storm Drain System Master Plans. A second review occurs for the created lots at the time of site plan review/building permit review to assure compliance with the zoning ordinance. Compliance with conditions of approval to satisfy the subdivision ordinance is checked prior to city staff signing the final subdivision plat. The proposed subdivision meets all applicable provisions of the Salem Revised Code as detailed below:

SRC Chapter 63 (Subdivisions): The intent of the subdivision code is to provide for orderly development through the application of appropriate standards and regulations. The applicant met all application submittal requirements necessary for review of the proposed subdivision. The proposed subdivision, as conditioned, conforms to the applicable provisions of SRC Chapter 63 as follows:

Parcel Configuration: The proposed subdivision creates six lots ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet).

SRC 63.145, SRC 150.070, and SRC 152.070 specify minimum lot area, dimension, and frontage requirements in the CO and CR zones. As identified under section 4 of this report, the proposed lots satisfy minimum lot size, dimension, and frontage standards.

The proposed lots will be suitable for the general purpose for which they may be used, and the lots are of a size and design that will not be detrimental to the public health, safety, and welfare.

Adequate Utilities: The Salem Public Works Department reviewed the proposal and determined that water, sewer, and storm drainage infrastructure is available and appears to be adequate to serve future development. Conditions of approval established as part of this decision ensure that such utilities are provided in conformance with the City's public facility plans.

Street Connectivity: SRC 63.225(p) requires that developments provide for local streets oriented to or connecting with existing or planned streets, existing or planned schools, parks, shopping areas, transit stops, and employment centers located within one-half mile of the development. Developments shall also provide for the extension of local streets to adjoining major undeveloped properties for eventual connection with the existing street system.

The lots within the proposed subdivision are intended to be part of a larger commercial retail and office center occupying the 28 acres of land located between Kuebler Boulevard, Boone Road, Battle Creek Road, and 27th Avenue. Three different streets border the subject property and provide connectivity to Salem's surrounding transportation network in conformance with this standard.

A flag lot accessway off Boone Road SE is proposed to provide primary vehicular access to the individual proposed lots within the subdivision. Because of limitations on access to the subject property, and because of the property's overall size and dimensions, the proposed flag lot accessway exceeds some of the standards applicable to flag lot accessways. In order to address this issue, the applicant has requested a Class 2 Adjustment with the subdivision seeking approval to allow more than 4 lots to be served by a flag lot accessway and the length of the flag lot accessway to exceed 400 ft.

Analysis of the requested Class 2 Adjustment for conformance with the applicable approval criteria contained within SRC Chapter 250 is included in Section 10 of this report.

Hazards, Site Disruption, and Limitations to Development: The City's landslide hazard ordinance (SRC Chapter 69) establishes standards and requirements for the development of land within areas of identified landslide hazard susceptibility. According to the City's adopted landslide hazard susceptibility maps, the subject property contains 2 mapped landslide hazard susceptibility points. There are 3 activity points associated with the proposed development activity, a subdivision. Pursuant to the requirements of SRC Chapter 69, the cumulative total of 5 points between those associated with the land and those associated with the proposed development activity indicates a moderate landslide risk and therefore a geologic assessment is required. As part of the previous

development approvals for the subject property, a geologic assessment was submitted and approved for the subject property in conformance with SRC Chapter 69.

The City's wetlands ordinance, SRC Chapter 126, establishes requirements for notification to the Oregon Department of State Lands when an application for development is received in an area designated as a wetland on the official wetlands map. According to the Salem-Keizer Local Wetland Inventory (LWI) there are no wetlands or waterways identified on the subject property. Pursuant to SRC Chapter 126, a wetlands notice to the DSL is not required in conjunction with the proposed subdivision.

SRC Chapter 65 (Excavation and Fills): SRC Chapter 65 (Excavations and Fills) establishes standards to ensure that any excavation or fill adjacent to public right-of-way or within a public easement, designated waterway, or floodplain overlay zone creates no imminent danger to public safety or public facilities and does not create a public nuisance. SRC Chapter 65 also prohibits excavation or fill that causes surface drainage to flow over adjacent public or private property in a volume or location materially different from that which existed before the grading occurred. There is no evidence that the subject property cannot be developed consistent with the provisions of SRC Chapter 65.

Pursuant to SRC 65.040, and prior to any ground disturbing activity, permits shall be required and obtained from the Public Works Director for any excavation work adjoining a public right-of-way, or adjoining or within an easement (or future right-of-way or easement), or within or adjoining a designated waterway, or within a floodplain overlay zone.

SRC Chapter 66 (Urban Growth Management): The subject property is located outside of the City's Urban Service Area. Pursuant to the Urban Growth Management requirements contained under SRC Chapter 66, an Urban Growth Area (UGA) Development Permit Preliminary Declaration is required when property is located outside the boundaries of the Urban Service Area. On September 7, 2012, UGA Preliminary Declaration No. 12-11 was issued identifying the public facilities required for development of the subject property. Development of the subject property is required to comply with the requirements of UGA Development Permit Preliminary Declaration No. 12-11.

SRC Chapters 68 (Tree Preservation): The City's tree preservation ordinance (SRC Chapter 68) establishes requirements for the preservation of heritage trees, significant trees *(Oregon white oaks 24 inches or more in diameter)*, trees and native vegetation within riparian corridors, and trees on lots or parcels 20,000 square feet or greater in size. The tree preservation ordinance defines "tree" as, "any living woody plant that grows to 15 feet or more in height, typically with one main stem called a trunk, which is 10 inches or more dbh, and possesses an upright arrangement of branches and leaves." There are no trees on the subject property.

Pursuant to SRC Chapter 68.100(a), tree conservation plans are required in conjunction with development proposals involving the creation of lots or parcels to be used for the construction of single family or duplex dwelling units, if the development proposal will result in the removal of trees. The tree preservation ordinance defines "tree" as, "any living woody plant that grows to 15 feet or more in height, typically with one main stem called a trunk, which is 10 inches or more dbh, and possesses an upright arrangement of branches and leaves."

Because there are no trees on the subject property and because the proposed subdivision is not for the purpose of creating lots to be used for the construction of single family dwelling units or duplex dwelling units, a tree conservation plan is not required.

SRC Chapter 69 (Landslide Hazards): The City's landslide hazard ordinance (SRC Chapter 69) establishes standards and requirements for the development of land within areas of identified landslide hazard susceptibility. According to the City's adopted landslide hazard susceptibility maps, the subject property contains 2 mapped landslide hazard susceptibility points. There are 3 activity points associated with the proposed development activity, a subdivision. Pursuant to the requirements of SRC Chapter 69, the cumulative total of 5 points between those associated with the land and those associated with the proposed development activity indicates a moderate landslide risk and therefore a geologic assessment is required. As part of the previous development approvals for the subject property, a geologic assessment was submitted and approved for the subject property in conformance with SRC Chapter 69.

SRC Chapter 126 (Wetlands): Grading and construction activities within wetlands are regulated by the Oregon Department of State Lands (DSL) and US Army Corps of Engineers. State and Federal

wetlands laws are also administered by the DSL and Army Corps, and potential impacts to jurisdictional wetlands are addressed through application and enforcement of appropriate mitigation measures.

The Salem-Keizer Local Wetland Inventory (LWI) does not identify any wetlands or waterways on the subject property. Therefore, there are no impacts related to jurisdictional wetlands or waterways as a result of the proposed subdivision and development of the property.

SRC Chapter 150 (Commercial Office Zone) & 152 (Commercial Retail Zone): The subdivision code, SRC 63.145(i), requires that lots be suitable for the general purpose for which they are likely to be used. No lots can be of such a size or configuration that is detrimental to public health, safety, or welfare; or sanitary needs of users of the lot.

The lots within the proposed subdivision are zoned CO (Commercial Office) and CR (Commercial Retail). The lots meet SRC Chapter 63 (Subdivision), SRC Chapter 150 (Commercial Office), and SRC Chapter 152 (Commercial Retail) minimum lot size, dimension, and street frontage standards. The lots are suitable for the general purpose for which they may be used and are of size and design that is not detrimental to the public health, safety, or welfare.

The two proposed CO zoned lots are already developed in conformance with the applicable standards of the code. The four proposed CR zoned lots are currently undeveloped. Future development of these lots will be reviewed for conformance with applicable code standards at the time of Site Plan Review for development of the individual lots.

D. 63.046(b)(4): The proposed subdivision provides safe and convenient bicycle and pedestrian access from within the subdivision to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development.

Finding: The subject property, along with the contiguous property to the east, are intended to be developed as an office and commercial retail center, which when developed, will in itself represent an activity center within neighborhood. Existing streets surrounding the property will provide access to the proposed development. Bicycle and pedestrian access will be available along the frontage of Boone Road and along the internal driveway providing access to the subdivision in conformance with this criterion.

10. Criteria for Granting a Class 2 Adjustment

Because of limitations on access to the subject property, and because of the property's overall size and dimensions, the applicant has requested a Class 2 Adjustment with the subdivision seeking approval to allow:

1) The number of flag lots within the subdivision to exceed 15 percent;
2) More than 4 lots to be served by a flag lot accessway; and
3) The length of the flag lot accessway to exceed 400 ft.

Pursuant to SRC 250.005(d)(2), an application for a Class 2 Adjustment shall be granted if the following criteria are met:

A. 250.005(d)(2)(A): The purpose underlying the specific development standard proposed for adjustment is:

(i) Clearly inapplicable to the proposed development; or
(ii) Equally or better met by the proposed development.

Applicant's Statement: The written statement provided by the applicant's representative (Attachment 5) indicates that the application satisfies criterion (A)(ii). It is explained that Comprehensive Plan Change/Zone Change 06-6 established conditions of approval limiting the number and location of driveways that can provide access to the public streets and that these conditions of approval were established to assure adequate access to the contiguous development and efficient flow of traffic on the public streets. The applicant's statement indicates that because of these access limitations, it is necessary to serve the development with reciprocal easements for access to the driveways. The applicant's statement also indicates that the large size of the property makes it impractical to limit the length of the accessway to 400 feet. The applicant's statement explains that the proposed access to the lots provides them with appropriate access to the common driveway, as required by the conditions of

approval, and that there will be adequate turn-around space for emergency vehicles at the end of the accessway within each lot. For these reasons, it is explained that the purpose underlying the three specific development standards proposed for adjustment are equally or better met by the proposed development and this criterion is satisfied.

Finding: Staff concurs with the applicant. Points of access to the subject property and the adjacent property to the east were limited by previous land use approvals in order to promote the efficient circulation of traffic and minimize impacts to surrounding properties. Because of the size of the subject property and there being only one point of access to Boone Road SE, access to the individual lots within the subdivision are required to come from the existing driveway via a flag lot accessway.

The proposed subdivision is consistent with other commercial developments where joint access easements are provided across adjacent properties in order to gain access to joint driveways. In addition, though four of the proposed lots within the subdivision technically meet the definition of "flag lot" under SRC Chapter 63, only one of the proposed lots does not have frontage on a street. Because the proposed access to the subdivision is consistent with the conditions of approval of CPC/ZC06-6, and because the proposed flag lot accessway will provide for safe access to the development, the proposal equally meets the purpose underlying the development standards proposed for adjustment. This criterion is met.

B. 250.005(d)(2)(B): If located within a residential zone, the proposed development will not detract from the livability or appearance of the residential area.

Applicant's Statement: The written statement provided by the applicant's representative indicates that this criterion applies only to property located within residential zone and therefore does not apply to this application.

Finding: Staff concurs with the applicant. Because the subject property is zoned CO and CR, this criterion is not applicable to the proposed development.

C. 250.005(d)(2)(C): If more than one adjustment has been requested, the cumulative effect of all the adjustments result in a project which is still consistent with the overall purpose of the zone.

Applicant's Statement: The written statement provided by the applicant's representative indicates that the purpose of the zone in this case was established through the zone change cases that applied the CR and CO zones to the subject property. The purpose was to enable a consolidated, coordinated office and commercial retail center on the contiguous 28 acre site. Conditions of approval specify how aspects of the development, including access to the public street, are to be coordinated. It is explained that the requested adjustments fulfill the requirements of those conditions by providing internal access to the property from the common driveway that will access the public street. Though the proposed flag lots lie greater than 400 feet distant from the common driveway as a result of the size of the property, the project remains consistent with the overall purpose of limiting access to the public street to the specified number and location of common driveways. The cumulative effect of the three requested Adjustments results in a project that conforms to the zoning conditions of approval, and which is consistent with the purpose of the zone.

Finding: Staff concurs with the applicant. Approval of the proposed adjustments does not cumulatively result in a project that is inconsistent with the overall purpose of the zone. The zoning of the property was changed to CO (Commercial Office) and CR (Commercial Retail). The intent of these zones is to provide land for the development of various commercial office and retail uses. The previous comprehensive plan change and zone changes which applied these zone districts to the subject property and the contiguous property to the east established conditions of approval in order to minimize the impacts of the proposed development to surrounding properties.

The requested adjustments allow for the subject property to be developed as a part of an office and commercial retail center consistent with the conditions of approval of the previous comprehensive plan change and zone changes that applied the CO and CR zone districts to the subject property and consistent with the purpose of the CO and CR zones. This criterion is met.

11. Conclusion

Based upon review of SRC 63.046(b), 63.051, 250.005(d)(2), the findings contained under sections 9 and 10 above, and the comments described, the tentative subdivision and Class 2 Adjustment comply with the requirements for an affirmative decision.

IT IS HEREBY ORDERED

The request to divide approximately 7.32 acres into 6 lots ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet), with a Class 2 Adjustment to:

1) Allow the number of flag lots within the subdivision to exceed 15 percent;
2) Allow more than 4 lots to be served by a flag lot accessway; and
3) Allow the length of the flag lot accessway to exceed 400 ft;

for property zoned CO (Commercial Office) and CR (Commercial Retail) and located at 2521 and 2531 Boone Road SE, is hereby GRANTED subject to SRC Chapters 63, 150, 152, 250, and the following conditions prior to final plat approval, unless otherwise indicated:

Condition 1: Design sewer and water systems to serve each lot.

Condition 2: Show all necessary access and utility easements on the plat and provide appropriate documentation of infrastructure maintenance agreements as approved by the Public Works Director and required by SRC 70.100.

Condition 3: Stormwater infrastructure provided to serve new development within the subdivision shall comply with the applicant's stormwater management plan.

Bryce Bishop, Planner II,
Urban Planning Administrator Designee

Attachments:
1. Vicinity Map
2. Applicant's Tentative Subdivision Plan
3. South Gateway Neighborhood Association Comments
4. City of Salem Public Works Department Comments
5. Applicant's Written Statement

Application Deemed Complete: January 23, 2014
Notice of Decision Mailing Date: March 21, 2014
Decision Effective Date: April 8, 2014
State Mandated Decision Date: May 23, 2014

The rights granted by this decision must be exercised or extension granted by the following dates or this approval shall be null and void:

Tentative Subdivision Plan: April 8, 2016
Class 2 Adjustment: April 8, 2016

A copy of the complete Case File is available for review during regular business hours at the Planning Division office, 555 Liberty Street SE, Room 305, Salem OR 97301.

This decision is final unless written appeal from a party with standing to appeal, along with an appeal fee, is filed with the City of Salem Planning Division, Room 305, 555 Liberty Street SE, Salem, Oregon 97301, no later than **Monday, April 7, 2014, 5:00 p.m.** The notice of appeal must contain the information required by SRC 300.1020. The notice of appeal must be filed in duplicate with the City of Salem Planning Division. The

appeal fee must be paid at the time of filing. If the notice of appeal is untimely and/or lacks the proper fee, the notice of appeal will be rejected. The Salem Planning Commission will review the appeal at a public hearing. The Planning Commission may amend, rescind, or affirm the action or refer the matter to staff for additional information.

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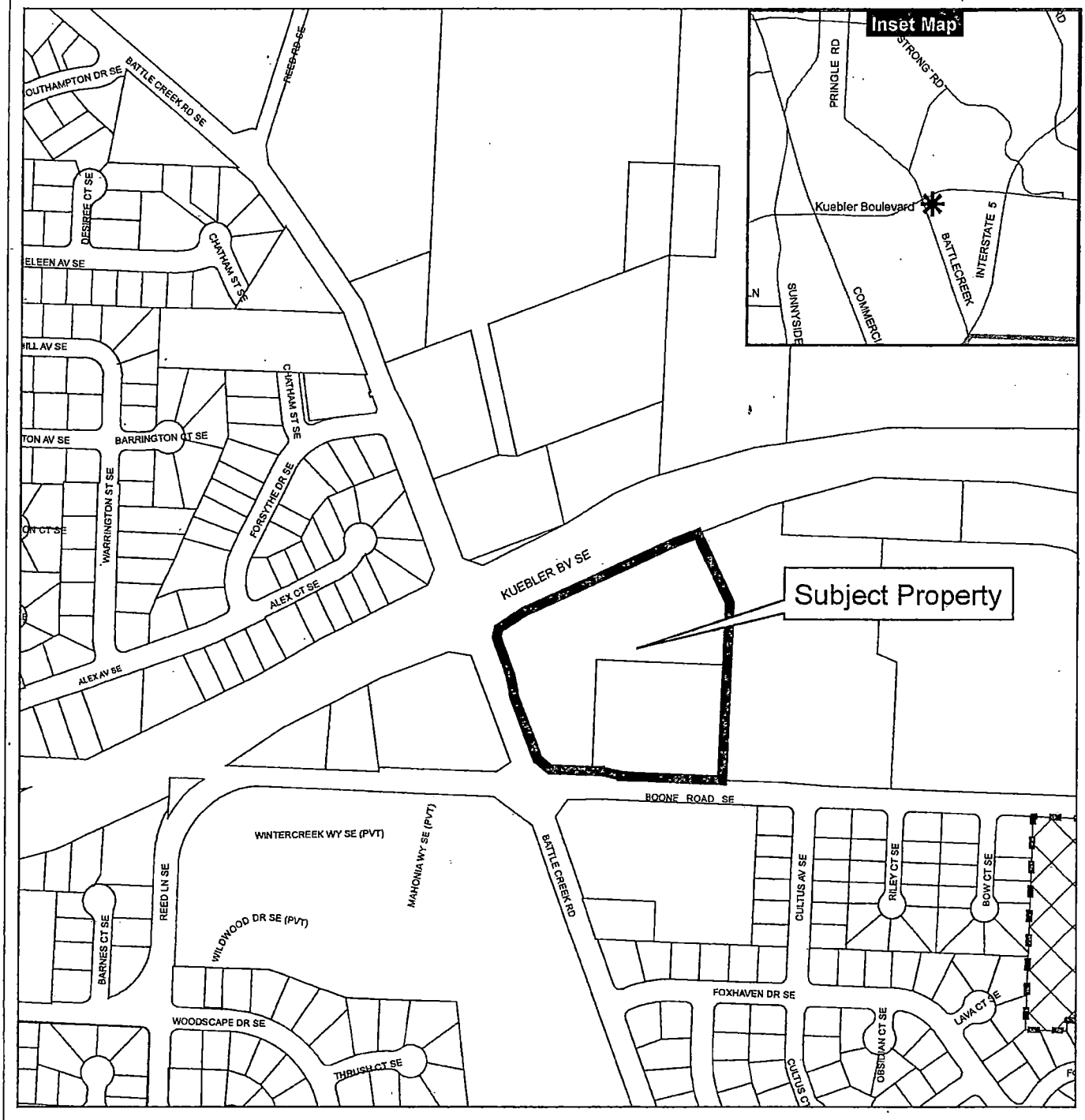
Vicinity Map
2521 & 2531 Boone Road SE



Legend

- Taxlots
- Urban Growth Boundary
- City Limits
- Outside Salem City Limits
- Historic District
- Schools
- Parks

0 100 200 400 Feet

CITY OF Salem AT YOUR SERVICE
Community Development Dept.

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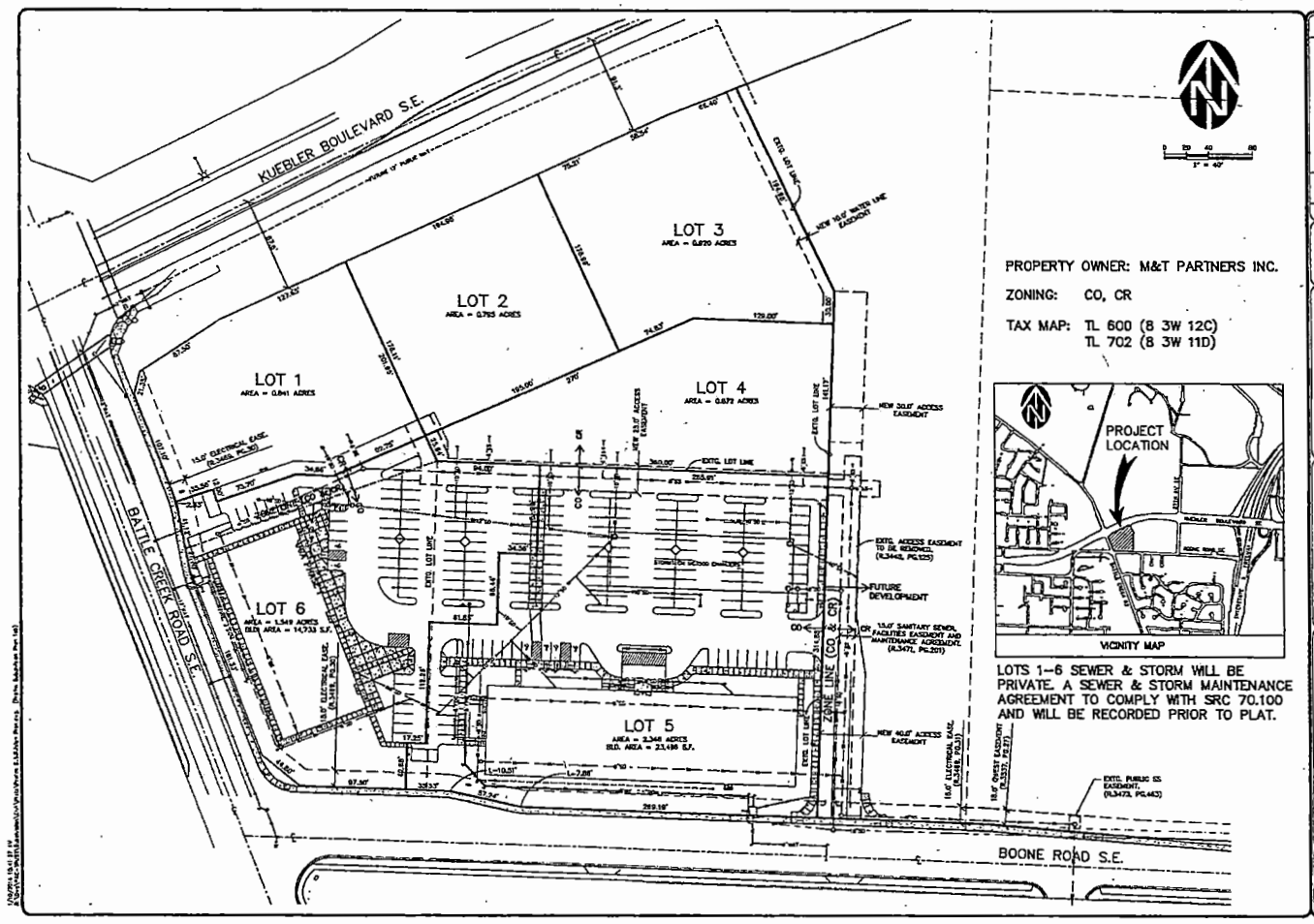
ATTACHMENT 1

G:\CD\PLANNING\Bryce\Current Planning\Subdivisions\2013\2531 Boone Road SE\VicinityMap (2521 & 2531 Boone Road SE).mxd - 1/6/2

ATTACHMENT 2



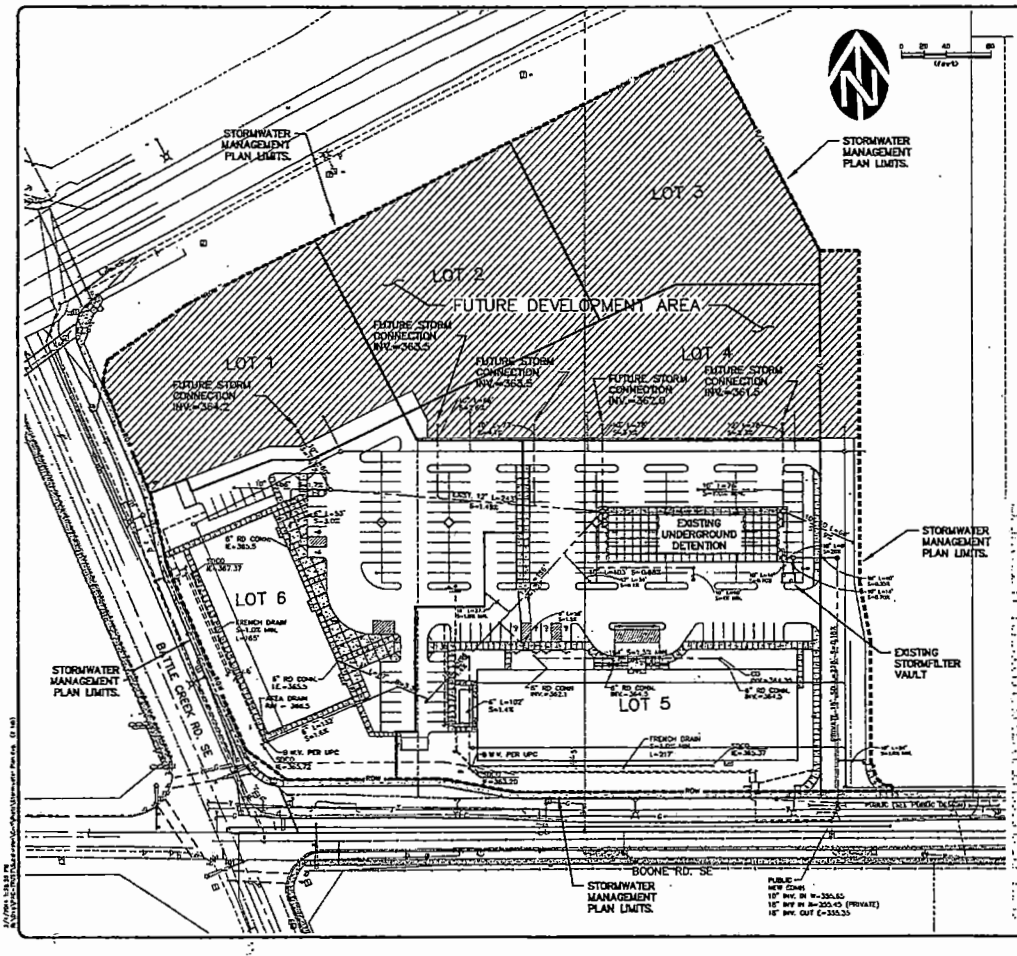
ATTACHMENT 2

REVIEW REVIEW

M & T PARTNERS
PROPOSED PRELIMINARY SUBDIVISION PLAN
KUEBLER GATEWAY
TENTATIVE SUBDIVISION PLAN

DRAWING
1

JOB NUMBER
2672.7000.0



STORMWATER NARRATIVE

Stormwater Management Plan Narrative

Summary:
The existing stormwater detention and water quality treatment system is sized for the Stormwater Management Plan limits at buildout including all future impervious areas, per the specifications below.

Detention Requirements:
Provide detention for the difference between the 5 yr predeveloped storm event and the 50 yr developed storm event based on the rational method at buildout.

- Existing Detention Required (see spreadsheet) = 21, 382 CF
- Existing Detention Provided = 23,000 CF

Stormwater Quality Treatment Requirements:

- Existing Stormwater Treatment Required = None Required
- Existing Stormwater Treatment Provided = CosTech StormFilter Vault sized to treat 0.86 cfs (equal to the detention 5 yr predeveloped release rate)

Future Development Detention & Treatment Requirements
Stormwater detention and water quality is provided for the entire subdivision at buildout. However, Green Stormwater Infrastructure (GSI) filtration BMP's will be provided for an impervious area equal to 50% of building footprint for lots 1 -4 (as shown on this plan) if a building is constructed. GSI will be located somewhere on each lot and will be constructed at the time of development of each lot. The GSI will be designed to filter a 1.38 inch storm over 24 hours (Type 1A) using the Santa Barbara Unit Hydrograph Method and assume a 2 inch/hour media filtration rate. GSI will be planted with approved plantings. Storms of additional size will overflow and enter the existing stormwater system. A minimum of 18 inches of filtration media (as approved by the City) and underdrain system will be provided in each GSI to convey filtered water to the existing system. No additional stormwater detention or stormwater quality treatment requirements are required.

STORMWATER DETENTION CALC'S
FOR EXISTING UNDERGROUND DETENTION

CITY OF SALEM REQUIRED DETENTION VOLUME

Client:	PAC-TRUST	Project:	32-Acres-23
Project Name:	Battle Creek Development	Job Number:	2672.00
Developed Conditions		Undeveloped (Historic) Conditions	
Storm Frequency, years	50	Storm Frequency, years	5
A. Impervious Surface Area, Acres	4.50	A. Total Area, Acres	7.27
C. Runoff Coefficient, Impervious Surface	0.90	C. Runoff Coefficient	0.76
A. Pervious Ballast Area, Acres	1.97	A. Impervious Roadways Combined	0.39
C. Runoff Coefficient, Pervious Surface	0.15	C. Runoff Coefficient, Undeveloped	0.71
Coef. Weighted Average Runoff Coefficient	0.83	C. Slope, assumed	2.23
A. Total Area, Acres	7.27	L. Length, Feet	650
Elevation Overflow Elevation, feet	364.00	H. Time of Concentration, minutes	37
Orifice Pipe Invert Elevation, feet	358.00	IQ. Allowable Outflow, cfs	0.86
H. Elevation Head, feet	6.00		
D. Orifice Diameter, inches	3.5		

Time, minutes	C x I (cfs/ac)	Runoff Volume (cfs)	Time, mins	Accumulated Gross Volume (cubic feet)	Outflow (cfs)	Accumulated Outflow Volume (cubic feet)	Required Detention Volume (cubic feet)
5	4.63	3.75	18.74	4956	0.86	259	4777
6	4.63	3.58	17.90	5668	0.86	311	5357
7	4.63	3.43	24.02	6367	0.86	363	6046
8	4.63	3.31	26.47	7055	0.86	414	6641
9	4.63	3.24	29.13	7776	0.86	466	7310
10	4.63	3.18	31.79	8761	0.86	518	7763
15	4.63	2.85	42.76	9775	0.86	777	8998
20	4.63	2.67	53.41	11364	0.86	1036	10329
25	4.63	2.57	64.24	12772	0.86	1294	11502
30	4.63	2.50	75.04	13317	0.86	1553	11765
35	4.63	2.43	85.01	14060	0.86	1812	12249
40	4.63	2.38	95.03	14760	0.86	2071	12689
45	4.63	2.34	105.29	15399	0.86	2330	12969
50	4.63	2.30	115.24	15939	0.86	2589	13175
55	4.63	2.27	125.01	16571	0.86	2848	13624
60	4.63	2.25	134.98	16998	0.86	3107	13824
70	4.63	2.21	154.84	17982	0.86	3625	14262
80	4.63	2.18	174.39	18838	0.86	4143	14637
90	4.63	2.15	193.82	19743	0.86	4662	14982
100	4.63	2.13	213.38	20267	0.86	5179	15089
110	4.63	2.11	232.72	20906	0.86	5696	15211
120	4.63	2.09	251.98	21449	0.86	6213	15236
130	4.63	2.07	271.08	22054	0.86	6731	15323
140	4.63	2.07	290.14	22814	0.86	7249	15565
150	4.63	2.06	309.06	23463	0.86	7767	15697
200	4.63	2.02	403.71	26973	0.86	10358	16615
250	4.63	2.00	500.00	31277	0.86	12941	18336
300	4.63	1.98	594.00	34913	0.86	15530	19383
360	4.63	1.96	705.60	38753	0.86	18635	20118

DESIGN	JAT
DRAWN	JAT
CHK	MJC
APP	MJC
DATE	10/15/2012

NO.	DATE	DESCRIPTION

M & T PARTNERS
PROPOSED PRELIMINARY SUBDIVISION PLAN
STORMWATER MANAGEMENT PLAN

DRAWING 2

JOB NUMBER 2672.7000.0

NEIGHBORHOOD ASSOCIATION
555 LIBERTY ST. SE ROOM 300 SALEM OREGON 97301 • TELEPHONE (503) 588-6261

February 5, 2014

Mr. Bryce Bishop, Case Manager
Salem Planning Division
555 Liberty Street, SE, Room 505
Salem, Oregon 97301

Dear Mr. Bishop:

Re:	Property Owners	:	M & T Partners
	Property Location	:	2521 and 2531 Boone Road, SE
	Case No.	:	SUB 14-01
	AMANDA App. No.	:	13-119992-LD

After discussion and review of the above-proposed application, the South Gateway Neighborhood Association (SGNA) will supprt this application under the following condition. That all site and street improvement conditions which accompanied the original approval remain in force and that said improvements will occur using the same time period restrictions as if the property had not been sub-divided. SGNA reiterates its strong commitment that the improvements to Kuebler Boulevard between Commercial Street and I-5 should be completed no later than the future improvements to the I-5/Kuebler interchange. Additionally (relating to the Miller partition and the Elite Care site review) street improvements to Boone Road, west of Battlecreek, and Reed Lane–ending at Woodscape Drive and Barnes Road remain unsettled continuing a life-threatening traffic situation in that area.

SGNA reserves the right to amend this position up to and including the date the final determination is made by the City.

Stephen C. Withers, Chairman
Development/Land Use Committee
South Gateway Neighborhood Association
5434 Salal Street, SE; Salem, Oregon 97306
503.540.0442 (landline) 503.510.6004 (mobile)

SW*pw

CC Peter Fernandez, Public Works Director
Glenn Gross, Urban Planning Administrator

ATTACHMENT 3

PUBLIC WORKS

CITY OF Salem AT YOUR SERVICE

MEMO

TO: Bryce Bishop, Planner II
Community Development Department

FROM: Glenn Davis, P.E., C.F.M., Chief Development Engineer
Public Works Department

DATE: March 21, 2014

RECEIVED
MAR 20 2014
COMMUNITY DEVELOPMENT

SUBJECT: **PUBLIC WORKS RECOMMENDATIONS**
SUBDIVISION PLAT NO. 14-01 (13-119992)
2521 AND 2531 BOONE ROAD SE
SIX-LOT SUBDIVISION

PROPOSAL

A subdivision to divide 7.32 acres into six lots ranging in size from approximately 0.795 acres (34,630 square feet) to approximately 2.35 acres (102,192 square feet), with a Class 2 Adjustment to:

1. Allow the number of flag lots within the subdivision to exceed 15 percent;

2. Allow more than four lots to be served by a flag lot accessway; and

3. Allow the length of the flag lot accessway to exceed 400 feet.

The property is zoned CO (Commercial Office) and CR (Commercial Retail) and is located at 2521 and 2531 Boone Road SE.

RECOMMENDED CONDITIONS OF PLAT APPROVAL

1. Design sewer and water systems to serve each lot.

2. Show all necessary access and utility easements on the plat and provide appropriate documentation of infrastructure maintenance agreements as approved by the Public Works Director and required by SRC 70.100.

3. Stormwater infrastructure provided to serve new development within the subdivision shall comply with the applicant's stormwater management plan.

ATTACHMENT 4

Code authority references are abbreviated in this document as follows: *Salem Revised Code* (SRC); *Public Works Design Standards* (PWDS); *Salem Transportation System Plan* (Salem TSP); and *Stormwater Management Plan* (SMP).

FACTS

Urban Growth Area Development Permit—Urban Growth Area Development (UGA) Preliminary Declaration 12-11 was issued September 25, 2012, establishing requirements for development of the subject property.

Streets

1. Battle Creek Road SE

    a. Existing Conditions—This street was recently improved as a condition of UGA Phase 1 to provide a variable improvement up to 56 feet wide within a 72-foot-wide right-of-way. There is a slope easement along the full frontage of Battle Creek Road SE (Battle Creek) adjacent to the subject property.

    b. Standard—This street is designated as a minor arterial street in the Salem TSP. The standard for this street classification is a 46-foot-wide improvement within a 72-foot-wide right-of-way.

2. Kuebler Boulevard SE

    a. Existing Conditions—Kuebler Boulevard SE (Kuebler) has a varied turnpike pavement section within a varied right-of-way of 180 feet to 150 feet in width. The intersection with Battle Creek has a signal.

    b. Standard —This street is designated as a parkway in the Salem TSP. The standard for this classification of street is an 80-foot-wide improvement within a minimum 120-foot-wide right-of-way.

3. Boone Road SE

    a. Existing Conditions—This street was recently improved as a condition of UGA Phase 1 to provide a variable improvement up to 58 feet wide within a varied right-of-way of 60 feet to 78 feet in width.

    b. Standard—This street is designated as a collector street in the Salem TSP. The standard for this street classification is a 34-foot-wide improvement within a 60-foot-wide right-of-way.

Storm Drainage

Existing Conditions

a. There is a drainage ditch in Battle Creek along the full frontage of the subject property.

b. There is a drainage ditch in Kuebler adjacent to the subject property. There is a grade change where the drainage flows split.

c. An 18-inch storm main is located in Boone Road SE (Boone).

Water

Existing Conditions

a. The subject property is within the S-2 water service level.

b. A 12-inch water main is located in Battle Creek.

c. A 10-inch water main is located in Kuebler.

d. There are 24-inch and 30-inch water lines in Boone.

Sanitary Sewer

Existing Sewer

a. There is no sewer available in Kuebler and Battle Creek.

b. An 8-inch public sewer line is located at the southeast corner of the subject property.

CRITERIA AND FINDINGS

SRC 63.046(b) and 63.051 indicate the criteria that must be found to exist before an affirmative decision may be made. These criteria and the corresponding findings are as follows:

SRC 63.046(b)(2) Provisions for water, sewer, streets, and storm drainage facilities comply with the city's public facility plan.

Finding—The water, sewer, and storm infrastructure is available and appears to be adequate to serve future development. The detailed design for serving each parcel shall be provided in conjunction with the final plat approval.

New stormwater requirements in SRC Chapter 71 and PWDS became effective January 1, 2014. The proposed subdivision was submitted prior to the effective date of the new requirements. However, Site Plan Review applications for proposed developments within the subdivision will be submitted under the new requirements.

As specified in SRC 71.080(c), because the applicant has submitted a stormwater management plan as a part of the subdivision application prior to the effective date of the new ordinance, future Site Plan Review applications shall comply with the applicant's stormwater management plan instead of the stormwater requirements that became effective January 1, 2014.

SRC 63.046(b)(3) The tentative plan complies with all applicable provisions of this Code, including the Salem zoning ordinance, except as may be waived by variance granted as provided in this chapter.

Finding—Public Works staff has analyzed the proposed development for compliance with applicable provisions of SRC Chapters 21, 63-66, 69-70, 72-78, 80, and 140. Any Code provisions found to be out of compliance are shown in the recommended conditions of development.

The applicant shall provide the required field survey and partition plat as per Statute and Code requirements outlined in the *Oregon Revised Statutes* (ORS) and the SRC. If said documents do not comply with the requirements outlined in ORS and SRC, and as per SRC 63.060(a), the approval of the partition plat by the City Surveyor may be delayed or denied based on the non-compliant violation. It is recommended the applicant request a pre-plat review meeting between the City Surveyor and the applicant's project surveyor to ensure compliance with ORS 672.005(2)(g)&(h), ORS 672.007(2)(b), ORS 672.045(2), ORS 672.060(4), OAR 850-020-0015(4)&(10), OAR 820-020-0020(2) and OAR 820-020-0045(5).

SRC 63.051(a)(2)—The proposed street system in and adjacent to a subdivision or partition conforms to the *Salem Transportation System Plan* adopted under SRC 64.230, and is designed in such a manner as to provide for the safe, orderly, and efficient circulation of traffic into, through, and out of the subdivision or partition.

Findings—The applicant's site plan provides for safe and orderly circulation of traffic into and through the proposed subdivision. Traffic circulation through lots 1 through 4 will be addressed with individual Site Plan Review applications.

Boundary and off-site transportation improvements are specified in the Preliminary Declaration for Urban Growth Area (UGA) Development Permit No. 12-11, which establishes requirements for each development phase of the proposed subdivision consistent with conditions of Zone Change 09-3 and CPC/ZC 06-6. The proposed subdivision does not create transportation impacts that warrant boundary street or off-site improvements at this time. Transportation improvements for future building projects will be addressed in Site Plan Review decisions consistent with the appropriate provisions of UGA 12-11, ZC 09-3, and CPC/ZC 06-6.

SRC 63.051(a)(3)—The proposed subdivision or partition will be adequately served with city water and sewer, and will be served by other utilities appropriate to the nature of the subdivision or partition.

Findings—Public Works Department has reviewed the applicant's preliminary utility plan for this site. The water, sewer, and storm infrastructure are available within surrounding streets / areas and appear to be adequate to serve the proposed subdivision in compliance with the conditions of approval.

SRC 63.051(a)(5)—The proposal conforms to the Salem Zoning Code (SRC Title X) and the excavation and fill provisions of SRC Chapter 65.

Findings—Prior to any ground disturbing activity, permits shall be required and obtained from the Public Works Director for any excavation work adjoining a public right-of-way, or adjoining or within an easement (or future right-of-way or easement), or within or adjoining a designated waterway, or within a floodplain overlay zone (SRC 65.040).

Prepared by: Robin Bunse, C.F.M., Administrative Analyst II
cc: File

Tross Consulting, Inc. Jeffrey R. Tross Land Planning and Development Consultant
1720 Liberty St. SE, Salem, Oregon 97302
Phone (503) 370-8704 email jefftross@msn.com

APPLICANT'S STATEMENT FOR M&T PARTNERS, INC. - KUEBLER GATEWAY COMMERCIAL PROJECT SUBDIVISION

Background

M&T Partners, Inc. (M&T) proposes to subdivide its 7.32 acre property located along the east side of Battle Creek Road, between Kuebler Blvd. and Boone Road. The M&T property makes up the western end of the Kuebler Gateway commercial project, which consists of a 28 acre tract situated between Kuebler Blvd., Boone Road, 27th Avenue, and Battle Creek Road. The contiguous Kuebler Gateway site is planned and zoned for a commercial retail and office center. M&T Partners, Inc. is a wholly-owned subsidiary of Pacific Realty Associates, L.P., which owns the rest of the commercial property adjacent to the east of M&T. The first phase of the development, consisting of two office buildings, has been built on the M&T property. One of the buildings is occupied by Salem Clinic.

The M&T property currently exists as two contiguous Tax Lots, identified as Tax Lot 600 on Assessor's map T8S-R3W-Section 11D, and Tax Lot 702 on map -12C. Tax Lot 600 is 4.73 acres and has frontage along Battle Creek Road, Boone Road, and Kuebler Blvd. Tax Lot 702 is 2.59 acres and has frontage along Boone Road The parcels currently share two common property boundaries, a north-south line that constitutes an eastern/western boundary, and an east-west line that constitutes a northern/southern boundary.

The M&T property is zoned CO and CR (Zone Change Case 09-3). The CO zoning borders Boone Road, and includes Tax Lot 702 and the southern part of Tax Lot 600. The two office buildings are within the CO zoned area of the property. The remaining land to the north, which is all within Tax Lot 600 and borders Kuebler Blvd., is zoned CR and is vacant.

Access to the property is provided by a driveway to Boone Road, which runs along the east side of the property. This driveway will also serve as an access in common with the adjoining commercial land to the east, in keeping with a condition of approval adopted at the time of zoning approval, Comp Plan Amendment/Zone Change Case 06-6.

ATTACHMENT 5

Subdivision Preliminary Plan

The purpose of the proposed subdivision is to create future building lots for the next stage of the site's development. The proposal is to divide the property into six lots, two of which will contain the existing buildings. As shown on the preliminary subdivision plan provided by Westech Engineering, the Project Engineer, Lot 1 is at the corner of Battle Creek Road and Kuebler; Lots 2 and 3 are located along the Kuebler frontage; Lot 4 is situated in between Lots 2 and 3 on the north, Lot 5 on the south, and the common access drive; Lot 5 is located along the Boone Road frontage and is the site of the Salem Clinic Building, and Lot 6 borders Boone Road and Battle Creek Road, and includes the second office building.

The size, zoning, and existing condition of each proposed lot is as follows:

Lot 1	.841 acre/36,634 squ ft.	CR	vacant
Lot 2	.795 acre/34,630 squ. ft.	CR	vacant
Lot 3	.920 acre/42,835 squ. ft.	CR	vacant
Lot 4	.872 acre/37,984 squ. ft.	CR	vacant
Lot 5	2.346 acres/102,192 squ ft.	CO	developed, Salem Clinic
Lot 6	1.549 acres/67,474 squ ft.	CO/ CR (northern edge), developed, office building	

There is no minimum lot size in the CR zone. The minimum lot size for most non-residential uses in the CO zone is 6,000 squ. ft. The proposed lots satisfy the applicable lot size requirements.

The primary access to all of the proposed lots is the common driveway to Boone Road. None of the lots have individual access to any of the bordering public streets. Reciprocal access easements will allow all six of the lots in this subdivision to access the common driveway to Boone Road, as well as lots created in the future from the commercial area to the east as it is developed. As more than four lots will have access to the easement; more than 15% of the lots in this subdivision will be "flag lots", and the length of the flag lot access easement will be greater than 400', Class 2 Adjustments to SRC 63.295(a) and (d) (ref Table 63-1) are required. The requirements for the Adjustments are addressed as part of this report.

Findings for Approval of a Subdivision, SRC 63.046

(b) *Before approval of a tentative plan, the planning administrator shall make affirmative findings that :*

(1) *Approval does not impede the future use of the remainder of the property under the same ownership, or adversely affect the safe and healthful development of the remainder of any adjoining land or access thereto.*

The proposed subdivision constitutes all of the land in the ownership of M&T Partners, Inc., at this location. The subdivision is proposed to create building lots that will promote and enhance the future use of the property. The development of the property is being coordinated with the future development of the commercial land to the east with regards to building placement, driveway access, parking and circulation, internal utility infrastructure, and public improvements, among other factors. Both the subject property and the adjoining commercial land to the east are subject to the conditions of approval adopted in the decision for CPC-ZC 06-6, which assures that incremental development provides for the future use of remaining portions of the 28 acre site. Because the development of the overall 28 acre site is coordinated by the conditions of approval with regards to on-site and off-site improvements, and these requirements are incorporated into the subdivision design, the future use of the M&T property will not be impeded, and the safe and healthful development of the remaining adjoining commercial land to the east, and the access to it, will not be adversely affected. Approval of the subdivision will benefit the future use and development of the contiguous property by including incremental development of facilities that will serve both properties.

(2) *Provisions for water, sewer, streets, and storm drainage facilities comply with the City's public facility plan.*

The water, sewer, street and storm drainage facilities have been designed by Westech Engineering, the Project Engineer, and permits for construction were issued by the City. As stated by the Project Engineer, during 2013 the applicant submitted private and public construction drawings that were reviewed and approved by the City of Salem. The private improvements consisted of two buildings, a parking lot, private sanitary sewer system, private water system, and a private storm drain system. The storm drain system included detention and stormwater quality treatment for a 7.57 acre site. The public improvements consisted of

widening Boone Road, Battle Creek Road SE and a portion of Kuebler Blvd., as well as public sanitary sewer, storm and water line infrastructure. After City plan approval the applicant constructed the private (PERMIT # 12-115538-CO et al) and public improvements (PERMIT # 12-107400-02-PC) later that year in 2013. To date, the City has accepted the public improvements, thereby acknowledging that the improvements were constructed per City standards. Improvements constructed during this project provide the necessary infrastructure consisting of private sanitary sewer, private storm sewer, and public water that are available to fully serve this proposed subdivision.

(3) *The tentative plan complies with all applicable standards of this Code, including the Salem zoning ordinance, unless a variance or adjustment therefor has been obtained.*
The subdivision property is zoned CO and CR. There is no minimum lot size in the CR zone. The minimum lot size for most non-residential uses in the CO zone is 6,000 square feet. The two proposed lots in the CO part of the property are substantially larger than 6,000 square feet, and they are developed. All applicable standards of the Code were met at the time of development. The proposed undeveloped lots also meet the applicable lot standards of 63.145. The subdivision borders the adjacent, vacant CR land to the east only along the east line of Lot 3. Because the proposed lot and the adjoining land are zoned CR it is expected that the bufferyard setback requirement will be minimal.

Three features of the subdivision require Adjustments. More than four lots will be served by an access easement; Lots 1, 2 ,3, and 6 are flag lots; and the length of the accessway exceeds 400'. Class 2 Adjustments to the standards of SRC 63.295(a) and (d) and Table 63-1 are requested for these features, and the criteria of SRC 250.005(d)(2) are addressed below.

At the time the development of a lot is proposed, the site plan will be required to demonstrate compliance with the applicable standards for property line setbacks, parking, access, landscaping, etc.

(4) *The proposed subdivision provides safe and convenient bicycle and pedestrian access from within the subdivision to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development.*

There are no residential areas adjacent to the proposed subdivision, and no neighborhood activity centers within a half-mile. The nearest residential area is located to the north-east, across Boone Road. An internal driveway along the east side of the subdivision provides access to Boone Road. This driveway will also serve as access to the adjoining commercial land to the east of the subdivision. Easements will provide access to each proposed lot, as well as future lots. Bicycle and pedestrian access will be available along Boone Road, and along the internal driveway providing access to the subdivision. Boone Road is a public street, and sidewalks and a bike lane will be located along Boone Road. By providing a direct link to Boone Road, the public street that serves the nearest residential area, safe and convenient bicycle and pedestrian access will be available from within the subdivision.

Adjustments, SRC Chapter 250

Class 2 Adjustments are requested to allow more than four lots to be served by the accessway, to allow the number of flag lots in the subdivision to exceed 15%, and to allow the length of the access to the flag lots to be greater than 400'. The criteria for a Class 2 Adjustment in SRC 250.005(d)(2) are addressed as follows:

(2) *An application for a Class 2 adjustment shall be granted if all of the following criteria are met:*

(A) The purpose underlying the specific development standard proposed for adjustment is

(i) Clearly inapplicable to the proposed development, or

(ii) Equally or better met by the proposed development

The application satisfies (A)(ii). The property is subject to the conditions of approval of CPC/ZC 06-6, which apply to the entire contiguous 28 acres. Those conditions limit the number and the location of the driveways that can provide access to the public streets. These are one driveway to Boone Road, one driveway to 27th Avenue (at the far east end of the 28 acre site), and one right-in only from Kuebler Blvd. The limited number and specific location of the driveways makes it necessary to serve the development property with reciprocal easements for access to the driveways. In addition, the size and dimensions of the sudivision, in particular its depth to the west of the Boone Road driveway, results in the necessity for four flag lots, and an accessway length that exceeds 400'.

The large size of the property is a geographic feature that makes it impractical to limit the length of the accessway to 400' (ref Table 63-1 footnote 4). There will be adequate turn-around space for emergency vehicles at the end of the accessway within each lot. The conditions of approval that limited the number of driveways to the public street, and specified their locations, was adopted to assure adequate access to the contiguous development and efficient flow of traffic on the public streets. The proposed access to the lots and the property provides them with appropriate access to the common driveway, as required by the conditions of approval. For these reasons, the purpose underlying the three specific development standards proposed for adjustment are equally or better met by the proposed development, and this criterion is satisfied.

(B) (This criterion applies only to property located in a residential zone. The subject property is zoned CR. Therefore, this criterion does not apply.)

(C) *If more than one adjustment has been requested the cumulative effect of all the adjustments result in a project which is still consistent with the overall purpose of the zone.* Three Adjustments are requested; to allow more than four lots to be served by the accessway, to allow more than 15% of the lots to be flag lots, and to allow the length of the accessway to exceed 400'. The purpose of the zone in this case was established through the zone change cases that applied the CR and CO zones, CPC/ ZC 06-6 and ZC 09-3. The purpose was to enable a consolidated, coordinated retail and office center on the contiguous 28 acre site. Conditions of approval specify how aspects of the development, including access to the public street, are to be coordinated. The requested Adjustments fulfill the requirements of those conditions by providing internal access to the property from the common driveway that will access the public street. The proposed flag lots lie greater than 400' distant from the common driveway as a result of the size of the property. However, the project remains consistent with the overall purpose of limiting access to the public street to the specified number and location of common driveways. Therefore, the cumulative effect of the three requested Adjustments results in a project that conforms to the zoning conditions of approval, and which is still consistent with the overall purpose of the zone. These factors satisfy this criterion.

Summary

The land to be subdivided is part of the larger, approved, commercial center project. The subdivision organizes the future development of this part of the overall commercial site, and it coordinates future development with the provision of public services. It will have no effect on off-site properties and it will not change the relationship of the commercial center to adjoining properties. The exterior boundaries of the larger, approved, project site will not change as a result of the subdivision. Access to the subdivision lots from the external streets will remain as specified in the project conditions of approval. The proposed subdivision covers all of the property in the M&T ownership and there is no remainder that is not part of the subdivision. The subdivision will not adversely affect the safe and healthful development of the remaining commercial land within the project site to the east, or affect its access. The provisions made for water, sewer, streets, and storm drainage facilities for the subdivision comply with the City's public facility plan. The tentative subdivision plan addresses the applicable standards of the Zone Code, through compliance with the standards and by showing how the three requested Adjustments are equally consistent with the standards. The subdivision provides for all private and public facilities needed to serve the project.

For the facts and reasons presented, the subdivision addresses and satisfies the criteria for approval.

KUEBLER BLVD.

PROPOSED TRAFFIC SIGNAL MODIFICATIONS

RIGHT IN ONLY

PROPOSED TRAFFIC SIGNAL MODIFICATIONS

NEW STREET IMPROVEMENTS

27TH AVENUE

PROPOSED ROUNDABOUT

RETAIL

RETAIL

RETAIL

RETAIL

STORMWATER DESIGN
Standard: SUB 14-01 Stormwater Management Plan
Allowed per Salem Revised Code Section (SRC) SRC Sec. 71.080(c) A lot or parcel created through an approved tentative plan submitted to the City prior to January 1, 2014 may comply with the requirements of this chapter or with the regulations in effect at the time of the tentative plan application.

STORMWATER DESIGN
Standard: 2014 City of Salem Department of Public Works Administrative Rules Chapter 109, Division 004 Stormwater System

EXISTING PHASE

EXTG. BUILDING

EXTG. BUILDING

COSTCO WHOLESALE

168,550 SF.

BOONE ROAD S.E.

NEW TRAFFIC SIGNAL

REFER TO KUEBLER GATEWAY SHOPPING CENTER WEST DRAWINGS

REFER TO KUEBLER GATEWAY SHOPPING CENTER EAST DRAWINGS

STREET FRONTAGE IMPROVEMENTS

0 30 60 120

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN

DSN: JW
DRN: JW
CHK: JN
DATE: MAY 2016

NO. | DATE | DESCRIPTION
REVISIONS

REVIEW REVIEW

WESTECH ENGINEERING, INC.
CIVIL STRUCTURAL TRAFFIC LAND USE
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-2996
Contact: mail@westech-eng.com

M. & T. PARTNERS
KUEBLER GATEWAY SHOPPING CENTER

STORMWATER STANDARDS MAP

DRAWING
C2.0

JOB NUMBER
2672.8001.0

KELLINGTON LAW GROUP, PC

Wendie L. Kellington
P.O. Box 159
Lake Oswego Or
97034

Phone (503) 636-0069
Mobile (503) 804-0535
Facsimile (503) 636-0102
Email: wk@klgpc.com

December 10, 2018

Via Hand Delivery

Honorable Mayor and Members of the City Council
City of Salem
555 Liberty Street SE, Room 305
Salem, OR 97301

RE: Kuebler Gateway Shopping Center File No. SPR-DAP 18-15

Dear Honorable Mayor Bennett and Members of the City Council:

This letter is written on behalf of the applicants, M & T Partners and Pacific Realty Associates (PacTrust), and accompanies applicants' oral presentation at the December 10, 2018 public hearing regarding the above-referenced matter. Please include this letter in the record for Kuebler Gateway Shopping Center File No. SPR-DAP 18-15. Thank you for your consideration.

There are three legal issues to discuss at this public hearing: 1) the well-established legal principle that issues that could have been raised, or were raised, in the 2007 City Council decision processes cannot be raised now; 2) to go over the standards that do apply and that the City's professional staff correctly determines are met; and 3) to briefly discuss particular issues that have been raised, including to make sure that you understand that Kuebler Blvd. functions and has capacity only because PacTrust spent millions of dollars creating capacity and functionality on Kuebler Blvd. i) from Commercial to I-5, ii) for this exact shopping center, and iii) that PacTrust has a vested right to the 299,000 sq. ft. shopping center use of the property.

I. The legal principle that collateral attacks on the 2007 Decision are unlawful

Issues that could have been or were resolved in the City Council 2007 Decision are final and cannot be raised now. Per the 2007 City Council Decision, the use of the site for a large retail shopping center is resolved. In fact, it is the only use allowed on the property, per the City Council's 2007 Decision, requiring the site "shall be developed with a retail shopping center." Accordingly, the 2007 Decision conclusively resolved that the property will be developed with a 299,000 sq. ft. shopping center.

That decision completely dealt with the effects of a shopping center of that size on transportation systems, hardscape and landscaping along Boone Road, and other issues. Under the finality principle, those issues cannot legally be raised again now. This finality principle is the only reason that PacTrust has paid the City millions of dollars in reliance upon the 2007

approval decision. The property is ready for the 2007-approved shopping center, subject only to this technical City review of the arrangement of buildings, parking, and circulation.

The 2007 Decision conclusively decided that a shopping center composed of 299,000 sq. ft. or less is not a regional shopping center. This approach is reflected not only in the 2007 Decision, but also in LUBA's *General Growth v. City of Salem* decision, 16 Or LBUA 447 (1988).

Finally, please understand that issues about wetlands or air quality relate to no applicable approval standard, and are irrelevant. And, regardless, evidence in the record is clear: all grading and wetland issues have been positively resolved under fully approved city, state, and federal permits. Claims to the contrary lack any merit.

II. All applicable standards are met

Regarding tree preservation, the standard asks: is it necessary to remove the 8 white oaks to develop the shopping center? Your professional staff confirms, the answer is yes – it is impossible to establish the only permitted use on the site – a retail shopping center – and save them. The City has uniformly interpreted the "necessary to remove" standard in the manner that staff has interpreted it here: that it is met where the proposed development cannot occur without the removal of the trees as here. It is impossible to establish the shopping center of the size that the city fully approved in 2007 – which is larger than proposed – or indeed any shopping center on the site, and save those trees. Regardless, PacTrust and Costco are concerned about the White Oak trees, such that even though the city code requires planting just 16 trees to replace the ones that are necessary to remove, the site plan shows that 54 new white oak trees having a caliper of at least 2.0" will be planted. You are free to impose a condition of approval to that effect.

Access in and out of the site is "safe, orderly and efficient." This is a micro standard that looks to the access to and from the site. This standard is not about a larger area – the evaluation of the traffic impacts of a larger shopping center were thoroughly evaluated in the 2007 Decision process and are not now at issue. And even if you look at a larger area, all standards are still, met as your professional staff explained. Driveways and parking areas are safe and efficient—there is no evidence otherwise. The shopping center will be adequately served with all water, sewer, stormwater and other facilities.

Staff is correct—the proposed shopping center site plan meets all relevant standards.

III. Particular Issues – Traffic

Some claim that the shopping center will use up capacity on Kuebler Blvd. that is reserved for others. This is untrue and unfair. As you know, PacTrust created the capacity on Kuebler Blvd. Before PacTrust, Kuebler was failing and without PacTrust, would be worse off. The capacity of Kuebler Blvd. that PacTrust created was not a charitable contribution—it was a necessary part of the 2007 Decision that this exact shopping center, and one even larger, meets

all standards. PacTrust made it possible for Kuebler Blvd. to work for everyone including for the approved shopping center. PacTrust has done its part and has earned city approval.

IV. Particular Issues – The proposal is for a retail shopping center and Costco is a retail sales use

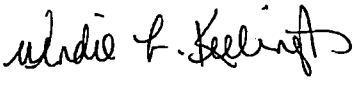
The site plan shows a retail shopping center anchor store, fueling station, 4 retail pads complemented by two medical office buildings that function as an integrated whole—that is quintessentially a shopping center. A Costco store was always one of the options for the anchor tenant, as Exhibit 2 to the Applicant's November 29, 2018 letter shows. Exhibit 2 is a summary sheet of possible tenants that PacTrust gave to SGNA in response to their questions, at one of the 6 or so meetings conducted in connection with the 2007 Decision. SGNA specifically recommended approval of the 299,000 sq. ft. shopping center and both PacTrust and the City have relied upon that approval.

Costco is a retail use, as is clear from the city's code and from how the City has categorized the Salem Costco and Salem Bi-Mart in numerous land use and decisions, for decades. It fits no other use category as your staff has explained.

PacTrust has done its part. It has earned and deserves your approval of its site plan.

We ask you to do so. Thank you

Very truly yours,



Wendie L. Kellington

WLK:wlk
CC: Clients

December 10, 2018

Dear City Council Members.

My name is William Dalton. I live in South Salem, and have been a City resident since 1996. I am writing as both a 'citizen' and a formal "Appellant" of the recent decision by City staff to approve an application by CostCo to relocate to the Battlecreek Rd.-Kuebler Boulevard-I 5 area.

There a numerous reasons for my opposition to this decision/relocation. Our Attorney and numerous citizens stand ready to document and enumerate the concerns that we share.
A Summary of those concerns will include:
.. The failure of the Applicant to meet the conditions applied to that property when re-zoned [e.g., local retail, no gas station,...] several years ago by a previous Council.
.. The failure of the City Planning process to identify those shortcomings and to require the Applicant to address them before recommending approval of the Application.
.. The failure to consider the appropriateness/compatibility of this regional warehouse store and associated industrial-sized gas depot—with the character and needs of the neighborhood.
.. The complete failure to assess and address the impact of this and other proposed commercial development in this specific area with respect to road capacity/traffic and safety; nor its compatibility with Kuebler Boulevard as a designated "parkway" and 'connector.'
.. The failure to adequately address water run-off and storage issues and historical flooding.
.. Planned destruction of natural resources and features (wetlands, large stand of older 'protected' white oaks and mature conifers;potential site for a neighborhood mini-park ...).
.. The major impact (value, livability) of significantly increased traffic, noise, and air pollution on current and proposed residences in an area now largely residential, church, and senior living.

This does not include all of our citizens' concerns, which address both legal and quality-of-life issues. But we certainly feel they summarize the basis for having the City Council overturn this inappropriate and injudicious Application.

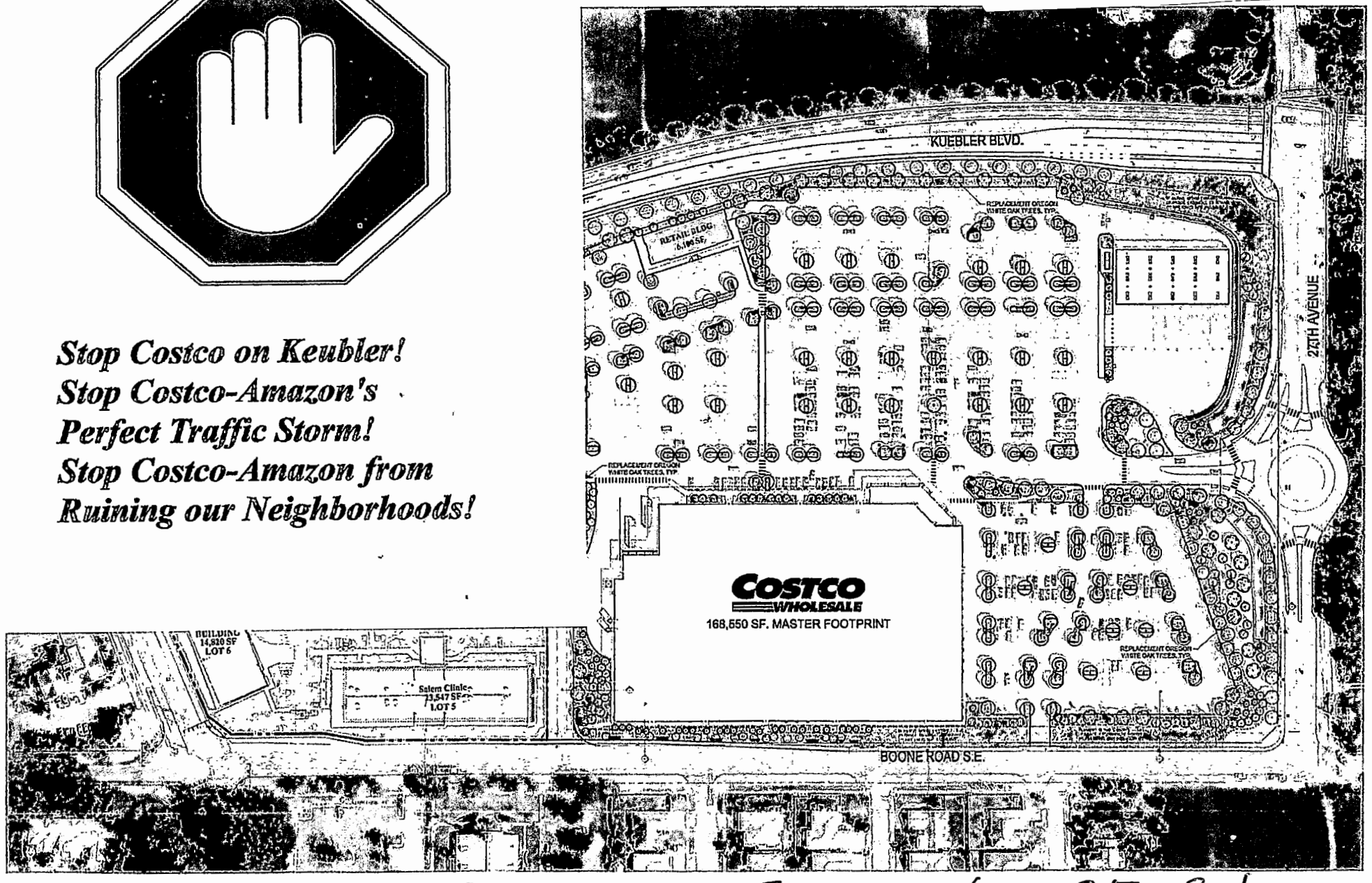
That said, based on numerous meetings, a major public hearing, and ongoing comments accumulated over a period of months – it is important to note that objections and major concerns regarding this Application do NOT reflect opposition or negativity to CostCo itself: The Appellants and many opponents are CostCo members, and consider a well-located CostCo to be an asset for our community. In fact, given CostCo's reputation as a good employer and a good Neighbor, we cannot imagine why they are attempting to relocate to an area where they will both be unwelcome and will negatively impact neighborhoods and community services and infrastructure. These same citizens stand ready to actively support CostCo's relocation to a site (e.g., on the east side of I 5...) where it would be both accessible and appropriate.

Thank you for your consideration regarding this very important issue.

William B. Dalton
6619 Huntington Circle SE Salem, Oregon 97306
(503) 371-4174 daltfam@comcast.net

Received At Council Meeting
Meeting Date: 12-10-18
Agenda Item: 4.a
Received by: A. Johnson
From: Sharon Smith

Stop Costco on Keubler!
Stop Costco-Amazon's
Perfect Traffic Storm!
Stop Costco-Amazon from
Ruining our Neighborhoods!



WD and Sharon Smith 4774 Bradford Loop S.E. Salem 97302

The proposed Costco Facility on Kuebler Blvd and Battle Creek Road and adjacent commercial development will move the traffic from Hawthorne Avenue SE, SR 22 and I-5 to Battle Creek Road, Kuebler Blvd and I-5 on top of the hundreds of Amazon cars and hundreds of trucks servicing the Amazon Facility. Do we want the "quality of our lives" destroyed? Contact the City Planning Office and the City Council to register your concerns. Costco on Kuebler is not a done deal in spite of what Costco Management might think.

SAY NO TO COSTCO ON KUEBLER BLVD!

CASE #SPR DAP 18-15 TESTIMONY—BILL WORCESTER, 1935 WICKSHIRE AVE SE

I BELIEVE THE KITTELSON TRAFFIC IMPACT ANALYSIS FOR THE PROPOSED COSTCO RELOCATION UNDERESTIMATES TRIP GENERATION BY AS MUCH AS 18%.

I BASE THIS ON TIA'S FOR 6 OTHER COSTCOS AND 2 WALMARTS. OF THE 6 COSTCO TIA'S, 4 WERE DONE BY KITTELSON & ASSOC.

FROM EACH TIA I PULLED 3 BASIC NUMBERS:

- STORE SF (COSTCO = 168,550)
- WEEKDAY NET PM PEAK HOUR TRIPS (COSTCO TIA = 701)
- DAILY NET NEW TRIPS (COSTCO TIA = 7,210)

(NET TRIPS = TOTAL TRIPS-BYPASS TRIPS - INTERNAL TRIPS.)

FROM THOSE NUMBERS I CALCULATED 2 RATIOS (SEE ATTACHED SPREADSHEET):

- DAILY NET NEW TRIPS/NET WEEKDAY PEAK HOUR TRIPS
- WEEKDAY NET PM PEAK HOUR TRIPS/KSF

MY RESULTS:

- KITTELSON'S ESTIMATED DAILY NET NEW TRIPS = 7,210 = 10.3 X PEAK HOUR TRIPS. THE 8 OTHER STUDIES AVERAGE 12.2 X PEAK HOUR TRIPS. 701 X 12.2 = 8,552 TRIPS = 1,342 TRIPS > KITTELSON (16% SHORTFALL)
- NET DAILY TRIP ESTIMATE IS 43 TRIPS/KSF. THE 8 OTHER STUDIES AVERAGE 52 TRIPS/KSF. 168.55 X 52 = 8,765 TRIPS = 1,555 TRIPS > KITTELSON (18% SHORTFALL)
- A 16-18% UNDER-ESTIMATION OF TRIPS IS SIGNIFICANT ENOUGH TO RAISE CONCERNS ABOUT THE VALIDITY OF KITTELSON'S ASSUMPTIONS AND THE SCOPE AND ADEQUACY OF TRAFFIC MITIGATION MEASURES PROPOSED IN THE TIA

IN ADDITION TO WHAT MY NUMBERS SEEM TO INDICATE, I AM CONCERNED THAT:

- THE TIA DOES NOT ADDRESS THE POTENTIAL FOR INCREASED CUT-THROUGH TRAFFIC IN THE SOUTH GATEWAY AND MORNINGSIDE NEIGHBORHOODS DUE TO INCREASED CONGESTION ON KUEBLER BLVD. AND BATTLECREEK RD.
- WICKSHIRE AVE. IS ALREADY PART OF A POPULAR CUT-THROUGH ROUTE BETWEEN COMMERCIAL AND BATTLECREEK.
- THE TIA DOES NOT ADDRESS SOUTH MORNINGSIDE RESIDENTS' ACCESS ONTO BATTLE CREEK WHEN IT BECOMES A MAIN THOROUGHFARE LEADING TO THE NEW REGIONAL SHOPPING CENTER. EVERY BATTLE CREEK INTERSECTION FROM FORSYTHE NORTH TO SUNLAND HAS LIMITED SIGHT DISTANCE ALONG BATTLE CREEK DUE TO HILLS AND CURVES. WE MAY NEED A SIGNAL AT SOME LOCATION (INDEPENDENCE?) FOR REASONABLE ACCESS ONTO BATTLECREEK.
- THE TIA TAKES A PIECEMEAL APPROACH TO TRAFFIC IMPACTS, ADDRESSING COSTCO IN ISOLATION AND NOT THE CUMULATIVE IMPACTS OF COSTCO + 2 REGIONAL SHOPPING CENTERS + AMAZON + THE RETIREMENT FACILITY UNDER CONSTRUCTION + HUNDREDS OF APARTMENTS AND HOUSES EITHER APPROVED OR IN DEVELOPMENT.

FINALLY, ANECTODAL EVIDENCE: WHEN I RETURNED HOME FROM AN EVENT IN NE SALEM ON A RECENT THURS. EVENING AROUND 5:15 PM, WB KUEBLER WAS BACKED UP ALMOST TO TURNER RD. SB BATTLECREEK WAS BACKED UP ALMOST TO REED RD. IF THIS IS NORMAL COMMUTE-HOUR TRAFFIC, WHAT WILL A LARGE REGIONAL SHOPPING CENTER, INCLUDING A COSTCO WITH 30 GAS PUMPS, ADD TO WHAT IS ALREADY NEAR GRIDLOCK AT TIMES ON THESE AND OTHER ROADS IN THE VICINITY? I BELIEVE THESE TRAFFIC CONCERNS WARRANT FURTHER STUDY BASED ON REAL-WORLD DATA AND REALISTIC ASSUMPTIONS. THANK YOU.

12/9/2018			COSTCO TRIP GENERATION COMPARISON 4							
Project	Location	TIA Consultant	TIA date	Store Size (SF)	Wkday net PM peak hour trips	Net PM peak hr trips/kSF	Daily net new trips	Daily net trips/ peak hr trips	Net new daily trips/kSF	Pass-by trips
Costco + 30 gas pumps	**27th/Kuebler**	**Kittelson & Assoc**	**5/31/2018**	**168,550**	**701**	**4.2**	**7,210**	**10.3**	**43**	**30-34%**
Costco + gas	Elk Grove CA	Kittelson & Assoc	2/2016	150,548	1,096	7.3	10,978	10.0	73	Excluded
Costco + 24 gas pumps	Central Point OR	Kittelson & Assoc	10/2015	160,000	900	5.6	10,670	11.9	67	7-15%**
Costco + gas	E Vancouver WA	Kittelson & Assoc	10/2009	154,700	417	2.7	6,158	14.8	40	34-35%
Costco +12 gas pumps	Ukiah CA	W-Trans	6/2012	148,000	700	4.7	11,204	16.0	76	37%
Costco + gas	San Marcos CA	RBF Consulting	9/2009	148,200	926	6.2	9,248	10.0	62	22%
Costco + 12 gas*	Roseburg OR	Kittelson & Assoc	May-09	160,850	365	2.3	3,640	10.0	23	35%
Wal-Mart Expansion	North Salem	Transpo Group	9/2003	91,000	288	3.2	3,545	12.3	39	17%
Wal-Mart	South Salem	ATEP	6/1991	144,000	452	3.1	5,651	12.5	39	40%
			Averages for 8 TIAs	144,662	643	4.4	7,637	12.2	52	27-29%
*148 ksf Costco + 12.85 ksf future retail										
									**30-35% typical for Costco	

CONCLUSIONS:

1) **Kittelson underestimates new Costco daily trips by 16% to 18% (1,342 to 1,555 trips).** Understating new trips makes it easy to downplay/ignore traffic impacts on surrounding neighborhoods and existing infrastructure (eg. I-5/Kuebler interchange), and minimizes improvements required to maintain acceptable levels of service.

>The TIA estimates new Costco net daily trips at **10.3 x weekday pm peak hour trips**; the average of 8 other studies is 12.2 x weekday pm peak hour trips. By this measure, new Costco net daily trips should be **701 x 12.2 = 8,552** = 1,342 more than Kittelson's 7,210 estimate.

>The TIA estimates new Costco net daily trips at **43 per 1,000 square feet (kSF)**; the average of 8 other studies is 52 trips per kSF. By this measure, new Costco net daily trips should be **168.55 kSF x 52 trips/kSF = 8,765** = 1,555 more than Kittelson's 7,210 estimate.

2) **The TIA does not address increased cut-through traffic in the South Gateway and Morningside neighborhoods** when Kuebler and/or Battle Creek inevitably back up more at peak hours than they do already.

3) **The TIA does not address increased difficulty of south Morningside residents in accessing Battle Creek Rd.** when it becomes a main thoroughfare to Costco. The intersections with Sunland, Gladmar, Independence, Southampton, and Forsythe all have reduced sight distance north and south along Battle Creek, due to hills and curves, exacerbated by excessive speeds many vehicles travel on Battle Creek. We may need a signal at one of the intersections (Independence?) to make access onto Battle Creek by south Morningside residents reasonably convenient and safe.

4) **The TIA takes a piecemeal approach to traffic impacts**, addressing Costco in isolation and not the cumulative impact of Costco + two adjacent regional shopping centers + the existing businesses on site + the million SF Amazon distribution center + the retirement facility now under construction + hundreds of apartment units and single-family residences now in the land use approval/development process.

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December 10, 2018

Mayor & Council
City of Salem
555 Liberty Street SE
Salem, OR 97031

RE: City Council Review of the Planning Administrator's decision, Class 3 Site Plan Review / Class 2 Driveway Approach Case No. SPR-DAP18-15 – aka – **Proposed New Costco with Fueling Depot in South Gateway Neighborhood**

Dear Mayor & Council:

This is the written testimony of Appellants John Miller, Lora Meisner and William Dalton, for the December 10, 2018 Hearing.

1. Standard of Review

The burden is on the applicant, PacTrust, to **prove** that all elements of the approval standards and criteria from the Salem Revised Code, as well as the Salem Area Comprehensive Plan (SACP), Administrative Rules, and other applicable land use statutes have been met.[1]

As Appellants' appeal letters, our testimony here tonight, the detailed written testimony and expert reports that we are submitting tonight, and the testimony of the many concerned residents here tonight show, there are many criteria and standards that have not been met.

[1] Salem City Council Rule 19(3)(A, B).

2. What Should Happen Tonight

This development should be sent back to Staff, with instructions to follow up on and answer the many questions and issues that have been raised. There should also be instructions to the applicant PacTrust, to re-think their current position.

They need to tell their land use lawyer to stop trying to bully and bamboozle this Council and the Staff into approving something that is inconsistent with what this Council previously approved and what this applicant represented to the City it would propose. The applicant should be instructed to put its alleged professional expertise and creativity to work to propose an alternative project that meets both its legal obligations under the SRC, and its past representations to the City and the Neighborhood.

Barring that, the Council should continue this matter for another Hearing in January. That way the Council will have time to carefully review the proverbial mountain of material that has been submitted in this matter in the last 30 days or so. That way all the issues can be more thoroughly addressed by Staff, by the Applicant, by the Appellants, and by the many members of the public – on both sides of the issue, who care about what happens in this neighborhood.

3. The Size, Scale And Uses In The Proposed Development Are Not Appropriate

This property was rezoned for a "Community Retail Shopping Center." It was **not** rezoned for a big box wholesale warehouse, and massive fueling depot.

Only a shopping center of the type represented by the applicant in 2006, and as described and approved in the Conditions in CPC/ZC06-06,[2]

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[2] "Given the Applicant's clearly stated intentions in the application and hearing process, as well as the conditions imposed in this decision, it is reasonable to assume for purposes of the TIA that the proposal is for **a community level retail shopping and service center as described in the Applicant's submittals and as limited in this decision**... it is irrelevant as the proposal is **not for a Wal-Mart, as the applicant has so represented and Council has relied on that representation.**" ORDER NO. 2007-16-CPZ/ZC COMPREHENSIVE PLAN CHANGE/ ZONE CHANGE.NO. 06-6-CPC/ZC, Page 29 (emphasis

can and should now be approved. Exhibit #1 shows what that looked like.[3] Now take a moment and think about, and look at, what those PacTrust representations that this Council relied upon – and incorporated into its approval – really were.

There were **affirmative representations** by PacTrust that no gas station/fueling depot would be proposed.[4] They were **affirmative representations** that a "big box" store - such as a Wal-Mart - would not be proposed. Yet that is exactly what is before you tonight.

PacTrust should not be allowed to submit a rezone proposal for a neighborhood scale community shopping center - and make promises about its size, scale and purposes in order to win its approval - and then turn around and switch to a proposal that involves a huge fueling depot and a building that looks like and is a proverbial "big box" store. The City Council, and neighborhood groups and citizens that have been involved in the process for the past thirteen years, have every right to hold PacTrust to its original proposal. This Council can, and should, reject the wholly inappropriate "bait and switch" that PacTrust has now presented.

Here are just a few of the representations made by PacTrust during the rezoning and Comprehensive Plan change process:

- At a May 7, 2007 City Council meeting Ken Grimes, Pac Trust's Architect said that the plan was for a "**community center**" with "architecture [that] would be in scale with residential buildings as opposed to large boxes."

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added). *See also,* PacTrust Letter dated 11-29-18 (located at PDF pages 508-524 of the Staff Report) Appendices 1, 2, 3, and 4 (various proposed layouts for this site, dated in 2016, none of which shows a tenant building larger than 44,700 square feet, and none of which show a fuel depot).

[3] Staff Report PDF p.516.

[4] The Staff Report focuses on the fact that gas stations are now a Permitted use in a CR zone. However, the approval decision on the rezone (which is considered by law an approval criteria for the current proposal) was **expressly conditioned** on the proposal being a project "as described in the Applicant's submittals." In those submittals the applicant represented that no gas stations would be proposed. Thus, no gas stations **is an approval criteria** that this current proposal does not meet.

That was at 1 minute, 47 seconds into the Hearing Recording.[5] Curious, isn't it, how the proposal now before you looks for all the world like a "big box" building, that is completely out of scale with nearby residential buildings.

- Mr. Grimes went on to represent that the:

> "Buildings would be a mix of brick and stucco with parapets to screen rooftop equipment"

and he compared it to PacTrust's project at Orenco Station Town Center in Beaverton.[6]

Curiously, the largest single tenant at Orenco is a New Seasons grocery, that occupies roughly 33,000-40,000 square feet. Two photos of the Orenco project, including a scaled photo of the New Seasons building are provided as Exhibit #5. The behemoth proposed Costco before you, covers considerably more area, particularly when you add in the fueling depot.

- At the same meeting, Glenn Gross, of Salem City Staff repeatedly represented to the Council that the project **as Staff understood it**, and that Staff recommended for a rezone, would be a "**community shopping center.**"[7]

What should be clear is that everyone involved thought, and approved this, as something other than a proverbial "big box" store. Yet that is precisely what you are now being asked to approve.

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[5] To ensure there was no dispute over what was actually said, Recordings of these hearings were obtained from the City. Copies of all the recordings are provided on the CD and Flashdrive that we have provided to Staff with our written testimony and marked as Exhibit #2. We have also made written Excerpts or partial transcripts made of the key portions of those hearings. Those are also provided, as Exhibits #3 & #4. The portion just quoted is from the excerpted transcript of May 7, 2007, Ex. #3, at p.2.

[6] *See,* May 7, 2007 Recording in Ex. #2 at 1:47:00. *See also,* transcript Ex. #3, at p.1.

[7] *See,* 5-7-07 Recording at 1:09:03 in Ex. #2, and transcript Ex.#3, p.1.

- At the November 21, 2006 Planning Commission meeting, which led ultimately to that 2007 City Council Hearing that I just quoted from, PacTrust representative Jeffrey Tross stated, at 19 minutes 8 seconds:

> "We [PacTrust] are proposing CR which is a lower intensity zone than CG. One of the chief differences is that CG allows for gasoline service stations, various other type of automotive services and dealerships outright permitted. The **PacTrust** proposal **is proposing none of those**. They are conditional uses in the zone [CR} and **we are not asking for** any conditional uses."(emphasis added).[8]

Yet what is part of the Project before you now? A huge fueling depot, which PacTrust claims you have no choice but to approve.

- Similarly, later on in the same Planning Commission Hearing, Dick Loffelmacher of PacTrust said:

> "We're not going to be creating something here that's gonna be drawing for 10 miles."[9]

- Mr. Loffelmacher went on to state that:

> "This idea that somehow we're pulling from all over Salem, it just isn't going to happen. It just won't because you're not going to get regional types of tenants to come into that kind of center, in that location."[10]

Yet now PacTrust is telling you that the **only** project that will work on this property is a big box that clearly is intended to **and will** draw from quite some distance away.

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[8] *See,* 11-21-06 Recording part 1, at 19:08:00 in Ex. #2, and transcript Ex.#4, p.1.

[9] *See,* 11-21-06 Recording part 3, at 11:29:00 in Ex. #2, and transcript Ex.#4, p.2.

[10] *Id.* Ex. #2 at 12:02:009. *See also,* transcript Ex.#4, p.3.

In short, despite their prior public representations that the Site Plan would be fixed around an appropriately sized **community-scaled** development, PacTrust now proclaims that it is economically impossible to build such a development. They and their lawyer even go so far as to claim that unless you approve **exactly** what they are now proposing, it will render the property worthless and constitute an unconstitutional taking.[11] According to the lawyer, the demographics and economic have changed so drastically since 2007, that a gigantic big box with a massive fueling station is the **only** viable development path.[12]

First of all that's not the current economy, as hopefully everyone in this room recognizes. Second, even if it hypothetically was true, it doesn't change the fact that the rezone was approved **on the condition** that a "community scale shopping center" be sited here – **not** a big box, and certainly not one with a huge gas fueling station.

PacTrust is a large and sophisticated developer. Many types of profitable properties are in its portfolio. And despite the claimed upheaval in the market (unsupported by any shred of evidence) PacTrust proudly touts Orenco Station Town Center as part of an "award-winning master-planned Orenco Station," with a "bustling main street."[13] A "bustling main street" is not too bad for a type of development that PacTrust's lawyer now claims has been entirely left behind and has zero economically viability.[14]

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[11] *See,* PacTrust Letter p.1 ("Absent approval, the applicant's property has no economically viable use."); and 11-3-18 letter from attorney Wendie L. Kellington located at pp.525-550 of the Staff Report PDF (hereafter WLK Letter) p.8 ("Refusing to allow the proposed shopping center means that the exactions lack the required 'rough proportionality' to comply with the federal and state constitution's 'unconstitutional conditions' taking standards." and "Refusing to approve the site plan for the proposed shopping center use that is permitted outright, will likely leave the subject property with no economically viable use.").

[12] WLK Letter, p.8. Somewhat ironically, the only other allegedly viable potential lessee identified by PacTrust's lawyer at this time is WalMart - the very type of store that PacTrust swore up and down in 2006 & 2007 that it would never propose on this site.

[13] See, PacTrust Website: https://properties.pactrust.com/portfolio/1175, last visited on 12/04/2018.

[14] And what about the money that PacTrust has expended on this property and the improvements? There is no question they have spent some money. They, and their lawyer, repeatedly tally it up. With such assiduous accounting, PacTrust should also be able to provide for this Council a figure showing **how much it gained - in increased property value** - from the rezone and Comprehensive Plan change and how much it expects to make in reimbursements through the SDC process when a development is ultimately approved. Curiously, no such figure has been offered into the Record, but no doubt it would be impressive. Appellants suspect that it might well fairly compensate the company for their outlays on this project to date.

It should be emphasized that the applicant left no doubt that it was submitting a plan that was neighborhood-scale, similar to the Orenco development, **and nothing like** the large scale big box that is now proposed. Mr. Loffelmacher from PacTrust specifically described it this way:

> Those are the primary tenants - again you don't know who is going to show up until you get there. But if you take a look at it, Lancaster is just down the road and has every kind of retail imaginable. Nobody from down there is driving to this shopping center. North Salem is taken care of. Commercial is taken care of. We're not creating something drawing for ten miles, we are responding to a market that exists. A road with 27,000 cars on it that is only going to go up, a neighborhood with very good demographics, which allows you to get good restaurants and uses that people will enjoy. That is what we'll respond to. This idea that we are pulling from all over Salem just isn't going to happen.[15]

Having previously represented to the City – and the neighborhood - that the rezone of this property would **not** result in construction of or involve a big box retail warehouse and/or fueling station, the Applicant today should be equitably and legally estopped from pursuing that sort of use on the property.[16]

The development as currently proposed is nothing like what PacTrust originally represented would be submitted for this site. The current proposal makes a mockery of the phrases "community shopping center" and "in scale with residential buildings."

PacTrust certainly knows better, having built actual community-level developments - like Orenco. The contempt shown to this community by this

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[15] Applicant testimony, quoted in ORDER NO. 2007-16-CPC/ZC COMPREHENSIVE PLAN CHANGE/ZONE CHANGE NO. 06-6-CPC/ZC, December 10th, 2007, p.12. *See also,* Recording in Ex.#1.

[16] *See,* e.g., *Culligan v. Washington County*, p. 8 LUBA No. 2008-038 (Or. LUBA, 2008) (finding that a specific condition of approval criteria is not necessary where an applicant's promise or statement "is embodied or found on the face of the plan that the decision approves.").

cynical bait and switch manipulation of the process – in an effort to try to force a big box warehouse into a place where the opposite was promised, proposed, and approved, should not be rewarded.

PacTrust's lawyer also complains that unless it gets exactly what it wants, the company is being "taxed" or exacted – something that this Council knows is not actually happening - beyond the permissible "rough proportions" of its project impacts.[17] But the development **proposed and promised at the time of the zone change** is something that PacTrust could easily still achieve approval of. The appellants have learned to live with that idea, and they would welcome a proposal that fits what was actually promised and what was previously approved by the Council. Yet that is not what is before you.

What is before you – sadly – is a classic "bait and switch" tactic by a sophisticated applicant. PacTrust now claims that it is impossible to find tenants to fill a development like the highly successful Orenco Station Town Center (which is what it promised here), and that **only** a giant big box like Costco can possibly confer any value on the site. That's an astounding claim, and one that rings hollow in the current economy.

In an impressive stretch, both PacTrust and its attorney claim that the Costco was always an actively considered tenant, and that the SGNA always knew that.[18] PacTrust cites a document that does nothing more than compare typical square footages for various types of stores. This despite all of the emphatic public avowals by PacTrust - in testimony to City - that it would not build a big box of the very kind now proposed.

In addition to more hyperbole about constitutional takings, PacTrust's lawyer claims that the SGNA lacks institutional memory. The only clear and apparent lapse of memory here seems to be on the part of the applicant, PacTrust. Until 2016 it had never submitted plans showing a proposed store larger than 44,700 square feet. Yet they now claim that an enormous big box Warehouse was **always** in the mix.

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[17] WLK Letter, p. 8.

[18] *See,* PacTrust Letter p. 4 and WLK Letter p.9.

Appellants urge the Council to give PacTrust's testimony at **this** hearing the exact weight that PacTrust apparently assigns to its own previous testimony - which is apparently none at all.

A. Costco Is A Warehouse, Not A "Community Level Retail Shopping" Store

The prior approval Conditions on the property are, pursuant to SRC 300.820(b), treated as a part of the UDC. As a part of the UDC, those Conditions constitute **approval criteria that must be met** - per SRC 220.005(f)(3)(A). What was approved was a **community retail shopping center**, not a massive warehouse and fueling depot.

Costco is a **warehouse** and a wholesale outlet.[19] The company is actually registered officially as the Costco Wholesale Corporation, and it calls itself a "membership warehouse club."[20]

Taking the applicant at its word, this is not a community or "retail shopping center" as required by Condition 14 of the Rezone approval. This is a wholesale warehouse **- reserved for members only**. Despite the claims in PacTrust's materials to the contrary, Costco is legally not "open to the general public" – any more than an exclusive golf country club is. The truth is, you have to be a member of the club, to use the facility. Costco will turn you away if you are not a member. They have people at the door, tasked with doing precisely that, and you cannot purchase anything unless you show a membership card.

Remember this was supposed to be a "community shopping center."[21] What kind of neighborhood community store, demands tribute or membership in order to purchase something?

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[19] *See,* e.g., SPR-DAP 18-15 Decision Part 1 October 23, 2018, Pages 1, 4, 12, 16-18, et al., (referring to Costco Wholesale); and SPR-DAP 18-15 Decision Part 4 Pages 17, 22 (referring to Costco Warehouse).

[20] *See,* e.g. https://www.costco.com/membership-information.html (the "Company Information" page of the Costco Website.

[21] "Moreover, to the extent the issue has to do with the opponents' speculation about an "outlet" mall, the applicant specifically represented and Council specifically relies on the Applicant's representation, that the property will not be developed with a "Factory Outlet" mall. **The evidence in the record supports**

Similarly, the PacTrust lawyer tries to argue that Costco is open to the general public.[22] But in the very next paragraph, she states that the fueling area will be "integrated with the shopping center" and that to use it, one **must be a Costco member.**[23]

Evidently, even the advocates for this project find it confusing that the Costco could be simultaneously open to the public and yet strictly limited to members. Who can blame them? Better to rely on Costco's own description of itself - as a **warehouse outlet operating as a membership club**.

Costco sells in bulk. It offers Business Memberships, which small businesses take advantage of to buy products in bulk for resale. Costco stacks merchandise to the proverbial ceiling. The general public is not allowed to use Costco facilities, without first paying a fee. Costco is not properly classified as a retail sales use.

Wholesaling uses are prohibited in CR zones, per SRC 522.005(a) (Table 522-1). Since the SRC does not recognize Membership Warehouse Clubs as an approved use, this development should not be allowed in this zone. Classifying this warehouse members only facility as a "retail sales use" was an error by the Planning Division. [24]

Warehousing can only be allowed as a Conditional use in a CR zone.[25] As a result, this application should have required a variance and zone change and should be considered as a Type III, rather than Type II procedure under SRC 300.100 (Table 300-2) and SRC 245.005(b). In short, in reality, a variance under SRC Chapter 245 and a conditional use permit under SRC 240.005 and or a zone change under SRC 256.005 are necessary for this project - as currently proposed.

Council's determination that the proposal is for a community level shopping and service facility." ORDER NO. 2007-16-CPZ/ZC COMPREHENSIVE PLAN CHANGE/ ZONE CHANGE.NO. 06-6-CPC/ZC, Page 18.

[22] WLK Letter p.13.

[23] *Id.*

[24] SPR-DAP 18-15, Page 6.

[25] SRC 522.005(a)(Table 522-1).

The addition of a massive fueling depot further takes this development out of the definition of a "shopping center" under SRC 111.001 because it is not a "retail sales and service use category" as defined in the SRC. Gas stations are specifically excepted from the comprehensive list of retail sales categories in SRC 400.045(b)(3)(A).

The current approval is also contrary to the prior procedural and substantive findings made to support the prior Zone change and Comprehensive Plan Amendment for this site. In granting a Rezone, the City Council specifically relied upon applicant's affirmative representations about what would or would not be proposed for the site.

The fueling depot, with 30 pumps, is scaled far beyond the accepted definition of "gasoline service station" and should be classed as an Industrial facility as defined in the Comprehensive Plan and should only be permitted in Industrial Commercial (IC) zoning. "Gasoline stations" are specifically excepted by the SRC from being part of retail shopping center sites, and "are included in motor vehicle, trailer, and manufactured dwelling sales and services: motor vehicle services" under SRC 400.045(b)(3)(A)

The approval is also contrary to the applicable Neighborhood Plan. The Liberty-Boone Neighborhood Plan (now incorporated into the South Gateway Neighborhood) was adopted by the City pursuant to Ordinance No.90-83. The Goals and Policies of that Plan "are intended to provide direction for future decisions affecting [the] Neighborhood." (Plan at p.2, §3) One of the Commercial General Policies that is expressly stated in the Plan is that:

> "19. Commercial uses will be compatible with surrounding properties and will not interfere with the safe movement of pedestrian and vehicular traffic along major streets." (Plan at p.6)

As outlined in this testimony, and the expert report from Greenlight Engineering submitted with this testimony as Exhibit #6, the TIA itself shows that this proposal is not compatible, and it will likely interfere with safe movement in the neighborhood. The project will also not be consistent with many of the Transportation Policies in the Plan. (Plan at p.8) The facilities and infrastructure to accommodate this development are simply not sufficient, because of the inappropriate scale of the proposal.

Since a Type II application and procedure was used, instead of the appropriate Type III requirements, SRC 300.510 and SRC 300.610 were violated. Since the conditions of approval fail to adequately protect the public and adjacent property owners from the adverse effects of the development, SRC 300.820 was also violated, and the approval was not consistent with the requirements of the UDC.

The failure to adequately consider this proposal violates multiple SRC sections. Since the approval does not meet all the standards of the UDC, the approval criteria at SRC 220.005(f)(3)(A) was not met.

2. Traffic Impacts Inadequately Evaluated

The Traffic Impact Analysis (TIA) used to approve this permit is inadequate. It does not maintain or provide for the safe, orderly and efficient movement of traffic and it does not adequately mitigate negative impacts on the transportation system.

The TIA methodology and assumptions are flawed, and it does not consider the traffic impacts of other development already approved or under way in the traffic impact areas. A detailed report by Greenlight Engineering that describes the many inaccuracies, inadequacies and omissions in the TIA – which was relied upon by the Staff for its approval of this application - is attached to and incorporated into this testimony as Exhibit #6.

Failure to adequately evaluate traffic impacts violates SRC 803.015; SRC 803.035; and SRC 200.055,and as such it does not meet the approval criteria in SRC 220.005(f)(3)(B). For the reasons outlined in the attached detailed report from Greenlight Engineering, the TIA and the impact analysis associated with it are fundamentally flawed.

Moreover, the proposed project driveways also do not meet the approval criteria in SRC 804.025(d). One or more of those driveways, in combination with the projects other traffic impacts, would create traffic hazards and/or interfere with safe turning movements and access. In addition, one or more of those driveways, in combination with the project's other traffic impacts, would result in significant adverse impacts to the streets and neighborhoods in the vicinity.

Methodologies, assumptions, and data used in the TIA are flawed, contrary to the WRC mandates, and in some cases entirely missing. Various other developments that are planned for or already advanced in their approval process in the near area are ignored.

Attached as Exhibit #7 is an aerial photo with some of the nearby development called out. The TIA does not take all of these into account.

Of particular note is the Mill Creek Corporate Center, which contains the Amazon distribution center. This development is expected to generate significant traffic impacts, and a TIA for that development was completed. That TIA assessed impacts on the intersections along Kuebler Boulevard and near this development. But the TIA for this PacTrust development omits any mention of traffic impacts from Mill Creek Corporate Center.

Also missing is any accounting for impacts from Kuebler Station, for which a zoning change was approved in 2015. Besides these glaring omissions, the detailed analysis attached to this testimony as Exhibit #6 by Greenlight Engineering shows many fundamental deficiencies in the TIA.

In addition, the TIA does not separately evaluate the impact on Sunday mornings, of Costco traffic added to the LDS and Morningstar church traffic. Traffic is already bad at that time. A photo of the traffic stacking at the light at Kuebler and 27th taken just the weekend before last, is provided as Exhibit #8.

Counsel for PacTrust argues that every traffic issue for this newly proposed Site Plan was already essentially preserved in amber for all time, never to be disturbed - once the zoning change and Comprehensive Plan approval was made in 2007.[26] To paraphrase, no new roads, no new developments, no acts of God, nor any intervening changes in the physical world may ever intrude on the settled traffic analysis of 12 years ago - which apparently infallibly predicted all possible traffic universes through 2025. And according to PacTrust's lawyer, any other approach is merely an improper collateral attack on the prior decision.

[26] WLK Letter, pp. 2-3.

That argument is wrong as a matter of fact, and law. It is an effort to create what is called a straw man argument - where you claim that your opponent is making an argument (even if they are not), and then you attack that hypothetical argument and show why it is flawed.

The idea that appellants are collaterally attacking the prior Zone Change does not stand scrutiny. Appellants have attacked the TIA that was done for this Site Plan Review. That is the TIA that the Code requires at a Site Plan level. That is the issue, not some hypothetical scenario where no other TIA's are required after a Rezone is adopted.

If this idea that no further TIA's are needed - and that the prior rezone approval resolved all traffic issues outside of the project property - were more than a mere figment of the PacTrust lawyer's imagination, then PacTrust itself would have told Staff that they objected to doing a TIA for this Site Plan. They did not do so. There is a reason for that.

PacTrust no doubt recognized that the SRC requires a TIA at the Site Plan level – just as it requires one at the Rezone level. That is clearly what is required here by SRC 220.005(f)(3)(B) and SRC 803.015. To now suggest that these Code sections actually have no meaning or application is absurd.

Ms. Kellington seizes upon the case *Siporen v. City of Medford,* claiming that it stands for the proposition that there is a chasm between a Site Plan and the TIA needed for a zone change, and that there can be no overlap. That is an utterly mistaken, or disingenuous, reading of that case.

Here is a less romantic and more realistic or direct explanation of the *Siporen* case **by the Land Use Board of Appeals** itself from a case earlier this year:

> "We are required to accept the city commission's interpretation of its own comprehensive plan and land use regulations if the interpretation is plausible and not inconsistent with the express language, purpose, or policy of the comprehensive plan or land

use regulations. ORS 197.829(1); *Siporen v. City of Medford*, 349 Or 247, 243 P3d 776 (2010)."[27]

In short, the case was simply an affirmation of the deference due cities in making reasonable interpretations of their rules and laws when applying them.

In the *Siporen* case, Medford had conflicting Code provisions, about which body at the City could or should require a TIA. One section called for a TIA to be done **only** on a Rezone and for it to handled by the Planning Commission. A separate section suggested that the Site Plan and Architectural Review Commission (the SPAC) had authority to look at traffic impacts at the Site Plan level.[28]

The Medford City Council recognized that there were arguably inconsistent directives in the Code on the TIA issue. The Council made a decision to "reconcile" those conflicting provisions in a way that **only** required a TIA at the Planning Commission Rezone approval level.

Since that was a decision by the elected body of the City, that was "choosing between or harmonizing conflicting provisions" of its own City Code, the Court upheld the City's position. The court concluded that interpretations intended to harmonize or reconcile conflicting Code provisions by an elected body would be upheld so long as that interpretation was "plausible."[29]

So, **far** from prohibiting Salem from applying the plain language of its development Code – which unlike Medford's Code clearly mandates a TIA at each level of decision making, including at the Site Plan level - *Siporen* says quite the opposite. It merely holds that as long as an interpretation of **conflicting** provisions of a Code made by an elected Council is a "plausible" interpretation, it will be upheld.

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[27] *Nicita v. City of Or. City* (Or. LUBA, 2018), pp.11-12

[28] *Siporen,* 349 Or at 251-54.

[29] *Id.* at 259.

In the situation at hand, none of the issues presented in *Siporen* are present. There are no "conflicting" Code provisions here, that need to harmonized or reconciled by the Council.

Salem is solidly within its rights to enforce the Code and to protect its citizens by insisting on a TIA at each level of the land use process. That is how the City Staff and Council have always interpreted its Code, and there is no reason to change that approach.

Counsel for PacTrust would apparently like to rewrite some of the Salem Revised Code that applies to Site Plan Review. Specifically, she would like to give effect to four specific words in the first half of SRC 220.005(f)(3)(B) - the words that reference circulation "into and out of" the development - and forget about the rest of the words in Code section, including the entire second half of the sentence where it requires that the "negative impacts to the transportation system are mitigated adequately."

Here is what the Code actually specifies as an approval criteria at SRC 220.005(f)(3)(B):

> "The transportation **system** provides for the safe, orderly, and efficient circulation of traffic into and out of the proposed development, **and** negative impacts to the **transportation system** are mitigated adequately" (emphasis added).

First of all, it might seem obvious that the use of the conjunction "and" separates different requirements in the statute. However, PacTrust's counsel seems to have tried to read that "and" out of existence in her interpretation.

Secondly, you are being asked to conclude that this statute only addresses the narrow issue of ingress and egress from the site. How then, does one explain the repeated use of the phrase "transportation system"? There is no "transportation system" that is internal to the site, and certainly not one that would create "negative impacts" that would have to be mitigated. The use of that phrase **only** makes sense if the analysis is to be of the full impacts of the project – just like any normal TIA.

PacTrust's counsel's letter is apparently premised on imagining a changed or very different Code, one that has brand new – and entirely different - language that the actual SRC. In that imaginary world, the Code

only applies to traffic matters that are "*internal to the site and that are immediately adjacent to it.*"[30]

That's very creative, but that is not what the current Code says, nor a reasonable interpretation of the current Code. That imaginative interpretation is certainly not one that would be upheld under the *Siporen* standard, since there are no conflicting Code provisions that have to be reconciled and nothing in the current Code limits the scope of a TIA that has to be done at the Site Plan level to **just** the impacts that are "*internal to the site and that are immediately adjacent to it.*"

Counsel does quote SRC 220.001, which in relevant part, states that the intent of the Code is "to ensure that such development meets all applicable standards of the UDC, including...transportation and utility infrastructure."[31] But curiously she then concludes, based on nothing in particular that those requirements are also somehow limited solely to "the site itself and its immediate vicinity."[32]

Wishing doesn't make it so. The requirements in the Unified Development Code that any development account for and mitigate for its impacts on "transportation and utility infrastructure" is not limited to just the internal parts of a property. Nor, to our knowledge has the Code ever been interpreted or applied in that way by the City of Salem in the past.

The truth is, the current stance of PacTrust and its attorney are an insult to the Mayor and this Council - and a betrayal of the citizens and neighborhood. PacTrust's stance has gone from portraying themselves as a community asset, to trying to be a bully wielding the club of a takings claim.

The real issue before this Council is the potential degradation of health, safety and quality of life that this project will most likely create for the local citizens. The TIA provided to you uses rose-colored glasses to undercount traffic impacts, which will snarl traffic for miles. The gas station will unacceptably degrade local air quality and produce odors (the lack of any attention to that issue by PacTrust is a significant omission). And a

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[30] WLK Letter, p. 4.

[31] WLK Letter, p. 5.

[32] *Id.*

grove of magnificent standing Oaks will fall, all causing the neighborhood to irrevocably lose its character.

The development laws are in place to protect Salem's citizens. The City Council giving full effect to those laws are the only protection that the citizenry has from a corporation that has gone from pretending to be a good neighbor, to ruthlessly promoting its own bottom line – at the expense of its neighbors.

Finally, if the Council shows the courage to stand up for its citizens, LUBA and the courts will have its back. The laws have all the teeth they need to hold PacTrust to account. If the Council interprets and applies those laws reasonably, the City has nothing to fear from a challenge to a decision in this matter, because as *Siporen* makes clear there is a presumption in the City's favor.

B. Lack Of Transparency

Another fundamental problem is the lack of transparency on the TIA. The PacTrust consultant relied on data that only it and Costco apparently have access to. No one else has seen that data, much less vetted it or its use in this TIA. ODOT asked to see that data, but none was apparently provided to them.

Appellant's counsel specifically asked the City Traffic Engineer Mr. Tony Martin, if he had seen and reviewed the actual data. Mr. Martin confirmed that all he had been provided with was a **summary** of the data – created by Kittelson.

We have no idea if that data actually shows what Kittelson claims it does. It may, but without actually seeing the data we have only the statistical manipulation of that data provided by the applicant's chosen traffic consultant.

For those of you who are not cynical, or who are not steeped in national political infighting, this may come as a shock to you:

> People can sometimes misrepresent or manipulate statistics or data, to try to prove a point.

The only way to protect against that sort of manipulation, is full transparency. If the data shows what Kittelson claims, then they have nothing to fear and should produce the data for inspection by ODOT, the City, and other outside experts such as Greenlight.

So far, Kittelson has refused to do that. One has to wonder, if the data really shows what they claim, why is that?

One thing we do know, even without seeing the data, is that if the TIA were revised using the ITE Manual figures that the Code requires (and that are normally used), the result would likely produce much higher impact numbers. For example, while the Costco/Kittelson numbers in their summary are slightly higher than the ITE Manual numbers for a "discount club" **that is only half the story.** Those numbers need to be combined with the ITE Manual numbers for the 30 fueling stations. When you combine those numbers they vastly exceed what the Kittelson TIA uses in its calculations.

Thus, contrary to PacTrust's assertion that there can be no serious dispute that transportation impacts have all been accounted for and mitigated by it, there are in fact **serious problems** with both the Kittleson TIA and proposed mitigation. These are addressed in more detail in the attached expert report from Greenlight Engineering.

3. Tree Retention

First, the PacTrust materials misrepresent the number of Oregon White Oaks at issue on this site. There are actually 13 there, not 8 as PacTrust keeps claiming. Their own drawings, specifically Sheet C101 from the DOWL report show 12 White Oaks over 12" in diameter, and based on observations from the road with binoculars we believe that there is an additional 12" tree that was misclassified as an Elm, that is actually an Oak.[33] This sort of significant factual error makes one question **all of the other factual assertions** by PacTrust.

Second, the approval and conditions do not adequately protect the Oregon White Oak trees on the site, which are significant and likely qualify for listing as heritage trees. Those trees should be preserved.

[33] A copy of the DOWL drawing, and a highlighted Excerpt are provided as Exhibit #9.

The Purpose section of the tree preservation Code, SRC 808.001, sets out a clear rationale for Salem's policy on tree retention:

> The purpose of this chapter is to provide for the **protection** of heritage trees, significant trees, and trees and native vegetation in riparian corridors, as natural resources for the City, and to increase tree canopy over time by requiring tree preservation and planting of trees in all areas of the City.

In short, as a matter of policy, the Oak trees on this site should have been protected. They likely should have been designated heritage trees under SRC 808.010 and SRC 808.015. And as a matter of policy, no permit should have issued under SRC 808.025 or removal allowed without a permit under SRC 808.030(2)(L), because their destruction has not been shown to be "necessary" by the applicant.

In practice, these trees currently really have no protection in any commercial setting, since the standard for their removal under the exception in SRC 808.030(A)(2)(L) is merely a finding that it is "necessary." The applicant here is a sophisticated one. They should be fully able to develop this property in a way that treats these legacy trees as more than an obstacle to be eliminated by following a pro-forma process.

Several alternate site plans that preserve the significant Oregon White Oaks do already exist.[34] These undercut the claim that it is "necessary" to remove these trees. Moreover, the existing drawings were done using a big box store of the size currently proposed. Imagine what could be done if the applicant chose to use a smaller "Community Center" scale retail neighborhood shopping center, as was represented to this Council and the neighbors would be proposed for this site.

PacTrust should be told to work around these trees, by adjusting parking and other design elements. Chief among those adjustments should be an appropriately sized Community Retail Shopping Center, rather than the enormous warehouse and a fueling depot.

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[34] *See e.g.,* The MG2 drawings at SPR-DAP18-15 Decision Part 3, pp. 158-166. Copies are provided with this testimony as Exhibit #10.

The trees could and should remain as a community asset, and the shopping center could actually become a community asset by providing the type of development promised at the time the rezoning and comprehensive plan changes were approved. Saving the Oaks would provide a feather in PacTrust's cap, rather than the black eye that the destruction of these rare trees in order to make way for a big box store would produce.

4. Costco has Alternatives to this Site

The desire of PacTrust to shoehorn a non-conforming Costco onto this site is not a sufficient reason to permit them to abandon the promised Community Retail Shopping Center. If Costco is determined to abandon its present Salem-Keizer area location, there are several sites that do not portend the same magnitude of negative impacts that this site does.

Appellants to not oppose Costco. Appellants oppose putting a Costco big box in a location that was represented and rezone for a vastly different community level project – one like Orenco Station.

Council should encourage Costco to identify other sites and to explore those - rather than to try to force South Gateway to be sacrificed to maximize PacTrust's bottom line. Some possible sites are: One or more of the IC zoned parcels on the east side of I-5, or the Fairview Mixed Use zone further north along Battle Creek Rd.

5. Stormwater

The Finding in Criterion 4 in the Decision Document for this application that this development should be subject to pre-2014 stormwater requirements is in error. It states that a stormwater management plan was submitted prior to January 1, 2014, and therefore the present proposal need only comply with those earlier standards:

> As specified in SRC 71.080(c), **because the applicant submitted a stormwater management plan as a part of the subdivision application prior to the effective date of the new ordinance,** future Site Plan Review applica-

> tions shall comply with the applicant's stormwater management plan instead of the stormwater requirements that became effective January 1, 2014.

This is contrary to the Land Use Application submitted by the applicant (signed by the property owners in December of 2015). In that application, under the section for Storm Drainage, the applicant states:

> **No public stormwater system improvements are required by the UGA Preliminary Declaration Decision. Details of the onsite stormwater drainage system will be addressed at the time of Site Plan Review for the proposed development.** However, there are no known stormwater drainage condition constraints that would preclude commercial retail development of the site as intended by the applicant.

See, numbered page 3 of CPC-ZC 16-01 documents.pdf (PDF page 7).

The Staff decision that is on appeal in this case ignores this inconsistency. It does, however, recognize that while part of the property is subject only to the pre-2014 stormwater requirements, the reminder (the part outside the Subdivision) is subject to the current stormwater Code.[35]

Of particular concern is that the proposed fueling depot, which was not even contemplated until recently, should conform to the most recent and protective standards to prevent contamination of nearby water bodies. The Council should make sure, that if it allows the fuel depot to go forward, that the strictest standards are followed to protect the state's water resources.

6. Air Quality and Other Environmental Impacts

The proposed use is a large warehouse. It will require an almost continuous supply of diesel-burning over the road large trucks. These trucks should not be allowed to idle while they are unloading or waiting to unload,

[35] *See,* Staff Report Attachment 2, pp.27-28,

except for driver safety in dangerously cold weather or in the case of refrigerated trailers that require the tractor to idle to supply them with power.

In addition, there is a 30 pump fueling depot. That will produce large volumes of air emissions, both during fueling and during tank refilling.

Neither the applicant, nor the Staff, has made any attempt to address air emissions associated with the increased vehicle traffic and trucks supplying the warehouse, or from the proposed fueling depot. These need to be assessed and quantified.

The traffic Code, SRC 220.005(f)(3)(B), mandates that traffic result in "safe" conditions. Having huge air emissions located immediately adjacent to a residential neighborhood is not safe. If construction is going to be allowed, it should be conditioned on the applicant paying for and installing and operating an air monitoring station to ensure that the neighborhood is not exceeding standards for NO_2, SO_2, PM, and other NAAQS standards. The fuel depot, if approved, should have state-of-the-art VOC recovery systems both at the underground tank outlets and at the gas pumps, to minimize harmful emissions into the neighborhood.

This is also required by Statewide Planning Goal 6, which applies to the warehouse, and to the proposed fuel depot. The applicant must show, and the City must verify, that the proposed use will comply with state and federal environmental standards.[36]

There does not appear to be any assessment of this this issue in the Record so far. The applicant should be required to show that the emissions from this proposed use will comply with all applicable environmental laws and regulations.

Gas dispensing facilities are required to comply with EPA National Emissions Standards for Hazardous Air Pollutants (adopted through Oregon DEQ at OAR 340 Division 232, 242, and 244). This requires an air

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[36] *Friends of the Applegate v. Josephine County*, 44 Or LUBA 786, 802 (2003)

quality permit from DEQ. There are also permits required for the Underground Storage Tanks that will be used at the fueling depot, under DEQ's UST program.[37]

Under the SRC no Development Permit may be issued until: "All necessary regulatory permits for the project shall be obtained, including those issued by the City and from other agencies, prior to approval of final plans."[38] So where are the multiple DEQ permits for the proposed fueling depot?

Equally, this development should not exceed standards for air quality, noise, odors or other disturbances that would violate SRC 50.85(a)[39] or other provisions of that chapter as public nuisances. Nothing has been done in this regard with respect to the 30 pump fuel facility proposed for insertion into a residential neighborhood.

One thing the Council could and should do, is instruct the applicant to complete an air emissions and odor study, similar to the one required for a proposed Costco fueling depot in Maryland that was half the size of this one.[40] That Maryland study is 187 pages long, and it is looking only at a 16 pump fueling station. As already outlined, the City needs to evaluate the air impacts of this project on the neighborhood, to comply with Goal 6 and the traffic safety requirements of the SRC.

Of note, the Maryland Court of Special Appeals recently upheld a local governments rejection of a 17 pump fuel depot at a Costco, precisely because:

> "likely levels of NO2 and PM2.5 may have adverse health impacts linked to the unusual size of the proposed station and its

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[37] *See,* DEQ's UST Program materials at: https://www.oregon.gov/deq/tanks/Pages/UST.aspx

[38] *See,* Salem Administrative Rule, General Design Standards, 109-001-1.16 (Permits)

[39] "Any thing, condition, or act which is or may become a detriment or menace to the public health, welfare, and safety;"

[40] A copy of that study is provided on the CD/Flashdrive as Exhibit #11.

proximity to the residential neighborhoods, the Kenmont pool, and the Stephen Knolls School."[41]

Costco in that case was unable to show that its proposed use would **not** cause adverse health effects to those in the general vicinity. The same concern exists here. This fueling depot is more than twice the size of the one at issue in that case. This Council should take steps to protect its citizens from air emissions, the same as the folks in Maryland did.

Here, the burden is on PacTrust to show that its development will conform to all applicable standards and not endanger the health, welfare, and safety of Salem residents. To date, PacTrust has brought forward no evidence to substantiate that its proposed enormous fueling depot will in fact not cause air quality issues for the neighbors.

Greenhouse gas emissions generated by this proposed development should also be accounted for. Costco has a "C" rating for its 2017 report with the Carbon Disclosure Project.[42]

7. Need For A Continuance

The time period between the filing of this appeal and the setting of this hearing date was quite short. A significant number of documents were not made available to the public on the City's website, during the comment period or since. The Recordings of the prior meetings, where PacTrust made critical representations that the City Council relied upon, are one example of that.

In the intervening time, appellants and other members of the public have attempted to obtain additional records. But some of those requests are still unanswered. I know, for example, that SGNA still does not have all the communications between PacTrust and City staff that they asked for.

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[41] *Costco Wholesale Corp. v. Montgormey County, Maryland, et al.* No. 2450 (Md. App 2018), p. 4-5 (Unreported).

[42] Available here: https://www.cdp.net/en/responses/3944?back_to=https%3A%2F%2Fwww.cdp.net%2Fen%2Fresponses%3Fpage%3D3889%26per_page%3D5%26queries%255Bname%255D%3D%26sort_by%3Daccount_name%26sort_dir%3Dasc&queries%5Bname%5D=. (Free registration required to view full report).

This is a complex and large application. In particular, the problems with the TIA are numerous, and the underlying data and methods used by Kittleson in conducting its study have not been transparent and readily available to our expert for review. The significant disparities between appellants' analysis of traffic impacts and the applicant's TIA means that a good deal of time and resources must be applied to resolve those disparities.

While appellants have made all efforts to thoroughly point out deficiencies and offer corrections to the current TIA, appellants believe that more time should be allocated to dig in and look carefully at these issues. Goa1 1 of the Statewide Land use laws encourages Citizen Involvement. To meet that goal, more time is needed.

There was not enough time allocated to cover all the issues on which appellants wished to be heard. Appellants have tried to summarize in this testimony their points, and they have each attached personal statements outlining some of their own heartfelt view.

The most recent Staff Report, released on December 3rd, 2018, just a week before this hearing, contained of over 1,390 pages of material. That includes over 360 pages of reports and other material only recently submitted by PacTrust.[43]

The Staff Report contains new information from PacTrust, new information from PacTrust's lawyer, new information from the PacTrust's Traffic Consultants, from the PacTrust Wetland consultants, and from their Stormwater Engineers, among others. Appellants, the public, Staff, **and the Council**, have not had sufficient time to review and vet all that material. How this Council could be expected to absorb all this material, and to ask intelligent questions and digest all the issues raised in one night, I do not know.

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[43] *See,* Staff Report, at PDF pages 401-508 (107 pages of public comments submitted post-deadline); PDF pages 509-524 (A 15 page single spaced November 29th, 2018 Letter from PacTrust's Shari L. Reed); PDF pages 525-550 (A 25 page single spaced November 30th, 2018 Letter from PacTrust's attorney); PDF pages 970-992 (A 22 page Kittleson Memorandum dated November 29th, 2018); PDF pages 993-998 (A 5 page Weisman Design Group Landscape Design Narrative dated November 30th, 2018); PDF pages 999-1030 (A 31 page Drainage report from DOWL Corporation dated November 28th, 2018); PDF pages 1244-1352 (A 108 page Stormwater Calculations report from Westech Engineering, updated November 2018); and PDF pages 1353-1395 (A November 27, 2018 Memo from Pacific Habitat Services with 42 pages of materials on wetland issues).

The short window between the issuance of the Staff Peport and the Council meeting on December 10th does not allow sufficient time to adequately respond. Appellants request that this Hearing be continued to another date, so that all testimony may be presented and fairly considered.

It is vital to the public process that the public have **all** of the record materials that the Planning Division based its decision on. That has not yet happened. It is vital to the public process that all members of the public be given ample time to submit questions and comments. That also has not happened.

It is also vital to the public process that key data, that relied upon by the applicant for its TIA, be made available to the City, to ODOT, and to the Appellants and their expert, for review and evaluation. If that data is as solid as the applicant claims, then no harm will come from making it available for review. That also has not happened.

And finally, it is vital to the process that the Council be given enough time to carefully review and digest the material and arguments being presented. The Council needs time to read all the materials, and to think about those and to ask follow up questions on key issues – once they fully digested the material in front of them.

The only fair thing to do, for everyone – Staff, the Applicant, Appellants, and the Council members - is to Continue this matter and to have a second more lengthy Hearing in January where all the issues can be more thoroughly reviewed and discussed.

Respectfully Submitted,

Karl G. Anuta

WILDWOOD | MAHONIA
Urban Design & Development | Vineyards & Nursery

December 10, 2018
Mayor and Council
City of Salem
555 Liberty Street SE
Salem, OR 97031

Dear Mayor Bennett and City Councilors:

Please include this input as you consider the appeals to the staff decision on Site Plan Review/Driveway Approach Case No. SPR-DAP18-15. The details of the myriad shortcomings of this application are being well described by others. Given my many years of service to the City as a member/chair of the Salem Planning Commission and other related boards I offer instead some observations about the opportunity before you:

- I believe that the decision regarding the 2006/07 Comp Plan/Zone Change application would have been much different if the current Mayor and Council had been in office. Luckily, the criteria for a Site Plan Review are far more stringent and finer-grained than those for a Comp Plan/Zone Change so an opportunity is before you to address some of the major shortcomings of the "any development is good development" approach to planning our community. It may be that many on the City staff believe this as well.

- This proposal is an attempt to put a size 13 foot into a size 8 shoe. It will irreparably damage the immediate and area-wide traffic system, unnecessarily kill a grove of Oregon Oak that has a cumulative age of two centuries and turn its rear end towards an existing neighborhood and community church. Both the community shoe and Costco foot will suffer.

- Require PacTrust to provide what they promised the City and neighbors: An Orenco Station flavored, locally oriented, gas stationless, walkable (people don't walk to Costcos), a shopping center that will fit into the neighborhood, not on it.

- I live in and operate several businesses in this neighborhood including the award-winning Old Pringle Schoolhouse, the Woodscape Community and Mahonia Vineyards & Nursery. But I am also concerned about the impacts upon the the safety and convenience of folks for miles in all directions.

This site is a gateway to South Salem; it deserves better. There are sites nearby (the 80 acre IC zone on the east side of I-5 is one of many) that would serve both Costco and Salem much better. Please send this one back to the drawing boards.

Respectfully,

John Miller,
President, Wildwood/Mahonia

4985 Battlecreek Rd. SE #200 • Salem, OR 97302 • phone (503) 585-8789 • fax (503) 363-2358 • frontdesk@wildwoodco.com

VICINITY MAP - PROPOSED COSTCO WHOLESALE WAREHOUSE

1 MILE

N

I-5

AMAZON DISTRIBUTION CENTER

IC

IC

225 LOT, 52 ACRE SUBDIVISION (TENTATIVE PLAN)

26 ACRE ZONE CHANGE TO CR GRANTED 2016

IC

OSP H.Q.

27TH AVE. SE

CR

MORNINGSTAR CHURCH

PACTRUST (CR)

CR

Battle Creek @ Kuebler

CO

SALEM CLINIC

LDS CHURCH

CR ZONE CHANGE APP RECENTLY WITHDRAWN

IC

IC

IC

IC

KUEBLER BLVD. SE

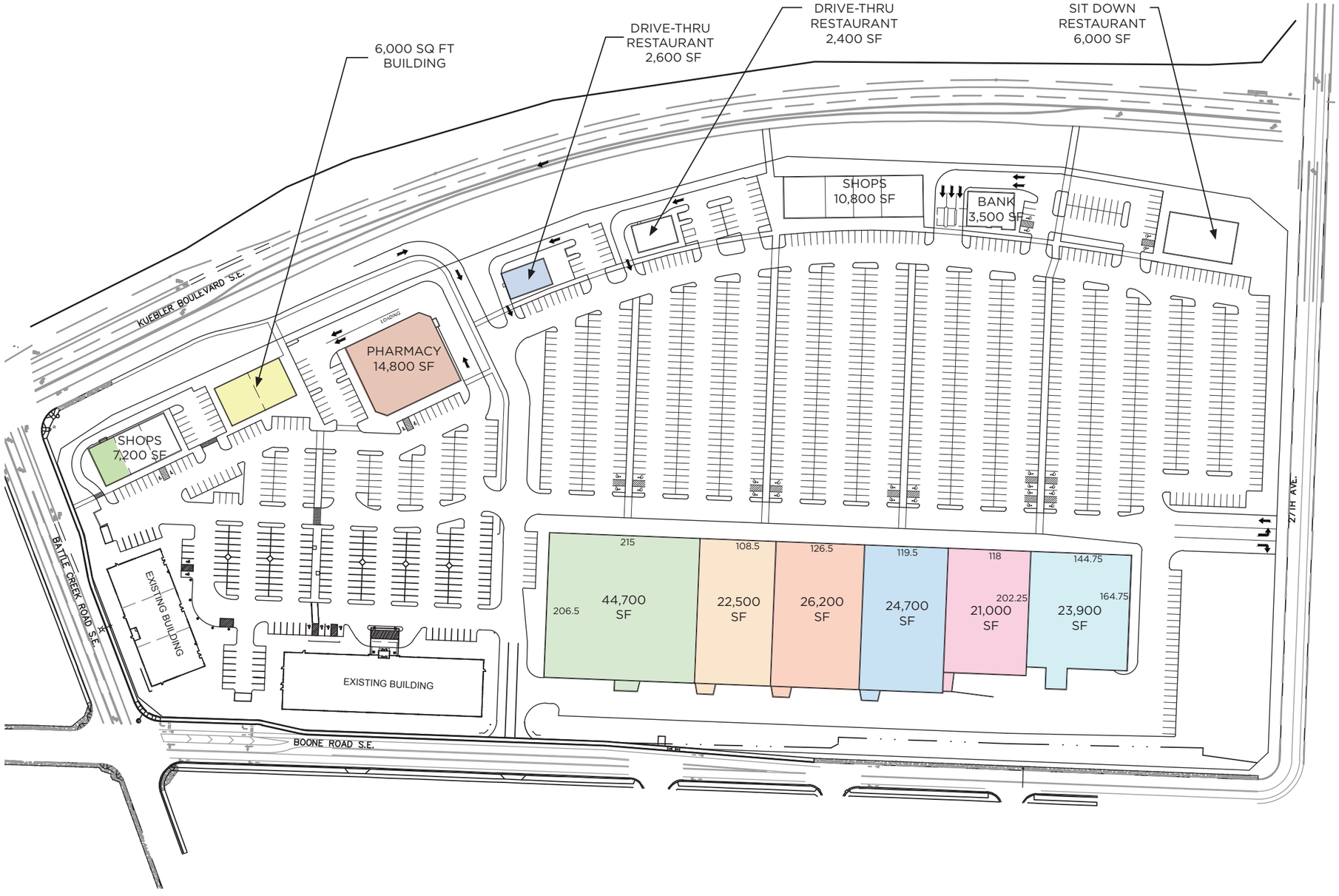
IC

80 ACRE ZONE CHANGE TO IC (2017)

COMMERCIAL ST. SE

Earth

EXHIBIT A.1



SITE AREA SF	1,232,500
BUILDING SF	258,600
COVERAGE %	21%
SHOPS SF	28,000
PHARMACY SF	14,800
BANK SF	3,500
GROCERY SF	44,700
JUNIOR ANCHORAGE SF	118,300
[EXISTING] OFFICE	38,300
DRIVE-THRU RESTAURANTS	5,000
SIT DOWN RESTAURANT	6,000
TOTAL	258,600
PARKING	1579
PARKING RATIO	6.1/1000

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DESIGN DRIVEN | CLIENT FOCUSED

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NORTH

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PACTRUST
Pacific Realty Associates, L.P.

Salem City Council Meeting on May 7th, 2007 Excerpts Transcription

Starting at 1:09:13 and Ending at 1:11:03:

Glenn Gross (Urban Planning Administrator-Salem City Staff):1:09:03:

I'd like to provide just a few clarifying comments. First of all the planning commission has reviewed and approved an applicant initiated comprehensive plan map amendment and zone change for this property on Kuebler Blvd, in South Salem. So this public hearing tonight is to consider whether the city council should confirm, should modify or reverse that decision.

Staff reviewed the application and did recommend approval to the planning commission. And the reason for that was, er, is, in our judgement the applicant met their burden to prove that the proposal meets the adopted criteria for comprehensive plan amendment and zone changes. Among these criteria is whether there's a lack of appropriately designated suitable alternative sites within the vicinity of the proposed used. In this case the proposed use is **a community shopping center.(1:09:53)**

We believe the record includes adequate information that this criteria has been met. The city council now must decide, in light of the record, whether the application meets all relevant standards and whether the proposed change will result in a land use pattern that benefits the public. And as you consider the evidence we respectfully ask you to keep in mind the following; the applicant proposes a two hundred and ninety thousand square foot **community retail shopping center. (1:10:26-27)**

The significance of the proposed size at this time is primarily for purposes of traffic impact analysis. There's nothing in the adopted criteria for plan amendment or zone change that requires an attached site plan that indicates square footage or a particular mix of uses. The applicant has provided a conceptual plan so that staff could review land use assumptions for traffic impact and mitigation.....

Comments Period:

Starting at 1:44:22 and Ending at 1:48:04

Dick Loffelmacher (PacTrust's Director of Retail Development):1:44:22

Next we have Ken Grimes who is PacTrust's Corporate Architect.

Ken Grimes (PacTrust's Corporate Architect):

Good evening. Kenneth Grimes. 15350 SW Sequoia Parkway, Portland, Oregon 97224. **Our concept vision of a community center (1:44:47)** is organized with medical and related uses on the left and commercial retail activities on the right. (Let me get my pointer here.) Site circulation occurs with three entries, (Apparently Indicating): One, two, three. And two exits. (Apparently Indicating): Those are the only two exits.

Customer and pedestrian access is on the interior. Service access is along this edge. Buildings are oriented toward Kuebler, screening activity, sound and lighting from the residential neighborhood. Service areas are screened by earth forms and dense planting's along this edge. City required set back is 15 feet. (Apparently Indicating): There's a section in here through Boone.

We are proposing set backs of 20 to 50 feet depending upon the activity, that would be screened with earth forms, dense planting and walls, from deliveries and recycling. This would rise to a height of 13 feet. Screening the over the road trucks.

Lighting would be indirect, (Apparently Indicating): Shown Here, to the neighborhood. Directed down on service areas and screened from view. Pedestrian lighting at sidewalks would be low in scale, approximately 14 feet in height, and residential in character. Fixtures include house side shields limiting extending light across the street. Our face to the neighborhood would be a park like setting.

As at one of our community centers, architecture would be in scale with residential buildings as opposed to large boxes. (1:47:00) Buildings would be a mix of brick and stucco with parapets to screen rooftop equipment. At **Orenco Station**, canopies and awnings announce entries and provide rain protection, presenting a friendly pedestrian environment. Project entries are an important element. At our office in Bissell Park (SP) in Tigard and at **Orenco Station** we developed dramatic and colorful entries.

In my 19 years at PacTrust and in our 34 years of history we have never developed an outlet mall. **In contrast to what you may hear, this project would not be an outlet mall nor like it in size. (1:47:43)** Tonight you may see an alternative plan from Mr. Miller. We have looked at this briefly. For us it is not a mixed use plan. It lacks the synergy that we would want

in our development. Thank you.

November 21st, 2006 Salem City Planning Commission Meeting Excerpts Transcription:

CPCZC-06-06 Testimony Part 1:

Starting 17:55:00 and Ending 20:17:00

Jeff Tross (PacTrust's Land Use Planning Consultant): 17:55:00:

In 1996 a local developer contracted to purchase eight acres, bordering 27th ave, specifically for retailed and office uses as had been described in the Camby study. That would be the eight acres over here. That contract was never concluded. No zone changes were ever proposed. If so it would have resulted in the 10 acres here being commercial and the 8 acres here being commercial for a total of 18 acres, within this approximately 28 acre area.

What would have become of the center 10 acres is only speculation but we're trying to cure that speculation at that time. In 1997, as I already mentioned, city planning department put forth a proposal to the planning commission for an overlay zone again recognizing the Kuebler area as a regional transportation hub and as a gateway to Salem. It identified it's function as regional, community, and neighborhood level activity. It identified the SW quadrant, which is where this property is, as a community services node. And it recommended re-zoning most of the site to the CO and CG, Commercial general zones, and part of it was to have been re-designated for high density residential use.

Now keep in mind that, that study recommended CG. **We are proposing tonight CR, which is a lower intensity zone than CG. (19:08:00) One of the chief differences is that CG allows for gasoline service stations**-various other type of automotive services, and auto dealerships-out right permitted. **The PacTrust proposal is proposing none of those. They are in fact conditional uses of the CR zone and we're not asking for any conditional uses. (19:13:00 - 19:30:00)**

In 2001 what is now the entire subject property, the 18 acres were talking with tonight, was proposed for annexation. This annexation was approved by a vote. It was subject to a vote of the electors. It was approved with a 71.7% favorable margin. This was the highest approval that year. It was brought in as RA land which is as it is today, which is customary, cause that's the way it's done here in the City of Salem. But, and a very important distinction, is that in the

voters pamphlet there is a statement specifically that say's that the intend of the petitioner is to develop the property for commercial purposes. So while that request was not made at that time. That's what the intend was and that was stated in the voters pamphlet.....

CPCZC-06-06 Testimony Part 3:

Starting 10:16:00 and Ending 12:29:00

Ian Levin (Member of City of Salem's Planning Commission): 10:16:00:

Right. What I heard described was not a retail shopping center. I heard you describe a neighborhood commercial. And service commercial supplemented with some retail, drug store, grocery, etc.

Dick Loffelmacher (PacTrust's Director of Retail Development): 10:43:00:

Sure. Those are the primary tenants. I mean, again, you don't know exactly whose going to show up until you get there. They're gonna do their own market studies, your gonna have a group of people that are gonna come back and say you know we got an interest in there, you take a look at. But if you just take a look at, you got Lancaster that's down the street, not very far. Clearly, you have every kind of retail imaginable.

Nobody from down there's driving down to this shopping center. We're not gonna have anybody new there that's not already down there. You got, you know, North Salem's already taken care of. Commercial has a significant amount of retail down there. Nobody that is gonna go to, be on (commercial first or be down in that area, is going to come up and buy groceries in our center or to go to a Target, or anybody else that would-that we could put in there, because they're all down there, Fred Meyer, I mean you know.

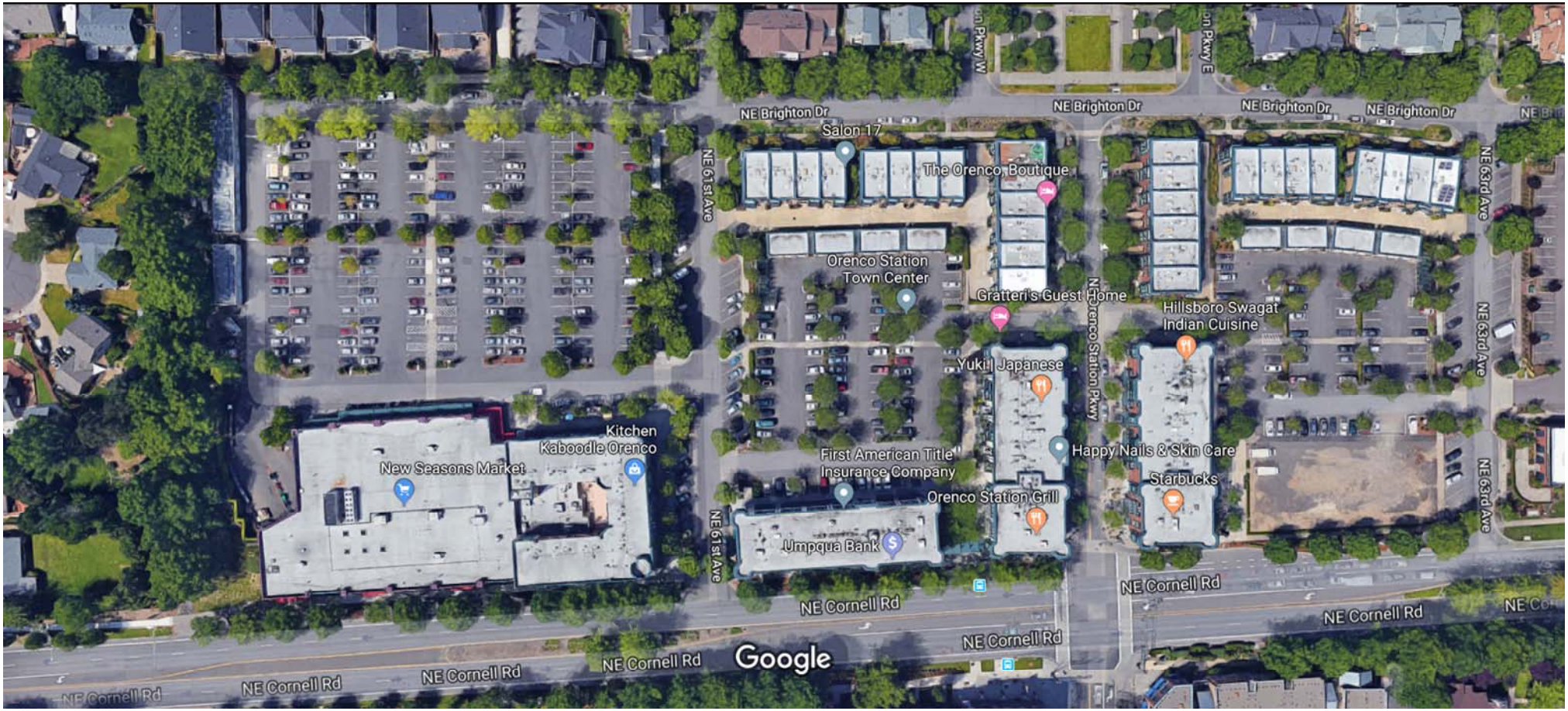
And so again, I mean this, you know, we're not gonna create something here that's gonna be drawing for 10 miles. (11:29:00) We're responding to a market that in the main exists, which again... I mean twenty-seven thousand cars on a road right now, that's scheduled obviously to go up. A neighborhood with very good demographics in it, which allows you hopefully to get some good restaurants and other kind of uses in there that the people who live up there will you know enjoy going down and using. And that's what we're responding to.

But this idea that somehow we're pulling from all over Salem, it just isn't going to

happen.(12:02:00) It just won't because your not going to get regional types of tenants to come into that kind of a center, in that location. (12:09:00) And secondly it's not big enough that you can get enough of them in there (12:17:00) that you know, they all get excited and wanna hover together and put together a mall.

Ian Levin (Member of City of Salem's Planning Commission): Very good. Thank you very much.

Google Maps NW Cornell Rd



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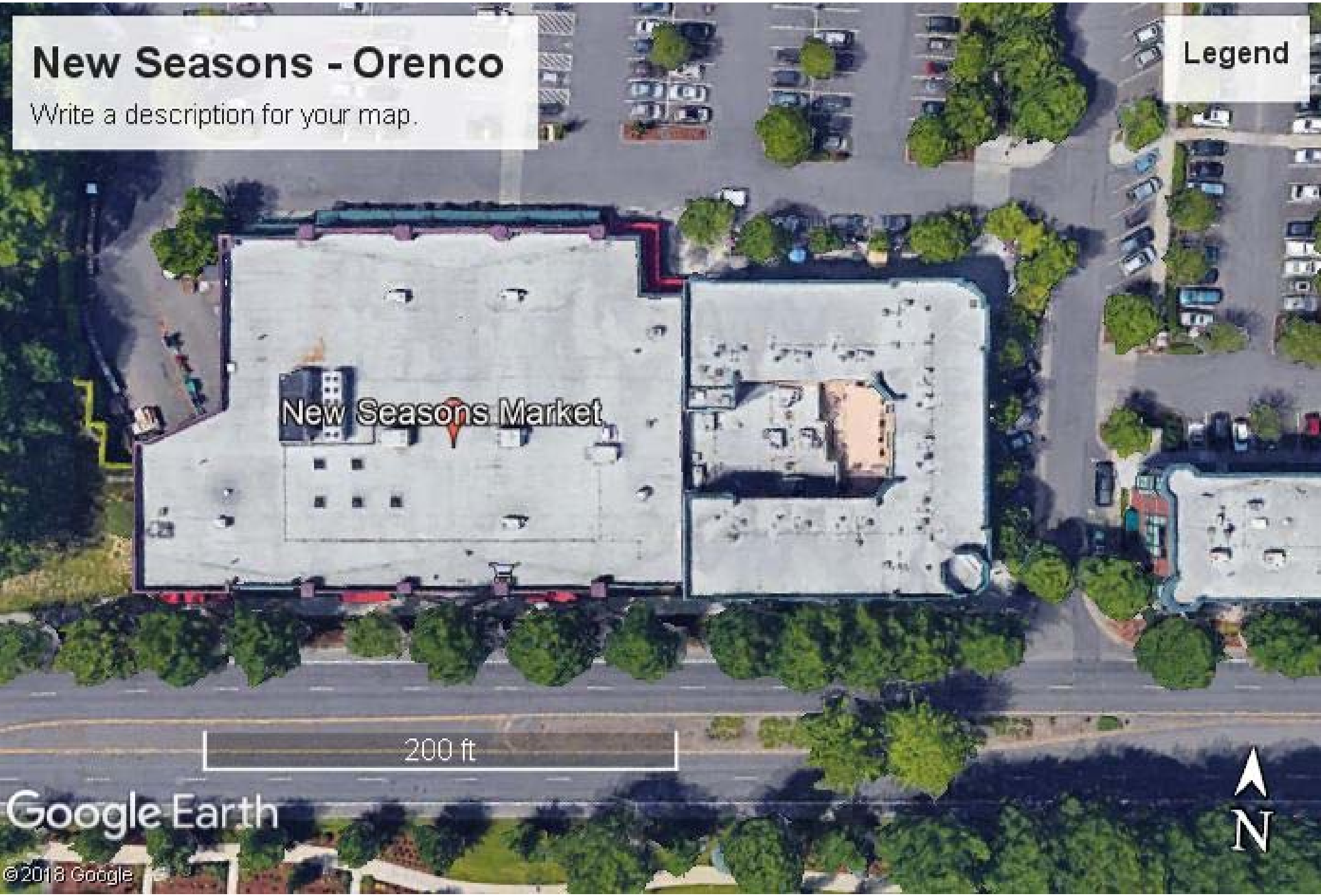
New Seasons - Orenco
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GREENLIGHT ENGINEERING
TRAFFIC ENGINEERING/TRANSPORTATION PLANNING

December 10, 2018

City of Salem City Council
555 Liberty ST SE
Salem OR 97301

Honorable Mayor Bennett & Salem City Council,

Greenlight Engineering has been asked by attorney Karl G. Anuta to evaluate the transportation related impacts of the proposed Salem Costco, gas station and other retail pads project. We have reviewed and will refer to the following documents herein:

- May 31, 2018 Memorandum from Kittelson & Associates, Inc ("KAI")
- August 9, 2018 Memorandum from KAI
- September 17, 2018 Memorandum from KAI
- November 29, 2018 Memorandum from KAI (previous four documents herein referred to collectively as the traffic impact analysis, or "TIA")
- September 27, 2018 Memorandum from PacTrust
- October 19, 2018 Public Works Recommendations Memorandum
- October 23, 2018 City of Salem Decision of the Planning Administrator

Executive Summary

The TIA includes a number of errors and omissions and lacks adequate evidence to establish compliance with the Oregon Department of Transportation ("ODOT") and City of Salem standards. The TIA has ignored the clear and objective standards of the City of Salem with regard to the requirements of a TIA. City staff has erred in their recommended approval of this application.

Salem Revised Code Section 220.005(f)(3) states that for the approval of a Class 3 Site Plan Review "shall be granted if: A) The application meets all applicable standards of the UDC [Uniform Development Code]; B) The transportation system provides for the safe, orderly and efficient circulation of traffic into and out of the proposed development, and negative impacts to the transportation system are mitigated adequately (C) Parking areas and driveways are designed to facilitate safe and efficient movement of vehicles, bicycles and pedestrians." A development that does not meet this criteria should not be approved.

There are multiple instances where the applicable standards of the UDC are ignored and not met. There are multiple reasons why the impacts of the transportation system presented in the TIA are so unreliable that the negative impacts have not been appropriately identified. Even so, compliance with City of Salem and ODOT standards rests on a razor's edge with the TIA presenting two intersections operating exactly at the City and ODOT mobility standards. Therefore, compliance with SRC 220.005(f)(3) is

not met and the application should be denied. While there are many other issues with the TIA and application, below provides some of the key errors and omissions.

- There is no evidence supporting the use of the alternative trip generation presented in the TIA nor does City Code allow for the use of alternative trip generation.
- The intersection study area presented in the TIA does not remotely follow City Code and many additional intersections are required for analysis in order to comply with City Code.
- The growth rate presented in the TIA does not follow City Code and is not supported by evidence.
- The trip distribution does not follow City Code and is not supported by evidence.
- The proposed development is multi-phased, yet provides a build-out year of 2019, which is unlikely to be met for even the first phase of development.
- The I-5 SB/Kuebler Boulevard intersection is analyzed with incorrect intersection geometry and unsubstantiated right-turn-on-red volumes.
- The TIA does not take into account the impact of the Mill Creek industrial development, which includes the Amazon distribution facility.
- Traffic counts taken in May of 2018 illustrate substantially higher traffic volumes at two study intersections than presented in the May 31, 2018 TIA.

Two Intersections are Projected to Operate at the City of Salem and ODOT Mobility Standard

According to the TIA, the Kuebler Boulevard/Battle Creek Road intersection is expected to operate with a v/c ratio of 0.90 with the approval of the development (May 31, 2018 TIA, Figure 11), which matches the upper limit of the City of Salem mobility standard of a v/c ratio of 0.90. Also according to the TIA, the I-5 SB/Kuebler Boulevard intersection will operate at a v/c ratio of 0.85 during the weekday PM peak hour with the approval of the development, which also reaches ODOT's mobility standard (May 31, 2018 TIA, Figure 11).

Any errors, omissions or increase in traffic may result in each intersection exceeding the required City of Salem and ODOT mobility standard. Based upon the following, it is likely that the outcomes of the TIA will change when the TIA is compliant with City Code and ODOT requirements. As the applicant has not provided a TIA that is compliant with City Code, the application should be denied.

Trip Generation of Costco and Costco Gas Station is Not Supported by Evidence

The trip generation for the Costco and gas station are not based on the ITE *Trip Generation Manual*. City of Salem Administrative Rules Section 109-006-6.33(h) requires that "[t]rip generation for the proposed development shall be estimated using the most current version of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. For land uses not listed in the ITE *Trip Generation Manual*, studies for similar

development in similar regions may be used upon approval by the City Traffic Engineer." Additionally, Salem Revised Code ("SRC") Section 8.03.015 requires that "[t]rips shall be calculated using the adopted Institute of Transportation Engineer's *Trip Generation Manual*."

The *Trip Generation Manual* provides trip generation data for all of the uses presented in the TIA which include "Discount Club" (ITE Code #857), "Gasoline/Service Station" (ITE Code #944) and "Shopping Center" (ITE Code #820), but the TIA instead relies upon a trip generation estimate that is not supported by any evidence in the record. Each iteration of the TIA relies upon a contention that data exists to support the use of alternative trip generation figures and a provides a rough summary of those figures, but provides none of the background evidence to support its use. The TIA presents the conclusions supposedly derived from this data, but provides no supporting evidence of how the trip generation was derived. This ensures that such that the trip generation presented cannot be reviewed. By lacking the transparency to evaluate the purported data upon which the TIA is founded, the applicant has created an issue of substantial evidence whereby the applicant clearly does not comply with the requirements of the SRC and Administrative Rules, which don't allow for the submission of the data in the first place.

Rather than relying on the *Trip Generation Manual,* the TIA refers to a supposed abundance of information from other Costco locations but provides none of that data that supports the use of an alternative trip generation estimate or pass-by rate (May 31, 2018 TIA, pg 19; August 9, 2018 TIA, pg 2). In their June 28, 2018 letter, ODOT recognized that insufficient data regarding the trip generation of the site had been presented and commented that "[t]his study has not provided the data referenced to produce custom trip generation for the 'Costco Warehouse with Gas Station (30 positions)' This information should be provided for review." In their June 6, 2018 letter, City staff requested trip generation data by stating "[s]ince the trip generation is estimated from Costco data, please provide some background how it was derived."

Rather than provide any data, the applicant continued to provide no data, instead summarizing their results and claiming its reliability without evidence and claiming how it has been reviewed and approved by many unnamed jurisdictions. If it indeed has been reviewed and approved by so many jurisdictions, it would seem easy to repackage and provide some evidence to the City of Salem, ODOT and the public for review. It has been requested several times, but still remains missing from the written record of the application. Additionally, if it has indeed been collected for so many years and been independently reviewed by so many reviewers, why is it not presented in the ITE *Trip Generation Manual*?

The applicant continues to fail to provide substantial evidence in their August 9, 2018 memorandum. The August 9, 2018 TIA states that the daily trip generation and pass-by trip generation rates are based upon Costcos with gas stations across the United States. Similarly, that TIA states that the weekday PM peak hour and Saturday peak hour trip generation rates are based upon data taken from the existing Salem Costco. In that same

TIA, it is stated that "[i]t is important to note that trip generation for the Costco sites is not linearly tied to square-footage size of the Costco warehouse building." If not tied to the size of buildings, what is it based upon?

If an alternative trip generation is entertained (although not permitted by City Code), Chapter 9 of the 3rd Edition of the ITE *Trip Generation Handbook* provides guidelines on how custom trip generation studies should be conducted. The TIA provides no reference to the *Trip Generation Handbook* in their limited description of their methodology for their alternative trip generation, so it is unclear how these trip generation studies were conducted and if it follows the national standard ITE *Trip Generation Handbook*.

However, in one very clear way, the trip generation provided in the TIA is clearly not compliant with the industry standard *Trip Generation Handbook*. The 3rd edition of the *Trip Generation Handbook* states that in developing a local trip generation rate "[t]he analyst should collect trip generation data at a minimum of three local sites. Collecting data at five or more sites is preferable. Where there are only one or two potential data collection sites in a comparable setting, the analyst should use that data, coupled with other local or national data, to derive the estimate. The analyst is cautioned that this recommendation should not be used as an excuse for collecting and using data from only one or two sites when more sites are reasonably available."

As noted previously, the August 9, 2018 TIA states that the weekday PM and Saturday trip generation estimate is "based upon data taken from the existing Salem Costco." Based on this statement, it appears that the trip generation of this site is based upon solely the existing Salem Costco. Par for the course, there is no way to confirm the trip generation of the existing Salem Costco as no traffic counts are presented for that site nor are any trip generation rates or equations reported in the TIA. How the trip generation of the site was derived remains a mystery.

Finally, in the applicant's November 29, 2018 memorandum, additional summary information indicating that the 160,000 square foot Costco daily trips are based upon a trip rate of 75.86 vehicles per 1,000 square feet per day, contradicting their previous statement that the Costco warehouse trip generation is not linearly tied to the size of the building. This equates to 12,138 daily trips, which is also illustrated in the earlier TIA memorandums. The trip rate doesn't appear to take into account the influence of the 30 fueling position gas station as the trip rate is based upon the square footage of the Costco building only and not the fueling positions which are typically measured based on a per fueling position metric. However, in previous TIAs, the 12,138 daily trips were purported to include both the Costco and 30 fueling position gas station.

It is important to note that in none of the TIAs is any weekday PM or Saturday trip generation rate reported nor any equation or any description about how the trip generation was calculated or could be calculated. It remains a mystery that only the applicant would be able to answer. As no data is provided to prove the adequacy of this trip generation summary, it is not possible for any reviewer to confirm the use of the trip

generation estimate presented nor could a reviewer derive trip generation figures for a slightly smaller or slightly larger development as the trip generation provides no numerical evidence or correlations between the size of the structures and/or the number of fueling positions.

Salem Administrative Rules 109-006-6.33(h) requires that "[p]ass-by trips must be quantified and may be approved based upon sufficient supporting data." Presumably, the ITE *Trip Generation Handbook,* if used, would have provided sufficient supporting data. However, the TIA doesn't rely upon the national standard *Trip Generation Handbook*, but instead relies upon "data" that is not provided. The TIA utilizes a daily pass-by trip rate of 34%, an AM/PM pass-by trip rate of 35% and a Saturday pass-by trip rate of 30%. However, the TIA provides no data to support the use of these pass-by trip rates. Thus far, "the sufficient supporting data" required by City Code is non-existent and seems to rely solely upon the word of the applicant. Again, the applicant provides no evidence to support their trip generation conclusions.

The TIA lacks transparency in its key trip generation assumptions which form the basis of the conclusions of the remainder of the TIA. For that reason alone, the TIA should have been rejected. There is not substantial evidence to support the use the alternative trip generation or pass-by figures reported in the TIA. Even more, the use of alternative trip generation and pass-by figures are not supported by the clear and objective code requirements. As the ITE *Trip Generation Manual* provides trip rates for the proposed uses and the *Trip Generation Handbook* allows for the combination of the Discount Club, Gasoline/Service Station and Shopping Center uses in their methodology, City Code does not allow for the use of alternative trip generation methodology. For this reason alone, the TIA should be rejected and the application denied.

Intersections Required to be Analyzed Were Not Included in the TIA

Salem Administrative Rules 109-006-6.33(c) requires that the "TIA study area shall extend to the following: (1). All proposed access points (2). Any intersection where the proposed development can be expected to contribute 50 or more trips during the analysis peak hour on a collector, arterial, or parkway, or 20 or more trips on a local street or alley (3). Any intersection where the additional traffic volume created by the proposed development is greater than ten percent of the current traffic volumes on any leg..."

The TIA illustrates that 40% of site generated traffic travels to/from intersections to the west (August 9, 2018 TIA, Figure 8, Appendix A enclosed herein). The Kuebler Boulevard/Stroh Lane intersection will see an increase of 418 trips in weekday PM peak hour and 529 trips in the Saturday peak hour yet was not included in the study area. **It is likely that the Commercial Street/Kuebler Boulevard intersection will experience an increase of over 400 trips in the weekday PM peak hour and over 500 trips in the Saturday peak hour. This omission is not even close to meeting City Code, with the proposed development's traffic exceeding the threshold by up to ten times greater than the allowed amount. The Commercial Street corridor and Kuebler Boulevard**

west of Commercial Street will both likely experience an increase in hundreds of vehicles per hour due to the proposed development. However, inexplicably, the TIA doesn't address the intersections that are required for analysis. The City of Salem threshold for study area is an increase in trips of 50 in a peak hour along each of these roadways. There are likely many intersections along Kuebler Boulevard and Commercial Street that were omitted from the TIA and are required to be analyzed per the clear and objective city standard. Because the TIA includes an inappropriate study area, the application fails to comply with SRC 220.005(f)(3) as it does not comply the UDC.

The November 29, 2018 TIA addresses this criticism by contending that since the almost 13 year old 2006 TIA didn't address the appropriate study area, then the 2018 study area shouldn't either. Standards change. It's possible that those intersections should have been included in that original TIA as well. However, that does not matter as the site plan review requirements are clear.

The November 20, 2018 TIA states "[f]or all intersections evaluated in the 2006 TIA, none are expected to receive a contribution of 50 or more trips during the analysis peak hour over those anticipated and studied in the 2006 TIA and mitigated in the 2007 Council Decision. Moreover, there is no intersection studied in the 2006 TIA where the proposed shopping center here will create more than 10% of the current traffic volumes on any leg beyond that which was studied in the 2006 TIA and mitigated in the 2007 Council Decision. The analysis area selected for this site review is appropriate and is reasonably calculated..." Unfortunately, the applicant provides no City Code reference that makes this comment relevant. City Code is clear in it's study area requirement for the site plan review. Their comments on the study area are irrelevant to the clear and objective City Code standard. It is clear that the application does not meet this standard.

Additionally, Figure 8 of the May 31, 2018 TIA illustrates more than 50 weekday PM and Saturday peak hour trips distributed along Kuebler Boulevard east of I-5. At the very least, the city requires the Kuebler Boulevard/36th Avenue to be analyzed.

The TIA illustrates more than 50 weekday PM and Saturday peak hour trips being distributed to/from the west along Boone Road. At the very least, city requirements require that the Reed/Woodscape intersection to be analyzed. Similarly, the TIA illustrates more than 50 weekday PM and Saturday peak hour trips being distributed to the south along Battle Creek Road. There are likely several intersections along Battle Creek Road that meet the threshold for inclusion in the TIA study area.

The TIA distributes more than 50 weekday PM and Saturday peak hour trips through the Boone Road/Riley Court and Boone Road/Cultus Avenue intersections, but does not analyze those intersections.

In addition to the previously described requirements, City Code calls for the analysis of "[a]ny intersection where the additional traffic volume created by the proposed development is greater than ten percent of the current traffic volumes on any leg." Aside

from the study intersections identified in the TIA, the TIA provides no analysis to determine the need to analyze additional study intersections based on the criteria just described. This would require the collection of existing traffic counts at potential study intersections and comparing the trip distribution to determine the impact of the development upon these intersection legs. This was not done or discussed in the TIA.

Figure 8 of the TIA appears to assume that not a single vehicle will arrive to the development via Cultus Avenue at Boone Road. For a good portion of the neighborhood to the south of Boone Road, it would be more expedient to arrive at the development via Cultus Avenue than another route. The TIA should address the impacts to this street and the other local streets in the area. Cultus Avenue should be evaluated for the provision described above. However, the TIA has not provided any traffic counts along this roadway nor does it evaluate this City Code provision in any way.

The TIA distributes 5% of the site traffic to Battle Creek Road north of the site, 5% to Boone Road west of the site, and 5% to Battle Creek Road south of the site, and to I-5 south. Inexplicably, none of these 5% trip distributions result in the same number of trips. It appears that a mathematical error has been made.

In order to be compliant with City Code, the TIA should be updated and required to analyze all intersections along parkways, arterials and collectors that will experience an increase in 50 trips during a peak hour. Similarly, the TIA should be required to be updated to analyze all intersections along all local streets and alleys that will experience an increase in 20 trips during a peak hour. Lastly, the TIA should be required to be updated to identify and analyze all intersections where the additional traffic volume created by the proposed development is greater than ten percent of the current traffic volumes on any leg. Until that time, City Code requirements are not met and the application should be denied.

Growth Rate Not Based Upon Evidence

Salem Administrative Rules 109-006-6.33(g) requires that "[b]ackground rates shall be based upon the Mid-Willamette Valley Council of Governments Transportation Model." The TIA relies on 1% growth rate citing this "is a similar approach to other traffic studies completed in the area" (May 31, 2018 TIA, pg 12). The TIA cites no references for these other traffic studies nor any reference to utilizing the MWVCOG background traffic growth rate as required.

We obtained limited MWVCOG transportation modeling data and have provided it in Appendix B. Based upon this information and a preliminary analysis, growth on Kuebler Boulevard between I-5 SB/Kuebler Boulevard and Kuebler Boulevard/27th Avenue is anticipated to be approximately 1.8% per year from 2010 to 2035 with weekday PM peak hour link volumes of 2860 and 4495 vehicles per hour ("vph"), respectively.

Again, the TIA fails to follow the UDC and should be updated. Until then, the application should be denied.

Trip Distribution Not Based upon MWVCOG Data

The Salem Administrative Rules 109-006-6.33(g) requires that "...trip distribution shall be based upon the Mid-Willamette Valley Council of Governments Transportation Model. If model data is not available...trip distribution shall be determined by the City Traffic Engineer." The TIA states that the trip distribution "was based on historical Salem Costco sales data and examination of site access, parking layout and site circulation" (May 31, 2018 TIA, pg 20). There is a travel demand forecasting model in this area and trip distribution should have been based upon that model. An excerpt of the travel demand forecasting model is provided in Appendix B. Additional information should be sought from MWVCOG by the applicant. There is also no information provided about how the trip distribution figures were determined nor was the "historical Salem Costco sales data" presented. Therefore, the TIA's trip distribution assumptions have no way to be reviewed or supported by evidence.

Horizon Year Not Analyzed

Salem Administrative Rules Table 6-33 requires horizon year analysis periods of year of opening for development "allowed under existing zoning" and "year of opening each phase" for "multi-phased development." The TIA indicates that the year of opening for a portion of the proposed development is 2019. For such a large project, an opening year of 2019 is not realistic and the TIA should be updated to include a horizon year of at least 2020 unless the applicant can present a reasonable schedule illustrating how this development can be fully opened in 2019. The TIA was completed in May of 2018 and seven months later, no permits have been secured with several more months before construction permits could be issued. It is unlikely that this substantial delay was considered in the TIA.

Additionally, this project is proposed to be constructed as a multi-phased development although no schedule has been provided in the TIA. The May 31, 2018 TIA states that "[t]he proposed Costco will include a warehouse and fuel station with four islands and the potential to add a fifth island in the future (30 fueling positions)." The fifth island will apparently be constructed at some later time. The TIA provides no trip generation estimate for that fifth island separate from the rest of the development, but according to Salem Administrative Rules 109-006-6.33(e), the TIA needs to identify a horizon year and analyze that year.

Additionally, the site plan submitted by the applicant illustrates 21,000 square feet of retail use as a "future phase," seemingly indicating that it will not be constructed and opened as part of the 2019 development. In their November 29, 2018, KAI states that "[i]t is not a multi-phased development...and will include all major buildings such as Costco, the fuel station, and shops building." It is unclear how "future phase" doesn't

equate to "multi-phased" development or what is meant by "shops building" (the site plan shows four additional structures while the staff report refers to five). Perhaps KAI is not clear on the development plan or the plan has changed. It is also interesting to note that KAI states that "major buildings such as Costco, the fuel station, and shops building" only, again leaving the door open that future development will occur at a later date and what is defined as "major buildings."

Again, there are no specifics about the time line of the future phase of construction. As a future phase, the TIA should be updated to include the build-out year of both the fifth fuel island as well as the 21,000 square feet of retail development unless there is clarity on the proposed plan along with a reasonable schedule.

According to Table 3.3 of the ODOT *Design Review Guidelines*[1], a development with a trip generation of excess of 5,000 trips like the one proposed should be required to be required to provide an analysis at least 15 years into the future. This analysis has not been provided. It should be noted that the approval criteria between a zone change/comprehensive plan amendment and site plan review are quite different. A zone change/comprehensive plan amendment would not necessarily require mitigation in the face of intersection failure while a site plan review requires the adequacy of intersection operations.

Traffic Counts Are Not Compliant with City Standards

Salem Administrative Rules 109-006-6.33(f) states that "[t]raffic studies shall comply with the following: (1) Traffic counts shall be collected for both the AM (6:00 – 9:00 AM) and the PM (3:00-6:00 PM) peak." The TIA included traffic counts that were collected for only the weekday PM peak hour between 4 PM and 6 PM (May 31, 2018 TIA, Appendix A). When the TIA is redone to include this required information, traffic counts shall be based upon the hours of 3 PM- 6 PM. There are a number of schools in the area which may impact the subject area peak hour.

Kuebler Boulevard Access Should be Removed

SRC 804.001 states that the "purpose of this chapter is to establish development standards for safe and efficient access to public streets." SRC Salem Revised Code Section 220.005(f)(3) states that for the approval of a Class 3 Site Plan Review "shall be granted if: ...C) Parking areas and driveways are designed to facilitate safe and efficient movement of vehicles, bicycles and pedestrians."

Kuebler Boulevard is classified as a Parkway (May 31, 2018 TIA, pg 6, Table 2). Section 804.040 of the SRC states that "[d]riveway approaches onto a parkway shall be no less than one mile from the nearest driveway approach or street intersection, measured from centerline to centerline." The existing Kuebler Road access (which currently serves no development and carries no traffic) is just 660 feet east of the Kuebler Boulevard/Battle

[1] http://www.oregon.gov/ODOT/Planning/Documents/Development-Review-Guidelines.pdf

Creek Road intersection and approximately 1290 feet west of the Kuebler Boulevard/27th Avenue intersection. This criterion cannot be met. City Code further states that "[t]he standards set forth in this section cannot be varied or adjusted." A Kuebler Boulevard access cannot meet the standard and should be removed. The TIA and site plan need to be updated to reflect no access to Kuebler Boulevard.

The only argument the applicant provides in keeping this access is that since the access was required as a condition of approval of the 2006 zone change application, then it needs to be provided. However, the inclusion of the driveway is in clear violation of the UDC. SRC 804.001 establishes the "standards for safe and efficient access to public streets." As the access does not comply with this section, then the access does not meet the standards for a safe and efficient access to a public street. In fact, its presence is in clear violation of the UDC. If the access remains, then the application must be denied because the UDC cannot be met. If the access is removed, then that portion of the UDC can be met, but the TIA must be updated to reflect the removal of the driveway access.

Gas Station Queuing Not Adequately Analyzed

The November 29, 2018 TIA provides an analysis of queuing associated with the gas station. Previous versions of the TIA provided no analysis. This new TIA states that the "Costco fuel station may open with 24 fueling positions." Previous versions of the TIA refer to 30 fueling positions, so again, the various versions of the TIA conflict with each other and vary between 24 fueling positions and 30 fueling positions. If 30 fueling positions are eventually proposed, then this development is a multi-phased development and the horizon year should be based upon the opening of the 30 fueling positions rather than the 24 fueling positions. If that's the case, the queuing analysis should be updated to include 30 fueling positions. It is interesting that the queuing analysis is not based upon 30 fueling positions. The traffic engineer doesn't seem to know what is proposed exactly and leaves the reader unclear as to what is proposed and when.

However, Table 1 of the November 29, 2018 TIA provides queuing estimates but provides no explanation of the methodology used to determine these queue estimates. There are no analysis printouts that establish how the data presented in Table 1 was determined. Again, the TIA provides no transparency and no ability to check the work presented in the TIA. If the proposal were to be adjusted to 30 fueling positions (as it should be if not multi-phased development), only the applicant can provide that estimate given it is based on no evidence.

Within a few years of construction, the Tigard, Oregon Costco has had to make modifications to the on-site queue storage due to heavy demand of that gas station. The TIA prepared for that project was prepared by this same consultant presumably based upon this same data set that has not been provided for review. That design and the data has proven insufficient in that case if it the data was utilized. Given the proximity of the gas station to 27th Avenue, it is possible that the gas station queue could extend into primary entrance from 27th Avenue and into the roundabout. The TIA should provide

evidence of the analysis and describe their methodology as well as finally provide the required trip generation data.

The TIA Fails to Analyze the Weekday AM Peak Hour as Required

Salem Administrative Rules 109-006-6.33(c) requires the analysis of the weekday AM peak hour. It requires that the "TIA study area shall extend to the following:..[a]ll proposed access points...[a]ny intersection where the proposed development can be expected to contribute 50 or more trips during the analysis peak hour on a collector, arterial, or parkway, or 20 or more trips on a local street or alley." Costco gas stations are typically open in the weekday AM peak hour.

Since the TIA provides no information about how the trip generation of the Costco and gas station of any time period is derived, the industry standard *ITE Trip Generation Manual* was referenced as required by City Code. According to *Trip Generation Manual*, 30 fueling positions would generate 308 trips in the weekday AM peak hour. Costco gas stations appear to generate more traffic than typical gas stations based upon our informal observations. The 21,000 square feet of retail will likely be operating during the weekday AM peak hours as well. A 21,000 square foot shopping center generates 162 weekday AM peak hour trips according to the *Trip Generation Manual*. Based upon limited data of the Trip Generation Manual, a 160,000 discount club generates 78 weekday AM peak hour trips. All told, the *Trip Generation Manual* would estimate over 500 weekday AM peak hour trips. This quantity of trips would certainly require a number of intersections throughout the study area to be analyzed as required by Section 109-006-6.33(c).

Seasonal Adjustment

In their June 28, 2018 letter, ODOT stated that "[t]he study utilized traffic counts from December 2017, during a period of the year when volumes are lowest, and did not apply any seasonal adjustment. ODOT's analysis procedures specify use of the 30th highest hour volume (30HV) of the year for analyses of ODOT facilities as the Oregon Highway Plan (OHP) mobility targets are specifically defined to be compared to the 30HV."

Chapter 5 of ODOT's *Analysis Procedures Manual*[2] states that "[t]raffic counts alone should not be used for design or operational analysis of projects. This chapter will outline procedures for developing 30th highest hour volumes (30HV)..."

The July 2018 traffic count at the I-5 SB/Kuebler Boulevard intersection was not seasonally adjusted. Additionally, the I-5 NB/Kuebler Boulevard intersection analysis continues to rely on the December 2017 traffic count that was not seasonally adjusted. The TIA is not compliant with the APM and therefore, compliance with the mobility standard of the Oregon Highway Plan cannot be determined.

[2] https://www.oregon.gov/ODOT/Planning/Pages/APM.aspx

TIA Relies on Unsubstantiated Saturation Flow Rates

The TIA relies on an ideal saturation flow rate of 1,900 vehicles per hour of green per lane for all intersections, for all movements and for all time periods. It appears that the May 31, 2018 TIA failed to consider Section 109-006-633(b)(1) of the SRC which requires that "ideal saturation flow rates greater than 1,800 vehicles per hour should not be used unless a separate flow rate analysis has been completed." In order to address this error, a very limited saturation flow rate analysis was completed as part of the August 9, 2018 TIA for the following intersections, time periods and movements:

- Weekday PM peak hour at Kuebler Boulevard/Battle Creek Road, westbound through movement & eastbound through movement
- I-5 Southbound/Kuebler Boulevard southbound right turn movement

In turn, the TIA continued to utilize a saturation flow rate of 1,900 vehicles per hour of green per lane for all movements at all intersections for all time periods even though a saturation flow rate study does not support that use except at the movements specified above for the weekday PM peak hour only. There is no data to support the use of that saturation flow rate except for the intersection movements observed during the time period observed. There is no basis for the use of this ideal saturated flow rate at the other locations and time periods

At all other locations and time periods where a saturation flow study was not conducted, the default saturation flow rate of 1800 vehicles per hour of green per lane should be used. In all, the saturation flow study evaluated two intersections and a total of three intersection approaches in the weekday PM peak hour only. In whole, the TIA analyzes the impacts at nine intersections and 31 different approaches in two different time periods. While 1,900 vehicles per hour per lane is appropriate at the observed approaches, there is no evidence that supports the use of the ideal saturation flow rate of 1900 vehicles per hour of green per lane at the remaining 28 intersection approaches during the weekday PM peak hour period nor at any of the 31 approaches during the Saturday peak hour. Considering the impacts of both the weekday PM and Saturday peak hours, the saturation flow rate of a total of 59 approaches was not observed, but were assumed to operate with a saturation flow rate of 1900 vehicles per hour of green per lane at each of these locations and time periods.

The observations collected are not indicative of the saturation flow rates at any of the other intersection movements during any other time period. If the applicant intends to rely upon the 1900 vehicles per hour of green per lane ideal saturation flow rate, they should provide saturation flow rate analyses that support the use of those parameters that appear to have been used in error.

Existing Frontage Improvements are Not Compliant with City Standards

Kuebler Boulevard is classified as a "parkway." Approximately 1,200 feet of the site's Kuebler Boulevard frontage was constructed without compliance with the City of Salem's Transportation System Plan[3], which requires a seven foot wide landscape planter strip between the curb and sidewalk. A small portion of the frontage along Kuebler Boulevard will be constructed with a planter strip, between Battle Creek Road and the Kuebler Boulevard driveway that is prohibited by City Code.

The remainder of the Kuebler Boulevard frontage is not illustrated to include a landscape strip. Additionally, a 16 foot wide center landscaped median is required, but not illustrated along any portion of the Kuebler Boulevard site frontage. As no access is permitted to Kuebler Boulevard, there is no reason not to construct this landscaped median at this time.

27th Avenue, Boone Road and Battle Creek Road are all classified as "collectors." A large portion of the site's 27th Avenue frontage that will be constructed is not illustrated to include a planter strip, also not in compliance with the City TSP. None of the site's Boone Road frontage is illustrated to be constructed with a landscape strip. None of the site's Battle Creek Road frontage is illustrated to be constructed with a landscape strip.

Synchro Is Not Always Appropriate Tool for Analysis

According to the Synchro Studio 10 User Guide, "All analysis methods in Synchro have this limitation. If vehicles are spilling out of a turn pocket or through vehicles are blocking a turn pocket, the delay that would occur in the field is not included in the models' delay output."

Much of the queuing analysis was prepared using Synchro, which is a macroscopic model. This methodology is appropriate for isolated intersections that are uncongested. In order to capture realistic queue lengths and spillover effects in an urban setting such the case in the study area, a microscopic simulation model such as SimTraffic should be utilized to report the queue lengths for closely spaced intersections such are many of the intersections in the study area.

Although not reported in the queue tables of the TIA, the westbound and eastbound through queue exceed the theoretical capacity of the intersection per the Synchro outputs. The eastbound through movement queue is reported as 727 feet and the westbound through movement queue length is reported as 947 feet, far exceeding the depth of the turn lanes.

During the weekday PM peak hour, the westbound through movement queue length at the Kuebler Boulevard/27th Avenue intersection is anticipated to be 500 feet, blocking the

[3]http://temp.cityofsalem.net/Departments/PublicWorks/TransportationServices/TransportationPlan/Documents/tsp_street_approved.pdf, see Figure 3-1

westbound left turn lane (August 9, 2018 TIA, pg 9, Table G) with the approval of the development. As noted, the delay associated with this issue is not documented in Synchro.

During the weekday PM peak hour, the northbound right turn movement queue length at the Kuebler Boulevard/27th Avenue intersection is anticipated to be 325 feet, extending into the roundabout at 27th Avenue/Costco site access (August 9, 2018 TIA, pg 9, Table G) with the approval of the development.

Queues Will Extend Into the 27th Avenue/Site Access Roundabout Intersection

The TIA establishes that during the weekday PM peak hour, the northbound right turn movement queue length at the Kuebler Boulevard/27th Avenue intersection will be 325 feet, which will extend into the 27th Avenue/Site Access roundabout intersection.

I-5 Southbound/Kuebler Boulevard Intersection Not Analyzed Correctly

The TIA analyzes the intersection of I-5 SB/Kuebler Boulevard and Kuebler Boulevard/27th Avenue incorrectly. Exhibits 1 and 2 of the August 9, 2018 TIA illustrate channelized southbound dual right turn lanes turning into three westbound through lanes on Kuebler Boulevard that extend all the way to the Kuebler Boulevard/27th Avenue intersection. In reality, the dual southbound lanes are not channelized behind an island nor are there three westbound lanes on Kuebler Boulevard.

It should be noted that ODOT has not received the Synchro and SimTraffic files from the applicant, as they noted in their August 27, 2018 letter, they cannot "confirm if the I-5 signalized ramp terminals have been appropriately analyzed." The Synchro output sheets that have been provided don't provide enough detail to verify issues like these. The applicant should be required to provide the Synchro and SimTraffic files especially for the intersections that are projected to operate exactly at the agency mobility standards with the approval of the proposed development, or the I-5 SB/Kuebler Boulevard and Kuebler Boulevard/Battle Creek Road intersections.

Screenshot of Exhibit 1 of August 8, 2018 TIA illustrating the TIA analysis of the I-5 SB/Kuebler Boulevard intersection.

Aerial view of I-5 SB/Kuebler Boulevard intersection. The dual southbound right turn lanes are not behind an island as analyzed in the TIA.

Screenshot of Exhibit 2 of August 8, 2018 TIA illustrating three westbound lanes on Kuebler Boulevard between I-5 and 27th Avenue

Aerial view of Kuebler Boulevard between I-5 SB and 27th Avenue. There are not three westbound through lanes on Kuebler Boulevard as analyzed in the TIA.

I-5/Kuebler Boulevard Intersection Analyzed with Inappropriate Southbound Right Turn Assumption

The TIA assumes that 42% of southbound right turns at the I-5 SB/Kuebler Boulevard intersection are made on red signal indication (May 31, 2018 TIA, pg 4). This assumption is not based on any submitted evidence and varies from the default right turn on red assumptions according to industry standard. Per the TIA, the information is based upon observations collected during the weekday PM peak hour, yet this assumption carries over to the Saturday peak hour, again without any evidence to support the use of this factor.

In Process Traffic

The May 2018 TIA considers the impact of several in-process developments including Boone Wood Estates, a 31 unit residential subdivision located south of the Boone Road/27th Avenue intersection. Additionally, the TIA consider a 122 unit assisted senior

care facility southeast of Boone Road/27th Avenue. Lastly, the TIA considers the impact of 6,900 square feet of space at the 38,700 square foot Salem Clinic and medical office building located on the same site as the proposed development.

The applicant will likely argue that the 1% growth rate and the in-process traffic included in the May 2018 is sufficient to overcome the shortcoming of not basing the TIA on the MWVCOG travel demand model as required by City Code. However, the applicant has not provided the trip distribution sheets associated with those in-process developments. As described earlier, a simplistic approach to reviewing the growth along Kuebler Boulevard yielded a growth of between approximately 1.8% and 3.75%. At the intersection of Kuebler Boulevard/Battle Creek Road, an increase in 1% of traffic equates to approximately 400 additional vehicles in the weekday PM peak hour. The in-process traffic considered above will not generate 400 weekday PM peak hour trips, so it's unlikely that the 1% growth rate and in-process traffic considered in the TIA is sufficient to address the requirements of City Code.

Additionally, the TIA does not but should have considered the impacts of the Mill Creek Corporate Center (buildings 1B and 1C), which includes the Amazon distribution center. This development was approved and not operational prior to the December 2017 traffic counts. The Mill Creek TIA clearly illustrates site traffic utilizing several of the study intersections of the Costco TIA. The inclusion of this traffic may affect the operations of these intersections, yet has not been accounted for. The trip distribution of that development is provided in Appendix C.

May 2018 Traffic Counts Illustrate Higher Traffic Volumes

Traffic counts were collected at the Kuebler Boulevard/27th and Kuebler Boulevard/Battle Creek intersections in May 2018 (Appendix D), prior to the original submission of the traffic impact study that paint a different traffic count picture than presented in the May 31, 2018 TIA, which is based upon traffic counts collected in December 2017. All of the traffic counts were collected by the same vendor, Quality Counts.

At the intersection of Kuebler Boulevard/27th Avenue, the May 2018 traffic counts illustrate an entering volume of 3521, while the December 2017 traffic counts illustrate an entering volume of 3384 vehicles per hour. This is a difference in traffic count over that six month period that is approximately 4% higher than what was presented in the TIA.

At the intersection of Kuebler Boulevard/Battle Creek Road, the May 2018 traffic counts illustrate an entering volume of 4145 vehicles per hour while the December 2017 traffic counts presented in the May 31, 2018 TIA present traffic counts with an entering volume of 3995 vehicles per hour. The increase in traffic count over that six month period is approximately 3.7%.

It should again be noted that the TIA illustrates the Kuebler Boulevard/Battle Creek Road intersection is expected to operate at the City of Salem mobility standard of 0.90. With a traffic volume 3.7% greater than the TIA illustrates, the intersection will likely operate with a v/c ratio greater than 0.90, thereby requiring mitigation.

Response to PacTrust September 27, 2018 Memorandum

PacTrust, represented by a construction engineer, not a traffic engineer, provided responses to several of the traffic engineering related issues raised in the September 19, 2018 Karl Anuta letter as well as the South Gateway Neighborhood Association "SGNA" letter dated September 19, 2018. The PacTrust traffic engineering related responses are numbered from 1 to 11, but certainly don't address each of the comments presented in the Anuta or SGNA letters. In most cases, PacTrust fails to acknowledge the shortcomings of their analysis or provide counterarguments regarding why the TIA is adequate when clearly in violation of City Code.

1. PacTrust argues that the in-process developments included in the TIA were coordinated with city staff. Unfortunately, Buildings 1B and 1C of the Mill Creek development were not addressed in the TIA and certainly has an impact on the study intersections. As a result, the TIA should be updated to include all in-process traffic that was not considered. PacTrust also argues that PacTrust has provided "more than its share of traffic capacity and other improvements for those projects." While this work is likely appreciated by the community, it does not address any relevant city approval criteria. If additional improvements are required in order to meet city criteria, then those improvements should be required or the application must be denied.
2. PacTrust states that the trip generation calculations are "based on actual data from years of study of Costco trip generation. It is the best and most reliable data." While that may be true, City Code requires the use of the *Trip Generation Manual*. Even if the data is the "best and most reliable," it has not been provided and there is no evidence that supports its use nor can anyone check the applicant's work due to the lack of data. PacTrust also argues that "Kittelson's work in this regard and its TIA meet all relevant city standards." The trip generation, in fact, does not meet any city standards with regard to trip generation. Again, no reviewer could replicate the trip generation estimate provided in the TIA. We would challenge any TIA reviewer to provide a reliable trip generation estimate for a 159,000 square foot Costco and 29 fueling position gas station and compare that with the applicant's estimate. This calculation can't be done because the applicant doesn't provide it. Therefore, there is inadequate evidence to support its use.
3. PacTrust states that the "pass-by trip generation rates used in the study are based on data taken from existing Costcos with gas stations in the United States...The Costco transportation database is the best source of information to use in developing trip generation estimates for Costco developments...Kittelson's bypass rate and its TIA meet all relevant city standards," Again, the applicant has not

provided any data that supports the use of this pass-by rate and again, the use of this data is not supported by City Code. Lastly, there are numerous City Codes that are very clearly violated.

4. PacTrust argues that "[p]er coordination with the City and ODOT, the application of a seasonal adjustment only applies to State facilities and not City intersections." We appreciate and agree with the applicant's statement that only state facilities are required to be seasonally adjusted. Per ODOT's Analysis Procedures Manual, state intersections are required to be seasonally adjusted. However, the TIA does not provide any seasonal adjustment as required by the Analysis Procedures Manual to any of the state intersections. As discussed earlier, if the Analysis Procedures Manual would have been referenced, the December 2017 traffic counts should have been adjusted.
5. PacTrust argues that the use of the saturation flow rates captured in the saturation flow rate are appropriate. We agree that their use is appropriate for the intersection movement observed in that that particular time period. We do not agree that the use of the 1900 vehicles per hour of green per lane is appropriate for every single intersection movement for every single time period as applied in the TIA. The use of those saturation flow rates in that fashion is very simply not compliant with city standard and requires adjustment.
6. PacTrust argues that "[t]he study area assumed in the TIA is appropriate. It was coordinated with City staff as part of the TIA scoping process and is consistent with the study area analyzed as part of the approved Kuebler PacTrust comprehensive plan amendment and zone change project." Unfortunately, the study area of comprehensive plan amendment and zone change are not at all relevant to this project. The city's objective study area requirements are clearly not met. There are major intersections that will experience an increase in peak hour traffic volume of greater than 50 trips. Per Salem Administrative Rules 109-006-6.33(c), those intersections shall be studied.
7. Providing no argument, PacTrust alleges that "[t]he horizon year analysis period meets the requirements set under Section 6.33 of the City Public Works Design Standards." In fact, the TIA is directly in conflict with Table 6-33 of the City Administrative Rules as described earlier.
8. PacTrust argues that the right-turn-on-red adjustment are reliable. The TIA provides no evidence that this study occurred and provides no evidence for review.

City Response to Transportation Related Concerns

In the October 23, 2018 Decision of the Planning Administrator (hereafter referred to as the "decision") and the October 19, 2018 Public Works Recommendations memorandum (hereafter referred to as the "memorandum", the city responds to some of the criticisms of the TIA. The City's decision refers to a development that consists of five retail shell buildings while the memorandum refers to a development that consists of four retail shell buildings.

The City argues that the inclusion of "in-process traffic in a TIA is not a requirement pursuant to City Code or Administrative Rule, the City required only the proposed development that has been permitted and is reasonably expected to be operational by the time the proposed development opens." It is sometimes difficult to determine when development will be operational. For instance, the subject development proposes to be operational in 2019 although even the very first phase is unlikely to be open in 2019. Additionally, there are likely two other phases associated with the development that are projected to open in any particular time period. It is notable that buildings 1B and 1C of the Mill Creek development were not included. These developments were proposed prior to December 2017, when the TIA counts were collected. However, the impact of those developments are not included in the TIA.

November 23, 2018 Response to Transportation Related Concerns

In their November 23, 2018 memorandum, KAI responds to several of the traffic engineering related issues raised in the September 19, 2018 Karl Anuta letter as well as the South Gateway Neighborhood Association "SGNA" letter dated September 19, 2018. Our response to the KAI responses are provided below and based upon the headings presented in the KAI memorandum.

Study Area

KAI argues that study area is adequate, coordinated with staff and consistent with the comprehensive plan amendment and zone change project. The KAI response continues to fail to respond to the clear City Code criteria with regard to the study area. The study area of the comprehensive plan amendment and zone change is irrelevant to the approval criteria. There are many intersections that will fall within the requirement to include in the study area. SRC 109-006-6.33(c) is clear in its requirement and it does not appear to vary based upon staff's direction.

Analysis Year

KAI states that "[i]t is not multi-phased development and was coordinated with City staff as part of the TIA scoping process." Again, the previous TIAs and the site plan are both clear that there are future phases of development and not all will be constructed in 2019. If that is no longer the case, that should be made clear and a reasonable schedule should be provided that illustrates how the entire development will open in 2019.

Seasonal Adjustment

KAI provides no counterargument that ODOT intersections should have been seasonally adjusted. In fact, they acknowledge that state intersections should be seasonally adjusted. None of the I-5/Kuebler Boulevard intersections analysis includes any seasonal adjustment as required by the APM.

Right-Turn-On-Red Adjustment

KAI argues that this criticism is mistaken and they point to the May 2018 TIA on page 4 and Appendix A of the TIA. While raw traffic counts are provided in the May 2018 TIA, there is no evidence of the number of vehicles that turned right-on-red or that a special study was conducted to observe this right-turn-on-red factor. That evidence should be provided, but wasn't.

Saturation Flow Rate

KAI argues that "the saturation flow rate study was performed at several key locations." We agree with the use of the observed "several key locations." We don't agree that the saturation flow rate observed at the "several key locations" should be applied at all of the study intersections for all time periods. That simply is not compliant with an appropriate saturation flow rate study and should be rejected. The result of utilizing that saturation flow rate for all intersections during all time periods without a study is non-compliance with the parameters required by City Code.

Background Growth and In-Process Developments

KAI argues that "[m]odel data for Costco is not available in the Mid-Willamette Valley COG model. Therefore, the City Traffic Engineer determined trip distribution be based upon Costco specific data. In turn, as required by the City Traffic Engineer, the site review TIA used existing proprietary Salem Costco sales data from FY 2014 through FY 2016 for every zip code in Oregon was analyzed to determine the percent of sales value to each zip code." Unfortunately, the applicant has not provided any of the data that this trip distribution is reportedly based upon. Like many of the aspects of the TIA, it cannot be reviewed. Again, travel demand forecasting model data is in fact available for this area and City Code does not afford the flexibility of utilizing alternative data (which wasn't provided) unless there is not a transportation model in the area.

KAI argues that "the referenced Amazon facility would not be included in this or any project transportation analysis, in any event, because its transportation impacts have been fully anticipated and mitigated through the Mill Creek Industrial Master Plan..." This is not how in-process traffic is supposed to be accommodated. There are Mill Creek trips that were not yet realized on the system at the time of the December 2017 traffic counts. To properly account for those in-process trips, this project's TIA should have considered those vested trips in their analysis, but didn't. KAI again brings up the 2006 TIA for this site, which is again not relevant to the approval criteria of the site plan review.

Trip Generation

KAI continues to try to rely on data that is not provided in the written record of the application. There are no reported trip rates for the weekday PM or Saturday peak hour. There is no evidence that supports the use of their proposed alternative trip generation.

Additionally, City Code does not support the use of an alternative trip generation as the *Trip Generation Manual* provides trip generation data for each of the proposed uses associated with the development. The fact that these uses are combined into a single site falls within the *Trip Generation Handbook* methodology. KAI continues to not provide any data that supports their alternative trip generation with no ability to check their work. According to the *Trip Generation Handbook*, reliance upon the existing Salem Costco solely does not follow industry standard.

KAI references a 34% pass-by trip reduction, but continues to provide no evidence that supports its use besides a database that no one but them have access to review.

KAI also references several other Costco projects across the country. The written record of the application does not include those other TIAs, so there is no evidence about the information that went into developing those TIAs. If the applicant intends to rely upon information from those other studies, they should submit those TIAs into the record for review.

Pass-by Rate

KAI continues to provide no evidence to support the use of their alternative trip generation, which is not allowed by City Code.

Intersection Operations

KAI contends there are no "omissions and errors." We have spent several pages quite clearly illustrating sections of City Code and ODOT standards that were either ignored or simply not met. Many of these are indisputable. Again, KAI relies on the 2006 zone change and comprehensive plan amendment, which is not relevant to the site plan review application of 2018. For approval of the site plan review, the requirements of the site plan review must be met and they clearly are not.

With regard to the analysis of the I-5 SB/Kuebler Boulevard intersection, KAI states that "[t]he dual southbound right turn lanes at the I-5 Southbound/Kuebler Boulevard intersection were modeled as channelized lanes in order to implement the right turn on red (RTOR) movement in SimTraffic. In reviewing initial SimTraffic model runs without any right turn channelization, vehicles were not simulating making a right RTOR movement. Therefore, to more closely align with existing operations, the right turn lanes were modified within the model to be channelized, to allow the RTOR movement, matching real world operations." As ODOT notes, none of the analysis files have been presented in the record of the application and therefore ODOT cannot confirm the operations at this intersection.

Again, the TIA provides no evidence that southbound right turns occur at a rate of 42%. There is no evidence that a RTOR study was even conducted.

KAI states that "the eastbound and westbound channelized right turn lanes at the I-5 Southbound/Kuebler Boulevard intersection do not yield to any conflicting vehicle movements, therefore modeling as a free movement is reasonable." While the eastbound and westbound right turn lanes do not have a conflicting movement, the issue here is the southbound right turn. The southbound right turn conflicts with westbound through movements. As KAI has analyzed the intersection, it has eliminated the conflicts of the westbound through movement and assumes that movement has a free movement, which is fundamentally untrue. Synchro allows for the adjustment of RTOR volumes without artificially creating travel lanes that do not exist and aren't proposed. If the applicant proposes to construct the intersection as it was analyzed, that has not been established.

Queuing

As established earlier in this report, Synchro self reports that it has limitations when it comes to queuing issues and congestion. KAI has ignored this advice and relied upon Synchro outputs when a SimTraffic analysis would have provided more reliable results.

It is likely that in the future, if not at the day of opening, standing queues from the Kuebler Boulevard/27th Avenue intersection will extend into the proposed 27th Avenue/Site Access roundabout.

Fuel Station

KAI states that the lack of a queue study for the gas station "is inaccurate." Factually, none of the previous TIAs provided any queuing analysis of the gas station. As previously discussed, the November 29, 2018 provides no methodology for how the results of Table 1 of this TIA are derived. There are no analysis worksheets or any description about how these numbers are determined. Therefore, there is no ability to review them.

Conclusion

There are numerous errors and omissions presented in the TIA that remain unresolved. There are clear violations of City Code addressed herein. According to the SRC and UDC, this application cannot be approved. An updated, fully compliant TIA is required to fully realize the negative impacts of the proposed development. Until that time, the application should be denied.

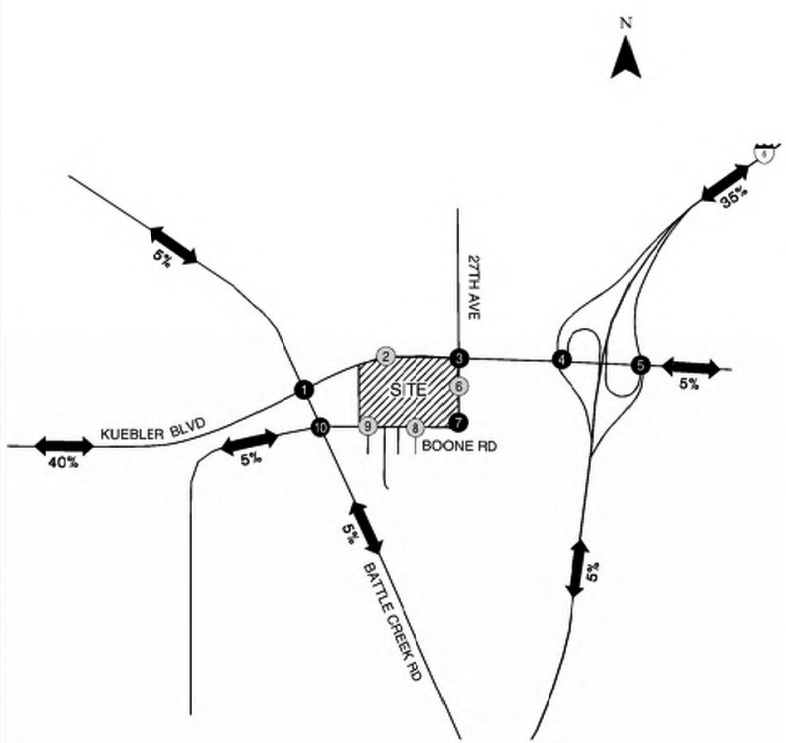
Should you have any questions, please contact me at rick@greenlightengineering.com or 503-317-4559.

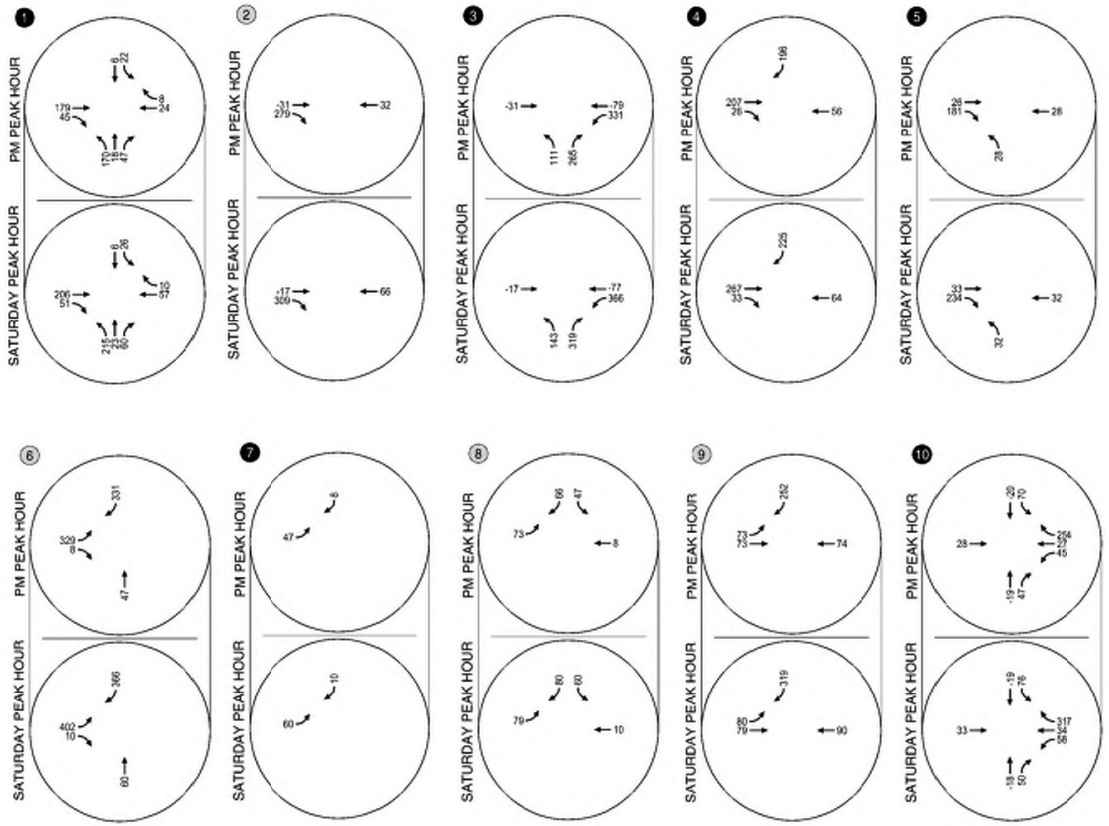
Sincerely,

Rick Nys, P.E.
Principal Traffic Engineer

Appendix A

Figure 8 of May 31, 2018 TIA





Trip distribution is based on FY 2014 - FY 2016 Salem Costco sales data.
Negative trips represent pass-by trips.

● - Study Intersections
(#) - Study Site Driveways

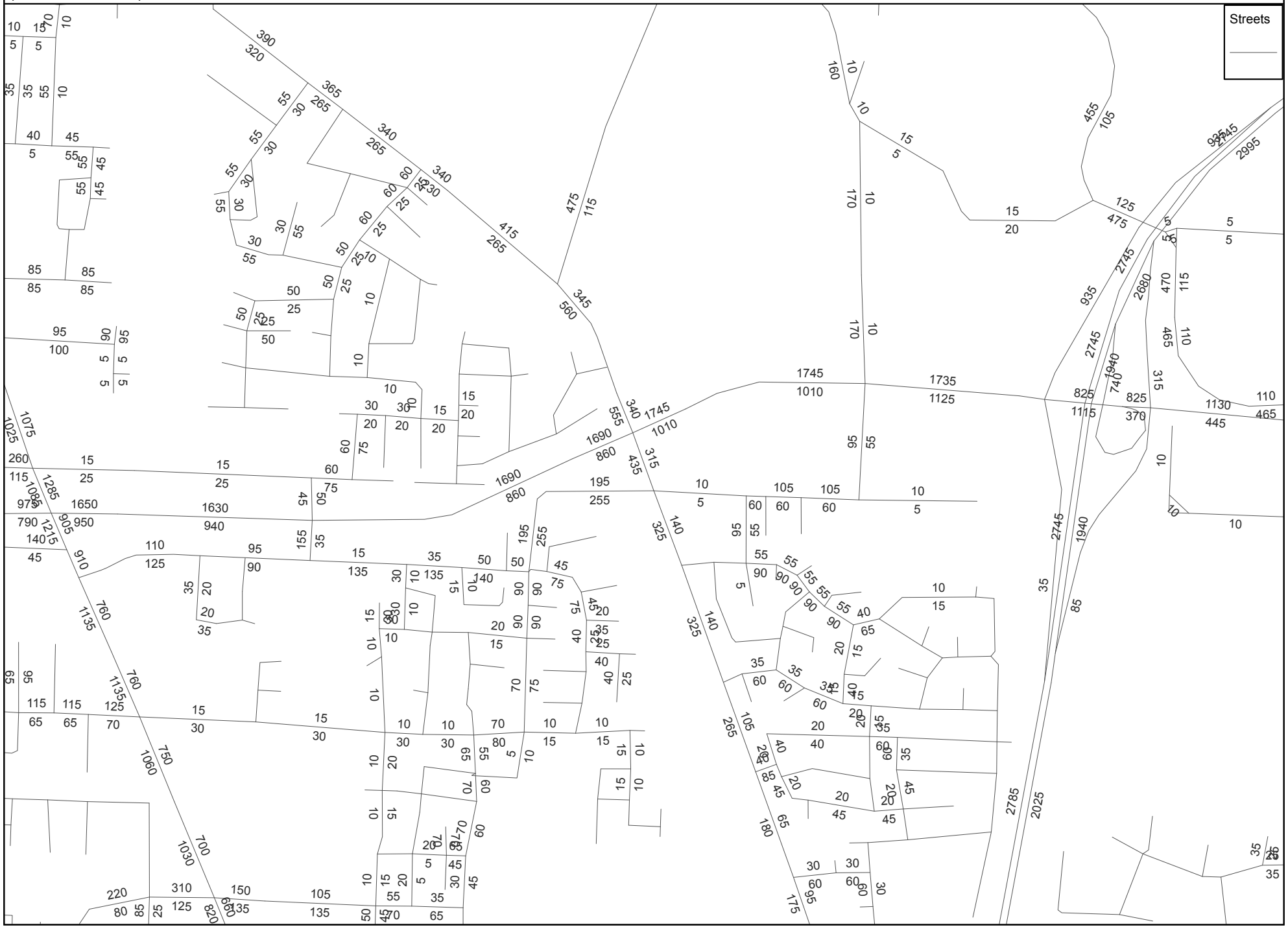
Estimated Costco Trip Distribution Pattern and Assignment (Total Trips)
Weekday PM and Saturday Midday Peak Hour
Salem, OR

Figure **8**

Appendix B

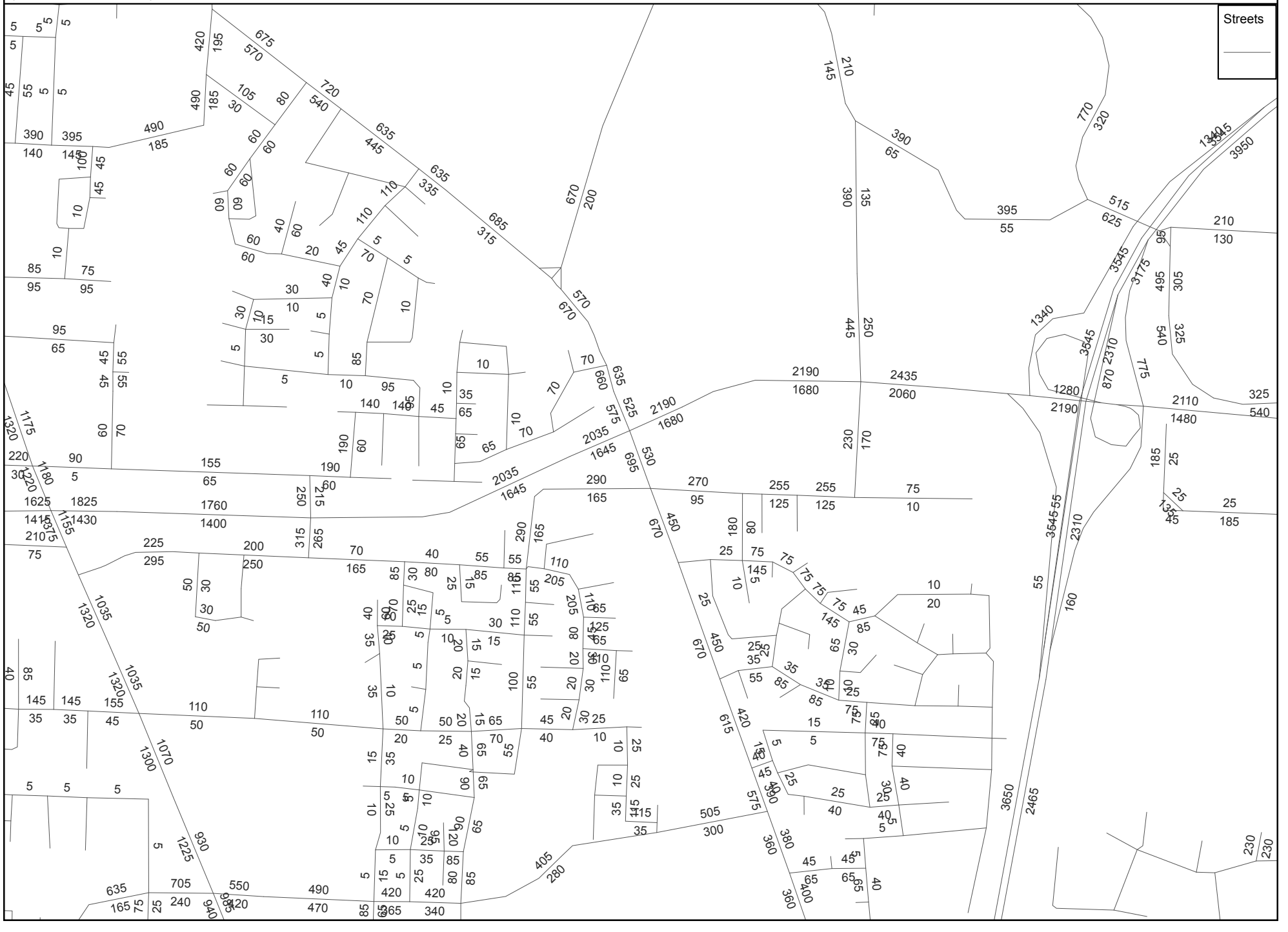
Mid-Willamette Valley Council of Governments
Travel Demand Modeling Outputs

2010 PM Peak Volume Demand
(round value = 5)



2035 PM Peak Volume Demand

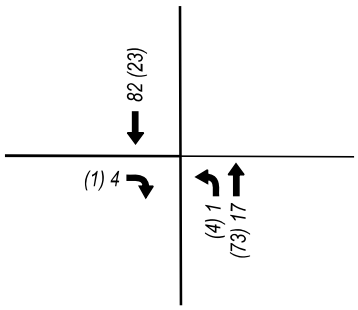
(round value = 5)



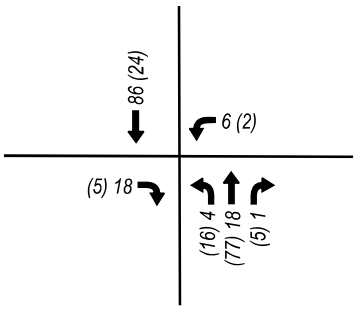
Appendix C

Mill Creek Trip Distribution

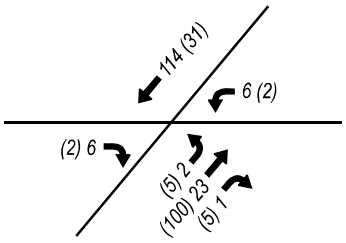
1. Auburn Rd. @ Cordon Rd.



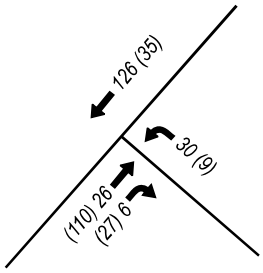
2. State St. @ Cordon Rd.



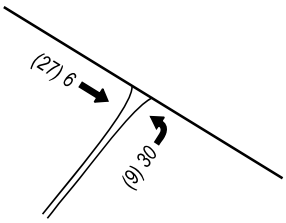
3. MacLeay Rd. @ Cordon Rd.



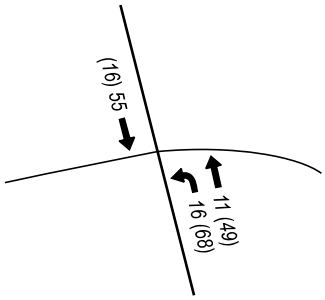
4. Gaffin Rd. @ Cordon Rd.



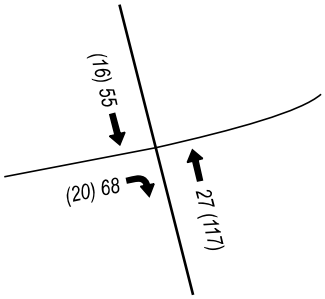
5. Gaffin Rd. @ Hwy 22 WB Ramps



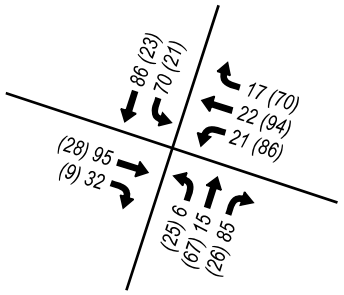
6. Mission St./Hwy 22 WB Ramps @ Lancaster Dr.



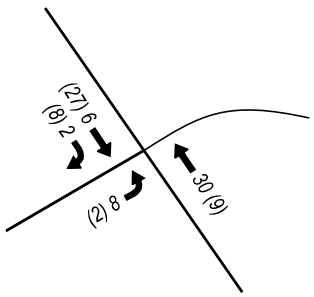
7. Mission St./Hwy 22 EB Ramps @ Lancaster Dr.



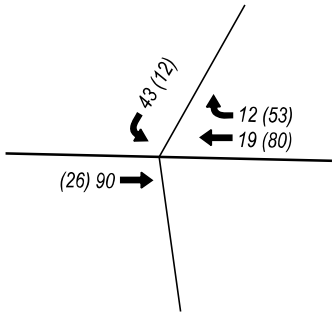
8. Lancaster Dr./Aumsville Hwy. @ Kuebler Blvd./Cordon Rd.



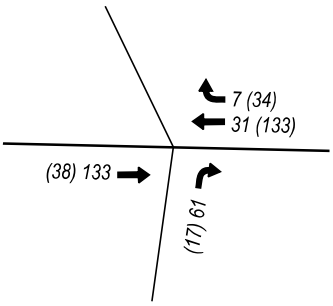
9. Aumsville Hwy. @ Deer Park Dr.



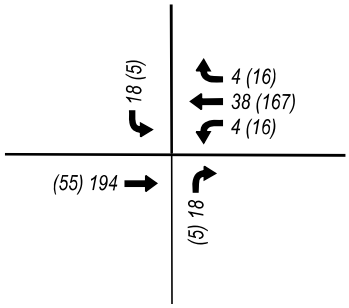
10. Kuebler Blvd. @ I-5 SB Ramps

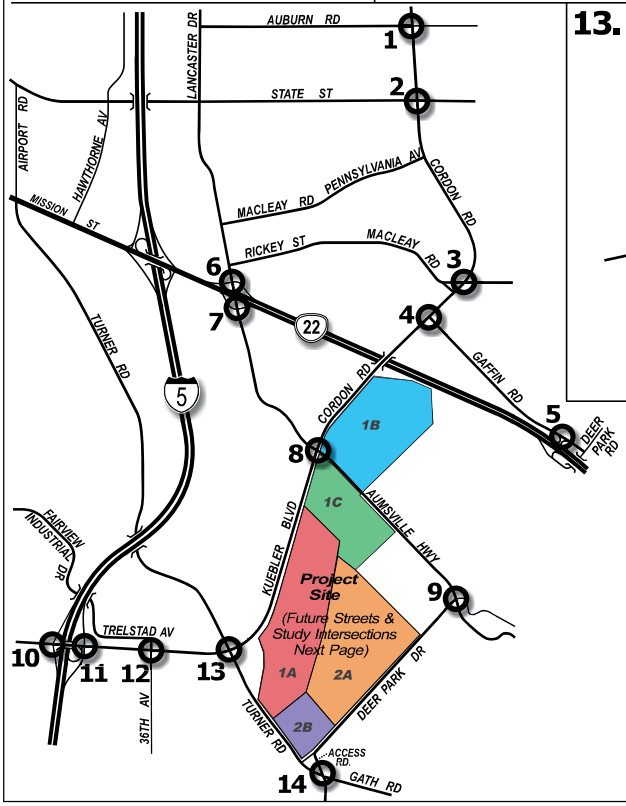


11. Kuebler Blvd. @ I-5 NB Ramps

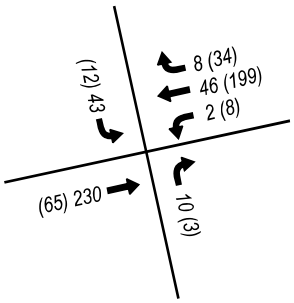


12. Kuebler Blvd. @ 36th Ave.

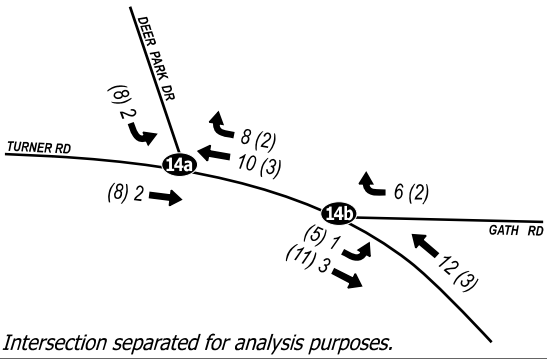




13. Kuebler Blvd. @ Turner Rd.



14. Turner Rd. @ Deer Park Dr./Gath Rd.



Intersection separated for analysis purposes.

LEGEND

#○ - Study Intersection & Number

← AM (PM) - Peak Hour Project Trips by Turn Movement

DKS

No Scale

Figure **4a**

2017 AM/PM PEAK HOUR DEVELOPMENT TRIPS

Appendix D

May 2018 Traffic Counts

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

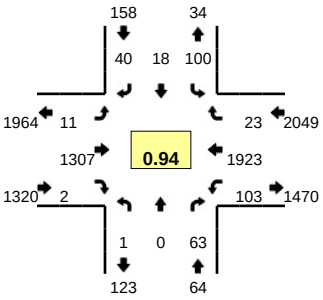
LOCATION: 27th Ave SE -- Kuebler Blvd

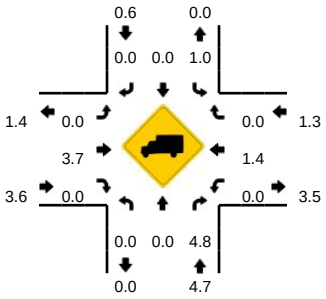
QC JOB #: 14711010

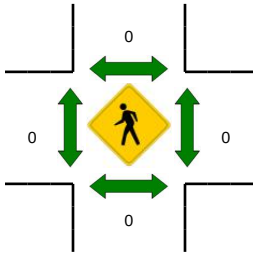
CITY/STATE: Salem, OR

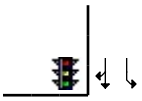
DATE: Wed, May 16 2018

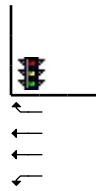
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

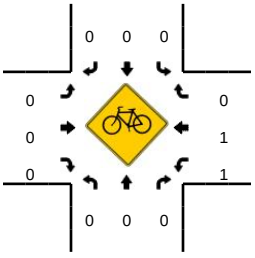


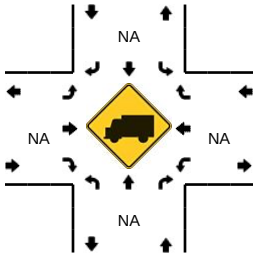


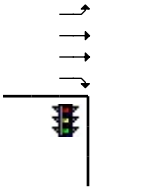


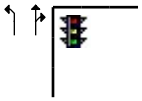


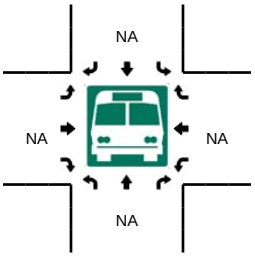












5-Min Count Period Beginning At	27th Ave SE (Northbound)				27th Ave SE (Southbound)				Kuebler Blvd (Eastbound)				Kuebler Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	3	0	5	0	2	0	0	106	0	0	10	128	1	0	255	
4:05 PM	0	0	5	0	5	0	4	0	1	96	0	0	4	157	5	0	277	
4:10 PM	0	0	9	0	8	0	1	0	0	106	1	0	6	155	2	0	288	
4:15 PM	0	0	2	0	10	1	0	0	1	113	0	0	4	138	3	0	272	
4:20 PM	0	0	3	0	2	0	3	0	4	117	0	0	7	166	5	0	307	
4:25 PM	0	0	3	0	2	1	0	0	1	85	0	0	9	151	2	0	254	
4:30 PM	0	0	8	0	8	1	4	0	4	114	1	0	9	120	1	0	270	
4:35 PM	0	1	6	0	10	1	0	0	1	110	0	0	4	155	0	0	288	
4:40 PM	0	0	10	0	1	0	1	0	2	94	0	0	12	158	1	0	279	
4:45 PM	0	0	9	0	5	0	1	0	2	131	0	0	6	152	4	0	310	
4:50 PM	0	0	4	0	6	1	4	0	0	118	0	0	4	145	4	0	286	
4:55 PM	0	0	4	0	3	1	1	0	1	104	0	0	9	168	0	0	291	3377
5:00 PM	0	0	4	0	4	1	3	0	0	115	0	0	9	154	3	0	293	3415
5:05 PM	0	0	8	0	34	3	11	0	1	98	1	0	9	127	3	0	295	3433
5:10 PM	0	0	4	0	11	3	2	0	1	109	0	0	8	187	0	0	325	3470
5:15 PM	0	0	9	0	12	0	3	0	0	105	0	0	14	183	0	0	326	3524
5:20 PM	1	0	3	0	7	4	4	0	0	110	0	0	5	169	1	0	304	3521
5:25 PM	0	0	3	0	3	1	5	0	1	112	0	0	11	158	2	0	296	3563
5:30 PM	0	0	3	0	6	2	3	0	1	94	1	0	8	168	1	0	287	3580
5:35 PM	0	0	2	0	8	2	2	0	2	117	0	0	8	154	4	0	299	3591
5:40 PM	0	1	6	0	4	0	1	0	3	99	0	0	13	136	1	0	264	3576
5:45 PM	0	0	3	0	4	0	2	0	2	87	0	0	3	159	2	0	262	3528
5:50 PM	0	1	3	0	1	0	1	0	1	94	0	0	6	172	0	0	279	3521
5:55 PM	0	0	4	0	4	1	2	0	0	98	0	0	5	130	1	0	245	3475

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	64	0	120	28	36	0	4	1296	0	0	108	2156	4	0	3820
Heavy Trucks	0	0	4		0	0	0		0	40	0		0	32	0		76
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/20/2018 9:49 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

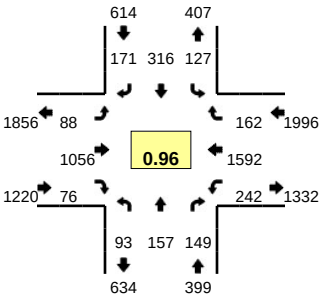
LOCATION: Battle Creek Rd SE -- Kuebler Blvd

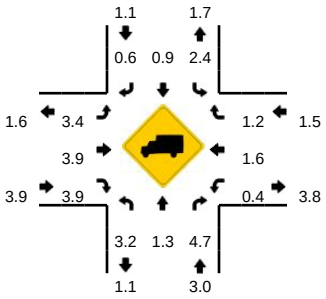
QC JOB #: 14711012

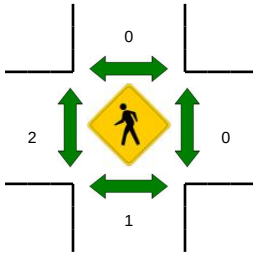
CITY/STATE: Salem, OR

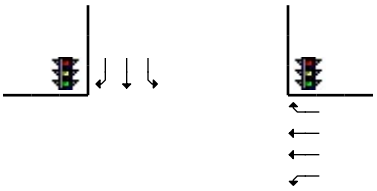
DATE: Wed, May 16 2018

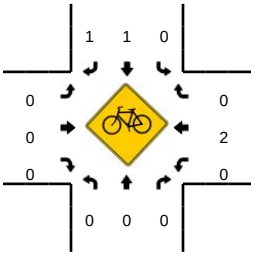
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

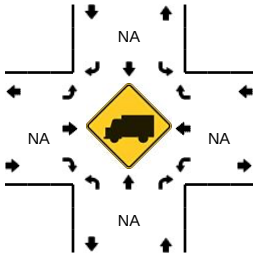


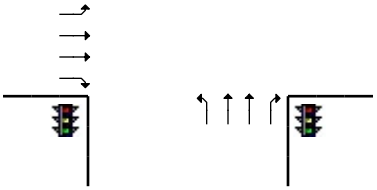


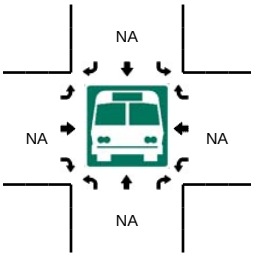












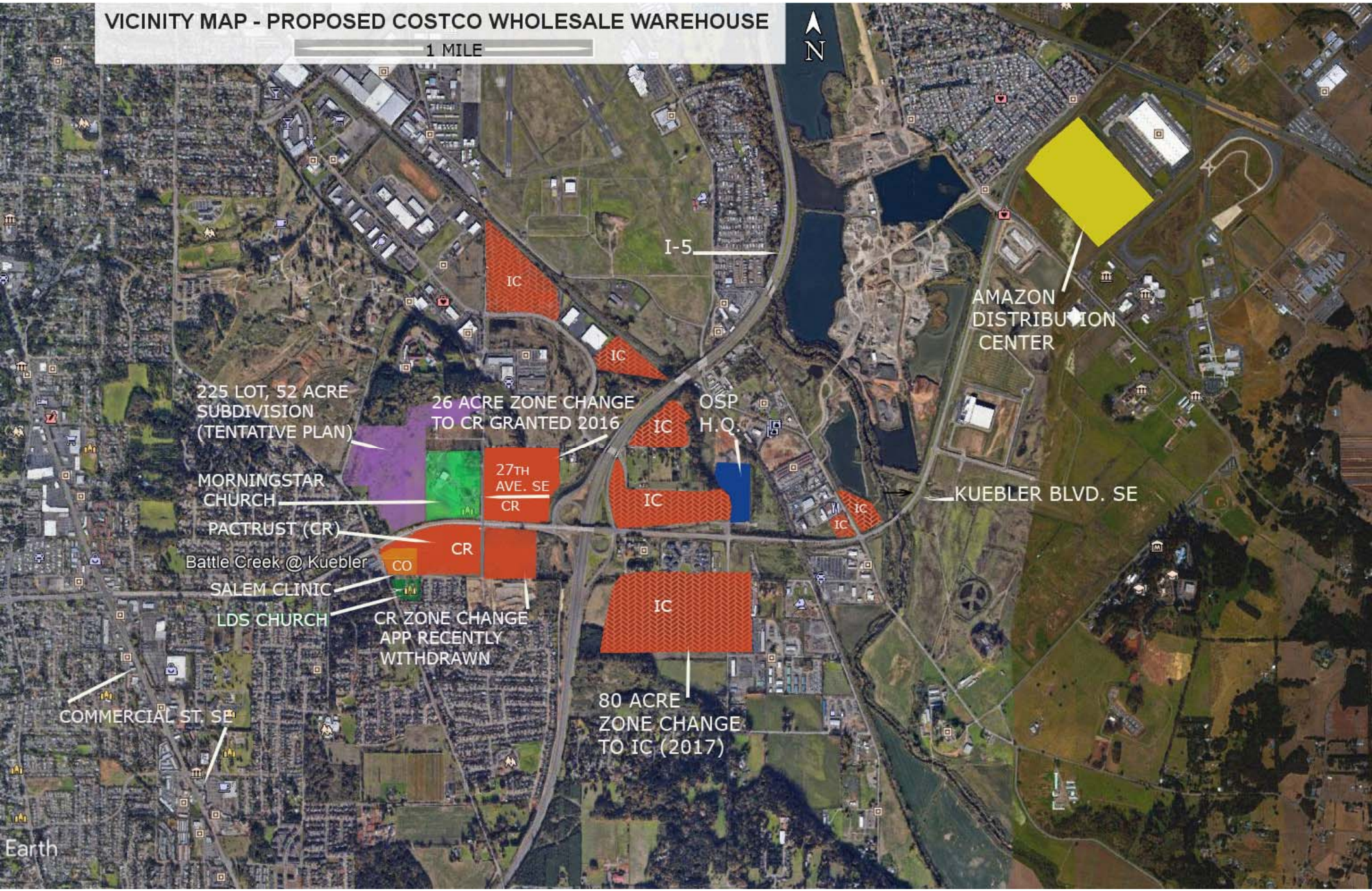
5-Min Count Period Beginning At	Battle Creek Rd SE (Northbound)				Battle Creek Rd SE (Southbound)				Kuebler Blvd (Eastbound)				Kuebler Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	12	19	7	0	12	19	9	0	1	71	7	0	19	103	7	0	286	
4:05 PM	8	9	13	0	4	29	26	0	8	74	4	0	19	107	16	0	317	
4:10 PM	7	8	11	0	13	17	11	0	4	101	6	0	11	157	16	0	362	
4:15 PM	9	12	12	0	11	22	16	0	7	87	3	0	21	103	13	0	316	
4:20 PM	7	13	11	0	10	34	7	0	5	84	7	0	18	125	17	0	338	
4:25 PM	6	6	5	0	6	25	12	0	6	97	4	0	12	127	20	0	326	
4:30 PM	6	8	14	0	14	18	14	0	5	81	7	0	22	95	21	0	305	
4:35 PM	6	9	17	0	9	35	22	0	10	77	5	0	9	105	11	0	315	
4:40 PM	11	10	9	0	9	18	16	0	11	92	7	0	25	128	11	0	347	
4:45 PM	9	10	11	0	14	24	10	0	7	107	4	0	15	144	13	0	368	
4:50 PM	17	15	14	0	20	30	14	0	7	79	5	0	17	111	12	0	341	
4:55 PM	8	6	12	0	9	27	16	0	11	80	11	0	19	133	11	0	343	3964
5:00 PM	2	13	10	0	13	27	9	0	6	100	6	0	14	134	14	0	348	4026
5:05 PM	10	12	14	0	15	35	18	0	4	80	6	0	19	116	18	0	347	4056
5:10 PM	3	14	13	0	9	34	20	0	7	64	4	0	34	118	10	0	330	4024
5:15 PM	7	15	11	0	10	25	19	0	8	105	8	0	22	159	14	0	403	4111
5:20 PM	6	14	13	0	13	28	14	0	6	90	9	0	17	151	11	0	372	4145
5:25 PM	9	20	15	0	3	32	16	0	9	68	4	0	18	99	15	0	308	4127
5:30 PM	1	12	13	0	8	15	8	0	5	94	7	0	21	168	20	0	372	4194
5:35 PM	10	16	14	0	4	21	11	0	7	97	5	0	21	131	13	0	350	4229
5:40 PM	7	17	15	0	9	36	16	0	5	76	5	0	19	93	16	0	314	4196
5:45 PM	6	14	11	0	7	24	12	0	8	68	5	0	22	144	12	0	333	4161
5:50 PM	9	10	11	0	5	17	6	0	2	86	3	0	22	136	18	0	325	4145
5:55 PM	7	10	9	0	11	24	10	0	5	65	8	0	19	98	10	0	276	4078

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	64	172	148	0	128	348	212	0	84	1036	84	0	292	1712	140	0	4420
Heavy Trucks	0	4	4		0	4	0		4	48	4		0	40	0		108
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/20/2018 9:49 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212


VICINITY MAP - PROPOSED COSTCO WHOLESALE WAREHOUSE
1 MILE
N
I-5
AMAZON DISTRIBUTION CENTER
IC
IC
225 LOT, 52 ACRE SUBDIVISION (TENTATIVE PLAN)
26 ACRE ZONE CHANGE TO CR GRANTED 2016
IC
OSP H.Q.
27TH AVE. SE
CR
MORNINGSTAR CHURCH
IC
KUEBLER BLVD. SE
IC
IC
PACTRUST (CR)
CR
Battle Creek @ Kuebler
CO
SALEM CLINIC
LDS CHURCH
CR ZONE CHANGE APP RECENTLY WITHDRAWN
IC
COMMERCIAL ST. SE
80 ACRE ZONE CHANGE TO IC (2017)
Earth

SURVEY INFORMATION

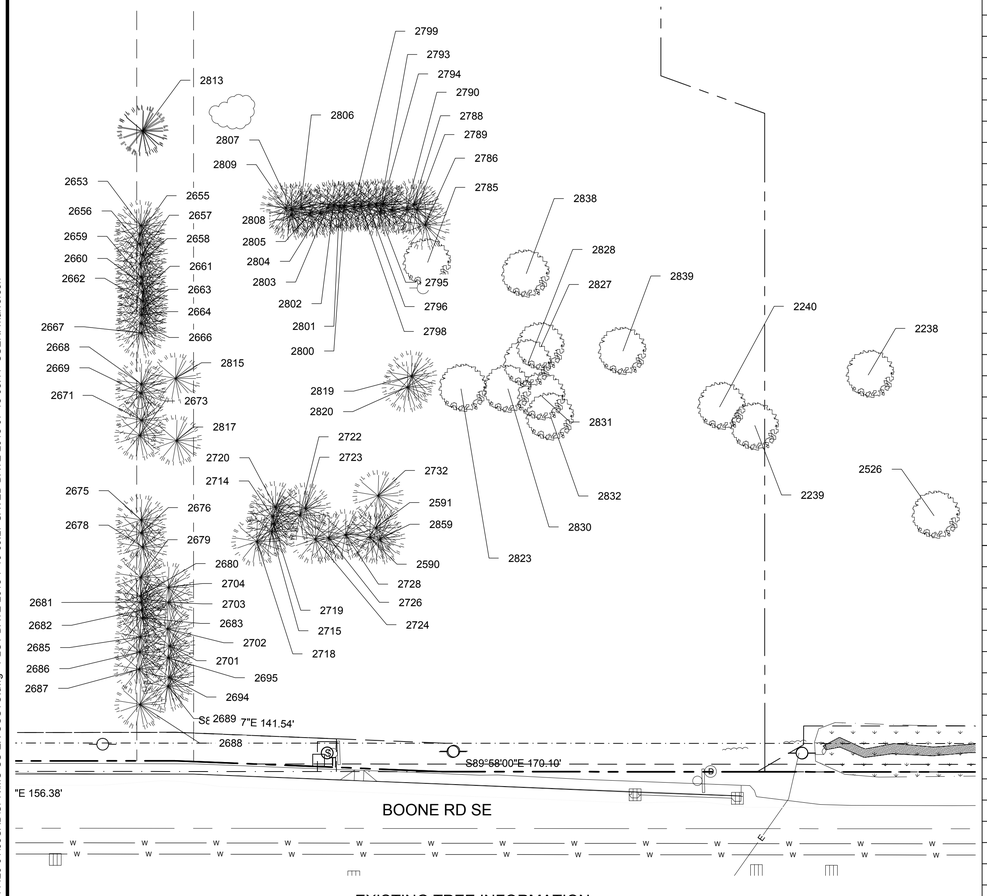
PARCEL A:
A TRACT OF LAND LYING IN THE SOUTHWEST ONE-QUARTER OF SECTION 12, TOWNSHIP 8 SOUTH, RANGE 3 WEST OF THE WILLAMETTE MERIDIAN, CITY OF SALEM, MARION COUNTY, OREGON, DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTH RIGHT-OF-WAY LINE OF BOONE ROAD S.E., SAID POINT BEING 30.00 FEET NORTH 00°05'21" EAST AND 678.71 FEET SOUTH 89°58'00" EAST FROM THE SOUTHWEST CORNER OF SAID SECTION 12; AND RUNNING THENCE NORTH 89°58'00" WEST 467.90 FEET ALONG SAID NORTH RIGHT-OF-WAY LINE; THENCE NORTH 00°00'13" WEST 491.37 FEET; THENCE NORTH 27°44'38" WEST 207.56 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF KUEBLER BOULEVARD, SAID POINT BEING 90.56 FEET SOUTHEASTERLY OF AND AT RIGHT ANGLES TO THE CENTERLINE OF SAID KUEBLER BOULEVARD; THENCE NORTH 66°34'28" EAST 210.23 FEET ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE TO AN ANGLE POINT IN SAID RIGHT-OF-WAY, SAID POINT BEING 80.00 FEET SOUTHEASTERLY OF AND AT RIGHT ANGLES TO SAID CENTERLINE; THENCE NORTH 72°32'17" EAST 41.95 FEET ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE TO A POINT WHICH IS 79.61 FEET SOUTHEASTERLY OF AND AT RIGHT ANGLES TO SAID CENTERLINE; THENCE LEAVING SAID SOUTHERLY RIGHT-OF-WAY LINE SOUTH 00°00'33" EAST 88.97 FEET; THENCE NORTH 89°58'56" EAST 276.76 FEET; THENCE SOUTH 00°00'33" EAST 315.21 FEET; THENCE SOUTH 70°05'50" EAST 58.24 FEET; THENCE SOUTH 00°00'33" EAST 347.58 FEET TO THE POINT OF BEGINNING; EXCEPTING THAT PORTION CONVEYED TO CITY OF SALEM, AN OREGON MUNICIPAL CORPORATION, ORGANIZED AND EXISTING UNDER AND BY VIRTUE OF THE LAWS OF THE STATE OF OREGON BY DEED RECORDED FEBRUARY 25, 2013 IN REEL 3476, PAGE 0048, BOOK OF RECORDS.

PARCEL B
BEGINNING AT A POINT ON THE WEST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 2556, PAGE 0136, DEED RECORDS FOR MARION COUNTY, OREGON WHICH BEARS SOUTH 89°58'00" EAST 347.25 FEET AND NORTH 00°00'33" WEST 712.34 FEET FROM THE SOUTHWEST CORNER OF SECTION 12 IN TOWNSHIP 8 SOUTH, RANGE 3 WEST OF THE WILLAMETTE MERIDIAN, IN THE CITY OF SALEM, MARION COUNTY, OREGON; THENCE NORTH 00°00'33" WEST ALONG SAID WEST LINE A DISTANCE OF 88.97 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY OF KUEBLER BOULEVARD; THENCE NORTH 72°32'17" EAST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 259.30 FEET; THENCE NORTH 89°59'52" EAST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 247.43 FEET TO THE EAST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 2579, PAGE 0170, BOOK OF RECORDS; THENCE SOUTH 00°02'44" EAST ALONG SAID EAST LINE A DISTANCE OF 166.63 FEET; THENCE SOUTH 89°58'56" WEST 494.90 FEET TO THE POINT OF BEGINNING.

PARCEL B1:
A 30.00 FOOT WIDE ACCESS EASEMENT THE WESTERLY LINE OF WHICH IS DESCRIBED AS FOLLOWS:
BEGINNING AT THE SOUTHWEST CORNER OF THE ABOVE DESCRIBED TRACT AND RUNNING THENCE SOUTH 00°00'33" EAST A DISTANCE OF 682.34 FEET TO THE NORTH LINE OF BOONE ROAD.

PARCEL C:
BEGINNING AT A POINT ON THE NORTH LINE OF BOONE ROAD AT ITS INTERSECTION WITH THE WEST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 2579, PAGE 0172 BOOK OF RECORDS WHICH POINT BEARS SOUTH 89°58'00" EAST 842.63 FEET AND NORTH 00°02'44" WEST 30.00 FEET FROM THE SOUTHWEST CORNER OF SECTION 12 IN TOWNSHIP 8 SOUTH, RANGE 3 WEST OF THE WILLAMETTE MERIDIAN IN THE CITY OF SALEM, MARION COUNTY, OREGON; THENCE NORTH 00°02'44" WEST ALONG THE WEST LINE OF SAID TRACT, A DISTANCE OF 682.78 FEET TO THE TRUE POINT OF BEGINNING; THENCE NORTH 00°02'44" WEST ALONG THE WEST LINE OF SAID TRACT, A DISTANCE OF 166.63 FEET TO THE SOUTHERLY RIGHT-OF-WAY LINE OF KUEBLER BOULEVARD SE; THENCE NORTH 89°59'52" EAST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 144.06 FEET TO AN ANGLE POINT THEREIN; THENCE SOUTH 82°43'26" EAST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 272.85 FEET; THENCE SOUTH 51°36'40" EAST 71.07 FEET TO AN ANGLE POINT IN THE WEST RIGHT-OF-WAY LINE OF 27TH AVE.; THENCE SOUTH 00°02'23" EAST ALONG THE WEST RIGHT-OF-WAY LINE OF SAID 27TH AVE. A DISTANCE OF 313.02 FEET; THENCE NORTH 89°58'00" WEST A DISTANCE OF 108.00 FEET; THENCE NORTH 00°02'11" WEST ALONG THE WEST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 1595, PAGE 0219, BOOK OF RECORDS, A DISTANCE OF 150.83 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF A 100.00 FOOT RADIUS CURVE TO THE LEFT (THE CHORD OF WHICH BEARS NORTH 50°37'43" WEST 106.15 FEET) A DISTANCE OF 111.90 FEET; THENCE NORTH 82°41'03" WEST 54.30 FEET; THENCE NORTH 89°59'00" WEST 226.50 FEET TO THE TRUE POINT OF BEGINNING.

PARCEL D:
BEGINNING AT A POINT ON THE NORTH LINE OF BOONE ROAD AT ITS INTERSECTION WITH THE WEST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 1089, PAGE 0148, BOOK OF RECORDS WHICH POINT BEARS SOUTH 89°58'00" EAST 842.63 FEET AND NORTH 00°02'44" WEST 30.00 FEET FROM THE SOUTHWEST CORNER OF SECTION 12 IN TOWNSHIP 8 SOUTH, RANGE 3 WEST OF THE WILLAMETTE MERIDIAN IN THE CITY OF SALEM, MARION COUNTY, OREGON; THENCE NORTH 89°58'00" WEST ALONG SAID NORTH LINE A DISTANCE OF 163.81 FEET; THENCE NORTH 00°00'33" WEST 347.58 FEET; THENCE NORTH 70°05'50" WEST 58.24 FEET; THENCE NORTH 00°00'33" WEST 315.21 FEET; THENCE NORTH 89°58'56" EAST 218.14 FEET; THENCE SOUTH 89°59'00" EAST 226.50 FEET; THENCE SOUTH 82°41'03" EAST 54.30 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF A 100.00 FOOT RADIUS CURVE TO THE RIGHT (THE CHORD OF WHICH BEARS SOUTH 50°37'43" EAST 106.15 FEET) A DISTANCE OF 111.90 FEET TO A POINT ON THE WEST LINE OF THAT TRACT OF LAND DESCRIBED IN REEL 1595, PAGE 0219, BOOK OF RECORDS; THENCE SOUTH 00°02'11" EAST ALONG SAID WEST LINE A DISTANCE OF 150.83 FEET; THENCE SOUTH 89°58'00" EAST A DISTANCE OF 108.00 FEET, TO THE WEST RIGHT-OF-WAY LINE OF 27TH AVENUE; THENCE SOUTH 00°02'23" EAST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 431.98 TO AN ANGLE POINT IN SAID RIGHT-OF-WAY LINE; THENCE SOUTH 44°59'52" WEST 36.75 FEET TO THE NORTH LINE OF SAID BOONE ROAD; THENCE NORTH 89°58'00" WEST ALONG SAID NORTH LINE, A DISTANCE OF 444.28 FEET TO THE POINT OF BEGINNING.



EXISTING TREE INFORMATION
SCALE: 1" = 40'

EXISTING TREE TABLE

POINT NUMBER	TREE TYPE	CALIPER
2238	WHITE OAK	34
2239	WHITE OAK	34
2240	WHITE OAK	44
2526	WHITE OAK	28
2589	DOUGLAS-FIR	24
2590	DOUGLAS-FIR	22
2591	DOUGLAS-FIR	16
2653	BLACK PINE	15
2655	BLACK PINE	12
2656	BLACK PINE	19
2657	BLACK PINE	16
2658	BLACK PINE	12
2659	PONDERSONA PINE	15
2660	BLACK PINE	14
2661	BLACK PINE	12
2662	BLACK PINE	16
2663	BLACK PINE	8
2664	BLACK PINE	10
2666	PONDERSONA PINE	18
2667	BLACK PINE	13
2668	PONDERSONA PINE	10
2669	PONDERSONA PINE	14
2671	DOUGLAS-FIR	15
2673	DOUGLAS-FIR	20
2675	DOUGLAS-FIR	24
2676	DOUGLAS-FIR	12
2678	DOUGLAS-FIR	19
2678	DOUGLAS-FIR	19
2679	DEAD	
2680	BLACK PINE	7
2681	PONDERSONA PINE	12
2682	DEAD	
2683	PONDERSONA PINE	22
2685	PONDERSONA PINE	19
2686	PONDERSONA PINE	13
2687	PONDERSONA PINE	16
2688	PONDERSONA PINE	14
2689	PONDERSONA PINE	21
2694	BLACK PINE	20
2695	BLACK PINE	15
2701	BLACK PINE	16
2702	BLACK PINE	16
2703	BLACK PINE	13
2704	BLACK PINE	17
2714	PONDERSONA PINE	28
2715	PONDERSONA PINE	21
2718	PONDERSONA PINE	6
2719	PONDERSONA PINE	12
2720	PONDERSONA PINE	26
2722	DOUGLAS-FIR	7

POINT NUMBER	TREE TYPE	CALIPER
2723	DOUGLAS-FIR	21
2724	GRAND FIR	25
2726	DOUGLAS-FIR	14
2728	DOUGLAS-FIR	21
2732	DOUGLAS-FIR	19
2785	ELM	12
2786	DOUGLAS-FIR	17
2788	DOUGLAS-FIR	14
2789	DOUGLAS-FIR	15
2790	DOUGLAS-FIR	12
2791	DOUGLAS-FIR	13
2793	DOUGLAS-FIR	9
2794	DOUGLAS-FIR	8
2795	DOUGLAS-FIR	13
2796	DOUGLAS-FIR	18
2798	DOUGLAS-FIR	7
2799	DOUGLAS-FIR	16
2800	DOUGLAS-FIR	14
2801	DOUGLAS-FIR	12
2802	DOUGLAS-FIR	14
2803	DOUGLAS-FIR	16
2804	DOUGLAS-FIR	8
2805	DOUGLAS-FIR	16
2806	DOUGLAS-FIR	17
2807	DOUGLAS-FIR	9
2808	DOUGLAS-FIR	21
2809	DOUGLAS-FIR	22
2813	DOUGLAS-FIR	26
2815	LONDON PLANETREE	26
2817	WESTERN REDCEDER	25
2819	BLACK PINE	21
2820	BLACK PINE	18
2823	WHITE OAK	51
2827	WHITE OAK	20
2828	WHITE OAK	18
2830	WHITE OAK	17
2831	WHITE OAK	12
2832	WHITE OAK	29
2838	WHITE OAK	30
2839	WHITE OAK	28

SANITARY SEWER DATA

1. SANITARY SEWER MANHOLE
RIM=364.11'
IE 8" PVC IN (N)=357.47'
IE 8" PVC IN (W)=357.26'
IE 8" PVC IN (E)=357.25'
IE 8" PVC OUT (S)=357.10'

2. SANITARY SEWER MANHOLE
RIM=361.86'
IE 8" PVC IN (N)=354.60
IE 8" PVC OUT (E)=354.36

3. SANITARY SEWER MANHOLE
RIM=361.02'
IE (W)=352.84'
IE (S)=352.56'

4. SANITARY SEWER MANHOLE
RIM=360.51'

5. SANITARY SEWER MANHOLE
RIM=360.57'

6. SANITARY SEWER MANHOLE
RIM=360.99'

7. SANITARY SEWER MANHOLE
RIM=360.87'

8. SANITARY SEWER MANHOLE
RIM=362.82'
IE (W)=345.05'
IE (N)=345.00'

9. SANITARY SEWER MANHOLE
RIM=362.02'

10. SANITARY SEWER MANHOLE
RIM=350.93'
IE (S)=341.99'
IE (N)=341.06'

11. SANITARY SEWER MANHOLE
RIM=344.44'
IE 8" PVC STUB? (W)=334.66'
IE 24" CONC IN (S)=333.86'
IE 24" CONC OUT (N)=333.10'

12. SANITARY SEWER MANHOLE
RIM=350.42'
IE 24" CONC IN (S)=329.68'
IE 24" CONC OUT (N)

13. SANITARY SEWER MANHOLE
RIM=363.83'
IE (W)=360.63'
IE (S)=360.39'

STORM DRAINAGE DATA

1. STORM DRAIN MANHOLE
FILTERA SYSTEM
RIM=366.06'
IE 12" CPP IN (S)=359.91'
IE 10" CPP IN (SE)=359.89'
IE 18" CPP IN (W)=359.75'
IE 18" CPP OUT (N)=359.67'
SUMP=356.03'

2. STORM DRAIN MANHOLE
FILTERA SYSTEM
RIM=365.99'
IE 18" CPP IN (W)=359.70'
IE 18" CPP OUT (N)=359.66'
PIPES TURNED DOWN TO S & E
SUMP=356.37'

3. STORM DRAIN MANHOLE
RIM=365.85'
IE 18" CPP IN (W)=356.33'
IE 8/10" CPP IN (S)=356.27'
IE 18" CPP OUT (E)=356.21'

4. CONTECH MANHOLE
RIM=365.41'
FILTERA SYSTEM

5. CONTECH MANHOLE
RIM=365.36'
FILTERA SYSTEM

6. STORM DRAIN MANHOLE
RIM=363.82'
IE 18" CPP IN (W)=356.10'
IE 18" CPP OUT (S)=356.00'

7. STORM TRAPPED INLET
RIM=363.55'
TRAPPED INLET (N)
IE 4" IP (S)=362.30'
SUMP=359.88'

8. STORM AREA DRAIN
RIM=363.42'

9. CONTECH MANHOLE/CATCH BASIN
FILTERA SYSTEM
RIM=361.24'

10. CATCH BASIN
RIM=362.56'

11. STORM DRAIN MANHOLE
RIM=361.85'
IE 18" CPP IN (N)=355.75'
IE 18" CPP OUT (E)=355.55'

12. CATCH BASIN
RIM=361.35'

13. CATCH BASIN
RIM=360.17'

14. CATCH BASIN
RIM=360.15'

15. CATCH BASIN
RIM=359.82'
IE 4" IN (W)=359.10'
IE 4" IN (E)=358.96'
IE 10" OUT (E)=358.36'

16. STORM DRAIN MANHOLE
RIM=360.68'
IE 18" IN (W)=354.55'
IE 18" OUT (E)=354.50'

17. CATCH BASIN
RIM=359.88'
IE 4" IN (W)=358.98'
IE 10" IN (E)=358.14'
IE 10" OUT (W)=358.03'

18. CATCH BASIN
RIM=359.46'

19. CATCH BASIN
RIM=359.68'

20. CATCH BASIN
RIM=359.91'

21. STORM DRAIN MANHOLE
RIM=360.47'
IE 18" IN (E)=353.77'
IE 18" OUT (W)=353.69'

22. CATCH BASIN
RIM=360.17'

23. STORM DRAIN MANHOLE
RIM=359.66'

24. STORM DRAIN MANHOLE
RIM=361.66'

25. STORM DRAIN MANHOLE
RIM=360.48'
IE 18" IN (W)=352.66'
IE 30" (N)=352.16'
IE 30" (S)=352.16'

26. CATCH BASIN
RIM=343.40'
IE 12" IP (W)=341.65'
SUMP=340.70'

27. STORM DRAIN MANHOLE
OVERSIZED LID
FILTERA SYSTEM
RIM=344.77'
IE 6" PVC IN (W)=337.70'
IE 6" PVC IN (S)=337.70'
PIPE TURNED DOWN TO N
SUMP=333.43'

28. CATCH BASIN
RIM=344.44'
IE 12" PVC (S)=341.92'
SUMP=341.44'

29. STORM DRAIN MANHOLE
RIM=344.92'
IE 18" PVC IN (S)=336.10'
IE 12" PVC IN (SW)=336.00'
IE 36" CONC OUT (E)=335.87'

30. STORM DRAIN MANHOLE
RIM=344.09'
IE 18" PVC IN (S)=336.29'
IE 36" CONC IN (W)=335.69'
IE 36" CONC OUT (E)=335.65'

31. STORM DRAIN MANHOLE
OVERSIZED LID
RIM=346.89'
IE 14" PVC IN (W)=341.99'
IE 16" PVC OUT (S) TURNED DOWN,
CANNOT DIP
SUMP=337.96'

32. CATCH BASIN
RIM=347.47'
IE 14" PVC IN (W)=343.15'
IE 14" PVC OUT (E)=342.91'
SUMP=341.92'

33. CATCH BASIN
RIM=349.45'
IE 14" PVC IN (W)=345.25'
IE 14" PVC OUT (E)=345.05'
SUMP=344.20'

34. CATCH BASIN
RIM=352.46'
IE 12" PVC IN (W)=348.45'
IE 14" PVC OUT (E)=348.10'
SUMP=347.29'

35. CATCH BASIN
RIM=355.38'
IE 12" PVC IN (W)=351.44'
IE 12" PVC OUT (E)=351.21'
SUMP=350.38'

36. CATCH BASIN
RIM=358.66'
IE 12" PVC IN (W)=354.61'
IE 12" PVC OUT (E)=354.48'
SUMP=353.70'

37. CATCH BASIN
RIM=362.12'
IE 12" PVC IN (W)=358.08'
IE 12" PVC OUT (E)=357.95'
SUMP=356.97'

38. CATCH BASIN
RIM=365.23'
IE 12" PVC (N)=361.08'
SUMP=360.18'

39. CATCH BASIN
RIM=365.35'
IE 12" PVC IN (W)=361.20'
IE 12" PVC OUT (E)=361.00'
SUMP=360.15'

40. CATCH BASIN
RIM=365.52'
IE 12" PVC OUT (E)= 361.50'
SUMP FULL OF DEBRIS

REV	DATE	DESCRIPTION	BY
		REVISIONS	

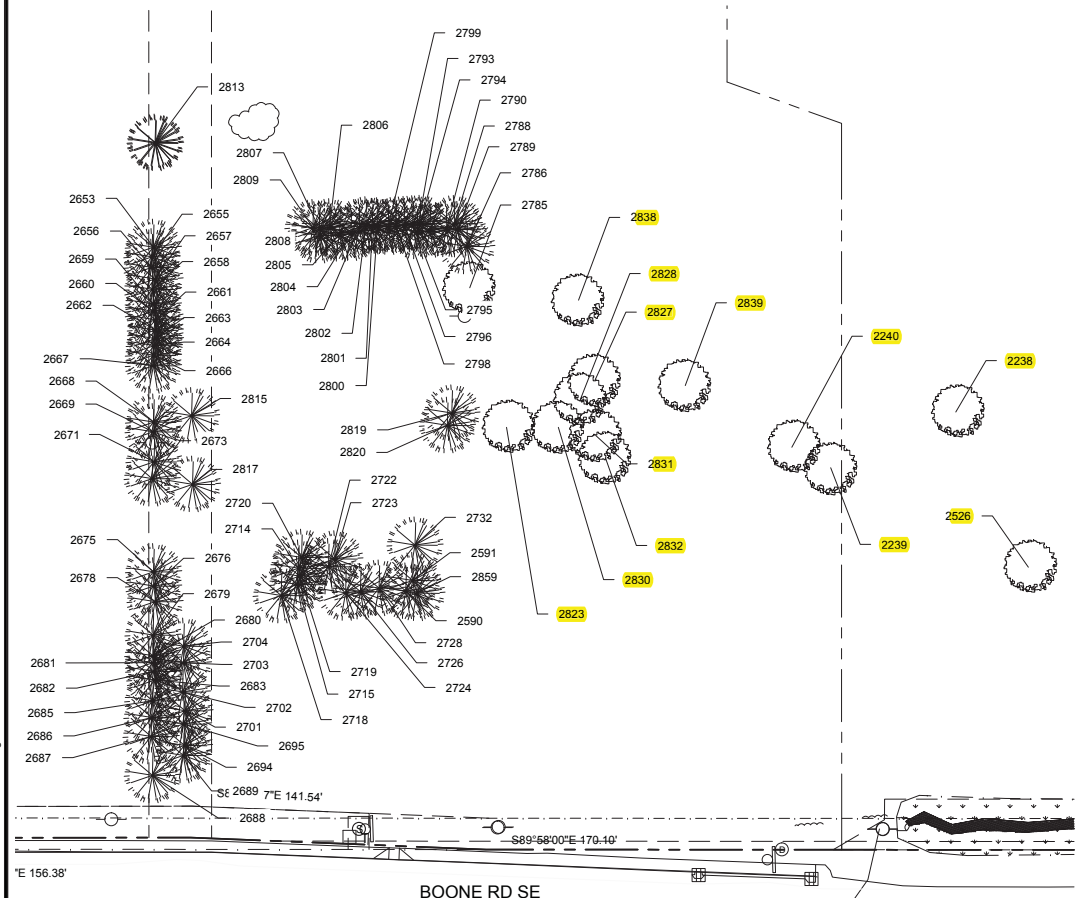
DOWL
WWW.DOWL.COM
720 SW Washington Street, #750
Portland, Oregon 97205
971-280-8641

PREPARED FOR
COSTCO WHOLESALE
COSTCO WHOLESALE CORPORATION
999 LAKE DRIVE
ISSAQUAH, WA 98027
TEL: (425) 313-8100

KUEBLER GATEWAY
SHOPPING CENTER
SITE PLAN REVIEW SET
EXISTING STRUCTURES
SE BOONE RD. AND 27TH AVE.
SALEM, OREGON, 97306

PROJECT	14429-01
DATE	05/04/2018

SHEET
C101



EXISTING TREE TABLE

POINT NUMBER	TREE TYPE	CALIPER
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2239	WHITE OAK	34
2240	WHITE OAK	44
2526	WHITE OAK	28
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2590	DOUGLAS-FIR	22
2591	DOUGLAS-FIR	16
2653	BLACK PINE	15
2655	BLACK PINE	12
2656	BLACK PINE	19
2657	BLACK PINE	16
2658	BLACK PINE	12
2659	PONDERSONA PINE	15
2660	BLACK PINE	14
2661	BLACK PINE	12
2662	BLACK PINE	16
2663	BLACK PINE	8
2664	BLACK PINE	10
2666	PONDERSONA PINE	18
2667	BLACK PINE	13
2668	PONDERSONA PINE	10
2669	PONDERSONA PINE	14
2671	DOUGLAS-FIR	15
2673	DOUGLAS-FIR	20
2675	DOUGLAS-FIR	24
2676	DOUGLAS-FIR	12
2678	DOUGLAS-FIR	19
2678	DOUGLAS-FIR	19
2679	DEAD	
2680	BLACK PINE	7
2681	PONDERSONA PINE	12
2682	DEAD	
2683	PONDERSONA PINE	22
2685	PONDERSONA PINE	19
2686	PONDERSONA PINE	13
2687	PONDERSONA PINE	16
2688	PONDERSONA PINE	14
2689	PONDERSONA PINE	21
2694	BLACK PINE	20
2695	BLACK PINE	15
2701	BLACK PINE	16

POINT NUMBER	TREE TYPE	CALIPER
2723	DOUGLAS-FIR	21
2724	GRAND FIR	25
2726	DOUGLAS-FIR	14
2728	DOUGLAS-FIR	21
2732	DOUGLAS-FIR	19
2785	ELM	12
2786	DOUGLAS-FIR	17
2788	DOUGLAS-FIR	14
2789	DOUGLAS-FIR	15
2790	DOUGLAS-FIR	12
2791	DOUGLAS-FIR	13
2793	DOUGLAS-FIR	9
2794	DOUGLAS-FIR	8
2795	DOUGLAS-FIR	13
2796	DOUGLAS-FIR	18
2798	DOUGLAS-FIR	7
2799	DOUGLAS-FIR	16
2800	DOUGLAS-FIR	14
2801	DOUGLAS-FIR	12
2802	DOUGLAS-FIR	14
2803	DOUGLAS-FIR	16
2804	DOUGLAS-FIR	8
2805	DOUGLAS-FIR	16
2806	DOUGLAS-FIR	17
2807	DOUGLAS-FIR	9
2808	DOUGLAS-FIR	21
2809	DOUGLAS-FIR	22
2813	DOUGLAS-FIR	26
2815	LONDON PLANETREE	26
2817	WESTERN REDCEDER	25
2819	BLACK PINE	21
2820	BLACK PINE	18
2823	WHITE OAK	51
2827	WHITE OAK	20
2828	WHITE OAK	18
2830	WHITE OAK	17
2831	WHITE OAK	12
2832	WHITE OAK	29
2838	WHITE OAK	30
2839	WHITE OAK	28

IE (N)=345.00'

(9) SANITARY SEWER MANHOLE
RIM=362.02'

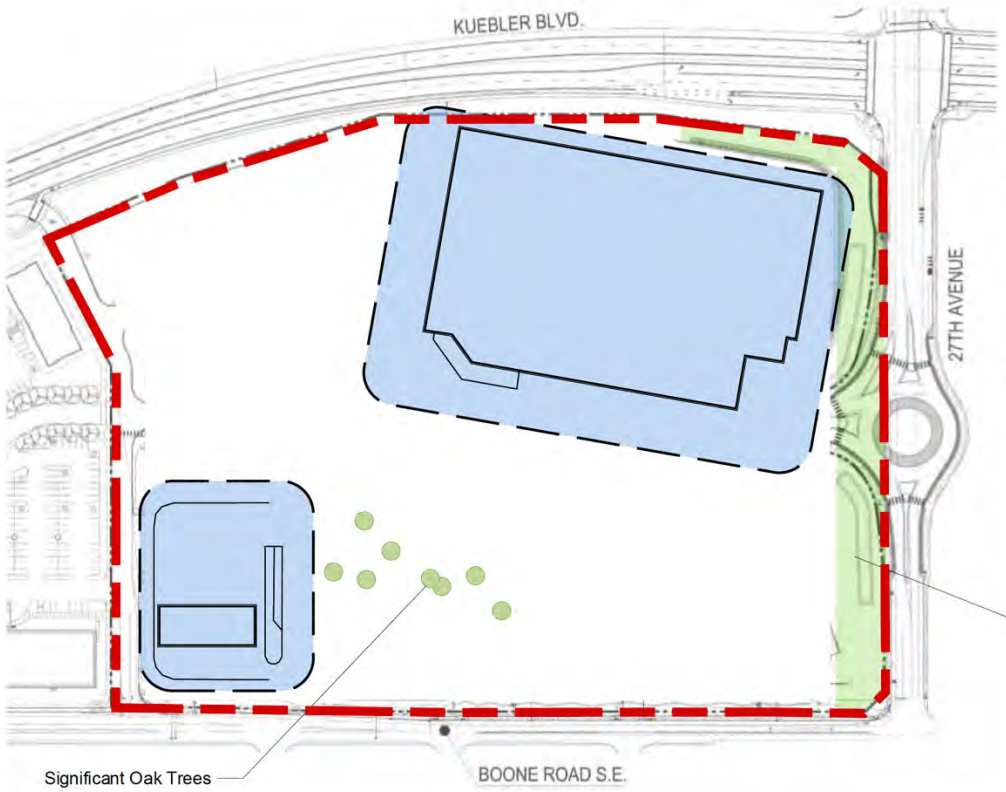
(10) SANITARY SEWER MANHOLE
RIM=350.93'
IE (S)=341.99'
IE (N)=341.06'

(11) SANITARY SEWER MANHOLE
RIM=344.44'
IE 8" PVC STUB? (W)=334.66'
IE 24" CONC IN (S)=333.86'
IE 24" CONC OUT (N)=333.10'

(12) SANITARY SEWER MANHOLE
RIM=350.42'
IE 24" CONC IN (S)=329.68'
IE 24" CONC OUT (N)

(13) SANITARY SEWER MANHOLE
RIM=363.83'
IE (W)=360.63'
IE (S)=360.39'

COSTCO SOUTH SALEM: WHITE OAKS PROTECTION: DENY CURRENT SITE PLAN



Pros:

1 Oak trees might be able to be retained but will reduce the number of parking stalls.

2 The Costco development integrates with the adjacent development to the west.

Cons:

1 Site access from 27th Ave roundabout impacted - conflicts with Costco Receiving Area.

2 Site access encourages use of residential street to the south.

3 Costco building mass does not act as noise buffer to neighborhood.

4 Back of warehouse oriented toward commercial street - screening entry from view.

5 Fuel facility directly adjacent to residential neighborhood.

6 Costco Receiving area directly oriented toward residential.

7 Warehouse siting creates inefficient parking layout - reducing stall count.

MG2

Costco Wholesale
Salem, OR

Site Plan Option for Tree Retention **NE Option**

MG2 Project: 17-0413-01A
Project Manager: S Bullock
Date: August 9, 2018

THIS SITE PLAN, FROM THE APPLICANT, SHOWS HOW THE SIGNIFICANT OAK TREES CAN INDEED BE PROTECTED AND RETAINED, AND THE NEW BUILDINGS ARE SHOWN SITED SO AS TO SAVE THE TREES.

COSTCO SOUTH SALEM: WHITE OAKS PROTECTION: DENY CURRENT SITE PLAN

Pros:

1 Oak trees might be able to be retained but will reduce the number of parking stalls.
2 The Costco development integrates with the adjacent development to the west.
3 Site layout allows for most access to avoid residential street to the south. However, since the store faces south, a fair number of trips will likely access from the south.

Cons:

1 Warehouse Receiving area directly oriented toward residential neighborhood.
2 Sound and light impacts from the parking lot, fuel facility and loading dock on the adjacent residential neighborhood.
3 Costco building mass does not act as noise buffer to neighborhood.
4 Back of warehouse oriented toward commercial street – screening entry from view.
5 Fuel Facility directly adjacent to residential neighborhood.
6 The Costco development somewhat turns away from the adjacent development to the west.
7 Left turn into fuel facility congested
8 Warehouse siting creates inefficient parking layout – reducing stall count.

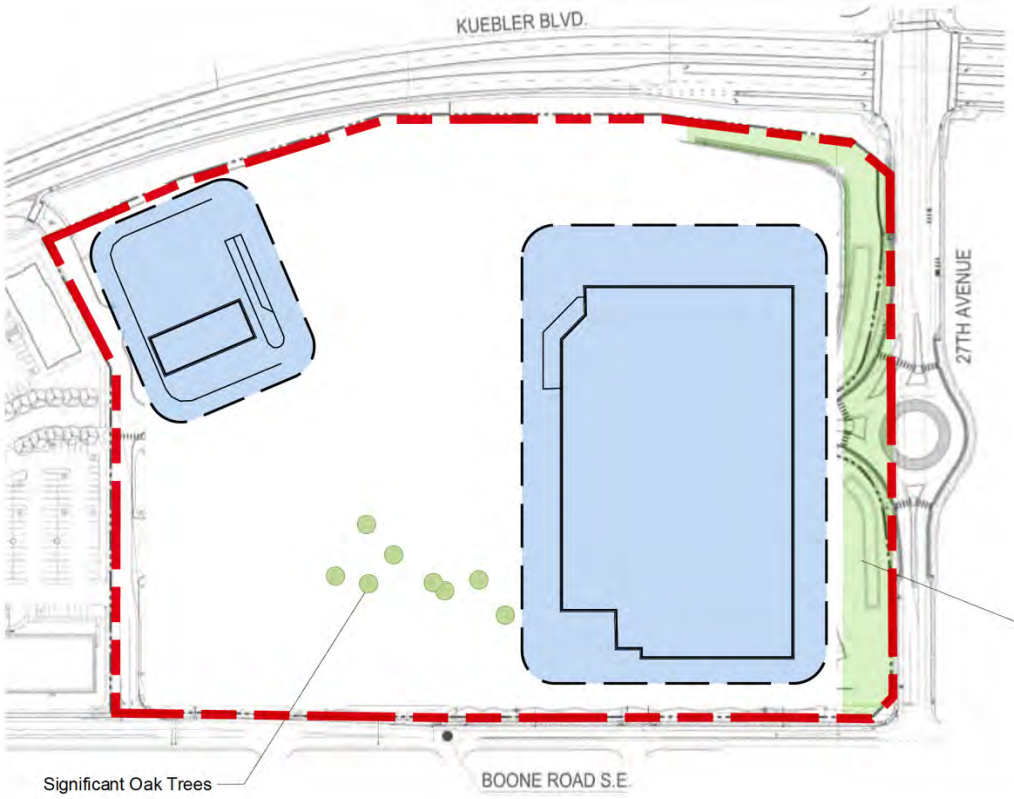
MG2

Costco Wholesale
Salem, OR
Site Plan Option for Tree Retention **NW Option**

MG2 Project: 17-0413-01A
Project Manager: S Bullock
Date: August 9, 2018

ANOTHER SITE PLAN, FROM THE APPLICANT, SHOWS HOW THE SIGNIFICANT OAK TREES CAN AGAIN BE PROTECTED AND RETAINED, AND THE NEW BUILDINGS ARE ONCE AGAIN SITED SO AS TO SAVE THE TREES.

COSTCO SOUTH SALEM: WHITE OAKS PROTECTION: DENY CURRENT SITE PLAN



Pros:

1 Oak trees might be able to be retained. Some will have to be removed to accommodate the loading dock.
2 Fuel facility located on Kuebler Blvd.
3 Costco entry more prominently faces Kuebler.
4 Costco improvements oriented towards Kuebler, the more commercial street.

Cons:

1 Site access from 27th Ave. roundabout lost.
2 Primary site access will be from residential street to the south.
3 Costco building mass does not act as noise buffer to neighborhood.
4 Loading docks directly adjacent to residential.
5 Fuel Facility operations oriented toward residential.
6 Connection with the development to the west is lost.
7 Primary parking area adjacent to existing residential
8 Warehouse siting creates inefficient parking layout-reducing stall count.
9 Tree retention impacts parking.

MG2

Costco Wholesale
Salem, OR

Site Plan Option for Tree Retention **SE Option 2**

MG2 Project: 17-0413-01A
Project Manager: S Bullock
Date: August 9, 2018

A THIRD ALTERNATIVE SITE PLAN, FROM THE APPLICANT, SHOWS HOW THE SIGNIFICANT OAK TREES CAN BE PROTECTED AND RETAINED, AND THE NEW BUILDINGS ARE ONCE AGAIN SITED SO AS TO SAVE THE TREES.

Air Quality, Noise Analysis, and Odor Analysis Conducted for the Proposed Costco Gas Station in Wheaton, MD

Prepared by:
Sullivan Environmental Consulting, Inc.
1900 Elkin Street, Suite 200
Alexandria, VA 22308

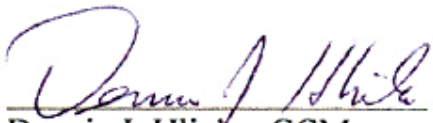
Prepared for:
Costco Wholesale
45940 Horseshoe Drive, Suite 150
Sterling, VA 20166

November 19, 2012

Approval Signatures:

11/19/2012

David A. Sullivan, CCM — Date
Sullivan Environmental Consulting, Inc.



11/19/2012

Dennis J. Hlinka, CCM — Date
Senior Meteorologist

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Executive Summary

Subsequent to the previous report submitted in July 2012, Costco representatives have met with the technical consultant for Kensington Heights (Dr. Henry Cole), with the objective of seeking consensus on the modeling methods to be used for the final analysis of the Costco gas station and associated operations. Based on this meeting, Costco developed a modeling protocol, which was subsequently reviewed by Dr. Cole. Based on Dr. Cole's comments, the protocol was refined. Dr. Cole's suggestions were incorporated into the modeling methods for the Costco sources. To the best of our understanding, consensus has been generally achieved on how to model the Costco sources to estimate air quality concentrations. As will be subsequently noted in this document, this does not mean there is consensus on the interpretation of the results, nor is this necessary as part of a modeling protocol. There is now at least a more common framework to compute expected concentrations from Costco operations, from which different analysts can draw their own conclusions.

In addition to incorporating Dr. Cole's comments into the protocol, Costco representatives have taken further steps beyond his suggested changes to ensure that the modeling conservatively (overstates) expected concentrations, including:

- Emissions associated with queuing sources were increased by a factor of 2.5.

- Shorter, more compressed queue lengths were used for queues at the gas station where averaging times were greater than 1 hour. The 40 car maximum was used for 1-hour assessment, 20 cars for all 8-hour assessment, and 10 cars for all annual/24 hour assessments. This change acted to increase the conservatism for the queue sources at the gas station for the 8-hour, 24-hour, and annual average concentrations.

- The processing of the meteorological data was done using a surface roughness value (0.021 cm, which is applicable to Reagan National Airport (location of the meteorological data used in the model)); this change approximately doubled the modeled concentrations as compared to using a roughness value more directly applicable to the modeling domain (0.85 cm). Per EPA guidance documents, it is necessary to use surface

roughness values of the meteorological station being used in the model and not the site location roughness value (U.S. EPA, 2003).

Summary of Results - Sullivan Environmental Consulting, Inc. conducted a detailed dispersion modeling evaluation of the proposed Costco gas station to be located in Wheaton, Maryland. This modeling was conducted based on the 12 million gallons/year annual gasoline throughput at the proposed gasoline station, the number of idling cars waiting to pump gas, truck deliveries for the Costco warehouse, Costco parking lot and parking garage, roadway emissions along the mall Ring Road, and roadway emissions from the most significant adjacent roadways / intersections. The analysis also considered the filling of the underground storage tanks (Stage 1 emissions), tank vent breathing losses, emissions associated with dispensing of the gasoline into vehicles and spillage (Stage 2 emissions). For the analysis of the National Ambient Air Quality Standards (NAAQS), all of the preceding sources were considered along with background concentrations for each pollutant (where applicable) to conservatively account for impacts from all other sources. The incremental impacts from the Costco gas station, and the sources associated with the gas station, were the basis for the risk assessment that also was conducted.

One of the differences between the July 2, 2012 report and this current update is the change in the location of the gas station, which was moved further east of the previous site in order to provide a 300 foot buffer to the Kenmont Swim and Tennis facility. This update also includes more refined consideration of the building specifications for the Costco warehouse, which will be sufficiently close to the gas station to create building downwash effects that were considered within the model in terms of enhanced dilution.

The model study results show that all applicable air quality standards will be met by a large margin of safety for all pollutants emitted in significant quantities. The modeling results of the combined impacts, as described above, are shown to be well below the standards as established by the U.S. Environmental Protection Agency to be protective of public health and welfare with a reasonable margin of safety. Review of VOC modeled concentrations, with apportionment into specific volatile compounds (EPA, 1988 & 1990), showed incremental risks to be low, and to be well below California action levels for risk assessment (there are not any applicable Federal standards or guidelines for risk assessment relative to the operation of this source).

Overview of Technical Approach - This report summarizes air quality, noise, and odor issues associated with the proposed operation of the Costco gas station in Wheaton, Maryland. The air quality modeling analysis is based on EPA standard emission factors and the state-of-the-art U.S. EPA approved AERMOD dispersion model, following EPA recommended options. The AERMOD model is specifically designed and recommended by EPA to address the simple, rolling terrain features such as those surrounding the proposed Costco station and for this small scale of analysis.

Concentrations were assessed and compared to the National Ambient Air Quality Standards (NAAQS) for 2nd high 1-hour CO, 2nd high 8-hour CO, 98th percentile 3-year (175th highest) 1-hour NO_2, annual average NO_2, 98th percentile (8th highest) 24-hour $PM_{2.5}$, and annual average $PM_{2.5}$. Specific attention was provided for a nearby school and pool in regards to both predicted concentrations relative to NAAQS and volatile organic compound (VOC) cancer risk. The results show that no EPA standards or guidelines will be threatened or exceeded by air quality impacts from Costco operations. Using this site-specific detailed modeling approach, incremental VOC risks were estimated at the school and pool considering potential occupancy relative to life-time exposure concentrations.

Estimated cancer risks were computed using 70 year mobile source emissions for very conservative assumptions (Scenario 1) and more realistic emissions assumptions (Scenario 2). The results show low risk levels at the closest residential areas: rural dispersion assumptions (1.7 to 1.3 in a million) and urban dispersion assumptions (0.6 to 0.8 in a million). The most representative risk estimates at the closest residential area are likely between the urban and rural values, i.e. ~ 1 in a million, as explained further subsequently in the report. The highest risks at the school and pool were less than 1 in a million.

The risk estimates were calculated using conservative assumptions that a child would spend every day that the pool was open for the year (75 days), 8 hours a day for 18 years of their lives, which also would be conservative for a lifeguard working at the pool, if that employee worked every day the pool was operational for 18 years. Similarly, assumptions were made for the school where estimations were made for a child attending school 180 days of the year, 7 hours a day, for 18 years of their lives. This assumption is based on the typical school hours of Stephen

Knolls School based on review of the school calendar and verbal communication with a staff member (Verbal Communication, April 30, 2012).

Noise - The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) was run for the incremental Wheaton gas station sources showing the noise levels at the nearby properties, including back yard properties. The modeled traffic areas included the gas station queue sources (vehicles waiting in line), the Costco parking lots, and background noise levels. This modeling accounted for terrain and acoustic wall effects as well. Overall, the noise contour plots, with measured Sterling data included for perspective, show results that are all far below applicable county noise level standards of 65 dBA, (decibels) especially when considering the fact that Sterling's gasoline throughput is estimated to be 30 percent higher than the expected sales at the proposed Costco gas station. Appendix X provides the updated noise analysis.

Odor - In addition, the report documents odor conditions at the existing Costco gas station in Sterling, Virginia compared to background odor levels in Wheaton. Based on an odor panel review of both sets of air samples, and further corroboration based on field instrumentation (a field olfactometer), it was found that at a distance of approximately 260 feet downwind of the Sterling gas station canopy, the odors were near neutral on a scale of -10 (unpleasant) to +10 (pleasant). At two dilutions, odors were not observed at approximately 260 feet (80 m). Based on odor panel review of samples from the Costco gas station in Sterling and in the Kensington Heights, Maryland community, it was found that the odor characteristics were similar, as shown in the odor section[1]. Plots of the model predicted dilution ratios[2] for the Wheaton site showed relatively large (1:7and 1:8) dilution values for 1-hour and even larger (1:50 and 1:30 dilution) for annual time periods at the 300 foot distance compared to predicted concentrations taken in close proximity to the gas station fuel dispensing area.

[1] An odor panel is a trained group of technicians that evaluate the odor characteristics of bagged air samples for characteristics and intensity.

[2] A dilution value of 1:2, for example, means that the air has had a 2-fold dilution in concentration compared to the reference location.

Use of Measured Data for Corroboration of Modeled Results - The primary air quality and noise analyses were based on modeling, which is standard practice. Monitoring of the Costco Sterling facility was conducted to further corroborate the modeling results. The following should be considered for perspective when reviewing the confirmatory results:

- The Costco Sterling gas station is expected to sell 30 percent more fuel than in Wheaton, which serves as a conservative representation of the Wheaton facility.

- The air quality, odor and noise samples were collected at a comparable type of source (Costco Sterling gas station), and in the same general region to help demonstrate the general magnitude of model performance relative to real-world data.

- Due to noted terrain / land use differences, odor, air quality and noise samples collected at the Costco Sterling gas station will tend to be a conservative representation of Wheaton. For odor and air quality, there would be some, although relatively small, additional dilution of the plumes from the gas station sources with flow towards the nearby residential areas. The enhanced dilution would be from the tree cover along those transects (which are not specifically accounted in the modeling), and also attributed under some conditions to the drop in terrain from the proposed Wheaton facility in comparison to the residential areas, which could generate some (relatively minor) additional dilution not considered by the modeling. In other words, the air quality and odor impacts at the residential areas in Wheaton, if different, would be expected to be lower than at the Costco Sterling gas station. Similarly, the noise modeling at Sterling was on a relatively flat ground without a line of sight break that occurs at the residential areas in Wheaton. The line of site break reduces noise impacts by 5 dBA (decibels) per the Montgomery County Parks and Planning noise guidelines, which is accounted for in the modeling but not in the directly measured noise data at the Costco gas station in Sterling, Virginia.

Areas Where Different Interpretation of the Modeled Data Can be Anticipated - There are areas associated with the interpretation of the modeled results where it can be anticipated that the Kensington Heights Civic Association and their consultant may draw different interpretations of the results. The following provides perspective to help guide further discussions:

Comprehensive consideration of sources other than Costco – We have modeled all Costco gas station sources (filling of underground tanks, vent emissions, fueling operations of vehicles, minor drips, major spills (defined as more than 1 gallon of fuel spilled), queuing at the gas station, traffic into and out of the queues), the Costco parking lot to the West, the Costco parking garage to the East, the Costco loading dock, traffic along the Ring Road of the mall, all major adjacent roadways and intersections (Georgia Avenue, University Blvd, Veirs Mill Road, and others). For the evaluation of the National Ambient Air Quality Standards the cumulative impacts from all of these sources is then added to the maximum concentrations for each pollutant and applicable averaging time that was measured in Montgomery County over the past three years.

This scope of analysis is extremely broad for modeling a gas station. The approach to account for sources beyond the facility is consistent with standard EPA modeling methods. Finally, the modeling analysis is very conservative with the inclusion of the maximum measured air quality data in the County as a conservative surrogate to account for all other sources. In terms of risk assessment, it is the policy of the EPA and state agencies to conduct incremental risk assessment as we have done (U.S. EPA, 2012; CAPCOA, 1997). It is not possible, nor necessary, to attempt to do a comprehensive cancer risk assessment explicitly considering all sources that could contribute to risk, which would include all sources within the County and beyond, indoor air quality contributions, as well as inputs from diet, drinking water sources, etc. Furthermore, it is well beyond the state-of-the-art to consider synergistic and antagonistic effects, which is the reason this is not done in applied risk assessments. With the possible exception of perhaps some locations in California, it is unlikely that any gas station in the U.S. has been evaluated as extensively as this proposed facility.

Gravity Flow / Special Case Wind Flows – Dr. Cole has hypothesized that cold air drainage on nights with inversion conditions / light winds could produce wind flow that could preferentially transport emissions from the gas station towards the community and the school. We agree that in some circumstances, gravity flows can alter wind flow. In this application, however, if any such flow were to occur it would be deflected away from the adjacent Kensington Heights community by an 8 foot acoustic wall. When the wall opens up east of the Costco loading dock, the flow is generally down the Ring Road to the east. Dr. Cole has hypothesized that this flow could be directed towards the school. On further review, the following factors make it clear that such a result is highly unlikely for the following reasons:

- Gravity flow is a nocturnal event, and can set up near sunset, and dissipate near sunrise. The school schedule is 8:55 A.M. through 3:10 P.M, i.e. school is not in session when there is a significant potential for this condition to occur.

- The roadway near the Stephen Knolls School slopes away from the school, i.e. towards the north. If gravity flows were to occur they would not be directed up-terrain towards the school.

- In the unlikely event that the gravity flow were to go to the south (in the general direction of the school), there is low terrain a few hundred feet west of the school that would receive such flow on a preferential basis, rather than the school.

Ultrafine Particulates – Dr. Cole has mentioned on several occasions that ultrafine particulates are a cause for concern. The U.S. Environmental Protection Agency (EPA) does not currently regulate ultrafine particulates. It is unlikely that ultrafine particulates emitted from the operations at the proposed gas station will create concentrations that are high relative to general background concentrations, or concentrations of concern, for the following reasons:

- $PM_{2.5}$ (fine particulate) impacts from the Costco gas station operations are very low. The total incremental impacts from the Costco gas station operations had a maximum residential long-term average of $0.01 \mu g/m^3$. For perspective, the current fine particulate

standard is 15 $\mu g/m^3$, which may be reduced by EPA down to 12 $\mu g/m^3$. Fine particulate impacts from other roadways at Stephen Knolls School for example are 0.18 $\mu g/m^3$ compared to 0.009 $\mu g/m^3$, i.e. 20 times higher than the proposed Costco gas station operations. Even if all Costco (including the warehouse), the maximum fine particulate ($PM_{2.5}$) impacts are 0.03$\mu g/m^3$.

- The most significant concern with regards to ultrafine particulates if they will be regulated in the future would be near major roadways, and not in association with gas stations. As shown in the modeling, any potential risks from ultrafine particulates would be higher from major nearby roadways at Stephen Knolls School than the minor contributions from the Costco gas station or warehouse operations.

- The concerns that have been expressed about diesels and ultrafine particulates do not distinguish between the new clean diesel technology that will be employed by the Costco heavy duty diesel trucks (including the four gasoline delivery trucks per day) and old diesel technology. New diesels emit on the order of 30 times lower mass of fine particulates and a less toxic mixture of pollutants than older technology diesels. As an example, looking at the incremental impacts from the Costco gas station, which is the subject of the Special Exception hearing, four clean diesel trucks per day are not going to create elevated levels of ultrafine particulates as compared to general background for nearby and regional mobile sources. It should also be noted that diesel fuel will not be sold at the proposed Costco gas station.

- The incremental impacts from the Costco gas station are low, and there is no Federal or State standard from which to evaluate ultrafine particulates. Furthermore, the incremental impacts from fine particulates emitted from the Costco gas station are minor compared the general background levels from major roadways in the vicinity of the Kensington Heights community. On this basis, the relevant standard to evaluate particulate concentrations is the Federal $PM_{2.5}$ (fine particulate) standard, which is met at this location.

1.0 Air Quality Analysis: Wheaton, MD Modeling Study 2012

1.1 Overview

This task involves modeling the emissions of air pollutants from the following sources: (a) loading the underground storage tanks (UST), (b) venting of the UST, (c) dispensing gasoline, (d) gas spillage, (e) vehicles queuing to purchase gas, (f) diesel truck emissions associated with gasoline delivery and warehouse delivery[3], the Costco parking lot and parking garage, and (g) nearby roadways (based on traffic counts) which include projected traffic increase on the Ring Road associated with the Costco gas station and warehouse. The gasoline throughput was modeled as 12,000,000 gallons per year (33,000 gallons / day), although Costco's expectation is that approximately 9,000,000 gallons / year will be sold.

1.2 Model Selection

This analysis was based on the EPA-recommended AERMOD dispersion model version 12060, run with quality control of the AERMET (meteorological processor) and AERMOD analysis. AERMOD was run consistent with EPA modeling guidelines.

AERMINUTE was used in addition to the standard AERMET to process the hourly meteorological data set in combination with 1-minute resolved wind data in order to decrease the number of calms in the original hourly data for Washington National Airport (DCA). The AERMINUTE processing is an option available with the AERMET preprocessor.

In addition to these main AERMOD model runs, CALMET/CALPUFF5/CALPOST5 model runs were also used to address the concerns expressed by Dr. Cole (consultant to Kensington Heights) regarding calm or near-calm winds, terrain, and flow associated with the acoustic wall. The goal of these special case runs was to address not only terrain effects but also to simulate to the extent feasible within model limitations, the 8-foot acoustic wall along the Ring Road under these

[3] The COSTCO warehouse delivery trucks (diesel) were part of the National Ambient Air Quality Analysis review but were not applicable to the incremental risk assessment for the COSTCO gas station.

special-case conditions. The processing of both the hourly and minute-resolved surface meteorological data for DCA in CALMET used the same 2006-2010 time period as used in the AERMET processing. This CALPUFF modeling is presented in Appendix AB.

1.3 Layout of Costco Gas Station

The layout of the proposed Costco gasoline station is shown in Figures 1-1 and 1-2. It should be noted that as shown in Figure 1-1, the proposed gas station does not include repair bays, but rather is a low profile station with islands and a small structure for the attendant. There will be four islands with two pumps on each island. This results in a total of 16 fueling positions. In terms of initial dispersion, the gas station building structure is insignificant and was not included in the analysis in the form of downwash calculations. Rather, the height of a typical car was used to set the initial vertical dispersion dimension using 1.5 meters (4.9 feet)/2= 0.75 meters, which characterizes half of the vehicle height. The initial dispersion of the source was assumed to be 0.7 meters (2.3 feet), per EPA methods, i.e., initial vertical dispersion for the fueling area sources was set to 1.5 / 2.15 = 0.7 meters (2.3 feet).

Figure 1-1: Proposed Costco Gas Station

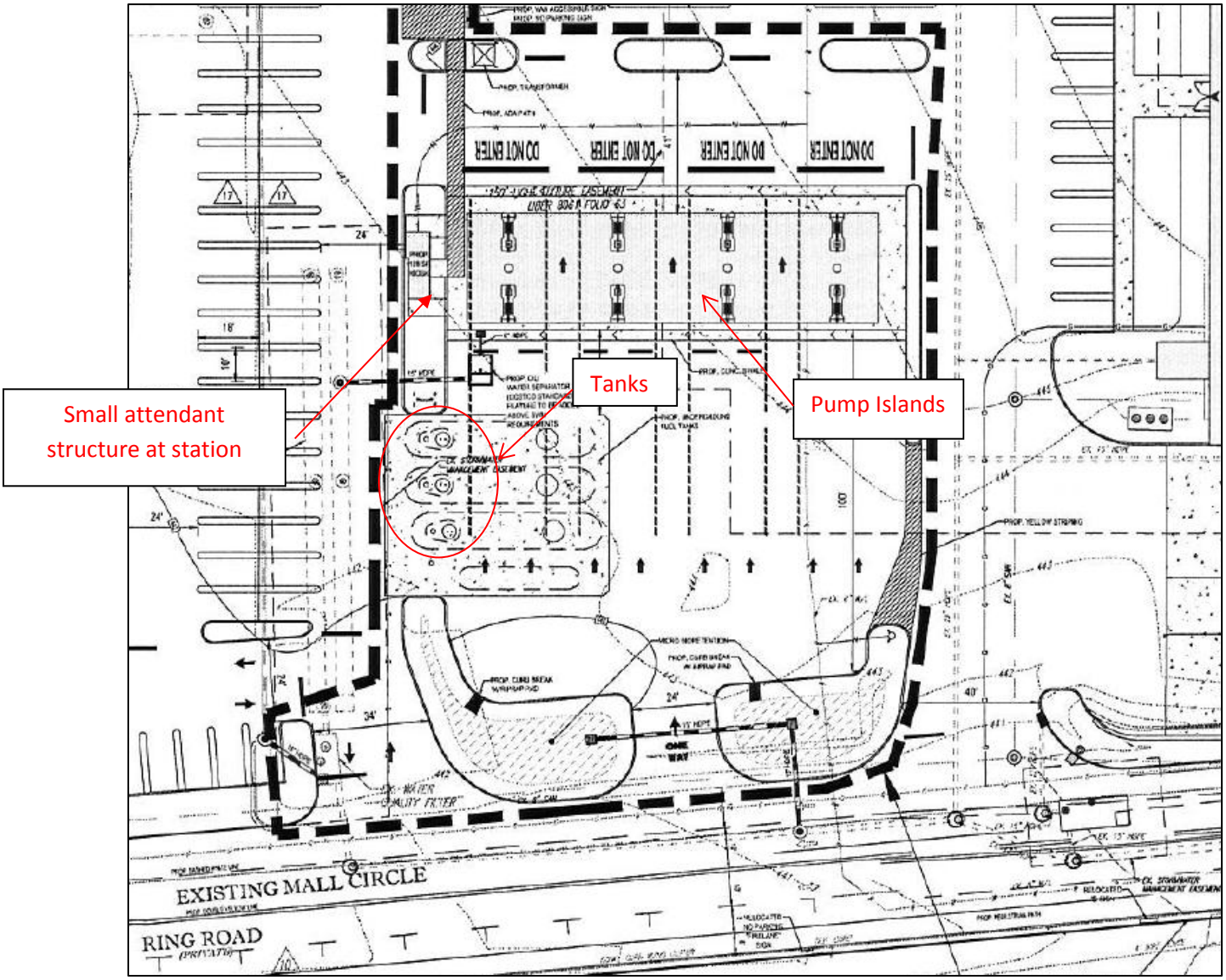
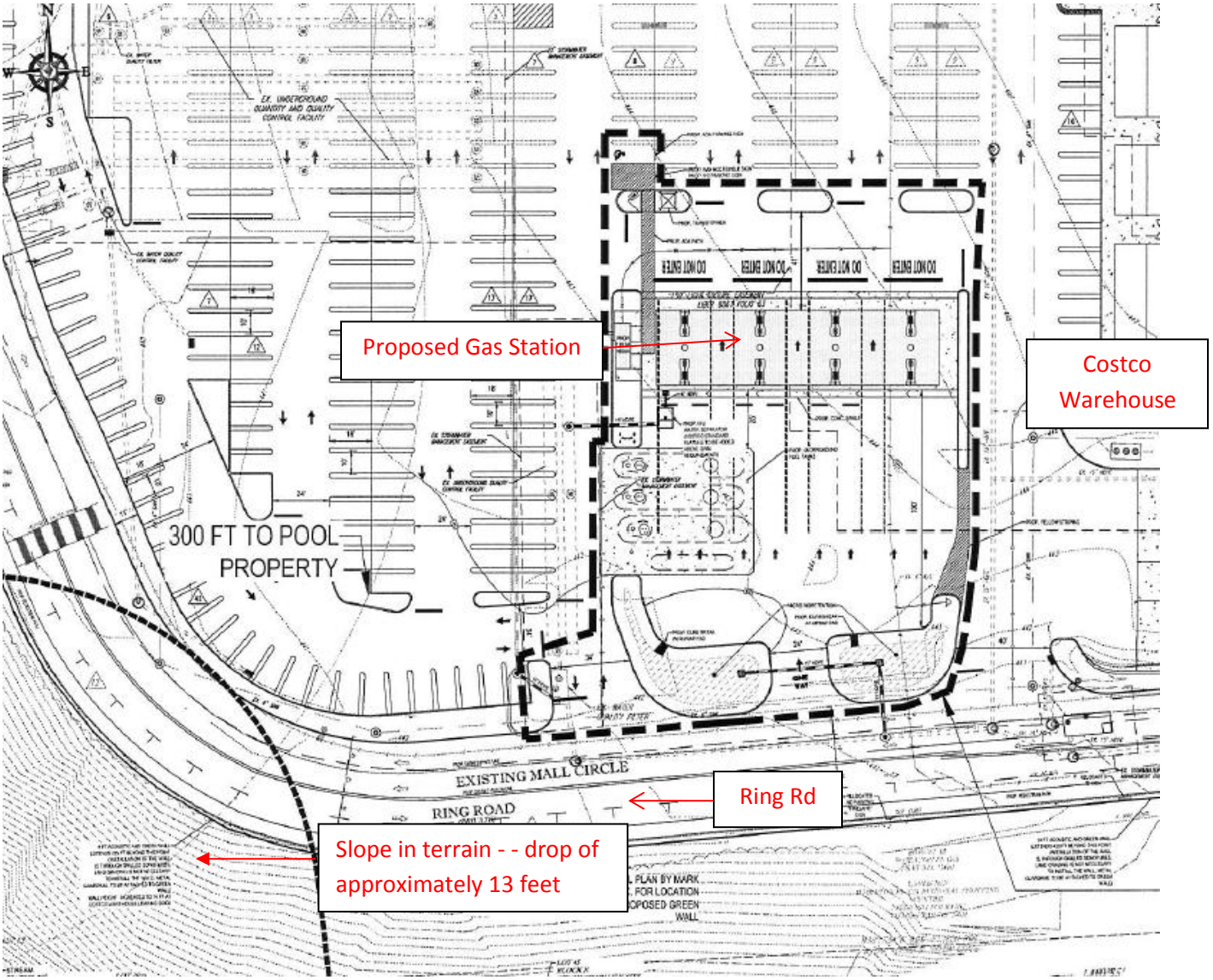


Figure 1-2: General Location of Proposed Costco Gas Station



This initial dispersion treatment at the fueling area has a minimal effect on the results on this facility.

A more significant factor associated with the relocation of the gas station further away from the Kenmont Swim & Tennis facility is that there is a greater influence of enhanced dilution from the Costco warehouse for some trajectories. The BPIP program was used within the AERMOD View user interface (Version 8.0.5) to account for enhanced dilution of emissions from the gas station operations and the loading dock area as a function of atmospheric conditions.

1.3.1 Costco Sources

A combination of AREA, AREAPOLY, VOLUME and POINT sources were created to represent gas station sources as well as nearby roadways. In addition, the following is a brief description of each source's contribution to Costco:

- Vent: Point source representing emissions with a release point located 3.81 meters high.
- Filling: Three adjacent point source locations where filling of underground storage tanks take place.
- HDDV: Point source[4] for heavy duty diesel vehicles is located near the loading docks adjacent to Costco warehouse and represented as a stack to represent exhaust pipe on vehicle.
- LDDV: Point source for light duty diesel vehicles located in the same location as HDDV with a shorter height to represent exhaust pipe.
- Fueling: Area source where vehicles are fueled.
- Spillage: Same area source location parameters as the fueling location area source; this source will represent any spillage that occurs when cars fill up with gas. The larger spills (greater than 1 gallon) as described previously also will be allocated to this area.

[4] The approach is to conservatively simplify loading dock emissions by having one centralized point source represent the heavy duty and light/medium duty diesel vehicles.

- Gas Queue: Area source displaying location where cars will line up and idle while awaiting an open gas pump. The north-south extent of the area source for queuing will be based on the assumed queue lengths applicable to the 1-hour, 8-hour, 24-hour, and annual average periods, assuming 18 feet spacing per vehicle to more accurately account for the varying sizes to this area source.

- W. Parking Lot: Parking area source to the west of Costco warehouse where cars will be driving and parking throughout the daily operation of the Costco Warehouse and gas station.

- E. Parking Garage: Parking garage located to the east of the Costco warehouse was modeled as a volume source to represent cars driving in, up and around this source. There are not any vent releases from this location because there are not any parking decks below grade and the parking areas are open to the ambient air.

- Exit East and Exit West: Two area poly sources were used to represent cars exiting the gas pump to travel to the Ring Road, half are set up to travel to the west and the other to the east and loop south to exit nearby the entrance.

- Gas Station Entrance: An area poly source was used to represent the entrance to the gas station area from the Ring Road.

- Roadways: A combination of area poly sources were used to represent area sources beyond the mall area where all roadways and queue sources, which were obtained from the Traffic Group's updated analysis of surrounding roadways (Traffic Group, 2012).

Figure 1-3 presents an aerial view of all proposed Costco related model sources, including nearby roadways and intersections. Figures 1-4 through 1-6 display the general layout of the specific POINT, AREA, AREAPOLY, and VOLUME sources associated with the Costco gasoline station and warehouse operations that are proposed to be included in the model analysis. Tables 1-1 through 1-3 summarize the source parameters for each of these proposed model sources.

Figure 1-3: Aerial View of all Proposed Costco and Roadway Sources (in red)

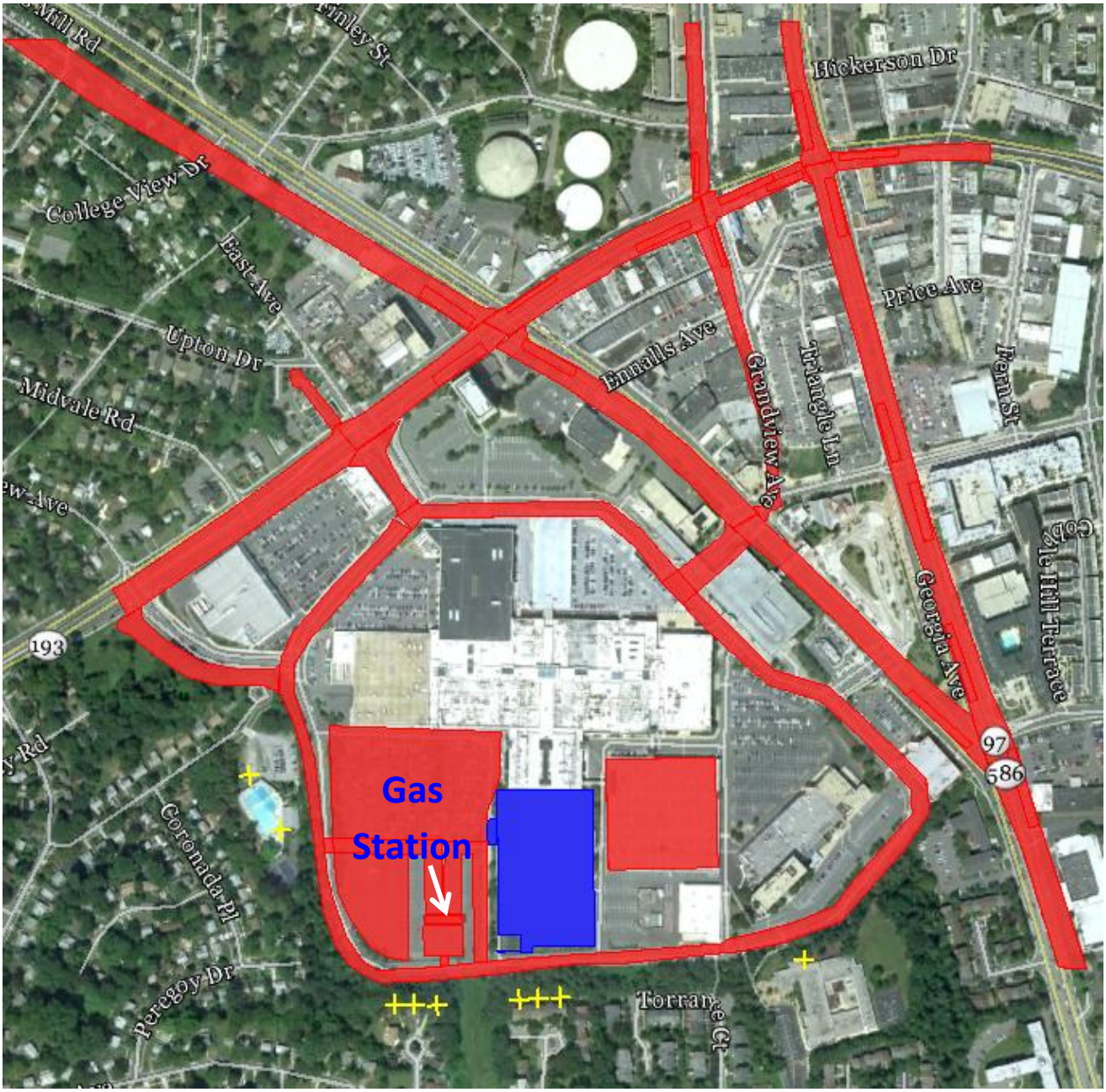


Figure 1-4: Costco Gasoline and Warehouse Point Sources (in red)

(Vent from underground tank and filling point for loading underground tank)

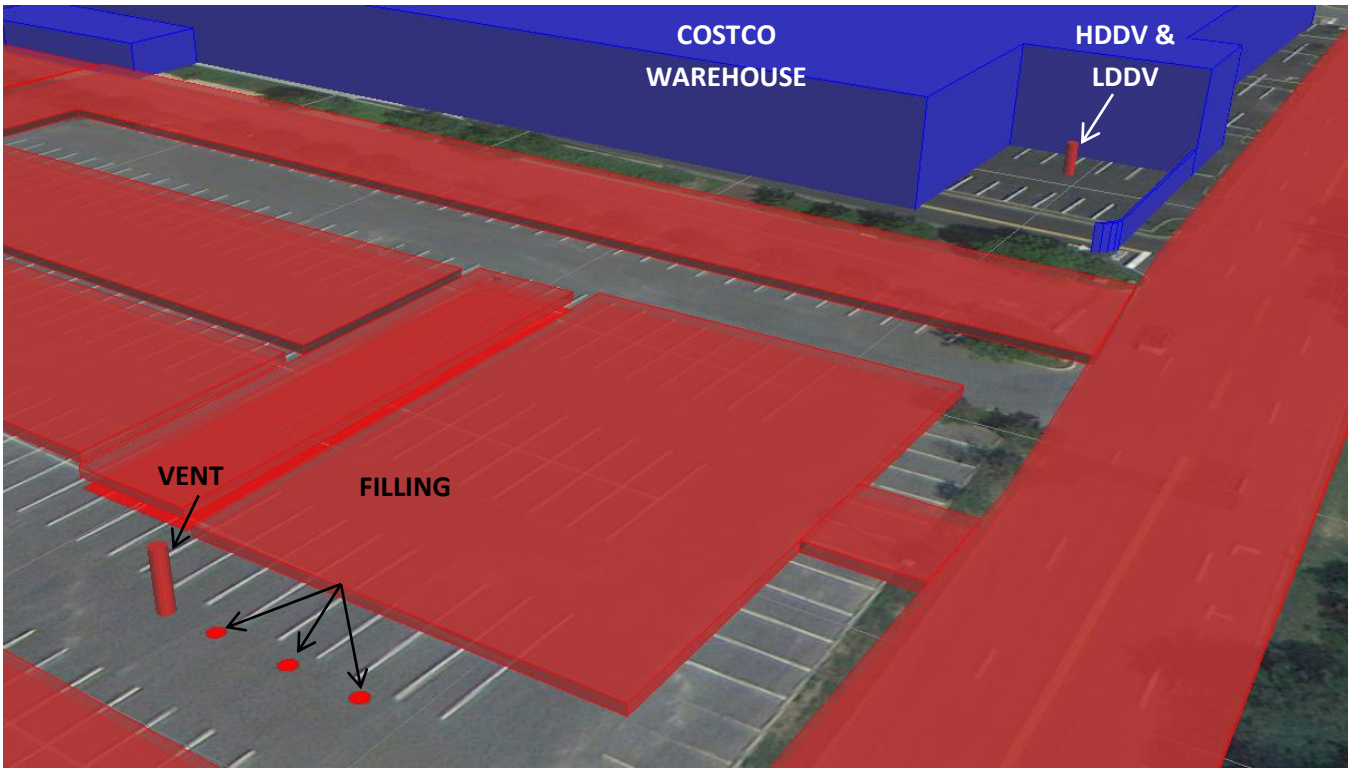


Table 1-1: Modeled Source Parameters for Point Sources

Source	UTM X	UTM Y	ELEV (m)	RELEASE HT (m)	GAS EXIT TEMP (K)	STACK DIAM (m)	GAS EXIT VELOCITY (m/s)	GAS EXIT FLOW RATE (ft^3/min)
HDDV	322102.31	4322604.45	133.89	2.9	613.294	0.0396	0	0
LDDV	322102.31	4322604.45	133.89	2.13	582.433	0.0244	0	0
VENT	322006.03	4322618.62	134.19	3.81	Ambient	0.0457	0	0
FILLING 1	322006.03	4322615.17	134.16	0	Ambient	0.0457	0	0
FILLING 2	322006.03	4322610.39	134.11	0	Ambient	0.0457	0	0
FILLING 3	322006.03	4322605.91	134.07	0	Ambient	0.0457	0	0

Figure 1-5: Costco Gasoline and Warehouse Area Sources (in red)

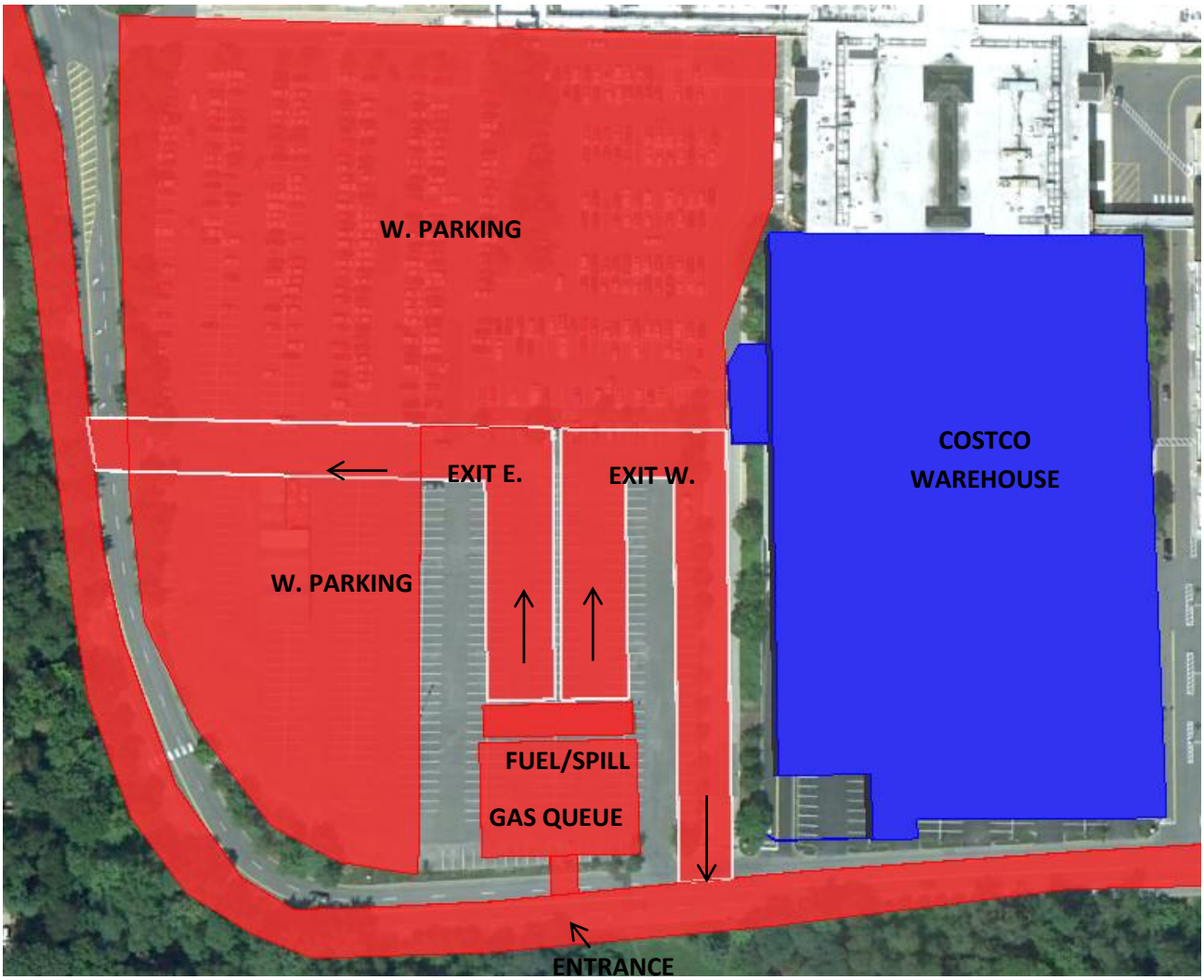


Table 1-2: Modeled Source Parameters for All Area and Area Poly Sources

SOURCE	UTM X	UTM Y	TYPE	GROUND ELEV (m)	HEIGHT (m)	TEMP (K)	SIGMA Z (m)
FUELING	322012.03	4322623.61	AREA	134.24	0.75	Ambient	0.7
SPILLAGE	322012.03	4322623.61	AREA	134.24	0.75	Ambient	0.7
GAS QUEUE	322010.91	4322592.23	AREA	133.93	0.75	Ambient	0.7
W. PARKING	321997.90	4322707.18	AREA POLY	134.64	0.75	Ambient	0.7
EXIT EAST	322031.91	4322633.17	AREA POLY	134.32	0.75	Ambient	0.7
EXIT WEST	321912.35	4322711.47	AREA POLY	133.76	0.75	Ambient	0.7
ENTRANCE	322028.09	4322592.22	AREA POLY	134.01	0.75	Ambient	0.7
ROADWAYS[5]	Variable	Variable	AREA/POLY	Variable	0.75	Ambient	0.7

[5] Roadway sources will be updated in final analysis to be more representative of exact locations when observed on updated Google Earth imagery.

Figure 1-6: East Parking Lot Volume Source (in red)

Table 1-3: Modeled Source Parameters for Parking Garage Volume Source

Source	UTM X	UTM Y	HEIGHT[6] (m)	GROUND ELEV (m)	TEMP (K)	Lateral Dimensions (m)	Vertical Dimensions (m)
E. PARKING	322251.31	4322728.28	4.34	131.16	Ambient	25.33	4.04

[6] The mid-point height of the garage is 28.5 feet= 8.7 meters, 8.7/2=4.34 meters

1.3.2 Assumed Queue Lengths

For the gasoline station queue sources, the following queue lengths are conservatively assumed:

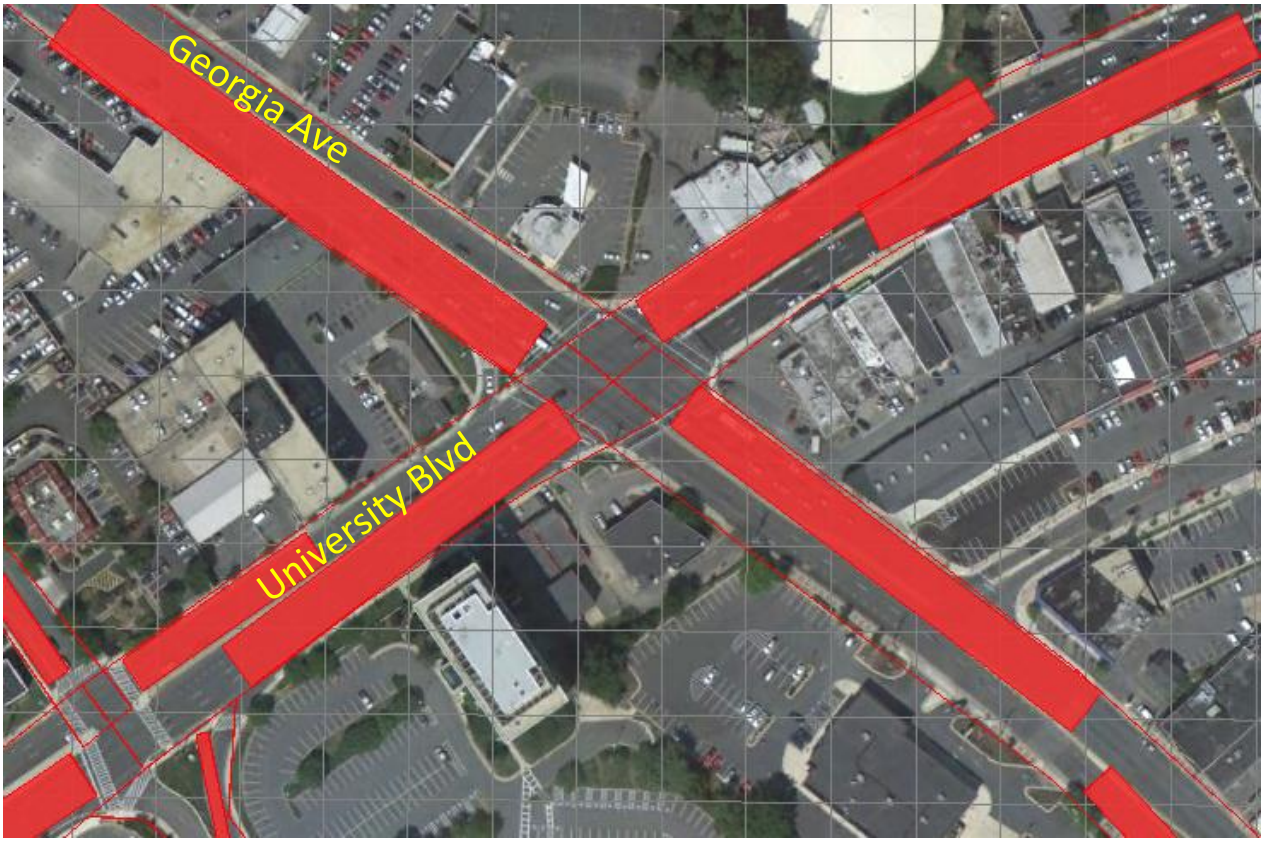
- 1-hour: 40 vehicles
- 8-hour: 20 vehicles
- 24-hour: 10 vehicles
- Annual: 10 vehicles (during operational hours)

For each queue assumption, the north-south extent of the queue will be computed and modeled based on assuming uniform distribution of vehicles across the 8 lanes (as feasible) and with 18 feet per vehicle (the average vehicle is approximately 15 feet long, with another three feet per vehicle of separation).

For the nearby road intersections within the model domain, an assumed 18-vehicle, 40-meter queue length was previously used to represent traffic stops due to timed traffic lights was used as shown in Figure 1-7. The incremental increase was originally based on the Traffic Group study in 2010 when the original report was created. With the new Traffic Study from 2012 this queue length were addressed and modified based on the newest traffic data if necessary (Traffic Group, 2012).

While emission rates for roadway sources are based on total traffic numbers for each road segment, queue sources at intersections were based on a EPA Volume 9 guidance document (U.S. EPA, 1978) for emission estimates for street intersections analysis. Similarly, the incremental traffic scenario uses the same queue length that was determined for total traffic run, but the amount of cars within that queue changed based on the amount of cars The Traffic Group determined would be on the nearby roads traveling to the gas station and warehouse. Figure 1-7 displays an example intersection of queue area sources within roadway sources. The free flow traffic on the roadways and the intersections queues were based on the traffic numbers produced by the traffic study (The Traffic Group, 2012). The intersection queues were based on idling and waiting for the traffic lights to change occurring at maximum traffic hours (i.e. where maximum queue lengths would occur).

Figure 1-7: Example of 18-Vehicle Traffic Queue Lengths at Nearby Road Intersections



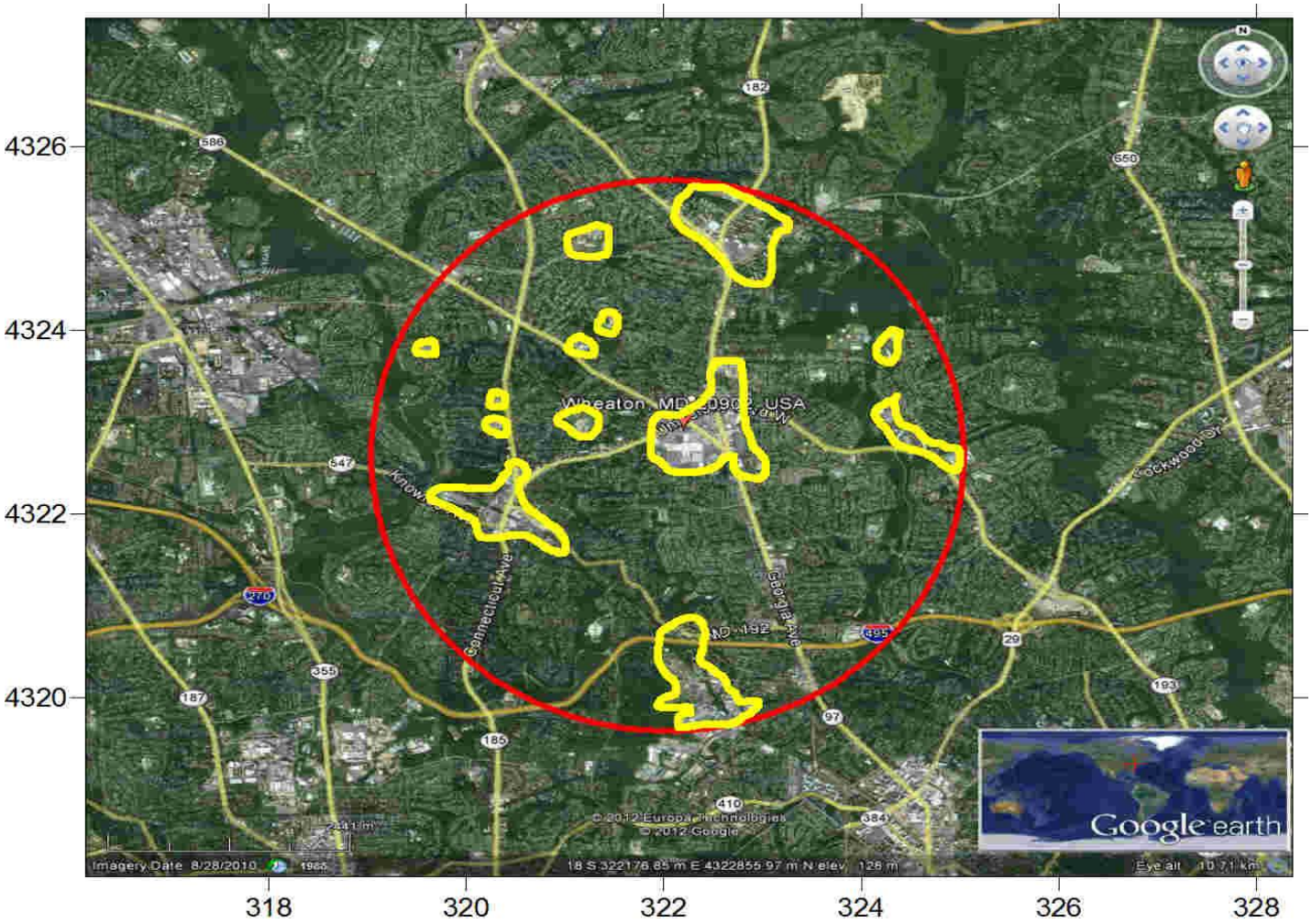
1.4 Urban/Rural Analysis

The determining factor on the selection of rural or urban conditions is the EPA Auer land use analysis method (Auer, 1978). Figure 1-8 identifies those urban areas in yellow within the 3-km radius of the site. When applying this method within the standard 3 km radius, it is clearly shown in Figure 1-8 that this area is generally rural for modeling purposes, i.e., less than 50 percent urban. Based on standard methodology using this Auer technique, it was confirmed that the rural land use feature is appropriate and consistent with EPA modeling guidelines.

In all previous modeling, Costco used the more conservative rural treatment - - more conservative for surface and near-surface releases that constitute the vast majority of emissions being modeled. Sensitivity testing has shown that the rural land use treatment produces modeled estimates that generally are approximately 2-3 times higher than the urban treatment at the closest residential areas.

Per standard guidance, the rural option was used to conform to EPA modeling guidelines (U.S. EPA, 2003). However, in order to provide a comparative perspective, we provide summary tables with urban and rural results shown separately. While it is noted that the predominant land use condition within the three kilometer radius is rural per the classification method, it also is true that more than 50 percent of the trajectories from the gas station area to the school, the pool, and the closest home are over asphalt and concrete, i.e. urban characteristics. The most accurate characterization of nearby sources would be expected to be between the urban and rural results.

Figure 1-8: Topographic Map Showing the 3-Kilometer Radius Circle Used to Define Land Use Characteristics of the Area Surrounding the Proposed Costco Gasoline Station



1.5 Receptor Grid

A wooded area (buffer zone) between the Ring Road and the outer extent of the Westfield property will be excluded from the residential NAAQS analysis. Figure 1-9 identifies the location and coverage of this zone. All exposures on the mall property for the 1-hour and 8-hour time periods will be applicable to the NAAQS analysis. For the 24-hour and annual risk assessments, only the residential areas outside of the Westfield mall buffer zone are applicable. The modeling results, however, show all receptors for all averaging times to support further review.

A general receptor grid was established considers 8,100 receptors overall with a 25 m (82 feet) grid spacing. Figure 1-10 presents the most critical part of the receptor grid used for the 1-hour and 8-hour AERMOD model runs. Figure 1-11 indicates the model receptor grid for AERMOD that was used generally outside of the mall and buffer zone for estimating the 24-hour and annual exposure concentrations. The model receptor grid was of similar areal coverage. Figure 1-12 shows the nine discrete receptors used to specifically identify the closest homes, pool and school. Table 1-4 details the locations and terrain elevations of each of these discrete receptors.

Figure 1-9: Westfield Buffer Zone (hatched wooded area)
Between the Ring Road and Nearby Residential Area

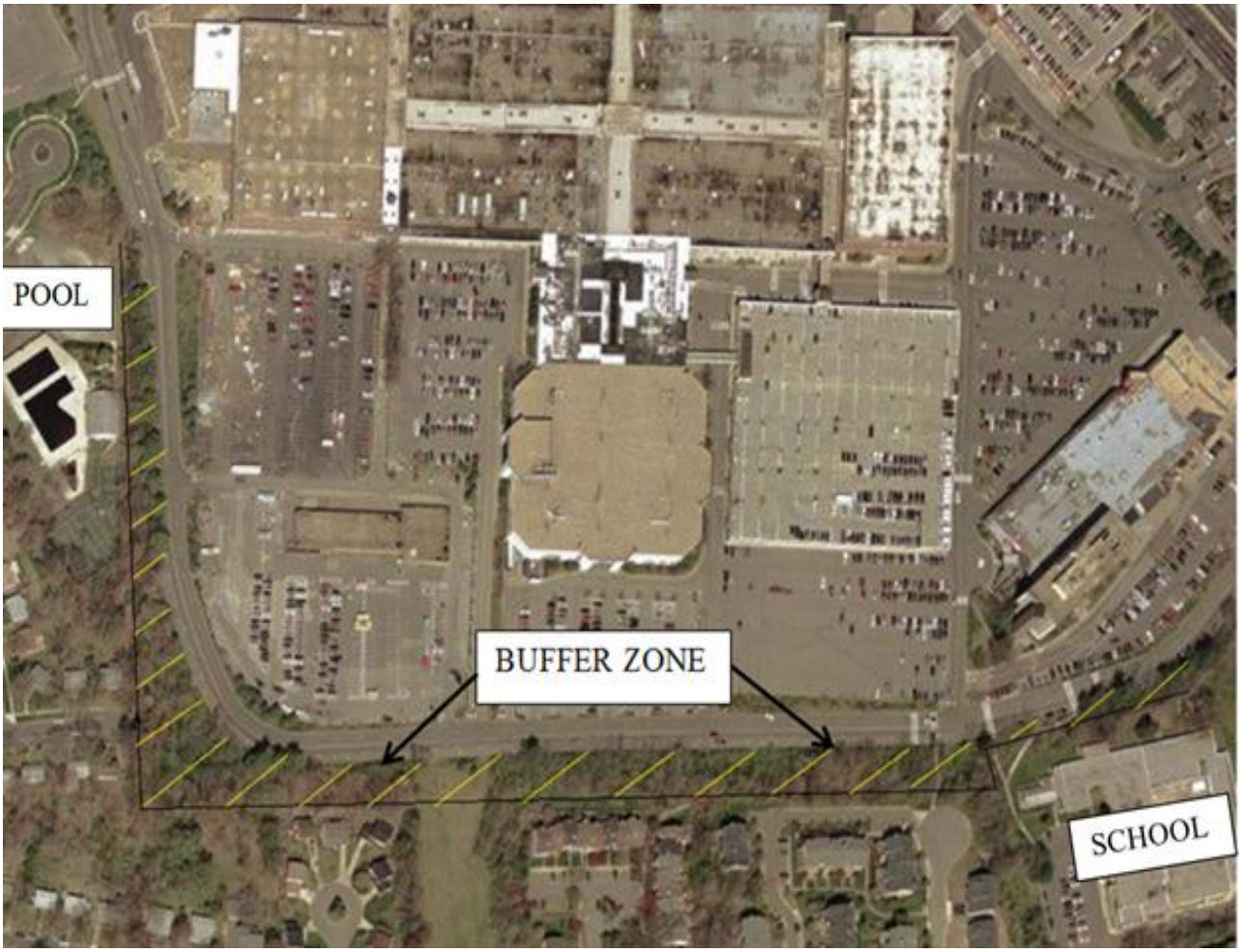


Figure 1-10: 25-Meter Spaced Model Receptor Grid for the 1-Hour and 8-Hour Model Runs

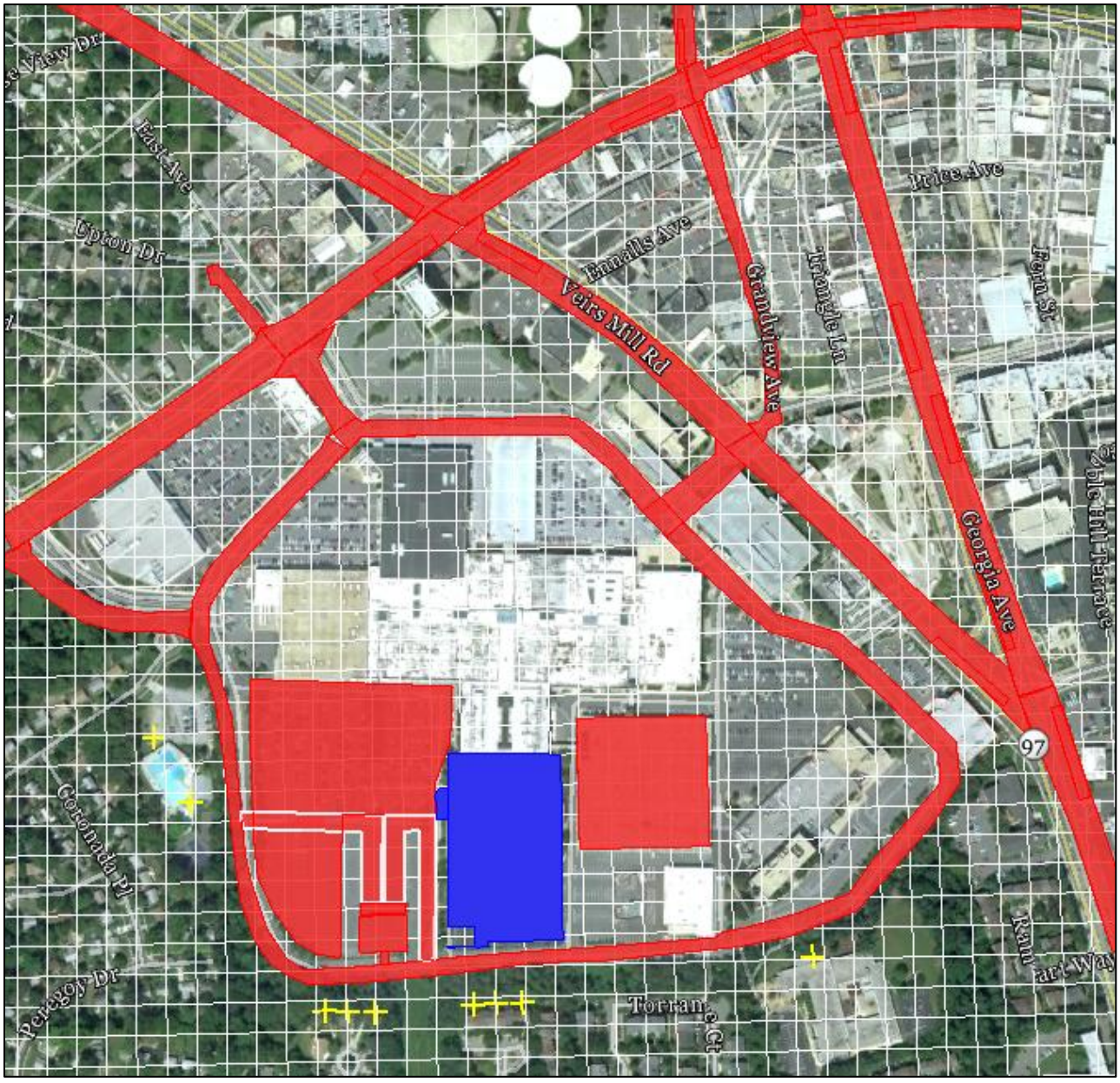
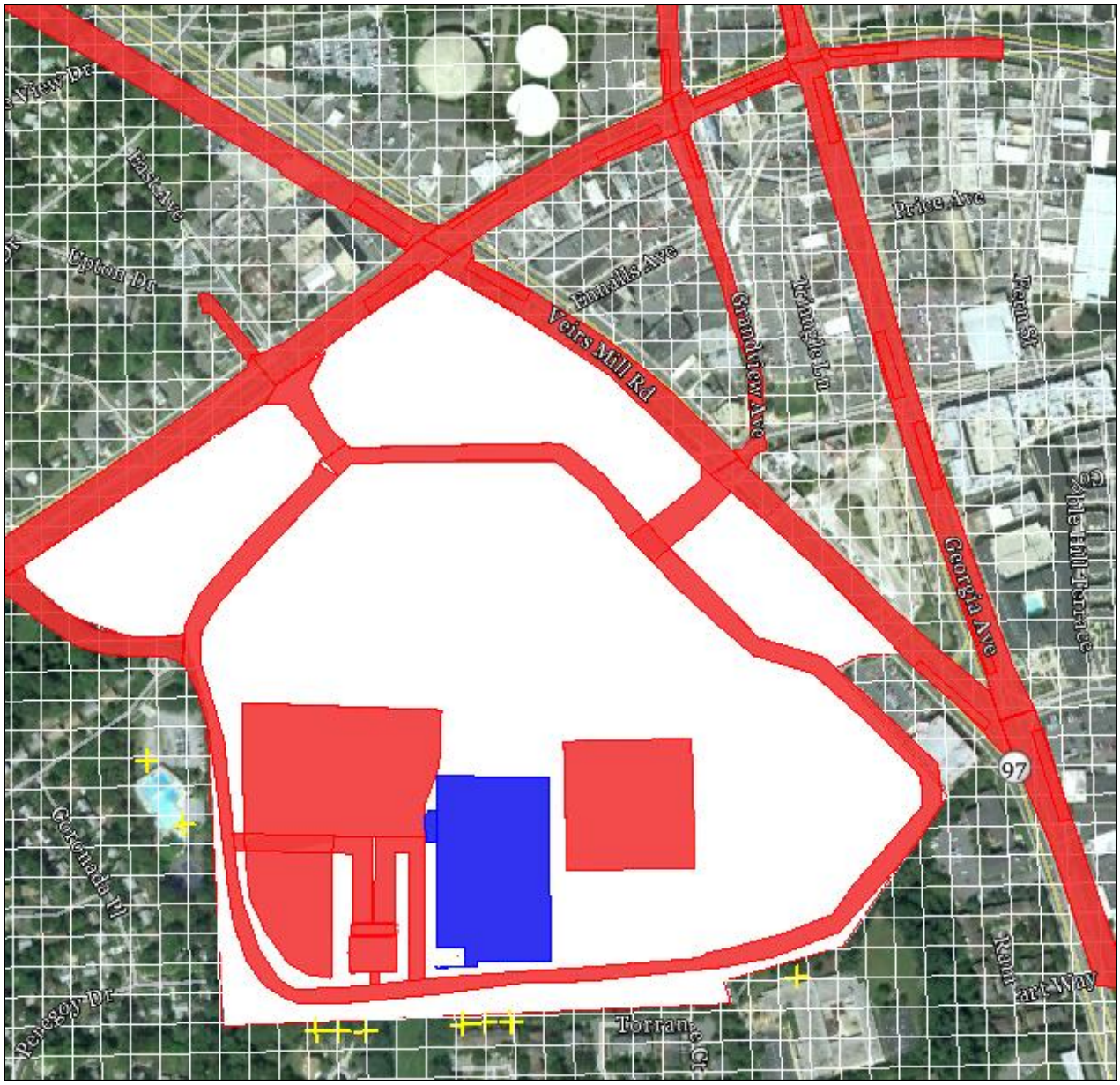


Figure 1-11: Model Receptor Grid for the 24-Hour and Annual Average Model Runs



Note: the receptors within the whited-out area are not applicable to the 24-hour and annual average exposure analysis

Figure 1-12: Discrete Receptors (yellow plus signs) for the Closest Homes, Pool and School

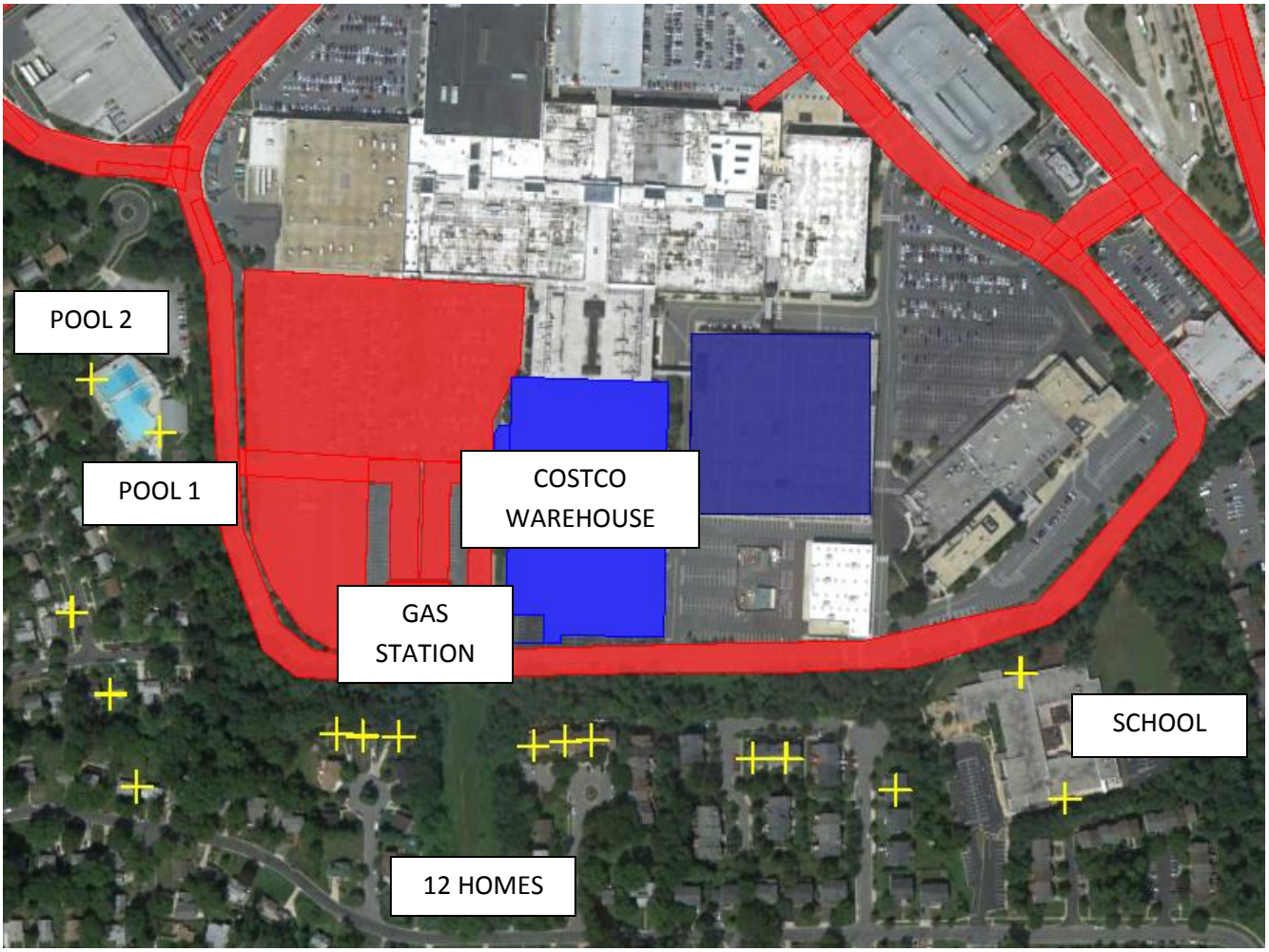


Table 1-4: Locations, Terrain Elevations, and Flagpole Heights of the Discrete Receptors Used to Identify the Closest Residences, Pool and School

Location Identifier	UTM X (km)	UTM Y (km)	Terrain Elevations (m)	Flagpole Heights (m)
Pool 1	321872.09	4322722.61	134.26	1.50
Pool 2	321830.08	4322754.64	133.29	1.50
School 1	322399.43	4322577.74	124.49	1.50
School 2	322426.79	4322501.14	122.58	1.50
Home 1	321980.91	4322538.97	129.31	1.50
Home 2	321996.77	4322537.86	129.8	1.50
Home 3	322019.00	4322537.86	129.77	1.50
Home 4	322101.45	4322532.36	128.53	1.50
Home 5	322120.77	4322535.08	127.84	1.50
Home 6	322137.06	4322535.94	127.22	1.50
Home 7	321818.67	4322612.56	127.38	1.50
Home 8	321842.32	4322562.82	125.26	1.50
Home 9	321858.62	4322506.55	119.56	1.50
Home 10	322235.36	4322525.22	125.24	1.50
Home 11	322256.09	4322525.09	124.28	1.50
Home 12	322322.79	4322506.12	120.5	1.50

* Locations highlighted in yellow were the locations closest to the Costco Gas Station and were used within result tables for closest pool, school and home discrete receptors.

1.6 Specific Pollutants Modeled

Volatile organic compounds (VOCs (as a class), NO_x, $PM_{2.5}$ and CO were the pollutants specifically modeled using the EPA-approved AERMOD dispersion model. The VOCS were then allocated into the following specific constituents based on cancer potential (EPA, 1988; 1990):

- Benzene
- 1,3 butadiene
- Formaldehyde
- Acetaldehyde

The reformulated gasoline components and combustion components are shown below.

Gasoline Compounds	Max % by Weight
Benzene	0.62
Ethyl Benzene	3
N-Hexane	4
Methyl tertiary butyl ether (MTBE)	15
Toluene	25
Xylene (all isomers)	15
Gasoline Combustion Compounds	% by Weight
Benzene	4.37
1,3 butadiene	0.54
Formaldehyde	1.33
Acetaldehyde	1.04
Toluene	9.62

For gasoline compounds, the maximum percent by weight was used to provide conservative estimates, except for reformulated gasoline, where the maximum benzene amount was modeled as 0.62 percent (eCFR, 2012). In addition, gasoline combustion compounds were based on reformulated gasoline values which were 4.37 percent for benzene (EPA, 2008). By verbal communication with Erich Brann of Costco, the gasoline products to be sold will contain up to 10 percent ethanol; therefore, the use of reformulated gasoline characteristics is not fully

appropriate and a weighted averaged between the combustion products of Ethanol E85 (15 percent ethanol) and reformulated gasoline (0 percent ethanol) was developed. The results of the analysis from the EPA Speciate 4.2 model are shown in sections 1.6.1 and 1.6.2 below.

1.6.1 Gasoline

The speciation of the Costco gasoline was updated to take into account the use of up to 10 percent ethanol in the gasoline Costco sells at their gasoline stations. Based on a Baltimore reformulated gasoline study in 2006, data are available that show the amount of benzene and ethanol that is used in their reformulated/ethanol blended gasoline. The ethanol percentages were used as a proxy for what is expected at the Costco gasoline station with up to 10 percent ethanol content range. In addition, this ethanol content was used in the gasoline combustion calculations.

Baltimore 2006 Study	Winter	Summer	Average
Benzene percent (by volume)	0.66 percent	0.63 percent	0.64 percent
Ethanol percent (by weight)	7.81 percent	9.97 percent	8.89 percent
SOURCE: EPA Reformulated Gasoline			
http://www.epa.gov/otaq/regs/fuels/rfg/properf/balt-md.htm			

Based on current Federal requirements, refinery average ≤ 0.62 percent benzene levels is required. On this basis, 0.62 percent benzene was assumed.

1.6.2 Combustion Sources

The specific apportionment of gasoline combustion compounds associated with the blend of Costco gasoline components is not available. As an approximation, the combustion compounds were determined by using a weighted average formula between two known gasoline fuels: 1) Ethanol E85 (15 percent ethanol content) and 2) reformulated gasoline (0 percent ethanol content) as provided in the table on the next page. Costco had indicated that up to 10 percent of their fuel contained ethanol. In addition, 8.89 percent ethanol

content was measured at the Baltimore in 2006 (US EPA, 2006). As an approximation, the combustion compounds were used that were in between the 0 percent ethanol content reformulated gasoline and the 15 percent ethanol content in E85 fuel (8.89% ethanol is between these two ethanol contents so we assumed a 50/50 mixture to be conservative).

For the benzene combustion calculations, the value of 2.28 percent benzene was calculated by the formula shown below:

Benzene Combustion Content = (0.19 + 4.37)/2 = 2.28 percent

Combustion Compound	Ethanol E85	**Reformulated Gasoline**	Ethanol Weighted Average between both types of Gasoline
Benzene	0.19 percent	**4.37 percent**	2.28 percent
1,3-Butadiene	0.04 percent	**0.54 percent**	0.29 percent
Formaldehyde	0.92 percent	**1.33 percent**	1.13 percent
Acetaldehyde	7.81 percent	**1.04 percent**	4.43 percent
SOURCE: Environ Studies from 2008 using Speciate4.2			
http://cfpub.epa.gov/si/speciate/ehpa_speciate_browse_details.cfm?ptype=G&pnumber=8750			

1.7 Emissions Assessment

The following provides the basis for the emission rates used in the modeling analysis. This analysis addresses the emissions from both the gasoline station and warehouse operations.

The list of modeled sources includes the following:

- Gasoline queue
- Ring Road around mall
- All other roads in the vicinity of the mall
- Gasoline delivery trucks (diesel)
- Costco warehouse delivery trucks (diesel)
- Costco parking lot and parking garage

The estimated modeled emissions for each of these sources for each model run scenario are summarized in Table 1-5.

The modeling includes mall traffic along the Ring Road and the traffic on nearby local streets. All modeled traffic data was derived from the 2012 traffic study (Traffic Group, 2012). The modeling also includes vehicles in the Costco parking lot and parking garage. Emissions associated with parked cars in the mall parking lots will not affect the incremental risk assessment for the gas station. Considering the fact that the NAAQS are being met by such a wide margin for all pollutants that are emitted in significant quantities by the gas station operations and associated peripheral sources, further increases of the scope of the modeling to include various additional parking lots around the mall is unnecessary, and would not be consistent with standard air quality modeling practice.

Table 1-5: Modeled Emission Rates for Gas Station Sources

SOURCE NAME	ALL TRAFFIC VOC ANNUAL 1	INCREMENTAL 1 VOC ANNUAL	ALL TRAFFIC VOC ANNUAL 2	INCREMENTAL 2 VOC ANNUAL	ALL TRAFFIC CO 1-HOUR	ALL TRAFFIC CO 8-HOUR	ALL TRAFFIC NOX 1-HOUR	ALL TRAFFIC NOX ANNUAL	ALL TRAFFIC PM2.5 24-HOURS	ALL TRAFFIC PM2.5 ANNUAL	INCREMENTAL PM2.5 ANNUAL
EXIT WEST (g/sec-m2)	4.34E-07	2.12E-07	4.34E-07	2.12E-07	1.11E-05	1.11E-05	5.28E-07	5.28E-07	1.23E-08	1.23E-08	7.24E-09
EXIT EAST (g/sec-m2)	4.63E-07	2.24E-07	4.63E-07	2.24E-07	1.20E-05	1.20E-05	5.32E-07	5.32E-07	1.24E-08	1.24E-08	6.95E-09
ENTRANCE (g/sec-m2)	1.11E-05	5.23E-06	1.11E-05	5.23E-06	9.10E-05	6.81E-05	3.27E-06	3.75E-06	4.99E-08	4.99E-08	2.59E-08
PARKING EAST (g/s)	1.67E-02	NA	1.67E-02	NA	1.56E-01	1.56E-01	4.61E-03	4.61E-03	6.84E-05	6.84E-05	NA
PARKING WEST (g/sec-m2)	8.07E-07	NA	8.07E-07	NA	7.55E-06	7.55E-06	2.23E-07	2.23E-07	3.31E-09	3.31E-09	NA
VENT (g/s)	1.26E-03	1.26E-03	1.26E-03	1.26E-03	NA	NA	NA	NA	NA	NA	NA
FILL1 (g/s)	3.31E-02	3.31E-02	3.31E-02	3.31E-02	NA	NA	NA	NA	NA	NA	NA
FILL2 (g/s)	3.31E-02	3.31E-02	3.31E-02	3.31E-02	NA	NA	NA	NA	NA	NA	NA
FILL3 (g/s)	3.31E-02	3.31E-02	3.31E-02	3.31E-02	NA	NA	NA	NA	NA	NA	NA
FUELING (g/sec-m2)	1.12E-03	1.12E-03	7.86E-04	7.86E-04	NA	NA	NA	NA	NA	NA	NA
SPILLAGE (g/sec-m2)	7.14E-04	7.14E-04	3.57E-04	3.57E-04	NA	NA	NA	NA	NA	NA	NA
MAJOR SPILL (g/sec-m2)	2.68E-06	2.68E-06	2.68E-06	2.68E-06	NA	NA	NA	NA	NA	NA	NA
HDDV Warehouse (g/s)	3.53E-03	NA	3.53E-03	NA	6.52E-02	6.52E-02	9.75E-02	9.75E-02	6.76E-04	6.76E-04	NA
LDDV Warehouse (g/s)	7.16E-03	NA	7.16E-03	NA	2.04E-02	2.04E-02	7.25E-03	7.25E-03	4.10E-04	4.10E-04	NA
GASQUEUE (g/sec-m2)	7.05E-05	7.05E-05	7.05E-05	7.05E-05	6.60E-04	6.60E-04	1.95E-05	1.95E-05	2.87E-07	2.87E-07	2.87E-07

The Ring Road traffic also was generated by the 2012 Traffic Group study (Traffic Group, 2012). The estimated traffic on the Ring Road is based the expected increase in traffic due to the gas station plus the background 2012 traffic counts that would not use the gas station. The emissions on the Ring Road are based on free flow traffic at 15 mph. The roadway emissions data includes Ring Road traffic, free flow traffic on the roadways, idling vehicles at the intersections, and the idling vehicles at the gasoline station. Emissions from traffic included the following:

- Increased traffic that only goes to the gasoline station.
- Traffic passing by the facility but not going into the gasoline station.
- Traffic from the Costco warehouse that did not utilize the gasoline station.
- Maximum traffic peaks were used for each roadway source for all area sources and area poly sources. Added to these maximum traffic peak values were incremental values (warehouse & gas station additional traffic) to determine total traffic for emission calculation for total traffic runs. Incremental runs used only incremental values.
- Volume 9 analysis (U.S. EPA, 1978) was used to determine queue lengths on all roadways with a waiting queue. Signal lengths were provided for all major intersections from The Traffic Group (personal communication with John Dirndorfer).

1.7.1 Roadway Sources

The 2013 emission rates were calculated by the emissions factors summarized below and the number of vehicles traveling on the Ring Road and the idling emissions from the vehicles at the projected gasoline station and the nearby surrounding intersections as shown in Table 1-6. The values for the Ring Roads were calculated by the MOBILE 6.2.03 model (EPA, 2003) based on fleet characteristics applicable to the Montgomery County region as of calendar year 2013. Note that as the fleet mix turns over as a function of time that these emissions will trend downward from the 2013 values.

Table: 1-6: 2013 Estimated Emission Rates Used in Modeling Analysis
(Grams / vehicle mile traveled)

Source Description	**CO**	**VOC**	**NO_x**	**$PM_{2.5}$**
Idling Sources	25.993	2.556	0.854	0.0127
Roadway Sources	12.240	0.355	0.456	0.0127

The 2013 emissions estimates were derived from the MOBILE6 model (US EPA, 2002) using Montgomery County fleet mix data. We conservatively assumed a 100 percent conversion from NO_x to NO_2. It should be noted that the Costco gas station will not sell diesel fuel, such that the gasoline delivery trucks (approximately 4 per day) are the only source of diesel emissions associated with the incremental risk assessment of the gas station operations.

1.7.2 Gasoline Station Sources

The VOC emission rates shown in Table 1-10 utilize the emissions factors used in the Environmental Protection Agency's AP-42 Air Pollutants Emissions Factor guide (EPA, 1997) for gasoline emissions and the varying time periods described below for each scenario.

(a) Stage I: Filling of Underground Storage Tank (UST)

The emissions associated with the filling of the underground storage tanks are greatly reduced because of the Stage I controls. These emissions were based on straight throughput. It was assumed that these emissions can occur anytime during the operational hours of the facility (assumed to be from 6:30 A.M. through 9:30 P.M.), with the emissions allocated accordingly.

(b) UST Vent emissions from breathing losses

A 10-foot high vent connected to the USTs and located near the fueling area is the source of the vented emissions. Emissions are assumed to be uniformly emitted throughout the day. Control credit of 99.27 percent removal of vent emissions due to the Arid Technologies permeator was accounted for, consistent with manufacturer's specifications. These emissions were assumed to occur uniformly throughout the day.

(c) Stage II: Vehicle Refueling Operations / Dispensing Gasoline

These emissions were based on Stage II controlled conditions and were assumed to occur 6:30 A.M. through 9:30 P.M.

(d) Stage II: Vehicle Refueling Operations / Spillage

These emissions were assumed to occur 6:30 A.M. through 9:30 P.M.

(e) Vehicles Queuing to Purchase Gas

The maximum queuing area is 40 cars at this location. For the 1-hour modeling analyses, it was assumed that the maximum queue of 40 cars occurs. For the 8-hour queues it was

assumed that 20 car queues occur. For the 24-hour and annual average periods, it was conservatively assumed that on average throughout the operational hours of the gas station there will be 10 cars in queue on average. In order to readily accommodate alternative assumptions on queue lengths, subsequent results tables provide the contributions made by each source category, including queuing. On this basis, the significance of conservatively doubling or tripling the average queues can be shown in the results. As is shown, the contributions from queues at the gas station based on any conceivable assumption are low relative to all standards and risk guidelines. In other words, EPA actions over the past 20-30 years to reduce vehicle emissions have been successful.

(f) Nearby roadways (based on traffic counts).

Traffic count data (Guckert, 2010) that were used in the original 2011 analysis were obtained for nearby roadways as shown in Figure 1-13. The traffic study (Guckert, 2010) estimated future traffic once the Costco gasoline station is built as the total amount of background traffic from already approved developments added to the expected gasoline station generated traffic counts. The incremental traffic increase due to the proposed Costco station for the gasoline queue, Ring Road traffic or cars going to the gas station, all other roads, and gas delivery trucks was modeled separately to establish the Costco incremental risk only. Updated traffic/pattern information used in this current 2012 modeling analysis was obtained is presented in Table 1-7.

Figure 1-13. Traffic Map used as a basis for Vehicle Traffic Patterns in the 2012 Analysis

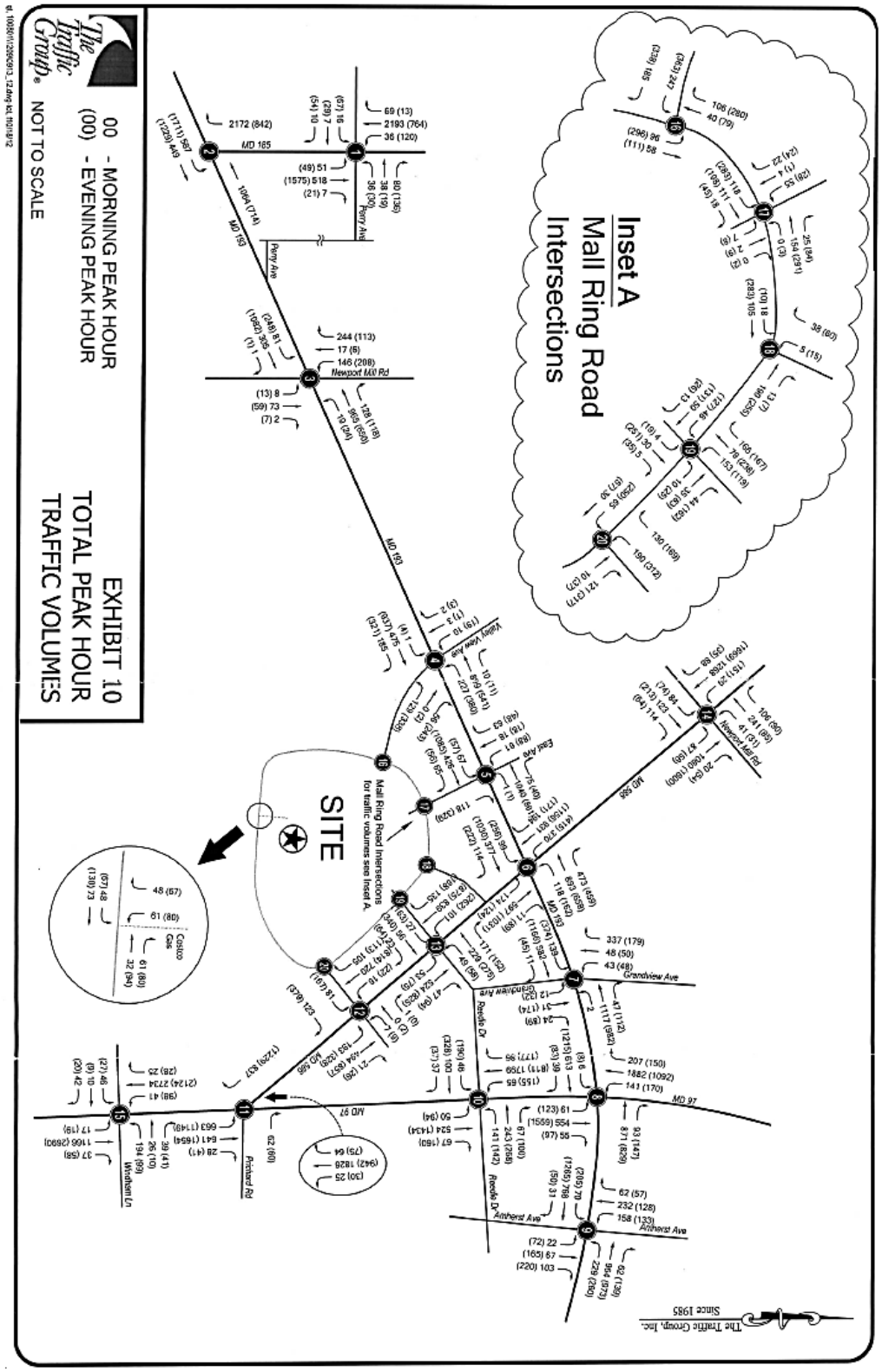


Figure 1-13. Traffic Map used as a basis for Vehicle Traffic Patterns in the 2012 Analysis (cont.)

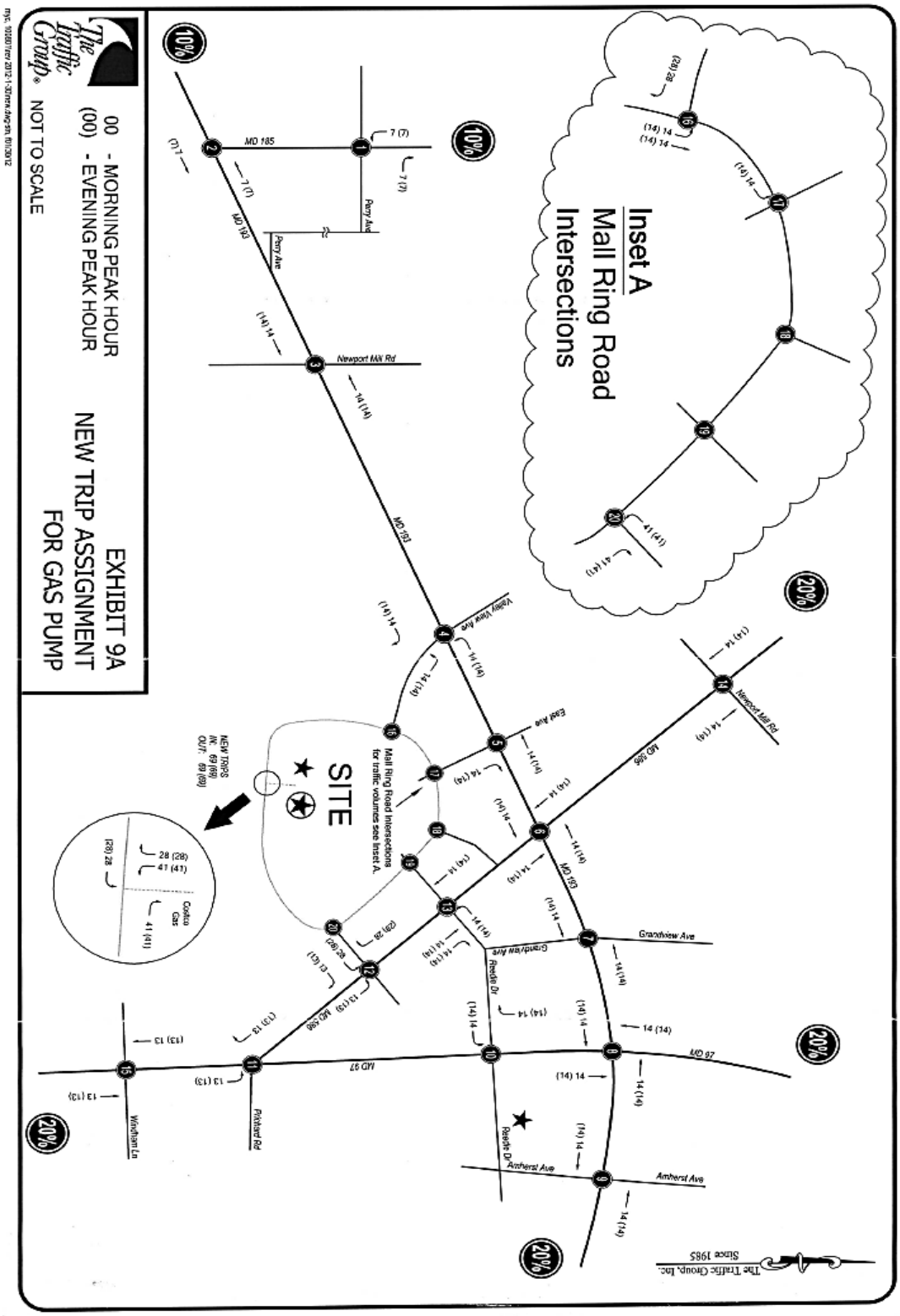


Table 1-7: Updated Traffic Count Data used in this 2012 Analysis

	Roadway			
Roadways	**Peak Morning Traffic Count**	**Peak Evening Traffic Count**	**Miles**	**Max traffic count**
University Blvd SW1 (4)	1694	2130	0.18	2130
University Blvd SW2 (2)	1706	2410	0.11	2410
University Blvd Center (1)	2216	2864	0.15	2864
University Blvd NE (11)	1824	2400	0.07	2400
University Blvd NE2 (17)	1833	2496	0.19	2496
Veirs Mill Road N (12)	2682	3452	0.16	3452
Veirs Mill Road Center (3)	1857	2549	0.20	2549
Veirs Mill Road (7)	1465	1943	0.12	1943
Georgia Ave 1 (16)	2883	3126	0.12	3126
Georgia Ave 3 (6)	2556	2735	0.18	2735
Georgia Ave 4 (18)	4132	5094	0.31	5094
GrandView Avenue (5)	128	390	0.22	390
GrandView Avenue (15)	645	937	0.14	937
Valley View Ave S (8)	617	1284	0.12	1284
East Ave S (9)	199	382	0.05	382
East Ave N (14)	284	251	0.05	284
Reedie Dr W (10)	504	1091	0.06	1091
University Blvd SW3 (19)	1773	2054	0.15	2054
Valley View Ave N (20)	26	40	0.07	40
Mall Road (21)	74	92	0.04	92
Veirs Mill Road S (22)	1545	2440	0.08	2440
Mall Road (23)	524	1027	0.04	1027
Pichard Rd (24)	115	131	0.08	131
Windham Ln W (25)	166	113	0.09	166
Windham Ln E (26)	347	315	0.06	347
Georgia Ave 5 (27)	4190	5010	0.13	5010
Reedie Dr (28)	562	1094	0.07	1094
Reedie Dr E (29)	683	1153	0.12	1153
Georgia Ave 2 (30)	2620	2922	0.20	2922
RING1	393	885	0.13	885
RING2	302	671	0.12	671
RING3	312	546	0.06	546
RING4	184	577	0.12	577
RING5*	315	639	0.66	639
Exit East	54.5	73.5	0.13	73.5

Exit West	54.5	73.5	0.11	73.5
Entrance	109	147	variable	147
***Ring Road South Average (RING5)**				
Intersection 16	379	824		
Intersection 20	351	723		
Intersection Gas Station	214	371		
Average	***315***	***639***		

1.7.3 Mobile 6.2 Emissions Estimates for Roadway Sources

A series of MOBILE6.2 runs were performed to estimate 2013 emissions for VOC, CO, NO_x, and $PM_{2.5}$ using the latest Montgomery County fleet mix, as provided through the DC Council of Governments (COG). These MOBILE6.2 runs consisted of two basic representative time periods, one set using representative January temperatures of 25ºF and 30ºF (default range to demonstrate typical temperature), and the other set using representative July temperatures of 75ºF and 85ºF. In each of these runs, a range of vehicle speeds of 2.5 mph, 10 mph, 15 mph, and 30 mph were also applied. Summary tables of these model runs are presented in Tables 1-8 through 1-9.

The yellow highlighted areas in these tables indicate the maximum emissions resulting for each pollutant for the range of vehicle speeds from 2.5 to 30 mph and were then used for the final emissions (grams/hour) estimations by multiplying by the actual number of vehicles and vehicle miles within each modeled road segment. Queue sources were set to 2.5 mph (with emissions increased by a conservative factor of 2.5 relative to the previous analysis), Ring Road 15 mph, and all main roadways 30 mph. In addition, the HDDV and LDDV followed the same method by using 30 mph when traveling on the main roadways and 15 mph when traveling on the Ring Road.

Table 1-8: MOBILE6.2 Emissions (grams/vehicle-mile) for Total Fleet Mix

JAN, 2013	TEMP	VOC	CO	NOX	PM
2.5	25	2.1750	25.9930	0.8540	0.0127
2.5	30	2.1430	24.2740	0.8310	0.0127
10	25	0.5590	14.4260	0.6270	0.0127
10	30	0.5380	13.3610	0.6100	0.0127
15	25	0.4560	13.2640	0.5420	0.0127
15	30	0.4370	12.2620	0.5280	0.0127
30	25	0.3530	12.2400	0.4560	0.0127
30	30	0.3370	11.2940	0.4440	0.0127
JULY, 2013	TEMP	VOC	CO	NOX	PM
2.5	85	2.7860	13.0250	0.7860	0.0126
2.5	75	2.5560	13.1450	0.7330	0.0126
10	85	0.6400	5.6060	0.5480	0.0126
10	75	0.6030	5.8450	0.5220	0.0126
15	85	0.5080	4.8230	0.4650	0.0126
15	75	0.4810	5.0860	0.4470	0.0126
30	85	0.3710	4.0790	0.3790	0.0126
30	75	0.3550	4.3850	0.3690	0.0126
	MAX - 2013	VOC	CO	NOX	PM
	2.5	2.7860	25.9930	0.8540	0.0127
	10	0.6400	14.4260	0.6270	0.0127
	15	0.5080	13.2640	0.5420	0.0127
	30	0.3710	12.2400	0.4560	0.0127

Table 1-8: MOBILE6.2 Emissions (grams/vehicle-mile) for Total Fleet Mix (cont.)

	NO HDDV INCLUDED				
JAN, 2013	TEMP	VOC	CO	NOX	PM
2.5	25	2.1625	25.9345	0.7661	0.0114
2.5	30	2.1300	24.2149	0.7434	0.0114
10	25	0.5505	14.3954	0.5605	0.0114
10	30	0.5297	13.3279	0.5434	0.0114
15	25	0.4484	13.2397	0.4848	0.0114
15	30	0.4303	12.2404	0.4702	0.0114
30	25	0.3492	12.2278	0.4105	0.0114
30	30	0.3324	11.2808	0.3984	0.0114
JULY, 2013	TEMP	VOC	CO	NOX	PM
2.5	85	2.7734	12.9673	0.7041	0.0114
2.5	75	2.5445	13.0878	0.6513	0.0114
10	85	0.6316	5.5743	0.4858	0.0114
10	75	0.5949	5.8145	0.4601	0.0114
15	85	0.5016	4.8005	0.4122	0.0114
15	75	0.4737	5.0648	0.3935	0.0114
30	85	0.3673	4.0701	0.3361	0.0114
30	75	0.3492	4.3769	0.3262	0.0114
	MAX - 2013	VOC	CO	NOX	PM
	2.5	2.7734	25.9345	0.7661	0.0114
	10	0.6316	14.3954	0.5605	0.0114
	15	0.5016	13.2397	0.4848	0.0114
	30	0.3673	12.2278	0.4105	0.0114

Table 1-8: MOBILE6.2 Emissions (grams/vehicle-mile) for Total Fleet Mix (cont.)

	Total without HDDV, LDDV & LDDT				
JAN, 2013	TEMP	VOC	CO	NOX	PM
2.5	25	2.1613	25.9305	0.7648	0.0113
2.5	30	2.1288	24.2109	0.7421	0.0113
JULY, 2013	TEMP	VOC	CO	NOX	PM
2.5	85	2.7722	12.9633	0.7029	0.0113
2.5	75	2.5433	13.0838	0.6501	0.0113
	MAX - 2013	VOC	CO	NOX	PM
	2.5	2.7722	25.9305	0.7648	0.0113

Table 1-9: MOBILE6.2 Emissions (grams/vehicle-mile) for HDDV and LDDT Vehicles Only

HDDV					LDDT				
JAN, 2013	TEMP	VOC	CO	NOX	JAN, 2013	TEMP	VOC	CO	NOX
2.5	25	1.0070	4.7660	7.0200	2.5	25	0.4640	1.3230	0.4700
2.5	30	1.0070	4.7660	7.0200	2.5	30	0.4640	1.3230	0.4700
10	25	0.6950	2.6820	5.2910	10	25	0.3360	0.8000	0.3520
10	30	0.6950	2.6820	5.2910	10	25	0.3360	0.8000	0.3520
15	25	0.5580	1.9360	4.5790	15	25	0.2800	0.6130	0.3040
15	30	0.5580	1.9360	4.5790	15	30	0.2800	0.6130	0.3040
30	25	0.3290	0.9560	3.6470	30	25	0.1860	0.3670	0.2410
30	30	0.3290	0.9560	3.6470	30	30	0.1860	0.3670	0.2410
HDDV					LDDT				
JULY, 2013	TEMP	VOC	CO	NOX	JULY, 2013	TEMP	VOC	CO	NOX
2.5	85	0.9890	4.4970	6.5580	2.5	85	0.4510	1.3080	0.4490
2.5	75	0.9890	4.4970	6.5580	2.5	75	0.4510	1.3080	0.4490
10	85	0.6820	2.5310	4.9430	10	85	0.3270	0.7920	0.3370
10	75	0.6820	2.5310	4.9430	10	75	0.3270	0.7920	0.3370
15	85	0.5470	1.8270	4.2780	15	85	0.2720	0.6070	0.2910
15	75	0.5470	1.8270	4.2780	15	75	0.2720	0.6070	0.2910
30	85	0.3230	0.9020	3.4060	30	85	0.1820	0.3640	0.2300
30	75	0.3230	0.9020	3.4060	30	75	0.1820	0.3640	0.2300
	MAX - 2013	VOC	CO	NOX		MAX - 2013	VOC	CO	NOX
	2.5	1.0070	4.7660	7.0200		2.5	0.4640	1.3230	0.4700
	10	0.6950	2.6820	5.2910		10	0.3360	0.8000	0.3520
	15	0.5580	1.9360	4.5790		15	0.2800	0.6130	0.3040
	30	0.3290	0.9560	3.6470		30	0.1860	0.3670	0.2410

Table 1-9: MOBILE6.2 Emissions (grams/vehicle-mile) for HDDV and LDDT Vehicles Only (cont.)

PM HDDV		PM LDDT	
JAN, 2013	PM	JAN, 2013	PM
2.5	0.1036	2.5	0.0266
2.5	0.1036	2.5	0.0266
10	0.1036	10	0.0266
10	0.1036	10	0.0266
15	0.1036	15	0.0266
15	0.1036	15	0.0266
30	0.1036	30	0.0266
30	0.1036	30	0.0266
JULY, 2013	PM	JULY, 2013	PM
2.5	0.0976	2.5	0.0257
2.5	0.0976	2.5	0.0257
10	0.0976	10	0.0257
10	0.0976	10	0.0257
15	0.0976	15	0.0257
15	0.0976	15	0.0257
30	0.0976	30	0.0257
30	0.0976	30	0.0257
MAX HDDV PM 2013	PM	MAX PM 2013	MAX LDDT PM 2013
2.5	0.1036	2.5	0.0266
10	0.1036	10	0.0266
15	0.1036	15	0.0266
30	0.1036	30	0.0266

1.7.4 VOC Emissions Estimates

These VOC emissions estimates include queuing and free flowing emissions and are displayed in Table 1-10. Note that the emissions shown for Scenario 1 below match the first draft of the modeling protocol and are very conservative (overstate). Scenario 2 shows more realistic fueling and spillage assumptions including consideration of the on-board ORVR system in place on most vehicles by 2013. The 70 year risks shown at the bottom of Table 1-15 are based on a 70 year projected average emissions based on 100 percent on-board ORVR system on the vehicles and the applicable fleet mix out to 2035 as a conservative representation of the 70 year period.

It should be noted that MOBILE 6.2 will be replaced by the MOVES emissions model as EPA's official model for estimating emissions from cars, trucks, and motorcycles. The MOBILE6.2 emissions model was not for the model runs because MOVES will not be implemented until March 2013, well after the completion of this analysis. On this basis, guidance from local regulatory agencies in terms of preferred model inputs is not available at this time. Some generic comparisons are shown in Appendix AC, which compare MOVES to MOBILE 6.2. It is expected that MOVES will show increased fine particulate and NO_x emissions, and decreased VOC and CO emissions. Refer to Appendix AC for further details.

Table 1-10: VOC Emission Rates and Source Characteristics of the Gasoline Station Sources Used in Modeling Analysis

Costco Gasoline Station	VOC Emissions Scenario 1	VOC Emissions Scenario 2	Height of Source	Initial Dispersion	VOC Emissions Scenario 1	VOC Emissions Scenario 2
Source Name	(g/s) (g/s-m^2)	(g/s) (g/s-m^2)	(meters)	(meters)	(tons/year)	(tons/year)
Filling of Underground Storage Tanks	9.93E-02	9.93E-02	0.0	N/A	2.22E-15	2.22E-15
Underground Storage Tank Vent Breathing / Working Losses	1.26E-03	1.26E-03	3.81	N/A	4.40E-17	4.40E-17
Vehicle Fueling	1.12E-03	7.86E-04	0.75	0.70	2.35E-14	1.64E-14
Spillage	7.14E--04	3.57E-04	0.75	0.70	1.49E-14	7.47E-15

1.8 Model Results

The AERMOD dispersion model results are shown by source group and emission types, Figures 1-14 through 1-23 present graphical concentration field results. These graphical concentration fields show refinements of the long-range views of modeled concentrations, including background, with comparisons to current National Ambient Air Quality Standards (NAAQS) for each modeled pollutant (see Appendix W) to more specifically describe air quality at the Kenmont Swim and Tennis Center and Stephen Knolls School. Concentrations were assessed for annual average VOC's, maximum 1-hour CO, maximum 8-hour CO, maximum 1 hour NO_2, annual average NO_2, maximum 24-hour $PM_{2.5}$, and annual average $PM_{2.5}$. In addition, Table 1-11 displays a summary of these results and comparisons of each to the NAAQS.

Based on the modeling results for the Costco related incremental emissions for queue sources, Ring Road, other roads, and gas delivery trucks indicated very low impact with maximum residential predicted annual average $PM_{2.5}$ concentrations of 0.012 µg/m^3. Adding in the Costco warehouse delivery trucks, the incremental annual average increase is predicted to be an additional 0.03 µg/m^3. Based on the total combined Costco results, it can be assumed that the inclusion of other additional delivery trucks in the Mall would show similar low additive impacts and still fall well below the current EPA annual standards of 15µg/m^3. By comparison, the total modeled annual average at the Stephen Knolls School is 0.18 µg/m^3 for $PM_{2.5}$. In other words, the total modeled impacts at the school is about 20 times greater than from the Costco gasoline incremental impacts

Tables 1-12 through 1-14 present the comparative model results for both the rural and urban model scenarios.

Figure 1-14: Predicted Highest Second-High 1-Hour CO Isopleth Results (µg/m^3) plus 1,488 µg/m^3 Background
NAAQS = 40,000 µg/m^3

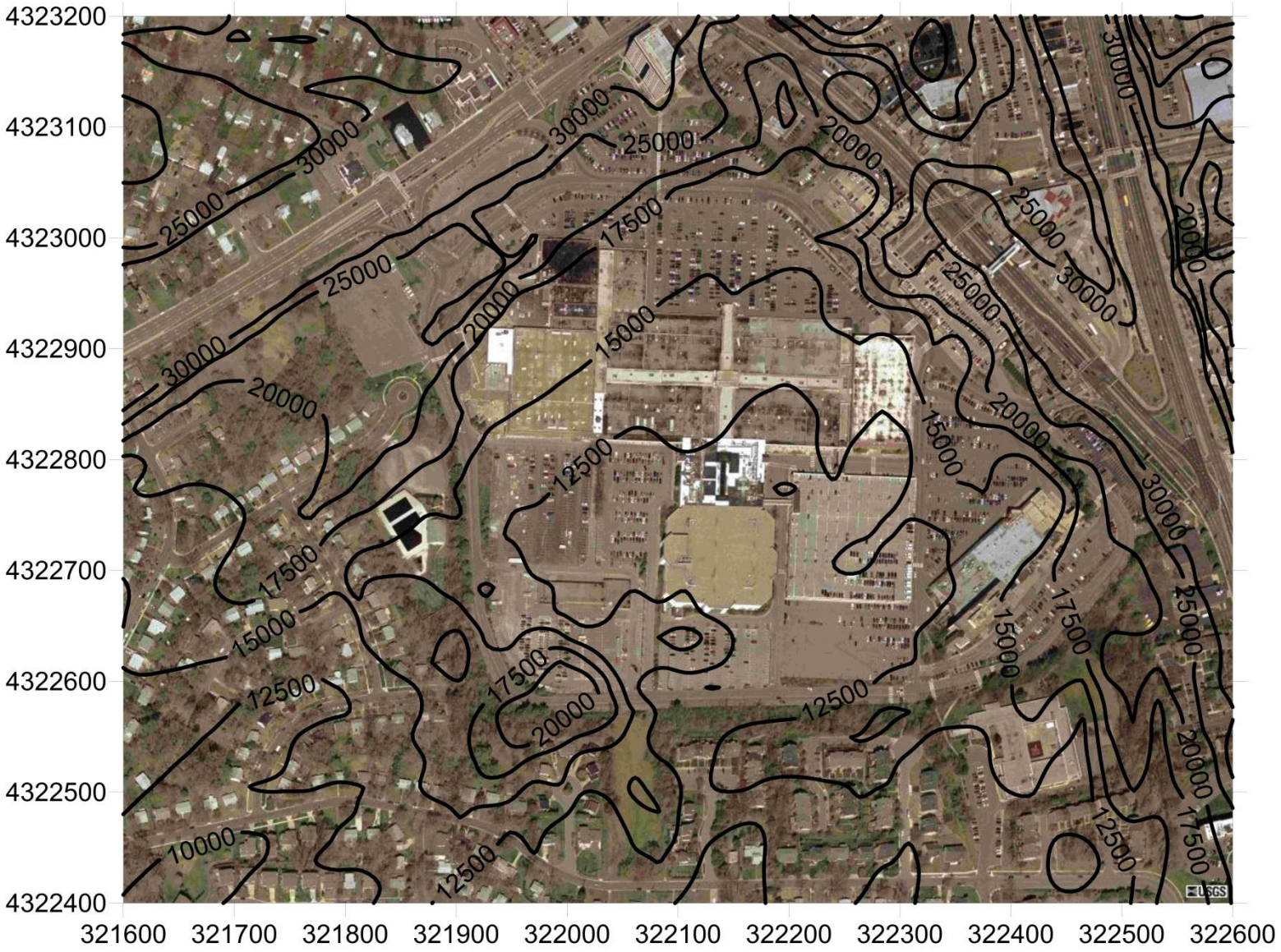


Figure 1-15: Predicted Highest Second-High 8-Hour CO Isopleth Results (µg/m^3) plus 1,145 µg/m^3 Background
NAAQS = 10,000 µg/m^3

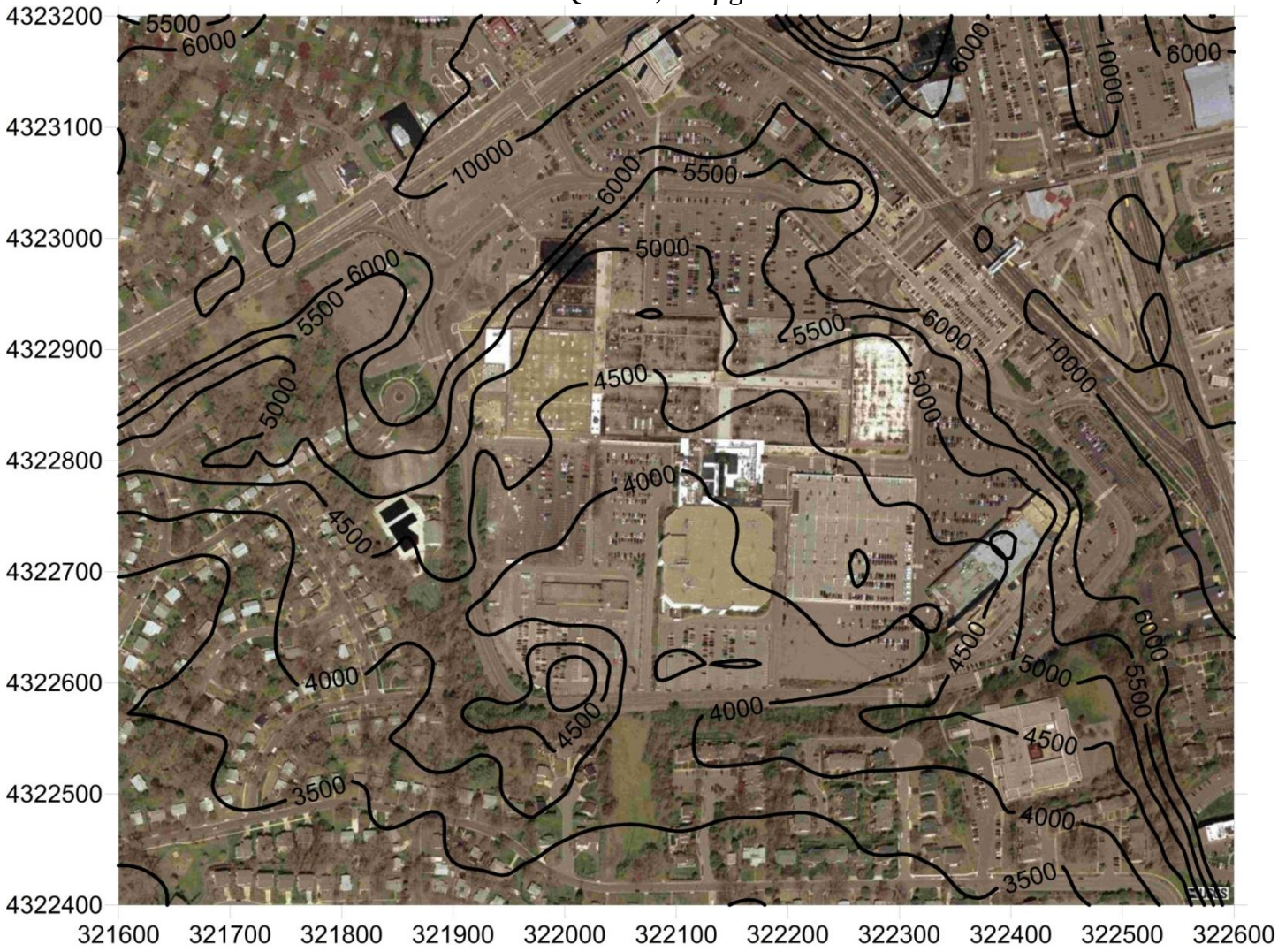


Figure 1-16: Predicted 98th Percentile 1-Hour NO_2 Isopleth Results (µg/m^3) plus 28 µg/m^3 Background
NAAQS = 190 µg/m^3

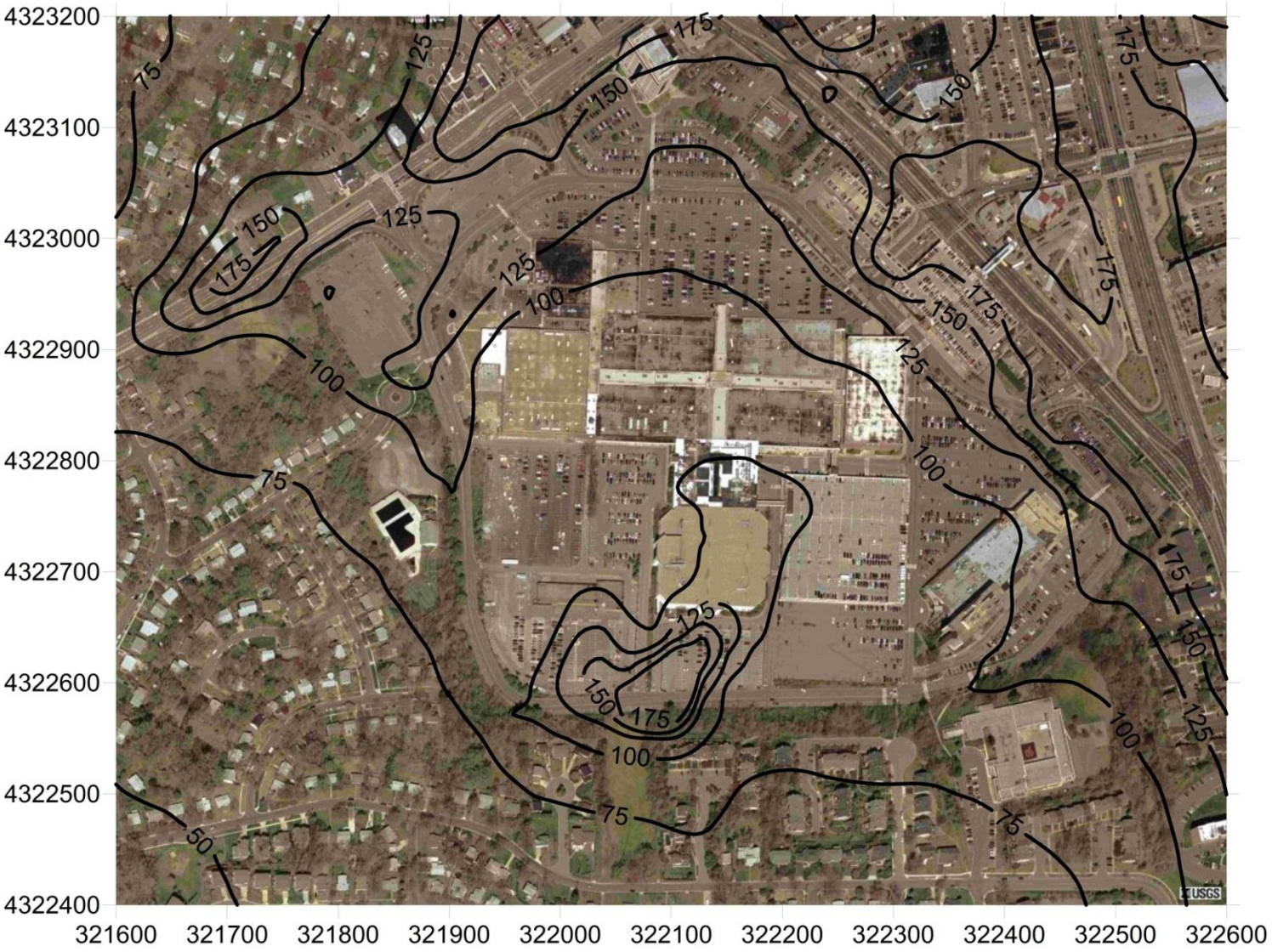


Figure 1-17: Predicted Annual Average NO_2 Isopleth Results (µg/m^3) plus 28 µg/m^3 Background
NAAQS = 100 µg/m^3

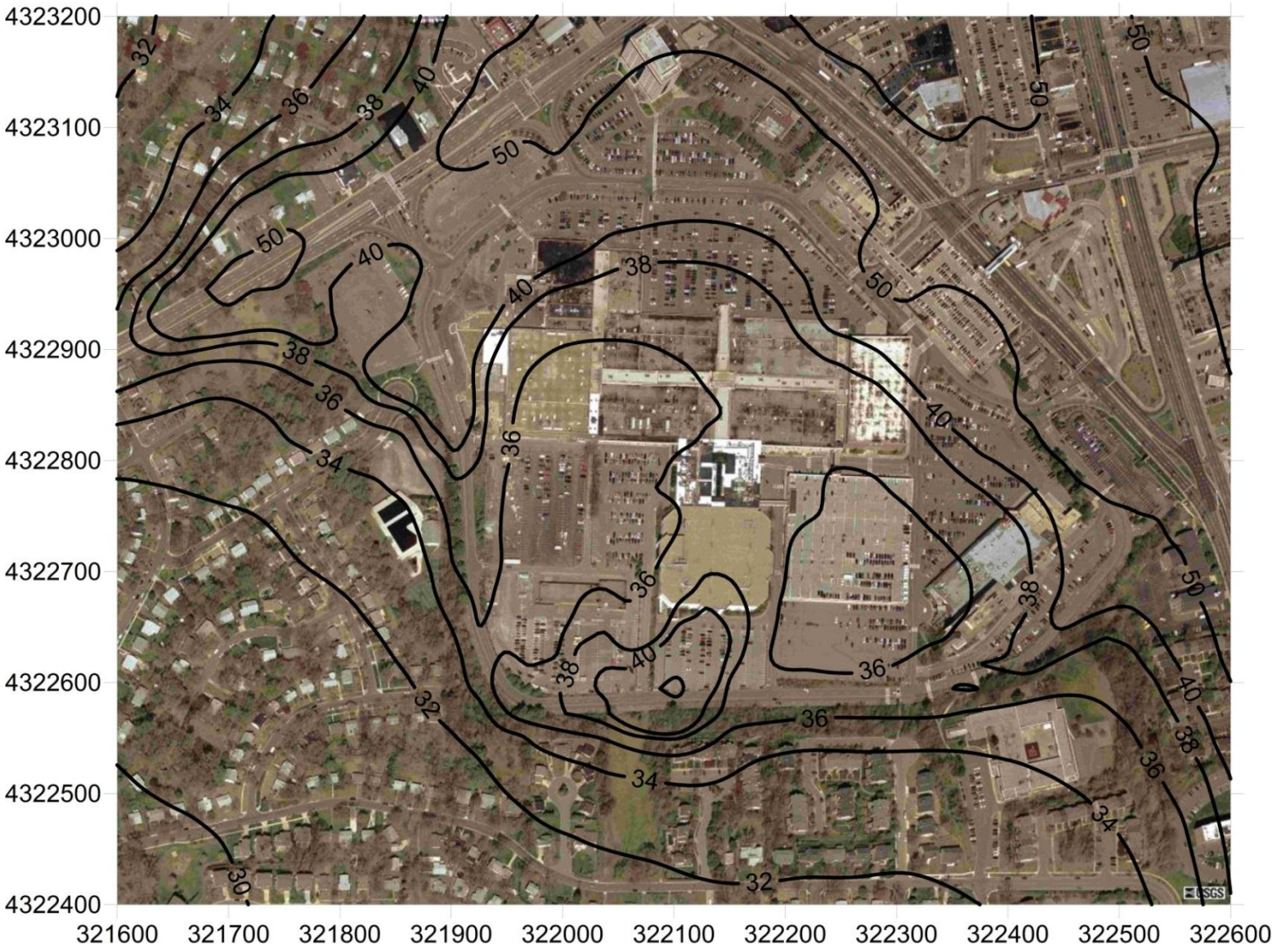


Figure 1-18: Predicted 98th Percentile 24-Hour $PM_{2.5}$ Isopleth Results (µg/m^3) plus 28 µg/m^3 Background
NAAQS = 35 µg/m^3

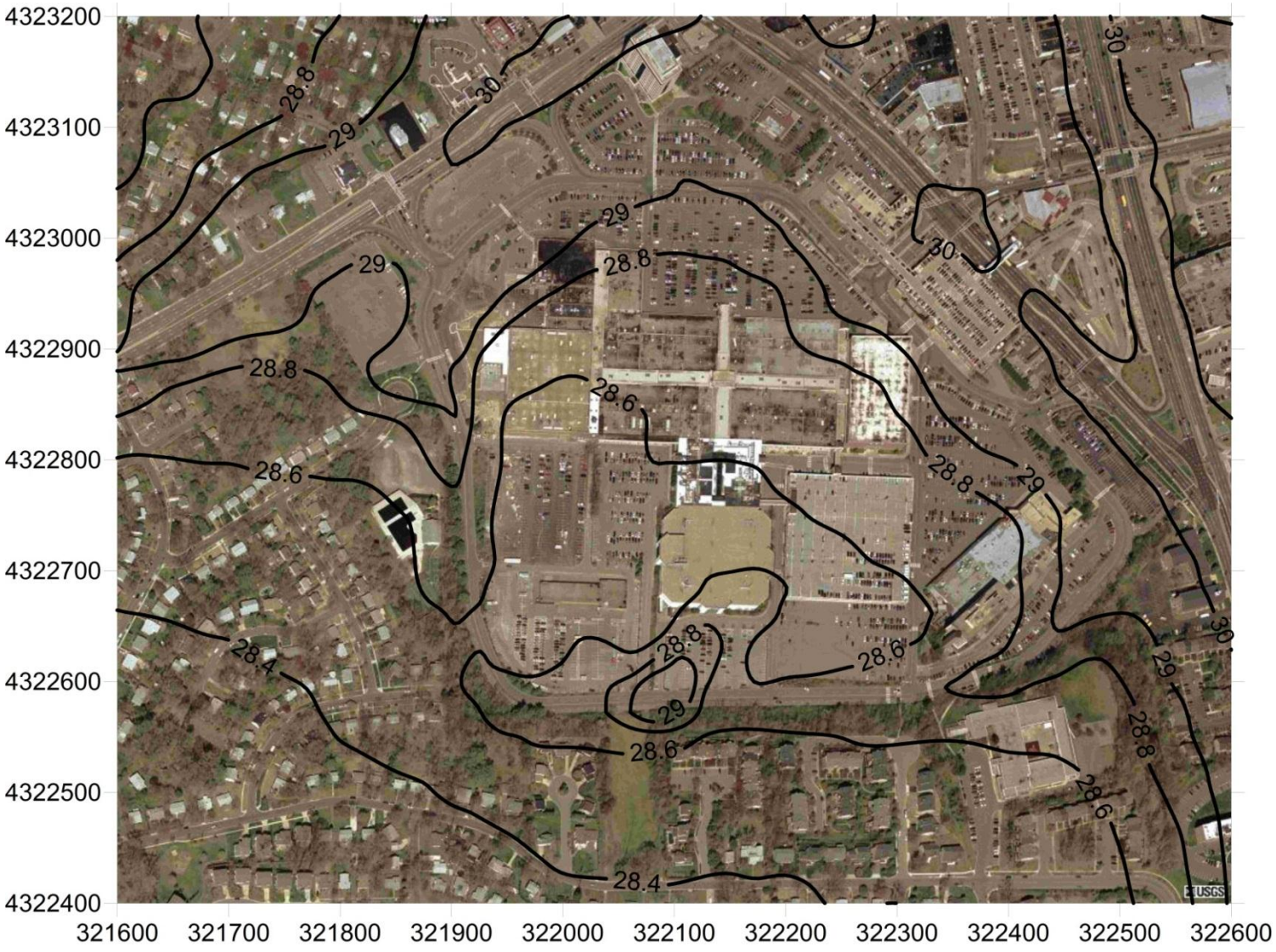


Figure 1-19: Predicted Annual Average $PM_{2.5}$ Isopleth **Total** (All Modeled Sources) Results (µg/m^3) plus 12.1 µg/m^3 Background
NAAQS = 15 µg/m^3

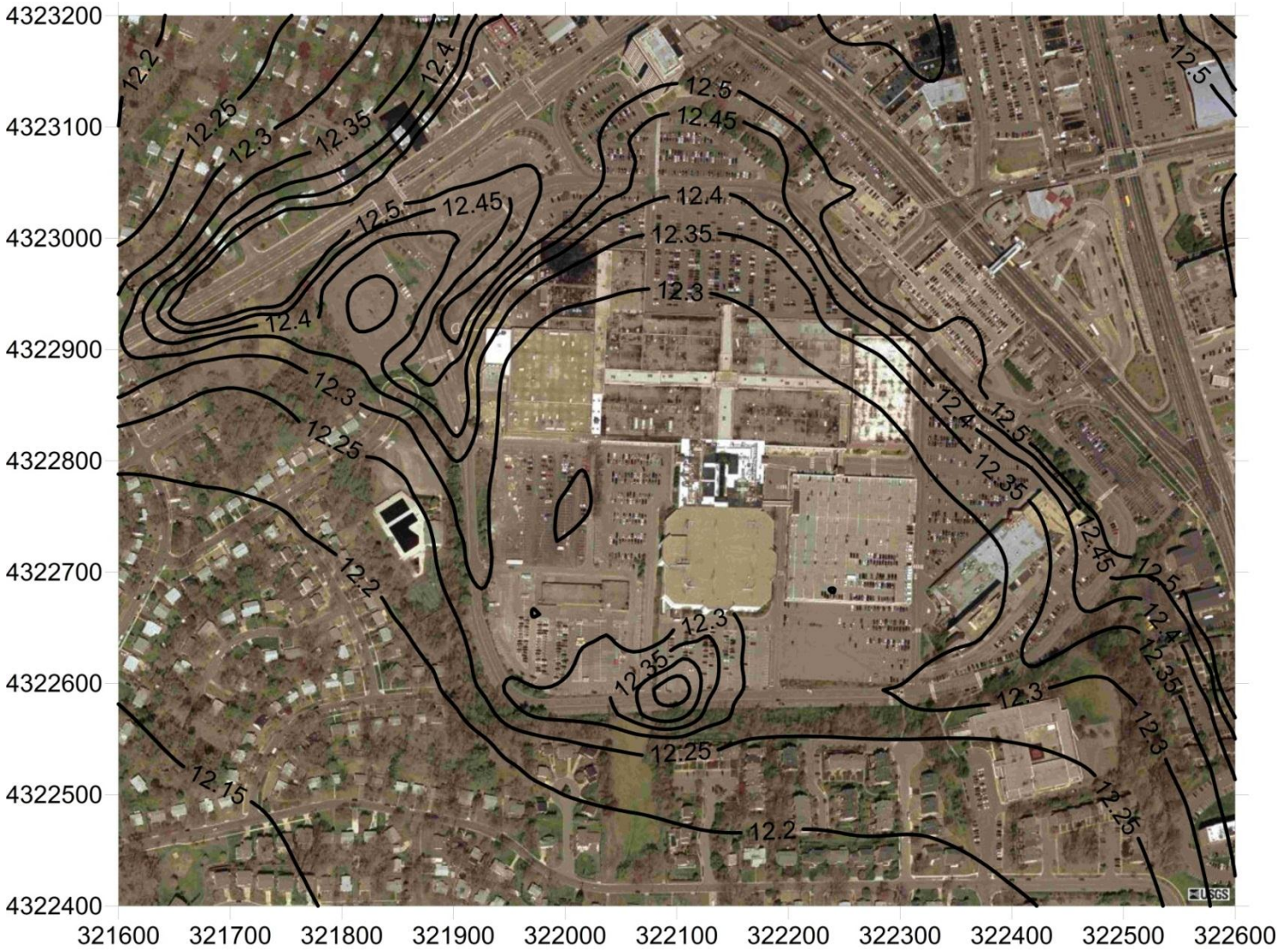


Figure 1-20: Predicted Annual Average $PM_{2.5}$ **Incremental** Isopleth Results (µg/m^3) plus 12.1 µg/m^3 Background
NAAQS = 15 µg/m^3

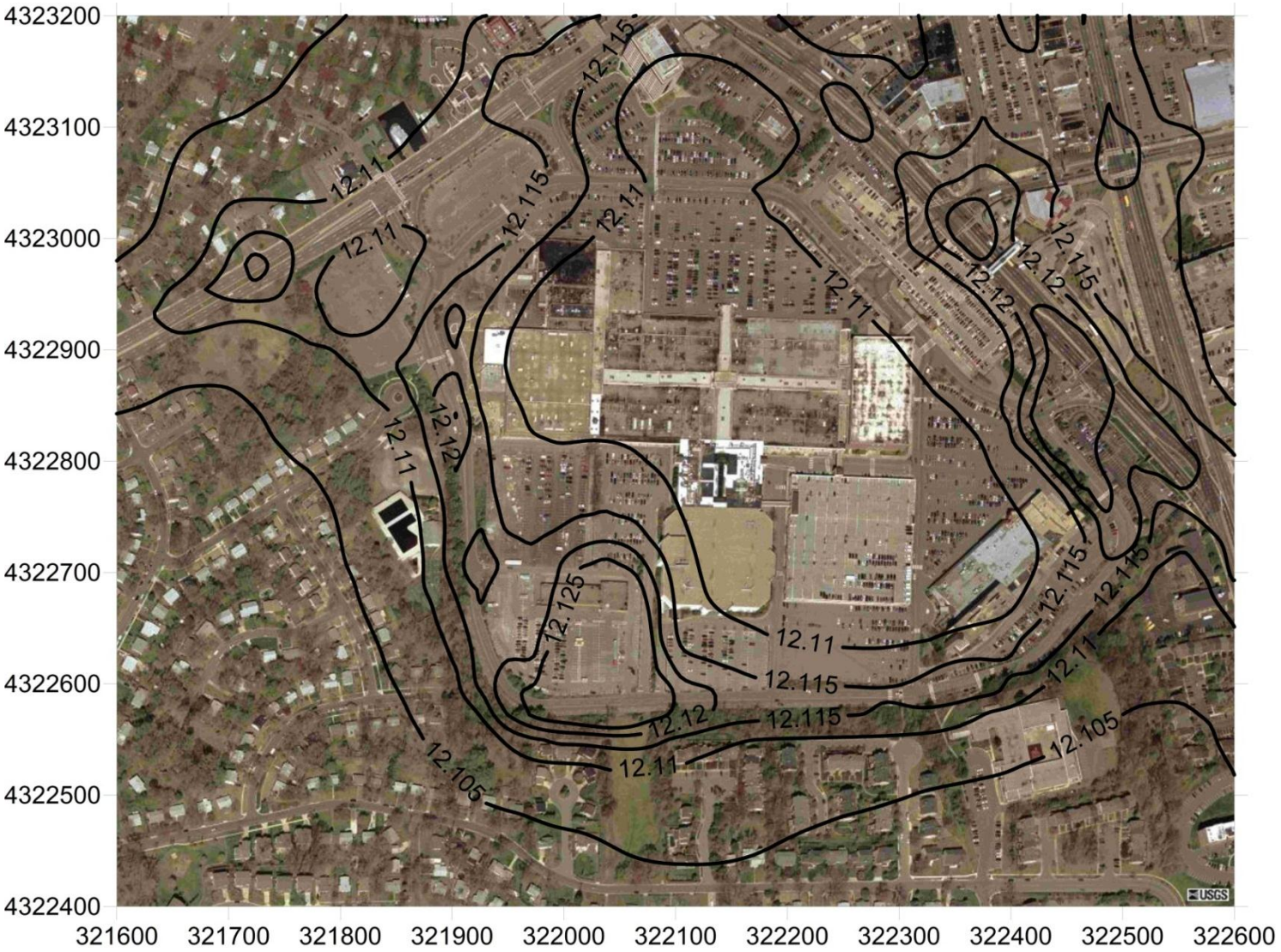


Figure 1-21: Predicted Annual Average VOC Isopleth Results (µg/m^3) for VOC Scenario 1 (**All** Sources)

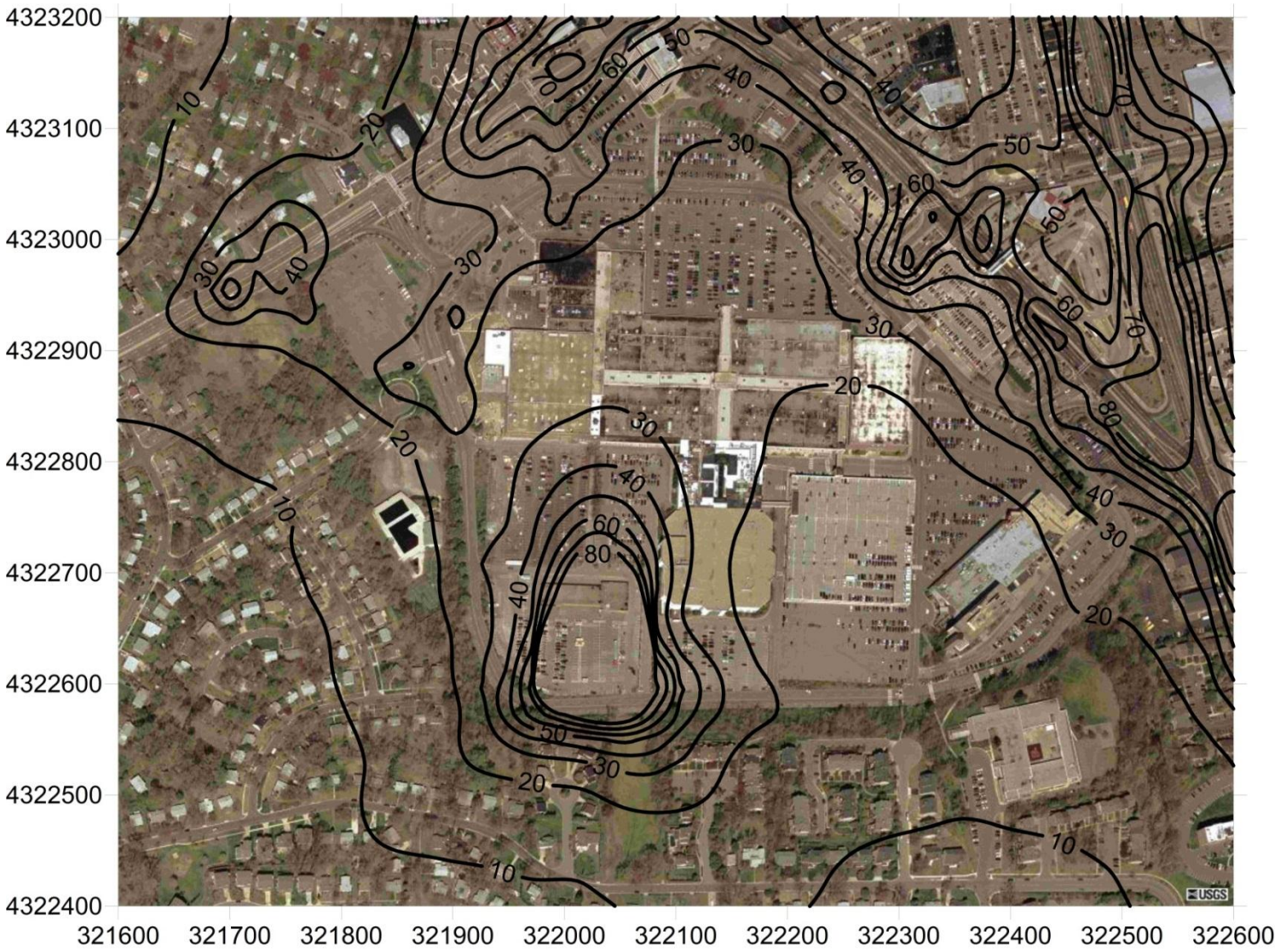


Figure 1-22: Predicted Annual Average VOC Isopleth Results (µg/m^3) for VOC Scenario 2 (**All** Sources)

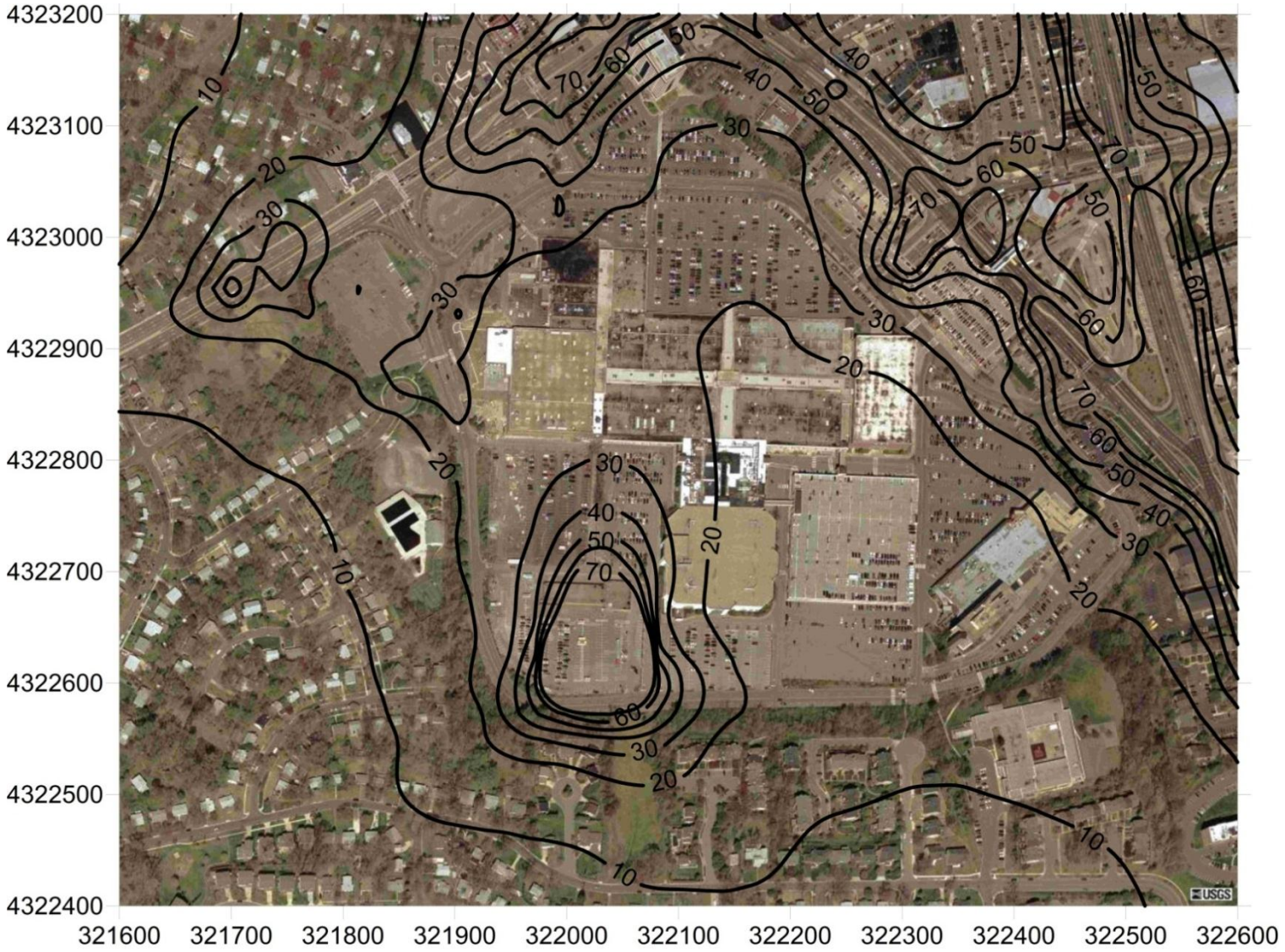


Figure 1-23: Predicted Annual Average VOC Isopleth Results (µg/m^3) for VOC **Incremental** Scenario 2

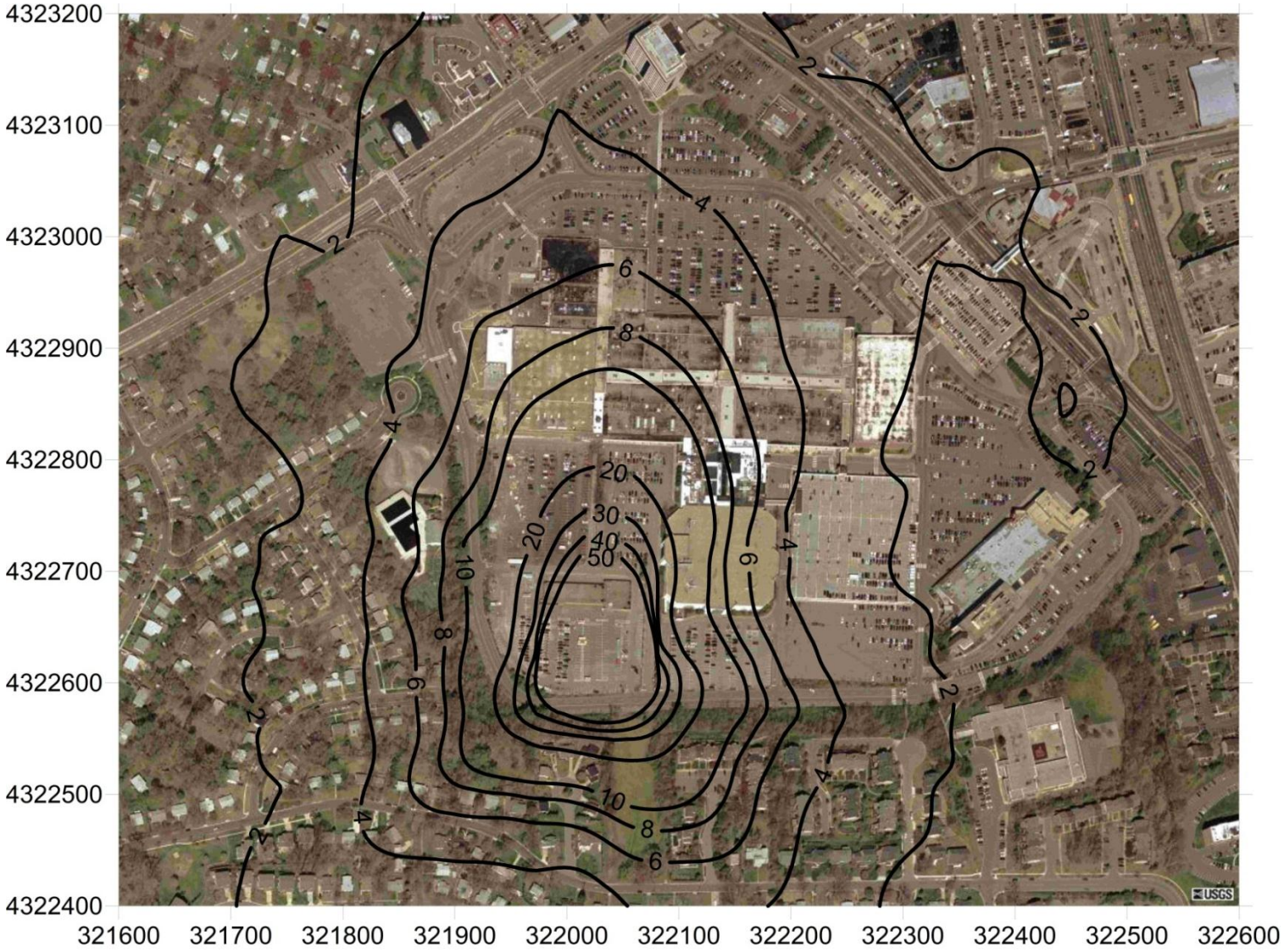


Table 1-11: Summary Table Showing Modeled Rural Concentrations at Pool and School Compared to Average Background[7] Standards (µg/m^3)

Locations	CO 1-Hour Maximum	CO 8-Hour Maximum	NO_2 1-Hour Maximum	NO_2 Annual Average	$PM_{2.5}$ Max 24-hr	$PM_{2.5}$ Annual Average
Pool	12,646	3,361	54	6	0.60	0.13
School	13,480	3,555	63	8	0.71	0.18
Average Background	1,488	1,145	28*		28	12
Total for Pool	14,134	4,506	82	34	28.6	12.1
Total for School	14,968	4,700	91	36	28.7	12.2
Standard	40,000	10,000	190	100	35	15

*The 28 µg/m^3 background value is applicable to the 1-hr averages. It was conservatively used to represent annual average as well.

[7] Average background concentrations were calculated from the raw measured concentrations dataset at the US EPA AirData website for 2010 Washington DC monitoring stations (http://www.epa.gov/airdata)

Table 1-12: Predicted Rural and Urban Concentrations for CO (µg/m^3)

RURAL MET RUNS	CO 1-HR			CO 8-HR		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	7,976.24	1,451.81	6,034.45	619.18	102.83	429.39
ROADWAYS (30 MPH)	7,231	11,487	10,664	2,012	3,038	2,616
RINGROAD	3,186	3,109	3,366	676	591	957
EXITS	216	81	518	46	14	84
ENTRANCE	109	9	54	35	3	14
PARKING	462	152	875	62	29	197
WAREHOUSE HDDV	171	36	40	33	6	6
WAREHOUSE LDDV	63	8	14	11	1	2
VENT	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA
NAAQS	40,000	40,000	40,000	10,000	10,000	10,000
Total Modeled	13,809	13,480	12,646	2,798	3,555	3,361
Background	1,488	1,488	1,488	1,145	1,145	1,145
Modeled +Background	15,297	14,968	14,134	3,943	4,700	4,506

URBAN MET RUNS	CO 1-HR			CO 8-HR		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	1,346.85	93.34	423.87	112.40	11.55	45.90
ROADWAYS (30 MPH)	885	1,370	1,159	318	543	388
RINGROAD	454	457	412	136	119	175
EXITS	38	7	66	9	2	11
ENTRANCE	17	1	3	6	0	1
PARKING	54	25	97	13	6	30
WAREHOUSE HDDV	217	35	42	38	6	6
WAREHOUSE LDDV	78	7	11	13	1	2
VENT	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA
NAAQS	40,000	40,000	40,000	10,000	10,000	10,000
Total Modeled	2,414	1,809	1,605	530	606	565
Background	1,488	1,488	1,488	1,145	1,145	1,145
Modeled +Background	3,902	3,297	3,093	1,675	1,751	1,710

Table 1-13: Predicted Rural and Urban Concentrations for NO_2 ($\mu g/m^3$)

RURAL MET RUNS	NOX 1-HR			NOX ANNUAL		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	14	0.38	1.33	0.22	0.01	0.06
ROADWAYS (30 MPH)	27	53	32	3	5	3
RINGROAD	14	15	19	2	2	2
EXITS	0.66	0.09	0.52	0.07	0.01	0.05
ENTRANCE	0.19	0.00	0.01	0.05	0.00	0.01
PARKING	0.63	0.39	1.03	0.06	0.04	0.10
WAREHOUSE HDDV	25	2	2	1.50	0.20	0.21
WAREHOUSE LDDV	2	0.23	0.24	0.14	0.02	0.02
VENT	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA
NAAQS	190	190	190	100	100	100
Total Modeled	66	63	54	7	8	6
Background	28	28	28	28	28	28
Modeled +Background	94	91	82	35	36	34

URBAN MET RUNS	NOX 1-HR			NOX ANNUAL		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	5	0	1	0.11	0.00	0.02
ROADWAYS (30 MPH)	6	11	7	1	2	1
RINGROAD	5	5	5	1	1	1
EXITS	0.24	0.03	0.25	0.03	0.00	0.02
ENTRANCE	0.07	0.00	0.01	0.03	0.00	0.00
PARKING	0.21	0.10	0.44	0.02	0.01	0.04
WAREHOUSE HDDV	33	2	2	2.50	0.26	0.28
WAREHOUSE LDDV	3	0	0	0.20	0.02	0.02
VENT	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA
NAAQS	190	190	190	100	100	100
Total Modeled	43	16	15	4	3	2
Background	28	28	28			
Modeled +Background	71	44	43	4	3	2

Table 1-14: Predicted Rural and Urban Concentrations for $PM_{2.5}$ ($\mu g/m^3$)

RURAL MET RUNS	PM 24-HR			PM ANNUAL			PM ANNUAL INCREMENTAL		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	2.31E-02	2.55E-03	1.66E-02	3.36E-03	2.00E-04	1.11E-03	3.36E-03	2.00E-04	1.11E-03
ROADWAYS (30 MPH)	3.23E-01	5.83E-01	3.97E-01	6.05E-02	1.24E-01	7.86E-02	1.25E-03	2.03E-03	1.75E-03
RINGROAD	1.76E-01	1.90E-01	2.19E-01	4.87E-02	5.24E-02	4.56E-02	6.05E-03	6.53E-03	5.39E-03
EXITS	9.42E-03	2.43E-03	1.58E-02	1.67E-03	2.23E-04	1.43E-03	9.57E-04	1.27E-04	8.27E-04
ENTRANCE	5.27E-03	2.83E-04	2.09E-03	6.60E-04	2.33E-05	1.47E-04	3.40E-04	1.00E-05	7.67E-05
PARKING	6.43E-03	3.05E-03	1.34E-02	1.07E-03	5.87E-04	1.68E-03	NA	NA	NA
WAREHOUSE HDDV	7.04E-02	1.12E-02	1.24E-02	1.10E-02	1.45E-03	1.57E-03	NA	NA	NA
WAREHOUSE LDDV	5.15E-02	6.30E-03	9.00E-03	8.79E-03	8.93E-04	1.13E-03	NA	NA	NA
VENT	NA	NA	NA	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAS DELIVERY	NA	NA	NA	NA	NA	NA	0.012	0.009	0.009
NAAQS	35	35	35	15	15	15	15	15	15
Total Modeled	0.58	0.71	0.60	0.14	0.18	0.13	1.20E-02	8.88E-03	9.11E-03
Background	28	28	28	12.1	12.1	12.1	12.1	12.1	12.1
Modeled +Background	28.58	28.71	28.60	12.24	12.28	12.23	12.11	12.11	12.11

URBAN MET RUNS	PM 24-HR			PM ANNUAL			PM ANNUAL INCREMENTAL		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	6.78E-03	4.83E-04	1.92E-03	1.68E-03	6.67E-05	2.80E-04	1.68E-03	6.67E-05	2.80E-04
ROADWAYS (30 MPH)	7.03E-02	1.23E-01	9.16E-02	1.62E-02	3.46E-02	2.32E-02	3.30E-04	5.77E-04	5.50E-04
RINGROAD	5.53E-02	5.98E-02	6.30E-02	1.88E-02	2.17E-02	1.74E-02	2.37E-03	2.72E-03	2.10E-03
EXITS	2.72E-03	4.03E-04	2.86E-03	6.77E-04	6.67E-05	4.63E-04	3.87E-04	3.67E-05	2.70E-04
ENTRANCE	1.45E-03	6.00E-05	2.37E-04	3.57E-04	1.00E-05	3.33E-05	1.87E-04	0.00E+00	2.00E-05
PARKING	1.53E-03	7.03E-04	3.20E-03	3.97E-04	2.13E-04	5.87E-04	NA	NA	NA
WAREHOUSE HDDV	1.04E-01	1.08E-02	1.23E-02	1.82E-02	1.87E-03	2.06E-03	NA	NA	NA
WAREHOUSE LDDV	6.70E-02	6.21E-03	9.16E-03	1.22E-02	1.09E-03	1.39E-03	NA	NA	NA
VENT	NA	NA	NA	NA	NA	NA	NA	NA	NA
FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
FUELING	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPILLAGE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAJOR SPILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAS DELIVERY	NA	NA	NA	NA	NA	NA	4.95E-03	3.41E-03	3.21E-03
NAAQS	35	35	35	15	15	15	15	15	15
Total Modeled	0.27	0.17	0.16	0.07	0.06	0.04	4.95E-03	3.41E-03	3.21E-03
Background	28	28	28	12.1	12.1	12.1	12.1	12.1	12.1
Modeled +Background	28.27	28.17	28.16	12.17	12.16	12.14	12.10	12.10	12.10

1.8.1 Evaluation of Diesel Emission Risks

Diesel emissions and ultrafine particulates have been raised as a potential area of concern for the gas station. Considering the extremely low concentrations of fine particulates (0.01 $\mu g/m^3$) from the incremental Costco emissions, these concerns are not supported by the modeling analysis. Comparison of clean diesel technology (as used by the Costco heavy duty trucks servicing their gas station and warehouse) to older studies on diesel technology of the past is an apples-to-oranges comparison that is not appropriate.

The totals concentrations shown for $PM_{2.5}$ include nearby roads and existing Ring Road traffic at the mall. When considering only incremental impacts from gas station operations, the highest annual average incremental $PM_{2.5}$ contribution in residential areas is approximately 0.01 $\mu g/m^3$ relative to a standard of 15 $\mu g/m^3$ i.e., about 1,500 times below the standard at the most affected location.[8] Such low contributions to background are not significant. The EPA national ambient air quality standards, developed by the U.S. EPA to protect public health of welfare with a wide margin of safety, are much higher than the incremental impacts associated with these exposures and demonstrate attainment of standards with a large margin for all pollutants emitted in significant quantities by the gas station operation.

If EPA determines in the future that ultrafine particulates need to be regulated with a different standard, this would likely be addressed at the national fleet level through motor vehicle controls for diesel and gasoline vehicles. Traffic near major roadways would be much more significantly affected by this issue than a specific gas station.

Based on our refined modeling analysis, the incremental $PM_{2.5}$ emissions from mobile sources, including the four diesel delivery trucks per day to the gas station is 0.01 $\mu g/m^3$ at the most affected nearby receptor. On this basis, there clearly is not a significant health risk. Furthermore, it should be noted that EPA regulates fine particulates, of which diesel particulates are clearly considered, with a 24-hour and annual standard. In terms of long-term risk the annual standard of 15 $\mu g/m^3$ is most relevant. A maximum incremental impact of 0.01 versus 15 $\mu g/m^3$ represents a fraction of 0.0007 of the standard (or 0.07 percent).

[8] EPA is considering lowering the fine particulate standard from 15 $\mu g/m^3$ to 12 or 13 $\mu g/m^3$. Even at 12 $\mu g/m^3$ the incremental contribution from gas station operations would be 1,000 times below the standard.

A research report on the evaluation of the carcinogenic hazard of diesel engine exhaust (McClellan, et. al., 2012) stated the following: *"The finding that extracts of diesel exhaust particulate matter contained mutagenic chemicals was viewed as presumptive evidence that exposure to diesel exhaust particulate matter could pose a carcinogenic hazard."* The report determined that the New Technology Diesel Exhaust (NTDE) systems are very effective in substantially reducing and changing particulate matter exhaust as compared to Traditional Diesel Exhaust (TDE) emissions. They noted that the key changes between the new and the old are: lower particulate mass emissions, different chemical composition, lower particle number emissions, altered composition of the semi-volatile fraction, and lower concentrations of unregulated pollutants. The report went on further to state: "*The extensive characterization of NTDE has clearly established that the emissions are substantially lower than the applicable, very stringent regulatory emission standards. Moreover, the detailed chemical characterization gives confidence that the emissions do not contain any unique constituents that might pose a hazard to human health. The new technology heavy-duty engines with ultra-low particulate emissions were introduced into the market for on-road use in 2007 as required by US regulations, and have been well received by customers. Starting in 2010, the engines marketed in the USA continue to have ultra-low particulate mass emissions and, in addition, even lower NOx emissions than the 2007 model engines. In future years, the number of NTDE units will increase and the number of TDE units will decrease in the on-road fleet. Moreover, a similar shift will follow with off-road diesel-power equipment."*

The report (McClellan, et. al., 2012) then concluded with this: *"The composition of New Technology Diesel Exhaust (NTDE) is qualitatively different and the concentrations of particulate constituents are more than 90% lower than for Traditional Diesel Exhaust (TDE). We recommend that future reviews of carcinogenic hazards of diesel exhaust evaluate NTDE separately from TDE."*

Note that for perspective (only), the incremental VOC risks from the Costco warehouse operations are shown in Appendix AD. These values are not relevant to the gas station operations, which are the subject of the Special Exception hearing.

1.8.2 VOC Cancer Potency Scores and Predicted 70-Year Cancer Risk

There are four VOC compounds with cancer potency scores available from the EPA IRIS data base, which are associated with gasoline combustion and gasoline constituents. The unit risk factors for these four compounds obtained from EPA's IRIS dataset are the following:

- Benzene: 7.8×10^{-6}
- 1,3-Butadiene: 3.0×10^{-5}
- Formaldehyde: 1.3×10^{-5}
- Acetaldehyde: 2.2×10^{-6}

Table 1-15 provides the predicted concentrations and calculations of risks for both rural and urban model scenarios based on the four carcinogenic compounds, as listed above, for gasoline and gasoline combustion sources from the modeled annualized VOC concentrations at the nearest residential area, school, and pool locations.[9]

[9] It should be noted that the U.S. Environmental Protection Agency uses cancer potency factors for risk assessment and risk management purposes. These values are generally derived with a wide margin of safety, and are not generally considered in an absolute sense as indicators of actual cancer risks.

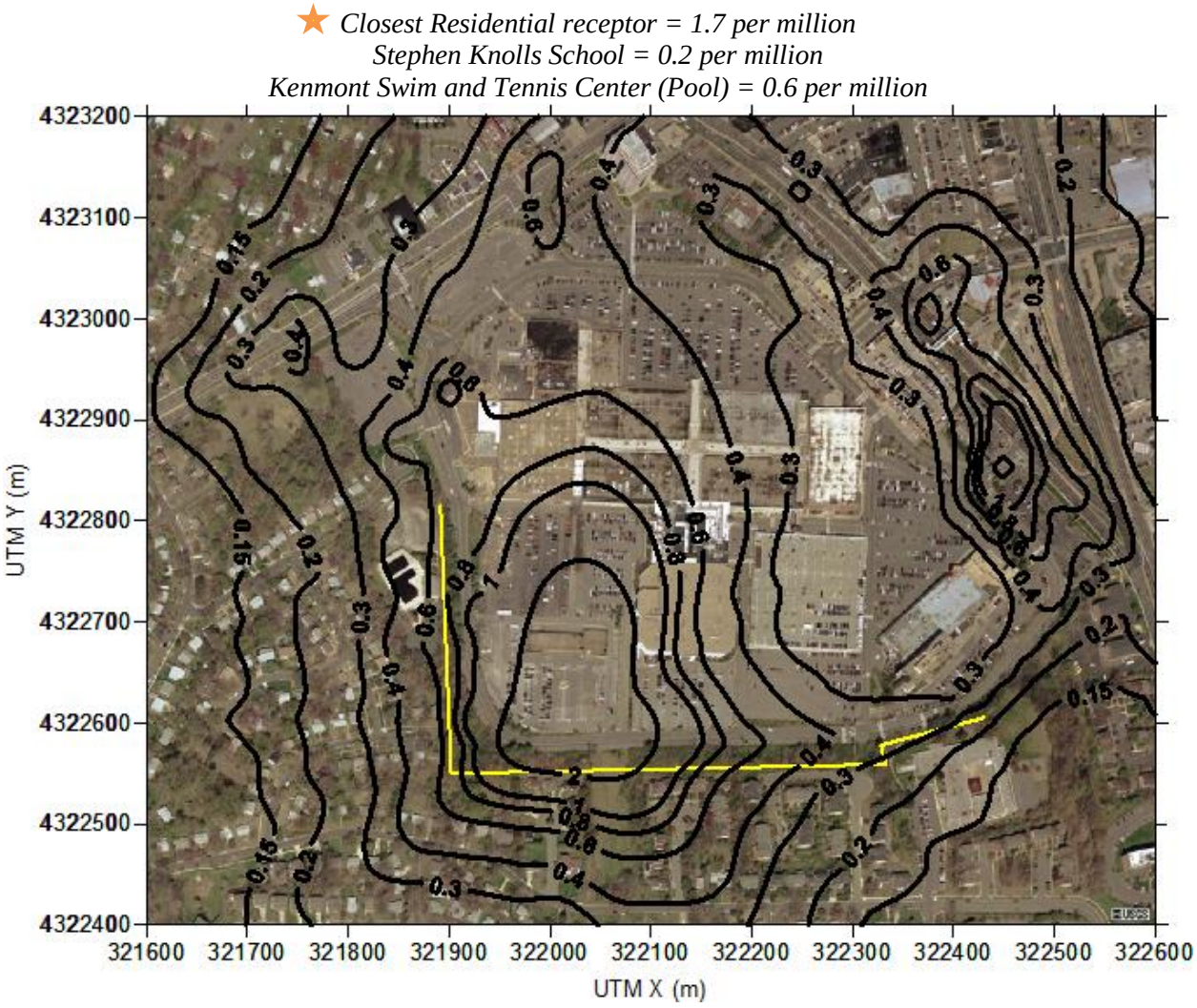
Table 1-15: Predicted Rural and Urban Concentrations and Risk for VOC (µg/m^3)

RURAL MET RUNS	VOC ANNUAL Scenario 1			VOC ANNUAL INCREMENTAL Scenario 1			VOC ANNUAL Scenario 2			VOC ANNUAL INCREMENTAL Scenario 2		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	0.79	0.04	0.23	0.79	0.04	0.23	0.79	0.04	0.23	0.79	0.04	0.23
ROADWAYS (30 MPH)	5.16	9.73	6.74	0.06	0.09	0.08	5.16	9.73	6.74	0.06	0.09	0.08
RINGROAD	1.56	1.71	1.45	0.16	0.18	0.14	1.56	1.71	1.45	0.16	0.18	0.14
EXITS	0.06	0.01	0.04	0.03	3.78E-03	0.02	0.06	0.01	0.04	0.03	3.78E-03	0.02
ENTRANCE	0.14	4.86E-03	0.03	0.07	2.29E-03	0.01	0.14	4.86E-03	0.03	0.07	2.29E-03	0.01
PARKING	0.24	0.14	0.38	NA	NA	NA	0.24	0.14	0.38	NA	NA	NA
WAREHOUSE HDDV	0.05	0.01	0.01	NA	NA	NA	0.05	0.01	0.01	NA	NA	NA
WAREHOUSE LDDV	0.14	0.02	0.02	NA	NA	NA	0.14	0.02	0.02	NA	NA	NA
VENT	0.09	0.01	0.03	0.09	0.01	0.03	0.09	0.01	0.03	0.09	0.01	0.03
FILL	6.18	0.20	1.50	6.18	0.20	1.50	6.18	0.20	1.50	6.18	0.20	1.50
FUELING	12.00	0.86	4.05	12.00	0.86	4.05	8.42	0.60	2.84	8.42	0.60	2.84
SPILLAGE	7.90	0.55	2.59	7.90	0.55	2.59	3.95	0.27	1.30	3.95	0.27	1.30
MAJOR SPILL	0.03	2.05E-03	0.01	0.03	2.05E-03	0.01	0.03	2.05E-03	0.01	0.03	2.05E-03	0.01
GAS DELIVERY	NA	NA	NA	0.014	0.015	0.014	NA	NA	NA	0.014	0.015	0.014
Total Modeled	34.34	13.27	17.08	27.30	1.93	8.67	26.81	12.74	14.58	19.77	1.40	6.16
			Cancer Risks	1.83E-06	2.39E-07	6.44E-07			Cancer Risks	1.46E-06	2.13E-07	5.23E-07
			70 Year Concentrations	26.98	1.83	8.51			70 Year Concentrations	19.45	1.30	6.01
			70 Year Cancer Risks	1.66E-06	1.85E-07	5.66E-07			70 Year Cancer Risks	1.30E-06	1.60E-07	4.45E-07

URBAN MET RUNS	VOC ANNUAL Scenario 1			VOC ANNUAL INCREMENTAL Scenario 1			VOC ANNUAL Scenario 2			VOC ANNUAL INCREMENTAL Scenario 2		
SOURCES	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL	HOME	SCHOOL	POOL
GAS QUEUE	3.90E-01	1.60E-02	6.31E-02	3.90E-01	1.60E-02	6.31E-02	3.90E-01	1.60E-02	6.31E-02	3.90E-01	1.60E-02	6.31E-02
ROADWAYS (30 MPH)	1.38E+00	2.89E+00	1.98E+00	1.48E-02	2.62E-02	2.49E-02	1.38E+00	2.89E+00	1.98E+00	1.48E-02	2.62E-02	2.49E-02
RINGROAD	6.08E-01	7.07E-01	5.58E-01	6.43E-02	7.46E-02	5.57E-02	6.08E-01	7.07E-01	5.58E-01	6.43E-02	7.46E-02	5.57E-02
EXITS	2.33E-02	2.40E-03	1.50E-02	1.13E-02	1.17E-03	7.30E-03	2.33E-02	2.40E-03	1.50E-02	1.13E-02	1.17E-03	7.30E-03
ENTRANCE	7.47E-02	1.82E-03	7.05E-03	3.52E-02	8.60E-04	3.32E-03	7.47E-02	1.82E-03	7.05E-03	3.52E-02	8.60E-04	3.32E-03
PARKING	8.98E-02	5.11E-02	1.33E-01	NA	NA	NA	8.98E-02	5.11E-02	1.33E-01	NA	NA	NA
WAREHOUSE HDDV	9.04E-02	9.46E-03	1.02E-02	NA	NA	NA	9.04E-02	9.46E-03	1.02E-02	NA	NA	NA
WAREHOUSE LDDV	2.00E-01	1.90E-02	2.23E-02	NA	NA	NA	2.00E-01	1.90E-02	2.23E-02	NA	NA	NA
VENT	6.14E-02	3.38E-03	1.56E-02	6.14E-02	3.38E-03	1.56E-02	6.14E-02	3.38E-03	1.56E-02	6.14E-02	3.38E-03	1.56E-02
FILL	2.34	8.42E-02	0.41	2.34	8.42E-02	0.41	2.34E+00	8.42E-02	0.41	2.34	8.42E-02	0.41
FUELING	5.91	0.30	1.19	5.91	0.30	1.19	4.15E+00	0.21	0.84	4.15	0.21	0.84
SPILLAGE	3.72	0.19	0.74	3.72	0.19	0.74	1.86E+00	9.53E-02	0.37	1.86	9.53E-02	0.37
MAJOR SPILL	1.40E-02	7.20E-04	2.79E-03	1.40E-02	7.20E-04	2.79E-03	1.40E-02	7.20E-04	2.79E-03	1.40E-02	7.20E-04	2.79E-03
GAS DELIVERY	NA	NA	NA	5.36E-03	5.66E-03	4.94E-03	NA	NA	NA	5.36E-03	5.66E-03	4.94E-03
Total Modeled	14.91	4.28	5.16	12.56	0.70	2.52	11.28	4.09	4.43	8.94	0.51	1.80
			Cancer Risks	8.45E-07	8.85E-08	1.93E-07			Cancer Risks	6.70E-07	7.96E-08	1.58E-07
			70 Year Concentrations	12.41	0.66	2.47			70 Year Concentrations	8.78	0.47	1.75
			70 Year Cancer Risks	7.68E-07	6.84E-08	1.68E-07			70 Year Cancer Risks	5.92E-07	5.95E-08	1.33E-07

Figure 1-24 presents an isopleth plot of the 70-year VOC risks (at 100 percent occupancy) for the entire model domain. As can be noted in that plot, all nearby residential areas are less than 2 per million and well below the CARB action level of 10 in a million (BAAQMD, 2009; CARB, 2008; CAPCOA, 1990).

Figure 1-24: Predicted 70-Year VOC Risk per Million Analysis Based on Rural Land Use*

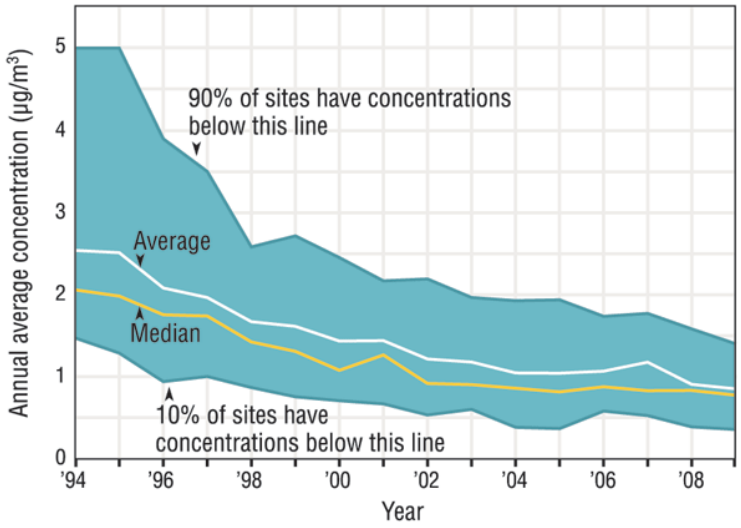


*Assuming 100 percent occupancy.

For perspective, the following was extracted from the EPA reference:

http://cfpub.epa.gov/eroe/index.cfm?fuseaction=detail.viewMidImg&lShowInd=0&subtop=341&lv=list.listByAlpha&r=216617#11302

Exhibit 2-43. Ambient benzene concentrations in the U.S., 1994-2009[a]



[a]**Coverage:** 22 monitoring sites nationwide (out of a total of 339 sites measuring benzene in 2009) that have sufficient data to assess benzene trends since 1994.

Data source: *U.S. EPA, 2010*

Most of the monitoring sites used by EPA in the 2010 report to show pollution concentration trends are located within metropolitan areas. The average benzene concentration in the most recent summary (2008) shows concentration levels of approximately 0.9 µg/m^3. Per the unit risk factors, this would translate to a typical cancer risk indicator of 7 in one million, which is approximately 7 times more than the maximum annual average concentration of benzene that was modeled as incremental risk in the residential area near the proposed facility. If a similar analysis were to be done for the wide range of compounds in a typical metropolitan environment, separate and apart from gas stations, substantially higher cancer risk indicators would be shown.

For perspective, based on the modeling of 80 pollutants, EPA estimated based on 2005 emissions data that in Montgomery County, Maryland, the total cancer risk is 65 in a million (U.S. EPA, 2010). Similarly, the measurement of 64 pollutants in the Washington, D.C. and Baltimore metropolitan areas, the cancer risk is shown to be in the range of 70 to 370 in a million (U.S. EPA, 2007). If more pollutants were evaluated, including secondary formed pollutants, the computed totals would further increase.

There have been updates in cancer potency scores and other changes that would need to be considered to fully place these analyses in perspective, but the fact is that using the risk assessment methodology, which is generally considered to be a conservative assessment, the actual computed risks are much higher than the incremental risks computed for the Costco gas station. In other words, the modeled values at the residential locations closest to the proposed Costco gas station are shown to have incremental concentrations from the proposed facility that are well below typical levels in metropolitan areas.

When estimated risks remain below 10 in a million, the source is considered a low priority and further review is not needed based on the CARB procedures (see Section 1.11). When incremental cancer risks are estimated to exceed 10 in a million, or the CARB screening notification level, further review is required. Risks are ~ 1 in a million at the highest location based on consideration of 70-year exposures, including conservatively accounting for projected emission reductions based on MOBILE 6.2 for the Montgomery County fleet mix. This 70-year projected cancer risk assessment is likely to be very conservative because of major changes in the future to further reduce emissions, such as conversion to natural gas and greater use of electric cars.

It also is a well-established fact that risk assessments of airborne exposures in the U.S. are conducted, when required, on an incremental basis (U.S. EPA, 2012; CAPCOA, 1997).

1.8.3 Addressing Conservative Background Treatment

Tables 1-16 through 1-20 present a comparative analysis showing the results using the default conservative background treatment as directly used in this modeling analysis compared to the results using background concentrations that match in date and time to the modeled maximums.

Table 1-16: Comparison of Maximum Modeled 1-Hour CO Concentrations Based on Conservative Representation of Background Concentrations in Comparison to Actual Measured Background Concentrations based on Matched Time Period

Receptor	**Maximum Modeled Value ($\mu g/m^3$) Without Background**	**Conservative Background ($\mu g/m^3$)**	**Actual Background For Time Period Of Maximum[10]**	**With Conservative Background**	**With Actual Background**
Closest Residence	**13,809**	**1,488**	**N/A [12/25/06]**	**15,297**	**N/A**
Stephen Knolls School	**13,480**	**1,488**	**N/A [12/25/06]**	**14,968**	**N/A**
Kenmont Swim and Tennis Center	**12,646**	**1,488**	**N/A [12/11/06]**	**14,134**	**N/A**

Standard= 40,000 $\mu g/m^3$

The difference between concentrations based on actual background versus concentrations based on maximum three year averages is effectively accounting for all other sources beyond the sources that were specifically modeled. The use of conservative background treatments, as required in EPA modeling methods, produces substantially higher modeled impacts than if it were feasible to model all sources in Montgomery County and beyond, including roadways, commercial operations, and so forth.

[10] CO 1-hr background values were not available from Montgomery county at this time

Table 1-17: Comparison of Maximum Modeled 8-Hour CO Concentrations Based on Conservative Representation of Background Concentrations in Comparison to Actual Measured Background Concentrations based on Matched Time Period Data

Receptor	**Maximum Modeled Value (µg/m^3) Without Background**	**Conservative Background (µg/m^3)**	**Actual Background For Time Period Of Maximum**	**With Conservative Background**	**With Actual Background**
Closest Residence	**2,798**	**1,145**	**458 [12/16/2010]**	**3,943**	**3,256**
Stephen Knolls School	**3,555**	**1,145**	**458 [12/16/2010]**	**4,700**	**4,013**
Kenmont Swim and Tennis Center	**3,361**	**1,145**	**572 [01/06/2008]**	**4,506**	**3,933**

Standard= 10,000 µg/m^3

Table 1-18: Comparison of Maximum Modeled 1-Hour NO_2[11] Concentrations Based on Conservative Representation of Background Concentrations in Comparison to Actual Measured Background Concentrations based on Matched Time Period Data

Receptor	**Maximum Modeled Value (µg/m^3) Without Background**	**Conservative Background (µg/m^3)**	**Actual Background For Time Period Of Maximum**	**With Conservative Background**	**With Actual Background**
Closest Residence	**66**	**28**	**24 [03/21/08]**	**94**	**90**
Stephen Knolls School	**63**	**28**	**13 [12/02/09]**	**91**	**76**
Kenmont Swim and Tennis Center	**54**	**28**	**17 [01/11/08]**	**82**	**71**

Standard= 190 µg/m^3

[11] NO2 annual concentrations table is planned to be completed in a supplemental report.

Table 1-19: Comparison of Maximum Modeled 24-Hour $PM_{2.5}$ Concentrations Based on Conservative Representation of Background Concentrations in Comparison to Actual Measured Background Concentrations based on Matched Time Period Data

Receptor	**Maximum Modeled Value ($\mu g/m^3$) Without Background**	**Conservative Background ($\mu g/m^3$)**	**Actual Background For Time Period Of Maximum**	**With Conservative Background**	**With Actual Background**
Closest Residence	**0.58**	**28**	**16.2 [12/22/06]**	**29**	**N/A**
Stephen Knolls School	**0.71**	**28**	**10.5 [11/25/06]**	**29**	**N/A**
Kenmont Swim and Tennis Center	**0.60**	**28**	**10.5 [11/25/06]**	**29**	**N/A**

Standard= 35 $\mu g/m^3$

Table 1-20: Comparison of Modeled Annual Average $PM_{2.5}$ Concentrations Based on Conservative Representation of Background Concentrations in Comparison to Actual Measured Background Concentrations based on Matched Time Period Data

Receptor	**Maximum Modeled Value ($\mu g/m^3$) Without Background**	**Conservative Background ($\mu g/m^3$)**	**Actual Background For Time Period Of Maximum**	**With Conservative Background**	**With Actual Background**
Closest Residence	**0.14**	**12**	**10.5 [2009]**	**12**	**10.6**
Stephen Knolls School	**0.18**	**12**	**10.5 [2009]**	**12**	**10.7**
Kenmont Swim and Tennis Center	**0.13**	**12**	**10.5 [2009]**	**12**	**10.6**

Standard= 15 $\mu g/m^3$

1.9 Comparative Analysis

Table 1-21 provides context for the general VOC emissions from the gas station sources as characterized by the emission rates calculated above and compares them to the following perspectives: (a) VOC emissions from mobile sources for Montgomery County and (b) VOC Emissions for All Sources in Montgomery County. The objective here is to place into perspective the magnitude of the emissions that were modeled for the gas station versus the larger scale of review.

Table 1-21: Comparison of VOC Emissions from Costco with Other Sources

Comparison of VOC Emissions	
Source	**VOC (lbs/year)**
Costco Gasoline Sources	36,456
Montgomery County Mobile Sources	28,118,160
Montgomery County All Sources	57,384,000

The gas station emissions are only approximately 0.064 percent of the overall county VOC emissions.

1.10 Question Concerning Deposition to Creek

At a community meeting held on October 25, 2011, there was a concern about deposition of pollution of particles into the nearby creek around the end of the outfall pipe (see Figure 1-25). In order to respond to this, Sullivan Environmental ran another AERMOD for the small particulates in the 2.5 micron range ($PM_{2.5}$) typically emitted by motor vehicles.

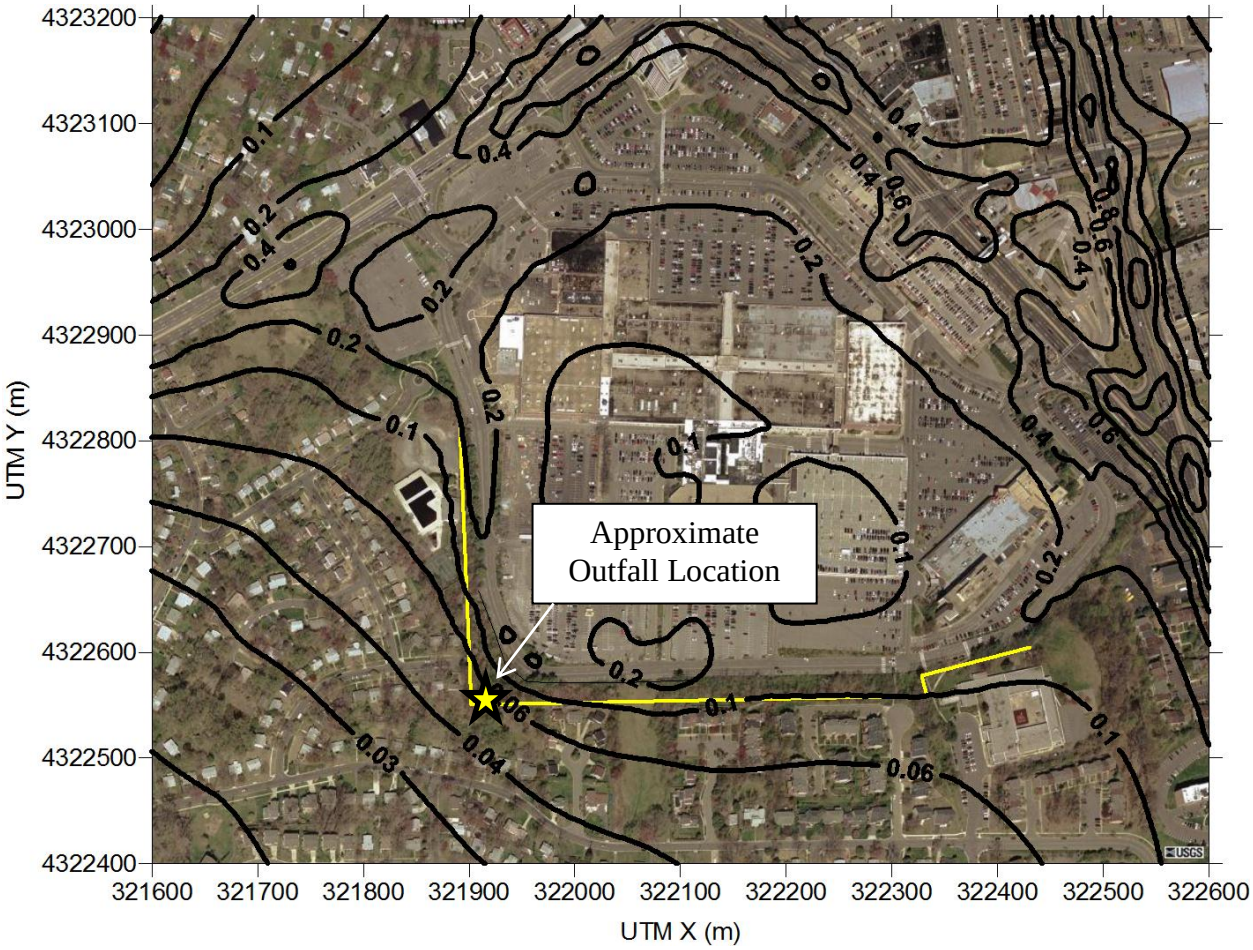
Using the latest version of EPA's Office of Mobile Sources MOBILE6 model (http://www.epa.gov/otaq/m6.htm) (version 6.2.03) and the 2013 fleet mix emissions applicable to Montgomery County, Sullivan Environmental estimated the total vehicle $PM_{2.5}$ emissions. These $PM_{2.5}$ emissions were run with the same AERMOD model and 5-years of meteorological data, used in earlier model analyses, to estimate total 5-year dry deposition of the particles onto the creek near the end of the outfall pipe, located about 240 feet SW of the proposed Costco station. A default of 0.5 cm/sec deposition velocity, based on that $PM_{2.5}$ particle size (http://webscripts.softpedia.com/script/Scientific-Engineering-Ruby/Earth-Sciences/gaussianPlume-33039.html), was used to represent the amount of dry fall of these small particles to the ground.

The predicted 5-year deposition fluxes of the $PM_{2.5}$ particles are plotted in Figure 1-26. The maximum 5-year deposition flux is predicted to be around 0.055 g/m^2 (0.000180 ounces / square foot) $PM_{2.5}$ in the vicinity of that creek and outfall pipe. This insignificant amount of deposition, and any relative chemical component attached to the particle, to this creek and surrounding area is not expected to result in any significant environmental impact.

Figure 1-25: Approximate Location of Outfall Pipe

Figure 1-26: Predicted 5-Year Total $PM_{2.5}$ Deposition (g/m^2) for All Sources

[Deposition Flux for Nearby Creek @ Outfall Pipe is approximately 0.055 g/m^2]



1.11 CARB Screening Guidelines

This screening-level guidance document has been brought up at previous public forums. This section has been added to provide perspective on the use of screening-level procedures for nearby schools, as compared to site-specific refined analysis as has been done for the proposed Costco facility. A California Air Resource Board report on EPA school siting guidelines (CARB, 2005) was discussed at the community meeting on October 25, 2011 concerning the Steven Knolls School. Figure 1-27 below, displays predicted cancer risk for a gas station with an underground storage tank with Phase I and II controls and vent valves by downwind distance. This graph was copied directly from that California handbook (CARB, 2005) for an example of gas dispensing throughput of 3.6 million gallons / year, which provides a very conservative analysis based on assuming hypothetical, worst-case meteorological conditions using urban dispersion coefficients. This screening procedure also does not consider site-specific control measures such as the arid permeator that reduces vent emissions by 99.27 percent.

Figure 1-27: Urban Gasoline Dispensing Facility Health Risk for 3,600,000 gal/year Throughput

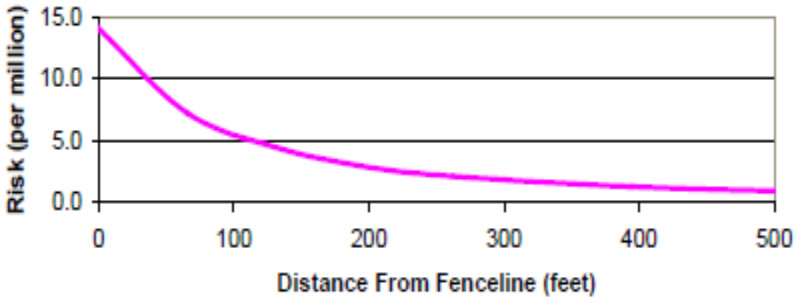


Figure 1-27 is not intended to be representative of realistic meteorological conditions, but is a simplified screening tool. The CARB modelers defaulted to using a very simplistic screening procedure, assuming a constant, hypothetical wind speed of 1 m / sec and reduced dilution conditions (Pasquill-Gifford stability of E or F) that are representative of (nighttime) conditions occurring all the time (CARB, 1997). Such meteorological conditions do not occur on a long-term basis. In addition, individuals also do not stay at one location for their entire lives, such as a school, as also assumed in the CARB screening-level procedure.

Applying this CARB screening-level analysis using urban dispersion coefficients (Figure 1-27) and adjusting based on 12 million-gallons/year throughput for the Wheaton station, the predicted cancer risk for the Steven Knolls School, located about 1,100 feet away, is 0.8 in one million. Considering the application of the rural dispersion characteristics, these very conservative CARB cancer risks would be around 7.1 per million for the school. However, these very conservative screening results do not account for the actual hours of occupancy, the prevailing, site-specific wind frequency distributions, and other site-specific factors that are specifically accounted for in the detailed modeling shown in this report for the Costco Wheaton gas station.

These very conservative screening-level cancer risk estimates for the Steven Knolls School remain well below the CARB cancer action level of 10 in a million (BAAQMD, 2009; CARB, 2008; CAPCOA, 1990). Refer to Appendix Y for the response to Dr. Breysse that provides a response summary to address issues and references discussed by Dr. Breysse. The entire EPA and CARB guidelines, when viewed in their entirety, clearly state that when less than the screening level of 300 feet that site-specific analysis is needed to specifically evaluate risks. The second paragraph of the Executive Summary of the CARB guidelines (CARB, 2001) says this: "*This methodology should be considered a screening methodology. Gasoline station owners or the district may want to prepare a site specific risk assessment to more accurately quantify risks if a significant risk is indicated using this methodology.*" That same CARB guideline goes on further to say on page 4, in Section F entitled: Site Specific Data Options: "*A gasoline station owner or district staff may want to more precisely characterize the risks from an individual gasoline station using site specific data if the risk appears significant after using this screening methodology."*

The CARB guidance lists a number of site specific parameters that may represent the emissions and risk from an individual gasoline station more precisely, including details such as:

- Actual pump islands and vent pipe locations relative to the property lines
- Use of site specific weather data
- Use of specific emissions profiles (time of day emissions occur in relation to actual weather data)

It is standard modeling practice that site-specific refined analysis always trumps simplified screening-level assessments, which are inherently designed to grossly overstate most applications.

1.12 Regional Meteorological Data Options

In order to address particular meteorological concerns, comparative wind roses for Washington Dulles Airport (IAD) and Washington National Airport (DCA) are presented in Figures 1-28 and 1-29 in order to provide a greater context for any potential regional differences. As can be noted in these two figures, the overall wind flow patterns are very similar with only slight differences. For dispersion modeling we have conducted in Wheaton, we have used the 5-years of the most representative location (DCA) based on our meteorological judgment considering the range of alternatives. The fact that there are very minimal differences in the wind direction frequency between the two stations does not affect the interpretation of the measured data sets collected in IAD to provide real-world confirmation of the magnitude of the modeling results.

The EPA regulatory approved AERMOD dispersion model, specifically designed for this type of application, uses processed hourly meteorological data (including AERMINUTE processing) from a nearby, representative monitoring station. As stated in the Guideline of Air Quality Models (US EPA, 2003), the representativeness of the meteorological data is dependent on the following: (1) the proximity of the meteorological monitoring site to the area under consideration; (2) the complexity of the terrain; (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected.

A review of all available hourly meteorological data stations in the modeled area was conducted. Three nearby meteorological monitoring stations that were reviewed: Washington National Airport (DCA), College Park, MD, and Gaithersburg, MD. The College Park and Gaithersburg sites are geographically closer to the Wheaton site. The terrain was similar in all three cases with a simple, rolling terrain feature with no complications of either high terrain or large water bodies.

Figure 1-28: 10-Year Wind Rose for Washington Dulles Airport (IAD)

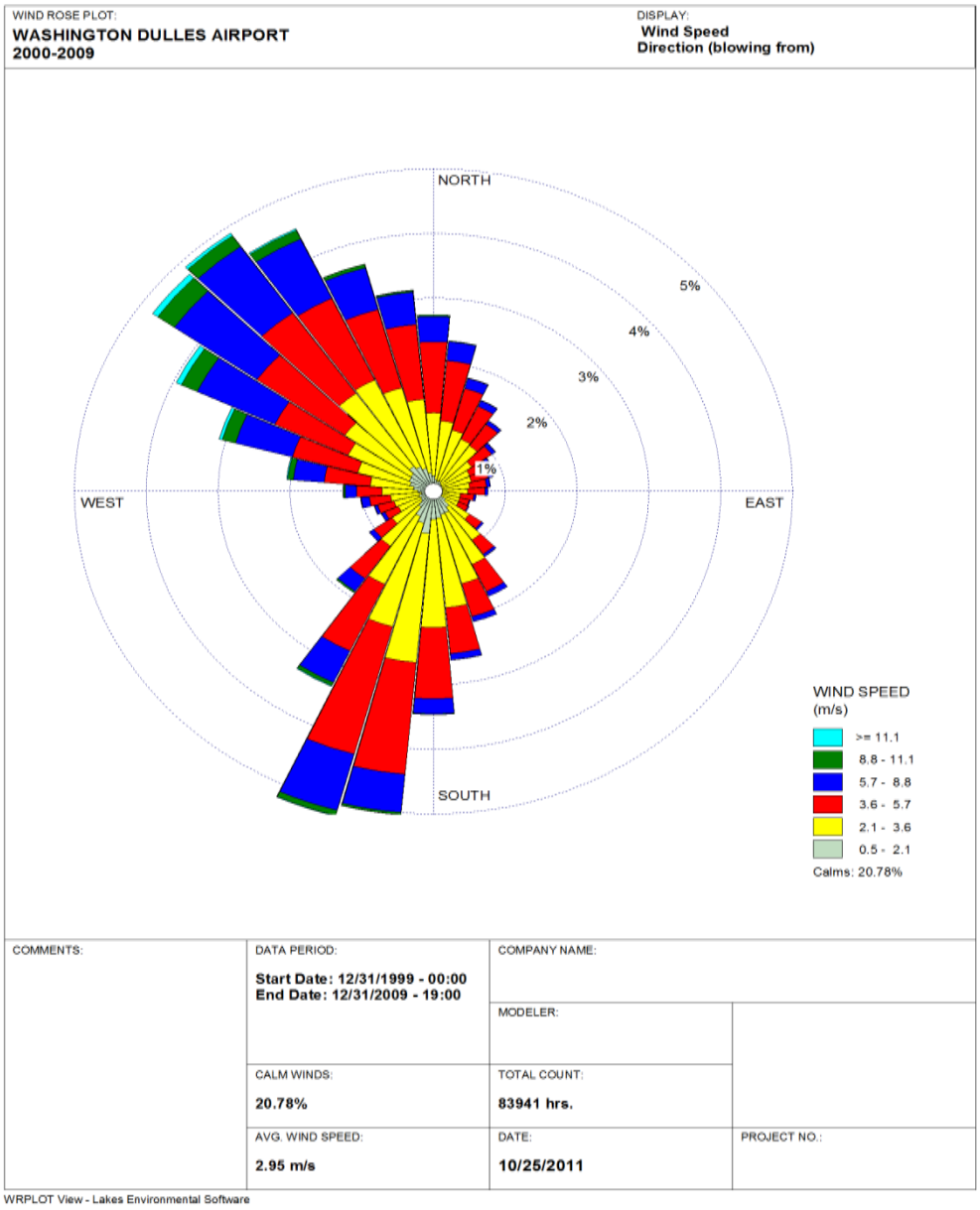
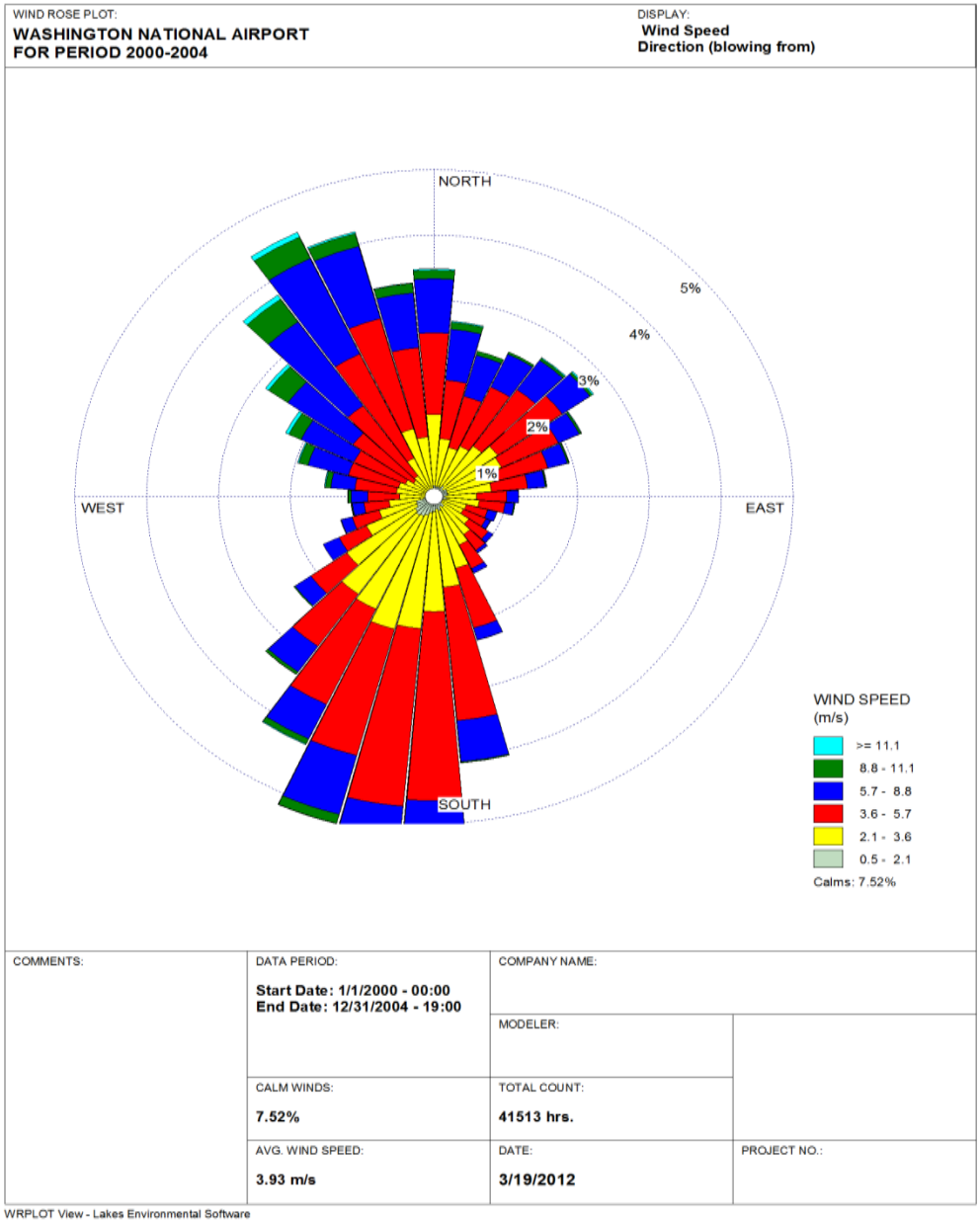


Figure 1-29: 5-Year Wind Rose for Washington National Airport (DCA)



Up to 5 years of hourly surface weather observations for College Park, MD (CGS) and Montgomery County (Gaithersburg), MD (GAI) airports were downloaded directly from the National Climatic Data Center (NCDC) web site [http://cdo.ncdc.noaa.gov]. The hourly surface weather data for these 2 stations are provided in wind rose format in Figure 1-31 and 1-32. These wind roses were compared to the wind rose for Washington National Airport (DCA) provided again for direct comparison in Figure 1-30. In all three cases, the wind rose plots in those figures are based on analyzing the wind frequency for the individual 36 compass wind directions observed in the raw hourly wind data set used to produce these wind rose plots. Review of those plots shows that the predominant northwesterly wind flow is evident in all three airport stations.

The biggest difference between the wind rose in Figure 1-30 and the wind rose in Figure 1-35, even though they are for the same DCA station, is the use of the number of compass wind directions in the wind rose analysis. In the case of Figure 1-30, 36 compass directions were used, while only 16 compass directions were used in Figure 1-35. The use of the smaller number of compass directions can distort the wind rose data and different conclusions that can be drawn from it. Additional proof of this is found in Figures 1-33 and 1-34 for the CGS station, which uses the exact same hourly data used in the wind rose plot presented in Figure 1-31 and changes the number of compass directions from 36 to 16. The wind rose in Figure 1-33 looks closely similar to the wind rose plot presented in Figure 1-34. So instead of the more predominant NW wind frequency found in the more detailed 36 compass direction plot (Figure 1-31), a more northerly wind component is found in the 16 compass direction plot (Figures 1-33 and 1-34).

A follow-up to this is to compare the 5-year wind rose for DCA produced by the 36 compass directions (see Figure 1-30) to a wind rose plot based on 16 compass directions (see Figure 1-29). As can be noted in this 16 compass direction plot (see Figure 1-29), while similar to the College Park wind rose, an even higher frequency of northerly winds is evident compared to those indicated in the College Park wind rose plots (Figures 1-33 and 1-34). Again, this is the same hourly meteorological data set for these sites, but each of these plots is analyzed in a different presentation format, differentiated by the number of compass wind directions. This

wind rose analysis does not affect the air quality modeling results because each hourly wind direction (reported in the 36 compass wind directions components) are actually modeled.

It should also be noted that the weather data and instrumentation at the larger airports, such as the DCA airport, undergo a much more rigorous quality assurance / quality control data review process through the National Weather Service (NWS) guidelines than the meteorological data at the smaller airports, which generally leads towards a higher quality of data for air quality modeling analyses. Besides the question of the quality of the weather data collected at the smaller airports, and other types of local weather stations networks, these meteorological monitoring sites are less likely to have wind exposure problems, creating wind direction bias / errors, which also decrease the quality of the wind data collected. The preferred method, and in accordance with current EPA Air Quality Modeling Guidelines (U.S. EPA, 2005), is to choose 5 years of hourly wind data from a representative NWS airport, such as DCA. .

In this case the higher quality data at the Washington National Airport (DCA) and its' observed wind frequency distribution (based on the comparison of wind roses using the same number of compass wind directions) is similar to that of the nearby College Park (CGS). DCA was chosen to be most representative of the overall wind flow patterns in the area of the Wheaton, MD region and used in the modeling analysis.

Figure 1-30: 5-Year Wind Rose for Washington National Airport (DCA)

[Using 36 compass wind directions]

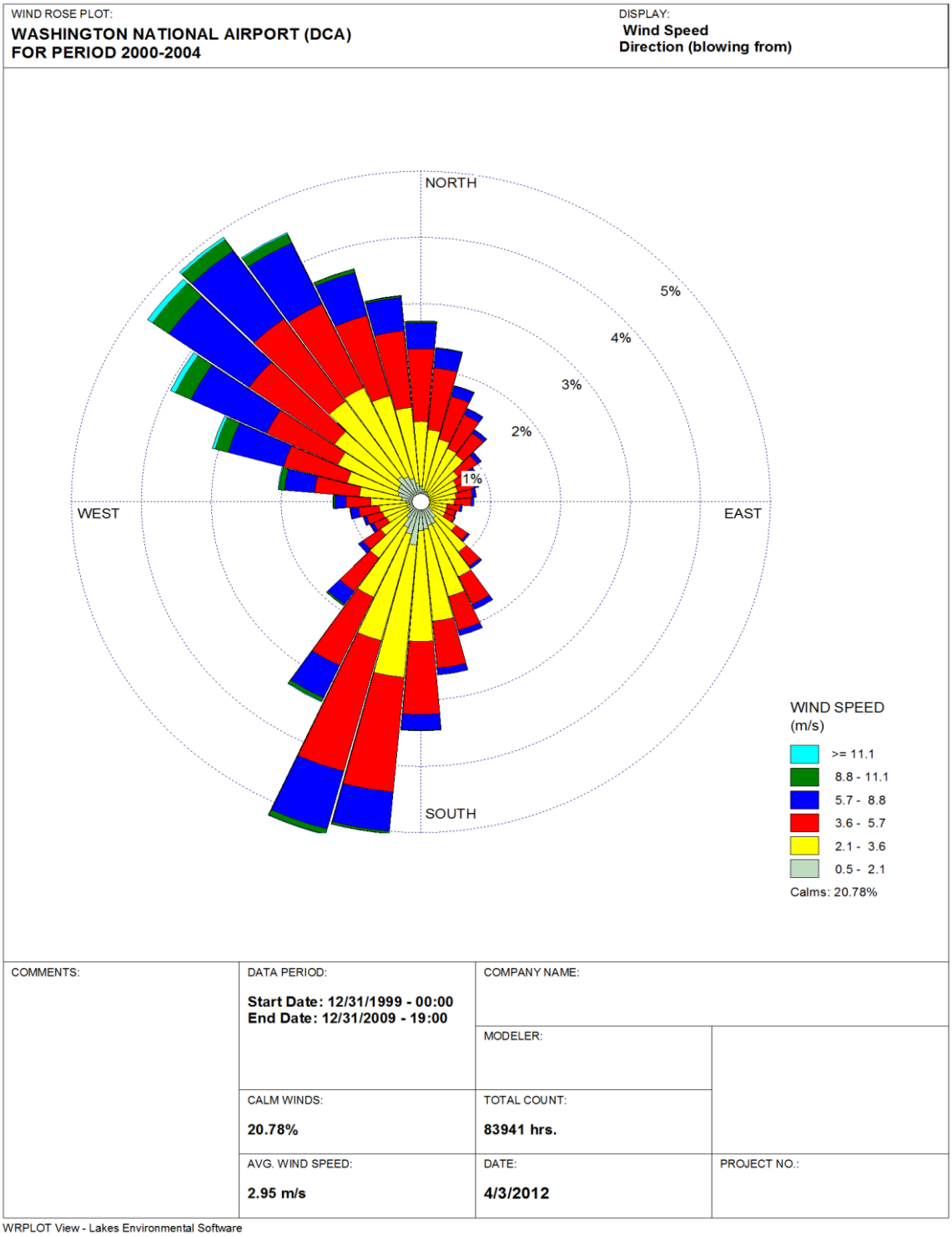


Figure 1-31: 5-Year Wind Rose for College Park, MD (CGS)

[Using 36 compass wind directions]

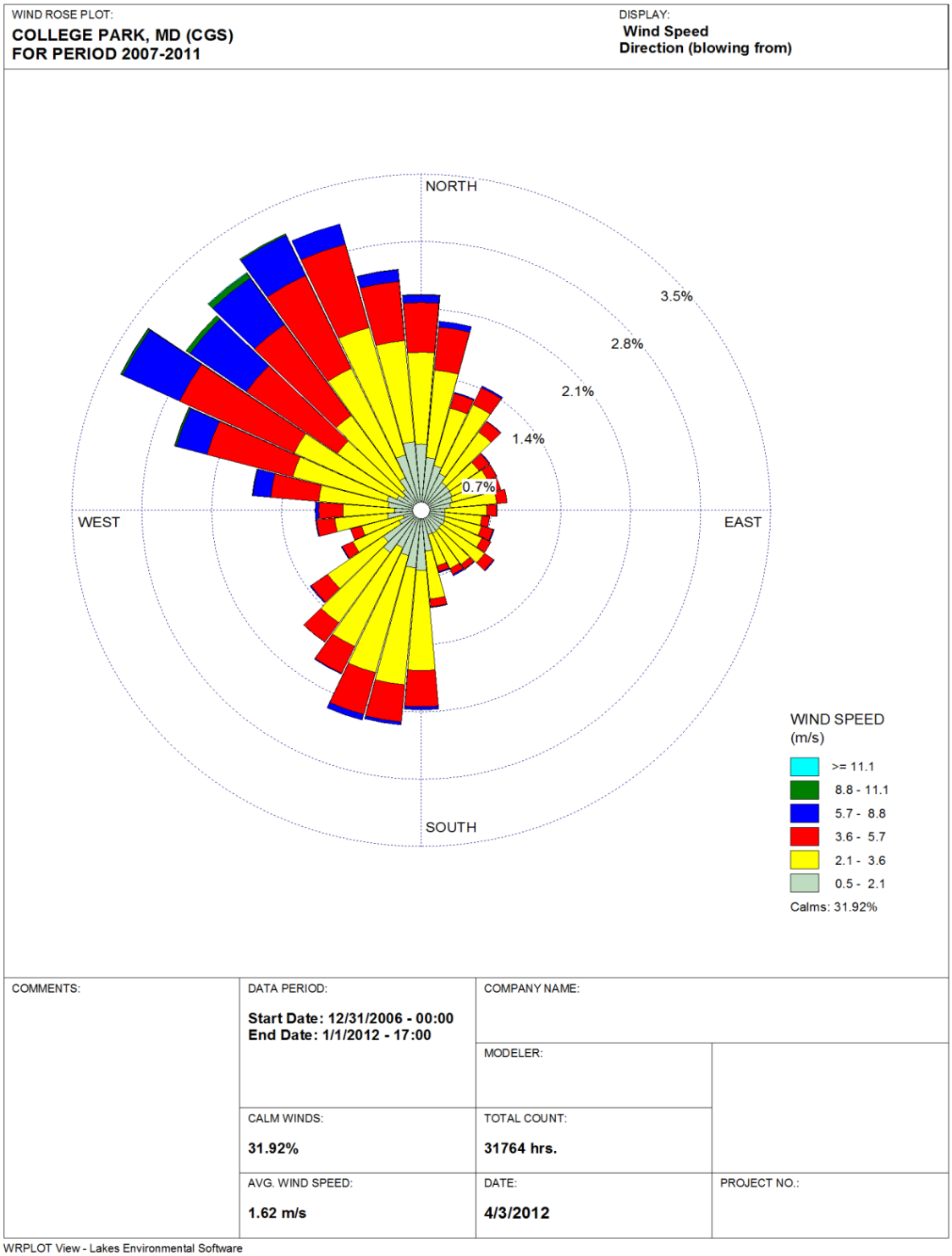


Figure 1-32: 4.5-Year Wind Rose for Montgomery County Airport, MD (GAI)

[Using 36 compass wind directions]

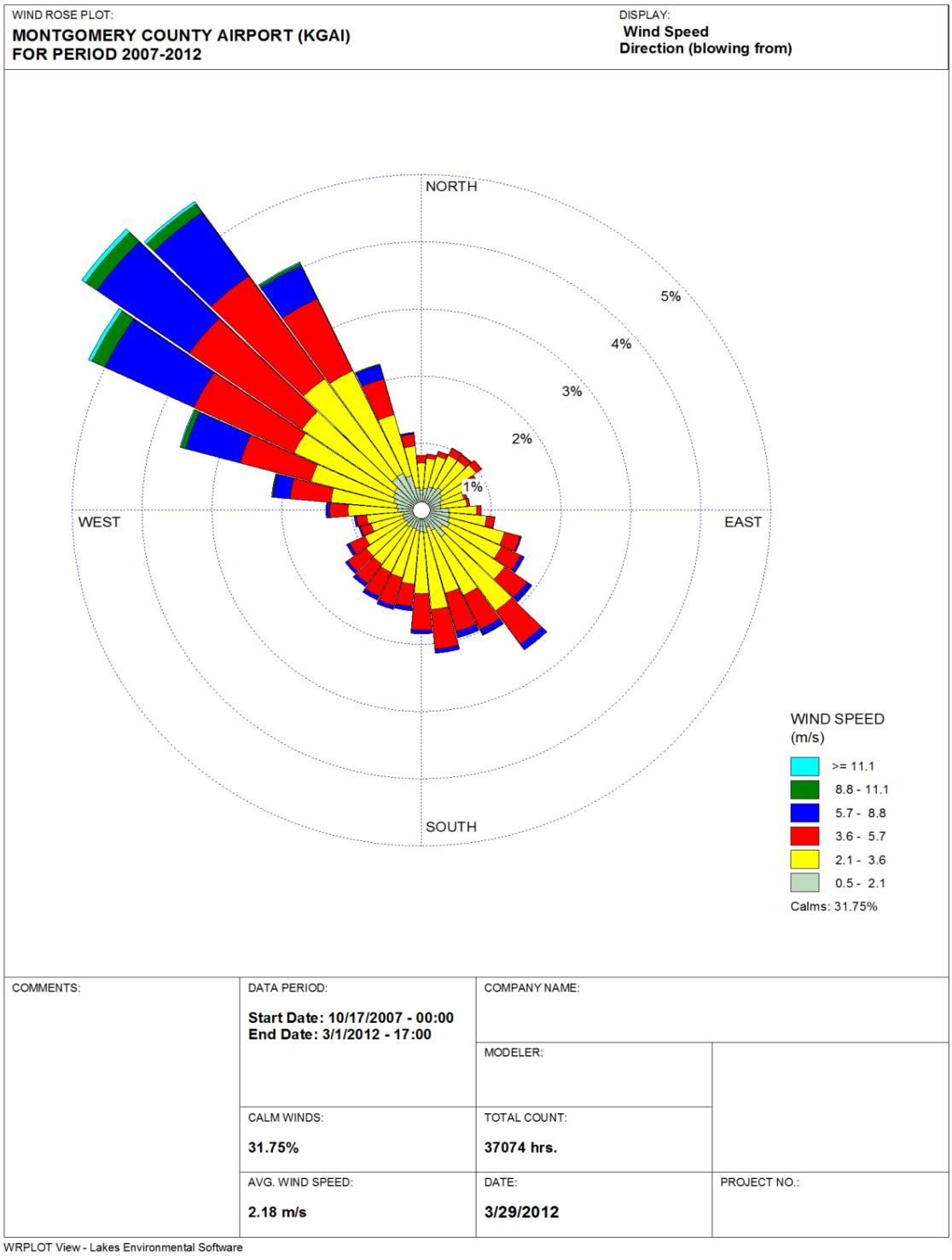


Figure 1-33: Wind Rose Plot for College Park, MD (CGS)

[Copied directly from Iowa State University web site using 16 compass wind directions]

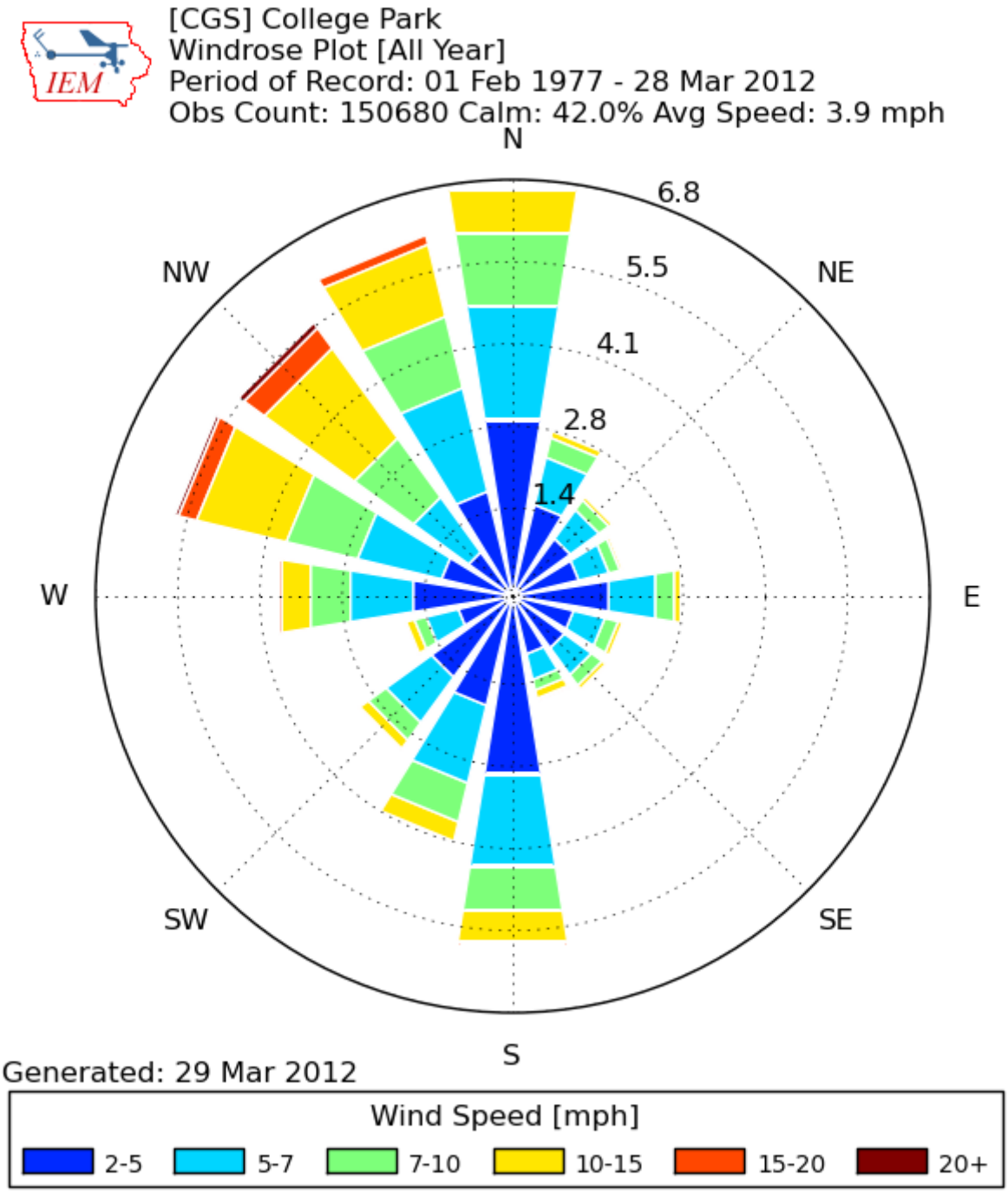


Figure 1-34: 5-Year Wind Rose Plot for College Park, MD (CGS)

[Using 16 compass wind directions]

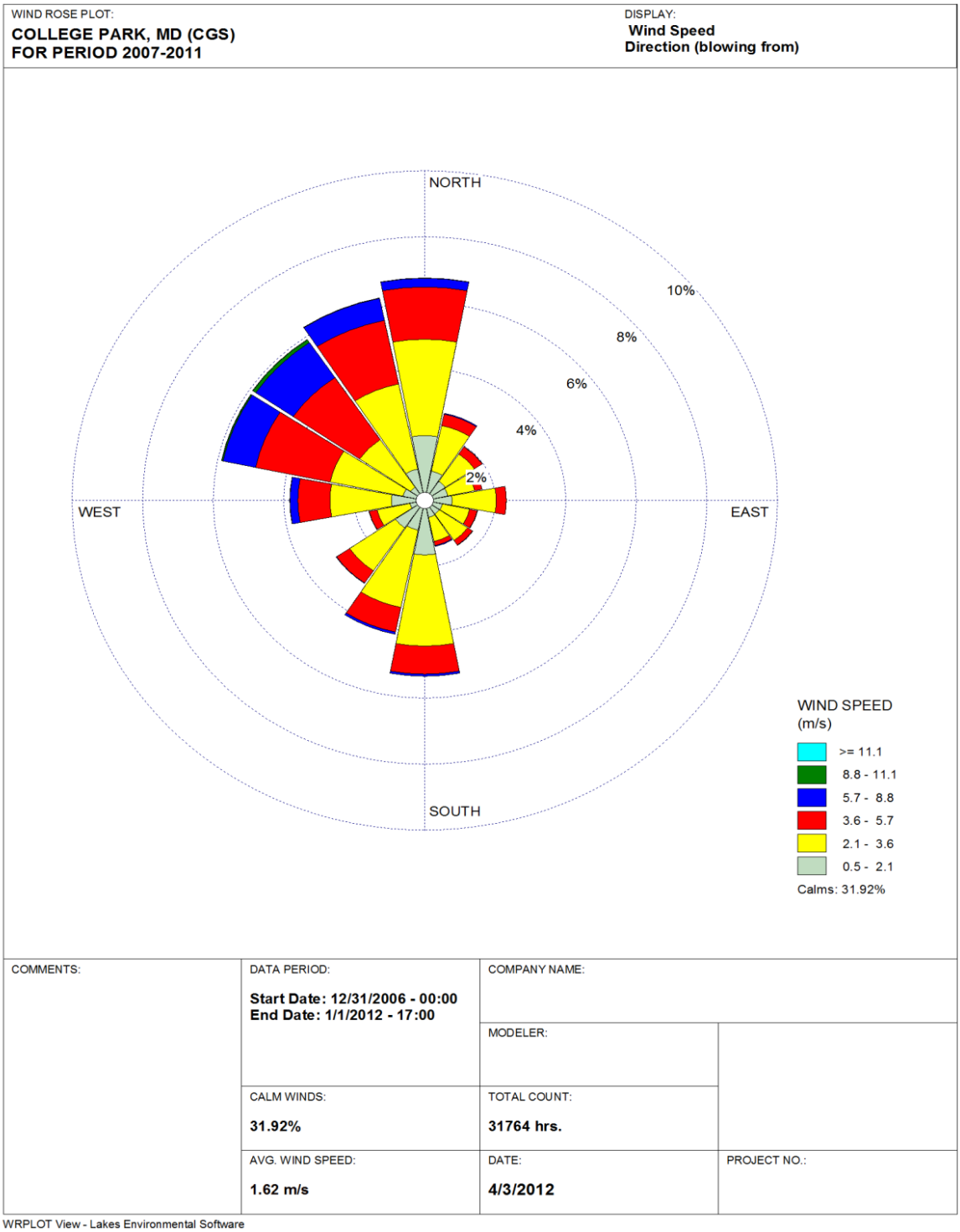
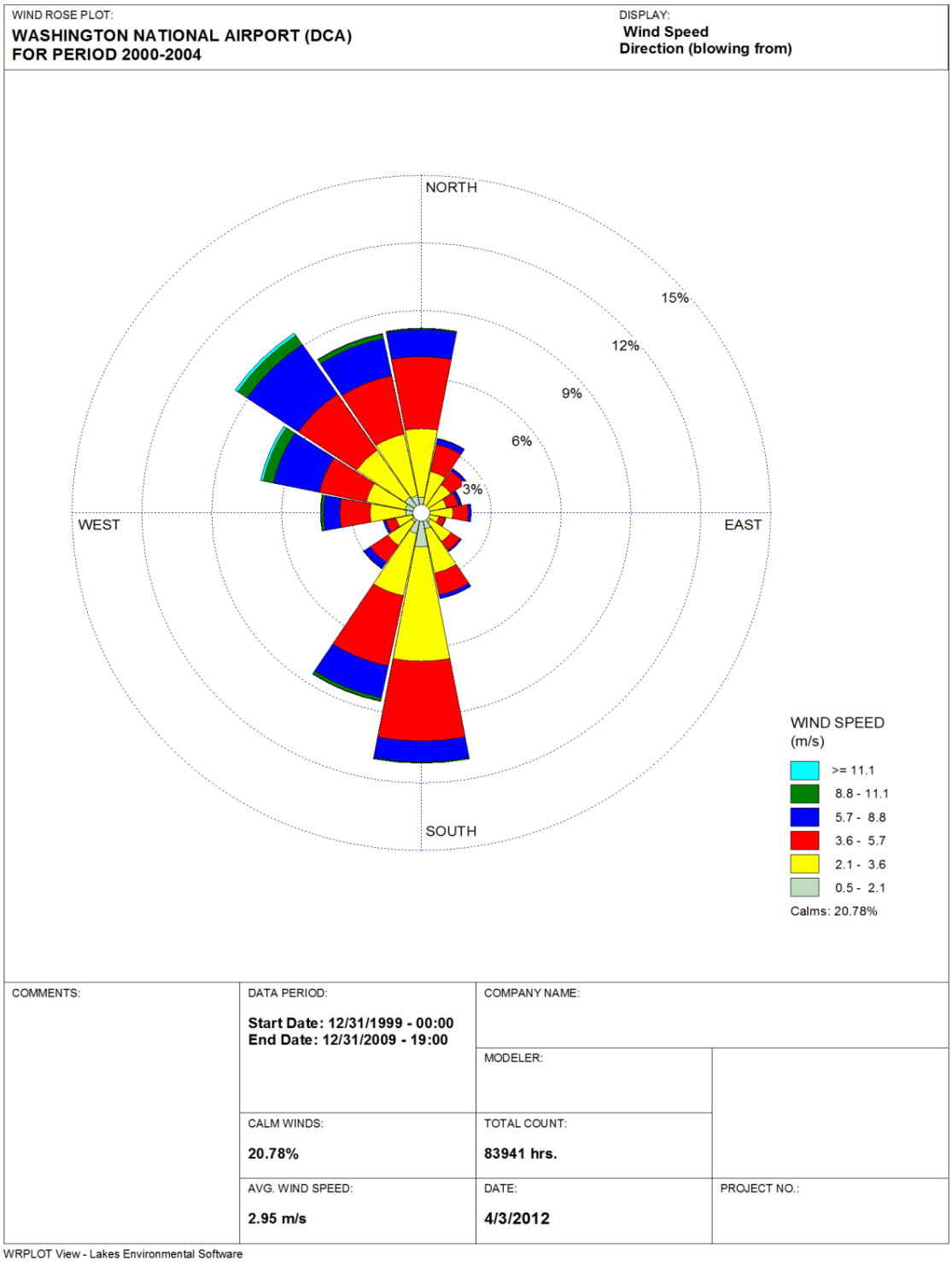


Figure 1-35: 5-Year Wind Rose Plot for Washington National (DCA)

[Using 16 compass wind directions]



1.12.1 Consideration of Local Topography and Potential Drainage Flow

Dr. Henry Cole testified at the Montgomery County Council meeting on June 19, 2012 that the potential for local drainage wind flow, in his opinion, would develop in the area of the proposed Costco facility in the Westfield Mall (Dr. Cole, 2012). In that submitted testimony, Dr. Cole hypothesized that downward flowing air created by surrounding lower terrain would create a low pressure situation that would transport gas station-related emissions counter to the flow in the modeling analysis.

A detailed response to these points is presented in Appendix AA and an image depicting terrain elevations are displayed below in Figure 1-36. Here are the key points from that analysis:

1. The potential for specialized gravity flows is only 3 percent of the time that the gas station is in operation.

2. Once the heavy (deciduous) vegetation along the path of the hypothesized gravity flow is considered, the potential drops to approximately 1.5 percent of the time the gas station is operational. In other words, 98.5 percent of the time conditions are not conducive to potential gravity flow.

3. A barrier to gravity flow will be in place in the form of an acoustic wall 8 feet high. This wall would deflect any potential gravity flow away from the downwind receptors in Kensington Heights.

4. The Ring Road in the vicinity of the Stephen Knolls School slopes away from the school (towards the north), which is inconsistent with gravity flow occurring towards the school.

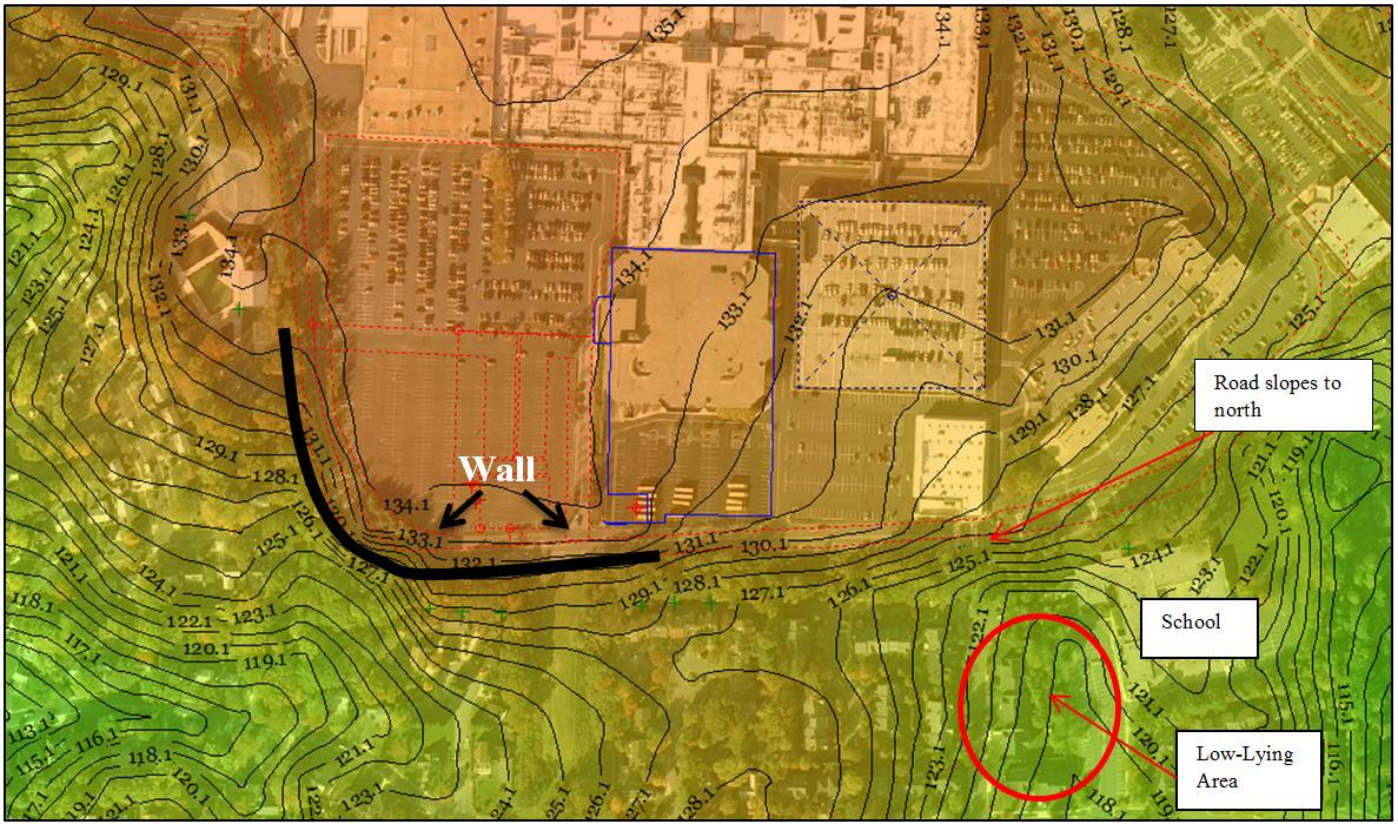
5. It would require approximately a 10-fold increase in incremental impacts from the Costco gas station sources to threaten any air quality standards or risk guidelines. Even if one were to ignore the acoustic wall (barrier), it is not mathematically possible for an effect that would have the potential to occur only 1.5 percent of the operational hours of the gas station to create an exceedance. Looking at the local topography, there is a narrow, much

sharper drop-off of terrain that extends from the SW corner of the Ring Road, WSW through the Kensington Heights neighborhood. Any gravitational flows that were transported to the south would likely flow into this narrow terrain drop-off. The Ring Road, however, slopes to the North in this area.

6. Modeling policy as documented by the U.S. Protection Agency's Guideline on Air Quality Models recommends the use of the AERMOD dispersion model for flat and rolling terrain, which is the case here. Our modeling is consistent with this policy.

7. The Stephen Knolls school is unaffected by this hypothesis because of the terrain and hours of operation (students are in school during the daytime, when there is no meaningful potential for hypothesized effect. The Kenmont pool also is unaffected because of two reasons: (1) gravity flow from the gas station sources (if they were to occur) would not flow uphill towards the pool, and (2) the pool is open in the summertime only and during predominantly daylight hours which are not consistent with gravity flow.

Figure 1-36: Terrain Contours (meters)



1.13 Noise Modeling

In order to more fully address noise issues due to the gas station operations only, a noise model analysis was performed using the latest Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5 (FHWA, 1998; FHWA, 2004).

The geographical layout of the modeled traffic areas relative to the proposed noise barrier and noise receiver locations is presented in Figure 1-37. The traffic areas are defined by the general parking lot and the gas station queue area surrounding the pumps. The noise barrier is located just outside of the main Ring Road and along the eastern and northern edges of the Kensington Heights neighborhood. The series of linear dots are the locations of the modeled noise receivers, or the receptor locations where predicted noise levels have been chosen for this analysis. These linear receivers are radially located from the direction of the gas pumping area to the closest residential areas of concern.

Figure 1-37: Layout of the Noise Model Traffic, Barrier, and Receiver Locations

[Red, blue, and green lines represent the traffic areas, the magenta line is the proposed noise barrier, and the yellow dots are the modeled noise receiver locations]

The traffic in the parking lot and Ring Road is assumed to have an average speed of 30 mph (48km/hr), while the vehicles in the gas pumping, or queue area are assumed to be 2.5 mph (4 km/hr) and vehicles in the east parking garage at 20 mph (32 km/hr). We modeled with the maximum 40 cars/hour in the queue area, 69 vehicles/hour on the Ring Road, 315 vehicles/hour for the west parking lot, and 260 vehicles/hour in the east parking garage.

The noise barrier was modeled at the designed 8 feet (2.44 m) height. In addition, a no barrier (0 foot height) was analyzed for comparison purposes. The results of the TNM model runs, without background, are presented in Table 1-22. The highest predicted noise level of 51.2 dBA was for the receiver located near the Kenmont Swim and Tennis facility and not in a residential location. This maximum also occurs just outside of the northern barrier edge and thus not affected by any potential noise reduction due to that barrier. The highest predicted noise level near the 8-foot sound barrier is 44.8 dBA just to the south and with the barrier and 49.8 dBA without the barrier. The predicted noise levels from these sources drop quickly to the upper 30's dBA further into the residential areas.

All model input and output files for these two barrier height TNM runs are presented in Appendix X.

These noise levels will be additive to the measured general background using the 8-foot acoustic wall as the example, adding 51.2 dBA to the background noise levels measured at 53 dBA at Kensington Heights, would produce a combined noise level of 55.2 dBA.

The equation below shows an example the calculation of sound using the background levels calculated by the TNM added to the Kensington Heights noise meter data collected on September 6, 2011:

$$10^{(53\ dBA/10)} + 10^{(51.2\ dBA/10)} = 331{,}352$$

$$10 \times \log (331{,}352) = 55.2\ dBA$$

Table 1-22: TNM Model Results (dBA), Without Background, for the Two Height Scenarios of the Noise Barrier in Comparison to the No Barrier (0 height)

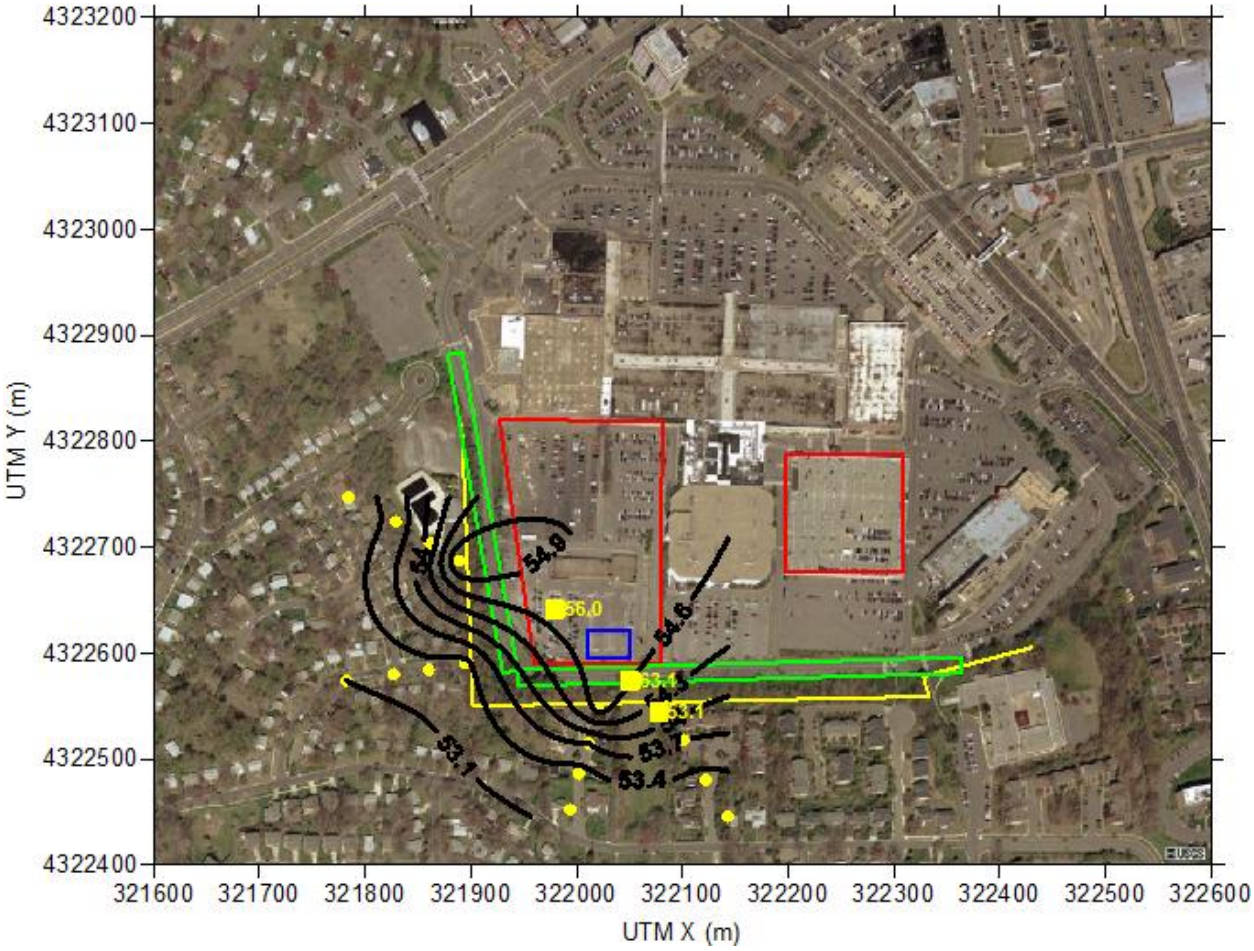
RECEIVERS	RECEIVER LOCATIONS		BASE ELEVATION	BARRIER HEIGHT	
	UTM X	UTM Y	(meters)	NO BARRIER	8 FEET
SOUTH1	322021	4322547	131	49.8	44.8
SOUTH2	322011	4322515	127	45.3	42.3
SOUTH3	322002	4322486	124	42.1	39.3
SOUTH4	321994	4322452	123	40.2	38.0
SE1	322081	4322547	130	48.2	44.9
SE2	322101	4322518	128	45.2	43.3
SE3	322122	4322480	127	41.9	40.7
SE4	322143	4322446	128	40.6	39.2
WEST1	321894	4322590	126	41.7	41.1
WEST2	321860	4322584	126	42.1	40.5
WEST3	321827	4322580	126	39.9	39.0
WEST4	321782	4322574	123	37.4	36.8
NW1	321889	4322687	132	51.2	51.2
NW2	321861	4322704	134	47.8	47.8
NW3	321829	4322724	133	44.3	44.2
NW4	321784	4322747	126	39.3	39.2

In the Figures 1-38 and 1-39, we show the noise contour mapping of the predicted noise levels for two model scenarios without and with the 8-foot noise barrier, plus background, overlaid onto base maps that show the properties in relation to the proposed site.

The noise modeling results also include the effect of a terrain height drop toward the residential area. In addition to the modeled noise levels, these figures also have the Costco Sterling noise data overlaid on top of each plot for confirmatory purposes. The inclusion of the Sterling data is presented for perspective (shown in yellow) at comparable distances and directions from the fueling area.

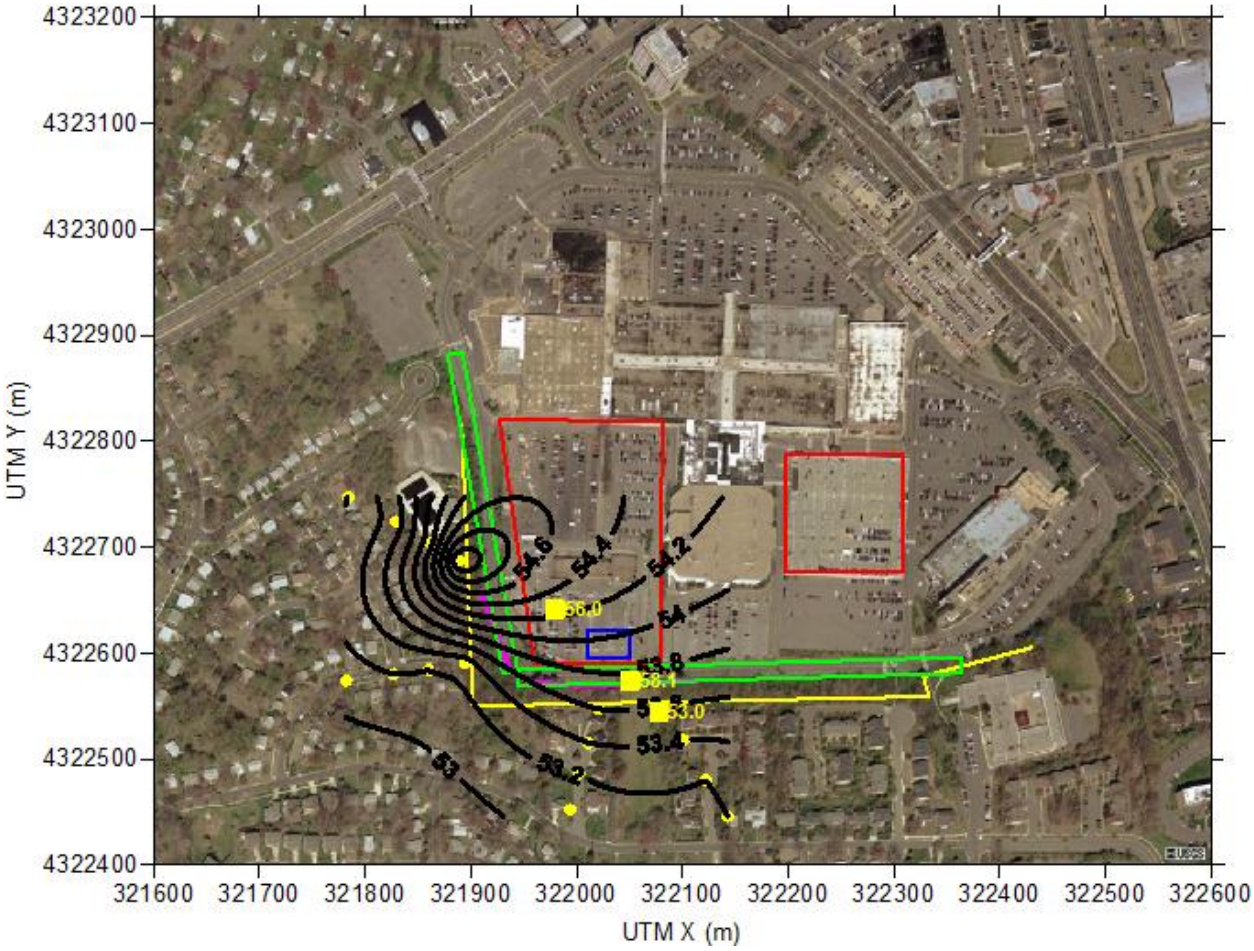
Overall, these noise contour plots overlaid with the measured Sterling data show consistent results that are well below noise level standards, especially when considering the fact that Sterling's gasoline throughput is estimated to be 30 percent higher than at Wheaton's.

Figure 1-38: TNM Predicted Noise Levels, Without Barrier, Plus 53 dBA Background
[MAX = 54.7 dBA south of barrier]



Measured data (yellow rectangles) from Sterling Noise Monitoring

Figure 1-39: TNM Predicted Noise Levels, With 8 Foot Barrier, Plus 53 dBA Background
[MAX = 53.6 dBA south of barrier]



Measured data (yellow rectangles) from Sterling Noise Monitoring

1.13.1 Log-Scale for Sound Measurements

It was stated at the community meeting on October 25, 2011, that the noise differences between Kensington Heights at the Costco Sterling gas station are larger than one would expect because noise is distributed on a log scale. It is true that noise is shown on a log base 10 scale. The implication of the statement made at the community meeting is that there is a large difference in noise intensity between 53 and 55 dBA. This of course is not correct. It is correct that the decibel scale is based on the logarithm base 10 of the measured sound pressure relative to the reference source pressure that is the equivalent to the lowest level of human hearing.[12] The log10 scale is used because it best represents human response to sound. It would not be possible to distinguish between 53 and 55 dBA, i.e., they are effectively the same level. The acoustic wall shielding a portion of the mall noise, which is not included in the measured baseline noise levels, further reduces the validity of this argument because the background noise from the mall also would be reduced. The actual difference in non-log pressure units between 53 and 55 dBA is about 62 percent. Since the human ear responds in the log10 scale, however, such a difference is not perceptible.

[12] Humans can hear from 20 µPa to 2,000,000 µPa (full symphony orchestra) and beyond. Without a log scale the range is too large to be readily tracked (http://www.epd.gov.hk/epd/noise_education/web/text/ENG_EPD_HTML/m1/intro_5.html).

1.14 Conclusions / Modeling & Air Quality Assessment

Sullivan Environmental Consulting, Inc. conducted a detailed dispersion modeling evaluation of the proposed Costco gas station to be located at the Wheaton Mall, in Wheaton, Maryland. This modeling was done consistent with standard EPA modeling methods, and based on consideration of the projected 12 million gallons/year annual gasoline throughput at the proposed gasoline station, the number of idling cars waiting to pump gas, diesel truck gas deliveries, diesel truck deliveries to the Costco warehouse, the two Costco parking areas, roadway emissions along the mall Ring Road, and roadway emissions from the most significant adjacent roadway / intersection. The analysis considered filling of the underground storage tanks (Stage 1 emissions), tank venting breathing, emissions associated with dispensing of the gasoline into vehicles and spillage (Stage 2 emissions), and emissions associated with idling of cars waiting to fuel.

Results show that modeling of the combined impacts from the gas station operations and nearby roadways are well below the standards as established by the U.S. Environmental Protection Agency. Review of VOC modeled concentrations, with apportionment into specific volatile compounds (EPA, 1988 & 1990), showed incremental risks from the Costco gas station to be low, and to be well below California action levels for risk assessment (there are not any applicable Federal or Maryland guidelines or standards for risk assessments).

2.0 Monitoring Studies 2010-2011

2.1 Sterling Virginia Costco Study 2010

Summary

The primary purpose of this study was to report the impacts of normal day-to-day operations at a Costco gas station to the ambient air surrounding the gas station in terms of airborne VOCs, CO, noise, and odor impacts.

In nearly all cases, the benzene concentrations measured close in at the existing Costco Sterling, Virginia gasoline station were < 3 parts per billion (ppb). With the exception of the concentrations downwind of the gasoline delivery trucks during unloading operations, there were only two measured concentrations approximately 12 meters downwind of normal refueling/queuing operations that were quantifiable at 35 and 13 ppb.

The average downwind concentration of benzene was 11.2 µg / m^3 over this two-day study at Site #1 when using one-half the detection limit (1.5 ppb) for non-detect concentrations and treating the 8 hours per day when the station is closed as having zero emissions. Extrapolating to a distance of 300 feet[13] (the approximate distance from the proposed Wheaton facility centroid to the closest residence centroid), the expected average downwind benzene concentration would be approximately 5.3 µg / m^3 during the two days of the study. The fact that the gasoline station will only be operating during a portion of the day, and accounting for the likely different wind directions occurring throughout the year, the annual average concentration would be substantially less. Based on the wind rose applicable to this area, where 2 to 2.5 percent of the flow is out of the north-northeast sector, the extrapolated average concentration applicable to the direction of flow towards the closest residences in Wheaton would be computed as approximately 0.1 µg / m^3, assuming that all measured benzene concentrations below 3 ppb were at one-half the detection limit, i.e., 1.5 ppb.

[13] 300 feet distance refers to the approximate distance from the center of the fuel pumping area to the center of the closest residence (to the south and west).

While cold weather conditions are conducive to worst case carbon monoxide emissions, VOC emissions peak in hot conditions. The MOBILE 6 model was used to compute ratios of hot weather (65-85 °F) versus cold weather (15-35 °F) ratios. A ratio of 1.146 (3.348/2.922) was computed on this basis. Scaling up by this ratio results in expected annual average benzene concentration applicable to 100 m exposures SSW of the gas station, which would be approximately 0.1 $\mu g/m^3$ during summertime operations at the maximum measured location. Considering a value between the two projections (cold and hot conditions) of approximately 0.1 $\mu g/m^3$ would be computed, which is below the typical range of benzene values measured in the U.S. at locations not substantially affected by any particular stationary source, i.e., on the order of 1 $\mu g / m^3$. Other gasoline components such as toluene, ethyl benzene, and xylene were not present at detectable concentrations based on the equipment used in Sterling, Virginia.

Average CO concentrations were approximately 1 ppm during the 2-day study. The CO monitor was located at a distance of approximately 80 feet from the Sterling gasoline station. The average downwind concentrations at 100 meter concentrations are projected to be approximately 0.7 ppm at 300 feet and well below the CO standard.

In other words, the measured and modeled concentrations show levels of benzene that are typical of urban / suburban concentrations routinely measured in the U.S. and carbon monoxide levels that would be 10-fold or more lower than applicable national ambient air quality standards developed to protect public health with an adequate margin of safety.

Odors were found to be generally light beyond 25 m from the pumping area. Odors (light) were detected out to 300 feet downwind of the gasoline station six out of seven times at zero dilution. Light odors may be detectable at the nearest residences in Wheaton only during times when the wind direction aligns the residence with the gas station which will occur on a 2-2.5 percent basis from the wind direction frequency analysis.

Note that ozone impacts were not addressed in this report because ozone is a regional issue. Any ozone impacts associated with the proposed gas station would have insignificant impacts at the metropolitan scale and would not be discernible on a local basis.

2.1.1 Objective

The objective of this monitoring study is to provide concentrations for benzene, ethyl benzene, toluene, xylene, and carbon monoxide that are representative of operations close-in to an existing Costco gas station during cold weather conditions. By documenting concentrations of these pollutants and meteorological conditions at the times of testing, data were compiled to help confirm the general magnitude of dispersion model results for the proposed Costco Wheaton, Maryland facility based on near-field monitoring in close proximity to the gas station.

2.1.2 Technical Approach

This monitoring study had four major components: (1) VOC monitoring, (2) carbon monoxide (CO) monitoring, (3) meteorological monitoring, and (4) odor assessment (characteristics and dilution ratios). In order to help ensure measured concentrations were above the detection limits of the equipment, the locations for sampling were established near the outer perimeter of the gas station operations, rather than at distances that would be comparable to those in Wheaton where residential areas are located. Since the AERMOD outputs demonstrate concentrations (and dilution ratios) as a function of distance, the close-in data can be extrapolated to greater distances, as necessary.

Figures 2-1 and 2-2 show photographs of the Sterling, VA Costco gas station. Figure 2-3 provides an overview of the location and relative perspective of distance between the warehouse and gas station.

Figure 2-1: Costco Sterling Virginia Gas Station (Facing NNE)

Figure 2-2: Costco Sterling Virginia Gas Station (Facing east towards warehouse)

Figure 2-3: General Overview of Gas Station at Costco Sterling, Virginia

2.1.2.2 Monitoring Sites

The selected locations are approximately 10-30 m from the pumping locations, with selection based on accessibility and access (avoiding ingress and egress of the gas station traffic). The GPS coordinates for the VOC and CO monitoring are recorded in Table 2-1 and displayed on Google Earth in Figure 2-4.

Table 2-1: GPS Positions of VOC and CO Monitoring Sites

Location recorded in sub meter accuracy via Trimble GPS	Latitude	Longitude
Site #1	39° 1’ 25.569"	77° 24’ 10.872"
Site #2	39° 1’ 26.551"	77° 24’ 11.196"
Site #3	39° 1’ 25.756"	77° 24’ 12.164"
Site #4	39° 1’24.744"	77° 24’ 11.634"
Site #5	39° 1’25.653"	77° 24’ 11.190"
Meteorological Monitoring (3d wind)	39° 1’ 25.340"	77° 24’ 12.826"
CO Monitoring Location	39° 1’ 25.446"	77° 24’ 10.401"
Refueling Truck Tank Access Point	39° 1' 26.21"	77°24'12.27"

Figure 2-4: GPS Positions of VOC monitoring stations (referred to as sites in Table 2-1)

2.1.2.3 Study Duration and Gasoline Consumption During Study

A two day, 12-hour per day study was conducted on the dates of December 8th and December 9th 2010. The total gasoline sales during these two dates are shown below in Table 2-2 and 2-3. The average daily gas consumption is 37,000 gallons for perspective.

Table 2-2: December 8th, 2010 Gasoline Amount Consumed (gallons)

Current	Day:	MONDAY	Sales Weeks (YYYY-PP-W):	2011-13-4	
Lctn/Dept#	218/ 53	218/ 53		12/8/2010	
Location		STERLING	STERLING		
Department		GASOLINE			
Item	REGULAR	PREMIUM GAS			
Item#					
Growth %		0			
	800599	800877	TOTAL GALLONS		
05:00-05:29	25	14			
05:30-05:59	279	94			
06:00-06:29	447	78			
06:30-06:59	699	176			
07:00-07:29	634	206			
07:30-07:59	652	302			
08:00-08:29	718	266			
08:30-08:59	821	181			
09:00-09:29	928	260			
09:30-09:59	963	217			
10:00-10:29	985	347			
10:30-10:59	994	290			
11:00-11:29	1064	174			
11:30-11:59	1051	313			
12:00-12:29	1069	431			
12:30-12:59	1069	466			
13:00-13:29	959	408			
13:30-13:59	1168	333			
14:00-14:29	1088	420			
14:30-14:59	1126	346			
15:00-15:29	1163	246			
15:30-15:59	1003	272			
16:00-16:29	1015	401			
16:30-16:59	1131	358			
17:00-17:29	1267	324			
17:30-17:59	1125	216			
18:00-18:29	1147	416			
18:30-18:59	1256	331			
19:00-19:29	1162	473			
19:30-19:59	1248	350			
20:00-20:29	1110	352			
20:30-20:59	837	281			
21:00-21:29	349	100			
	30552	9442	39994		

Table 2-3: December 10th, 2010 Gasoline Amount Consumed (gallons)

Current	Day:	WEDNESDAY	Sales Weeks (YYYY-PP-W):	2011-13-4
Lctn/Dept#	218/ 53	218/ 53		12/10/2010
Location		STERLING	STERLING	
Department		GASOLINE		GASOLINE
Item	REGULAR GAS	PREMIUM GAS		
Item#				
Growth %		0		
	800599	800877	TOTAL GALLONS	
05:00-05:29	58	26		
05:30-05:59	241	68		
06:00-06:29	365	64		
06:30-06:59	512	53		
07:00-07:29	475	79		
07:30-07:59	620	149		
08:00-08:29	466	139		
08:30-08:59	579	245		
09:00-09:29	686	267		
09:30-09:59	687	233		
10:00-10:29	764	251		
10:30-10:59	862	252		
11:00-11:29	1126	302		
11:30-11:59	1149	221		
12:00-12:29	988	267		
12:30-12:59	939	465		
13:00-13:29	1001	446		
13:30-13:59	964	228		
14:00-14:29	1019	363		
14:30-14:59	1019	276		
15:00-15:29	1209	334		
15:30-15:59	985	235		
16:00-16:29	1083	319		
16:30-16:59	1094	340		
17:00-17:29	1122	351		
17:30-17:59	1053	361		
18:00-18:29	1068	418		
18:30-18:59	1025	412		
19:00-19:29	1256	322		
19:30-19:59	1227	378		
20:00-20:29	908	298		
20:30-20:59	695	234		
21:00-21:29	459	119		
21:30-21:59	30	13		
	27734	8528	36262	

2.1.3 VOC Monitoring

A portable gas chromatograph was used to assess the airborne concentrations of the VOC pollutants benzene, toluene, ethyl benzene, and xylene. The instrument used was a PetroPRO which is a gas chromatograph used to assess the chemicals in question in the parts per billion resolution. The petroPRO was calibrated in the field multiple times per day using a trace gas balance of .5 PPM Benzene, .8 PPM Toluene, 1.6 PPM Ethyl benzene, and 1.6 PPM m-Xylene referred to as BTEX. The instrument was used as described in the protocol to measure the amount of chemicals in the air. The GPS coordinates of the exact locations sampled were displayed previously in Table 2-1. Note that low concentrations were observed for the duration of the study with the only detectable values for samples taken directly downwind of the pumping station and during instances of fueling. Levels of toluene ethyl benzene and xylene were not detected because of the low concentrations for all of these four chemicals. The measured data set shows low levels of BTEX emissions from this gas station, at levels undetectable for the BTEX pollutants in many cases. The results for each sample are shown in Table 2-4 with the gas chromatograph shown in Appendix I. The specifications of the gas chromatograph used for this study are detailed in Appendix K.

Table 2-4: BTEX VOC Sample Readings

Reading #	Location or Type	Time	Parts Per Billion Benzene	Download #	Date
1	Calibration	07:05	ok	1	12/08/2010
2	Site 1	07:10	<3ppb	1	12/08/2010
3	Site 2	07:20	<3ppb	1	12/08/2010
4	Site 3	07:25	<3ppb	1	12/08/2010
5	Site 4	07:33	<3ppb	1	12/08/2010
6	Site 5	07:71	<3ppb	1	12/08/2010
1	Calibration	08:16	Ok	2	12/08/2010
2	Site 1	08:25	<3ppb	2	12/08/2010
3	Site 2	08:29	<3ppb	2	12/08/2010
4	Site 3	08:34	<3ppb	2	12/08/2010
5	Site 4	08:39	<3ppb	2	12/08/2010
6	Site 5	08:44	<3ppb	2	12/08/2010
7	Truck filling	09:04	**NA**	2	12/08/2010
8	Site 1	09:36	<3ppb	3	12/08/2010
9	Site 2	09:41	<3ppb	3	12/08/2010
10	Site 3	09:46	<3ppb	3	12/08/2010
11	Site 4	09:51	<3ppb	3	12/08/2010
12	Site 5	09:56	<3ppb	3	12/08/2010
1	Site 1	11:19	<3ppb	4	12/08/2010
2	Site 2	11:46	<3ppb	4	12/08/2010
3	Site 3	11:51	<3ppb	4	12/08/2010
4	Site 4	11:56	<3ppb	4	12/08/2010
5	Site 5	12:00	<3ppb	4	12/08/2010
1	Calibration		Ok	5	12/08/2010
2	Site 1	13:20	<3ppb	5	12/08/2010
3	Site 2	13:25	<3ppb	5	12/08/2010
4	Site 3	13:29	<3ppb	5	12/08/2010
5	Site 4	13:34	<3ppb	5	12/08/2010
6	Site 5	13:39	<3ppb	5	12/08/2010
1	Calibration	14:10	ok	6	12/08/2010
2	Site 1	16:29	**35ppb**	6	12/08/2010
3	Site 2	16:33	<3ppb	6	12/08/2010
4	Site 3	16:38	<3ppb	6	12/08/2010
5	Site 4	16:43	<3ppb	6	12/08/2010
6	Site 5	16:48	<3ppb	6	12/08/2010

Table 2-4: BTEX VOC Sample Readings (cont.)

Reading #	Location or Type	Time	Parts Per Billion Benzene	Download #	Date
1	Calibration	17:12	ok	7	12/08/2010
2	Site 1	18:11	<3ppb	7	12/08/2010
3	Site 2	18:15	<3ppb	7	12/08/2010
4	Site 3	18:20	<3ppb	7	12/08/2010
5	Site 4	18:25	<3ppb	7	12/08/2010
6	Site 5	18:31	<3ppb	7	12/08/2010
9	Calibration	06:18	ok	8	12/09/2010
10	Site 1	06:25	<3ppb	8	12/09/2010
11	Site 2	06:28	<3ppb	8	12/09/2010
12	Site 3	06:31	<3ppb	8	12/09/2010
13	Site 4	06:32	<3ppb	8	12/09/2010
14	Site 5	06:34	<3ppb	8	12/09/2010
16	Calibration	07:02	ok	8	12/09/2010
17	Site 1	07:18	<3ppb	8	12/09/2010
18	Site 2	07:24	<3ppb	8	12/09/2010
19	Site 3	07:33	<3ppb	8	12/09/2010
20	Site 4	07:38	<3ppb	8	12/09/2010
21	Site 5	07:43	<3ppb	8	12/09/2010
22	Loading[14]	08:07	**17ppb**	8	12/09/2010
23	Loading[15]	08:12	**6ppb**	8	12/09/2010
24	Site 1	10:04	**13ppb**	8	12/09/2010
25	Site 2	10:10	<3ppb	8	12/09/2010
26	Site 3	10:17	<3ppb	8	12/09/2010
27	Site 4	10:20	<3ppb	8	12/09/2010
28	Site 5	10:25	<3ppb	8	12/09/2010
29	Site 1	13:07	<3ppb	8	12/09/2010
30	Site 2	13:11	<3ppb	8	12/09/2010
31	Site 3	13:16	<3ppb	8	12/09/2010
32	Site 4	13:22	<3ppb	8	12/09/2010
33	Site 5	13:27	<3ppb	8	12/09/2010
34	Calibration	16:00	ok	8	12/09/2010
35	Site 1	16:06	<3ppb	8	12/09/2010
36	Site 2	16:11	<3ppb	8	12/09/2010
37	Site 3	16:17	<3ppb	8	12/09/2010
38	Site 4	16:23	<3ppb	8	12/09/2010
39	Site 5	16:30	<3ppb	8	12/09/2010
40	Site 1	17:49	<3ppb	8	12/09/2010

[14] Sample taken downwind approximately 3 meters from open gas tank before truck fastened gasoline loading hose
[15] Sample taken downwind approximately 3 meters from underground tank as fuel truck loading in progress

41	Site 2	17:54	<3ppb	8	12/09/2010
42	Site 3	18:01	<3ppb	8	12/09/2010
43	Site 4	18:06	<3ppb	8	12/09/2010
44	Site 5	18:12	<3ppb	8	12/09/2010
45	Site 1	18:37	<3ppb	8	12/09/2010
46	Site 2	18:42	<3ppb	8	12/09/2010
47	Site 3	18:47	<3ppb	8	12/09/2010
48	Site 4	18:51	<3ppb	8	12/09/2010

2.1.4 Ambient Temperature

Ambient temperature was assessed onsite at the Sterling Costco gas station at various times (EDT) during the two days of the study. Dry bulb readings are summarized below. The relative humidity readings from the nearby Dulles International Airport are included under the field test results and are detailed in Appendix F.

Test #1

Test start time: 08:15, 12/8/2010

Dry Bulb temperature: 31º F

Test stop time: 08:15, 12/8/2010

Dry Bulb temperature: 26º F

Test #2

Test start time: 11:17, 12/8/2010

Dry Bulb temperature: 37º F

Test stop time: 11:26, 12/8/2010

Dry Bulb temperature: 36º F

Test #3

Test start time: 13:40, 12/8/2010

Dry Bulb temperature: 37º F

Test stop time: 13:45, 12/8/2010

Dry Bulb temperature: 33º F

Test #4

Test start time: 16:50, 12/8/2010

Dry Bulb temperature: 35º F

Test stop time: 17:00, 12/8/2010

Dry Bulb temperature: 32º F

Test #5

Test start time: 07:08, 12/9/2010

Dry Bulb temperature: 25º F

Test stop time: 07:13, 12/9/2010

Dry Bulb temperature: 24º F

Test #6

Test start time: 10:08, 12/9/2010

Dry Bulb temperature: 37º F

Test stop time: 10:12, 12/9/2010

Dry Bulb temperature: 35º F

Test #7

Test start time: 13:15, 12/9/2010

Dry Bulb temperature: 43º F

Test stop time: 13:20, 12/9/2010

Dry Bulb temperature: 35º F

Test #8

Test start time: 15:30, 12/9/2010

Dry Bulb temperature: 42º F

Test stop time: 15:36, 12/9/2010

Dry Bulb temperature: 34º F

Test #9

Test start time: 18:09, 12/9/2010

Dry Bulb temperature: 36º F

Test stop time: 18:14, 12/9/2010

Dry Bulb temperature: 31º F

2.1.5 Carbon Monoxide Analysis

A CO monitor with a data logger was placed at approximately one meter above the ground approximately 25 meters downwind of the refueling area of the gas station. The position of the sensor is recorded in Table 2-1 and identified in Figure 2-4. Note that the natural background levels of carbon monoxide measured at this location was found to be approximately 0.2 ppm. An average CO value during the operational time of the gas station was found to be approximately 1-2 ppm. The readings observed are graphed in Figures 2-5 and 2-6. Every ten second interval during the times that the analyzer was in use was fully logged and recorded and is documented in Appendix J.

Figure 2-5: CO Day One

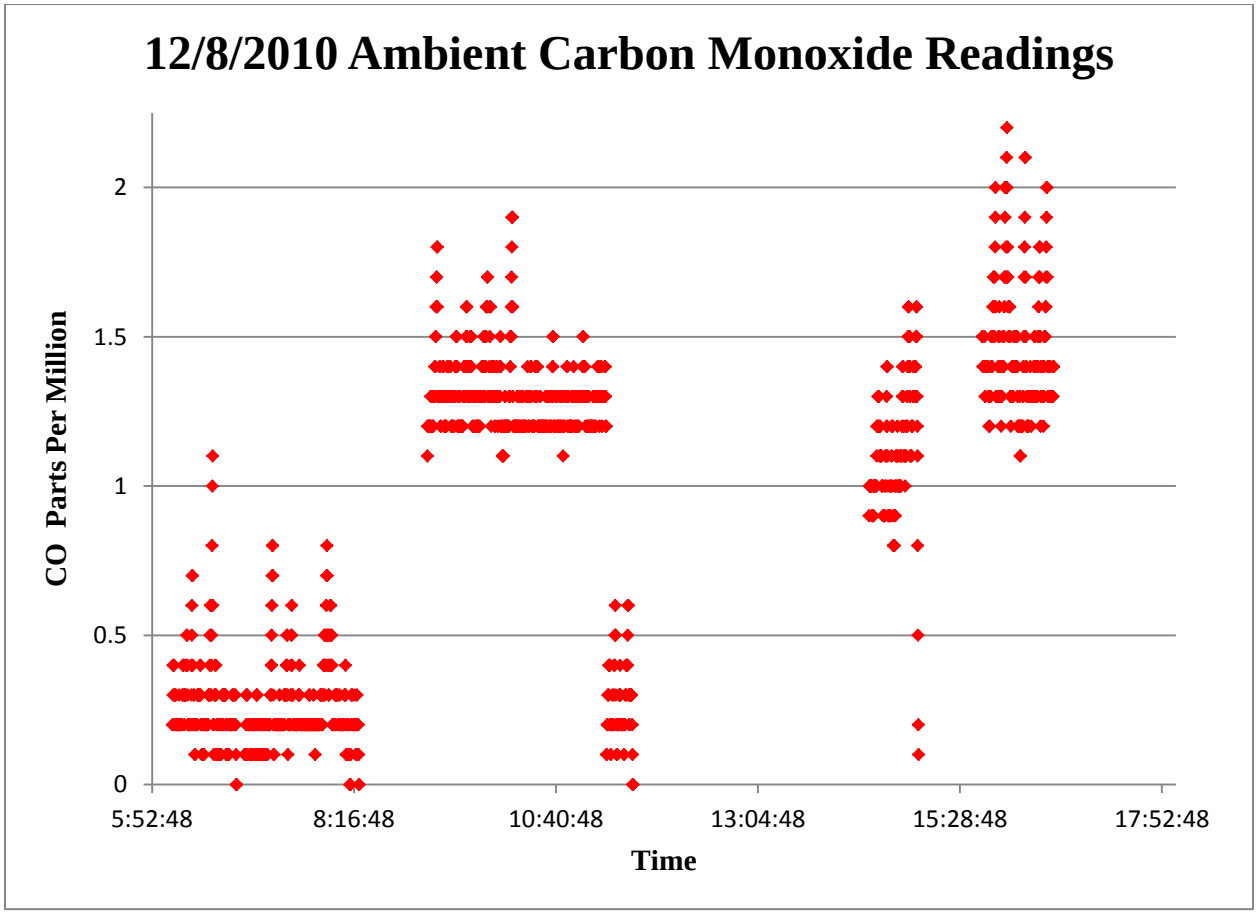
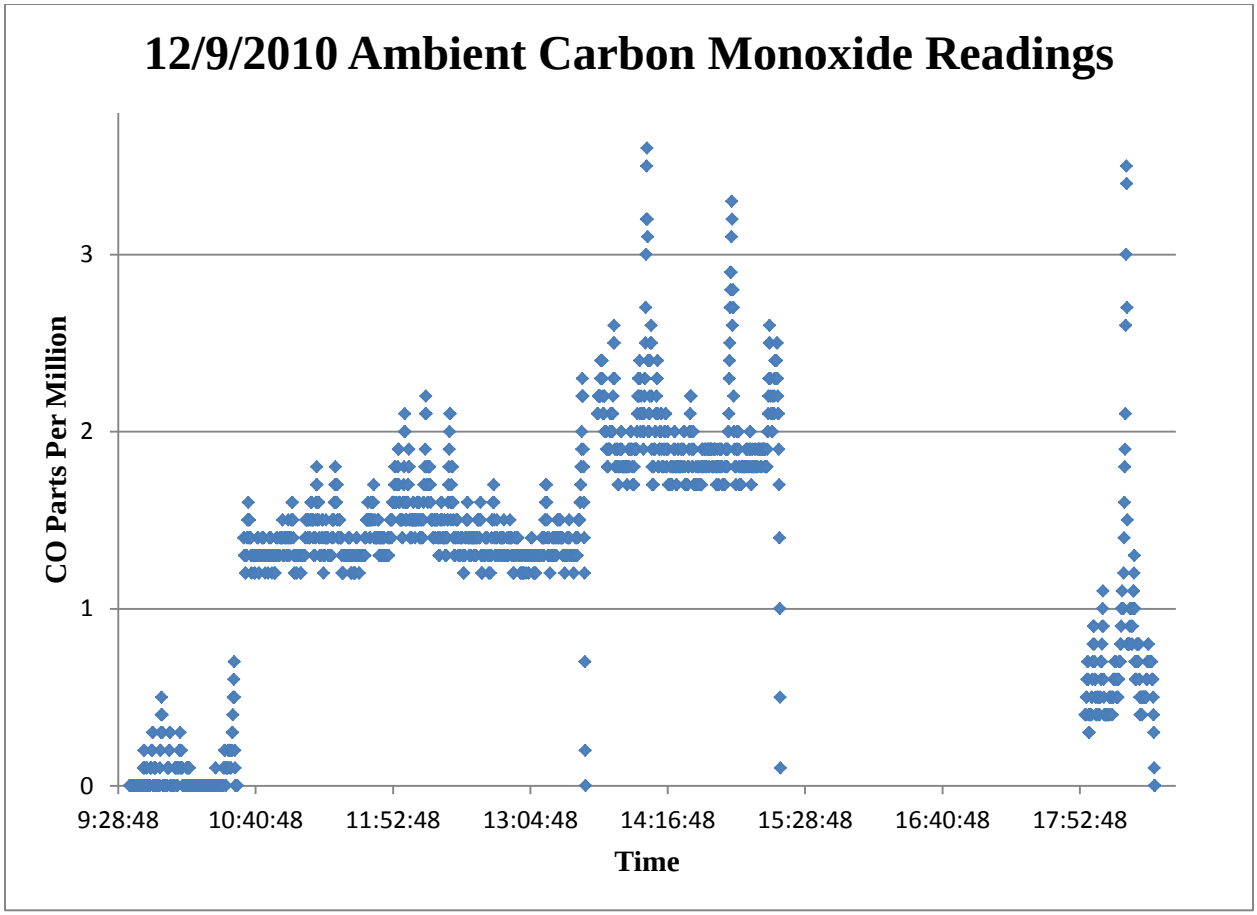


Figure 2-6: CO Day Two



2.1.6 Odor Analysis

Odor analysis was conducted during various parts of the day using a Nasal Ranger Field olfactometer with the range of 2-500 odor dilutions. Tables 2-5 through 2-11 are the results of the field odor sampling during the periods of the field study conducted on December 8-9, 2010 with times recorded in EDT. Note that all olfactometer readings were conducted downwind of the gas station.

The procedure that was generally followed for odor transects is as follows. If odor from gasoline dispensing was observed, staff recorded the distance from the edge of the pumping area to the location (done by range finder or GPS and subsequent analysis using Google Earth). If not detectable, staff walked directly towards the pumping area, and recorded the location number. As necessary, staff walked as close to the pumping area as necessary to detect the odor threshold. If the representative distance to the odor threshold could not be determined directly because there were detectable odors immediately adjacent to the warehouse, then the olfactometer and modeling was used to estimate the distance to the threshold.

Odor Test #1 11:00 A.M. -12:00 P.M., 12/8/2010

As an example, the following documents one of the odor evaluations conducted during the study. At 11:08 A.M. 12/8/2010 at Costco Warehouse: no dilutions = slight odor at 96.9 meters. At two dilutions no odors were detected at 96.9 meters. At 11:10 A.M. at 68.6 meters from the gas pumps a mild odor was detected when sampling with no dilutions. When sampling with 2 dilutions no odor was detected. At 11:12 A.M. when sampling 45.7 meters from the gas pumps a strong odor was detected when sampling with no dilutions, which may have been due to a fuel delivery truck's presence during a fuel loading event. This observation was atypical of observed odor conditions. At this time and location, when two dilutions were used, a faint or slight odor was still detected. The olfactometer was adjusted to four dilutions and no odors were detected. At 3:10 P.M. when sampling 22.9 meters from the gas pumps with no dilutions a medium strength odor was detected. When sampling with two dilutions a faint odor was detected. When sampling was conducted with four dilutions no odors were detected.

The annual average concentration relating to potential odor problems would be less when accounting for the likely different wind directions occurring throughout the year and the fact that the gasoline station will only be operating during a portion of the 24-hour period. Based on the wind rose applicable to this area, where 2 to 2.5 percent of the flow is out of the north-northeast sector, the extrapolated average concentration applicable to the direction of flow towards the closest residential area in Wheaton would be reduced accordingly. In other words, when accounting for the 2 to 2.5 percent of time that wind directions would occur to directly affect the closest residences to the south of the gasoline station, the probability of detectable odors is low.

Table 2-5: Odor Sample 1 11:00 -12:00, 12/8/2010

Time	Location	Dilutions	Odor
11:08	96.9 m from gas pump	0	Slight odor
11:08	96.9 m from gas pump	2	No odor
11:10	68.6 m from gas pump	0	Mild odor
11:10	68.6 m from gas pump	2	No odor
11:12	45.7 m from gas pump	0	Strong odor
11:12	45.7 m from gas pump	2	Faint odor
11:12	45.7 m from gas pump	4	No odor

Table 2-6: Odor Sample 2 15:00-16:00, 12/8/2010

Time	Location	Dilutions	Odor
15:00	96.9 m from gas pump	0	Very faint odor
15:01	96.9 m from gas pump	2	No odor
15:02	68.6 m from gas pump	0	Faint odor
15:03	68.6 m from gas pump	2	No odor
15:05	45.7 m from gas pump	0	Medium odor
15:06	45.7 m from gas pump	2	Faint odor
15:07	45.7 m from gas pump	4	No odor
15:09	22.9 m from gas pump	0	Medium odor
15:10	22.9 m from gas pump	2	Faint odor
15:12	22.9 m from gas pump	4	No odor

Table 2-7: Odor Sample 3 18:00-19:00, 12/8/2010

Time	Location	Dilutions	Odor
18:14	96.9 m from gas pump	0	No odor
18:15	96.9 m from gas pump	2	No odor
18:20	68.6 m from gas pump	0	Faint odor
18:20	68.6 m from gas pump	2	No odor
18:22	45.7 m from gas pump	0	Faint odor
18:22	45.7 m from gas pump	2	No odor
18:24	22.9 m from gas pump	0	Faintodor
18:25	22.9 m from gas pump	2	Very faint odor
18:26	22.9 m from gas pump	4	No odor

Table 2-8: Odor Sample 4 08:00-09:00, 12/9/2010

Time	Location	Dilutions	Odor
08:10	96.9 m from gas pump	0	Mild odor
08:10	96.9 m from gas pump	2	No odor
08:13	68.6 m from gas pump	0	Mild odor
08:13	68.6 m from gas pump	2	No odor
08:15	45.7 m from gas pump	0	Mild odor
08:15	45.7 m from gas pump	2	No odor
08:16	22.9 m from gas pump	0	Moderate odor
08:17	22.9 m from gas pump	2	Mild odor
08:17	22.9 m from gas pump	4	No odor

Table 2-9: Odor Sample 5 08:00-09:00, 12/9/2010

Time	Location	Dilutions	Odor
13:35	96.9 m from gas pump	0	Slight odor
13:35	96.9 m from gas pump	2	No odor
13:38	68.6 m from gas pump	0	Medium odor
13:38	68.6 m from gas pump	2	Slight odor
13:38	68.6 m from gas pump	4	No odor
13:40	45.7 m from gas pump	0	Mild odor
13:40	45.7 m from gas pump	2	Slight odor
13:40	45.7 m from gas pump	4	No odor
13:45	22.9 m from gas pump	0	Moderate/ strong odor
13:45	22.9 m from gas pump	2	Mild odor
13:45	22.9 m from gas pump	4	Slight odor
13:45	22.9 m from gas pump	7	No odor

‘

Table 2-10: Odor Sample 6 16:00-17:00, 12/9/2010

Time	Location	Dilutions	Odor
15:56	96.9 m from gas pump	0	Faint odor
15:56	96.9 m from gas pump	2	No odor
15:58	68.6 m from gas pump	0	Faint odor
15:58	68.6 m from gas pump	2	No odor
15:59	45.7 m from gas pump	0	Faint odor
15:59	45.7 m from gas pump	2	No odor
15:59	45.7 m from gas pump	4	No odor
16:03	22.9 m from gas pump	0	Moderate odor
16:03	22.9 m from gas pump	2	Faint odor
16:03	22.9 m from gas pump	4	No odor
16:03	22.9 m from gas pump	7	No odor

Table 2-11: Odor Sample 7 18:00-19:00, 12/9/2010

Time	Location	Dilutions	Odor
18:18	96.9 m from gas pump	0	Faint odor
18:18	96.9 m from gas pump	2	No odor
18:20	68.6 m from gas pump	0	Faint odor
18:20	68.6 m from gas pump	2	No odor
18:24	45.7 m from gas pump	0	Faint odor
18:24	45.7 m from gas pump	2	No odor
18:24	45.7 m from gas pump	4	No odor
18:25	22.9 m from gas pump	0	Moderate odor
18:25	22.9 m from gas pump	2	No odor
18:25	22.9 m from gas pump	4	No odor

2.1.7 Meteorological Monitoring

In order to assess the flow at the specific location of the Costco gas station in Sterling, a three-dimensional sonic anemometer was set up and oriented each day of the study at a location as close to the gas station as possible. The meteorological parameters of wind speed and wind direction were collected based on one minute averages for the duration of the two-day study. The specifications of this monitoring station are listed in Appendix G. The minute-by-minute meteorological data is listed in Appendix H. Figures 2-7 and 2-8 show the wind direction and wind speed during the active study periods.

Figure 2-7

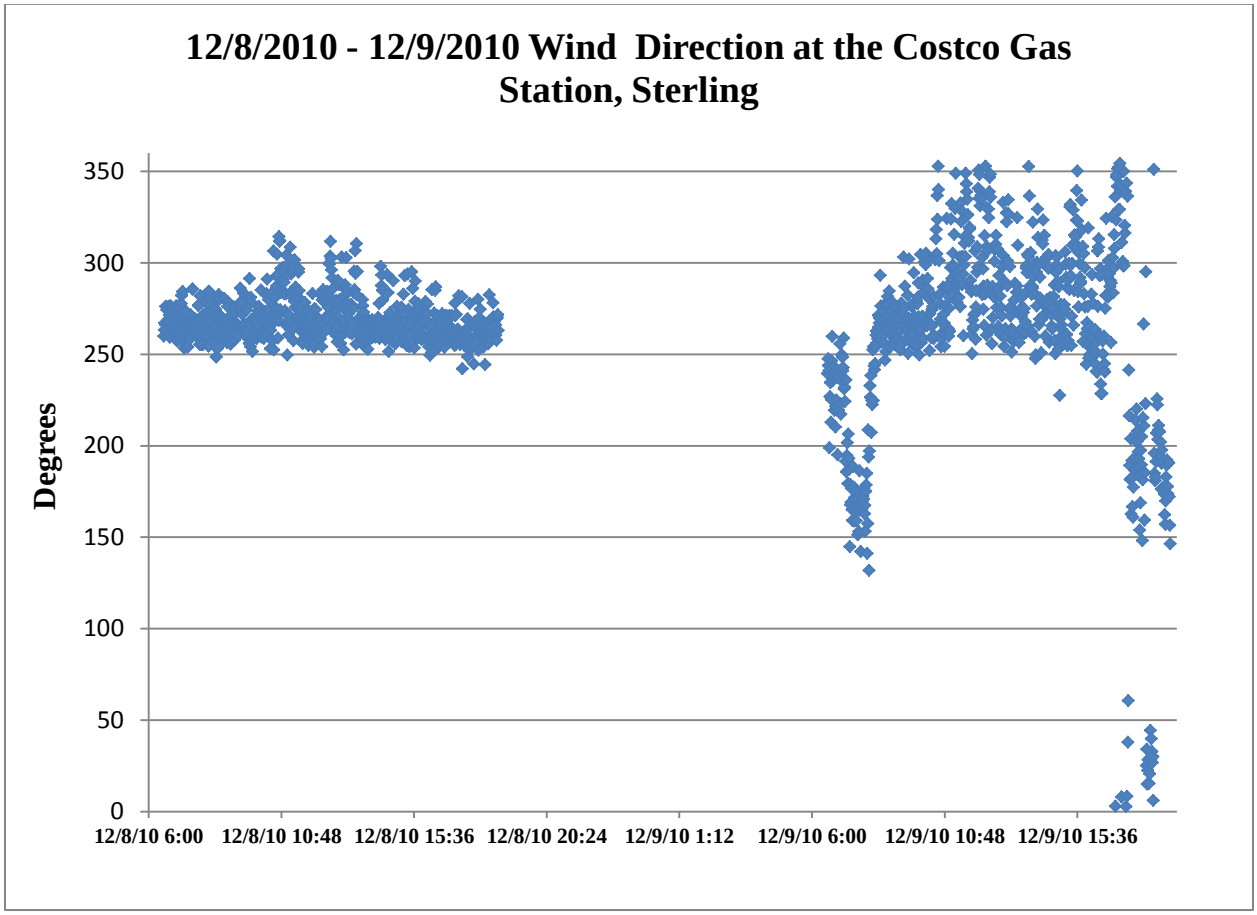
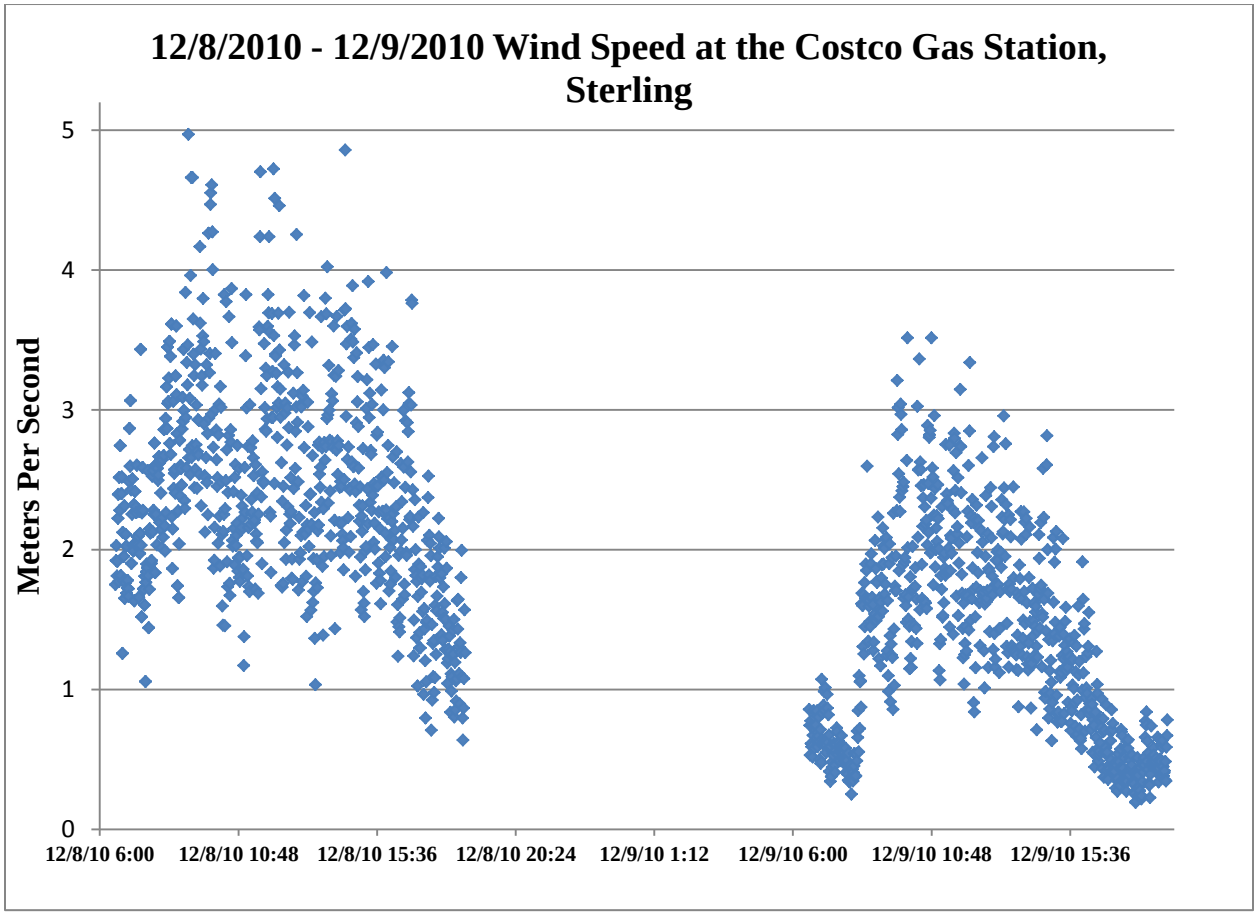


Figure 2-8


12/8/2010 - 12/9/2010 Wind Speed at the Costco Gas Station, Sterling
Meters Per Second
0
1
2
3
4
5
12/8/10 6:00
12/8/10 10:48
12/8/10 15:36
12/8/10 20:24
12/9/10 1:12
12/9/10 6:00
12/9/10 10:48
12/9/10 15:36

2.1.8 Model-Based Interpretation

The state-of-the-art AERMOD dispersion model was used in conjunction with collected wind data and observed cloud cover data (to compute atmospheric stability) to model representative periods for the morning rush period, mid-day, and evening rush hour periods for December 8-9, 2010. The modeling was conducted on a normalized basis (1 µg/m^2/sec) representing the fueling and queuing area. Isopleth analyses were then overlaid onto aerial maps out to a distance of 250 meters. Figures 2-9 and 2-10 present the results for Day 1 and Day 2 respectively. These results show relative concentrations to aid the interpretation of the measured air quality data.

During the summer time months, VOC emissions are expected to be 10 percent higher than shown and CO emissions are predicted to be lower than shown. Table 2-12 shows the MOBILE6 runs for the Wheaton, MD area for the relative amount of emissions per vehicle mile driven.

Table 2-12

MOBILE6 Vehicle Emission Rates by Season and Pollutant (For Wheaton, MD)

MOBILE6 Results	Vehicle Emissions (g/vehicle/mile) at 2.5 mph	
Season	CO	VOC
January 15-35 °F Run	37.791	2.922
July 65-85 °F Run	20.143	3.348

The MOBILE6 model can be accessed at

http://www.epa.gov/oms/m6.htm

Figure 2-9: Maximum 1-Hour Normalized Modeling for Day 1

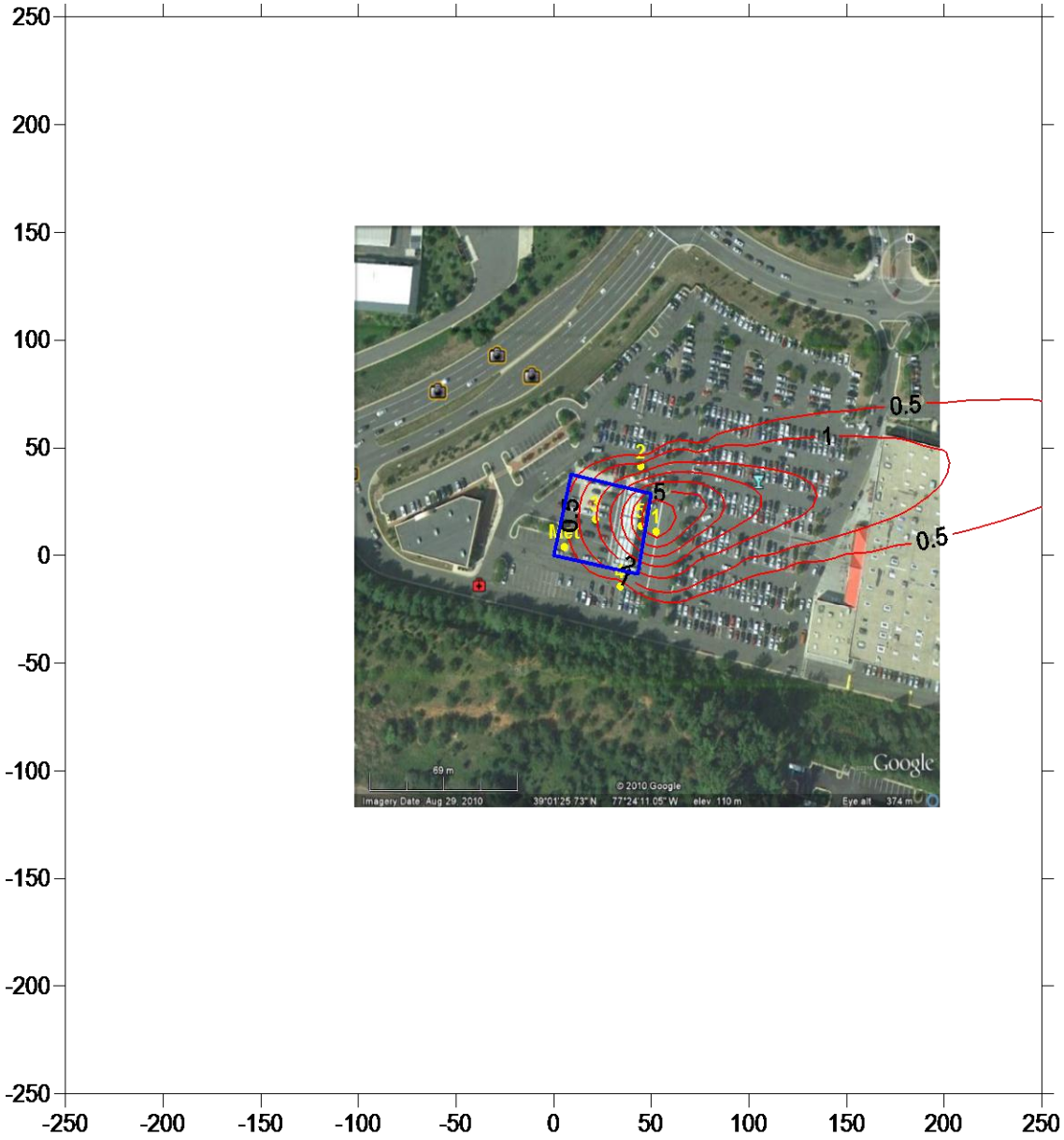
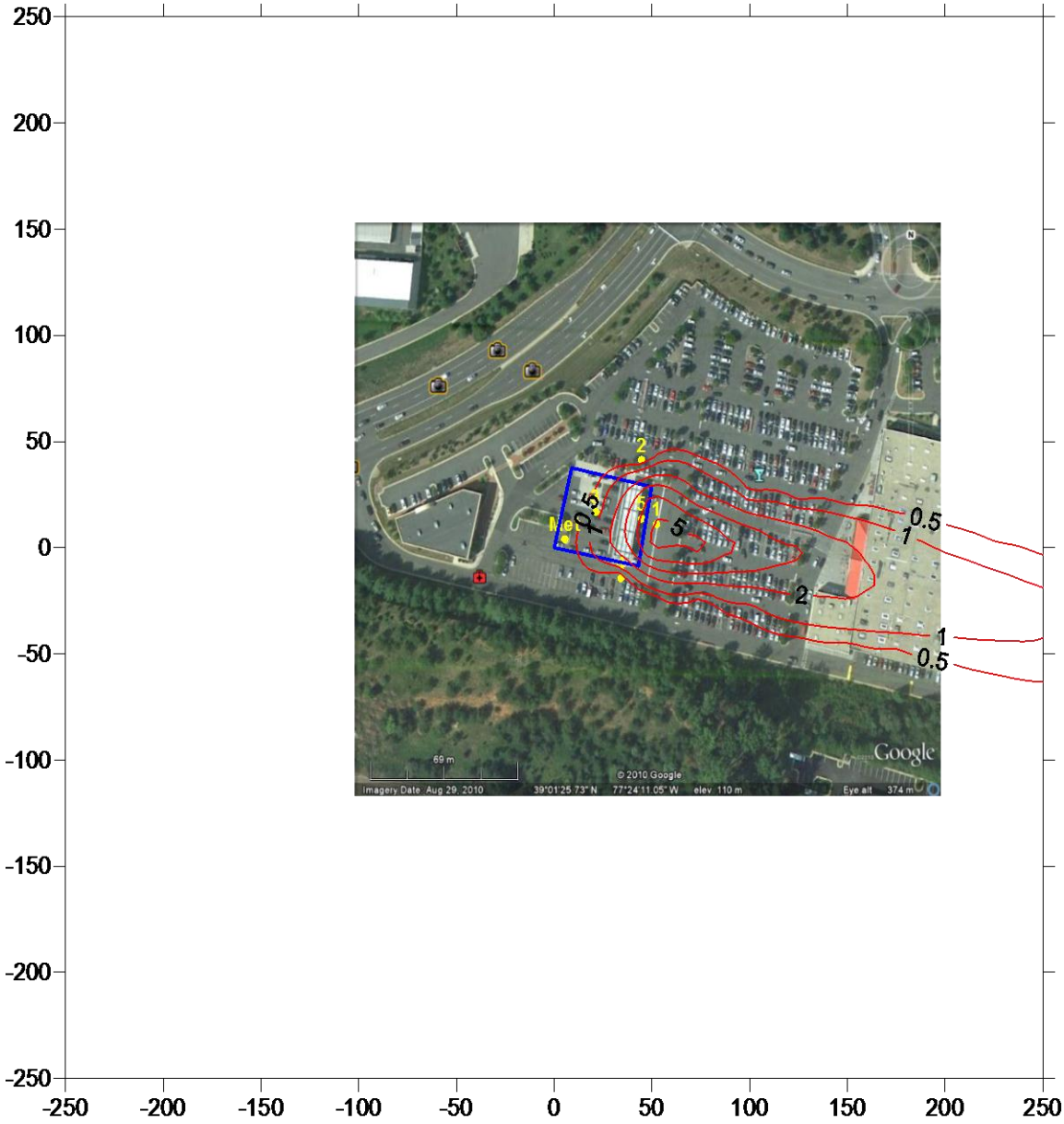


Figure 2-10: Maximum 1-Hour Normalized Modeling for Day 2



The maximum nearby benzene concentration detected at the VOC monitoring locations was approximately 35 ppb on the first day of the study and 13 ppb on the second day at Site #1 approximately 12m downwind of fueling area. No other detectable concentrations (above 3 ppb) were observed except during the loading of the underground storage tanks. Again, the fact that the specific wind directions that would move these odors towards the closest residences to the south of the gas station, would only occur 2 to 2.5 percent of the time on an annual basis, thus significantly reducing the overall potential number of odor incidences. The average ratio of the normalized modeled concentrations of the worst case measured hours (one each day) at the Site #1 monitoring location to the 100-meter distance that represents the nearest residential receptor at the new Costco site in Wheaton, Maryland is provided below in Table 2-13.

Table 2-13: Modeled Ratio Benzene at Site #1 to 100 Meter Location

Modeled Benzene			
Day	Site #1 Benzene (ppb)	100 meter Benzene (ppb)	Ratio (100 meter vs. Site #1)
1	0.09	0.04	0.37
2	0.07	0.04	0.58
		Average Ratio	**0.48**

This ratio was used to predict the average benzene concentration under different scenarios as show in Table 2-14:

Table 2-14: Calculations for Average Benzene Concentrations during various Scenarios

	Benzene Concentration	
Event	ppb	ug/m^3
During Operational Hours	5.25	16.74
Nighttime Conditions Included	3.50	11.16
100 meters Distant Adjustment	1.66	5.30
Using Windrose Frequency (N-NNE)	0.04	0.13
Scaled Up for Summer	0.05	0.15

1) Use the 12 monitoring data during the operational hours only to estimate the average benzene concentrations at the Site #1 location

2) Use the full 48-hour time period to estimate average benzene concentrations assuming station is open 32 hours out of the 48-hour period.

3) Extrapolate the average benzene concentration to the 100-meter distance representing the nearest residential (home) receptor.

4) Use the wind direction frequency to estimate how often a particular residence near the gasoline station will be impacted by odors and benzene concentrations

5) Use a scale-up factor to represent summertime conditions that increase VOC emissions.

The measured benzene concentrations corroborate low model results with modeled and extrapolated measured concentrations and were within the observable range of typical benzene concentrations in the U.S. at approximately 1.0 µg/m^3.

2.1.9 Sterling Monitoring 2010 Conclusions

The noise, air quality, and odor assessment at the Sterling Costco gasoline station was for a station that sells 12 million gallons of gasoline per year compared to the likely sales of approximately 9 million gallons of gasoline per year modeled for the proposed Wheaton Costco gasoline station, which makes the Sterling analysis conservative.

In nearly all cases (see Table 2-4), the benzene concentrations measured at the existing Costco Sterling, Virginia gasoline station were < 3 ppb. With the exception of the concentrations downwind and adjacent to the gasoline delivery truck during unloading operations, there were only two measured concentrations approximately 12 meters downwind of normal refueling/queuing operations that was quantifiable at 35 and 13 ppb.

The average concentration of benzene was 11.2 µg/m^3 over this two-day study at Site #1 when using one-half the detection limit (1.5 ppb) for non-detect concentrations and treating the 8 hours

per day when the station is closed as having zero emissions. Extrapolating to a distance of 300 feet (the distance from the proposed centroid of the Wheaton facility to the center of the closest residence), the average downwind benzene concentration at that distance would be approximately 5.3 µg/m^3 during the two days of the study. The annual average concentration would be less when accounting for the likely different wind directions occurring throughout the year and the fact that the gasoline station will only be operating during a portion of the 24-hour period. Based on the wind rose applicable to this area, where 2 to 2.5 percent of the flow is out of the north-northeast sector, the extrapolated average concentration applicable to the direction of flow towards the closest residential area in Wheaton would be approximately ~0.15 µg/m^3.

The 1-hour and 8 hour average carbon monoxide concentrations were well below the CO standards of 9 ppm and 35 ppm for 8-hour and 1-hour, respectively. Average CO concentrations were 1-2 ppm during the 2-day study (representative of operational hours). The CO monitor was located further at a distance of approximately 25 meters from the gasoline station and much closer than residential exposures. These results are generally consistent with the modeled estimates.

2.2 Sterling Costco Study August 2011

Summary

The field olfactometer readings from both days of sampling showed no odors to low odor impacts in the downwind locations shown in Figure 2-11 at the Costco gas station pumping facility. All odor impacts were observed to be light, variable, and were never strong enough to be consistently detected with two dilutions applied to the olfactometer. The odor lab provided comparable results. The readings of the odor lab were based on the perception of a trained odor panel. The hedonic scale is an effective indicator of the nature and intensity of the odors. This is a scale where -10 is a very obnoxious odor and +10 is a very pleasant odor (zero is no odor). The samples we have taken at the downwind locations shown in the Figure 2-11 at Costco gas pumping station are in the range of -0.2 to -1.2 on this scale, i.e., very close to neutral odor. All of the eight samples where near neutral odors with an average of -0.7 which compares very

closely with our values taken at Kensington Heights in a later study with an average value of -0.5. The slightly negative value on the odor scale for the Sterling gas station and the Kensington background values may be related to traffic-related emissions at both locations.

2.2.1 Objective

The objective of this study was to characterize CO, odors and noise from the Sterling, Virginia Costco gas station as a surrogate for the proposed Wheaton, Maryland Costco gas station. The testing methods used for this study are based on observed field dilution to threshold ratios, odor panel analysis, noise meter results and air dispersion modeling analysis of the highest 1-hour normalized modeling concentrations.

2.2.2 Description of Facility

Figure 2-11 shows an aerial map of the Costco gas station location in Sterling, Virginia that was used to represent the proposed Wheaton, Maryland facility. Also included on the map are distances from the central gas station point to the location of the noise and odor sampling. The hours of operation of the Sterling gas station are 6:00 A.M. to 9:30 P.M. Monday through Friday, and 6:00 A.M. to 7:00 P.M. for weekend operations. Our measurements for this study were taken Monday, August 22, 2011 from approximately 7 A.M.-12 P.M. and Wednesday, August 24, 2011 from approximately 12 P.M.-6 P.M. Figure 2-12 shows the ground-level panoramic view of the gas station and surrounding parking lot.

Figure 2-11: Costco Wholesale Sterling, Virginia

Figure 2-12: South Side View of Costco Gas Station

The total gasoline sales during these two dates are shown below in Table 2-15 and 2-16. The average daily gas consumption is 37,000 gallons for perspective.

Table 2-15: August 22nd, 2011 Gasoline Amount Consumed (gallons)

Current	Day:	WEDNESDAY	Sales Weeks (YYYY-PP-W):	2011-04-3
Lctn/Dept#	218/ 53	218/ 53		8/22/2011
Location		STERLING	STERLING	
Department		GASOLINE		GASOLINE
Item	REGULAR GAS	PREMIUM GAS		
Item#				
Growth %		0		0
	800599	800877	TOTAL GALLONS	
05:00-05:29	20	0		
05:30-05:59	212	42		
06:00-06:29	452	106		
06:30-06:59	302	68		
07:00-07:29	649	149		
07:30-07:59	742	155		
08:00-08:29	789	185		
08:30-08:59	963	222		
09:00-09:29	1009	339		
09:30-09:59	957	264		
10:00-10:29	1037	283		
10:30-10:59	998	371		
11:00-11:29	1034	300		
11:30-11:59	1105	349		
12:00-12:29	1121	392		
12:30-12:59	1146	345		
13:00-13:29	1109	309		
13:30-13:59	1164	320		
14:00-14:29	1063	278		
14:30-14:59	1035	541		
15:00-15:29	1184	351		
15:30-15:59	1168	255		
16:00-16:29	1094	457		
16:30-16:59	1101	408		
17:00-17:29	1125	366		
17:30-17:59	1054	367		
18:00-18:29	1159	329		
18:30-18:59	1201	355		
19:00-19:29	1031	467		
19:30-19:59	918	478		
20:00-20:29	717	221		
20:30-20:59	673	234		
21:00-21:29	353	112		
21:30-21:59	17	16		
	29702	9434	39136	

Table 2-16: August 24th, 2011 Gasoline Amount Consumed (gallons)

Current	Day:	THURSDAY	Sales Weeks (YYYY-PP-W):	2011-04-3
Lctn/Dept#	218/ 53	218/ 53		8/24/2011
Location		STERLING	STERLING	
Department		GASOLINE		
Item	REGULAR	PREMIUM GAS		
Item#				
Growth %		0		
	800599	800877	TOTAL GALLONS	
05:00-05:29	52	0		
05:30-05:59	176	37		
06:00-06:29	412	125		
06:30-06:59	409	98		
07:00-07:29	419	141		
07:30-07:59	679	125		
08:00-08:29	830	264		
08:30-08:59	920	201		
09:00-09:29	1038	331		
09:30-09:59	910	355		
10:00-10:29	906	267		
10:30-10:59	1135	252		
11:00-11:29	1114	293		
11:30-11:59	1162	331		
12:00-12:29	1057	440		
12:30-12:59	1038	527		
13:00-13:29	1148	292		
13:30-13:59	1104	367		
14:00-14:29	1098	349		
14:30-14:59	1192	304		
15:00-15:29	1077	354		
15:30-15:59	1251	287		
16:00-16:29	1053	443		
16:30-16:59	1081	392		
17:00-17:29	1076	478		
17:30-17:59	1140	422		
18:00-18:29	1150	324		
18:30-18:59	1207	340		
19:00-19:29	1094	434		
19:30-19:59	1201	275		
20:00-20:29	794	428		
20:30-20:59	715	275		
21:00-21:29	316	142		
21:30-21:59	41	17		
	29995	9710	39705	

2.2.3 Technical Approach

This project involved three major technical components:

(1) Collection of field data to support a dilution ratio analysis and evaluation of the intensity and characteristics of the emissions from the gas station facility. Field data consisted of field olfactometer readings, collection of Tedlar™ bag air samples for odor analysis, collection of noise meter and carbon monoxide data.

(2) Odor laboratory analysis of dilution ratio, odor characteristics, and odor intensity analysis: Staff members of Sullivan Environmental collected samples at different times of the day over a two-day period to support the collection of a representative data set.

(3) Air dispersion modeling analysis of highest 1-hour normalized modeling concentrations in the AERMOD View air dispersion model in ISCST3.

2.2.4 Field Operations

The objective of the field work was to assess odors, noise, and CO during typical and upper-bound times, to capture periods with good dispersion (high dilution ratios) as well as periods more likely to have suppressed atmospheric mixing / dilution conditions (low dilution ratios). The field olfactometer readings were taken by three Sullivan Environmental Consulting, Inc. staff members that were involved in the field study. The following is a brief description of the sampling procedures used for this analysis.

The downwind direction was identified and field olfactometer-based dilution ratios, wind speed, wind direction, ambient temperature, noise meter readings, carbon monoxide readings and Tedlar™ bag samples (when collected) were recorded or collected. The results were recorded in the form as shown in Appendix M along with the odor panel results in Appendix N. In addition, odor samples were taken during conditions, when odors were detected, and during spaced time intervals for odor lab analysis. These Tedlar™ odor sample bags were packed into shipping containers and placed in a secure location in the vehicle and out of the sun prior to same day overnight shipping. Also documented and recorded was noise meter readings and carbon

monoxide data which can be located in Appendix O-P. During each monitoring time period, the following meteorological data was collected and recorded on an ongoing basis: wind speed, wind direction, ambient temperature, and relative humidity (Appendix Q). Mostly sunny conditions were observed on the two days evaluated.

The GPS coordinates of the sampling locations were recorded as well as specific time of the olfactometer sampling, noise meter recordings, carbon monoxide readings and bag sample collection and are recorded in the tables provided in this section.

2.2.4.1 Equipment used for Field Operations

- St. Croix Sensory Field olfactometer
- New cartridges for field olfactometer
- 18 10L Tedlar™ air sample bags
- 2 SKC PCRX series air sampling pumps
- SKC Vac-U-Chamber negative pressure air sample collection system
- Shipping boxes for Tedlar™ bag samples
- Kestrel 4500 Portable meteorological monitoring system
- Extech Instruments Data logging sound level meter Model HD600
- Carbon Monoxide Meter / Data logger ZDL-500

2.2.5 Odor Laboratory Analysis

St. Croix Sensory Laboratory of Lake Elmo, Minnesota provided the odor panel analysis for this study. The odor laboratory initially analyzed eight samples for dilution to threshold, intensity, and characteristics of the odor. These samples were collected on August 22nd and 24th and shipped overnight to the Minnesota odor facility.

The Tedlar™ bags have about a 30 to 50 dilution ratio themselves, with a chemical or vinyl characteristic, which is present in nearly all of the samples collected and analyzed and is typical of Tedlar™ bag sampling. For example, in round numbers a dilution of 100 is about a 2x dilution relative to the blank.

One of the objectives of this study was to determine if the gas pumping station generates odors that would adversely impact the surrounding communities. As discussed below, the study revealed that a slight, almost negligible odor was identified in only three of the nine sampling periods at the Costco gas station in Sterling, Virginia. Summertime odors during more favorable dilution conditions were found to have reduced odors compared to the cold weather study at the Sterling facility. Considering the 7 sampling periods in the winter odor study (6 detectable odors) and the 9 sampling periods in the summer odor study (3 detectable odors), it was found that 9 of the 16 sampling periods had detectable odors. With wind flow on the order of 2 to 2.5 percent towards the closest residential areas to the south of the gas station, and considering that 9 of the 16 samples had detectable odors, there would be an expected 1 percent probability for detectable odors in the residential area. Within indoor environments, the probability would be further reduced.

The analytical results of the odor lab were based on the perception of an odor panel. In all cases, the dilutions were less than 90, which are considered low to no odor. The hedonic scale is a good relative indicator of the intensity and general character of the odors. This is a scale where -10 is a very obnoxious odor and +10 is a very pleasant odor (zero is no odor). The samples taken at the locations shown on the map in Figure 2-13 are downwind of the gas station and are in the range of -1.2 to -0.2. In addition Table 2-17 shows the meteorological conditions at the time of each sample. Most of these odors were considered light odors and in some cases (possibly related to

mulch) were perceived at least by some panel members as “earthy”. Note that when the odors are identified on the odor panel as “offensive odors” as noted in five of the samples, the hedonic scale was only in the range of -0.2 to -1.2, i.e., very light near neutral odors shown in Table 2-18 with an average hedonic tone of -0.7. This compares very closely to the current background levels at Kensington Heights which has an average hedonic tone of -0.5 which will be addressed in further detail in Section 2.3. Refer to Figure 2-14 and Figure 2-15 for a visual depiction of the odor scale at Sterling compared to Kensington Heights; these figures both display closely related values in terms of hedonic tone.

The full odor panel study is located in Appendix M where a visual image of strength of each panel member is displayed.

Figure 2-13: Bag Sample Locations 8/22/2011 and 8/24/2011

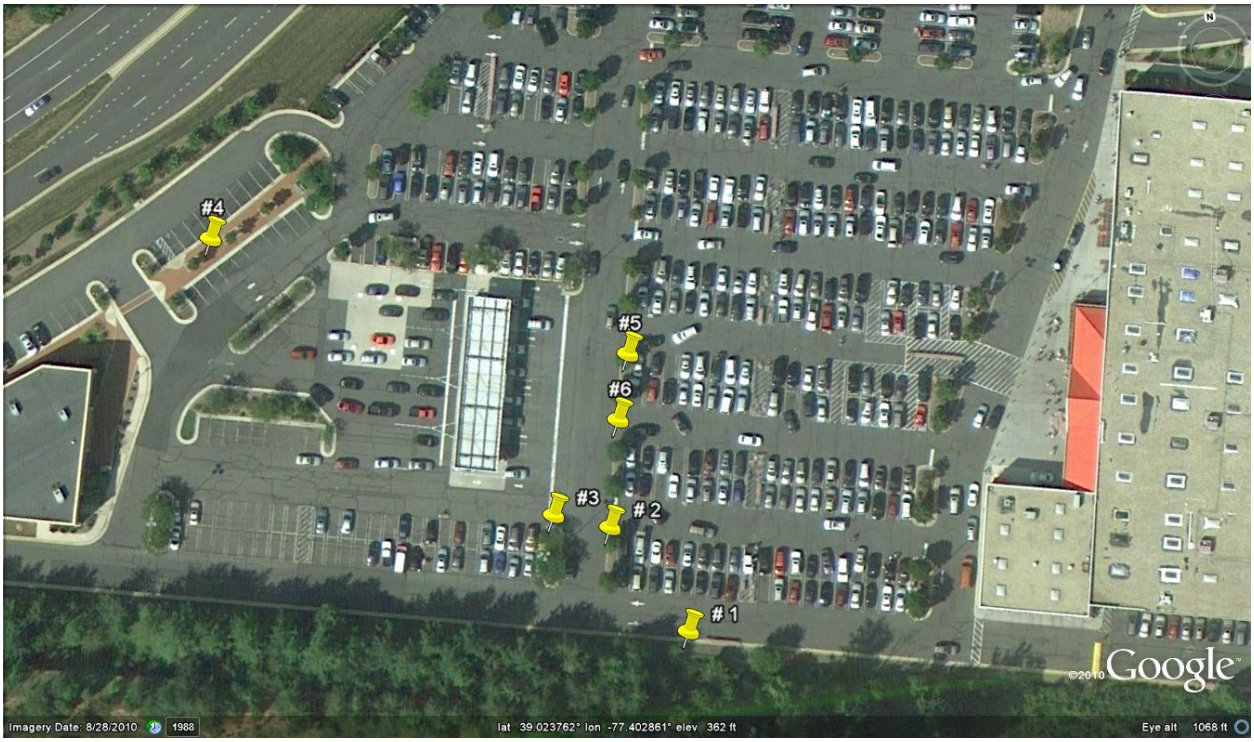


Table 2-17: Bag Samples and Meteorological Conditions

Loation #	Date	Time	Wind Dir	Wind Speed (MPH)	Deg F	RH	Latitude	Longitude
#1	8/22/2011	12:43	-	-	-	-	39.0232774	-77.40281072
#1	8/22/2011	13:40	320	3	78.1	39.1	39.0232774	-77.40281072
#2	8/22/2011	14:52	313	3.6	84.5	35.1	39.02346461	-77.40295799
#3	8/22/2011	16:09	316	5.6	81.2	33.6	39.02349527	-77.40308473
#3	8/22/2011	17:06	329	329	84.6	30.7	39.02349527	-77.40308473
#4	8/24/2011	6:56	154	0	64.4	75.5	39.02404759	-77.40379396
#5	8/24/2011	10:10	316	1.1	78.1	60.8	39.02376121	-77.4028663
#6	8/24/2011	10:53	283	4.2	78.7	60.2	39.02364058	-77.40290478

Table 2-18: Odor Panel Analysis- Summary Table

	ASTM E679 &EN13725		ASTM E544	CHARACTERIZATION	
Sample Site, Time, Date	Detection Threshold	Recognition Threshold	Intensity	Hedonic Tone	Principal Odor Description
# 1 12:43-12:48, 8/22/2011	65	35	21	-0.8	Chemical, Earthy
#2 13:40-13:45, 8/22/2011	70	40	19	-0.6	Chemical, Earthy, Offensive
#3 14:52-14:57, 8/22/2011	90	50	23	-1.2	Chemical, Earthy
#4 16:09-16:14, 8/22/2011	60	35	17	-1.2	Chemical, Earthy, Offensive
#5 17:06-17:09, 8/22/2011	85	50	20	-0.8	Chemical, Earthy, Medicinal
#6 6:56-7:00, 8/24/2011	25	17	9	-0.2	Chemical, Floral, Earthy, Offensive
#7 10:10-10:14, 8/24/2011	35	21	11	-0.2	Chemical, Floral, Earthy, Offensive
#8 10:53-10:57, 8/24/2011	70	50	16	-0.8	Chemical, Earthy, Offensive, Medicinal

***Average Hedonic Tone*= -0.7**

Figure 2-14: Summary of Odor Laboratory Results from Sterling Virginia Costco Relative to the -10 to +10 Odor Scale

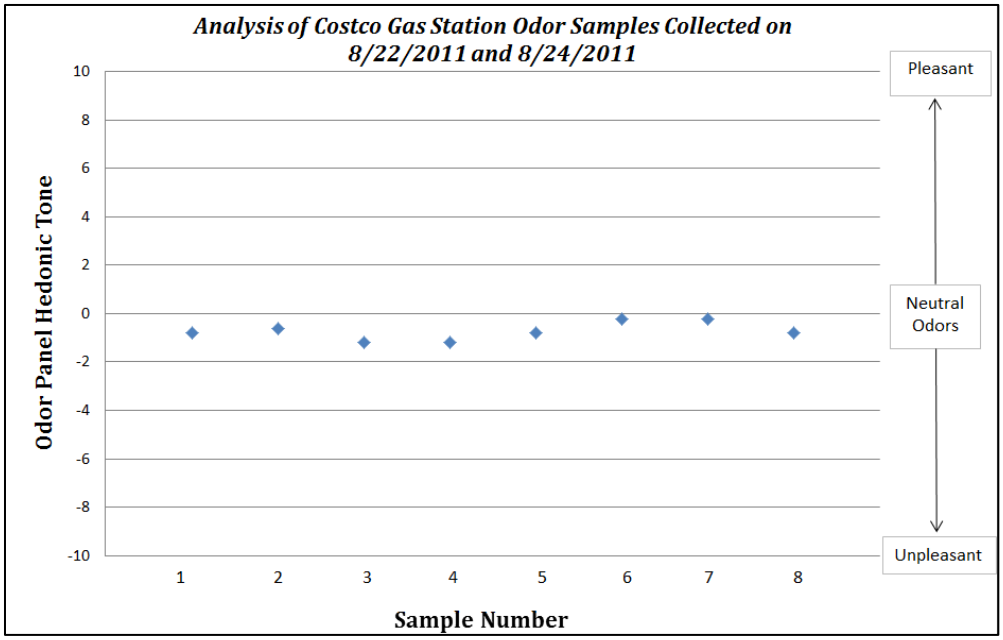


Figure 2-15: Summary of Odor Laboratory Results from Kensington Heights Relative to the -10 to +10 Odor Scale

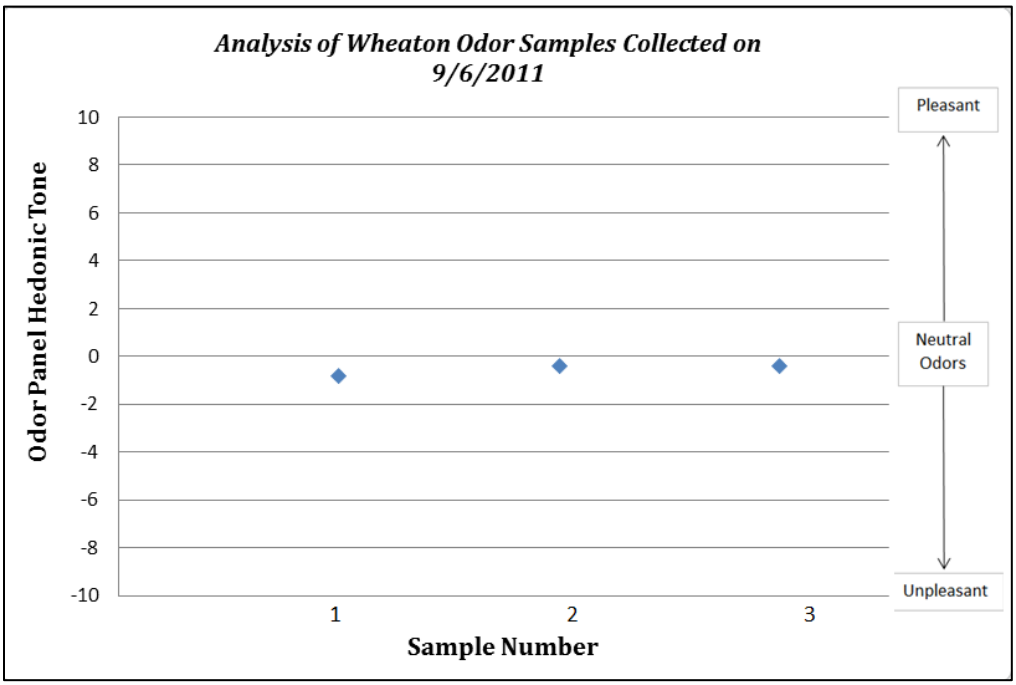


Figure 2-16 displays locations of all the olfactometer samples taken during August 22, 2011 and August 24, 2011. These samples were taken downwind of the gas station depending on current meteorological conditions shown in Table 2-19. These samples were taken approximately every hour during the two-day observation period to record the strength of odors produced by the Costco gas station facility.

In Table 2-19, the comment section indicates any odor that was observed without the olfactometer by three Sullivan Environmental Consulting, Inc. staff members. No odors were observed when using the olfactometer at two dilutions during this two day study. Without any dilutions the highest rating given to the odor observed was slight odor, and these observations were only indicated when staff members were in close proximity to the gas station.

The samples that were taken at 9:04 A.M. and 9:45 A.M. (EDT) on August 24, 2011 are highlighted in yellow and orange respectively in Table 2-19. These are the time periods where winds were highly variable and the staff members were unable to consistently determine a downwind location at that time. To account for the variability, samples were taken around the perimeter of the gas station to account for all possible wind direction and record if any odor could be detected.

Figure 2-16: Olfactometer Locations 8/22/2011 and 8/24/2011

Table 2-19: Olfactrometer readings and Meteorological Conditions

Location #	Date	Time	Wind Direction	Wind Speed (MPH)	Temp◦ F	RH	Olfactrometer Dilutions	Comments	Latitude	Longitude
1	8/22/2011	14:55	313	3.6	84.5	35.1	<2	No Odors	39.0232774	-77.40281072
2	8/22/2011	16:05	324	6.2	80.8	33.6	<2	Faint Odor	39.02346461	-77.40295799
3	8/22/2011	17:05	344	4.9	82.2	31.3	<2	Faint Odor	39.02349527	-77.40308473
4	8/22/2011	18:10	330	5.6	79.6	31.5	<2	Faint Odor	39.02347689	-77.4032278
3	8/24/2011	7:02	142	0	64.5	75	<2	Faint Odor	39.02352291	-77.40311786
5	8/24/2011	7:50	81	0	69.5	70.7	<2	No Odor	39.02360718	-77.4035951
6	8/24/2011	9:04	160	0	72.9	67.1	<2	No Odor	39.02403365	-77.40381309
4	8/24/2011	9:04	160	0	72.9	67.1	<2	Very Faint Odor	39.02348566	-77.40322236
7	8/24/2011	9:04	160	0	72.9	67.1	<2	No Odor	39.02365646	-77.40292276
8	8/24/2011	9:04	160	0	72.9	67.1	<2	No Odor	39.02404058	-77.40321156
6	8/24/2011	9:45	305	3.9	76.2	65.1	<2	No Odor	39.02403365	-77.40381309
4	8/24/2011	9:45	305	3.9	76.2	65.1	<2	Faint Odor	39.02348228	-77.40322015
7	8/24/2011	9:45	305	3.9	76.2	65.1	<2	Faint Odor	39.02364788	-77.40289666
8	8/24/2011	9:45	305	3.9	76.2	65.1	<2	No Odor	39.02402434	-77.40322918
9	8/24/2011	10:03	185	6.4	75.8	61.8	<2	No Odor	39.02376121	-77.4028663

There were questions related to the representativeness of the bag samples taken at Sterling in relation to the Wheaton site.

Figure 2-17 is a plot of the bag samples from the Sterling site overlaid on top of the Wheaton site at comparable distances from the center of the gas pump area. The odor (hedonic) scale used in the bag samples is an effective indicator of the nature and intensity of the odors. All odor samples from Sterling at 250 feet were observed to be basically near neutral (ranging from -0.2 to -1.2); i.e., light, variable, and were never strong enough to be consistently detected with two dilutions applied to the olfactometer:

Illustrated in Figures 2-18 and 2-19 are contour plots of model predicted dilution ratios that show as distance further increases from 250-300 feet as evaluated in Sterling, the odor potential would further diminish with distance. These contour plots of model predicted dilution ratios[16] for the Wheaton site showed relatively small (0.5-0.7) values for 1-hour and even smaller (0.02-0.04) for annual time periods at the 100-meter distance compared to predicted concentrations directly around the gas station pump area.

[16] A dilution value of 0.5, for example, means that the air has had a 2-fold dilution in concentration compared to the reference location.

Figure 2-17: Relational Plot of Odor Samples Taken in Sterling at Comparable Distances And Directions to the Gas Pumping Station at Wheaton

Figure 2-18: Predicted 1-Hour Dilution Ratios Within 160 meters of Wheaton Gas Station

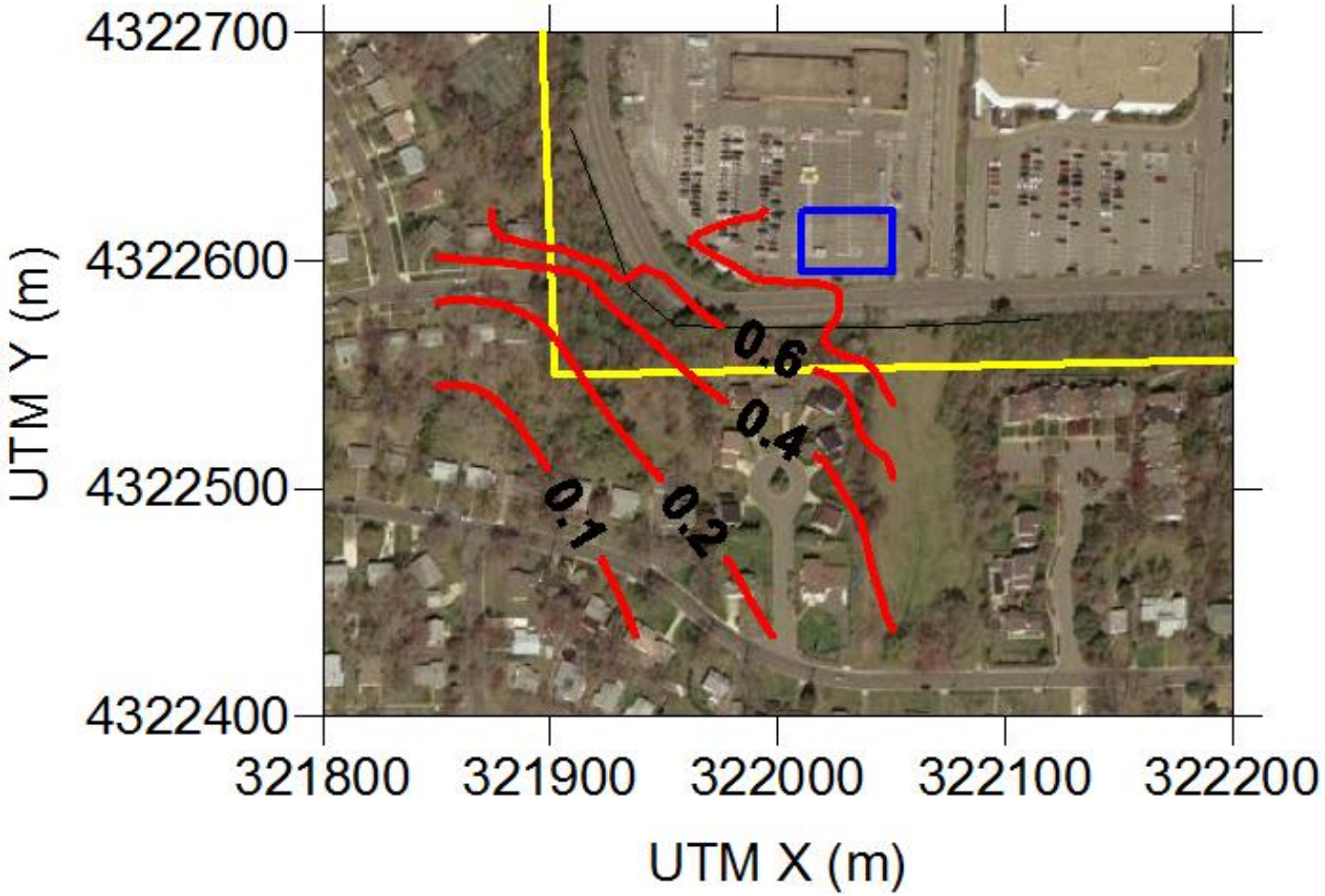
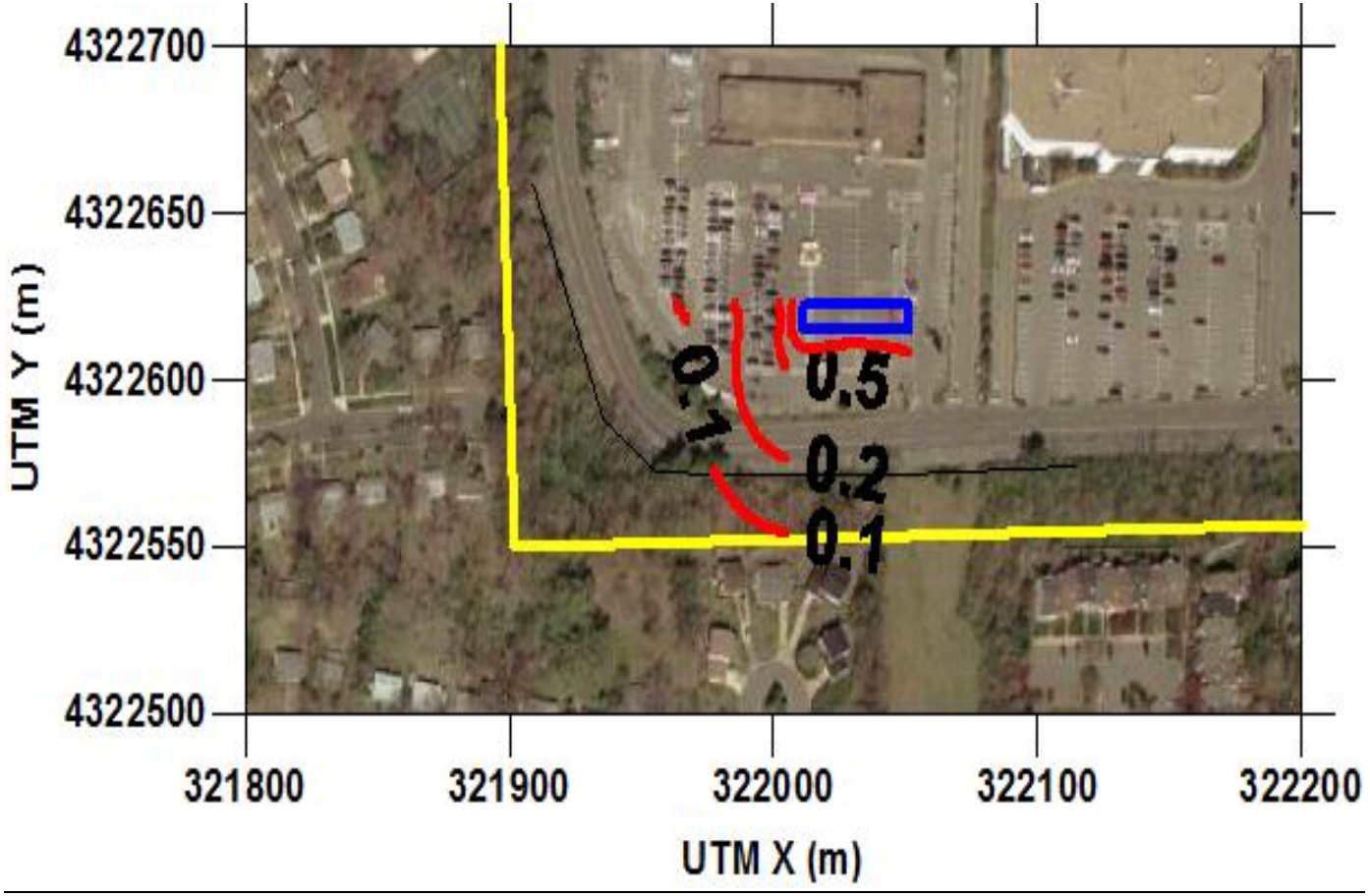


Figure 2-19: Predicted Annual Dilution Ratios Within160 meters of Wheaton Gas Station



In summary, the following were conclusions made from the odor analysis:

1. Odors were found to be generally light beyond 25 m from the pumping area.
2. Odors (light) were detected out to 100 m downwind of the gasoline station six out of nine times at zero dilution; three of nine sample sets showed no detectable odors.
3. Odors (light) would be detectable at the nearest residences in Wheaton only during times when the wind direction aligns the residence with the gas station which will occur on a 2-2.5 percent basis from the wind direction frequency analysis.
4. It is expected that odors could occur at less than 2 percent of the time in the outdoor environment at a distance of 100 m (the distance to the closest residence at the proposed Wheaton facility) based on this cold weather study.

2.2.6 Noise Meter Analysis

On the first day of observation August 22, 2011 noise readings were recorded from 1:19 P.M.-5:58 P.M. with an average noise reading of 58 dBA at location #1 and 68 dBA at location #2 closer to the gas station. The highest dBA value was recorded as 92.9 in Image 6 when a delivery truck passed along the road directly next to location #1 in Figure 2-20 which is approximately 78 meters away from the center point of the gas station. At 3 P.M. the noise meter was relocated to location #2 in Figure 2-20, or closer to the gas station facility at about 30 meters away. This location had more noise and traffic from vehicles exiting the gas pumps and the Costco parking lot. This location had averages at 68 dBA with less variability in dBA values compared to the earlier measurements at location #1. The lower variability and higher values are attributed to the more constant traffic at location #2 closer to the gas station and also because of steadier rush hour traffic volume. The average of dBA values at location #1 was 58 dBA and since after the move values increased to an average of 68 dBA shown in Figure 2-21, this shows a major decrease in noise levels with a distance of less the 50 meters from each other.

For day 2, August 24, 2011 observations were taken in the morning from 7:12-11:03 at location #3 in Figure 2-20 and results displayed in Figure 2-22. The average noise readings were lower than day 1 at an average of 56 dBA. The highest spike on this day was 88.2 dBA most likely due to a car door slamming near the noise monitor, but generally values were much lower than the peak amount. The traffic seemed to be less on this day of observation.

The noise meter raw data for this study is available in Appendix O. In addition, refer to Section 2.4 for a summary of how these noise levels compare to the noise guidelines in place for Montgomery County.

Figure 2-20: Noise Meter Locations 8/22/2011 and 8/24/2011

Figure 2-21: Noise Meter Data 8/22/2011

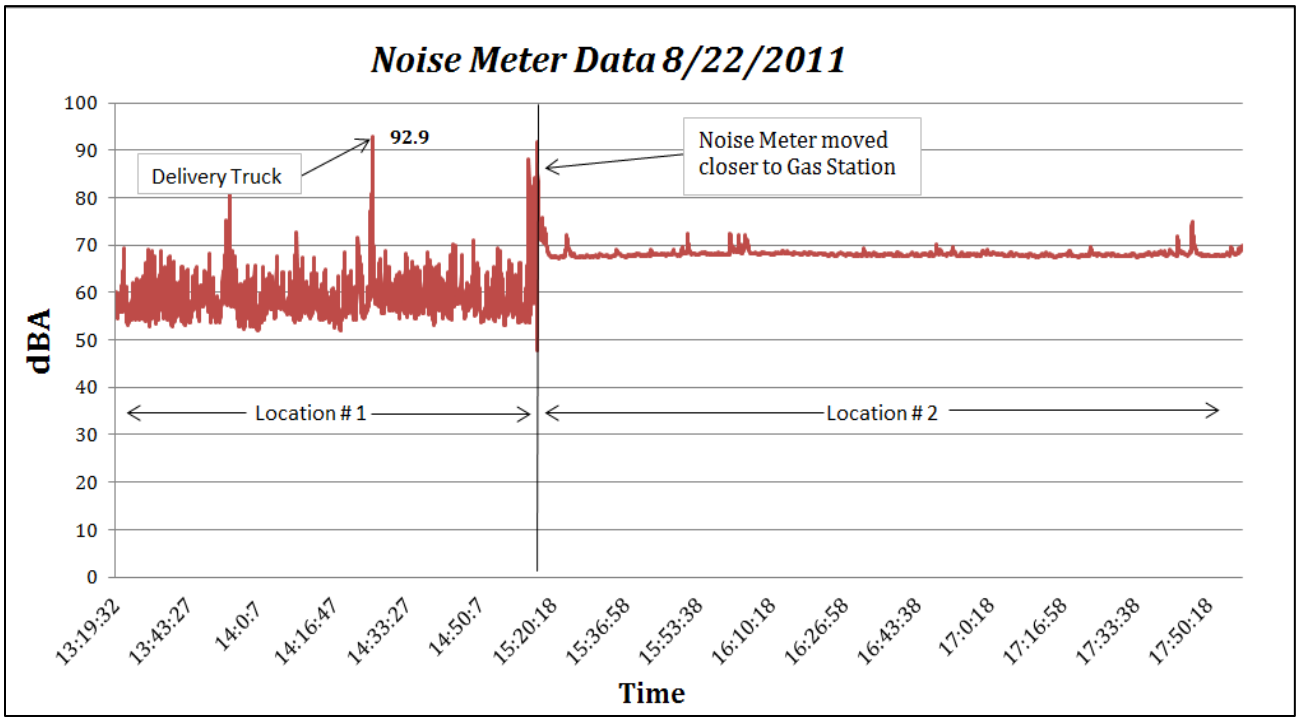
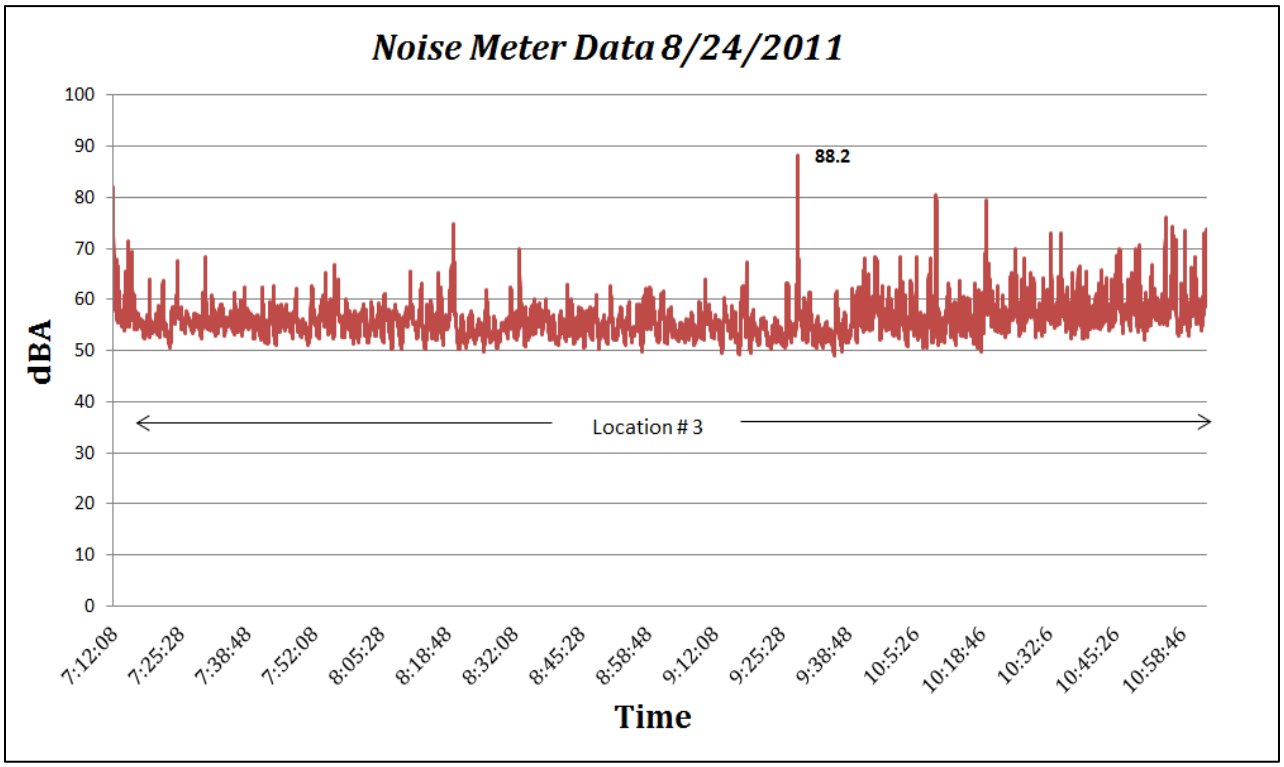


Figure 2-22: Noise Meter Data 8/24/2011



2.2.7 Carbon Monoxide Analysis

A CO monitor with a data logger was set up on both observations days. On the first day, August 22, 2011 the monitor was placed at approximately one meter above the ground and 30 meters downwind of the gas station at Site #1. The position of the sensor is displayed in Figure 2-23 and location #1 was recorded from 13:52-18:00 that afternoon. The National Ambient Air Quality Standards (NAAQS) requires carbon monoxide to be below 9 ppm for an 8-hour standard and 35 ppm for a 1-hour standard. For the duration of this study on day 1 the average CO value was 0.2 ppm for a 4-hour period, this value is well below the standard (45 times under the 8-hour standard) and would be expected to be of similar magnitude if the testing period was for a full eight hour period. The highest average 1-hour period was during the end of the period and reached 0.3 ppm which is far below the 35 ppm standard (117 times lower than the hourly standard). Figure 2-24 displays the visual depiction of this day's value. While higher measured CO concentrations would be anticipated during periods with more restricted dilution conditions, the monitoring study confirmed that the incremental contribution from the gas station under normal operating conditions is not high relative to the standard and would not be expected to create exceedances of the CO standards. This is consistent with the modeling analysis.

The second day of observation on August 24, 2011 from 7:06-11:03 A.M. the CO monitor was set up at location #2 in Figure 2-23. The monitor was moved at 10:25 A.M. to location # 3 which is located in front of the gas pumps approximately 30 meters away. Figure 2-25 CO shows levels increased after the move to location # 3. The average CO value before the move at location #2 was 0.1 ppm and this changed to an average of 0.3 ppm after the move. The highest 1-hour average recorded was at the end of the period closer to the gas station at 0.3 ppm, which again is well under the standards.

Figure 2-23: CO Monitor Locations 8/22/2011 and 8/24/2011

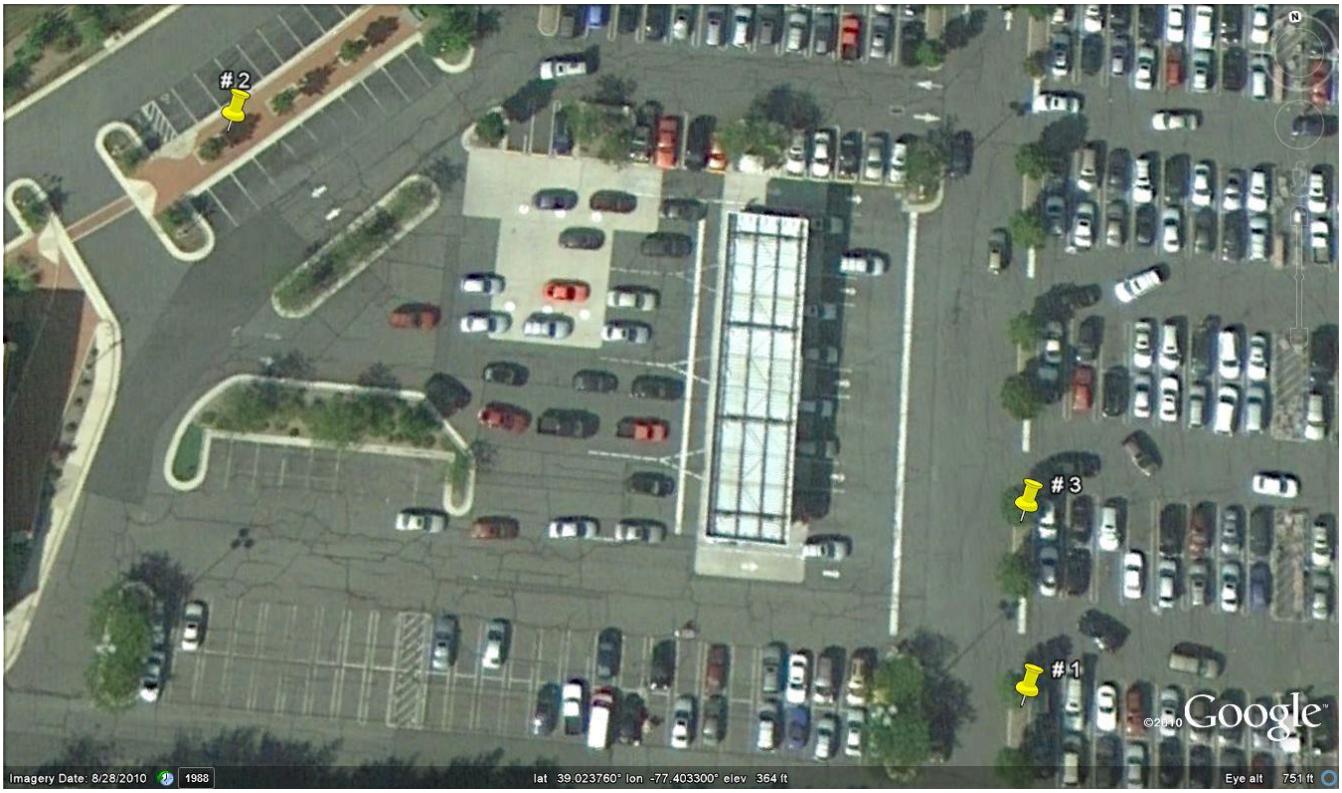


Figure 2-24: Ambient Carbon Monoxide Readings 8/22/2011

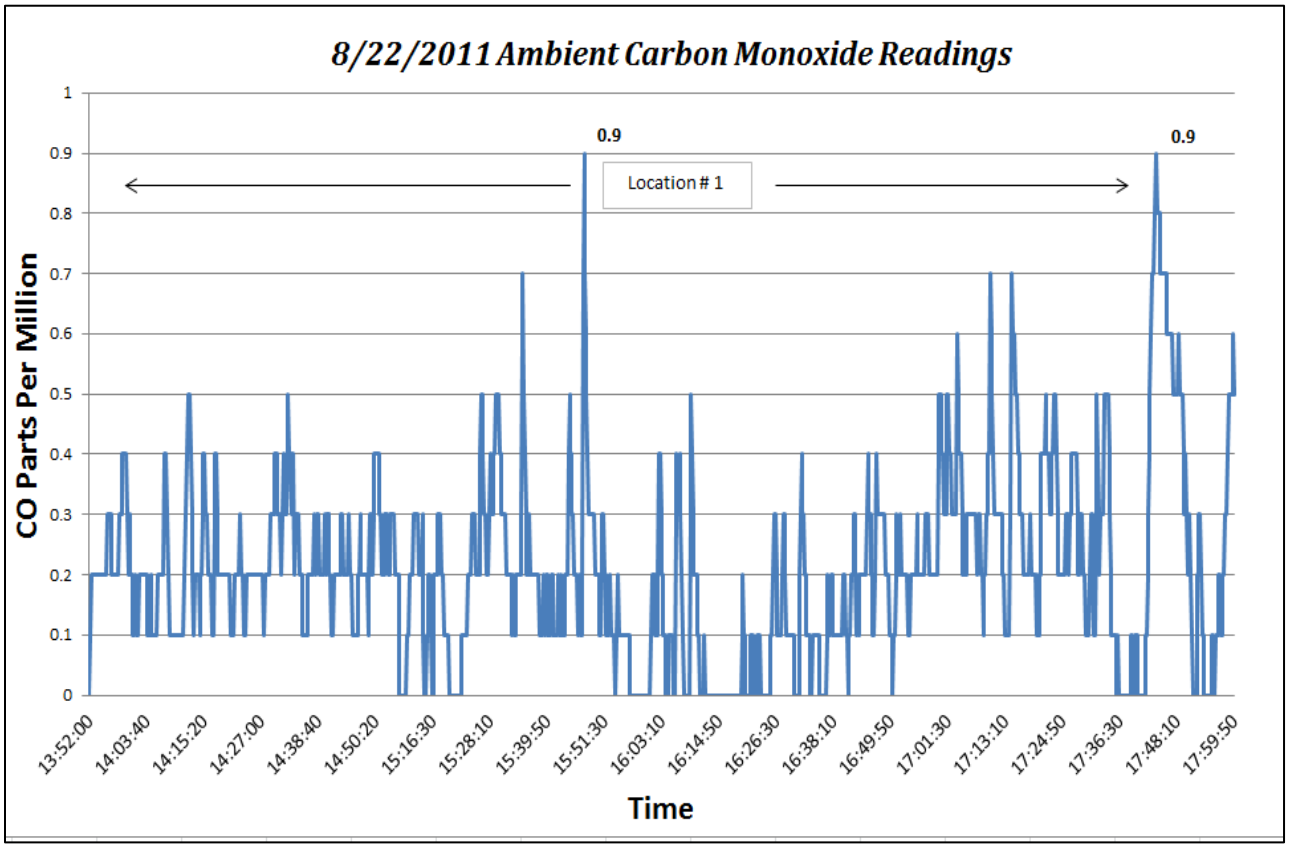
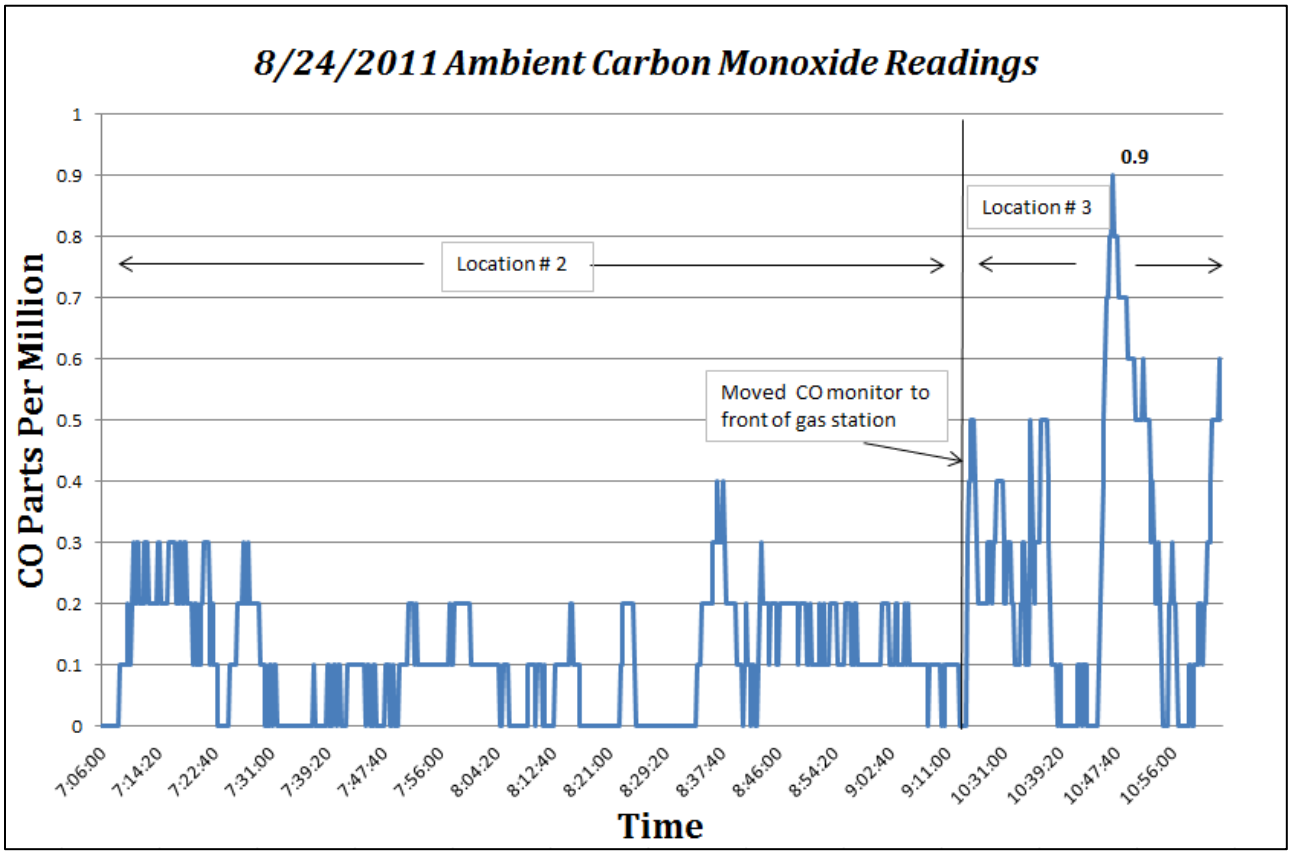


Figure 2-25: Ambient Carbon Monoxide Readings 8/24/2011



2.2.8 Dispersion Modeling Analysis

The AERMOD View air dispersion model in ISCST3 mode was run to compute the normalized concentrations and from the maximum computed concentration, dilution ratios, during the time the odor samples were taken using on-site weather data (wind speed, wind direction, temperature, on-site cloud cover observations and calculated atmospheric stability) with special receptors established for the proposed Costco property. The locations of the odor sampling monitoring stations were plotted to model representative periods during the odor study for August 22nd and 24th, 2011. The modeling was conducted on a normalized basis (1 µg/m^2/sec) using a rectangular source representing the fueling and queuing area. Isopleth analyses were then overlaid onto aerial maps out to a distance of 250 meters for an example.

Figures 2-26 and 2-27 present the results showing the maximum 1-hour averaged normalized concentrations for the sampling periods on each day. The green points identify the locations where the odor samples were taken. During the first day of sampling, during the afternoon hours of August 22nd, the wind aligned with the eastern monitors and during the morning hours of August 24th, the winds aligned more with the western monitor.

2.2.9 Dilution Results

Dilution ratios for expected odors were modeled out to the 250-meter distance for an example which ranged from 10-25 on the first day and 8-80 on the second day of what would be expected at the edges of the gasoline station source zone of emissions. Modeling input files are located in Appendix R and S.

Figure 2-26: 1-Hour August 22nd

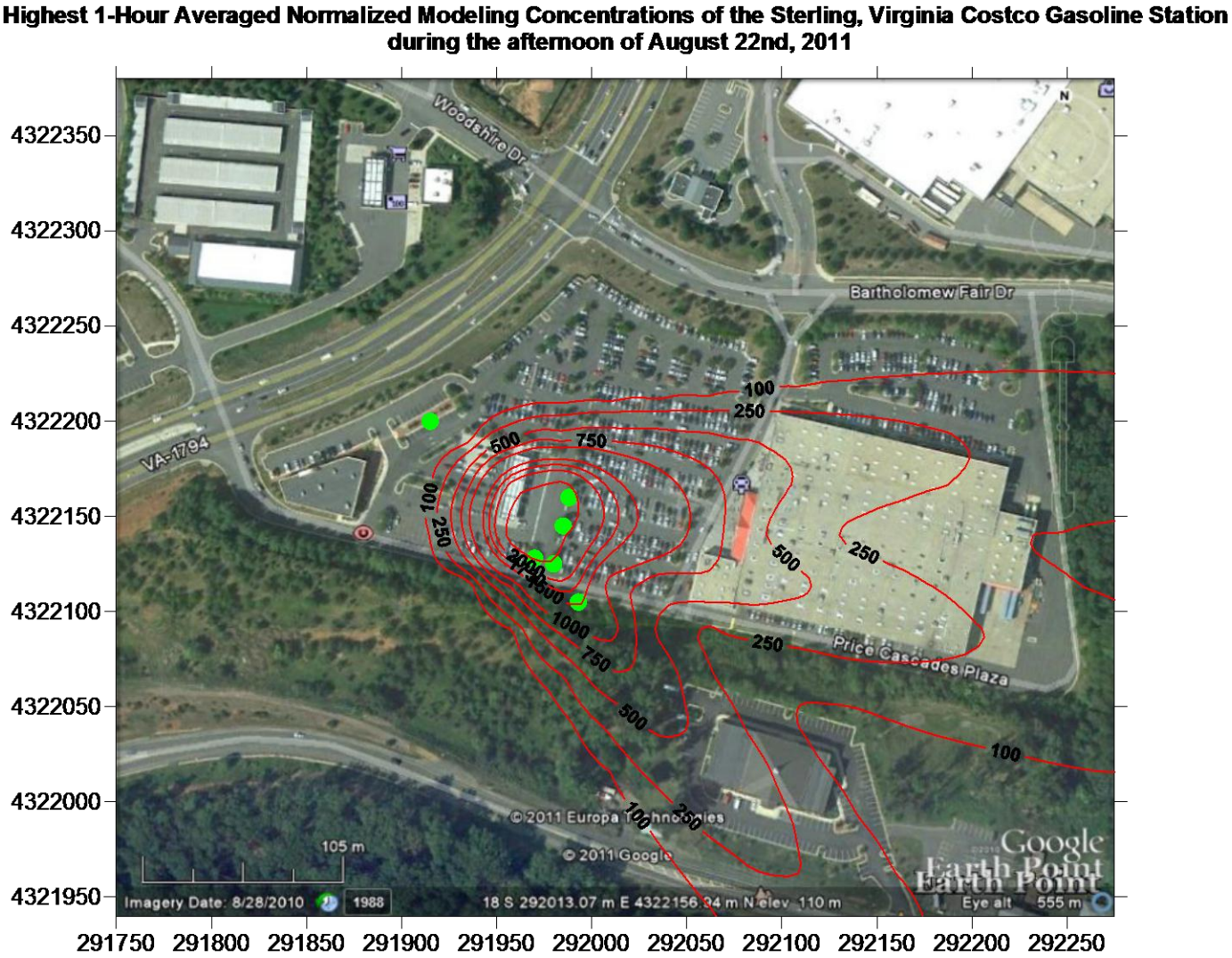
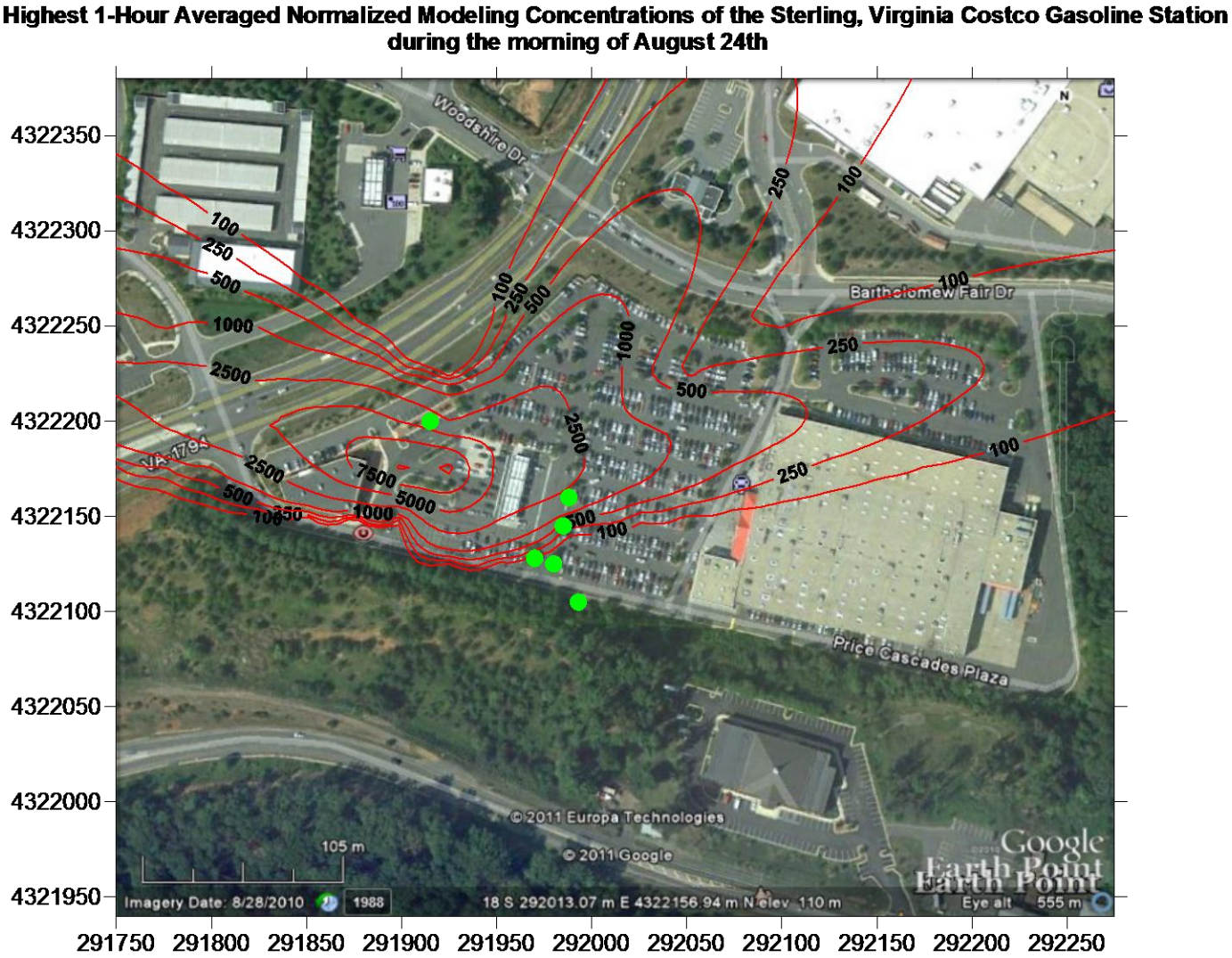


Figure 2-27: 1-Hour August 24th



2.3 Kensington Heights September 2011 Study

Summary

The odor lab results displayed near neutral odors but panel members did detect a slight offensive odor in all three samples. The readings of the odor lab were based on the perception of an odor panel. All three samples also were observed to have some pleasant odors. The dilution ratio in Kensington Heights was lower than those recorded at Sterling, although the distance s for the odor measurements at Sterling were generally closer than the property boundaries at the residential areas near the proposed station in Wheaton.

The hedonic scale is an effective indicator of the nature and intensity of the odors. This is a scale where -10 is a very obnoxious odor and +10 is a very pleasant odor (zero is no odor). The samples we have taken at the locations shown in Figure 2-30 are in the range of –0.8 to -0.4 and an average of -0.5 on this scale, i.e., very close to a neutral odor and very similar to the -0.7 average that was obtained at the Costco in Sterling, VA from the 2011 study.

2.3.1 Objective

The objective of this study was to characterize the background odors and noise approximately 200 meters away from the proposed Costco gas station and compare the results to the operating Sterling, Virginia facility. The testing methods used for this study are based on odor panel analysis and noise meter readings.

2.3.2 Description of Facility

Figure 2-30 shows an aerial map of the community near the Wheaton Mall complex where the Costco gas station is proposed to be located. The measurements for this study were taken on September 6, 2011. Three Tedlar™ bag samples were collected between 10:55 A.M. to 4:10 P.M. Noise samples were taken from 3:45-5:58 P.M. which avoided the heavier rain periods that would have affected the noise measurements.

2.3.3 Odor Laboratory Analysis

St. Croix Sensory Laboratory of Lake Elmo, Minnesota provided the odor panel analysis for this study. The odor laboratory initially analyzed three samples for dilution to threshold, intensity, and characteristics of the odor. These samples were collected on September 6, 2011 and shipped overnight to the Minnesota facility. These odor panel results are located in Appendix T.

The Tedlar™ bags have about a 30 to 50 dilution ratio themselves, with a chemical or vinyl characteristic, which is present in all of the samples collected and analyzed and is typical of Tedlar™ bag sampling. For example, in round numbers a dilution of 100 is about a 2x dilution relative to the blank.

This odor was detected in all three samples but in very weak form. As discussed below, the study reveals that a slight, almost negligible odor was identified in the three samples collected.

The analytical results of the odor lab were based on the perception of an odor panel. In all cases, the dilutions were less than 35, which are considered very near to no odor. The hedonic scale is a good relative indicator of the intensity and general character of the odors. The readings taken at the two different locations in this community are in the range of -0.8 to -0.4 shown in Table 2-20. These are light odors and in some cases (most likely related to lawn and plants) were perceived at least by some panel members as earthy and floral. A chemical odor was also indicated in all three samples most likely due to gasoline from surrounding vehicles. The most critical characteristic in terms of this study is “offensive” odors. This most likely would relate also to the gas or exhaust from existing vehicles from nearby general traffic. Refer to Figure 2-28 and 2-29 for a visual depiction of the odor scale of the bag samples at Kensington Heights and at Sterling Virginia to see how similar the bag samples are to each other in terms of hedonic tone. Figure 2-30 and Table 2-21 display the location and times of the bag samples during September 6, 2011.

Table 2-20: Odor Panel Analysis- Summary Table

			ASTM E679 & EN13725		ASTM E544	CHARACTERIZATION	
#	Field No.	Sample Description	Detection Threshold	Recognition Threshold	Intensity	Hedonic Tone	Principal Odor Descriptors
1	1	16:07 - 16:10	25	16	15	-0.8	Chemical, Earthy, Offensive, Floral
2	2	14:36 - 14:39	35	19	11	-0.4	Chemical, Earthy, Offensive
3	3	10:55 - 10:59	18	11	9	-0.4	Earthy, Chemical, Floral, Medicinal, Offensive

Figure 2-28: Summary of Odor Laboratory Results from Kensington Heights Relative to the -10 to +10 Odor Scale

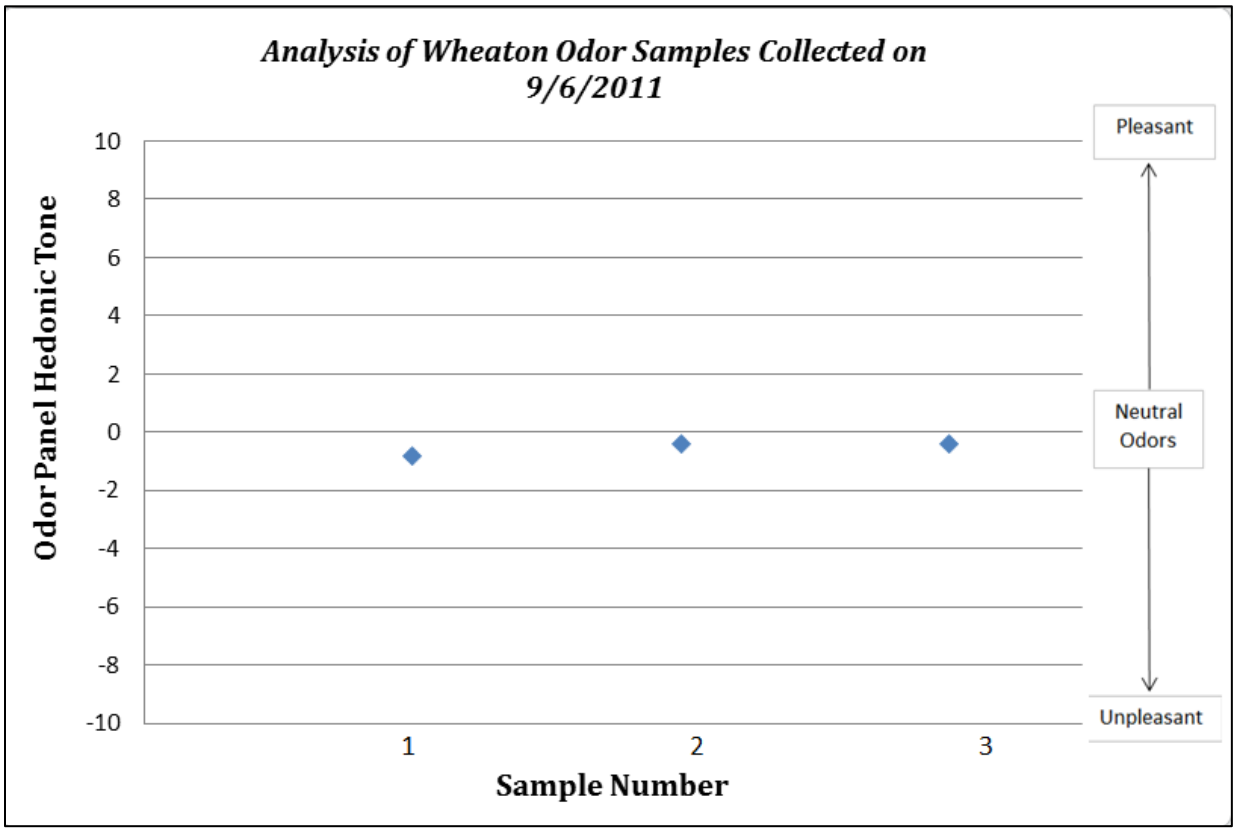


Figure 2-29: Summary of Odor Laboratory Results from Sterling Virginia Costco Relative to the -10 to +10 Odor Scale

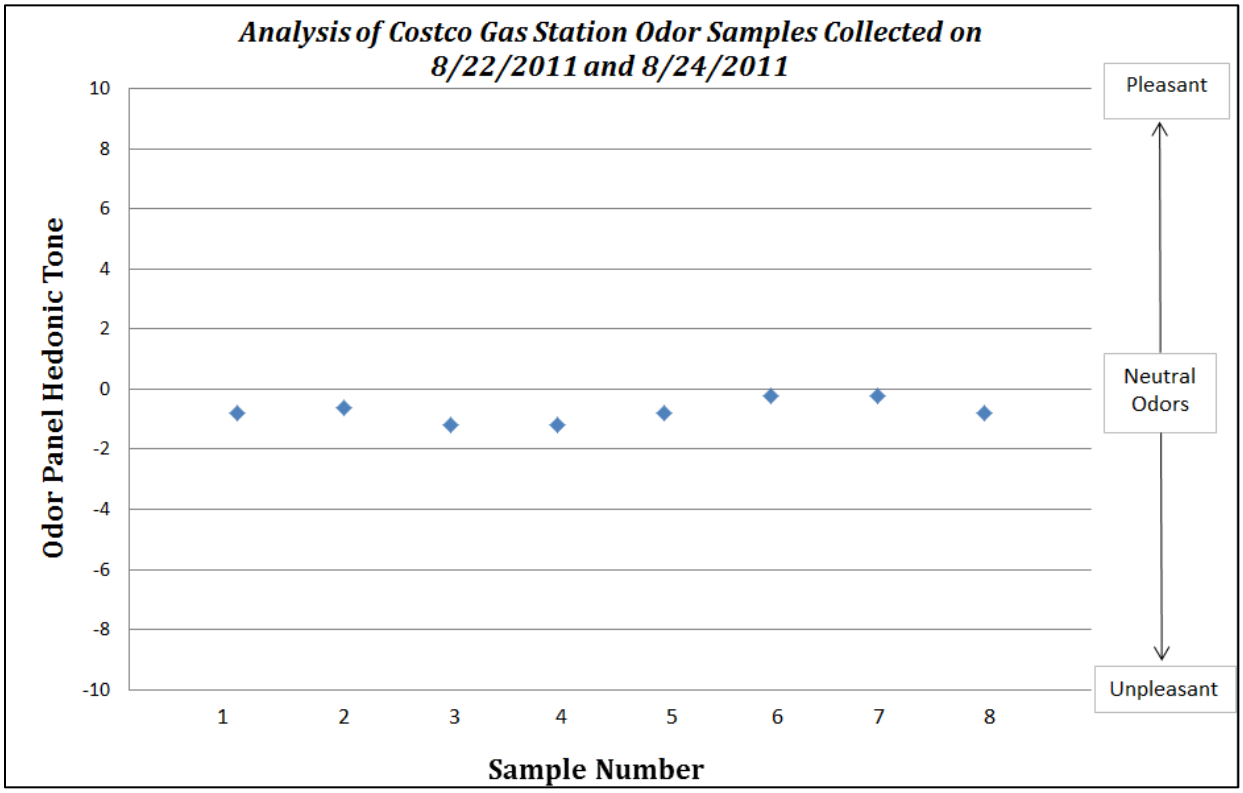


Figure 2-30: Bag Sample Locations (for Wheaton, MD Proposed Costco) 9/6/2011

Table 2-21: Bag Samples Locations

Loation #	Date	Time	Latitude	Longitude
#1	9/6/2011	10:55-10:59	39.033254	-77.056483
#2	9/6/2011	14:36-14:39	39.034155	-77.058775
#1	9/6/2011	16:07-16:10	39.033254	-77.056483

Conclusions

At the distances where the homes in Kensington Heights are located relative to the proposed gas pumps in Wheaton, the comparative odor panel results show lower dilution ratios, and in both cases, on a scale of -10 (very unpleasant) to +10 (very pleasant) the odors are near neutral, and within the range of -0.7 to -1.2 (neutral/no odors).

2.3.4 Noise Meter Analysis

Noise meter readings were taken approximately 100-200 meters away from the proposed gas station facility to document background noise in the nearby residential area. Heavy rain did occur on this day of observation and noise meter data were taken during periods with no rain to very light rain.

Figures 2-31 and 2-32 show the three locations where the noise meter was recorded from 3:46-5:58 P.M. on September 6, 2011. Location #1 had a noise recording from 3:46-4:05 P.M. where the average reading was 50 dBA. Weather conditions during this time were 100 percent overcast with no rain. Almost all spikes shown on the graphical image were due to cars passing by the monitoring location.

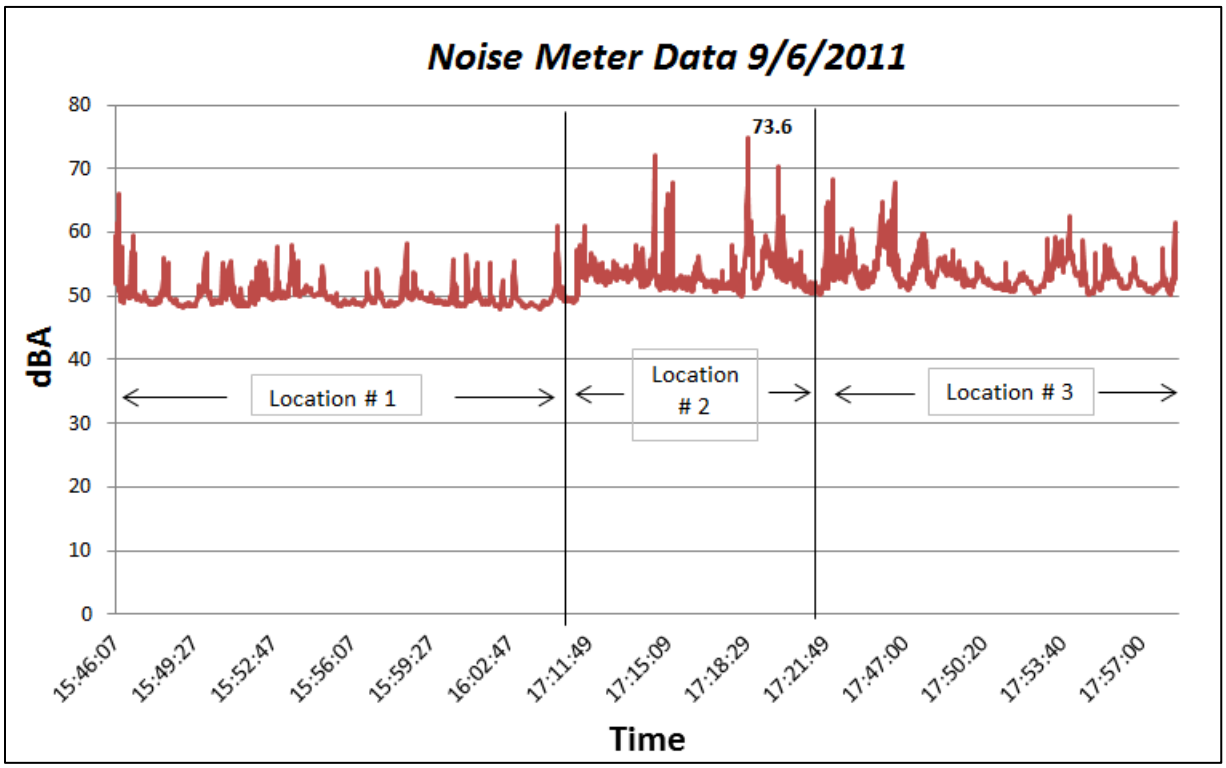
The next sample was taken from 5:11-5:21 P.M. at location #2. The average levels here were at 53 dBA with weather conditions consisting of light rain. The largest dBA level occurred in this location of 73.6 dBA displayed in Figure 2-32 which was due to a car passing by with a very loud muffler. Several typical vehicles passed by during this period causing dBA spikes to occur.

The final sample site at location #3 consisted of sampling from 5:23-5:26 P.M. and again at 5:46-5:58 P.M. During this time average values were 53 dBA with light rain and heavier rain occurring in the first part of the sample and rain stopping for the second sample.

The overall average dBA reading combining all the samples taken this day was 52 dBA. All noise meter raw data is located in Appendix U.

Figure 2-31: Noise Meter Locations (for Wheaton, MD Proposed Costco) 9/6/2011

Figure 2-32: Noise Meter Data (for Wheaton, MD, Proposed Costco) 9/6/2011



Conclusions

The terrain blocks the line of sight to the gas pumping area for the nearby homes in Kensington Heights, at least for the outdoor environment and the lower floors of the homes. When taking the average measured noise levels at Sterling from the 2011 study (about 78 m from the pumping area) and apply a 5 dBA credit (as allowed by the County for a break in the line of sight caused by terrain[17]) this would result in 53 dBA. This is well below the 65 dBA level shown in the county guidance document. While the 65 dBA does include a 10 dBA penalty for operations (EDT) 10 P.M. to 7 A.M., this only affects one hour within the 24-hour average because the proposed operation of the Wheaton facility will be 6:00 A.M. to 9:30 P.M. In short, the noise levels will be well below the county noise guidelines.

It was also found that an average background noise level in Kensington Heights is 52 dBA (very similar to the 53 dBA shown above). When taking into account dBA levels inside the homes, it can be assumed the noise levels would be even lower.

[17] As provided to Costco by the Montgomery County Planning Board: "Staff Guidelines for the Consideration of Transportation Noise Impacts in Land Use Planning and Development,", Environmental Planning Division, June 1983.

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