CIRI PROPERTY
TAX MAP 11, PARCEL 609
INDIAN HEAD, MD

Zoning Map Amendment Application

Prepared for:

Cook Inlet Region, Inc.
725 East Fireweed Lane, Suite 800
Anchorage, AK 99503

Prepared by:

Soltesz, Inc.
401 Post Office Drive, Suite 103
Waldorf, MD 20601

Scott Law Group, LLC
P.O. Box 1990
La Plata, MD 20646

November 2016

SOLTESZ

APPLICATION FOR
A ZONING MAP AMENDMENT
TAX MAP 11, PARCEL 609
INDIAN HEAD, MD

TABLE OF CONTENTS

1. Petition for a Local Zoning Map Amendment & Rationale for the Request
   - Mistake in the Existing Zoning Classification

2. Introduction

3. Property Zoning Maps and Exhibits
   - Site Boundary & Current Zoning Exhibit
   - 2006 Town of Indian Head Zoning Map
   - Open Space Zoning District Exhibit
   - Neighborhood Zoning Exhibit

4. Site Characteristics and Neighborhood
   - Existing Conditions & Environmental Features Exhibit
   - Aerial Neighborhood Exhibit

5. Analysis of Consistency with Town Plans
   - Current Town of Indian Head Comprehensive Plan (adopted 2/1/10)
   - Current Town of Indian Head Zoning Ordinance (dated 3/23/08)

6. Proposed Community Concept Plan
   - Approved by the Town of Indian Head Planning Commission 8/17/16

7. List of Adjacent Property Owners
   - Charles County Tax Map 5, parcels adjoining Parcel 609

8. Fiscal Impact Report

9. Traffic Impact Study

SECTION ONE

BEFORE THE PLANNING COMMISSION AND

TOWN COUNCIL OF THE TOWN OF INDIAN HEAD, MARYLAND

COOK INLET REGION, INC., **AN ALASKA CORPORATION** **PETITIONER**	: : : : : :	**ZMA No.:** ___________

: :

PETITION FOR LOCAL MAP AMENDMENT TO CHANGE BASE ZONE OF PROPERTY

COMES NOW, the Petitioner, Cook Inlet Region, Inc., an Alaska corporation, by and through its undersigned counsel, Scott Law Group, LLC, and its civil engineers and land planners, Soltesz Engineering, and hereby files this Petition for Local Map Amendment to Change the Base Zone of Real Property, and as reasons therefor hereby states as follows:

1. The Petitioner owns in fee simple, one (1) parcel of real property lying and being in the Seventh Election District of Charles County, Maryland, within the corporate boundaries of the Town of Indian Head, being shown and depicted on Charles County Tax Map 11, Grid 15, as Parcel 609, and being assessed under Real Estate Tax Account Number 07-045069 (the "**Property**"). The Property is more particularly described in that certain Deed dated November 3, 1987, recorded among the Land Records of Charles County, Maryland, in Liber 1259, at Folio 350. A copy of the aforesaid Deed is attached hereto, and made a part hereof, as **EXHIBIT A**. The land area of the Property is 19.3638 acres, more or less. A current Title Certificate confirming ownership of the Property, issued by Scott Law Group, LLC, is attached hereto, and made a part hereof, as **EXHIBIT B**.

2. The Property is situated on the north side of Maryland Route 210, in Indian Head, Maryland, near the Indian Head pavilion and the U.S. Navy Indian Head facility. A list of adjoining and confronting properties, including names and mailing addresses of respective owners, from the current MSDAT assessment records, is attached hereto, and made a part hereof, as **EXHIBIT C**.

3. The Property is currently undeveloped and unimproved.

4. The Property is split-zoned, being zoned under the Indian Head Zoning Ordinance partly Town Center Mixed Use (TCMX) and partly Open Space (OS), as depicted on **EXHIBIT D**,

attached hereto, and made a part hereof. **EXHIBIT D** is consistent with the Town of Indian Head zoning maps, which also illustrate the split zoning of the Property. A copy of the Town of Indian Head zoning map is attached hereto, and made a part hereof, as **EXHIBIT E**. To the knowledge of the Petitioner, the current split zoning of the Property of TCMX and OS was implemented by the Town of Indian Head following the adoption of the OS Zoning District into the Town's Zoning Ordinance.

5. The OS zoned area on the Property encompasses a large part of the Property, which otherwise could be used and developed but for the existence of the OS Zoning District. Moreover, the OS Zoning District on the Property creates an unnecessary and substantial hardship on the Petitioner as to the inability to use the OS zoned area on the Property for the highest and best use of the Property, which is residential development. This significantly reduces the value of the Property, and takes from the Petitioner, as owner of the Property, a significant and valuable financial asset. No portion of the Property is owned by any governmental entity or by any public charitable organization, public community association, or other public entity. Further, no public facilities are located on any part of the Property. The Petitioner, as owner of the Property, did not request or consent to the placement of a portion of the Property in the OS Zoning District. For these reasons, as is more specifically described below, it is the Petitioner's contention that the placement of a portion of the Property in the OS Zoning District constitutes a "mistake" on the part of the zoning authority.

6. The far northern area of the Property contains a stream, streambed and a small area of moderately steep slopes. The OS Zoning District may have been placed on the northern area of the Property by the Town zoning authority as an intended buffer to protect the environmental feature on the northern side of the Property. However, if this was intended by the zoning authority, the OS Zoning District line should have been more properly placed on the Property much farther north and closer to the stream and stream valley, as depicted on **EXHIBIT F**, attached hereto, and made a part hereof.

7. The area in which the Property is located is urban, dominated by high intensity residential uses. The Property is located adjacent and with easy access to Maryland Route 210, a heavily traveled major roadway. The predominant zoning in the area of the Property is residential, commercial and mixed use. Attached hereto, and made a part hereof, as **EXHIBIT G**, is a depiction of the Property, including the area and boundaries of the Property, and also including adjoining parcels, with a notation on each adjoining parcel indicating the zoning and land use currently applicable to each respective parcel, and also including a depiction of adjoining streets.

8. Given the purpose, intent and allowable uses under the OS Zone, the Petitioner is unable to determine why a portion of the Property was placed in the OS Zone, or, if the OS Zone was intended to protect the stream and stream valley on the Property, why such a large portion of the Property was placed in the OS Zone. The Petitioner can only conclude that this was a mistake on the part of the zoning authority. Due to this mistake made by the zoning authority when the Property was split-zoned and a part of the Property was zoned OS, the Petitioner hereby requests that the area of the Property zoned OS be rezoned from OS to TCMX. This change in the base zone of the Property as requested by the Petitioner would cause the entire Property to be zoned TCMX. In the alternative, the Petitioner requests that the area of the Property zoned OS be rezoned partially to TCMX, leaving only the environmentally sensitive area of the Property in the OS Zone by moving the OS Zoning boundary line on the Property to the north, to a location reasonably necessary to buffer only the environmental feature on the Property, and thereby minimizing the area of the Property zoned OS. Under this alternative, the Property would continue to be split-zoned, but the OS Zoning District would only encompass the area of the Property reasonably necessary to protect the stream and the stream valley from the impacts of development of the Property.

MISTAKE IN EXISTING ZONING CLASSIFICATION

9. The Petitioner hereby incorporates by reference, each and all of the allegations set forth in paragraphs 1 through 8 above.

10. In accordance with Section 4-02 of the Land Use Article of the Annotated Code of Maryland, a legislative body may grant a local map amendment to change the zoning classification of land based upon a finding that there was "a mistake in the existing zoning classification". For these purposes, a "mistake" means that there is some invalid or incorrect assumption or basis for placing the current zoning classification on a parcel of land, which may include "evidence to show that the assumptions or premises relied upon by the zoning body at the time of the comprehensive rezoning were invalid" *Anne Arundel County vs. Maryland National Bank*, 32 Md. App. 437, 36 A.2d 137 (1976).

11. In this case, the Petitioner contends that the placement of a portion of the Property in the OS Zone was the result of a mistake on the part of the zoning authority. That is, Section 905 of the Town of Indian Head Code indicates that the intent of the Open Space District is "to identify those open spaces within the Town that have been determined to be significant features of the landscape". Further, that the purpose of the OS Zone, once such features are identified, is so that "open spaces within the Town may be protected from future development and preserved for the

enjoyment of the community". Following the statement of intent, the OS Zoning District Ordinance then provides a very limited number of land uses which are permitted in the OS Zone, to include such things as "public parks, parkways, green ways, trails, playgrounds, golf courses, and the like", and also including "public zoos, arboretums, exhibits and libraries", "public utility installations, flood control works and the like", and "public cemeteries". Accessory uses permitted are only those uses and structures "that are necessary and desirable adjuncts to permissible uses and structures and are under the management or control of the Town". Thus, the OS Zone is intended to identify open spaces within the Town and to establish public uses on those open spaces. The OS Zone is not intended to facilitate development uses, or to accommodate the use of lands within the Town located in the OS Zone for residential or commercial development. As to the Property, no portion of the Property has been dedicated as "open space", no area of the Property has been dedicated to public use, no area of the Property is owned by any governmental or public entity or agency, and no area of the Property is improved with any public facilities intended for the use or benefit of the public. The entire land area of the Property is private land, under the dominion and control of a private corporate owner. Accordingly, the intent and purpose of the OS Zone is not compatible with the Property, and the placement of a part of the Property in the OS Zone is not appropriate. The Petitioner did not consent to the placement of the Property in the OS Zone, or to the use or appropriation of any part of the Property for open space or public purposes. Under the circumstances, one can only conclude that, in placing a portion of the Property in the OS Zone, the zoning authority was mistaken in their assumption that the portion of the Property was "open space" to be placed under public dominion, control, use and/or enjoyment.

12. The Petitioner contends that the placement of the Property partly in the OS Zone results in a mistake in the existing base zoning of the Property because the zoning authority failed to consider the facts set forth above in establishing the OS Zone on the Property. Moreover, the assumption that the Property fits the purpose and intent of the OS zoning category also constitutes error and mistake. As established in this Petition, if one makes the assumption that the placement of a portion of the Property in the OS Zone was intended to buffer or protect the stream and streambed on the northern edge of the Property, then the location of the OS Zoning line on the Property is located much too far to the south, encompassing much more of the Property area then is reasonably necessary to protect this environmental feature. If this is the intent of the OS Zoning line on the Property, the OS Zoning line must be moved to the north as depicted on the exhibits to this Petition. Further, if this is the intent of the OS Zoning area on the Property, then this represents a mistake in

assumption on the part of the zoning authority as to the current location of the OS Zoning line on the Property, in order to protect the environmental feature on the Property. In the case of *Boyce vs. Sembly*, 25 Md. App. 43, 334 A.2d 137 (1975), the Maryland Court of Special Appeals held that there were several alternative approaches to demonstrating a mistake in zoning. One such approach is establishing that the zoning authority was unaware of, or failed to take into account, physical characteristics, potential uses and location of a parcel in establishing the base zoning category thereon. Of course, physical characteristics can include the usable areas of a parcel. In this case, the Petitioner contends that the Town failed to take into account such factors, as described above, in placing a part of the Property in the OS Zone.

13. The rezoning of the subject Property from OS to TCMX is consistent with applicable Town plans and land use policies. Pursuant to the Growth Management and Land Use Chapter of the Town Comprehensive Land Use Plan, a primary goal and objective of the Comprehensive Plan is to concentrate residential uses primarily in currently developed portions of the Town. The subject Property is in a W3/S3 water and sewer category, available for immediate hookup. The Town's land use policies encourage growth within the area of the Property to facilitate the efficient use of public and private infrastructure, including water and sewer utilities, and to preserve the more environmentally sensitive areas of the Town outside of the designated development areas. Further, pursuant to the Land Use Concept Plan and the Land Use Concept Map of the Comprehensive Plan, the subject Property is located within a designated area for high density development. Moreover, the potential use of the subject Property for high density residential development in the TCMX Zone will provide necessary housing options for citizens of the Town. A more detailed analysis of the consistency of this requested rezoning with the Town Zoning Ordinance and Comprehensive Land Use Plan is attached hereto, and made a part hereof, as **EXHIBIT J**. Also, for informational purposes, the Petitioner is providing a copy of the General Development Plan of the Property as approved by the Town Planning Commission on August 18, 2016, as **EXHIBIT H**, attached hereto, and made a part hereof. The General Development Plan provides a conceptual depiction of the potential development of the Property under the TCMX zoning if the Property is rezoned as required herein. The General Development Plan is also submitted with the rezoning petition as required by Section 403(c)iii.2.a. of the Indian Head Zoning Ordinance. Finally, attached hereto, and made a part hereof, as **EXHIBIT I**, is the Traffic Study, which details the traffic impacts that are projected from the development and use of the Property as depicted on the General Development Plan.

14. For the above reasons, the Petitioner contends that the placement of a part of the Property in the OS Zone was a "mistake".

WHEREFORE, the Petitioner prays as follows:

a. That this Petition for Local Map Amendment, changing the base zone of the Property, be granted.

b. That the area of the Property zoned OS be rezoned from OS to TCMX based upon a "mistake". Or in the alternative, the OS Zoning line on the Property be moved to the north to encompass only the area of the Property which is not developable, and which contains a small environmental feature, as depicted on the exhibits to this Petition.

c. That the Petitioner be granted such other and further relief as may be just and proper under the circumstances of this case.

RESPECTFULLY SUBMITTED,

Stephen H. Scott, Esquire
Scott Law Group, LLC
Attorney for Petitioner
204 Washington Avenue, Suite 200
La Plata, Maryland 20646
(301) 870-5355 | Phone
SScott@ScottLawLLC.com

LIST OF EXHIBITS:

Exhibit A	Deed for the Property
Exhibit B	Title Certificate
Exhibit C	List of Adjoining and Confronting Property Ownership
Exhibit D	Depiction of Split Zoning of the Property
Exhibit E	Town of Indian Head Zoning Map
Exhibit F	Depiction of Conceptual OS zoning boundary if intended to buffer northern environmental feature
Exhibit G	Depiction of Property boundaries, adjoining parcels and zoning and land uses on adjoining parcels and adjoining streets
Exhibit H	General Development Plan approved by Planning Commission on August 18, 2016, in accordance with Section 403(c)iii of the Zoning Ordinance
Exhibit I	Traffic Study
Exhibit J	Analysis of Compatibility with Zoning Ordinance and Comprehensive Plan

EXHIBIT A

Deed for the Property

See attached.

CHARLES COUNTY COURT Land Records BK 3 PG 0850 MSA_CE62_1278. Date available 08/03/2006. Printed 04/13/2016.

LIBER 1259 PAGE 350

Prepared by:
Office of Regional Counsel
GSA, Region IV, Atlanta, GA
Nov 4-GR(2)-422-Y

QUITCLAIM DEED

STATE OF GEORGIA)
COUNTY OF FULTON)

CHARLES COUNTY 1987
#12852 1000 ROI 141.00
RECORD FEE 2.00
MCDT TAX 500.00
TRANSFER TAX 1400.00
DEED # 10
CHECK 10,000.00

THIS QUITCLAIM DEED made this the 12th day of November 1987, by and between the UNITED STATES OF AMERICA, acting by and through the Administrator of General Services, under and pursuant to the powers and authority contained in the provisions of the Federal Property and Administrative Services Act of 1949, 63 Stat. 377, as amended, and the regulations and orders promulgated thereunder, GRANTOR, and COOK INLET REGION, INC. of ANCHORAGE, ALASKA, GRANTEE.

WITNESSETH

THAT IN CONSIDERATION of payment by the Grantee in the amount of EIGHT HUNDRED EIGHTY THOUSAND AND NO/100 DOLLARS ($880,000) receipt whereof is hereby acknowledged, said Grantor has remised, released and forever quitclaimed, and does hereby remise, release and forever quitclaim unto the Grantee all of the right, title, and interest whatsoever of the Grantor in and to the following described property in Charles County, Maryland to wit:

BEGINNING at a point in the north line of way line of Maryland Route 210, said point being the southwest corner of land owned by the Town of Indian Head (Parcel A - Deed 389 Folio 111) running thence with Route 210

S. 79° 32' 21" W. - 120.6 feet, thence
S. 62° 50' 14" W. - 51.92 feet, thence

CHARLES COUNTY CIRCUIT COURT Land Records [illegible] 259 p. 1035 MSA CE 52 - 278 Date available [illegible] 08/07/2006 Printed 04/15/2016

S. 62° 08' 58" W. 252.85 feet; thence
S. 72° 48' 05" W. 139.64 feet; thence
S. 41° 37' 37" W. 127.18 feet to a corner of the land owned by the Board of Education of Charles County (Deed Liber [illegible] Folio 221) running thence with said property
N. 24° 45' 47" W. 432.16 feet; thence
S. 5° 32' 38" W. 213.20 feet; thence
S. 72° 27' 37" W. 241.94 feet to a point on the east side of a 30 foot right-of-way; thence with said right-of-way
N. 18° 58' 20" W. 168.84 feet; thence
N. 15° 53' 34" W. 165.28 feet; thence
N. 18° 04' 20" W. 373.41 feet; thence
N. 19° 03' 52" W. 70.04 feet to a point in the line of the land owned by the United States of America, Department of the Navy; thence with said land
S. 65° 16' 50" E. 59.27 feet; thence
N. 31° 59' 33" E. 160.00 feet; thence
N. 87° 21' 45" E. 290.00 feet; thence
N. 41° 31' 00" E. 249.96 feet; thence
N. 87° 20' 17" E. 544.98 feet to a point marking the northwest corner of the aforementioned parcel owned by the Town of Indian Head (Parcel 9-4 Deed 482 Folio 1); thence with said land
S. 07° 39' 00" E. 1010.86 feet to the point of beginning, containing 19.3668 acres more or less.

Title of the United States to this real property is derived from that certain deed from the Board of Education of Charles County, Maryland to the United States, dated June 19, 1985, and recorded in Liber 1074 beginning at page 134 in the Public Records of the Circuit Court of Charles County, Maryland.

TOGETHER with all and singular the tenements, hereditaments, and appurtenances thereunto appertaining and every right, title, or interest, legal or equitable, of the said

CHARLES COUNTY CIRCUIT COURT Land Records BK 2549 PG 0352 Date/Time: 09/03/2006 Printed 04/13/2016

Grantor of, in, and to the property herein conveyed, including all rights, title, and interest which the Grantor may have in the banks, beds, and waters of any streams bordering the aforesaid lands and also all interest in any alleys, roads, streets, ways, strips, gores, or railroad rights-of-way abutting or adjoining said lands, and in any means of ingress or egress appurtenant thereto, excepting any rights as herein specifically reserved or excepted.

SUBJECT HOWEVER, to existing easements for public roads and highways, public utilities, storm drains, railroads and pipe lines whether or not of record, and to other easements of record.

TO HAVE AND TO HOLD the tracts above described or mentioned, and hereby intended to be conveyed, together with the rights, privileges, appurtenances, and advantages thereto belonging or appertaining unto and to the only proper use, benefit, and behoof forever of the Grantee, its heirs and assigns, forever, subject to the above referred to restrictions.

THE PROPERTY HEREBY CONVEYED has heretofore been declared surplus to the needs of the needs of the UNITED STATES OF AMERICA, is presently under the jurisdiction of the General Services Administration, is available for disposal and its disposal has been heretofore authorized by the Administrator of General Services, acting pursuant to the above referred to laws.

CHARLES COUNTY CIRCUIT COURT (Land Records) b.6812 p.0033 MSA CE62-12788 Date available 06/03/2006 Printed 04/10/2016

regulations and orders.

WITNESS the following signature and seal.

UNITED STATES OF AMERICA
Acting by and through the
Administrator of General Services

WITNESSES:

BY: PATRICIA A. BAILEY
Contracting Officer
Office of Real Estate Sales
General Services Administration
Region 4, Atlanta, Georgia

(Name)

(Address)

15 Spring St SW

Atlanta, Ga 30303

(Address)

CHARLES COUNTY CIRCUIT COURT LAND RECORDS Page 1 of 1 Date available 08/03/2006. Printed 04/13/2018.

UNITED STATES OF AMERICA)
) to wit:
STATE OF GEORGIA)

hereby certify that on the 3rd day of November 1987, before the subscriber, a Notary Public in and for the State of Georgia, County of Fulton, personally appeared PATRICK J. BAILEY, Contracting Officer, Office of Real Estate Sales, General Services Administration, Region IV, Atlanta, Georgia, and on behalf of the United States of America, did acknowledge the foregoing instrument to be the act and deed of the United States of America.

Given under my hand and official seal this 3rd day of November 1987. My commission expires on the 11th day of January 1991.

ELAINE B. MITCHELL
Notary Public
State of Georgia

RECEIVED FOR TRANSFER
State Department
Assessments & Taxation
For Charles County
By
Agent Trans. Tax N/A

1-GR(2)-422-Y

EXHIBIT B

Title Certificate

See attached.

SCOTT LAW GROUP, LLC
Attorneys at Law
204 Washington Avenue, Suite 200
La Plata, Maryland 20646

TITLE REPORT for the exclusive use and benefit of:

Cook Inlet Region, Inc., an Alaska corporation

The undersigned certifies that according to the pertinent records as indexed by the Cott System in the Office of the Clerk of the Circuit Court for Charles County, Maryland, from 60 years past, to the date hereof, title to the following described property:

See Exhibit A attached hereto and made a part hereof.

is vested in:

Cook Inlet Region, Inc., an Alaska corporation

SUBJECT TO: Mortgages or Deeds of Trust:

None.

SAID PROPERTY SUBJECT TO OTHER ENCUMBRANCES:

1. Possible effect of any discrepancies or conflicts in boundary lines or shortage area, or encroachments, which a correct survey or inspection of the premises would disclose.

2. This Report makes no warranties or representations regarding subdivision, zoning, or planning regulations or restrictions, or Sanitary District levies or assessments.

3. Easements or Rights of Way imposed by Deed, as recorded in Liber 569, Folio 206.

STATE AND COUNTY TAXES:

2015/16 real property taxes on the above-referenced property are paid.

RESTRICTION:

This Certification was prepared for the persons named hereinabove and is not assignable or otherwise transferable and the undersigned assumes no responsibility hereunder except to the parties for whom it was prepared.

DATED this 11th day of April, 2016.

Scott Law Group, LLC

Stephen H. Scott, Attorney

Tax Map 11, Grid 15, Parcel 609
Election District: Seventh
Deed Reference: Liber 1259, Folio 350
Tax Assessment Number: 07-045069

FILINGS / Zoning Map Amendment (CIRI) / Preliminary Title Report (CIRI)

EXHIBIT A

All of that piece or parcel of land and premises lying and being in the Seventh Election District of Charles County, Maryland, and more particularly described as follows:

Beginning at a point in the north right-of-way line of Maryland Route 210, said point marking the southwest corner of the land owned by the Town of Indian Head (Parcel A-4 Deed 489, Folio 1); running thence with Route 210.

S. 79° 32' 21" W. – 120.64 feet; thence
S. 62° 50' 14" W. – 51.92 feet; thence
S. 63° 08' 58" W. – 52.85 feet; thence
S. 72° 48' 05" W. – 139.64 feet; thence
S. 41° 37' 37" W. – 27.18 feet to a corner of the land owned by the Board of Education of Charles County (Deed Liber 116, Folio 221);
running thence with said property
N. 24° 45' 47" W. – 482.16 feet; thence
S. 58° 32' 31" W. – 213.20 feet; thence
S. 74° 27' 31" W. – 264.99 feet to a point on the east side of a 30 foot right-of-way;
thence with said right-of-way
N. 16° 56' 25" W. – 168.84 feet; thence
N. 15° 53' 44" W. – 149.28 feet; thence
N. 18° 03' 29" W. – 173.41 feet; thence
N. 19° 03' 52" W. – 79.74 feet to a point in the line of the land owned by the United States of America, Department of the Navy; thence with said land
S. 65° 16' 50" E. – 59.27 feet; thence
N. 31° 59' 13" E. – 160.00 feet; thence
N. 87° 21' 45" E. – 190.00 feet; thence
N. 41° 31' 10" E. – 249.96 feet; thence
N. 87° 20' 17" E. – 544.96 feet to a point marking the northwest corner of the aforementioned parcel owned by the Town of Indian Head (Parcel A-4 Deed 489 Folio 1); thence with said land
S. 07° 37' 00" E. – 1010.86 feet to the point of beginning, containing 19.3668 acres, more or less.

Being all of the same property acquired by Cook Inlet Region, Inc., by Deed dated November 3, 1987, recorded among the Land Records of Charles County, Maryland, in Liber 1259, at Folio 350.

SECTION TWO

APPLICATION FOR A
ZONING MAP AMENDMENT
TAX MAP 11, PARCEL 609
INDIAN HEAD, MD

INTRODUCTION

This Application for a Zoning Map Amendment is submitted on behalf of Cook Inlet Region, Inc. (the "Applicant"), who requests a change in the zoning of a portion of the "Subject Property", which is shown on Charles County Tax Map 11 in Grid 4 as Parcel 609. The 19.67 acre parcel of land is located on the north side of MD Route 210 (Indian Head Highway) in Indian Head, Maryland. At the present time, the Subject Property is split-zoned, with TCMX (Town Center Mixed-Use) zoning on a +/- 12 acre portion of the parcel with frontage on MD 210, and OS (Open Space) zoning on the remaining +/- 7 acres on the north side of the parcel. The requested Amendment to the Zoning Map is to change the portion of Parcel 609 that is currently zoned OS to TCMX, providing a single zoning classification for the entire Property.

In this rezoning request, the Applicant presents a description and illustrations of the boundaries and character of the "Neighborhood" of the Subject Property. The pattern of existing development, the availability of public infrastructure (public utilities and roads), and the planned land use objectives for this area of the County support the rezoning to TCMX. The requested Zoning Map Amendment to establish TCMX zoning over all of Parcel 609 will allow a cohesive approach to development of the site in a way that is compatible and consistent with the existing and planned development in the surrounding neighborhood, and with the goals and objectives of the Town of Indian Head 2009 Comprehensive Plan.

In the Rationale for the Amendment, the Applicant will demonstrate that a "mistake" has been made by the Town of Indian Head with respect to the current split zoning of the Subject Property. That is, an underlying assumption used by the Town in zoning the Subject Property partially TCMX and partially OS has proved to be mistaken. More specifically, in placing any property within a particular zoning district, the zoning authority is reasonably presumed to have made the determination that the land subject to the zoning designation can in fact be used, improved or developed by the property owner for a private use. However, only public uses, such as parks, parkways, or playgrounds, public utility installations or public cemeteries, are permitted within the OS zoning district. In this case, the Applicant contends that due to OS zoning designation being placed "by mistake" on a portion of his property, his lawful right of private use has been severely limited. Moreover, the highest and best use of the subject land, given its location and designation in the Indian Head Future Land Development Plan, is not as Public Open Space. On the contrary, the 2009 Comprehensive Plan calls for specifically for Town Center-type development, including a mix of commercial development within the MD Route 210 Highway Corridor, supported by high-density residential development in close proximity to "Downtown Indian Head".

The following documents and exhibits are hereby presented for review:

- Property Boundary and Vicinity Map Exhibits.
- A description of the Neighborhood surrounding the Subject Property, including Tax Map and Zoning Map Exhibits.

- A "Petition" narrative describing the rationale and justification for the requested Zoning Map Amendment, describing the "Mistake" that was made in the current zoning of the Subject Property.

- A narrative which demonstrates how the requested change is consistent with the 2010 Comprehensive Plan, and the 2008 Zoning Ordinance.

- A Community Concept Plan, as approved by the Indian Head Planning Commission on 8/17/16, illustrating how a residential use could be developed on the Subject Property, and its future relationship to adjacent TCMX-zoned properties in the Town.

- A Traffic Impact Study, analyzing existing traffic patterns, background development, and post-development traffic in the vicinity of the site.

SECTION THREE

Zoning Districts

- R-1 Single Family Residential
- R-2 Single Family Residential
- R-M Multi-Family Residential
- TCMX Town Mixed Use
- GC General Commercial
- OS Open Space
- Highway Corridor Area
- Chesapeake Bay Critical Area Line
- Public/Institutional
- Corporate Limits

[adoption certificate]

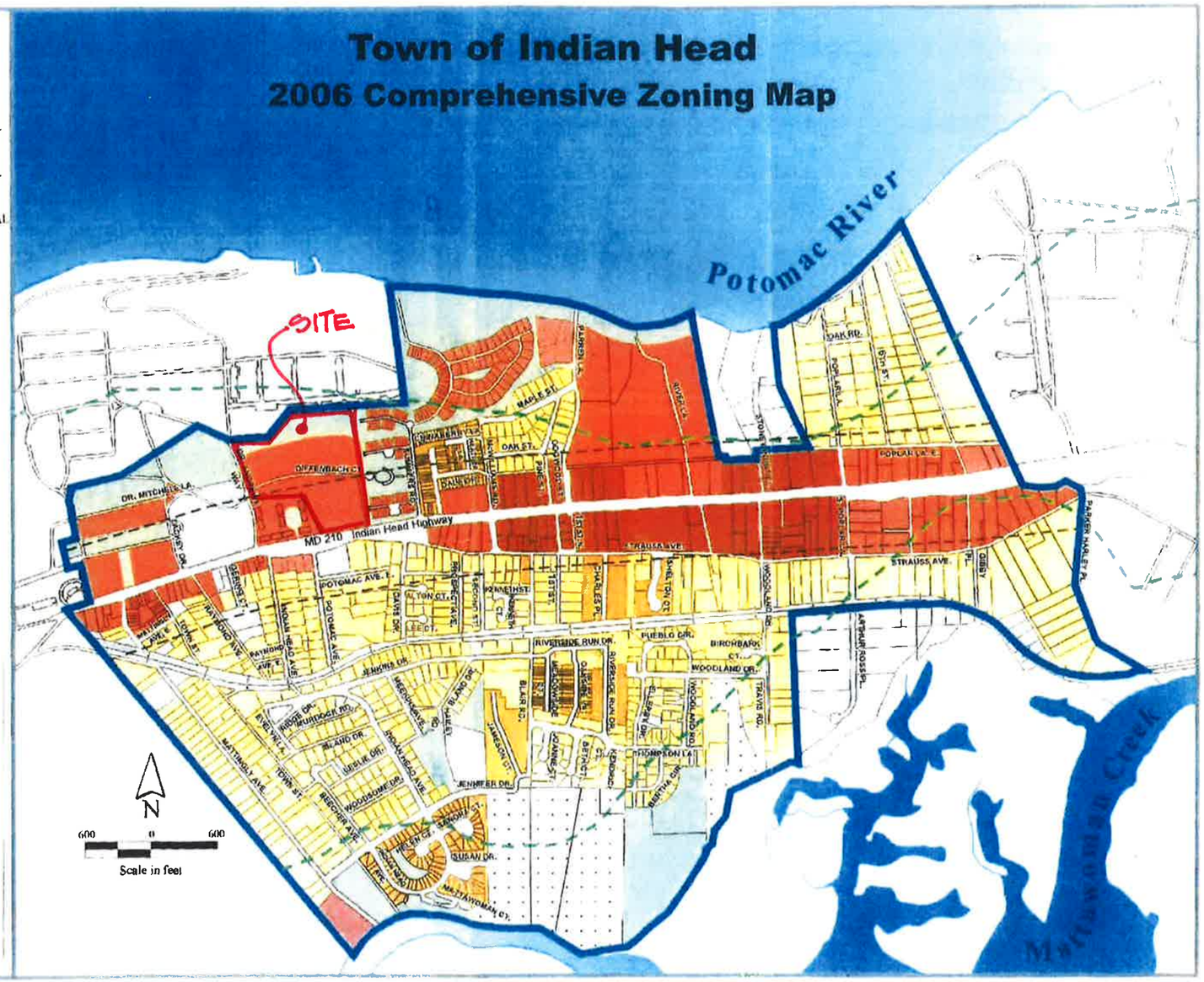
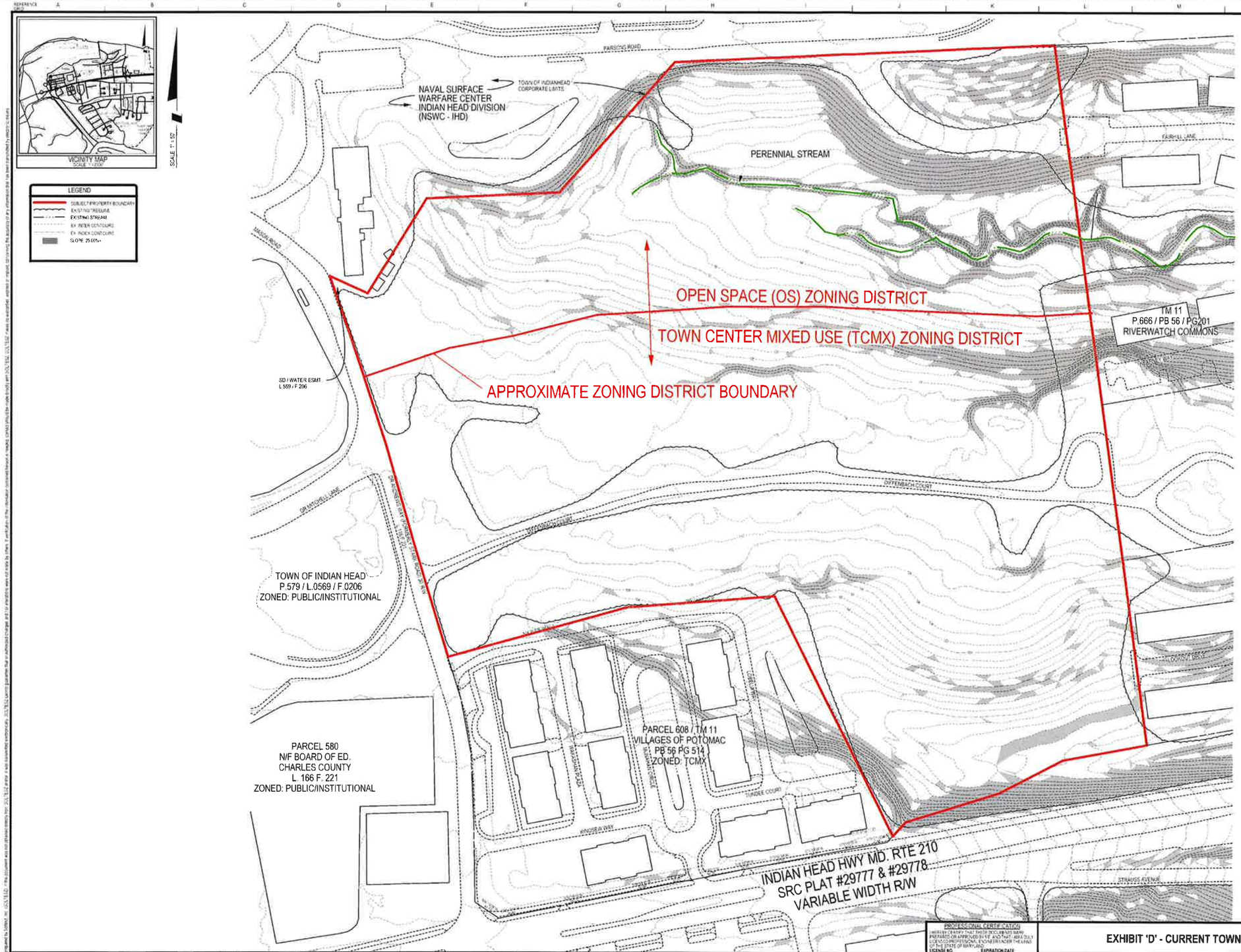


EXHIBIT 'E'



TOWN OF INDIAN HEAD
PARCEL 'B' / TM 11/ PARCEL 666
RIVERWATCH COMMONS
PLAT NO. 24121 A
3.89 AC.

SOLTESZ

Engineering
Surveying
Planning
Environmental Sciences

WALDORF OFFICE
401 Post Office Road, Suite 103
Waldorf, MD 20602
P. 301 870 2166 F. 301 870 2884

Rockville
Lanham
Waldorf
Leonardtown
Hagerstown
Soltesz DC, LLC

www.soltesz.com

NO.	REVISIONS	BY

DATE: MAY 2016
DRAWN BY: CR
CHECKED BY: CR

MISS UTILITY NOTE

OWNER/DEVELOPER/APPLICANT

COOK INLET REGION, INC
725 EAST FIREWEED LANE
SUITE 800
ANCHORAGE, AK 99503
(907) 263-5156

CONTACT: RANDY WARREN

TOWN OF INDIAN HEAD	
TCMX/OS	100.51
TM 11 / PARCEL 609	11
L.1259 / F.0292	

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. EXPIRATION DATE

EXHIBIT 'D' - CURRENT TOWN ZONING

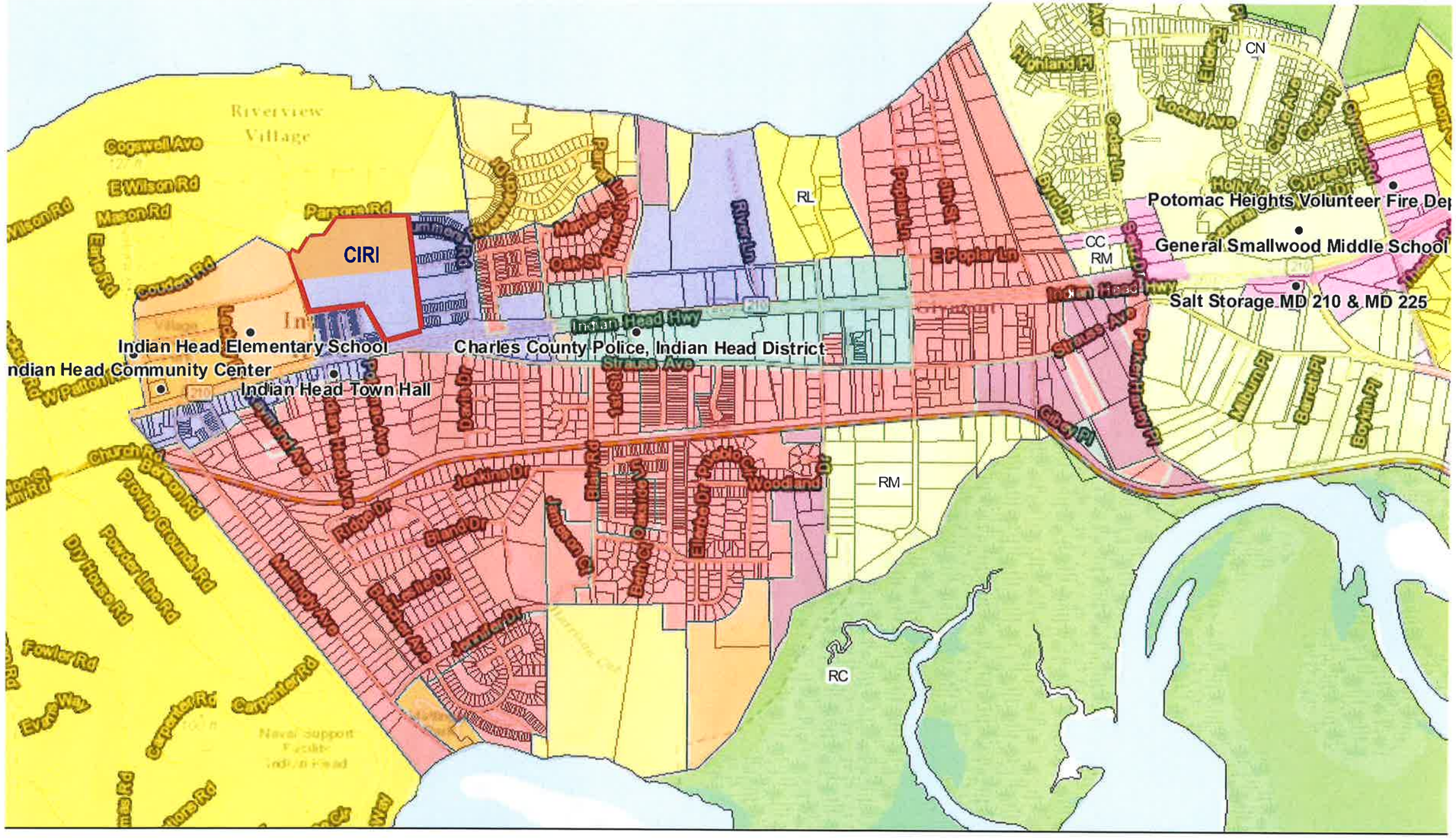
CIRI PROPERTY

TM 11 PARCEL 609

SEVENTH (7th) ELECTION DISTRICT, CHARLES COUNTY, MARYLAND

SHEET 1 OF 1

PROJECT NO. 3633-00 DE



TOWN OF INDIAN HEAD ZONING DISTRICTS LEGEND

- R-2 DISTRICT
- GC - GENERAL COMMERCIAL DISTRICT
- TCMX TOWN CENTER MIXED USE DISTRICT
- R-1 DISTRICT
- OS OPEN SPACE DISTRICT

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EXHIBIT 'G' - NEIGHBORHOOD ZONING EXHIBIT

CIRI PROPERTY

TM 11 PARCEL 609

SEVENTH (7TH) ELECTION DISTRICT, CHARLES COUNTY, MARYLAND

SOLTESZ
WALDORF OFFICE
401 Post Office Road, Suite 103
Waldorf, MD 20602
P: 301.870.2166 F: 301.870.2884

MISS UTILITY NOTE

OWNER/DEVELOPER/APPLICANT
COOK INLET REGION, INC.
1026 EAST 3rd AVENUE
SUITE 200
ANCHORAGE, AK 99501
(907) 263-5154
CONTACT: RANDY WARREN

SCALE	1" = 1000'
DATE	10/15/2021
DRAWN BY	MAF
TM 11 / PARCEL 609	19
SITE ZONE	MIXED USE
DRAWING No.	XXXX
SHEET No.	XXXX

PROJECT No. 3511-00-CO

SHEET 1 OF 1

POTOMAC RIVER

TOWN OF INDIAN HEAD MUNICIPAL LIMITS

TOWN OF INDIAN HEAD MUNICIPAL LIMITS

TOWN OF INDIAN HEAD MUNICIPAL LIMITS

CORP. LIMIT

INDIAN HEAD

SITE

COMMON AREA

MAP 12-P.57

MAP 12-P.510

MAP 12-P.83

MAP 20-P.2

MAP 11-P.182A

M.11-P.182

M.11-P.399

NELSON PT.

E.D.8

E.D.7

LEGEND

'OPEN SPACE' ZONING DISTRICT ON PUBLICLY OWNED LAND (BD. OF ED., TOWN OF INDIAN HEAD, HOMEOWNERS ASSOCIATIONS)

'OPEN SPACE' ZONING DISTRICT ON PRIVATELY OWNED LAND

INDIAN HEAD

SOLTESZ

WALDORF OFFICE
491 Post Office Road, Suite 103
Waldorf, MD 20602
P: 301 870 2766 F: 301 870 2884

MISS UTILITY NOTE

OWNER/DEVELOPER/APPLICANT

EXHIBIT "J" OPEN SPACE ZONING DISTRICT

ZONING MAP AMENDMENT APPLICATION

CIRI PROPERTY

TAX MAP 11 PARCEL 609

SECTION FOUR

APPLICATION FOR A
ZONING MAP AMENDMENT
TAX MAP 11 PARCEL 609
INDIAN HEAD, MD

SITE CHARACTERISTICS AND NEIGHBORHOOD

Existing Conditions and Environmental Features:

The Subject Property consists of 19.67 acres on the northeast corner of the intersection of Indian Head Highway and Dr. Andrew's Way. The site is currently vacant, and is mostly wooded with the exception of a gravel road providing access to a Town Water Tower which bi-sects the site. The existing woodland is a mid-succession upland forest in fair to good condition, with a mix of hardwood tree species. The forest areas identified as the highest priority for preservation are located adjacent to a perennial stream.

Topography

The site is characterized by a central ridge with level to gently rolling terrain, which slopes more steeply in proximity to the natural drainage channel of an Order 1 Perennial stream. Site topography that has been taken from Charles County topographical data files is shown on the Environmental Features Map provided within this Section of the application.

Soils

The predominant soils on the site are Beltsville silt loam and Woodstown sandy loam. The soil types and their disposition on the site have been shown on maps contained within the NRCS soils report, which has been provided at the end of this Section of the application. None of the site soils are rated as "hydric" or as "highly erodible".

Streams, Wetlands, Floodplain, and Resource Protection Areas

A perennial stream has been identified on the on the site, and has been shown on the Environmental Features Map and on the Proposed Community Concept Plan consistent with field observations. The stream flows from west to east across site, flowing downhill through the Riverwatch community to an eventual outfall at the Potomac River. A (25') stream buffer has been shown extending landward from the top of each stream bank, effectively identifying the "resource protection zone". There are no non-tidal wetlands on the site per the USFWS National Wetland Inventory (NWI) map. There is no 100-year Floodplain on the site per FEMA FIRM panel #24017C013D. Copies of the FEMA and NWI maps have been included at the end of this Section of the application.

Rare, Threatened & Endangered Species

A letter of inquiry was sent to the Maryland Department of Natural Resources Wildlife Heritage Service, requesting information pertaining to the presence of rare, threatened, or endangered plant or animal species on the site. A copy of the letter has been provided in this Section.

Neighborhood Description and Justification:

The Neighborhood of the Subject Property, as defined for purposes of this Application, is located in Indian Head, Maryland along a stretch of MD Route 210, roughly from River Lane to the Main Gate of the Naval Surface Warfare Center (NSWC-IHD). It has been delineated using geographical features such as local roadways, parcel boundaries, existing developments, and existing zoning district boundaries. The Applicant identifies the Neighborhood of the Subject Property with the Boundary described below and as depicted on the **Aerial Neighborhood Exhibit** provided in this Section of the Application.

To the North, the Neighborhood Boundary is defined by a portion of the Navy base, an area comprised of single family housing for Navy personnel.

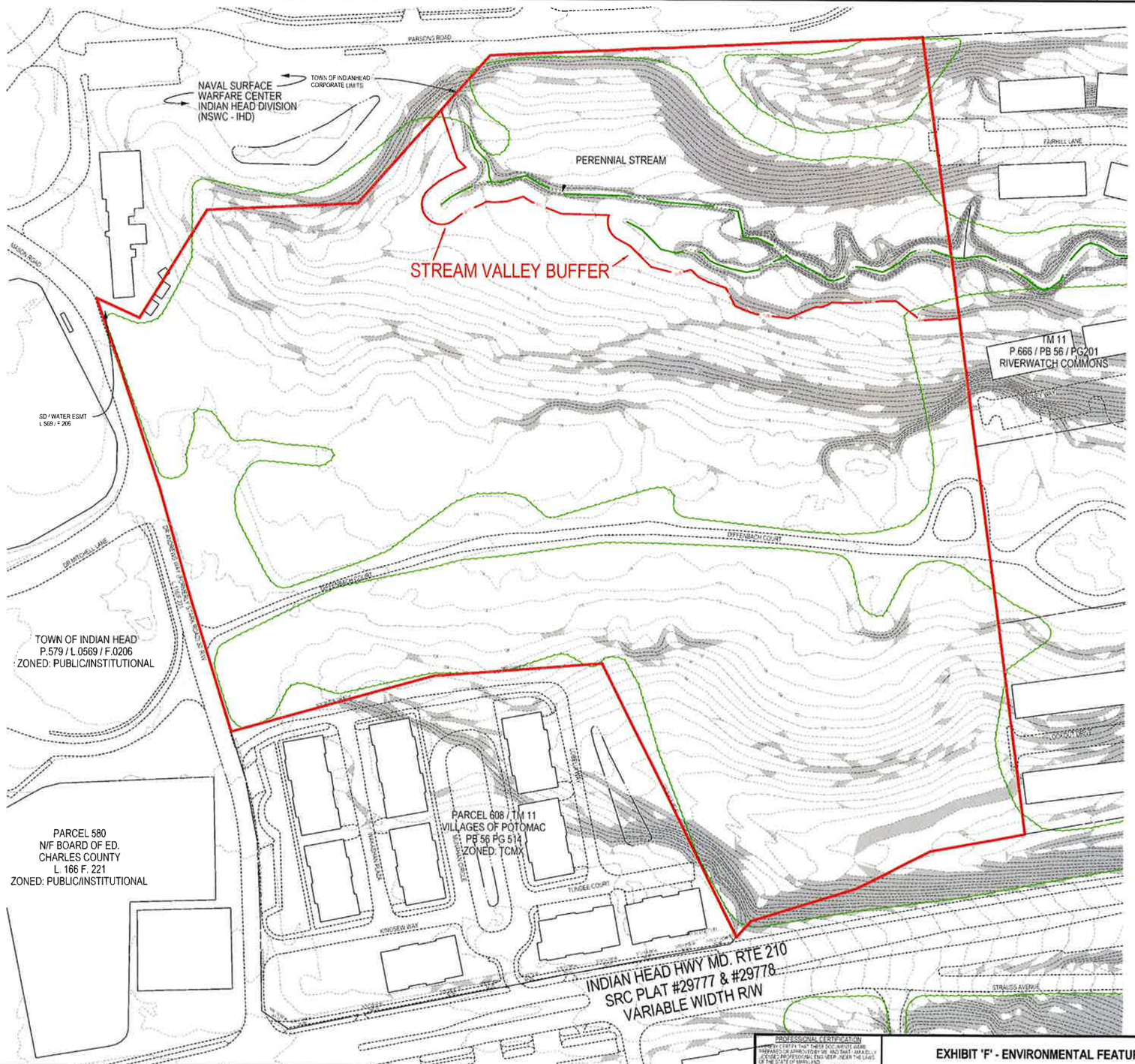
To the West, the Neighborhood Boundary extends to the NSWC Main Gate. This area between the Site and the Main Gate can be characterized as the primary public institutional and recreational complex for the Town, including Town Hall, the Village Green, the Village Pavilion, and Indian Head Elementary School.

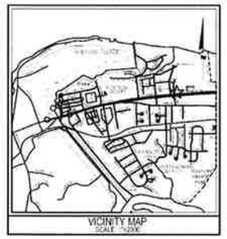
To the South, the Neighborhood Boundary is defined by the Indian Head Rail Trail, one of the most important Parks and Recreation facilities in Charles County.

To the East, the Neighborhood Boundary is defined as the eastern limit of the TCMX Zoning District (Town Center), in the vicinity of the Robinson Terminal properties and River Lane.

As identified above, the Neighborhood of the Subject Property includes a roughly rectangular area of land that falls within a ¼ to ½ mile radius of the site. It is characterized by a mix of commercial, institutional, employment, and medium-to-high density residential uses. Allowing the requested rezoning will enable development of a vacant property that is already integrated within a designated Town Center, in a manner in keeping with the goal of creating compact, walkable, mixed-use design that is compatible with existing community character. The Neighborhood as defined includes major transportation infrastructure, utility infrastructure, existing employment areas, and recreational and educational centers. The Neighborhood also includes a variety of residential development, some of it quite recent. The adjoining Riverwatch and Villages of Potomac communities are upscale townhome developments similar to that proposed for the Subject Property.

Development of the Subject Property with TCMX zoning in place is consistent with Indian Head land use planning objectives to enable infill and encourage revitalization of the existing Town community. A medium to high density residential use of the Subject Property is appropriate in this Neighborhood and is compatible with the existing land uses in the surrounding area.





SCALE 1" = 50'

LEGEND

- SUBJECT PROPERTY BOUNDARY
- EXISTING TREELINE
- EXISTING STREAM
- EX. INDEX CONTOURS
- EX. INDEX CONTOURS
- SLOPE 25.00%+

TOWN OF INDIAN HEAD
PARCEL 'B' / TM 11/ PARCEL 666
RIVERWATCH COMMONS
PLAT NO. 24121 A
3.89 AC.

PROFESSIONAL CERTIFICATION
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LICENSE NO. EXPIRATION DATE

EXHIBIT 'F' - ENVIRONMENTAL FEATURES MAP

CIRI PROPERTY

TM 11 PARCEL 609

SEVENTH (7th) ELECTION DISTRICT, CHARLES COUNTY, MARYLAND

SOLTESZ

Engineering
Surveying
Planning
Environmental Services

WALDORF OFFICE
401 Post Office Road, Suite 103
Waldorf, MD 20602
P. 301.870.2166 F. 301.870.2884

www.soltesz.com

Rockville
Lanham
Waldorf
Leesburg
Frederick
Soltesz DC, LLC

NO.	REVISIONS	BY	DATE

DATE: MAY 2015
DESIGNED: CF
CHECKED: CR

MISS UTILITY NOTE

THE CONTRACTOR SHALL EXCAVATE AND PROTECT ALL UTILITIES WITHIN CONSTRUCTION AREA. CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND DESIGN SUITABLE ALTERNATIVE ALIGNMENT IF NECESSARY. THE LOCATIONS SHOWN ON THE PLAN WERE OBTAINED FROM RECORDS AND ARE NOT GUARANTEED TO BE CORRECT OR COMPLETE. CLEARANCE BETWEEN UTILITIES MUST BE MAINTAINED. CONTRACTOR MUST CONTACT THE UTILITY COMPANIES AT LEAST FOUR WORKING DAYS PRIOR TO CONSTRUCTION. CLEARANCE LISTED THAN ACTUAL MAY RESULT IN DAMAGES.

OWNER/DEVELOPER/APPLICANT

COOK INLET REGION, INC.
725 EAST FIREWEED LANE
SUITE 800
ANCHORAGE, AK 99503
(907) 265-5135

CONTACT: RANDY WARREN

SOLTESZ PROJECT NO.	15051
TM 11 / PARCEL 609	
SHEET	1
OF	1
DWG. NAME	15051-EXHIBIT F
SCALE	1" = 50'

SOLTESZ JOB NO. XXXX
DATE: XXXX
L 1259 / F 0350

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P:\SOLTESZ\15-0 TO 15-EXHIBIT F ENV FEATURES.dwg Scale: 50.00X Plot Date: Change Plot Time: PDF Name: 15Landscape Plot Style: TEX* Sun Oct 18 2015 11:04:18 AM

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

LICENSE NO: EXPIRATION DATE:

EXHIBIT 'K' - AERIAL NEIGHBORHOOD EXHIBIT

CIRI PROPERTY

TM 11 PARCEL 609

SEVENTH (7th) ELECTION DISTRICT CHARLES COUNTY, MARYLAND

SHEET 1 OF 1

SCALE: 1" = 300'

SOLTESZ

Engineering
Surveying
Planning
Environmental Sciences

WALDORF OFFICE
401 Post Office Road Suite 103
Waldorf, MD 20602
P 301 870 2166 F 301 870 2884

www.soltesz.com

NO.	REVISIONS	BY	DATE

DATE: MAY 2018
DRAWN BY: CR
CHECKED: CR

MISS UTILITY NOTE

WORKING IN THE VICINITY OF OVERHEAD ELECTRIC LINES AND ARE LIKELY TO BE DAMAGED FROM ACCIDENTAL CONTACT. THE CONTRACTOR IS STRICTLY PROHIBITED FROM ALLOWING ANY PERSON TO COME WITHIN 10 FEET OF ANY ELECTRIC LINE. CONTACT MISS UTILITY AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCE IS LESS THAN 10 FEET OR IF ANY PART OF THE EXCAVATION IS TO BE CLOSER THAN 10 FEET TO ANY OVERHEAD LINE, CONTACT THE ENGINEER AND THE UTILITY COMPANY AND OBTAIN WRITTEN INSTRUCTIONS. CONTRACTOR IS LIABLE FOR ANY DAMAGES RESULTING FROM VIOLATION OF THIS RULE.

OWNER/DEVELOPER/APPLICANT

CGDN INLET REGION, INC
735 EAST FREEDOM LANE
SUITE 800
ANCHORAGE, AK 99503
(907) 263-5156

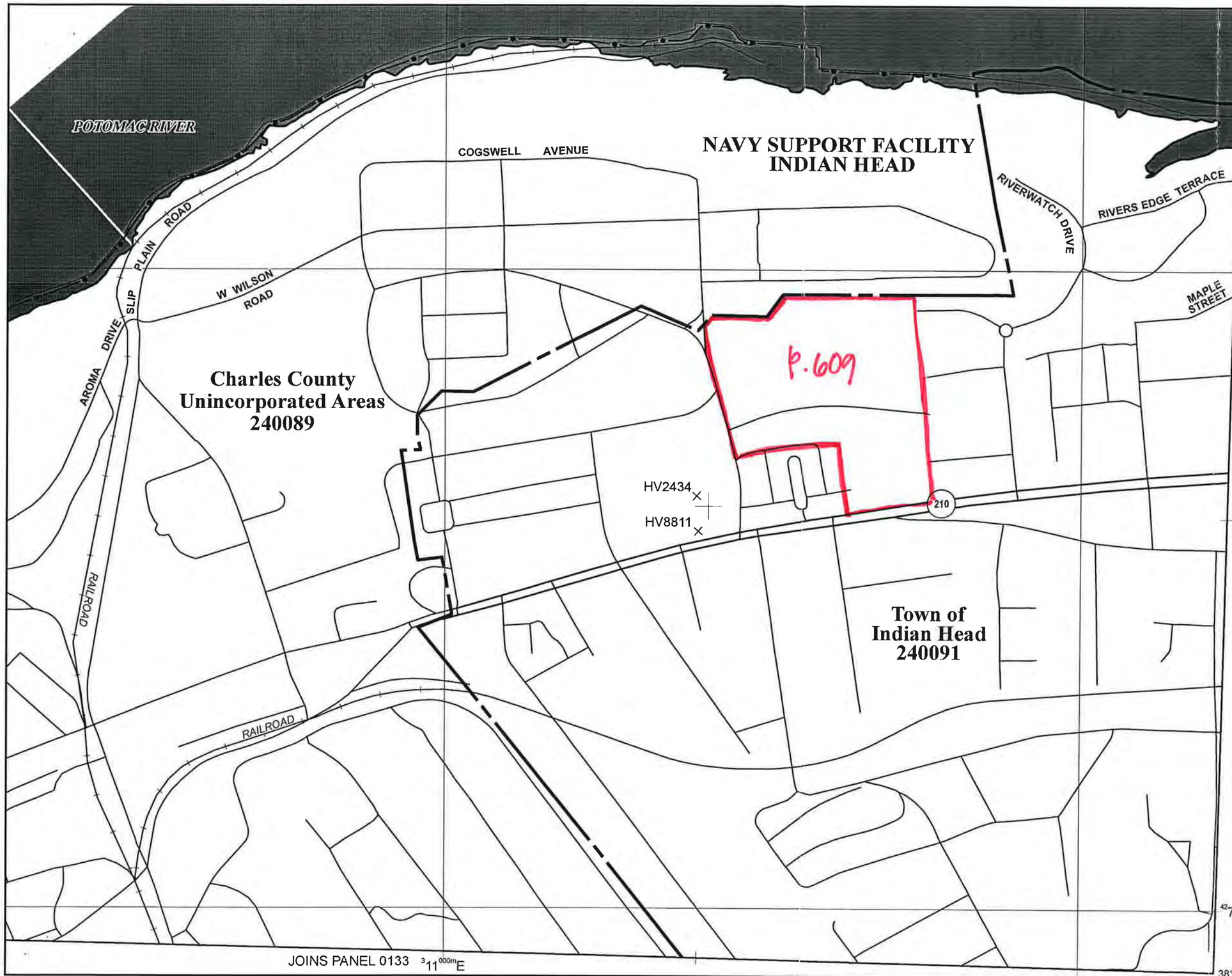
CONTACT: RANDY WARREN

ZONING DISTRICT: TOWN OS	ZONING DISTRICT: RE/SM
TAX MAP: 11 PARCEL: 609	GRID: 19
ZONING: OS	LAND USE:
ZONING NO.: XXXX	LIBER / FOLIO: L 7255 / F 0350
PLAN NO.: XXXX	

MAP: 11 GRID: 19

ZONING DISTRICT: TOWN OS
ZONING NO.: XXXX
PLAN NO.: XXXX
TAX MAP: 11
PARCEL: 609
ZONING: OS
LIBER / FOLIO: L 7255 / F 0350

SCALE: 1" = 300'



ational Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0131D

FIRM

FLOOD INSURANCE RATE MAP

CHARLES COUNTY, MARYLAND
AND INCORPORATED AREAS

PANEL 131 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHARLES COUNTY	240089	0131	D
INDIAN HEAD, TOWN OF	240091	0131	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
24017C0131D

MAP REVISED
MAY 4, 2015

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

U.S. Fish and Wildlife Service

National Wetlands Inventory

CIRI property - 2016

Mar 22, 2016

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

October 17, 2016

Lori A. Byrne
Environmental Review Specialist
Wildlife and Heritage Service
Maryland Department of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

Re: Request for Information, Charles County
Tax Map 11, Parcel 609

Dear Ms. Byrne,

This letter is sent as a request for any available information pertaining to the documented presence of any Federal or State rare, threatened or endangered (RTE) species within the above-referenced Subject Parcel.

We are conducting a preliminary assessment of the property and are seeking any information pertaining to RTE species on the property that you may be able to provide. I have included a copy of Charles County Tax Map 11 showing the Subject Parcel outlined in red.

Thank you in advance for any assistance you can provide in response to this request. If you have any questions or desire further information, please contact me directly at (301) 870-2166.

Sincerely

Cathy Flerlage

Cathy Flerlage, AICP
Soltesz, Inc.

cc: File

United States Department of Agriculture

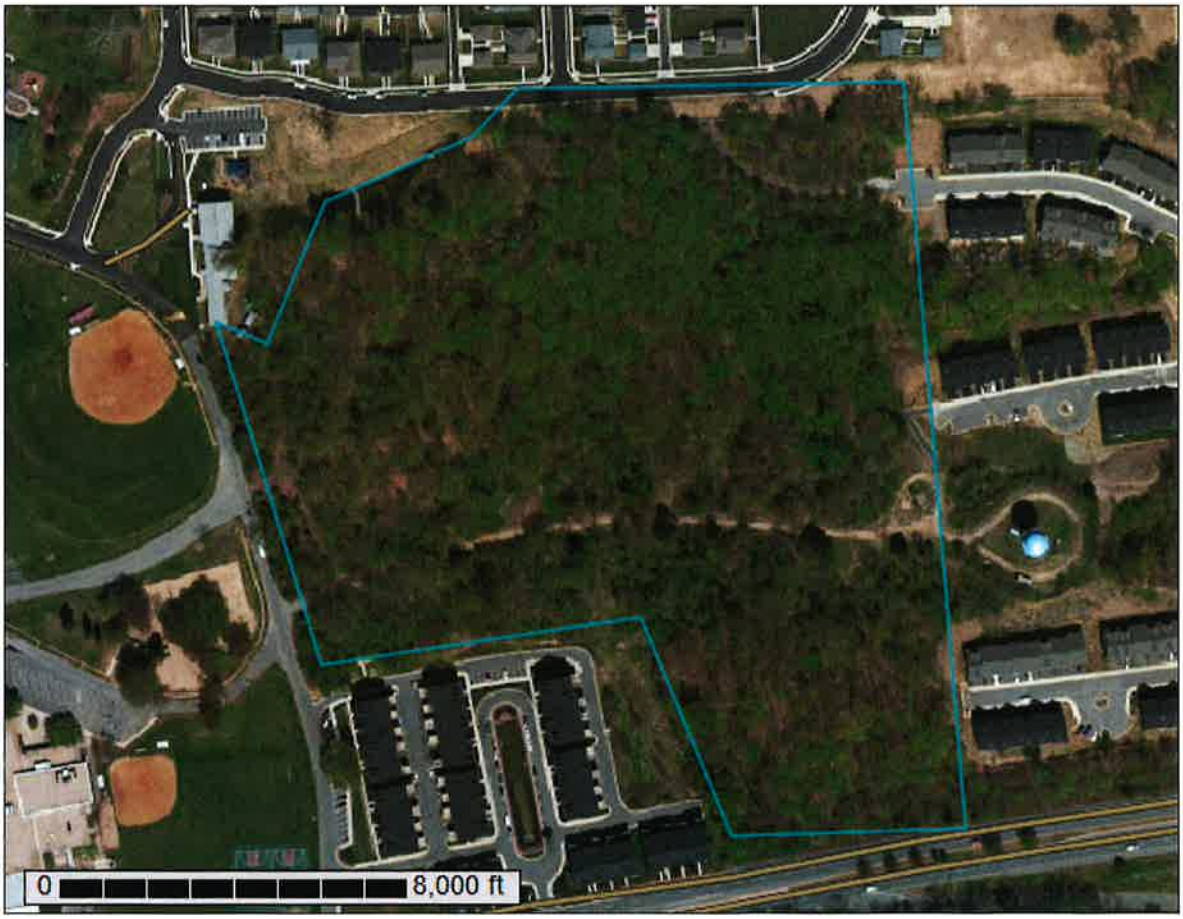
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Charles County, Maryland

CIRI Property



October 14, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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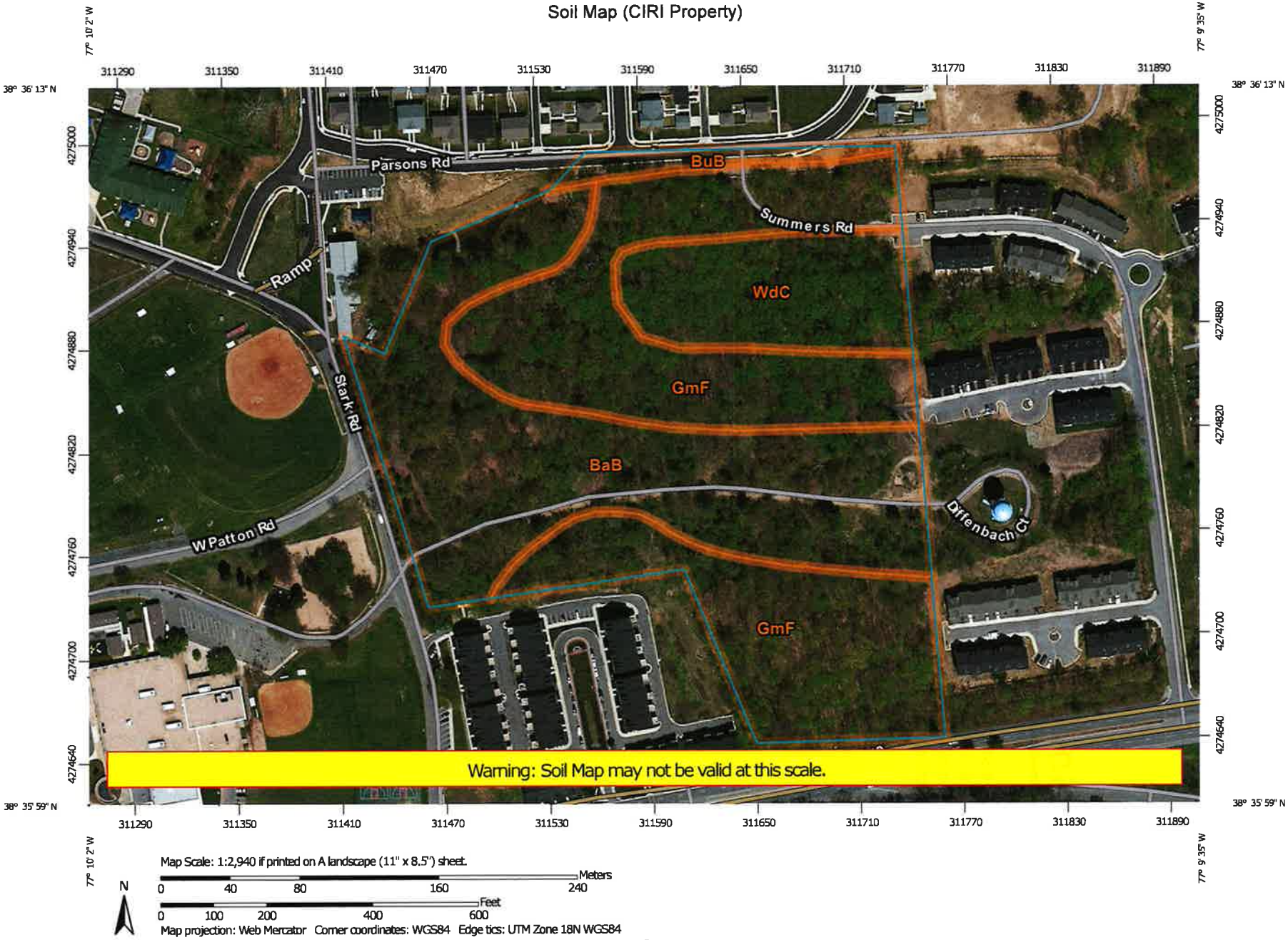
Contents

Preface.....2
Soil Map.....5
Soil Map (CIRI Property).....6
Legend.....7
Map Unit Legend (CIRI Property).....8
Map Unit Descriptions (CIRI Property).....8
Charles County, Maryland.....10
BaB—Beltsville silt loam, 2 to 5 percent slopes.....10
BuB—Beltsville-Urban land complex, 0 to 5 percent slopes.....11
GmF—Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes.....13
WdC—Woodstown sandy loam, 5 to 10 percent slopes.....15
Soil Information for All Uses.....18
Suitabilities and Limitations for Use.....18
Land Classifications.....18
Hydric Rating by Map Unit (CIRI Property).....18
Soil Properties and Qualities.....23
Soil Erosion Factors.....23
K Factor, Whole Soil (CIRI Property).....23
Soil Qualities and Features.....26
Hydrologic Soil Group (CIRI Property).....26
References.....31

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (CIRI Property)



Map Scale: 1:2,940 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 9, Sep 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (CIRI Property)

Charles County, Maryland (MD017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BaB	Beltsville silt loam, 2 to 5 percent slopes	8.1	38.7%
BuB	Beltsville-Urban land complex, 0 to 5 percent slopes	0.5	2.4%
GmF	Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes	9.6	46.0%
WdC	Woodstown sandy loam, 5 to 10 percent slopes	2.7	12.9%
Totals for Area of Interest		**20.9**	**100.0%**

Map Unit Descriptions (CIRI Property)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Charles County, Maryland

BaB—Beltsville silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1qzx2
Elevation: 10 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 180 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Beltsville and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beltsville

Setting

Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty eolian deposits over loamy fluviomarine deposits

Typical profile

A - 0 to 3 inches: silt loam
E - 3 to 8 inches: silt loam
Bt - 8 to 20 inches: silt loam
Btx - 20 to 41 inches: loam
2B't - 41 to 65 inches: sandy clay loam
2BCg - 65 to 71 inches: very gravelly sandy clay loam
2CB - 71 to 76 inches: gravelly coarse sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 20 to 40 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Aquasco

Percent of map unit: 10 percent
Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Reybold

Percent of map unit: 10 percent
Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lenni, undrained

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Grosstown

Percent of map unit: 5 percent
Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

BuB—Beltsville-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1qzx4
Elevation: 10 to 360 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 180 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Beltsville and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beltsville

Setting

Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty eolian deposits over loamy fluviomarine deposits

Typical profile

A - 0 to 3 inches: silt loam
E - 3 to 8 inches: silt loam
Bt - 8 to 20 inches: silt loam
Btx - 20 to 41 inches: loam
2B't - 41 to 65 inches: sandy clay loam
2BCg - 65 to 71 inches: very gravelly sandy clay loam
2CB - 71 to 76 inches: gravelly coarse sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Aquasco

Percent of map unit: 5 percent
Landform: Broad interstream divides
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lenni, undrained

Percent of map unit: 5 percent
Landform: Depressions

Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

GmF—Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1qzxc
Elevation: 0 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 180 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Marr and similar soils: 30 percent
Grosstown and similar soils: 30 percent
Hoghole and similar soils: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marr

Setting

Landform: Knolls
Landform position (three-dimensional): Side slope, head slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bt1 - 4 to 25 inches: fine sandy loam
Bt2 - 25 to 57 inches: sandy clay loam
BC - 57 to 76 inches: loamy fine sand

Properties and qualities

Slope: 15 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Grosstown

Setting

Landform: Fluviomarine terraces, broad interstream divides, stream terraces
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy and gravelly fluviomarine deposits

Typical profile

Ap - 0 to 4 inches: gravelly silt loam
Bt1 - 4 to 20 inches: silt loam
Bt2 - 20 to 26 inches: gravelly loam
2Bt3 - 26 to 71 inches: extremely gravelly silt loam
3BC - 71 to 80 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 15 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Hoghole

Setting

Landform: Fluviomarine terraces, broad interstream divides, stream terraces
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly fluviomarine deposits

Typical profile

A - 0 to 4 inches: sand
Bw1 - 4 to 33 inches: very gravelly sand
Bw2 - 33 to 80 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 15 to 40 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Potobac
Percent of map unit: 10 percent
Landform: Flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Dodon
Percent of map unit: 10 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Beltsville
Percent of map unit: 5 percent
Landform: Broad interstream divides
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

WdC—Woodstown sandy loam, 5 to 10 percent slopes

Map Unit Setting
National map unit symbol: 1qzxy
Elevation: 0 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 59 degrees F
Frost-free period: 180 to 220 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodstown and similar soils: 65 percent
Minor components: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodstown

Setting

Landform: Depressions, broad interstream divides, pediments, fluviomarine terraces, stream terraces, swales
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt - 8 to 28 inches: loam
BC - 28 to 42 inches: fine sandy loam
CB - 42 to 60 inches: sandy loam
CBg - 60 to 72 inches: loamy sand

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Grosstown

Percent of map unit: 20 percent
Landform: Fluviomarine terraces, broad interstream divides, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Reybold

Percent of map unit: 5 percent
Landform: Fluviomarine terraces, broad interstream divides
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: No

Piccowaxen

Percent of map unit: 5 percent
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Issue

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit (CIRI Property)

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

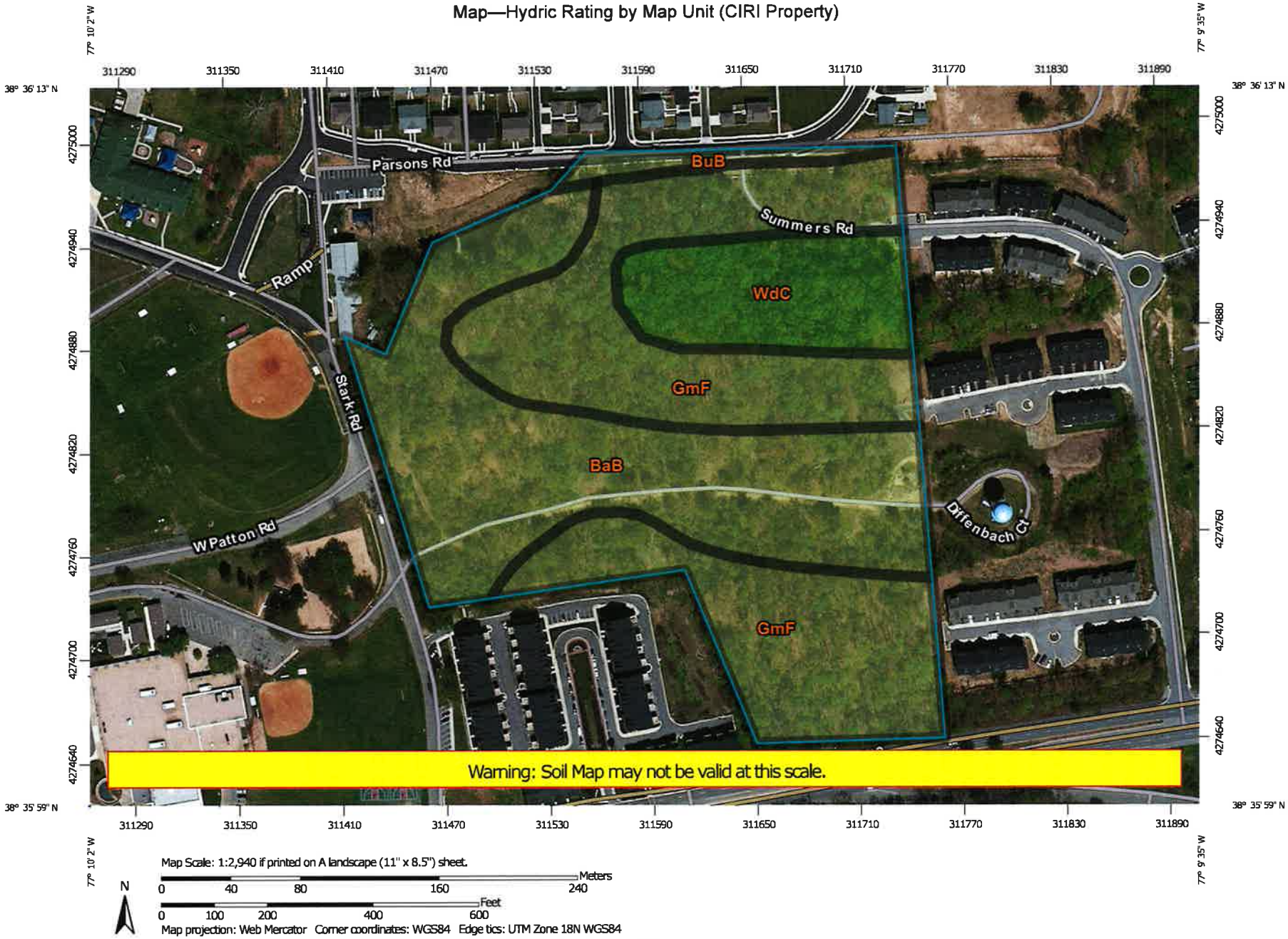
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit (CIRI Property)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Lines

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Points

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 9, Sep 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit (CIRI Property)

Hydric Rating by Map Unit— Summary by Map Unit — Charles County, Maryland (MD017)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BaB	Beltsville silt loam, 2 to 5 percent slopes	5	8.1	38.7%
BuB	Beltsville-Urban land complex, 0 to 5 percent slopes	5	0.5	2.4%
GmF	Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes	10	9.6	46.0%
WdC	Woodstown sandy loam, 5 to 10 percent slopes	0	2.7	12.9%
Totals for Area of Interest			**20.9**	**100.0%**

Rating Options—Hydric Rating by Map Unit (CIRI Property)

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

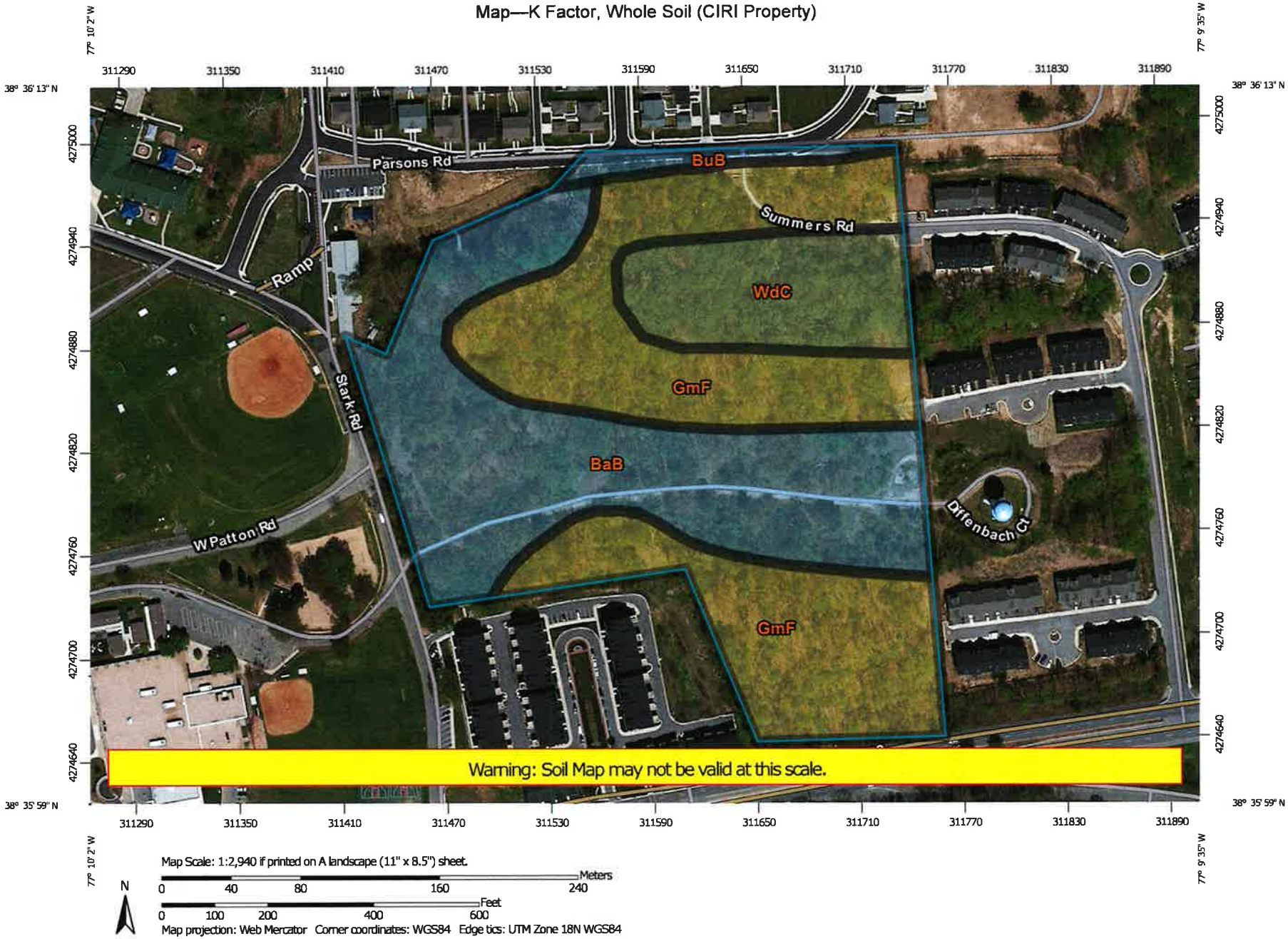
Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil (CIRI Property)

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Custom Soil Resource Report
Map—K Factor, Whole Soil (CIRI Property)



Map Scale: 1:2,940 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Lines

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Points

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 9, Sep 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil (CIRI Property)

K Factor, Whole Soil— Summary by Map Unit — Charles County, Maryland (MD017)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BaB	Beltsville silt loam, 2 to 5 percent slopes	.37	8.1	38.7%
BuB	Beltsville-Urban land complex, 0 to 5 percent slopes	.37	0.5	2.4%
GmF	Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes	.24	9.6	46.0%
WdC	Woodstown sandy loam, 5 to 10 percent slopes	.28	2.7	12.9%
Totals for Area of Interest			**20.9**	**100.0%**

Rating Options—K Factor, Whole Soil (CIRI Property)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (CIRI Property)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

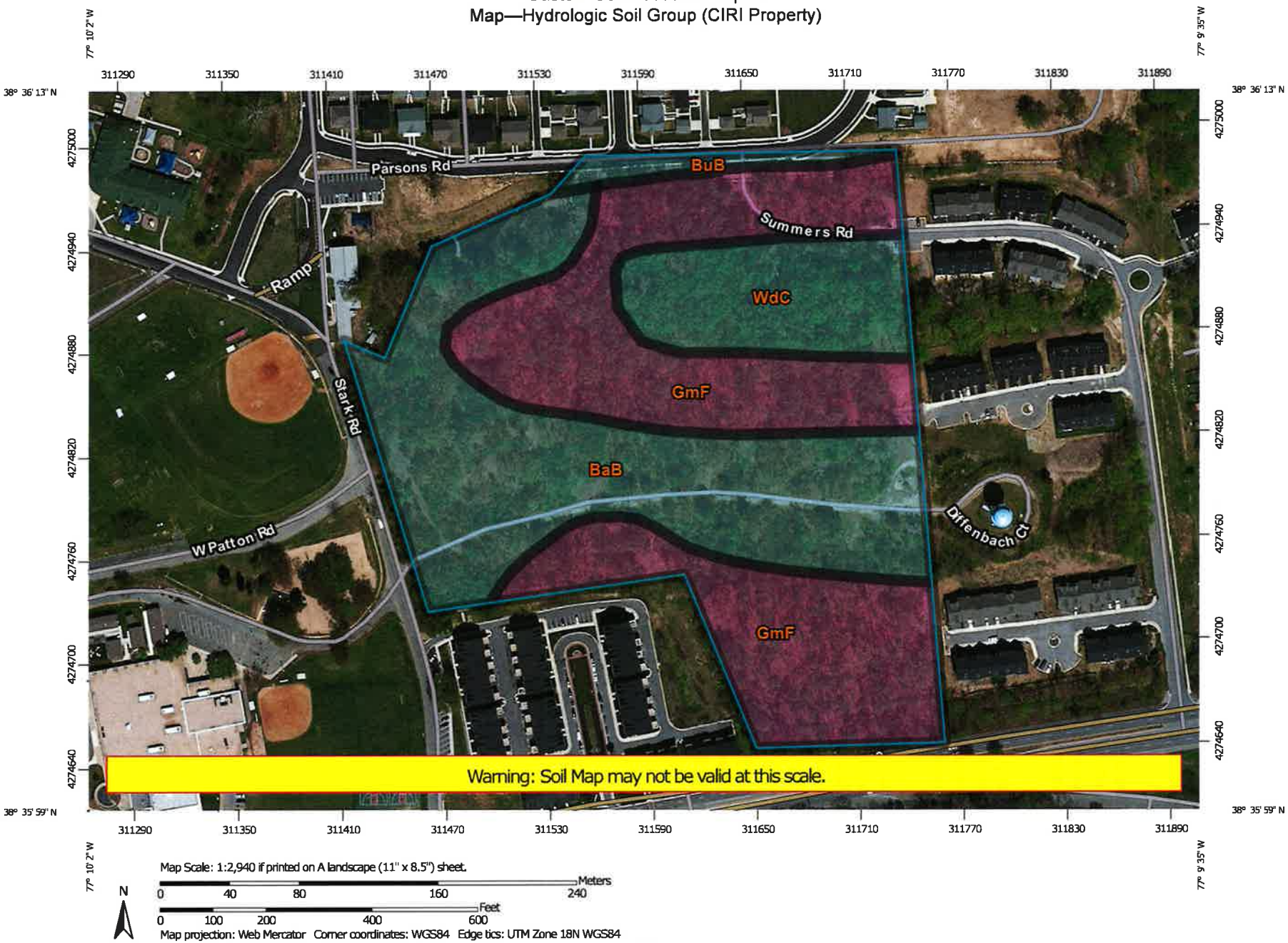
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (CIRI Property)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 9, Sep 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (CIRI Property)

Hydrologic Soil Group— Summary by Map Unit — Charles County, Maryland (MD017)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BaB	Beltsville silt loam, 2 to 5 percent slopes	C	8.1	38.7%
BuB	Beltsville-Urban land complex, 0 to 5 percent slopes	C	0.5	2.4%
GmF	Grosstown-Marr-Hoghole complex, 15 to 40 percent slopes	A	9.6	46.0%
WdC	Woodstown sandy loam, 5 to 10 percent slopes	C	2.7	12.9%
Totals for Area of Interest			**20.9**	**100.0%**

Rating Options—Hydrologic Soil Group (CIRI Property)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

SECTION FIVE

EXHIBIT 'J'
APPLICATION FOR
A ZONING MAP AMENDMENT
TAX MAP 11, PARCEL 609
INDIAN HEAD, MD

CONSISTENCY ANALYSIS

In conformity with Article XX of the Town of Indian Head Zoning Ordinance, Cook Inlet Region, Inc., as owner of Parcel 609 (the subject "Property"), seeks an amendment to the appurtenant zoning district designations and boundaries that have been established on the Property. As described in Section 2002 (a) ii. of the Code, an application requesting a change to the Base Zone of a property shall provide information which establishes the consistency of the proposed re-zoning with the most current Town of Indian Head Comprehensive Plan, Zoning Ordinance, and land use policies.

Excerpts from the Town's 2009 Comprehensive Plan (as adopted 2/1/10) and the Zoning Ordinance (print date 5/26/10) that are pertinent to this application have been provided below, followed by our response in ***bold italics*** that demonstrates conformity with the specific goal, policy, or objective.

Consistency with the 2009 Comprehensive Plan

Introduction

- Page IN-7. "The Town should continue to create a Downtown Redevelopment Plan...that will serve as the basis for creating a Town Center that will be supported by existing and future residential development."
  Although NSWC is one of the County's largest employers, the impact of those workers on local business is limited to peak commute times and "lunch hour" trade. New residential development, such as that proposed for the subject Property, has the potential to stimulate a significant increase in commercial activity and Town Center business development, by bringing in full-time members of the community. In supporting such growth, the Town can reduce its dependency on NSWC as the defining element which shapes the Town's future.

Land Use Element

- Page LU-1. "The Town of Indian Head contains approximately 800 acres, of which 70% to 75% is developed....The reminder of vacant land consists of small, undeveloped parcels and lots scattered throughout Town, and three large undeveloped tracts... The introduction of mixed-use zoning has made further in-fill development and redevelopment possible throughout the Town."
  The subject Property is one of the three tracts referenced in the statement above, logically designated for in-fill development as one of the last sizeable, undeveloped parcels remaining in the Town. As stated in the Plan, several large and small residential

developments have come to fruition under the Town Center Mixed Use zoning district regulations adopted by the Town in 2004. The proposed residential development of the subject Property is consistent with its TCMX zoning and with the Town's land use planning objectives. The subject Property's location immediately adjacent to the recently developed "Villages of Potomac" and "Riverwatch" townhome communities is further confirmation of the appropriateness of the proposed residential use.

- Page LU-2. "The Town has undertaken several major projects, which strengthen the core commercial area and further the adopted goals of the Town to make it a special place for residents. A new landscaping plan was prepared for the Village Green Area and the Village Green pavilion was constructed along the northern perimeter".
  Living directly across the street from the Village Green and Pavilion on Dr. Andrew's Way, the future residents of the subject Property will be able to easily access this important Town events venue and recreational facility, and will contribute to the vitality and vibrancy of this key community gathering space. The improvements to the Village Green and Pavilion area by the Town is one of many indications of the Town's commitment to providing a high quality of life for its present and future residents.

- Page LU-3. As described in Table LU-2, the Town Center Mixed Use zoning classification is "Intended to promote a mixture of multi-family and commercial uses, to promote and enhance a pedestrian-oriented development and permit a mix of uses that can be found in a traditional town center or neighborhood setting." Approximately 136 acres of the Town are designated TCMX, and have a recommended density per Table LU-3 of up to 20 units per acre.
  The proposed development of the 19.67 acre Property with 164 townhomes yields a net density of 8.3 units per acre, which is entirely consistent with the Town's goals for medium to high-density residential development within the TCMX zone. The location of the Property is conducive to creation of a pedestrian friendly community, within easy walking distance of the Village Green, the Indian Head Rail Trail, Town Hall, an elementary school, the NSWC base, public transportation, and food and entertainment venues.

- Page LU-4. As described in Table LU-3, Open Space land use designation is indicative of "Lands and facilities generally owned and operated by the Town or other level of government for the purpose of recreation or public open space."
  Approximately one-third of the Property (northern portion) is zoned OS (Open Space). Allowing re-zoning of that portion to TCMX, removing the split-zoning, is consistent with the intended use of the parcel as described in the Table. The OS zoned portion is not owned by the Town or any other public entity – Open Space zoning is not intended to be applied to privately owned lands.

- Page LU-6. Land Use Goals, Policies and Implementation Strategies.
  - "The overriding land use goal is to improve the pattern of land uses so that they are balanced to meet the needs of the community and stimulate physical, social, and economic development while minimizing fiscal and environmental impacts."

- "Enhance an "old town" feel in the town through the appropriate use of mixed-use zoning coupled with retention of existing residential areas."
- "Promote the development of pedestrian-friendly residential areas, and maintain a diversity of housing types available to all income levels. Promote the addition of elderly housing opportunities and retirement facilities."
- "Support a pedestrian-friendly environment for new and existing development by:
  - Requiring or supporting sidewalks/bicycle routes through the development and connectivity with existing routes;
  - Open space and parkland to encourage neighborhood gatherings and activities;

- Page LU-7: Land Use Goals, Policies and Implementation Strategies (cont.)
  - "Provide ample mixed-use areas along Route 210 to support the continued development and re-development of mixed-use activities."

The development of the subject Property is consistent with all of the above land use objectives. The community design, which achieved conceptual approval by the Town Planning Commission on August 17, 2016, incorporates many elements which enhance pedestrian connectivity. As proposed, sidewalks will line both sides of the primary and secondary streets and a trail system will connect residents with community park areas, a scenic stream valley and woodland, and the neighboring Riverwatch community. Five different neighborhood park areas have been proposed, providing a variety of recreational amenities and ample opportunities for community gatherings and activities. The site is within easy walking distance to the Village Green, to businesses on Route 210, and to the Indian Head Rail Trail.

In combination with the predominantly single-family detached homes already existing in the Town, the variety of townhome and condominium styles, sizes and floorplans that have been proposed for the subject Property will support the goal to maintain a diversity of housing types available to all income and activity levels. The mix of housing stock and the neo-traditional design of the community conforms to the Town's goal to provide more housing stock conducive to senior living, young professionals, and small families.

Environmental, Sensitive, and Critical Areas Element

- Pages EN-4 and EN-5: Environmental, Sensitive and Critical Area goals.
  "Protect environmentally sensitive areas (streams and their buffers...) from development impacts to provide for the continuance of a healthy environment and to maintain the current diversity of flora and fauna."
  "...establish a minimum 25-foot buffer from each bank for areas outside of the State Critical Area."
  The subject Property is located outside of the Critical Area, but is traversed by a perennial stream with a well-defined channel. The proposed development of the subject Property will include ample protection for the existing stream. In the approved Concept Plan, the recommended 25-foot buffer has been established from the top of both banks, including adjacent areas of steep slopes. The stream valley has been treated as a valuable amenity to the community, preserved within +/- 4 acres of undisturbed existing woodland to be

maintained as community Open Space. Stormwater best management practices and environmentally sensitive design (ESD) will be employed to reduce stormwater runoff and preserve water quality. In this manner, growth may be accommodated while the wildlife habitat and corridor functions of the stream valley are maintained.

Municipal Growth Element

- Page MG-6. Municipal Growth Element, Development Capacity and Build-out Analysis
  "It is prudent for the town to encourage infill development that can improve the quality of the older community. Infill development is encouraged by the State as an efficient method of development because the infrastructure is already available at the sites."
  As previously stated, the subject Property is one of the three remaining sizeable tracts of undeveloped land in the Town. The proposed residential development of the site represents the type of growth that is needed and encouraged, with the necessary infrastructure to support the development (roads, water, and sewer) already in place. As shown on Table MG-18, school capacity to support the proposed development exists at all three educational levels (elementary, middle and high school) in Indian Head.

- Page MG-7. As shown on Table MG-6, the remaining TCMX acreage in the town (54 acres total) is forecast for the development of up to 496 dwelling units. As stated, "Redevelopment of existing parcels within the Mixed Use District along Route 210 and Strauss Avenue that are outside of the Critical Area could be developed at a density between 20 and 40 units per acre...Infill development relieves growth pressure on areas in Charles County and can rejuvenate and improve the quality of life for older communities like Indian Head."
  In keeping with the goal for parcels within the Mixed Use District, the proposed development of the subject Property is higher in density than most of the existing Town neighborhoods, which consist primarily of single family detached homes. The 164 townhome and condominium units yield a density of 8.3 units per acre. The efficient "cluster" design maximizes the potential of the 19.67 acre site, balancing density with preservation and protection of natural features. The addition of new residents to the Town will spur economic growth through new commercial development, increase employment opportunities, and add activity and new vitality to the Town Center, improving the quality of life for all residents. With a substantial increase to the number of potential patrons, a grocery store (the "most needed service within the Town") could once again be open for business in Indian Head.

- Page MG-25. "Redevelopment and adaptive use of existing structures and development of vacant lots are and will continue to be a higher priority for growth rather than annexation."
  The proposed development of a medium to high density residential neighborhood on one of the last three sizeable vacant lots within the Town is consistent with this Municipal Growth priority.

Community Facilities Element

- Page CF-7. Community Facilities: Policies and Implementation Strategies
    - "Require through the site plan or subdivision process that new development contribute to facilities as called for in this Comprehensive Plan and reserve land for open space and recreation..."
    - "Require all new development to include areas designated for a trail system that can be incorporated into a Town-wide trail system."
    - "Plan and develop a comprehensive trail system throughout the Town (hiker and/or cycling). It is intended that the various trails be interconnected throughout the Town by a series of sidewalks and cycling paths."

As proposed, the new community on the subject Property will include an extensive network of pedestrian and cycling pathways. A crosswalk on Dr. Andrew's Way will connect the development to the Village Green, the Pavilion, the Senior Center, and Indian Head Elementary school. A sidewalk connection into the neighboring Riverwatch community will link residents to the recreational amenities at the Potomac River Boardwalk. Five park areas within the new community, ranging from 2000 to 19,250 square feet in size, will be interconnected by internal sidewalks, flagstone paths, and a mulched nature trail. In addition, over seven acres of on-site forest, including the beautiful stream valley, are to be retained in Community Open Space.

Housing Element

- Page H-2. "Since housing is the primary source of Town revenues, it is in the Towns' best interest to support high-quality development and redevelopment of moderate to upscale housing using the mixed-use zoning concept...As growth pressures continue in the future years, projects with higher densities will become more appealing which will not degrade the quality of life in Indian Head, as long as future plans contain landscaping, parks, public spaces outdoors, and recreational opportunities."
  In keeping with the above goals for housing in the Town, the proposed residential development utilizes the Mixed Use Zoning (TCMX) designation to achieve a high-quality, high-density design that incorporates seven acres of preserved woodland, five park areas for active and passive recreation, and a lush landscaping palette of native plant materials and seasonal floral displays.

Economic Development Element

- Page ED-4. "The Town needs to ensure that Land Use policies encourage the retention of existing businesses while attracting the much-needed new development within the appropriately designated areas. In order to accomplish this goal, the Town needs to be able to support a variety of development opportunities including Mixed Use Development..."
  The proposed community is consistent with the above goal to encourage Mixed Use residential development that is compatible with adjacent neighborhoods. The influx of new residents will act as a catalyst to local business development that cannot be provided by Navy Base employees running errands at lunch.

Transportation Element

- Page TN-4 and 5. "The lack of connecting sidewalks and bicycle pathways make pedestrian movement hazardous and discourages residents from undertaking either activity."
  "Require that sidewalks and bicycle access be provided in all new subdivisions and commercial development."
  As shown on the approved Concept Plan, a complete system of sidewalks, trails, and pathways will be developed within the proposed community. A bike rack will be provided at the entrance to the central Neighborhood Park.
  The internal system of pathways will be connected at two key locations to the existing network of pedestrian and bicycle pathways in the Town - to the west through a crosswalk on Dr. Andrew's Way, and to the east through a sidewalk extension to Kearney Way in the Riverwatch neighborhood. From there, bikers and hikers will be able to access the Potomac River Boardwalk.
- Policy T:1: "In working with the State Highway Administration, continue managing access and improving existing ingress and egress onto Maryland Route 210."
  To enable SHA and the Town to assess the potential impact of the proposed development on local travel function and vehicular safety, a Traffic Impact Study has been provided in Section 9 of the Application. Findings and Conclusions of the TIS indicate that all key intersections in the vicinity of the CIRI property will continue to operate at acceptable levels of service (LOS) under full future build-out traffic conditions. The proposed development of 164 townhomes will not have a significant impact on traffic in the surrounding neighborhood.

Water Resources Element

- Page WRE-14. "The remainder of the projected population growth will occur as infill within the residential or mixed-use zoned areas of the Town... future development trends along with implementation of best management practices in stormwater design should help reduce the ultimate loading (nitrogen and phosphorous) to the Potomac river and Mattawoman Creek from the current and future areas of the Town.
  The final engineering of the proposed residential development will utilize the most current stormwater best management practices and Environmental Site Design (ESD) to the maximum extent possible, in order to minimize nutrient runoff and erosion. These include such features as micro-bioretention facilities, vegetated filter strips, preservation of existing woodland in an undisturbed state, rain gardens, street trees and landscaping.

<u>Consistency with the Current Zoning Ordinance</u>

- As described in Section 1100 of the Zoning Ordinance, the intent of the TCMX Zone is to "control the placement, design, use and density of well-planned residential and commercial developments, which will offer a variety of building types and a more efficient overall use of land, and within these limits, permit the optimum amount of freedom and variety in the design and management of such varying types of residential structures including one and two-family units, townhouses and garden apartments. Within the intention of these regulations, the following objectives are sought to provide for the Residential Mixed Use Development:

a. to provide a more attractive and varied living environment
b. to encourage a more intimate, efficient and aesthetic use of space
c. to encourage developers to use a more creative approach in the development of land
d. to encourage variety in the physical development pattern of residential areas.
e. to foster forms of development which exhibit the characteristics of Traditional Neighborhoods within the town."

As proposed, the development of the 19.67 acre tract is consistent with the intent, goals and objectives for residential land development in the TCMX Zone. In this efficient design, the 164 dwelling units are clustered in the most appropriate areas of the site, leaving the stream valley, over seven acres of existing woodland, and most of the steep slopes on the Property undisturbed. The preserved natural features have been treated as an important amenity to the development, with an abundance of green Open Space available for the use and enjoyment of the residents. Following the concepts of Traditional Neighborhood Development, the network of streets, sidewalks and alleys form a grid-pattern, providing easy access for the residents to five on-site community park areas, the Village Green, businesses on Route 210, and the adjacent communities of Riverwatch and Villages of Potomac. The density falls within the targeted range for the type of medium to high-density development desired in the TCMX zone. A variety of floorplans and facades and an abundance of landscaping, street furnishings, and customized lighting and signage will provide visual interest to this high-styled and aesthetically pleasing community. Several community gathering spaces are incorporated into the design, encouraging social interaction, community pride and a special "sense of place".

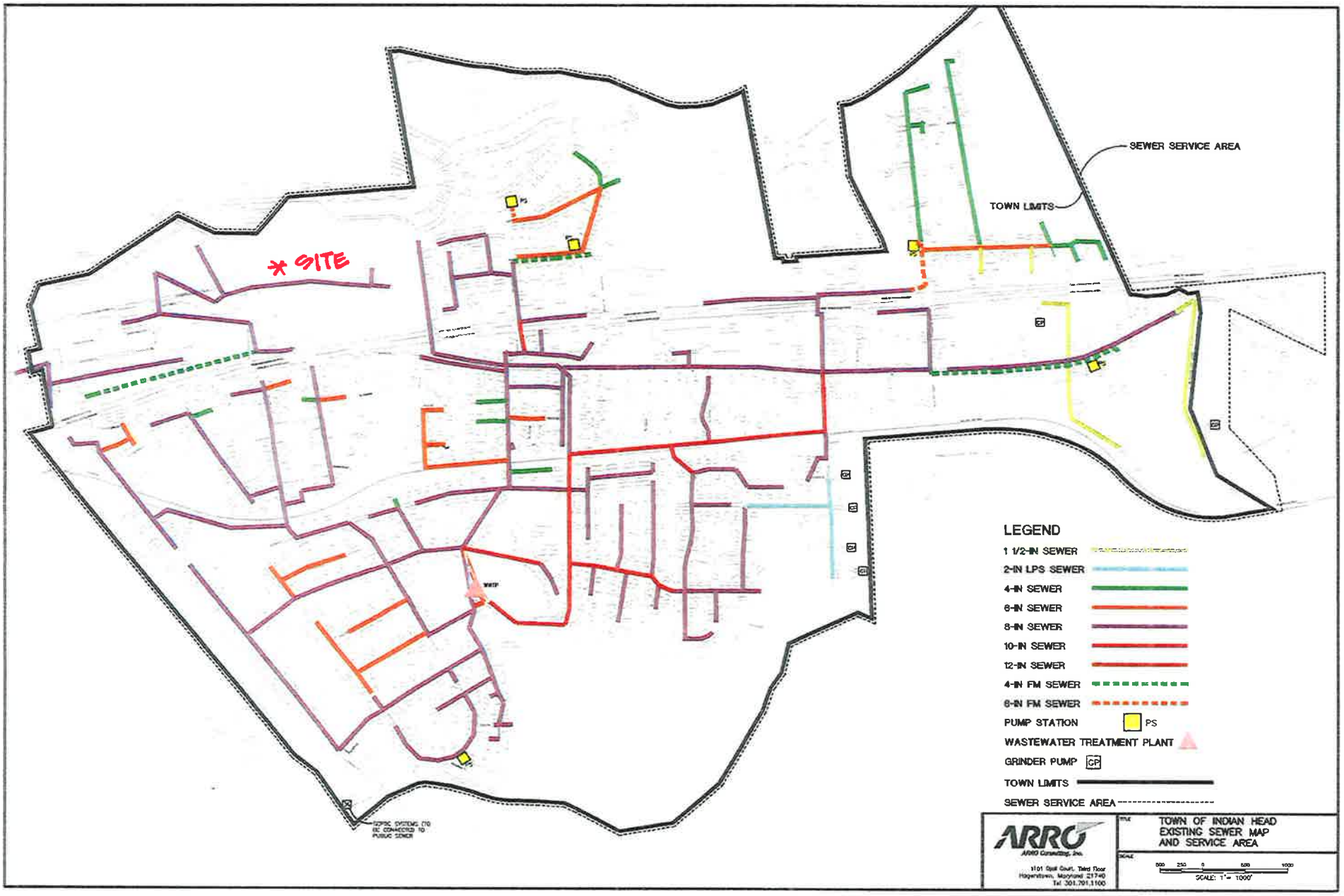
Supplemental Information - Town Maps

1) Town of Indian Head Proposed Land Use Map 2009

2) Town of Indian Head Future Development Map

3) Town of Indian Head Transportation Map 2009

4) Town of Indian Head Existing Water and Sewer Maps and Service Areas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TOWN LIMITS
* SITE
PS
WWTP
LEGEND
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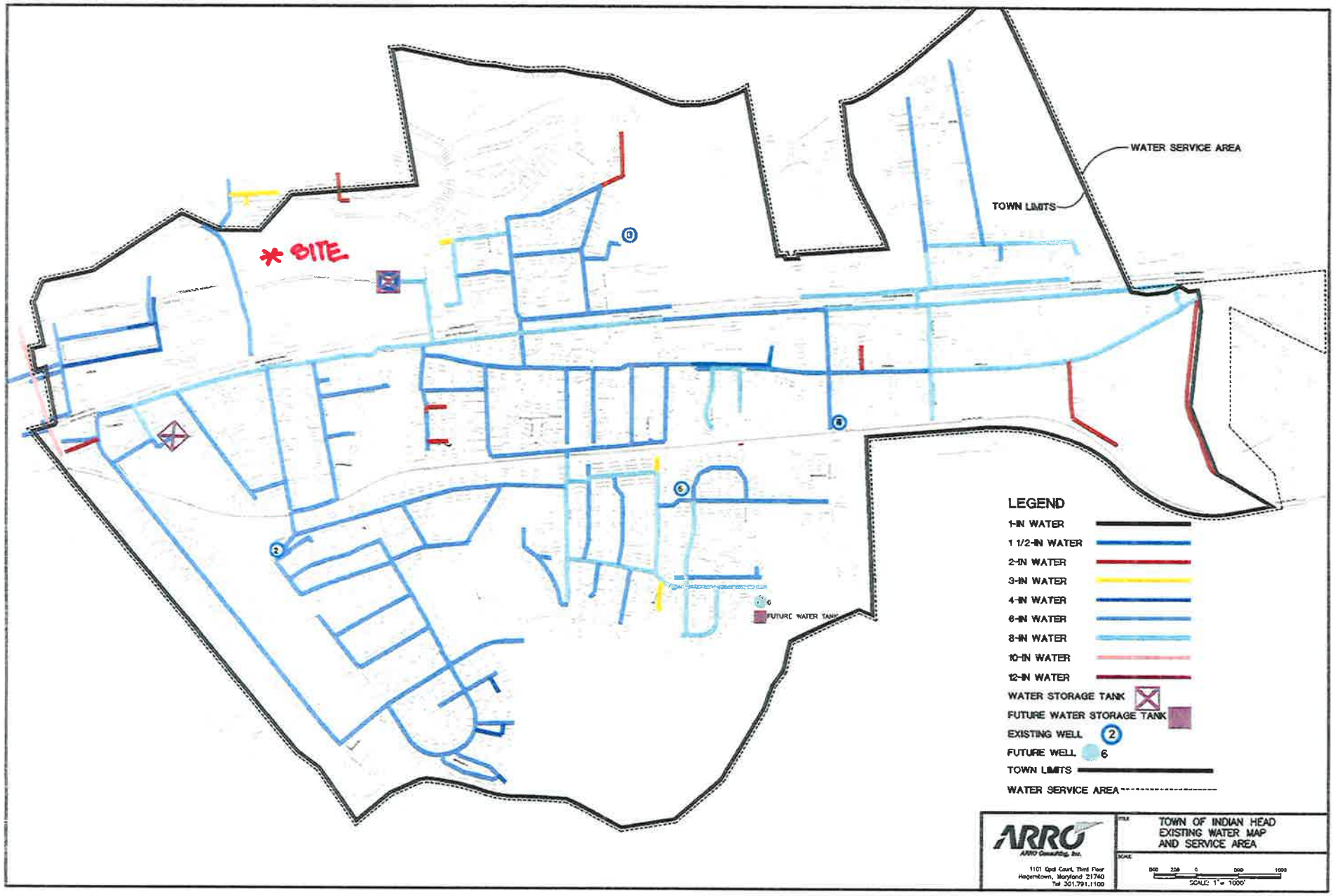
2-IN LPS SEWER
4-IN SEWER
6-IN SEWER
8-IN SEWER
10-IN SEWER
12-IN SEWER
4-IN FM SEWER
6-IN FM SEWER
PUMP STATION
PS
WASTEWATER TREATMENT PLANT
GRINDER PUMP
GP
TOWN LIMITS
SEWER SERVICE AREA
ARRO
ARRO Consulting, Inc.
1101 Opal Court, Third Floor
Hagerstown, Maryland 21740
Tel 301.791.1100
TOWN OF INDIAN HEAD
EXISTING SEWER MAP
AND SERVICE AREA
SCALE: 1" = 1000'


WATER SERVICE AREA
TOWN LIMITS
* SITE
FUTURE WATER TANK
LEGEND
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2-IN WATER
3-IN WATER
4-IN WATER
6-IN WATER
8-IN WATER
10-IN WATER
12-IN WATER
WATER STORAGE TANK
FUTURE WATER STORAGE TANK
EXISTING WELL
FUTURE WELL
TOWN LIMITS
WATER SERVICE AREA
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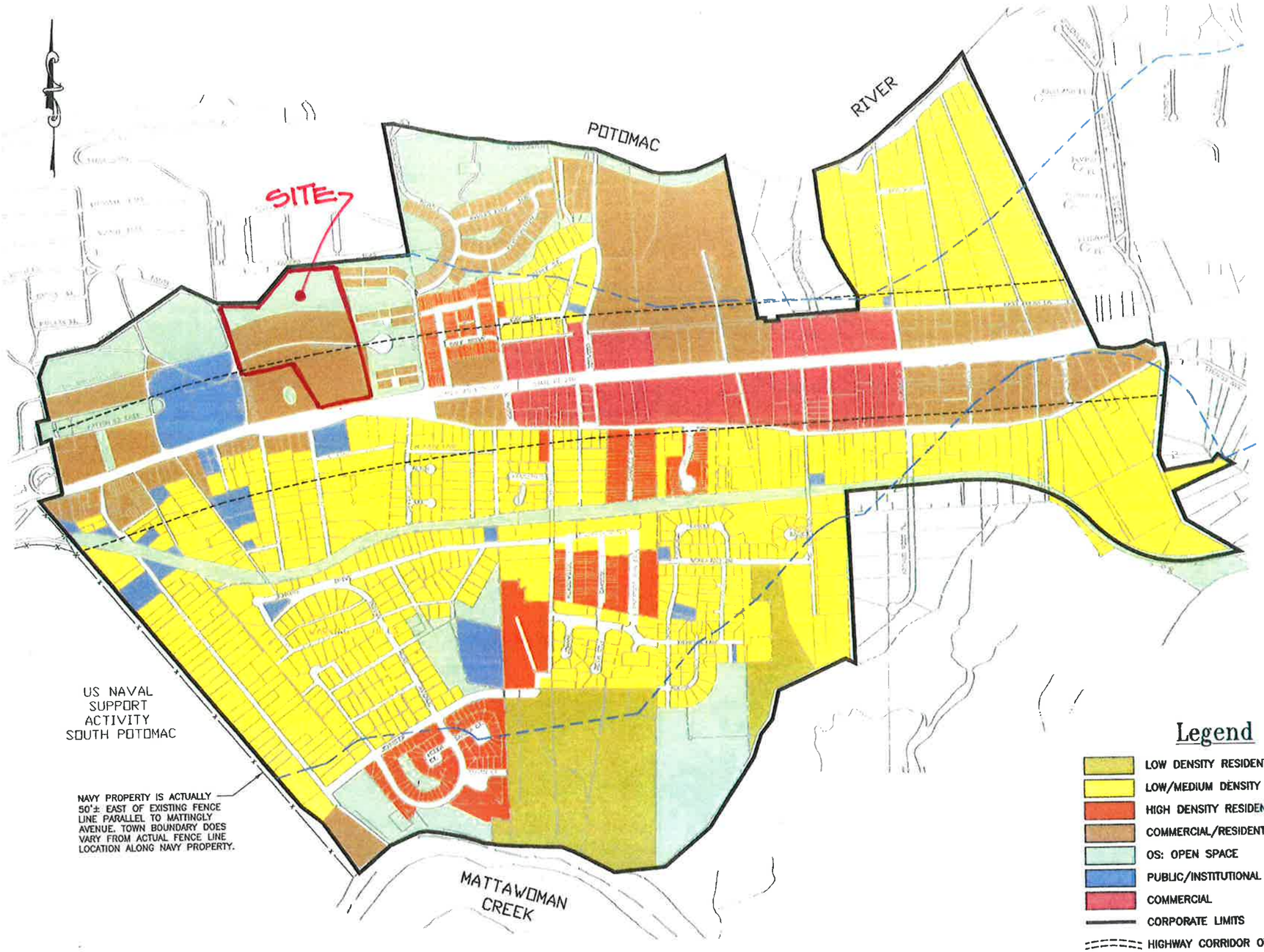
TOWN OF INDIAN HEAD
EXISTING WATER MAP
AND SERVICE AREA
SCALE 1" = 1000'

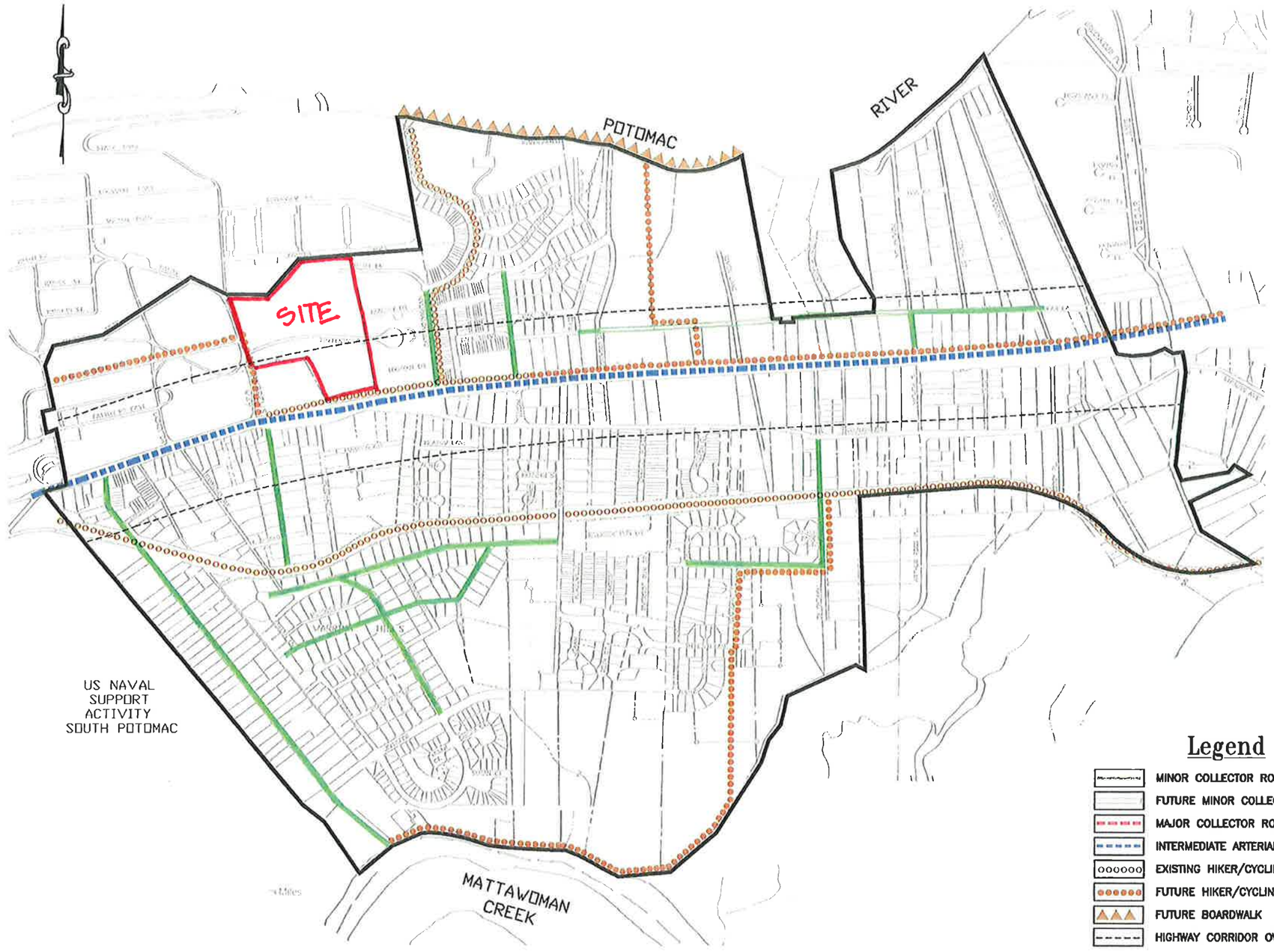


Town of Indian Head Maryland
Proposed Land Use Map 2009

ARRO
ENGINEERING & ENVIRONMENTAL CONSULTANTS

Town of Indian Head Maryland
Future Development Map

ARRO
ENGINEERING & ENVIRONMENTAL CONSULTANTS



Town of Indian Head Maryland
Transportation Map 2009

0 200 400 800 1200
SCALE: 1" = 400'

ARRO
ENGINEERING & ENVIRONMENTAL CONSULTANTS

SECTION SIX

AS APPROVED BY THE TOIH PLANNING COMMISSION 8/17/16

SOLTESZ

EXHIBIT 'H' COMMUNITY CONCEPT PLAN

CIRI PROPERTY

TM 11 PARCEL 609

SECTION SEVEN

EXHIBIT 'C'

APPLICATION FOR
A ZONING MAP AMENDMENT
TAX MAP 11, PARCEL 609
INDIAN HEAD, MD

ADJACENT PROPERTY OWNER LIST

Board of Education of Charles County, MD
Facilities Department
P.O. Box 2770
La Plata, MD 20646
Tax Map 11, Parcels 580 & 579

Town of Indian Head, MD
4195 Indian Head Hwy.
Indian Head, MD 20640-1750
Tax Map 11, P. 666, PAR 'B'

Riverwatch Commons Homeowners Assoc.
19650 Club House Rd., Suite 103
Gaithersburg, MD 20886-3039
Tax Map 11, P. 666, PAR 'C'

Kearney Cove, LC
6820 Elm St. FL. 2
McLean, VA 22101-6008
Tax Map 11, P.666, PAR 'A'

The Villages of Potomac Association, LNC
c/o Metropolis Condo Management
4307 Gallatin St.
Hyattsville, MD 20781-2051
Tax Map 11, P. 660, Phase 19 OS

Vestry of St. James Parish
c/o Mitchell & Clagett
7 Potomac Ave.
Indian Head, MD 20640-1714
Tax Map 11, Parcel 556

Carmen L. Abell
4205 Strauss Ave.
Indian Head, MD 20640-0000
Tax Map 11, Parcel 557

Richard I. & Penelope H. Gold
1038 East Potomac Ave.
Indian Head, MD 20640—1709
Tax Map 11, Parcel 558

Mildred & Carrie Raby
1036 East Potomac Ave.
Indian Head, MD 20640-1709
Tax Map 14, Parcel 526

Naval Surface Weapons Center
Indian Head EOD Technology Division
Public Affairs Office, Building 20, Suite 113
3767 Strauss Ave.
Indian Head, MD 20640-5150
Tax Map 11, Grid 14

Robin Urkums
34 Fairhill Lane
Indian Head, MD 20640-1577
Tax Map 11, Parcel 666

Brandi C Dais
32 Fairhill Lane
Indian Head, MD 20640-1577
Tax Map 11, Parcel 666

Michelle R Rodney
30 Fairhill Lane
Indian Head, MD 20640-1577
Tax Map 11, Parcel 666

Tina L Harrison
28 Fairhill Lane
Indian Head, MD 20640-1577
Tax Map 11, Parcel 666

Timothy J & Sybily Morris
26 Fairhill Lane
Indian Head, MD 20640-1577
Tax Map 11, Parcel 666

Keesha A Monk
33 Fairhill Lane
Indian Head, MD 20646-1578
Tax Map 11, Parcel 666

Emanuel Quildon
31 Fairhill Lane
Indian Head, MD 20640-1578
Tax Map 11, Parcel 666

Keisha L Williams
29 Fairhill Lane
Indian Head, MD 20640-1578
Tax Map 11 Parcel 666

Deidre R Coates
27 Fairhill Lane
Indian Head, MD 20640-1578
Tax Map 11, Parcel 666

Antwan Hannie
25 Fairhill Lane
Indian Head, MD 20640-1576
Tax Map 11, Parcel 666

Marcus Malloy
32 Kearney Way
Indian Head, MD 20640-1582
Tax Map 11, Parcel 666

Kevin Mark DeShields
30 Kearney Way
Indian Head, MD 20640
Tax Map 11 Parcel 666

Vonnie Marie Bradley
28 Kearney Way
Indian Head, MD 20640
Tax Map 11, Parcel 666

James E & Tiffany S Jones
28 Kearney Way
Indian Head, MD 20640
Tax Map 11, Parcel 666

Christina Diane Laury
24 Kearney Way
Indian Head, MD 20640
Tax Map 11, Parcel 666

LaKesha N Drayton
20 Kearney Way
Indian Head, MD 20640
Tax Map 11, Parcel 666

Candace Harley
18 Kearney Way
Indian Head, MD 20640
Tax Map 11, Parcel 666

John C Quarles
32 Lookout Drive
Indian Head, MD 20640
Tax Map 11, Parcel 666

Nichole D Hinton
30 Lookout Drive
Indian Head, MD 20640-1574
Tax Map 11, Parcel 666

Jennifer A Rosario
28 Lookout Drive
Indian Head, MD 20640
Tax Map 11, Parcel 666

Sara Habte
240 South Reynolds Street
Apt 105
Alexandria, VA 22304
Tax Map 11, Parcel 666

Carla Young-Turner
24 Lookout Drive
Indian Head, MD 20640
Tax Map 11, Parcel 666

Edward A Alexander Jr.
727 Meadow Lark
San Antonio, TX 78245
Tax Map 11, Parcel 666

Magdalene A Nyarko
Collins K Osei
20 Lookout Drive
Indian Head, MD 20640-1573
Tax Map 11, Parcel 666

Delores Ann Flowers
601 Luxor Court
Fort Washington, MD 20744
Tax Map 11, Parcel 666

Douglas & Monica Lewis
31 Lookout Drive
Indian Head, MD 20640-1571
Tax Map 11, Parcel 666

Emmanuel P Wood
29 Lookout Drive
Indian Head, MD 20640-1571
Tax Map 11, Parcel 666

Sharon T Middleton
27 Lookout Drive
Indian Head, MD 20640
Tax Map 11, Parcel 666

Katia A Adams
25 Lookout Drive
Indian Head, MD 20640-1571
Tax Map 11, Parcel 666

Francesca L Killebrew
23 Lookout Drive
Indian Head, MD 20640-1571
Tax Map 11, Parcel 666

Shalia & Ali Elijah Powell
21 Lookout Drive
Indian Head, MD 20640-1571
Tax Map 11, Parcel 666

Vestry of Saint James Parish
C/O Mitchell & Clagett
7 Potomac Ave
Indian Head, MD 20640-1714
Tax Map 11, Parcel 556

Kathyria Ayala
1008 Palmer Road
Apt 7
Fort Washington, MD 20744-4625
Tax Map 11, Parcel 660

Vanetta R Wells
320-B Munahan Circle
Indian Head, MD 20640-4401
Tax Map 11, Parcel 660

Jeremy Joseph Ludwiczak
6035 Blue Mist Lane
Dallas, TX 75248-2857
Tax Map 11, Parcel 660

Monique D Parrish
322-A Munahan Circle
Indian Head, MD 20640-4403
Tax Map 11, Parcel 660

Delon O & Terrence Edwards
326 B Munahan Circle
Indian Head, MD 20640
Tax Map 11, Parcel 660

Alonzo M Walker Sr
5508 Noble Effort Circle
Bowie, MD 20720-5612
Tax Map 11, Parcel 660

Kathy R Spratley
326 A Munahan Circle
Indian Head, MD 20640-4407
Tax Map 11, Parcel 660

Darlene S Andrew
328 Munahan Circle
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Jessica Thomas
328-BMunahan Circle
Indian Head, MD 20640-4409
Tax Map 11, Parcel 660

Michelle Owens
330 Munahan Circle
Unit B
Indian Head, MD 20640-4411
Tax Map 11, Parcel 660

John J Jr & Marion C Curry
155 Potomac Passage
Unit 614
Oxon Hill, MD 20745
Tax Map 11, Parcel 660

Dexter R Kingston Braithwaite
332 Munahan Circle
Unit B
Indian Head, MD 20640-4413
Tax Map 11, Parcel 660

La Tasha Banks
332 Munahan Circle
Unit A
Indian Head, MD 20646-4413
Tax Map 11, Parcel 660

Nancy E Solomon
334 Munahan Circle
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Pamela L Jones
334 Munahan Circle
Unit A
Indian Head, MD 20640-4415
Tax Map 11, Parcel 660

Enis Jervic
4222 Indian Head Hwy.
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Mohammad A & Khalida A Saleem
16355 Eagle Flight Circle
Woodbridge, VA 22191-6081
Tax Map 11, Parcel 660

Makeda Haileselassie
4224 B Indian Head Hwy.
Indian Head, MD 20640
Tax Map 11, Parcel 660

Diane W Graham
4224 Indian Head Hwy.
Indian Head, MD 20646
Tax Map 11, Parcel 660

Betty Turner
4226 B Indian Head Hwy.
Indian Head, MD 20640
Tax Map 11, Parcel 660

Carrie J Gravely
4226 Indian Head Hwy.
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Samantha Albright
4228 A Indian Head Hwy.
Indian Head, MD 20640
Tax Map 11, Parcel 660

Paresh K Patel
4228 Indian Head Hwy.
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Steve E Etal Wagstaff
4230 Indian Head Hwy.
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Philp M Jr & D Y Mathis Lee
4230 Indian Head Hwy.
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

LuQuay V Washington Sr
4232 B Indian Head Hwy.
Indian Head, MD 20640
Tax Map 11, Parcel 660

Heather Galbreath
4232 Indian Head Hwy.
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Michael L Jr & Ania D Tates
4234 Indian Head Hwy.
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Vinh Dao
4234 Indian Head Hwy.
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Jennifer L Barba
17109 N Bay Road
Apt 611
Sunny Island Beach, FL 33160-3998
Tax Map 11, Parcel 660

Ellington Adams Jr
310 Drive Andrews Way
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Harry R & Nicole Parker
310-A Drive Andrews Way
Indian Head, MD 20640-1165
Tax Map 11, Parcel 660

Jefferi Bass
308 Drive Andrews Way
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Tashina N Reynolds
308 Doctor Andrews Way
Unit B
Indian Head, MD 20640-1476
Tax Map 11, Parcel 660

Curtis L Johnson
306 Drive Andrews Way
Unit B
Indian Head, MD 20646
Tax Map 11, Parcel 660

Rachel N Roberts
802 Strausberg Street
Accokeek, MD 20607-2051
Tax Map 11, Parcel 660

Patricia L Bell
3695 Worthington Street
White Plains, MD 20695-3284
Tax Map 11, Parcel 660

Nebra O Singleton
304 Drive Andrews Way
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Michael Hogue
302 Drive Andrews Way
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Renee L Arroyo & Gino C Leesing
302 Drive Andrews Way
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Rhonda L Whiters
300 Drive Andrews Way
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Rhonda L Whiters
300 Drive Andrews Way
Unit B
Indian Head, MD 20640
Tax Map 11, Parcel 660

David & Emily E Smith
327-B Munahan Circle
Indian Head, MD 20640-1494
Tax Map 11, Parcel 660

Lawrence A Moore
327 Munahan Circle
Unit A
Indian Head, MD 20640
Tax Map 11, Parcel 660

Jessica Jackson
325 A Munahan Circle
Indian Head, MD 20640
Tax Map 11, Parcel 660

Cathy Y Bonilla
323 B Munahan
Unit 323B
Indian Head, MD 20640
Tax Map 11, Parcel 660

Tracie Johnson
323 Munahan Circle
Unit A
Indian Head, MD 20640-1490
Tax Map 11, Parcel 660

Mary L Gamble
321 Munahan Circle
Unit B
Indian Head, MD 20640-1488
Tax Map 11, Parcel 660

Jacqueline E McClary
321 A Munahan Circle
Indian Head, MD 20640
Tax Map 11, Parcel 660

D A Lee Elliot
319 B Munahan Circle
Indian Head, MD 20640
Tax Map 11, Parcel 660

Memuna Kamara
319-A Munahan Circle
Indian Head, MD 20640-1486
Tax Map 11 Parcel 660

Melanie & DaMarcus Marable
317 Munahan Circle
Unit B
Indian Head, MD 20640-1484
Tax Map 11, Parcel 660

Marc Cole
317 A Munahan Circle
Indian Head, MD 20640-1484
Tax Map 11, Parcel 660

Carmen L Abell
4205 Strauss Ave
Indian Head, MD 20640-1803
Tax Map 11 Parcel 557

SECTION EIGHT

Sage Policy Group, Inc.

Assessing the Economic Implications of the Indian Head Project in Charles County, MD

Submitted by:

Sage Policy Group, Inc.

Submitted to:

Charles County Stakeholders

August 2016

Assessing the Economic Implications of the Indian Head Project in Charles County, MD

Table of Contents

Executive Summary 3
Introduction 4
Economic Impacts 5
Fiscal Impacts 7
Conclusion 8
Appendix 9

List of Exhibits

Exhibit 1: Residential Unit Breakdown 4
Exhibit 2: Economic and Fiscal Impacts: Construction and Operational 6
Exhibit 3: One-time Construction Phase Fiscal Impacts 7
Exhibit 4: Ongoing Annual Fiscal Impacts 8

Executive Summary

- Introduction

This analysis supplies estimates of economic impacts associated with a proposed residential development in Indian Head, Maryland. The Town of Indian Head is 1.23 square miles, is home to roughly 4,000 people, and is located in Charles County.

The proposed development is comprised of 164 units that will be priced between $240,000 and $301,000. The units are scheduled for construction between 2018 and 2021. Total development costs will exceed $32 million.

In order to generate estimates of future economic impact, the Sage Policy Group, Inc. (Sage) study team used IMPLAN economic modeling software. The software embodies economic multipliers specific to both Charles County's and Maryland's economies. An appendix to this report supplies additional methodological detail.

- Analytical Findings

  - Construction Phase/One-Time Impacts

    - Once multiplier effects are considered, the construction phase will support 358 positions in Charles County. This impact is measured in job-years.
    - Construction phase-related positions will support $16 million in total compensation ($2016).
    - Charles County business revenues will be augmented by $51 million during the construction phase. Statewide economic/revenue impact will exceed $58 million.
    - During the construction phase, Charles County tax revenues will be augmented by approximately $3 million, the bulk of which will take the form of school excise taxes.
    - Indian Head revenues will be bolstered by over $1.7 million in charges and fees.

  - Operational Phase/Ongoing Impacts

    - Once occupied, the development will support roughly 56 positions in Charles County.
    - These positions, which represent a mix of full- and part-time positions, will support $2.2 million in annual salary and wage income. This is in addition to the estimated $11.7 million annual income of the new residents themselves.
    - Charles County business sales will be enhanced by $7 million per annum.
    - Statewide, the spending power associated with the new residences will support 84 jobs, $4.1 million in compensation, and $12.2 million in augmented business revenues.
    - Annual Charles County revenues will be augmented by approximately $866,339.
    - Annual State of Maryland revenues will be increased by roughly $959,775.

Economic Implications of the Indian Head Project in Charles County, MD

Introduction

Cook Inlet Region, Inc. (CIRI) commissioned Sage Policy Group, Inc. (Sage) to analyze the economic and fiscal impacts associated with a proposed residential development in Indian Head, Maryland. The 1.23 square mile town is located on the Potomac River in Charles County. The county's population is in excess of 150,000. The proposed development will supply 164 new residential units on the approximately 19.5 acre site that will be constructed between 2018 and 2021. See exhibit 1 for a breakdown of the four different types of units to be developed and their anticipated selling prices.

Exhibit 1: Residential Unit Breakdown

Type of Unit	Selling Price	Quantity
24' x 48' 2 over 2	$240,000 - $273,000	58
22' wide end-units	$301,000	38
22' wide interior units (front-loaded)	$286,000	34
22' wide interior units (rear-loaded)	$275,000	34

It is beyond the scope of this report to address issues of whether or not the proposed use of the site represents a highest and best use for the site. However, in our experience as analysts who have developed numerous economic development strategies, including in southern Maryland, we are aware that residential development often represents a necessary precursor to commercial development. As this report will indicate, once occupied, the proposed residential, owner-occupied units will be associated with meaningful augmentation of community spending power and workforce availability, thereby supporting faster business growth and formation.

The study team is aware that CIRI has worked with local engineers to incorporate design features that are consistent with surrounding product types. The proposed community's design is also consistent with the Town's Comprehensive Plan. Specifically, the development's schematic design is well within the Town's density objective of 20 units/acre on land designated Town Center Mixed Use (TCMX). Two townhome projects that surround the proposed development site—the Riverwatch Commons and the Villages of Potomac—have proven successful additions to the community.

Note that data pertaining to development costs (hard costs in particular) represent estimates generated by a careful study of similarly sized projects in the area and insight from contractors and builders. Estimates regarding sales prices are based on insights gleaned from builders and other industry experts as well as observed average selling prices for similar product in the area. Finally, this analysis conservatively presumes unit sales of ten per quarter or forty per annum; a presumption that local builders and industry experts have deemed reasonable.

Economic Impacts

- Development Phase

Total development costs for the project total $32 million. This all-encompassing figure includes everything from design costs and park/community area improvements to bonds and construction costs. Impacts from the construction phase occur only once and will take place over the course of the development phase (2018-2021).

In Charles County, the construction phase will support almost 360 jobs — measured in job years and full time equivalents — and more than $16 million in employee compensation. Countywide business sales will be bolstered by more than $51 million during the development phase.

Statewide impacts encompass local impacts and are by definition larger. The development phase will support more than 390 jobs across Maryland and in excess of $20 million in employee compensation. Statewide business activity will increase by $58.5 million. Exhibit 1 supplies relevant summary detail.

- Upon Occupancy at Full Build-Out

Once the project becomes operational, a set of ongoing, permanent economic impacts is produced. These estimated operational impacts embody the effects of the increased spending power brought in by the occupants of the new residential units. Because this is modeled as an expansion in total community household spending power, impacts are defined as induced as opposed to direct or indirect. The appendix to this report offers more information regarding relevant definitions and IMPLAN modeling software.

Increased spending power will support 56 FTEs each year in Charles County and 84 FTEs statewide. Those positions will be associated with $2.2 million and $4.1 million in employee compensation, respectively. Countywide business sales will expand by almost $7 million while statewide business sales will grow by over $12.2 million.

Exhibit 2: Economic and Fiscal Impacts: Construction (one-time impacts) and Operational (ongoing) Phases

	Jobs (FTEs)	Compensation (2016 dollars)	Business sales (2016 dollars)
Construction Phase (One-Time Impacts)			
Charles County			
Direct effects	183	$10,444,418	$32,054,400
Indirect effects	123	$3,810,982	$12,590,996
Induced effects	52	$1,750,383	$6,398,861
Total	**358**	**$16,005,783**	**$51,044,257**
Maryland			
Direct effects	190	$11,378,638	$32,054,594
Indirect effects	127	$4,968,572	$14,502,221
Induced effects	76	$4,100,308	$11,988,195
Total	**393**	**$20,447,518**	**$58,545,010**
	Jobs (FTEs)	Compensation (2016 dollars)	Business sales (2016 dollars)
Operational Phase (Ongoing Annual Impacts)			
Charles County			
Total[1]	**56**	**$2,218,620**	**$6,958,305**
Maryland			
Total[1]	**84**	**$4,120,797**	**$12,206,940**

Source: Sage, IMPLAN

[1] The ongoing economic impacts generated by the housing complex are only induced impacts. The event is modeled as a household income change, meaning that the only multiplier effects derive from the area's increased spending power.

Fiscal Impacts

- Development Phase

Construction of the proposed residential development would produce significant revenues for both Charles County and the State of Maryland. The study team derived effective tax rates from data obtained from the 2015 Comptroller of Maryland Comprehensive Annual Financial Report. The State's effective income tax rate was calculated as 3.77 percent, while the Charles County effective income tax rate was calculated at 2.3 percent. Using these figures, the study team determined that the construction phase will bolster income tax collections by approximately $771,000 at the State level and $368,000 for the County.

Charles County imposes a School Excise tax on all new residential development. These taxes/fees are paid by the homeowner over a maximum ten-year period. As of fiscal year 2017, the excise tax for townhomes is $16,213 per unit[2]. Applying this tax to the 164 planned units yields additional Charles County revenue of roughly $2.7 million. Note that these units will become available from 2018 to 2021 and taxes/fees may be have shifted by then. In total, Charles County revenues will be bolstered by more than $3 million as a result of development. State tax revenues will increase by more than $1.7 million. Note that this revenue increase will occur over several years.

The Town of Indian Head will collect over $1.7 million in addition revenues as a result of the new development. These fees and charges range from administrative fees to water and sewer capital contribution charges. See Exhibit 3 for additional relevant statistical detail.

Exhibit 3: One-time Construction Phase Fiscal Impacts

Indian Head	
Water & Sewer Capital Contribution Fees	$1,588,340
Parks & Recreation Impact Fee	$123,000
Building Permit Application Fees	$16,400
Administrative Fee	$8,200
Water Meter Charge and Appurtenances	$3,280
Total	**$1,739,220**
Charles County	
School Construction Excise Tax	$2,658,932
Income Tax	$368,133
Total	**$3,027,065**
Maryland	
Income Tax	$770,871
Sales Tax	$743,508
Business Taxes	$79,615
Other Taxes on Production and Imports[2]	$122,540
Total	**$1,716,534**

Source: Sage, IMPLAN

[2] Charles County, Maryland Budget Book, Adopted FY2017 Budget

Once the community is completed and occupied, there will be a set of permanent, annual fiscal impacts that can be estimated. The Town of Indian Head will collect more than $500,000 in additional annual property tax collections per annum. Charles County tax revenues will be bolstered by approximately $866,000 per annum, while the State of Maryland's tax revenues will grow by roughly $960,000 per year. See Exhibit 4 for summary detail.

Exhibit 4: Ongoing Annual Fiscal Impacts

Indian Head	
Property Tax	$522,427
Charles County	
Property Tax	$546,937
Income Tax	$319,402
Total	**$866,339**
Maryland	
Income Tax	$596,918
Sales Tax	$267,873
Property Tax	$50,836
Other Taxes on Production and Imports[3]	$44,148
Total	**$959,775**

Source: Sage, IMPLAN

Conclusion

The proposed 164 residential units would accomplish many things, including expanding Indian Head's population of homeowners, enlarging the Town and County tax bases, and creating more disposable spending power to support area small businesses and future expansion of the Town's commercial tax base. The addition of these units also has the potential to improve the community's built environment, which in turn supports the overall goal of proving a community that is positioned to continue to support the activities at the Naval Surface Warfare Center and at other key employers.

[3] Encompasses three fiscal impact categories generated implicitly by IMPLAN: motor vehicle licensing taxes, other taxes, and non-taxes.

Appendix

IMPLAN is an economic impact assessment software system. The system was originally developed and is now maintained by the Minnesota IMPLAN Group (MIG). It combines a set of extensive databases concerning economic factors, multipliers and demographic statistics with a highly refined and detailed system of modeling software. IMPLAN allows the user to develop local-level input-output models that can estimate the economic impact of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships.

There are two major components to IMPLAN: data files and software. An impact analysis using IMPLAN starts by identifying expenditures in terms of the sectoring scheme for the model. Each spending category becomes a "group" of "events" in IMPLAN, where each event specifies the portion of activity allocated to a specific IMPLAN sector. Groups of events can then be used to run impact analysis individually or can be combined into a project consisting of several groups. Once the direct economic impacts have been identified, IMPLAN can calculate the indirect and induced impacts based on a set of multipliers and additional factors.

Secondary benefits can be segmented into two types of impacts, indirect and induced. Indirect benefits are related to the business-to-business transactions that take place due to increased demand for goods and services that accompanies augmented investment and business operations. Impacted businesses sell everything from office furniture and copiers to computer and graphic design services. Induced benefits are created when workers directly or indirectly supported by increased economic activity spend their earnings in the local economy. Indirect and induced benefits together comprise total multiplier effects.

The hallmark of IMPLAN is the specificity of its economic datasets. The database includes information for five-hundred-and-twenty-eight different industries (generally at the three or four digit Standard Industrial Classification level), and twenty-one different economic variables. Along with these data files, national input-output structural matrices detail the interrelationships between and among these sectors. The database also contains a full schedule of Social Accounting Matrix (SAM) data. All of these data are available at *national, state*, and *county* levels.

Another strength of the IMPLAN system is its flexibility. It allows the user to augment any of the data or algorithmic relationships within each model in order to more precisely account for regional relationships. This includes inputting different output-to-income ratios for a given industry, different wage rates, and different multipliers where appropriate. IMPLAN also provides the user with a choice of trade-flow assumptions, including the modification of regional purchase coefficients, which determine the mix of goods and services purchased locally with each dollar in

each sector. Moreover, the system also allows the user to create custom impact analyses by entering changes in final demand.

A final advantage of IMPLAN is its credibility and acceptance within the profession. There are more than five hundred active users of IMPLAN databases and software within federal and state governments, universities, and among private sector consultants. The following list provides a sampling of IMPLAN users.

Sample of IMPLAN Users:

Academic Institutions

Alabama A&M University
Auburn University
Cornell University
Duke University
Iowa State University
Michigan Tech University
Ohio State
Penn State University
Portland State University
Purdue University
Stanford University
Texas A&M University
University of California – Berkeley
University of Wisconsin
University of Minnesota
Virginia Tech
West Virginia University
Marshall University/College of Business

Federal Government Agencies

Fed. Emergency Man. Agency (FEMA)
US Dep't of Agriculture, Forest Service
US Dep't of Ag., Econ Research Service
US Dep't of Int., Bureau of Land Mgmt.
US Dep't of Int., Fish and Wildlife Serv.
US Dep't of Int., National Parks Service
US Army Corps of Engineers

State Government Agencies

MD Dep't of Natural Resources
California Energy Commission
Florida Division of Forestry
Illinois Dep't of Natural Resources
New Mexico Department of Tourism
South Carolina Employment Security
Utah Department of Natural Resources
Wisconsin Department of Transportation

Private Consulting Firms

Coopers & Lybrand
Batelle Pacific NW Laboratories
Boise Cascade Corporation
Charles River Associates
CIC Research
BTG/Delta Research Division
Deloitte & Touche
Ernst & Young
Jack Faucett Associates
KPMG Peat Marwick
Price Waterhouse LLP
Sage Policy Group, Inc.
SMS Research
Economic Research Associates
American Economics Group, Inc.
L.E. Peabody Associates, Inc.
The Kalorama Consulting Group
West Virginia Research League

SOLTESZ
COMMUNITY CONCEPT PLAN
CIRI PROPERTY
TM 11 PARCEL 509

SECTION NINE

TRAFFIC IMPACT STUDY

CIRI PROPERTY
Residential Development
Town of Indian Head, Maryland

November, 2016

Prepared For:
Cook Inlet Region, Inc.

Prepared By:
TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
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Hanover, Maryland 21076
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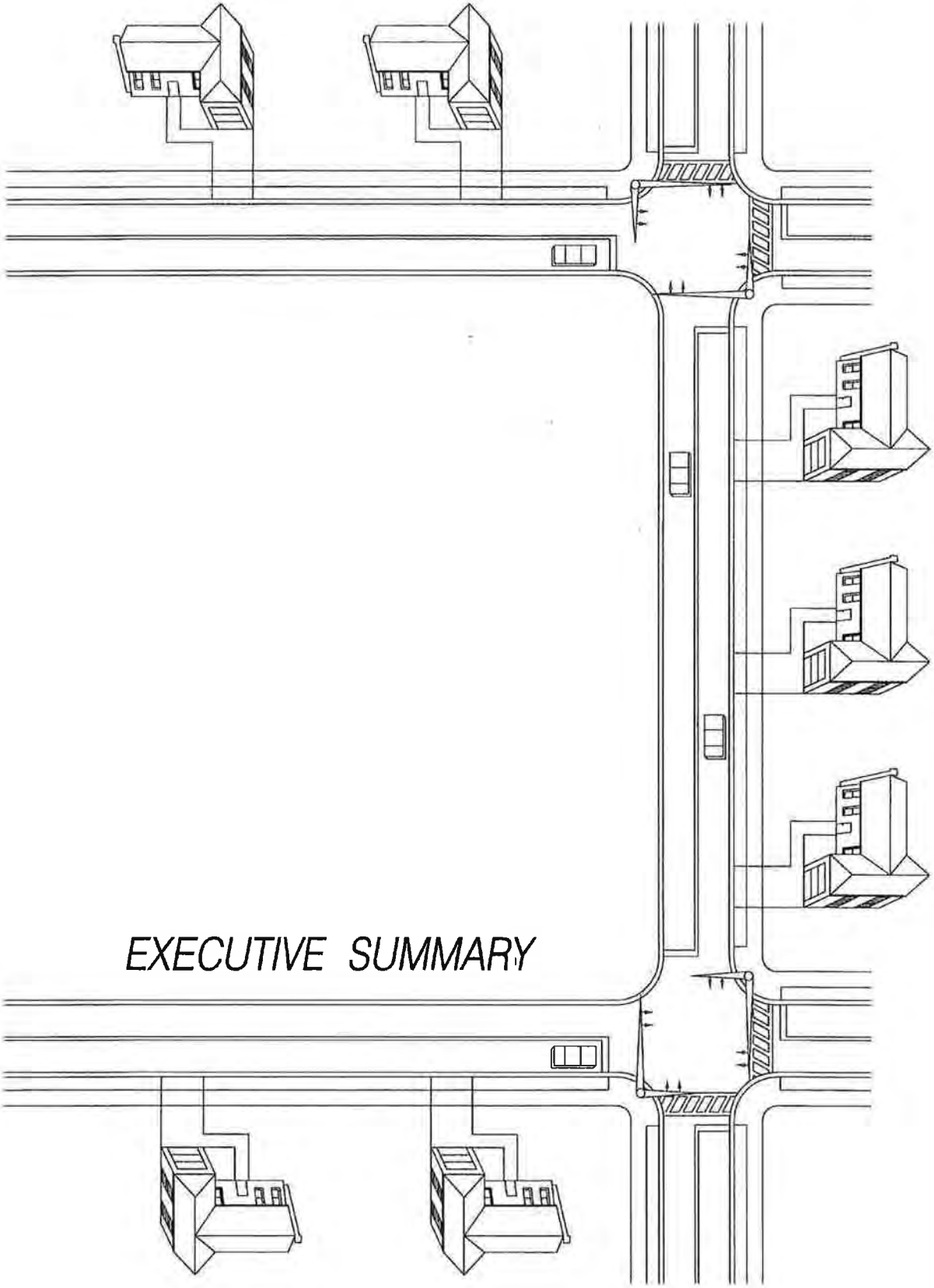
TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY	**1**
INTRODUCTION	**2**
EXHIBIT 1 SITE LOCATION	
EXISTING CONDITION	**5**
EXHIBIT 2 LANE CONFIGURATION	
EXHIBIT 3 EXISTING TRAFFIC VOLUMES	
BACKGROUND CONDITION	**10**
EXHIBIT 4 GROWTH RATE PROJECTIONS	
EXHIBIT 5 BACKGROUND DEVELOPMENT LOCATION	
EXHIBIT 6 BACKGROUND TRAFFIC VOLUMES	
EXHIBIT 7 TOTAL BACKGROUND TRAFFIC VOLUMES	
FUTURE CONDITION	**19**
EXHIBIT 8 SITE GENERATED TRAFFIC	
EXHIBIT 9 TOTAL FUTURE TRAFFIC VOLUMES	
CONCLUSIONS	**26**

APPENDICES

APPENDIX I-A	INTERSECTION CAPACITY CALCULATIONS (MD 210 @ DR. ANDREWS WAY)
APPENDIX I-B	INTERSECTION CAPACITY CALCULATIONS (MD 210 @ RIVERWATCH BOULEVARD)
APPENDIX I-C	INTERSECTION CAPACITY CALCULATIONS (MD 210 @ MD 225)
APPENDIX I-D	INTERSECTION CAPACITY CALCULATIONS (DR. ANDREWS WAY @ DR. MITCHELL LANE)
APPENDIX II	TRAFFIC COUNT INFORMATION



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Purpose

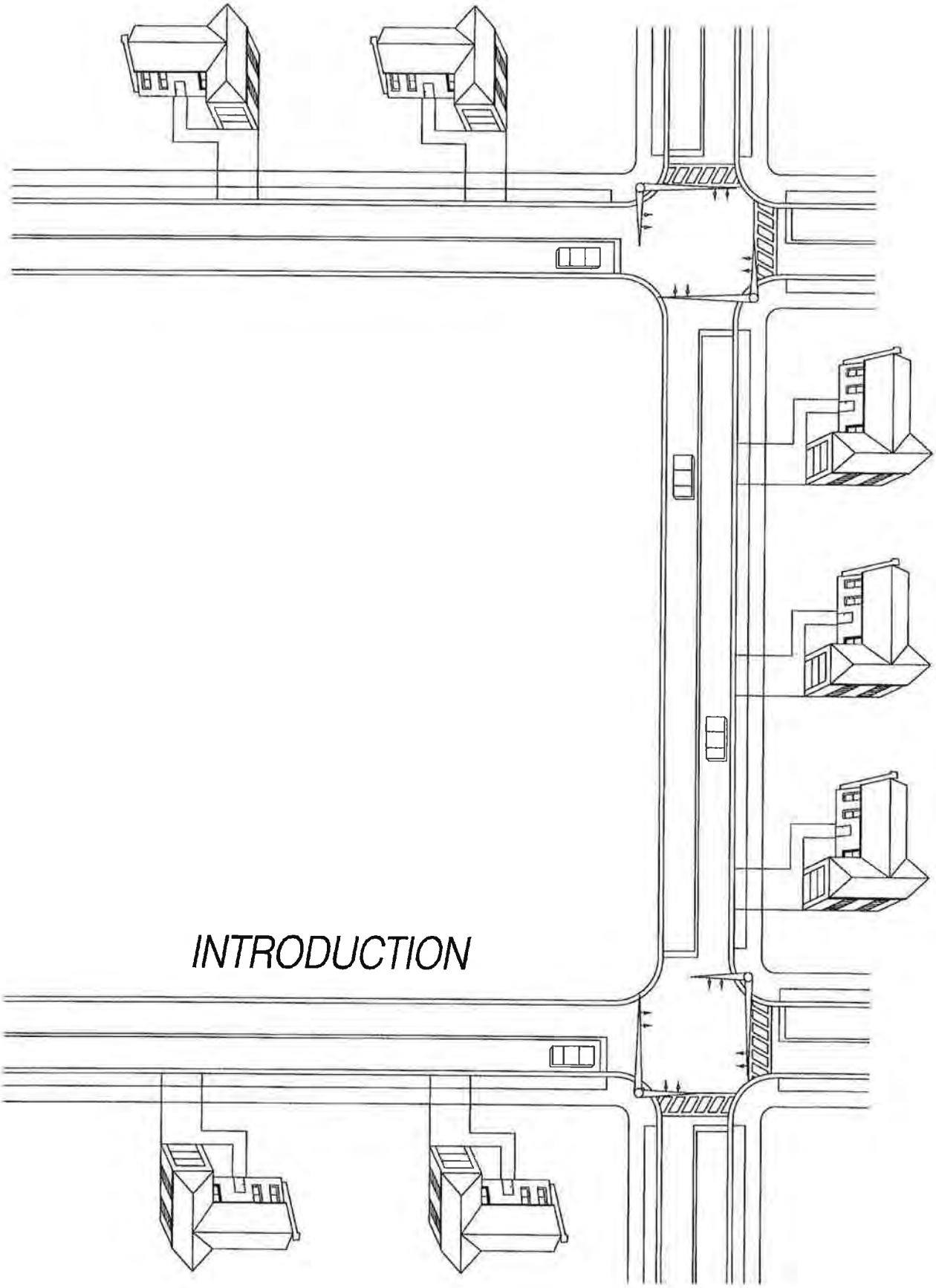
The purpose of this study is to determine the impact of the CIRI Property under total future traffic conditions, which are defined in this report. Specifically, the report will examine the key intersections contained in the study area for capacity constraints that are identified as the peak hour weekday morning and evening intersection level of service.

Methodology

This report examines in detail the level of service at each key intersection under existing, background and future traffic conditions. Existing turning movement counts determine the base traffic conditions. Background traffic volumes are established with the consideration of impacts generated by approved but not yet completed development projects as well as regional growth rates. Future traffic volumes determine the vehicle impact the CIRI Property will have on the key intersections. The report is conducted in accordance with Maryland State Highway Administration guidelines and with guidance from the Town of Indian Head. Each key intersection is analyzed with the Critical Lane Volume (CLV) methodology and Highway Capacity Manual during the weekday morning and evening peak time periods.

Summary of Conclusions

The study indicates that all of the key intersections will continue to operate at acceptable levels of service (LOS) under the future build-out traffic conditions.



INTRODUCTION

INTRODUCTION

Traffic Concepts, Inc. has been asked to prepare a traffic impact study to analyze the vehicle impact of the proposed CIRI Property. The proposed development will create 164 residential townhouse units. The site will create the fourth leg to the existing intersection of Dr. Andrews Way and Dr. Mitchells Lane. (See Exhibit 1 for site location.)

The study will be developed in accordance with the Town of Indian Head guidelines. The following intersections were determined to be key and will be analyzed during the AM and PM peak periods:

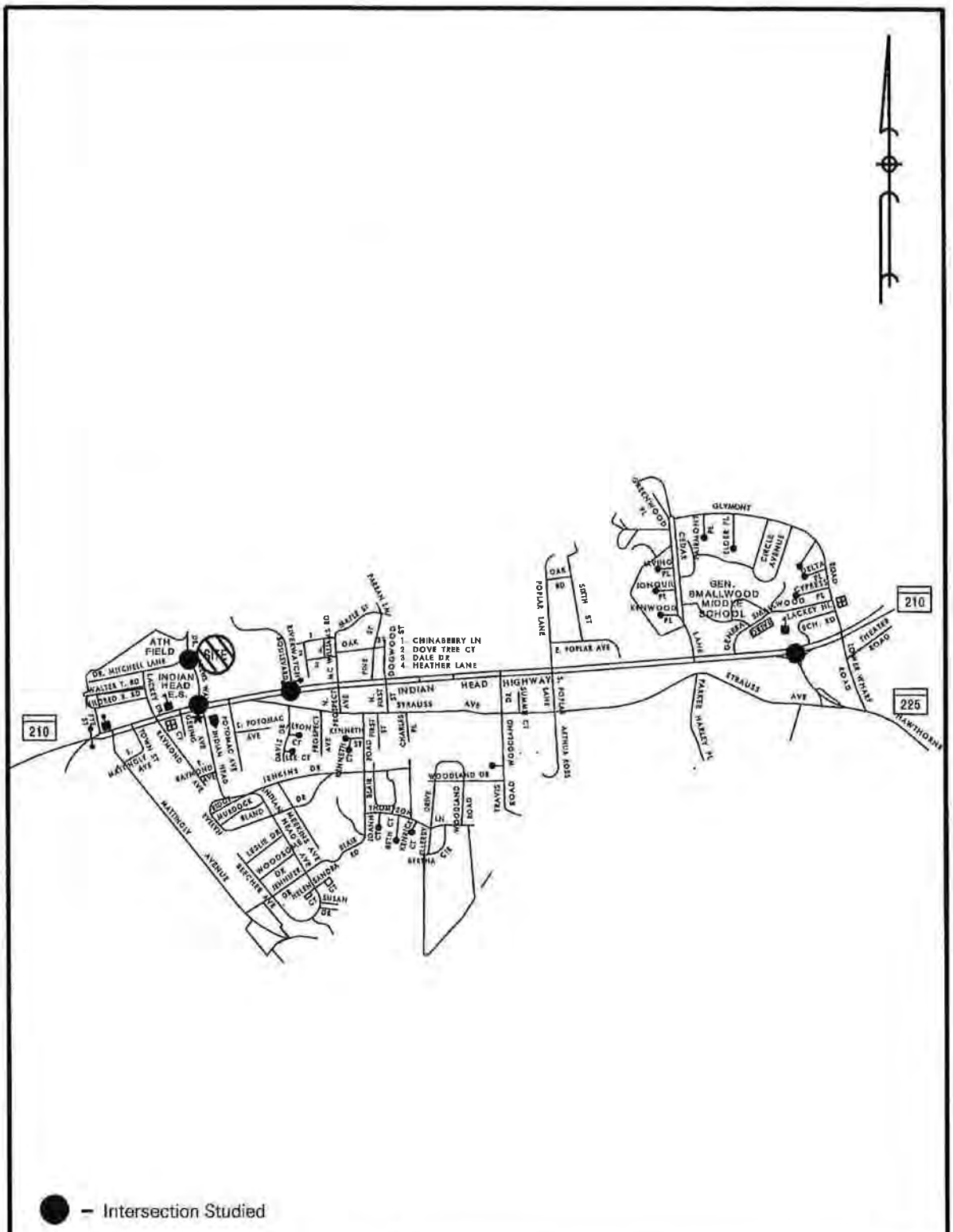
Key Intersections

- MD 210 (Indian Head Highway) @ Dr. Andrews Way (Unsignalized)
- MD 210 (Indian Head Highway) @ Riverwatch Boulevard (Unsignalized)
- MD 210 (Indian Head Highway) @ MD 225 (Signalized)
- Dr. Andrews Way @ Dr. Mitchell Lane/Site Access (Unsignalized)

The study will be conducted in three phases. First, peak hour turning movement counts will be obtained at the key intersections, and an analysis will be made using the Highway Capacity Manual and Critical Lane Analysis to determine existing levels of service.

Within the second phase, growth rates will be projected along all movements at the key intersections. Also, approved, but not yet built, developments that will impact the key intersections will be analyzed and their respective impact to the study area will be determined. A background level of service will then be calculated.

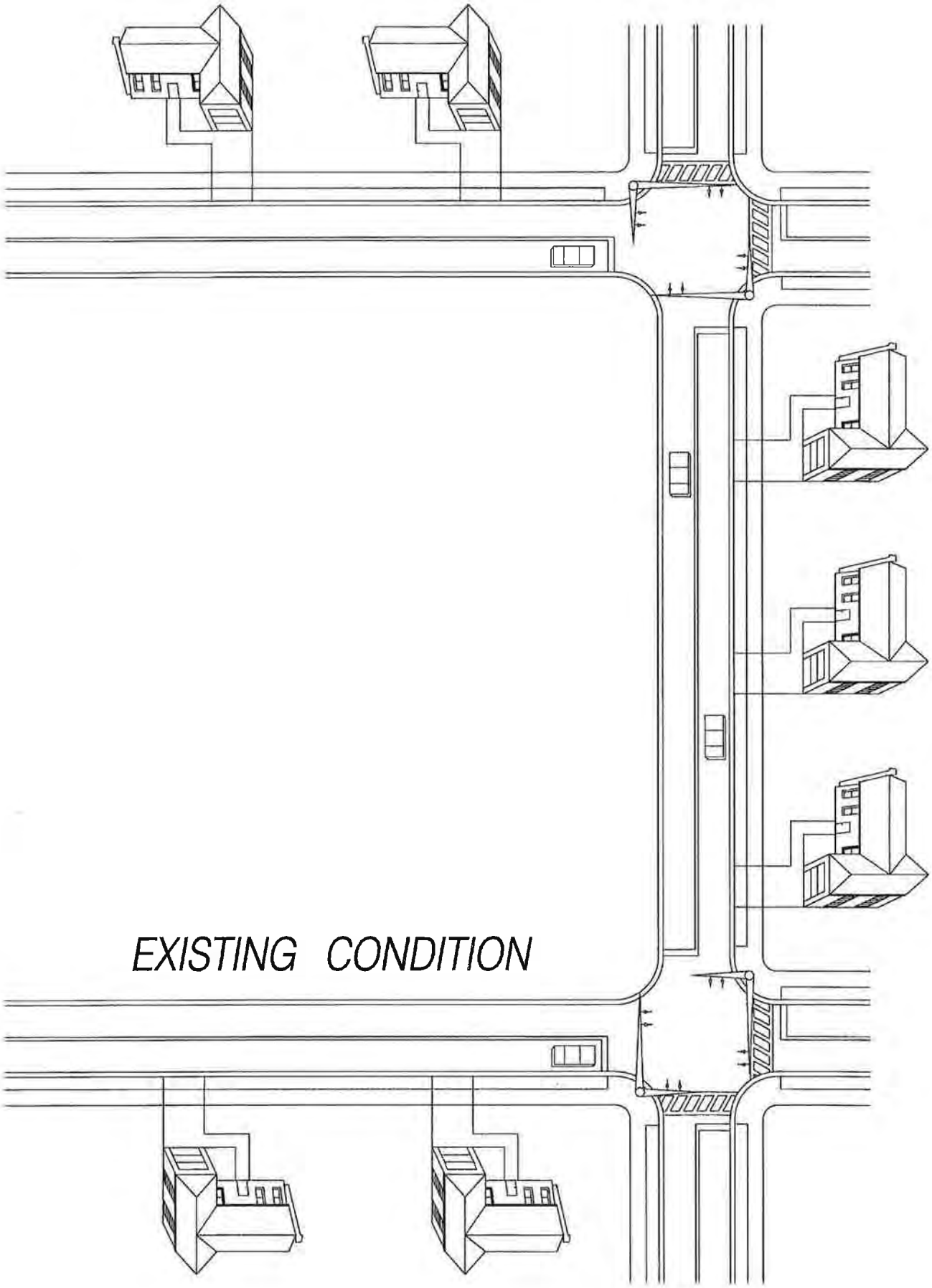
Within the third phase, the proposed development's impact will be determined and added to the background traffic volumes to arrive at total future traffic volumes. The corresponding level of service at which the intersection will operate will then be calculated.



● – Intersection Studied

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911

EXHIBIT 1
Site Location


EXISTING CONDITION

EXISTING CONDITION

The following intersections will be evaluated in this study:

- MD 210 (Indian Head Highway) @ Dr. Andrews Way (Unsignalized)
- MD 210 (Indian Head Highway) @ Riverwatch Boulevard (Unsignalized)
- MD 210 (Indian Head Highway) @ MD 225 (Signalized)
- Dr. Andrews Way @ Dr. Mitchell Lane/Site Access (Unsignalized)

The existing intersection configurations can be found in the appendix section of this report. Exhibit 2 shows the lane configuration at each intersection.

During this stage of the study, existing levels of service will be established at each intersection to create a base condition for proceeding levels of analysis. Peak hour turning movement counts were performed at the key intersections. The counts have been verified for accuracy based on review of historical data. Please note that the traffic volumes may not balance between intersections due to mid-block generators as well as possible difference in peak hours and/or dates the counts were performed. Peak hour volumes were determined and are displayed on Exhibit 3. Details of the traffic count data can be found in Appendix II of this report.

Using the Highway Capacity Manual Signalized and Unsignalized methods, levels of service were determined for key intersection movements, as well as the overall intersection. We have also analyzed each intersection using the Critical Lane Analysis Method. Details of the calculations can be found in the appendix section of this report. The results of the calculations can be found on the following pages.

CRITICAL LANE ANALYSIS

	AM CLV(LOS)	PM CLV(LOS)
MD 210 @ Dr. Andrews Way	383(A)	428(A)
MD 210 @ Riverwatch Boulevard	411(A)	460(A)
MD 210 @ MD 225	369(A)	549(A)
Dr. Andrews Way @ Dr. Mitchell Lane	32(A)	93(A)

SIGNALIZED INTERSECTION

MD 210 @ MD 225

	LOS AM(PM)	Approach LOS AM(PM)
Eastbound		
Thru	B(A)	B(B)
Right	B(B)	
Westbound		
Left	B(B)	B(B)
Thru	B(A)	
Northbound		
Left	B(B)	B(B)
Right	B(B)	

AM Intersection: Delay = 14.2 sec/veh; LOS = B

PM Intersection: Delay = 11.4 sec/veh; LOS = B

UNSIGNALIZED INTERSECTIONS

MD 210 @ Dr. Andrews Way

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	965(1430)	1(1)	964(1429)
Westbound			
Left	1511(847)	12(18)	1499(829)
Northbound			
Left/Thru/Right	801(550)	32(25)	769(525)
Southbound			
Left/Thru/Right	344(408)	28(14)	316(394)

MD 210 @ Riverwatch Boulevard

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	873(1324)	0(1)	873(1323)
Southbound			
Left/Right	347(401)	48(29)	299(372)

Dr. Andrews Way @ Dr. Mitchell Lane

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left/Right	1084(1084)	2(84)	1082(1000)
Northbound			
Left/Thru	1622(1622)	30(17)	1592(1605)

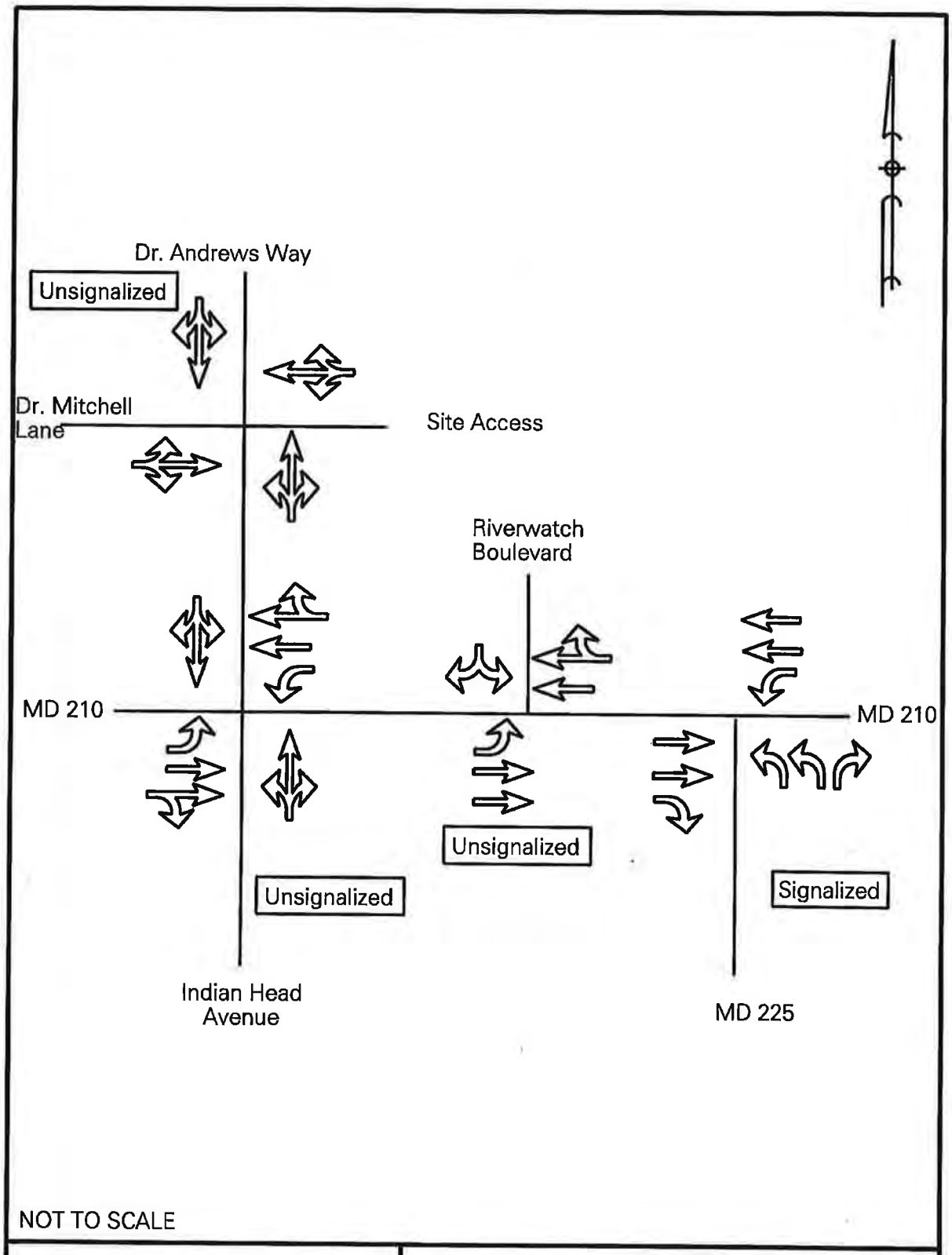


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EXHIBIT 2
Lane Configurations

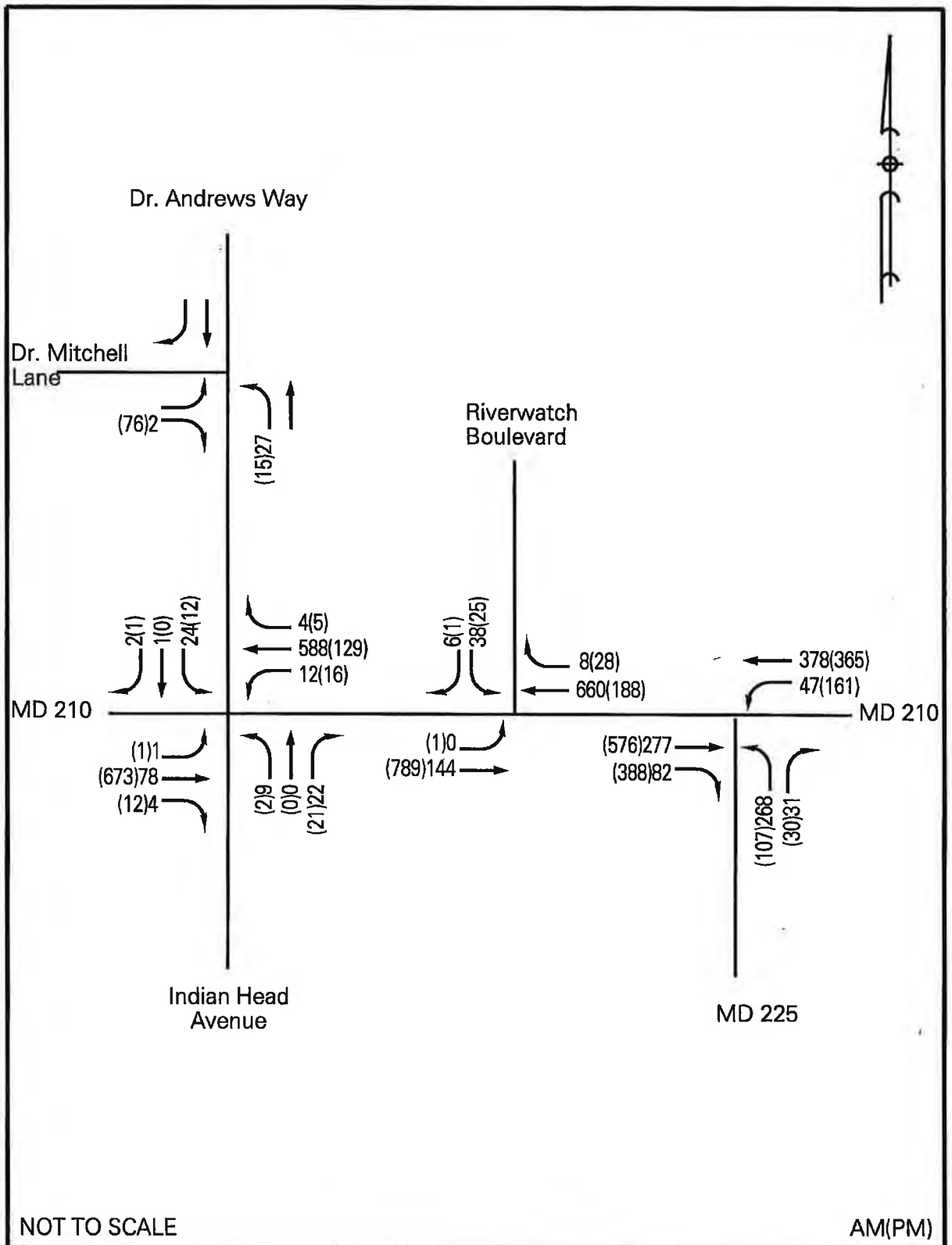

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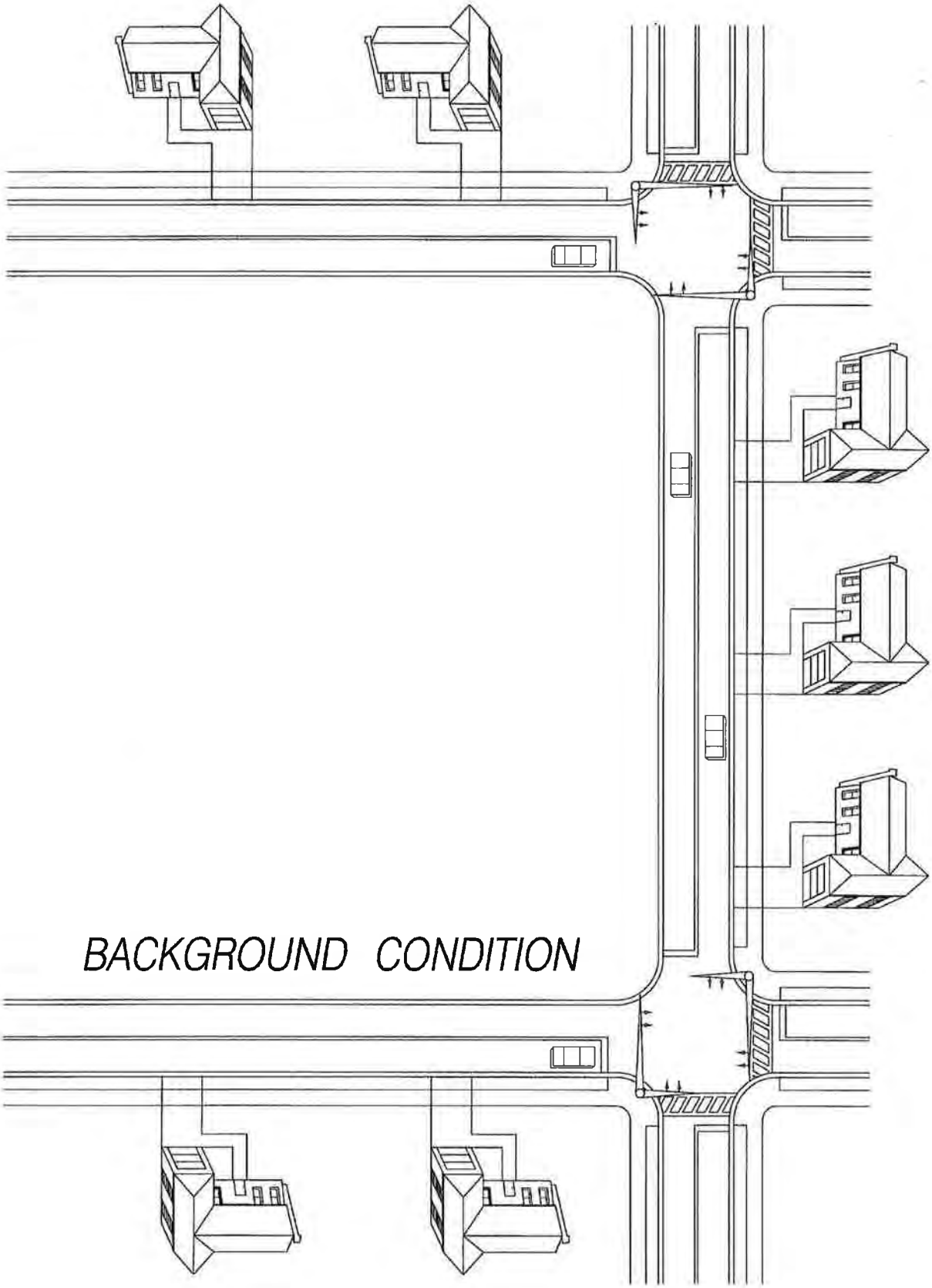
EXHIBIT 3
Existing Traffic Volumes


BACKGROUND CONDITION

BACKGROUND CONDITION

This stage of our analysis will evaluate the effect that projected growth rates as well as proposed developments will have on the study network.

As required, typical for projects located in Charles County, we have assumed a 3.0% growth rate for all movements. Since the build out of this site is estimated to take four (4) years, the growth rate was projected for that length of time. These figures are shown on Exhibit 4.

As required by the Town of Indian Head, we have included an existing vacant shopping center that could be occupied in the future. Although there are no approved plans, we have included the impact of this project on the study area. The location of this development is shown on Exhibit 5. Using the Institute of Transportation Engineers', Trip Generation Manual, 9th Edition, generation rates were determined for this development. They are as follows:

	AM		PM	
	IN	OUT	IN	OUT
1. Ely Property				
ITE Land Use Code 820				
per ksf	1.17	0.71	3.37	3.65
61,805 gsf	72	44	208	226
Less passby per ITE	- 0	- 0	- 93	- 101
Total New Trips	**72**	**44**	**115**	**125**

We have distributed the traffic generated by the background development through the study area based on location of work centers and major access routes as shown Exhibit 6.

We combined existing traffic volumes with projected growth rates and background traffic volumes to arrive at total background traffic volumes as shown on Exhibit 7.

Using the Highway Capacity Manual Signalized and Unsignalized methods, levels of service were determined for key intersection movements, as well as the overall intersection. We have also analyzed each intersection using the Critical Lane Analysis Method. Details of the calculations can be found in the appendix section of this report. The results of the calculations can be found below and on the following page.

CRITICAL LANE ANALYSIS

	AM CLV(LOS)	PM CLV(LOS)
MD 210 @ Dr. Andrews Way	433(A)	489(A)
MD 210 @ Riverwatch Boulevard	466(A)	524(A)
MD 210 @ MD 225	440(A)	651(A)
Dr. Andrews Way @ Dr. Mitchell Lane	35(A)	105(A)

SIGNALIZED INTERSECTION

MD 210 @ MD 225

	LOS AM(PM)	Approach LOS AM(PM)
Eastbound		
Thru	B(B)	B(B)
Right	B(B)	
Westbound		
Left	B(B)	B(B)
Thru	B(A)	
Northbound		
Left	B(B)	B(B)
Right	B(B)	

AM Intersection: Delay = 14.6 sec/veh; LOS = B

PM Intersection: Delay = 12.2 sec/veh; LOS = B

UNSIGNALIZED INTERSECTIONS

MD 210 @ Dr. Andrews Way

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	899(1390)	1(1)	898(1389)
Westbound			
Left	1487(771)	14(20)	1473(751)
Northbound			
Left/Thru/Right	761(503)	36(29)	725(474)
Southbound			
Left/Thru/Right	293(345)	31(17)	262(328)

MD 210 @ Riverwatch Boulevard

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	803(1273)	0(1)	803(1272)
Southbound			
Left/Right	298(343)	55(32)	243(311)

Dr. Andrews Way @ Dr. Mitchell Lane

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left/Right	1084(1084)	2(96)	1082(988)
Northbound			
Left/Thru	1622(1622)	33(19)	1589(1603)

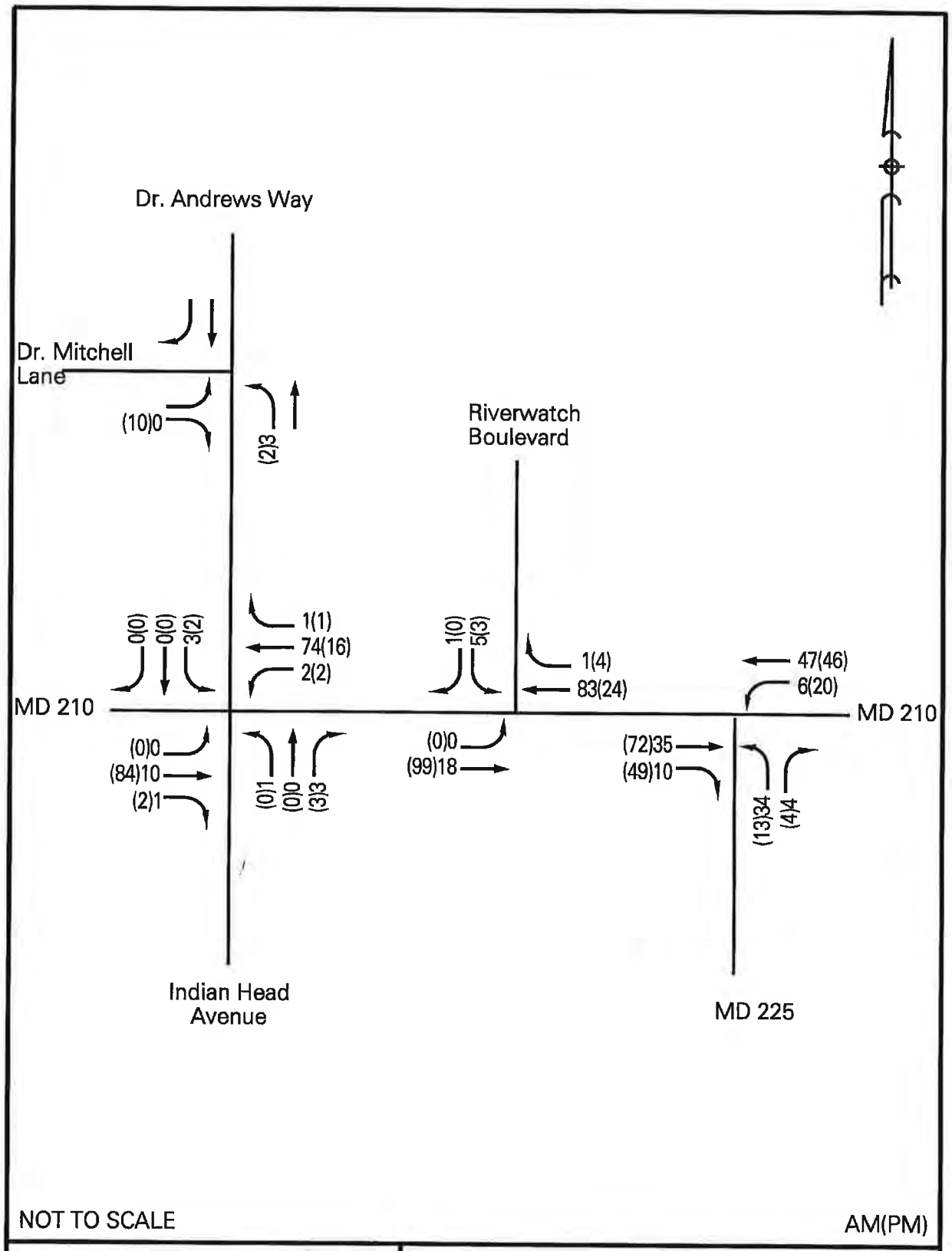


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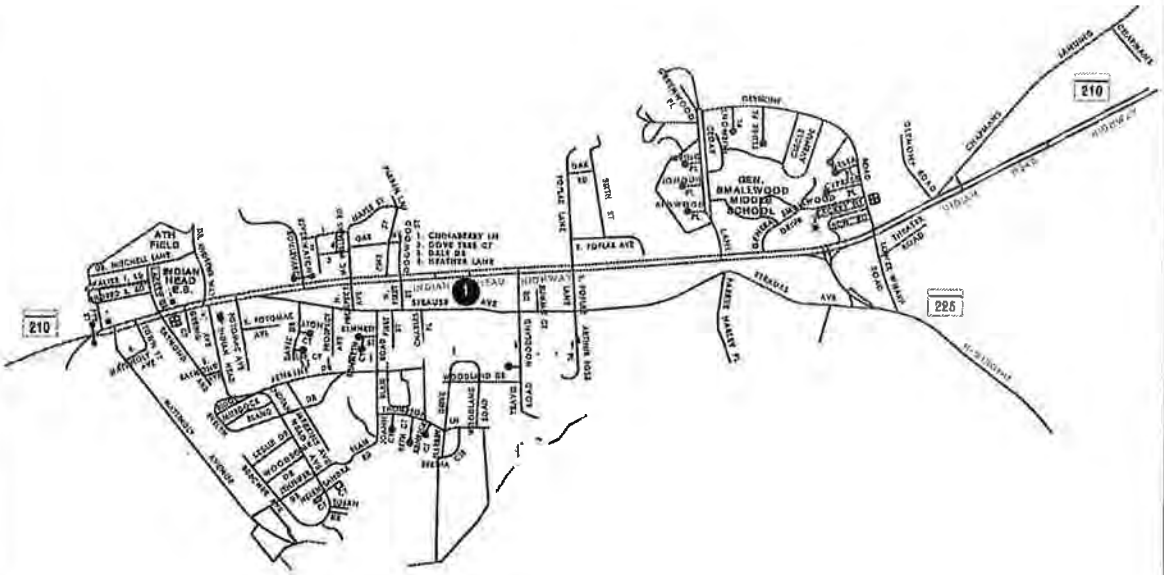
EXHIBIT 4
Projected Growth Rates
(3.0% for four years)



1. Ely Property

TRAFFIC CONCEPTS, INC. 7525 Connelley Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 5 Background Development Location

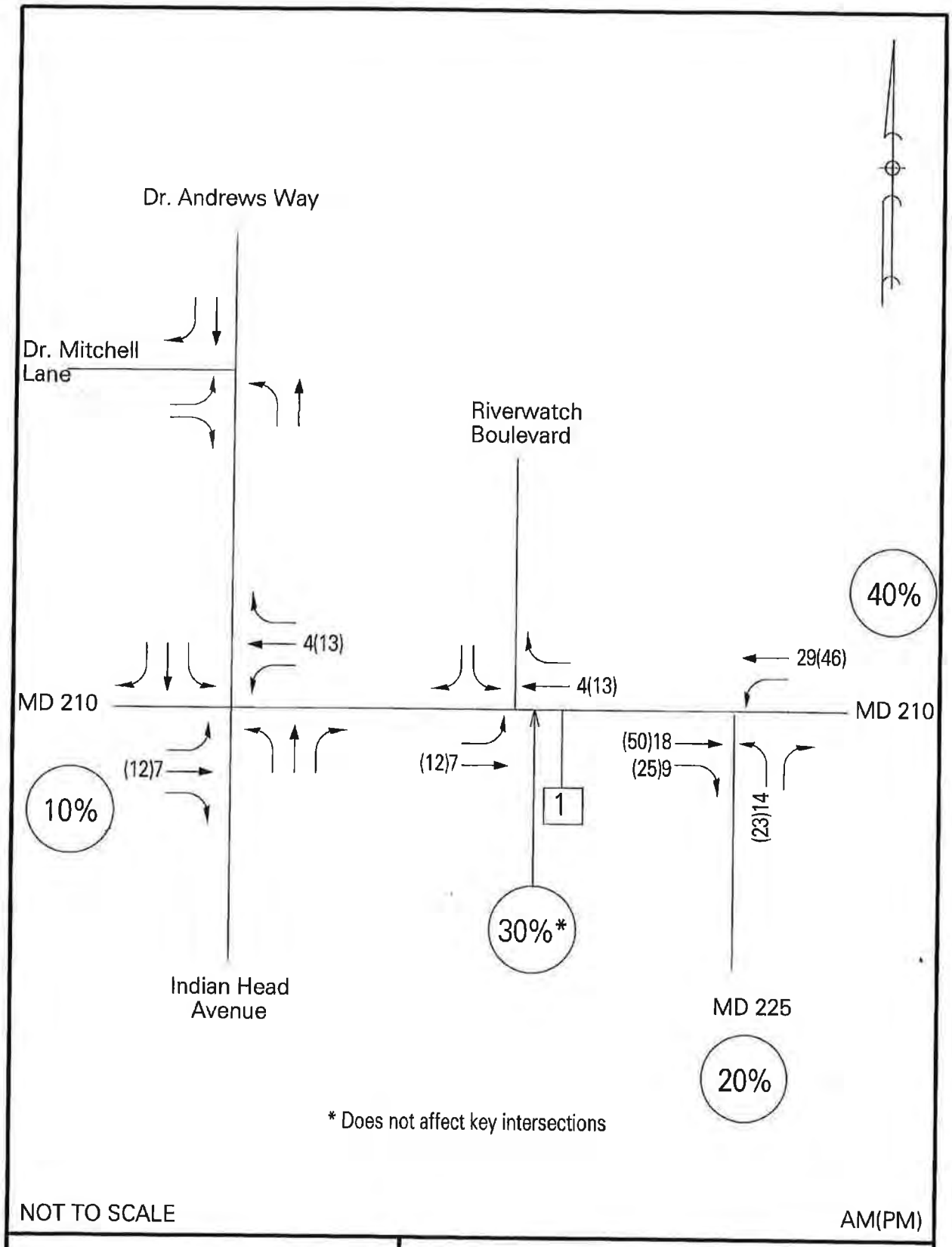


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EXHIBIT 6
Background Traffic Volumes
Ely Property

Detailed Average Rate Trip Calculations
For 61.805 Th.Sq.Ft. GLA of Shopping Center(820) - [E]

Project: Ely. Property
Phase:

Open Date:
Analysis Date:

Description:

	Average Rate	Standard Deviation	Adjustment Factor	Driveway Volume
Avg. Weekday 2-Way Volume	80.37	0.00	1.00	4967
7-9 AM Peak Hour Enter	1.17	0.00	1.00	72
7-9 AM Peak Hour Exit	0.71	0.00	1.00	44
7-9 AM Peak Hour Total	1.88	0.00	1.00	116
4-6 PM Peak Hour Enter	3.37	0.00	1.00	208
4-6 PM Peak Hour Exit	3.65	0.00	1.00	226
4-6 PM Peak Hour Total	7.02	0.00	1.00	434
AM Pk Hr, Generator, Enter	0.00	0.00	1.00	0
AM Pk Hr, Generator, Exit	0.00	0.00	1.00	0
AM Pk Hr, Generator, Total	0.00	0.00	1.00	0
PM Pk Hr, Generator, Enter	0.00	0.00	1.00	0
PM Pk Hr, Generator, Exit	0.00	0.00	1.00	0
PM Pk Hr, Generator, Total	0.00	0.00	1.00	0
Saturday 2-Way Volume	110.40	0.00	1.00	6823
Saturday Peak Hour Enter	5.38	0.00	1.00	333
Saturday Peak Hour Exit	4.97	0.00	1.00	306
Saturday Peak Hour Total	10.35	0.00	1.00	639
Sunday 2-Way Volume	83.82	0.00	1.00	5180
Sunday Peak Hour Enter	0.00	0.00	1.00	0
Sunday Peak Hour Exit	0.00	0.00	1.00	0
Sunday Peak Hour Total	0.00	0.00	1.00	0

The above rates were calculated from these equations:

24-Hr. 2-Way Volume:	LN(T) = .65LN(X) + 5.83, R^2 = 0.79
7-9 AM Peak Hr. Total:	LN(T) = .61LN(X) + 2.24
	R^2 = 0.56 , 0.62 Enter, 0.38 Exit
4-6 PM Peak Hr. Total:	LN(T) = .67LN(X) + 3.31
	R^2 = 0.81 , 0.48 Enter, 0.52 Exit
AM Gen Pk Hr. Total:	0
	R^2 = 0 , 0 Enter, 0 Exit
PM Gen Pk Hr. Total:	0
	R^2 = 0 , 0 Enter, 0 Exit
Sat. 2-Way Volume:	LN(T) = .63LN(X) + 6.23, R^2 = 0.82
Sat. Pk Hr. Total:	LN(T) = .65LN(X) + 3.78
	R^2 = 0.83 , 0.52 Enter, 0.48 Exit
Sun. 2-Way Volume:	T = 15.63(X) + 4214.46, R^2 = 0.52
Sun. Pk Hr. Total:	0
	R^2 = 0 , 0 Enter, 0 Exit

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation Manual, 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

Summary of Pass-By Trips
For 61.805 Th.Sq.Ft. GLA of Shopping Center(820) - [E]

Project: Ely Property
Phase:

Open Date:
Analysis Date:

Description:

	Driveway Volume	Pass-By Trips	Volume Added to Adjacent Streets
Average Weekday			
7-9 AM Peak Hour Enter	72	0	72
7-9 AM Peak Hour Exit	44	0	44
7-9 AM Peak Hour Total	116	0	116
4-6 PM Peak Hour Enter	208	93	115
4-6 PM Peak Hour Exit	226	101	125
4-6 PM Peak Hour Total	434	195	239
Saturday			
Saturday Peak Hour Enter	333	124	209
Saturday Peak Hour Exit	306	114	192
Saturday Peak Hour Total	639	239	400

Pass-By Trips were calculated on the basis of the following:

Weekday P.M. Peak Period Pass-By Trip Percentage: Ln(T)=-0.29Ln(X)+5.00, R^2=0.37
Saturday Midday Pk. Pd. Pass-By Trip Percentage: T=-0.02(X)+38.59, R^2=0.29

Number of Pass-By Studies:100 for Weekday PM PK PD and 11 for Saturday.

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation Manual, 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

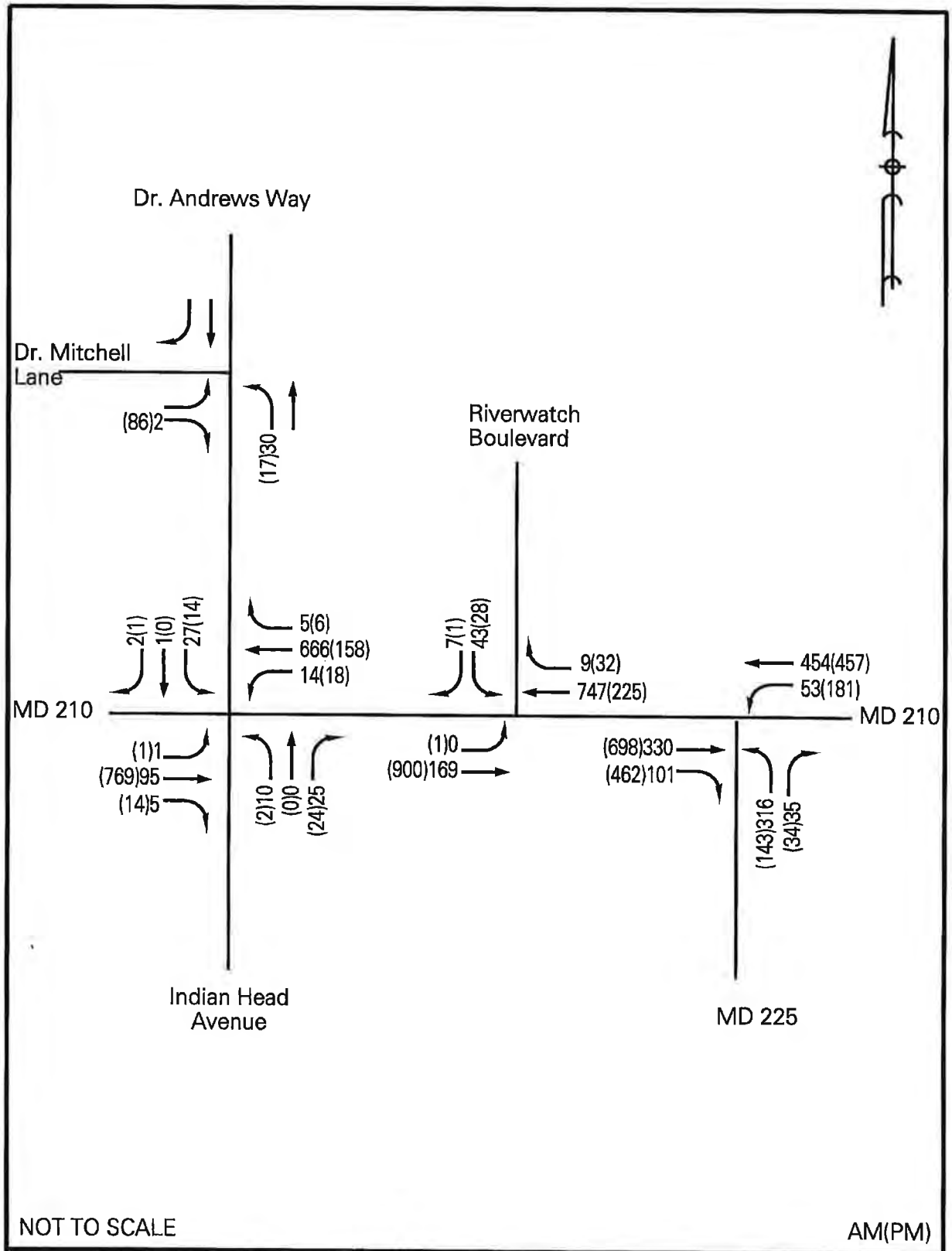

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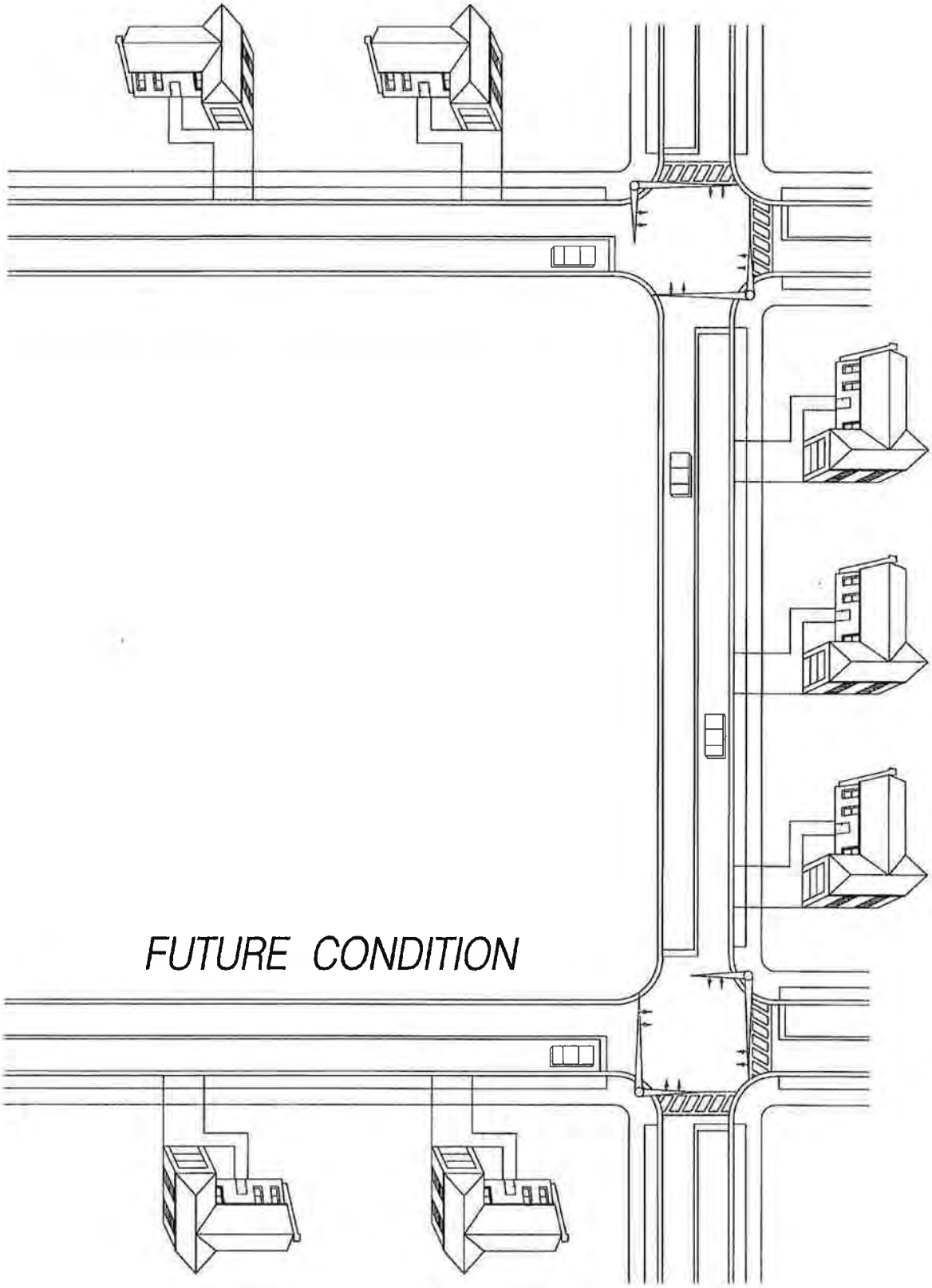
EXHIBIT 7
Total Background Traffic Volumes


FUTURE CONDITION

FUTURE CONDITION

We will, at this time, determine the vehicle impact the proposed development will have on the key intersections and the resulting levels of service. As mentioned previously, the CIRI Property will create 164 residential townhouse units. We have consulted the Institute of Transportation Engineers', Trip Generation Manual, 9th Edition to determine trip generation rates for this development. The results are as follows:

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
ITE Land Use Code 230				
Per residential townhouse	0.08	0.39	0.37	0.18
164 residential townhomes	**13**	**64**	**60**	**30**

Based on the location of work centers, major access routes and our knowledge of the study area, a distribution pattern was established as shown on Exhibit 8. By adding the site generated trips to total background traffic volumes, we obtain total future traffic volumes. (See Exhibit 9).

Using the Highway Capacity Manual Signalized and Unsignalized methods, levels of service were determined for key intersection movements, as well as the overall intersection. We have also analyzed each intersection using the Critical Lane Analysis Method. Details of the calculations can be found in the appendix section of this report. The results of the calculations can be found on the following pages.

CRITICAL LANE ANALYSIS

	AM CLV(LOS)	PM CLV(LOS)
MD 210 @ Dr. Andrews Way	499(A)	516(A)
MD 210 @ Riverwatch Boulevard	472(A)	539(A)
MD 210 @ MD 225	449(A)	670(A)
Dr. Andrews Way @ Dr. Mitchell Lane	116(A)	195(A)

SIGNALIZED INTERSECTION

MD 210 @ MD 225

	LOS AM(PM)	Approach LOS AM(PM)
Eastbound		
Thru	B(B)	B(B)
Right	B(B)	
Westbound		
Left	B(B)	B(B)
Thru	B(A)	
Northbound		
Left	B(B)	B(B)
Right	B(B)	

AM Intersection: Delay = 14.7 sec/veh; LOS = B

PM Intersection: Delay = 12.3 sec/veh; LOS = B

UNSIGNALIZED INTERSECTIONS

MD 210 @ Dr. Andrews Way

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	889(1321)	2(8)	887(1313)
Westbound			
Left	1487(771)	14(20)	1473(751)
Northbound			
Left/Thru/Right	757(500)	36(29)	721(471)
Southbound			
Left/Thru/Right	291(324)	97(50)	194(274)

MD 210 @ Riverwatch Boulevard

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left	794(1210)	0(1)	794(1209)
Southbound			
Left/Right	280(308)	55(32)	225(276)

UNSIGNALIZED INTERSECTIONS

Dr. Andrews Way @ Dr. Mitchell Lane

	Maximum Capacity AM(PM)	Volume AM(PM)	Reserve Capacity AM(PM)
Eastbound			
Left/Thru/Right	1084(1084)	2(96)	1082(988)
Westbound			
Left/Thru/Right	916(855)	71(33)	845(822)
Northbound			
Left/Thru/Right	1622(1622)	33(19)	1589(1603)
Southbound			
Left/Thru/Right	1603(1533)	0(0)	1603(1533)

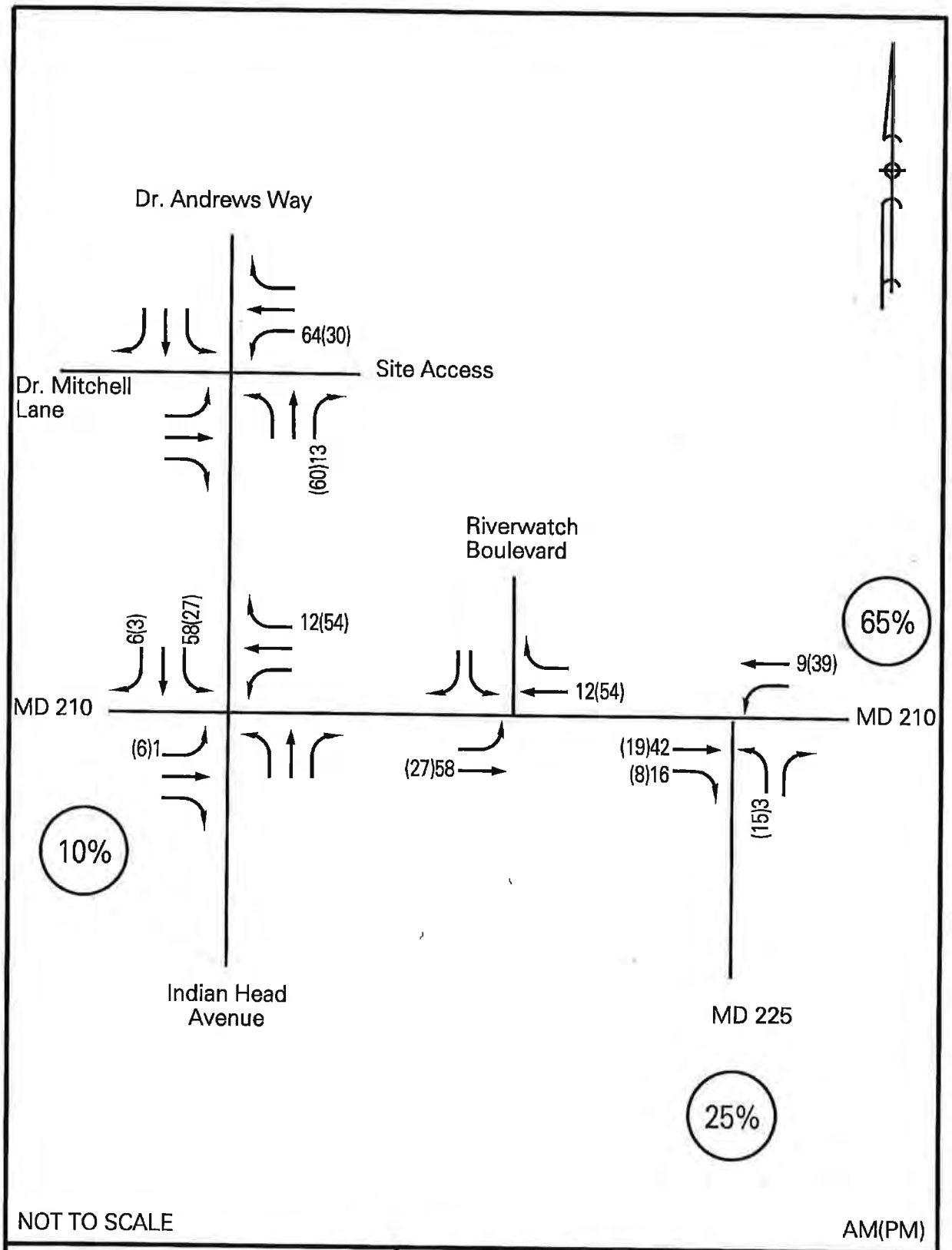


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EXHIBIT 8
Site Generated Traffic

Detailed Average Rate Trip Calculations
For 164 Dwelling Units of Residential Condominium / Townhouse(230) - [E]

Project: CIRI Property
Phase:

Open Date:
Analysis Date:

Description:

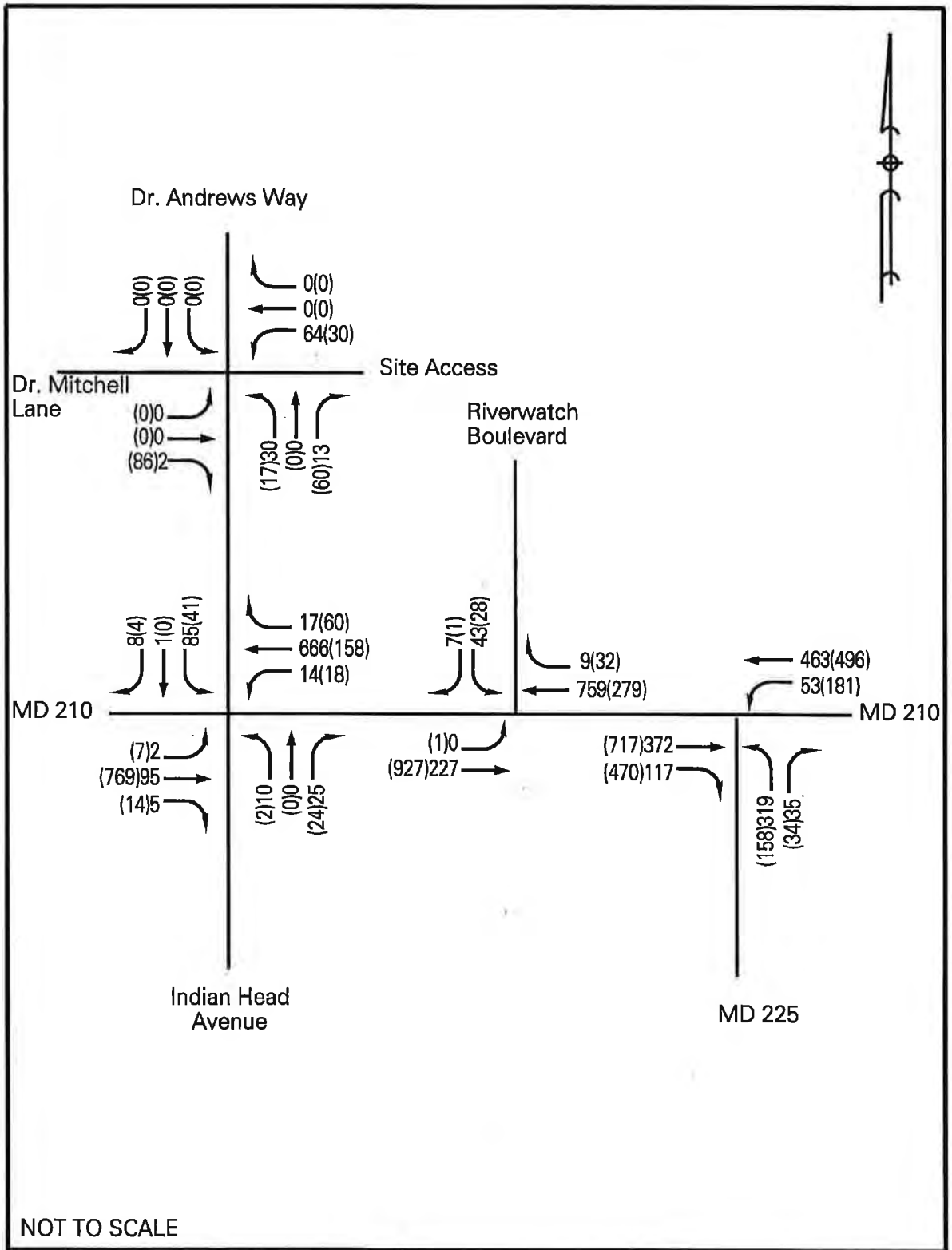
	Average Rate	Standard Deviation	Adjustment Factor	Driveway Volume
Avg. Weekday 2-Way Volume	6.03	0.00	1.00	989
7-9 AM Peak Hour Enter	0.08	0.00	1.00	13
7-9 AM Peak Hour Exit	0.39	0.00	1.00	64
7-9 AM Peak Hour Total	0.47	0.00	1.00	77
4-6 PM Peak Hour Enter	0.37	0.00	1.00	60
4-6 PM Peak Hour Exit	0.18	0.00	1.00	30
4-6 PM Peak Hour Total	0.55	0.00	1.00	90
AM Pk Hr, Generator, Enter	0.09	0.00	1.00	14
AM Pk Hr, Generator, Exit	0.38	0.00	1.00	62
AM Pk Hr, Generator, Total	0.46	0.00	1.00	76
PM Pk Hr, Generator, Enter	0.36	0.00	1.00	59
PM Pk Hr, Generator, Exit	0.20	0.00	1.00	33
PM Pk Hr, Generator, Total	0.56	0.00	1.00	92
Saturday 2-Way Volume	6.23	0.00	1.00	1022
Saturday Peak Hour Enter	0.30	0.00	1.00	49
Saturday Peak Hour Exit	0.25	0.00	1.00	41
Saturday Peak Hour Total	0.55	0.00	1.00	90
Sunday 2-Way Volume	5.31	0.00	1.00	871
Sunday Peak Hour Enter	0.26	0.00	1.00	43
Sunday Peak Hour Exit	0.27	0.00	1.00	45
Sunday Peak Hour Total	0.53	0.00	1.00	88

The above rates were calculated from these equations:

24-Hr. 2-Way Volume:	LN(T) = .87LN(X) + 2.46, R^2 = 0.8
7-9 AM Peak Hr. Total:	LN(T) = .8LN(X) + .26
	R^2 = 0.76 , 0.17 Enter, 0.83 Exit
4-6 PM Peak Hr. Total:	LN(T) = .82LN(X) + .32
	R^2 = 0.8 , 0.67 Enter, 0.33 Exit
AM Gen Pk Hr. Total:	LN(T) = .82LN(X) + .15
	R^2 = 0.8 , 0.19 Enter, 0.81 Exit
PM Gen Pk Hr. Total:	T = .34(X) + 35.87
	R^2 = 0.82 , 0.64 Enter, 0.36 Exit
Sat. 2-Way Volume:	T = 3.62(X) + 427.93, R^2 = 0.84
Sat. Pk Hr. Total:	T = .29(X) + 42.63
	R^2 = 0.84 , 0.54 Enter, 0.46 Exit
Sun. 2-Way Volume:	T = 3.13(X) + 357.26, R^2 = 0.88
Sun. Pk Hr. Total:	T = .23(X) + 50.01
	R^2 = 0.78 , 0.49 Enter, 0.51 Exit

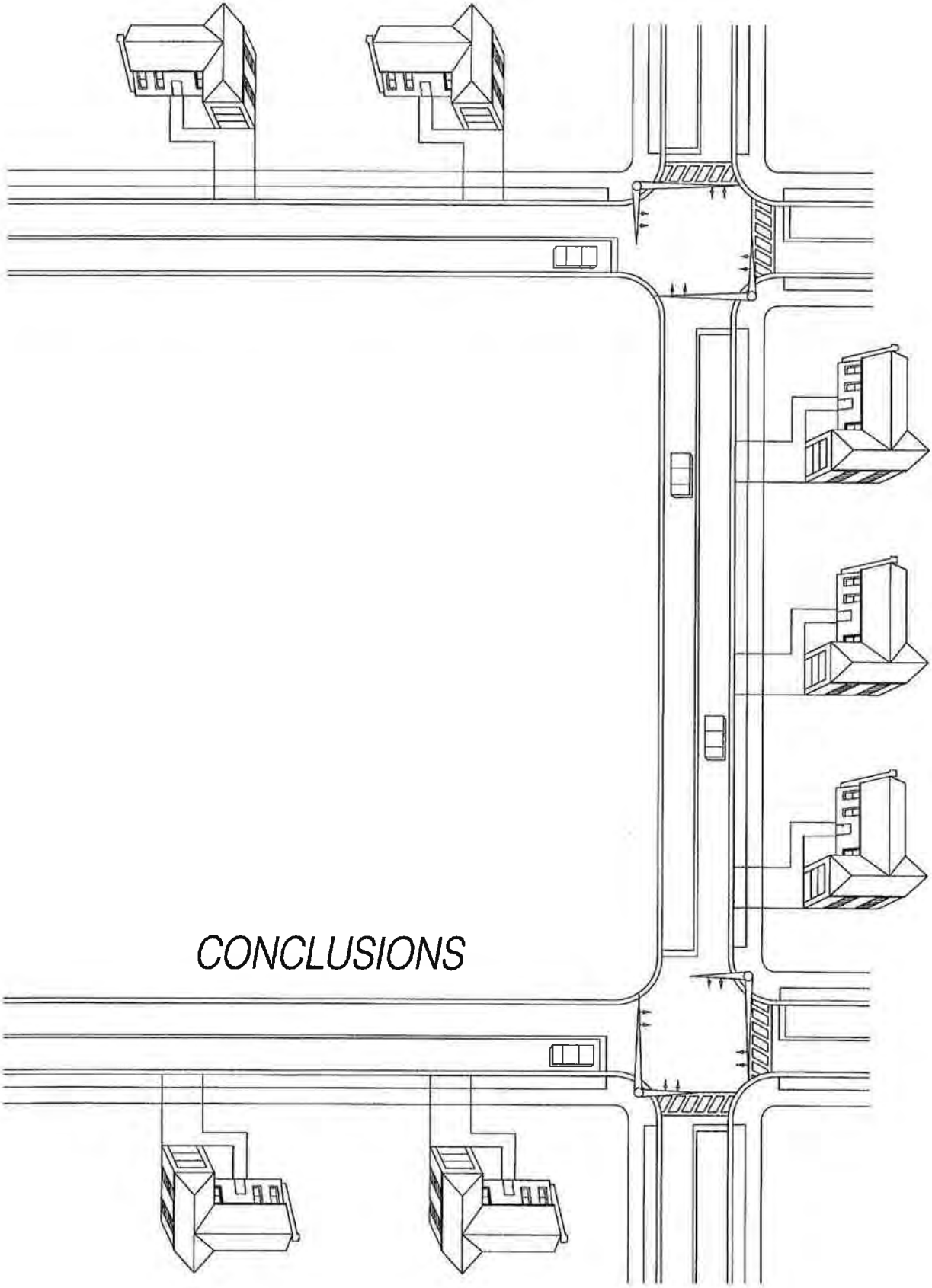
Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation Manual, 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC



NOT TO SCALE

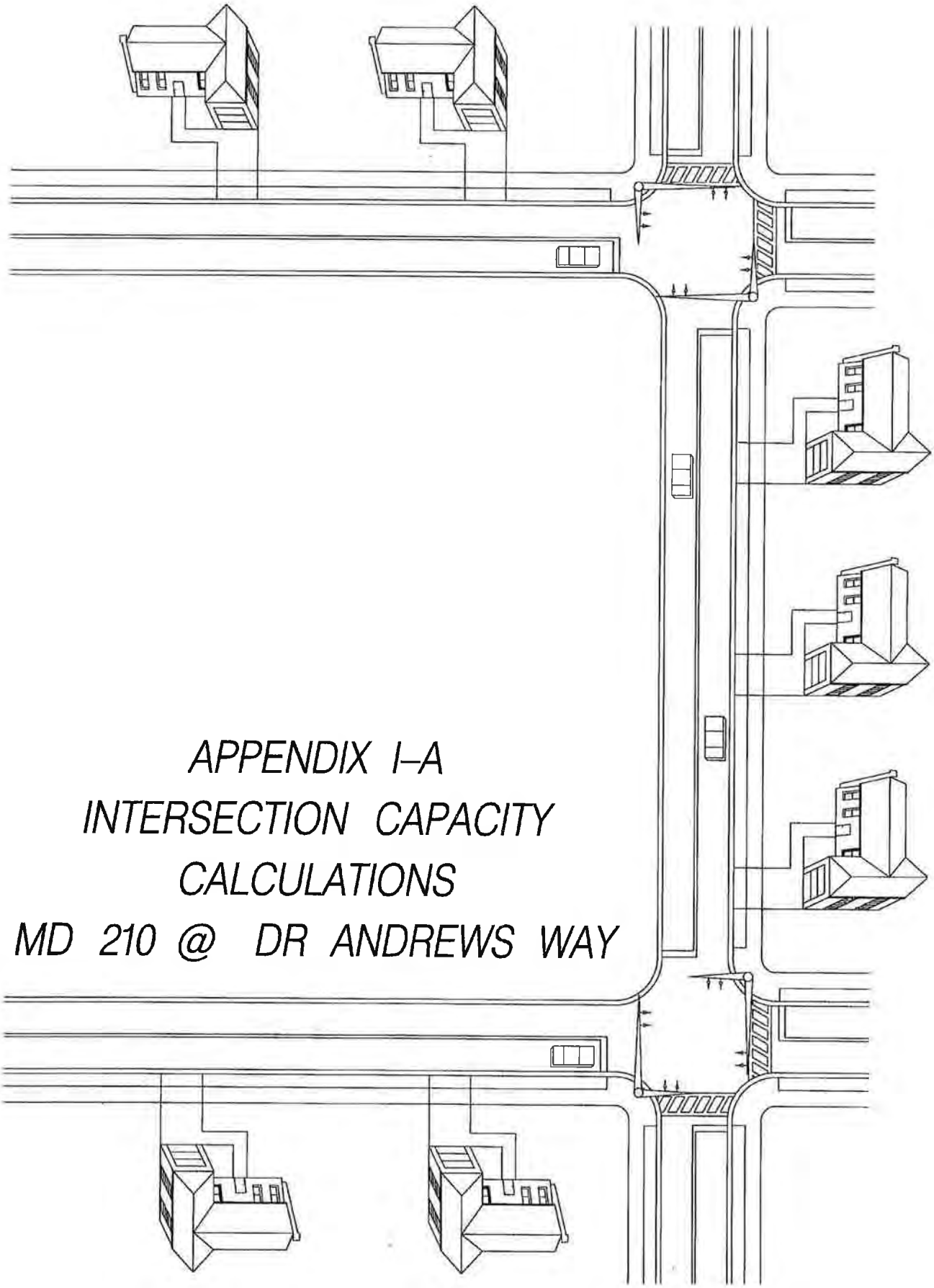
TRAFFIC CONCEPTS, INC. 7525 Connelley Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 9 Total Future Traffic Volumes



CONCLUSIONS

CONCLUSIONS

The analysis has shown that the key intersections will continue to operate at satisfactory levels of service under future conditions. Therefore, we respectfully request that your office approve this development from a traffic impact standpoint.



APPENDIX I–A
INTERSECTION CAPACITY CALCULATIONS
MD 210 @ DR ANDREWS WAY

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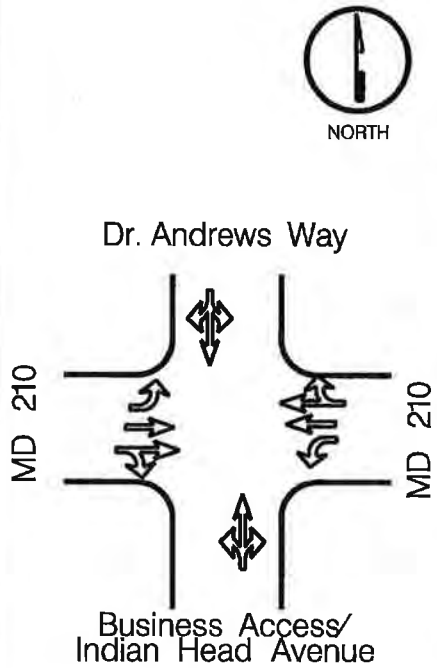
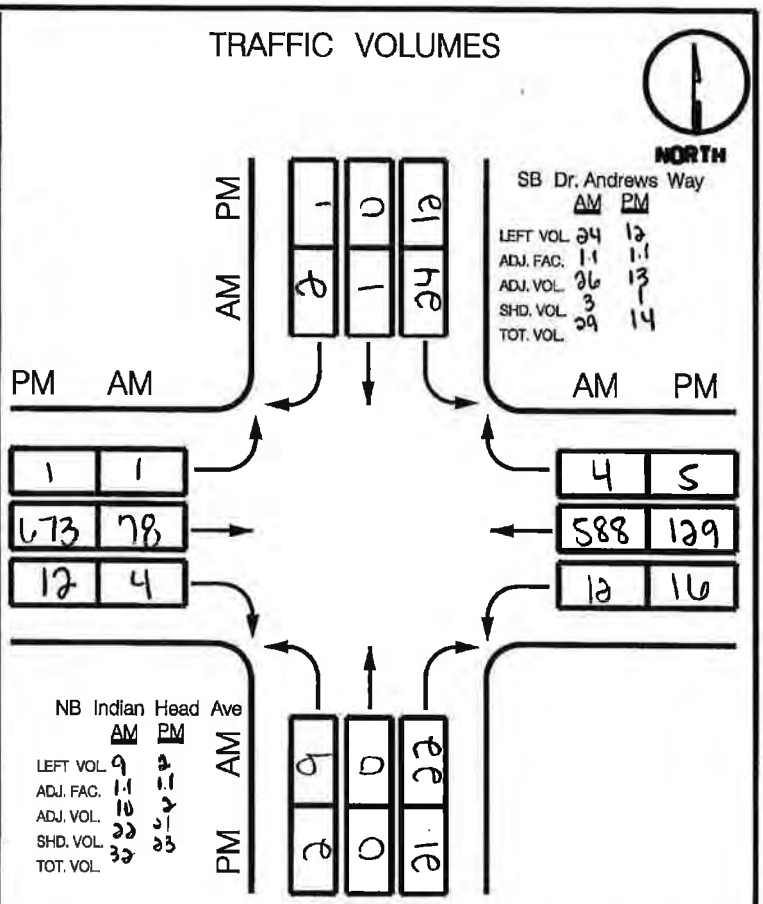
LANE CONFIGURATION



TRAFFIC VOLUMES



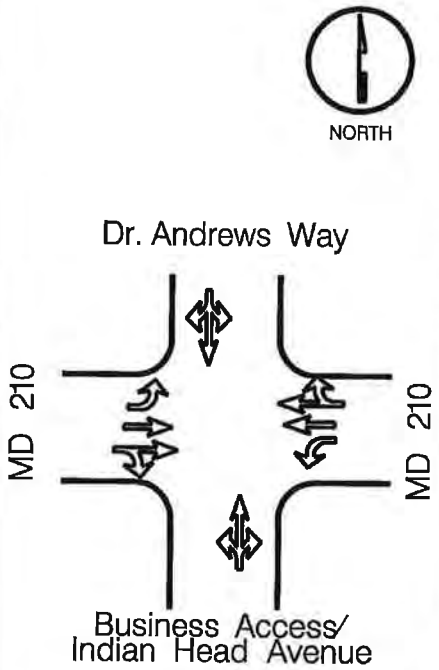
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	32 *1.0 + 24 *1.0	56*	
	SB	29 *1.0 + 9 *1.0	38	
	EB	(78 + 4) *.55 + 12 *1.0	57	A
	WB	(588 + 4) *.55 + 1 *1.0	327*	383
PM	NB	23 *1.0 + 12 *1.0	35*	
	SB	14 *1.0 + 2 *1.0	16	
	EB	(673 + 12) *.55 + 16 *1.0	393*	A
	WB	(129 + 5) *.55 + 1 *1.0	75	428

CRITICAL LANE ANALYSIS

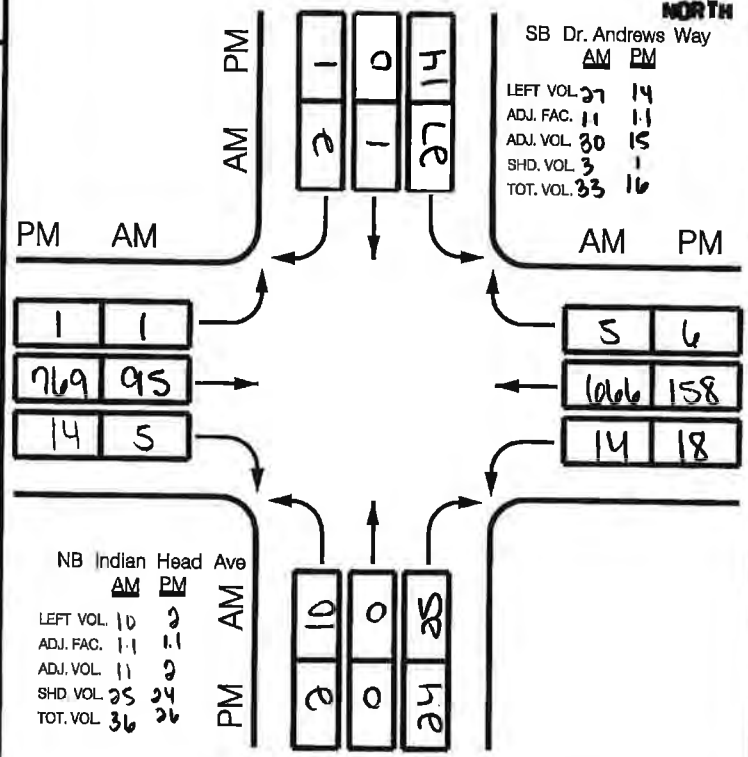
Prepared By: C. ATKINSON Condition: EXISTING

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



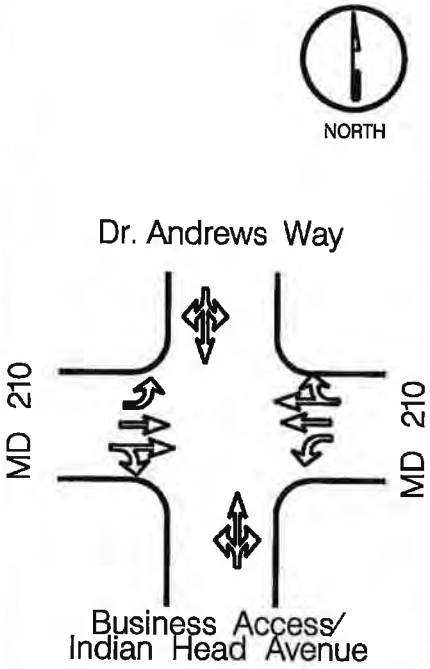
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	36 *1.0 + 27 *1.0	63*	
	SB	33 *1.0 + 10 *1.0	43	
	EB	(95 + 5) *.55 + 14 *1.0	69	A
	WB	(1666 + 5) *.55 + 1 *1.0	330*	433
PM	NB	26 *1.0 + 14 *1.0	40*	
	SB	16 *1.0 + 2 *1.0	18	
	EB	(769 + 14) *.55 + 18 *1.0	449*	A
	WB	(158 + 6) *.55 + 1 *1.0	91	489

CRITICAL LANE ANALYSIS

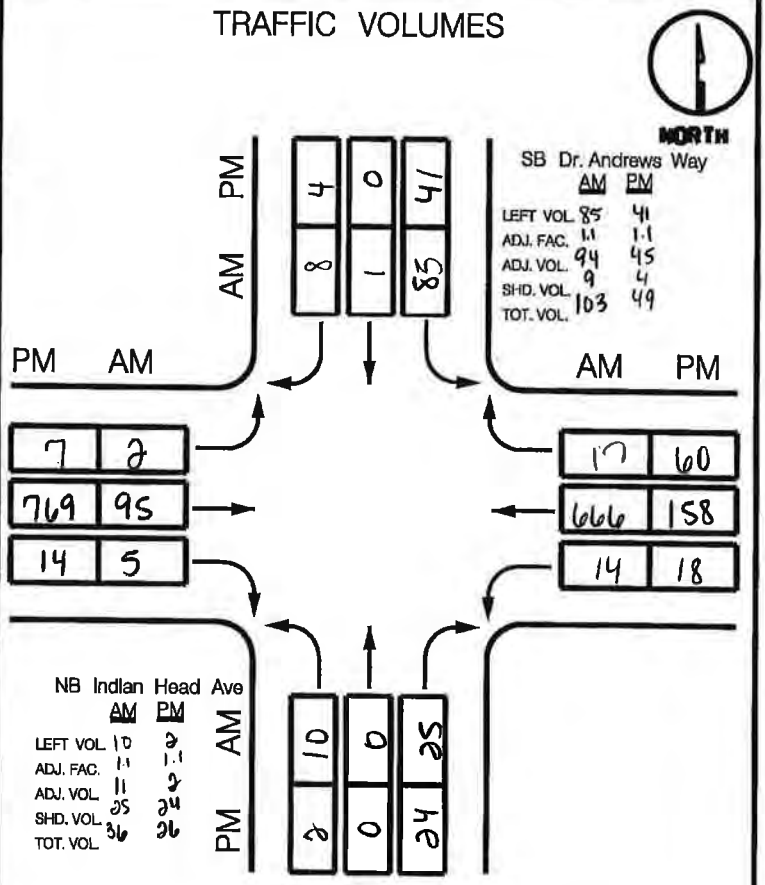
Prepared By: C. ATKINSON Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	36 * 1.0 + 85 * 1.0	121 *	
	SB	103 * 1.0 + 10 * 1.0	113	
	EB	(95 + 5) * .55 + 14 * 1.0	69	A
	WB	(666 + 17) * .55 + 2 * 1.0	378 *	499
PM	NB	26 * 1.0 + 41 * 1.0	67 *	
	SB	49 * 1.0 + 2 * 1.0	51	
	EB	(769 + 14) * .55 + 18 * 1.0	449 *	A
	WB	(158 + 60) * .55 + 7 * 1.0	127	516

CRITICAL LANE ANALYSIS

Prepared By: C. ATKINSON Condition: FUTURE

HCS 2010 Two-Way Stop Control Summary Report

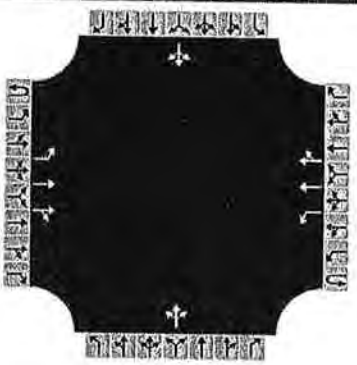
General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/24/2016
Analysis Year	2016
Time Analyzed	Existing- AM Peak
Intersection Orientation	East-West
Project Description	3297 - CIRI Property

Site Information

Intersection	MD 210 @ Dr. Andrews Way
Jurisdiction	Charles County, Maryland
East/West Street	MD 210
North/South Street	Dr. Andrews/Indian Head
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		1	78	4		12	588	4		9	0	22		24	1	2
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1				12					32				28	
Capacity		965				1511					801				344	
v/c Ratio		0.00				0.01					0.04				0.08	
95% Queue Length		0.0				0.0					0.1				0.3	
Control Delay (s/veh)		8.7				7.4					9.7				16.4	
Level of Service (LOS)		A				A					A				C	
Approach Delay (s/veh)	0.1				0.1				9.7				16.4			
Approach LOS									A				C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Dr. Andrews Way
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Dr. Andrews/Indian Head
Time Analyzed	Existing - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		1	673	12		16	129	5		2	0	21		12	0	1
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1				18					25				14	
Capacity		1430				847					550				408	
v/c Ratio		0.00				0.02					0.05				0.03	
95% Queue Length		0.0				0.1					0.1				0.1	
Control Delay (s/veh)		7.5				9.3					11.9				14.1	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				1.0				11.9				14.1			
Approach LOS									B				B			

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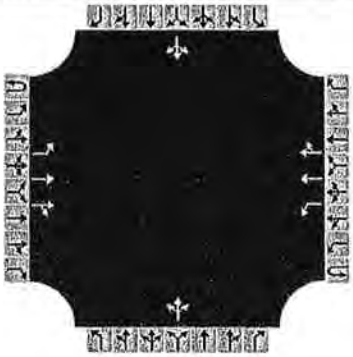
HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Dr. Andrews Way
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Dr. Andrews/Indian Head
Time Analyzed	Background - AM Peak	Peak Hour Factor	0.97
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		1	95	5		14	666	5		10	0	25		27	1	2
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1				14					36				31	
Capacity		899				1487					761				293	
v/c Ratio		0.00				0.01					0.05				0.11	
95% Queue Length		0.0				0.0					0.1				0.4	
Control Delay (s/veh)		9.0				7.4					10.0				18.7	
Level of Service (LOS)		A				A					A				C	
Approach Delay (s/veh)	0.1				0.1				10.0				18.7			
Approach LOS									A				C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/24/2016
Analysis Year	2016
Time Analyzed	Background - PM Peak
Intersection Orientation	East-West
Project Description	3297 - CIRI Property

Site Information

Intersection	MD 210 @ Dr. Andrews Way
Jurisdiction	Charles County, Maryland
East/West Street	MD 210
North/South Street	Dr. Andrews/Indian Head
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		1	769	14		18	158	6		2	0	24		14	0	1
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1				20					29				17	
Capacity		1390				771					503				345	
v/c Ratio		0.00				0.03					0.06				0.05	
95% Queue Length		0.0				0.1					0.2				0.2	
Control Delay (s/veh)		7.6				9.8					12.6				16.0	
Level of Service (LOS)		A				A					B				C	
Approach Delay (s/veh)	0.0				1.0				12.6				16.0			
Approach LOS									B				C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Dr. Andrews Way
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Dr. Andrews/Indian Head
Time Analyzed	Future - AM Peak	Peak Hour Factor	0.97
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		2	95	5		14	666	17		10	0	25		85	1	8
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		2				14					36				97	
Capacity		889				1487					757				291	
v/c Ratio		0.00				0.01					0.05				0.33	
95% Queue Length		0.0				0.0					0.1				1.4	
Control Delay (s/veh)		9.1				7.4					10.0				23.4	
Level of Service (LOS)		A				A					A				C	
Approach Delay (s/veh)	0.2				0.1				10.0				23.4			
Approach LOS									A				C			

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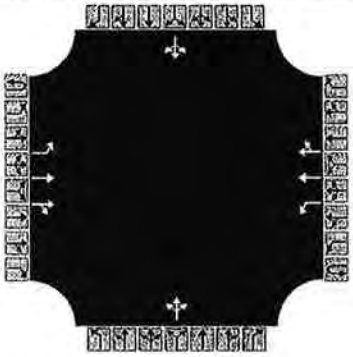
HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Dr. Andrews Way
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Dr. Andrews/Indian Head
Time Analyzed	Future - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)		7	769	14		18	158	60		2	0	24		41	0	4
Percent Heavy Vehicles		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		8				20					29				50	
Capacity		1321				771					500				324	
v/c Ratio		0.01				0.03					0.06				0.15	
95% Queue Length		0.0				0.1					0.2				0.5	
Control Delay (s/veh)		7.7				9.8					12.6				18.1	
Level of Service (LOS)		A				A					B				C	
Approach Delay (s/veh)	0.1				0.7				12.6				18.1			
Approach LOS									B				C			

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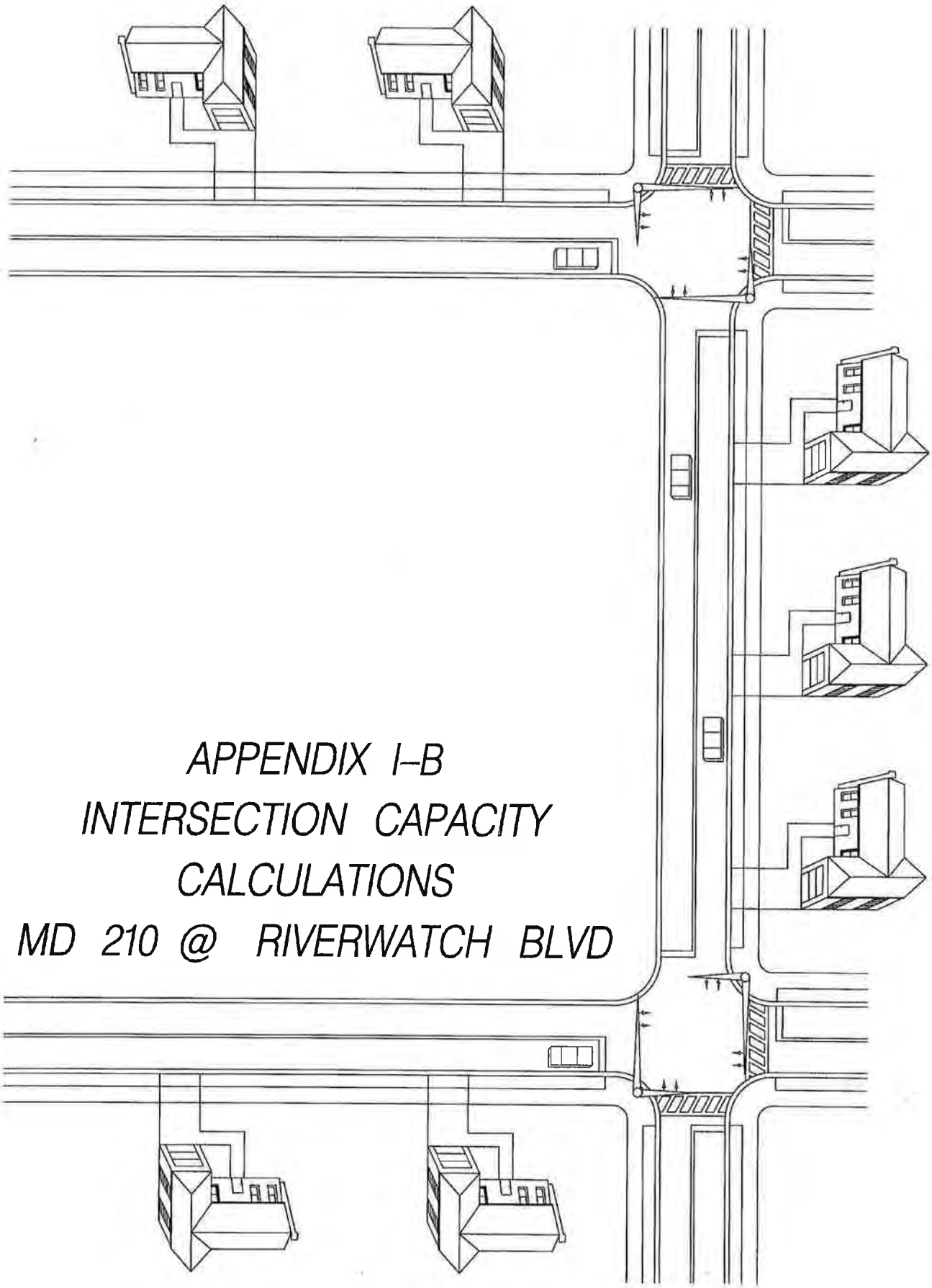
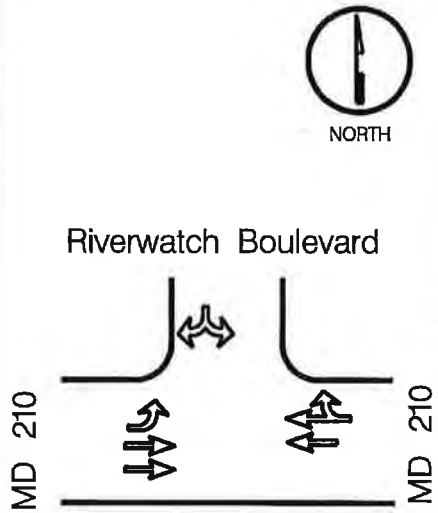


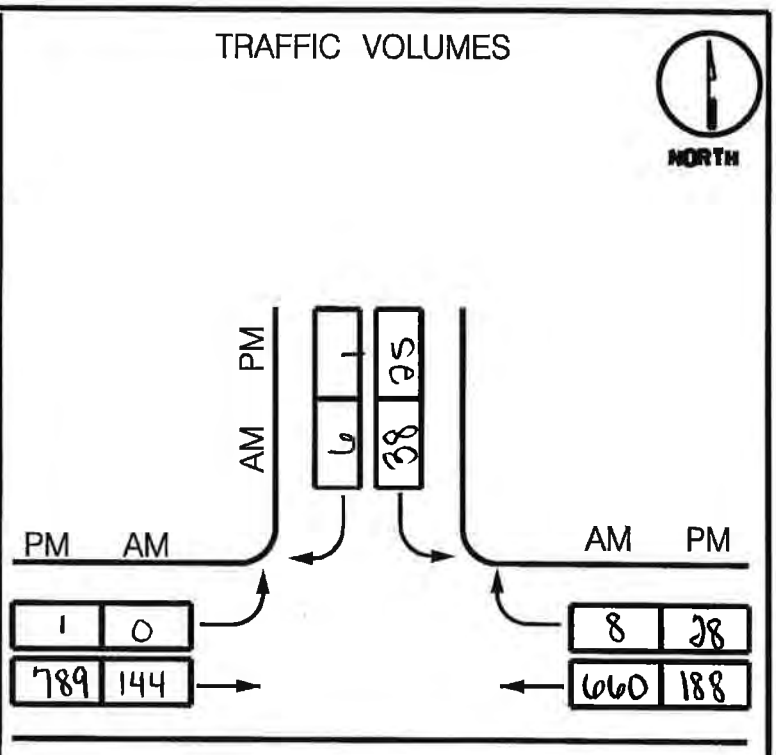
APPENDIX I–B
INTERSECTION CAPACITY CALCULATIONS
MD 210 @ RIVERWATCH BLVD

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



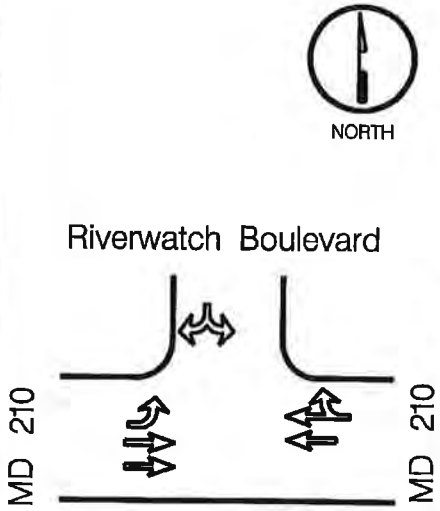
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	—	—	
	SB	(38 + 6) *1.0	44*	
	EB	144 *.55	79	A
	WB	(660 + 8) *.55 + 0 *1.0	367*	411
PM	NB	—	—	
	SB	(25 + 1) *1.0	26*	
	EB	789 *.55	434*	A
	WB	(188 + 28) *.55 + 1 *1.0	120	460

CRITICAL LANE ANALYSIS

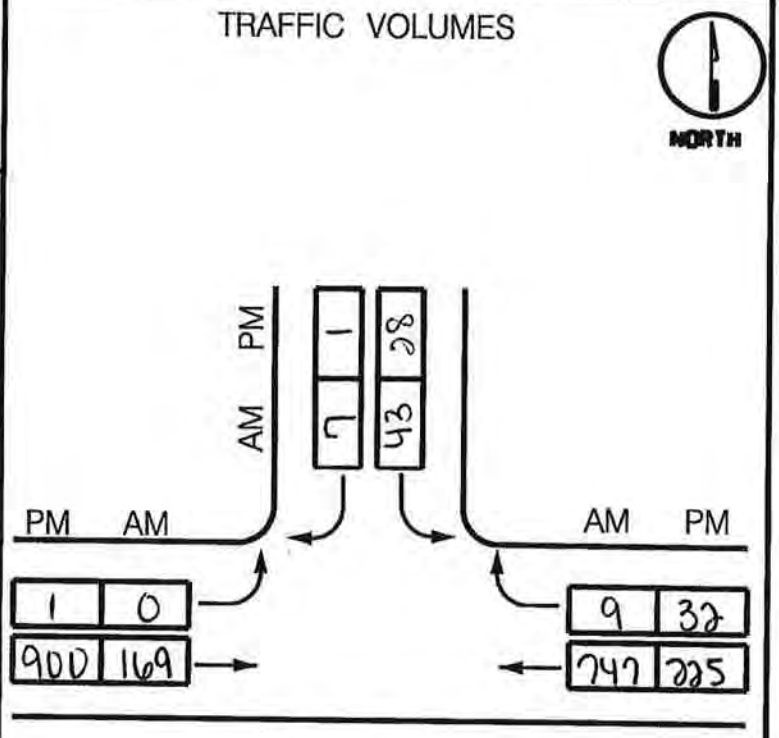
Prepared By: C. ATKINSON Condition: EXISTING

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



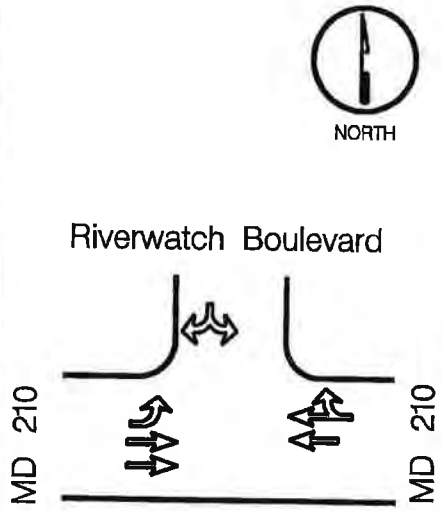
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	—	—	
	SB	(7 + 43) *1.0	50*	
	EB	169 *.55	93	A
	WB	(747 + 9) *.55 + 0 *1.0	416*	416
PM	NB	—	—	
	SB	(1 + 28) *1.0	29*	
	EB	900 *.55	495*	A
	WB	(225 + 32) *.55 + 1 *1.0	142	524

CRITICAL LANE ANALYSIS

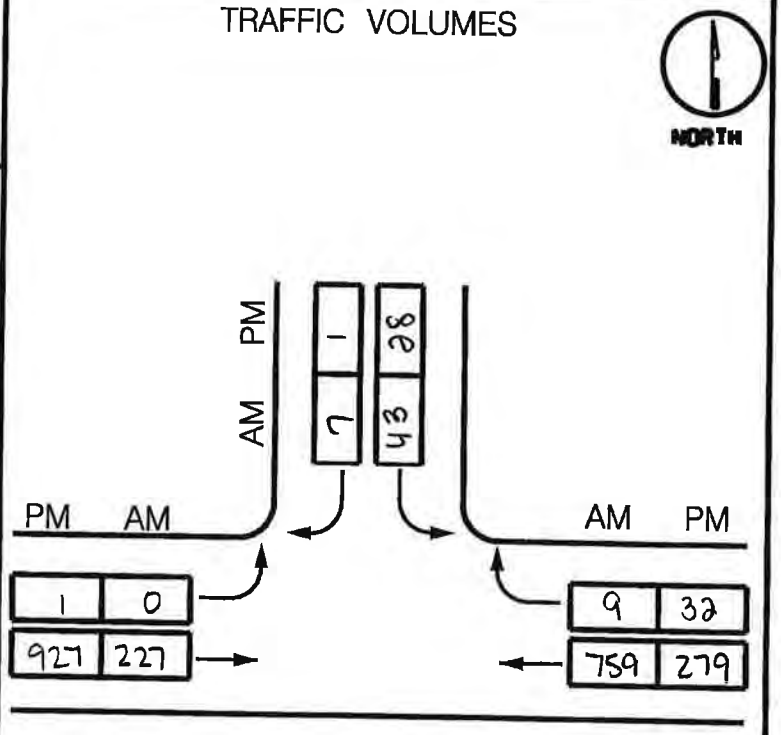
Prepared By: C. ATKINSON Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	—	—	
	SB	(43+7) *1.0	50*	
	EB	227 *.55	125	A
	WB	(759 + 9) *.55 + 0 *1.0	422*	472
PM	NB	—	—	
	SB	(1 + 28) *1.0	29*	
	EB	927 *.55	510*	A
	WB	(279 + 32) *.55 + 1 *1.0	172	539

CRITICAL LANE ANALYSIS

Prepared By: C. ATKINSON Condition: FUTURE

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Riverwatch Blvd
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Riverwatch Boulevard
Time Analyzed	Existing - AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		0	144				660	8						38		6
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		0													48	
Capacity		873													347	
v/c Ratio		0.00													0.14	
95% Queue Length		0.0													0.5	
Control Delay (s/veh)		9.1													17.0	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.0												17.0			
Approach LOS													C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/24/2016
Analysis Year	2016
Time Analyzed	Existing - PM Peak
Intersection Orientation	East-West
Project Description	3297 - CIRI Property

Site Information

Intersection	MD 210 @ Riverwatch Blvd
Jurisdiction	Charles County, Maryland
East/West Street	MD 210
North/South Street	Riverwatch Boulevard
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		1	789				188	28						25		1
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1													29	
Capacity		1324													401	
v/c Ratio		0.00													0.07	
95% Queue Length		0.0													0.2	
Control Delay (s/veh)		7.7													14.7	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.0												14.7			
Approach LOS													B			

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/24/2016
Analysis Year	2016
Time Analyzed	Background - AM Peak
Intersection Orientation	East-West
Project Description	3297 - CIRI Property

Site Information

Intersection	MD 210 @ Riverwatch Blvd
Jurisdiction	Charles County, Maryland
East/West Street	MD 210
North/South Street	Riverwatch Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		0	169				747	9						43		7
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		0													55	
Capacity		803													298	
v/c Ratio		0.00													0.18	
95% Queue Length		0.0													0.7	
Control Delay (s/veh)		9.5													19.8	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.0												19.8			
Approach LOS													C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Riverwatch Blvd
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Riverwatch Boulevard
Time Analyzed	Background - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		1	900				225	32						28		1
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1													32	
Capacity		1273													343	
v/c Ratio		0.00													0.09	
95% Queue Length		0.0													0.3	
Control Delay (s/veh)		7.8													16.6	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.0												16.6			
Approach LOS													C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Riverwatch Blvd
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Riverwatch Boulevard
Time Analyzed	Future - AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		0	227				759	9						43		7
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		0													55	
Capacity		794													280	
v/c Ratio		0.00													0.20	
95% Queue Length		0.0													0.7	
Control Delay (s/veh)		9.5													21.0	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.0												21.0			
Approach LOS													C			

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	MD 210 @ Riverwatch Blvd
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	10/24/2016	East/West Street	MD 210
Analysis Year	2016	North/South Street	Riverwatch Boulevard
Time Analyzed	Future - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	0	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)		1	927				279	32						28		1
Percent Heavy Vehicles		2												2		2
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		1													32	
Capacity		1210													308	
v/c Ratio		0.00													0.10	
95% Queue Length		0.0													0.3	
Control Delay (s/veh)		8.0													18.1	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.0												18.1			
Approach LOS													C			

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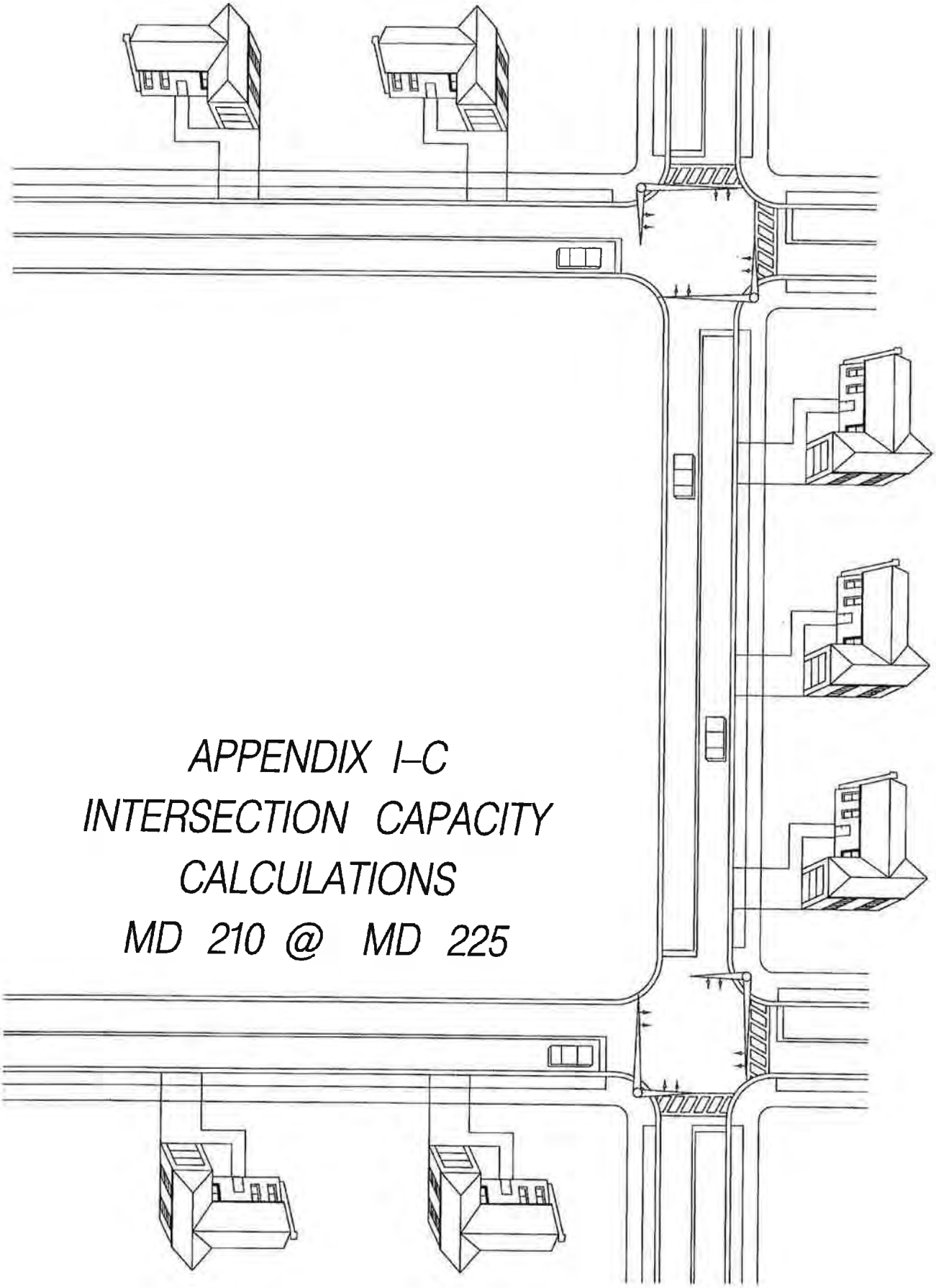
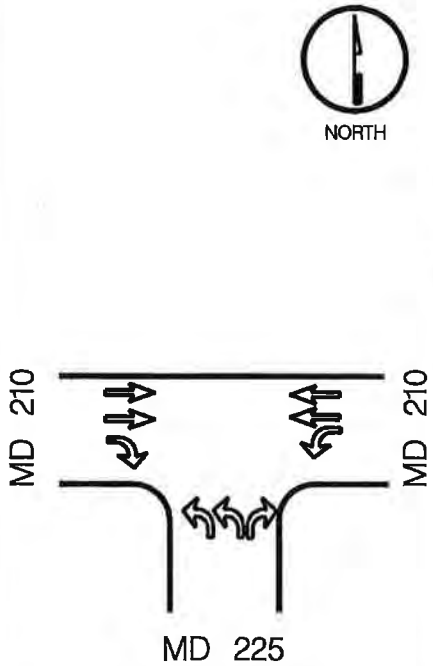


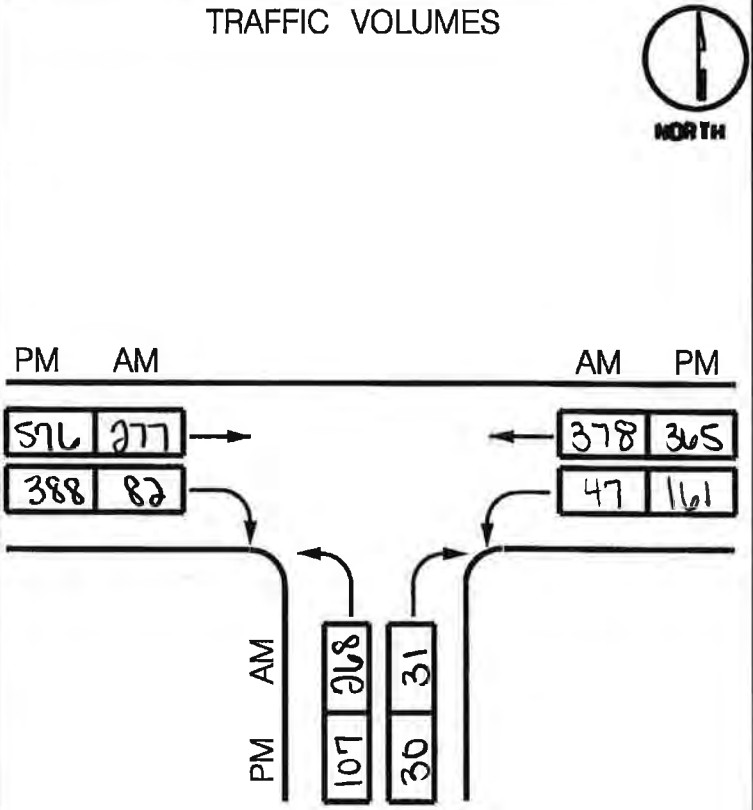
APPENDIX I–C
INTERSECTION CAPACITY CALCULATIONS
MD 210 @ MD 225

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



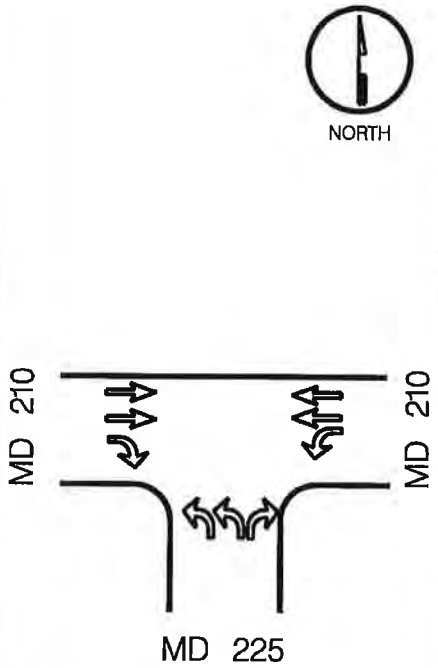
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	268 * .6	161*	
	SB	—	—	
	EB	277 * .55 + 47 * 1.0	199	A
	WB	378 * .55	208*	369
PM	NB	107 * .6	64*	
	SB	—	—	
	EB	(388 * 1.0) - (107 * .6) + 161 * 1.0	485*	A
	WB	365 * .55	201	549

CRITICAL LANE ANALYSIS

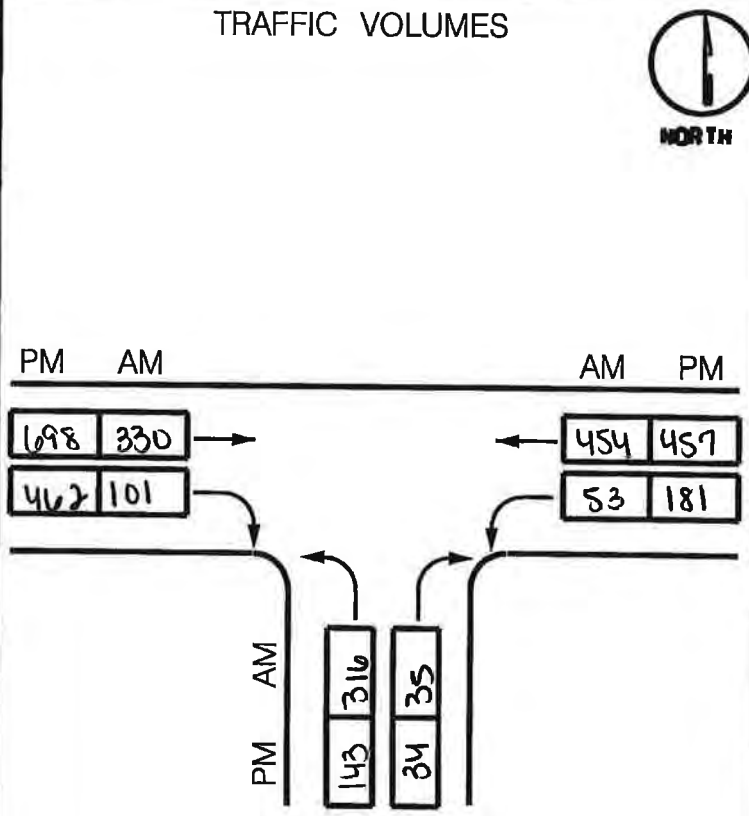
Prepared By: C. ATKINSON Condition: EXISTING

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



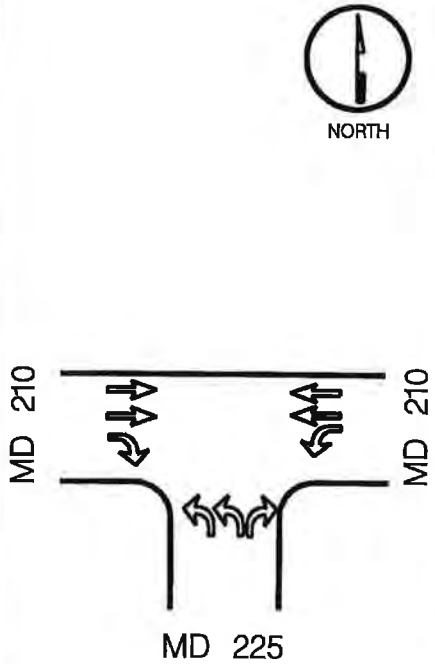
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	316 * .6	190*	
	SB	—	—	
	EB	330 * .55 + 53 * 1.0	235	A
	WB	454 * .55	250*	440
PM	NB	143 * .6	86*	
	SB	—	—	
	EB	698 * .55 + 181 * 1.0	565*	A
	WB	457 * .55	251	651

CRITICAL LANE ANALYSIS

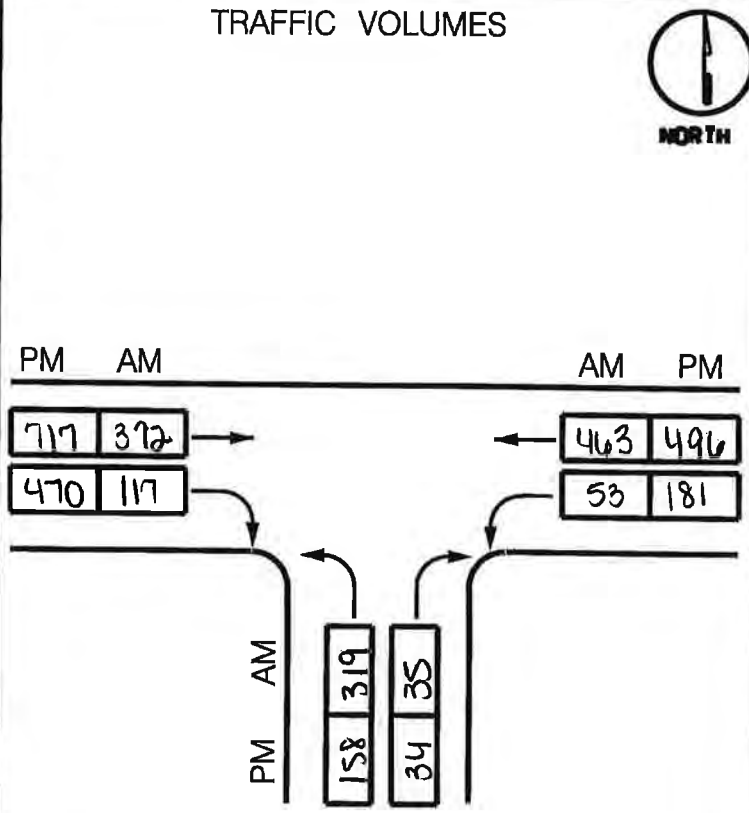
Prepared By: C. ATKINSON Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



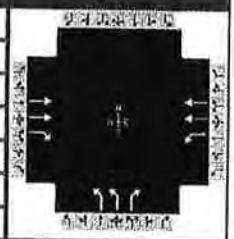
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	319 * .6	191*	
	SB	—	—	
	EB	372 * .55 + 53 * 1.0	258*	A
	WB	463 * .55	255	449
PM	NB	158 * .6	95*	
	SB	—	—	
	EB	717 * .55 + 181 * 1.0	575*	A
	WB	496 * .55	273	670

CRITICAL LANE ANALYSIS

Prepared By: C. ATKINSON Condition: FUTURE

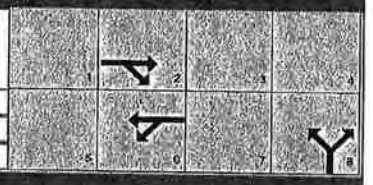
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:00
Intersection	MD 210 @ MD 225	File Name	MD210@MD225ExistingAM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		277	82	47	378		268		31			

Signal Information					EB		WB		NB	
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	40.0	40.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		45.0		45.0		45.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.1		3.1		3.1		
Queue Clearance Time (g_s), s		6.6		9.3		6.5		
Green Extension Time (g_e), s		2.0		2.0		0.7		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		308	91	52	420		298		34			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	1067	1773		1723		1579			
Queue Service Time (g_s), s		4.6	2.9	2.7	6.4		4.5		1.1			
Cycle Queue Clearance Time (g_c), s		4.6	2.9	7.3	6.4		4.5		1.1			
Green Ratio (g/C)		0.47	0.47	0.47	0.47		0.47		0.47			
Capacity (c), veh/h		1655	737	524	1655		1608		737			
Volume-to-Capacity Ratio (X)		0.186	0.124	0.100	0.254		0.185		0.047			
Back of Queue (Q), ft/ln (95 th percentile)		77.2	44.3	27.9	109.1		73.5		16.2			
Back of Queue (Q), veh/ln (95 th percentile)		3.0	1.7	1.1	4.3		2.9		0.6			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		14.0	13.6	16.1	14.5		14.0		13.1			
Incremental Delay (d_2), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		14.0	13.6	16.2	14.5		14.0		13.1			
Level of Service (LOS)		B	B	B	B		B		B			
Approach Delay, s/veh / LOS	13.9	B		14.7	B		13.9	B		0.0		
Intersection Delay, s/veh / LOS	14.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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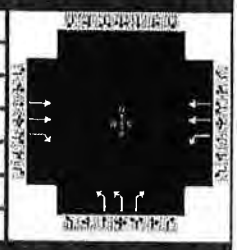
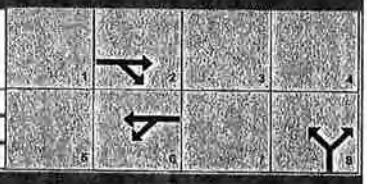
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.90
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:30
Intersection	MD 210 @ MD 225	File Name	MD210@MD225ExistingPM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		576	388	161	365		107		30			

Signal Information					EB		WB		NB	
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	50.0	30.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		55.0		55.0		35.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.3		3.3		3.1		
Queue Clearance Time (g_s), s		16.3		24.0		4.1		
Green Extension Time (g_e), s		4.9		4.8		0.3		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.00		0.02		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		640	431	179	406		119		33			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	786	1773		1723		1579			
Queue Service Time (g_s), s		8.4	14.3	13.7	4.9		2.1		1.3			
Cycle Queue Clearance Time (g_c), s		8.4	14.3	22.0	4.9		2.1		1.3			
Green Ratio (g/C)		0.58	0.58	0.58	0.58		0.36		0.36			
Capacity (c), veh/h		2049	912	461	2049		1225		561			
Volume-to-Capacity Ratio (X)		0.312	0.473	0.388	0.198		0.097		0.059			
Back of Queue (Q), ft/ln (95 th percentile)		128.8	196	100.7	75.7		35.4		19.9			
Back of Queue (Q), veh/ln (95 th percentile)		5.1	7.7	4.0	3.0		1.4		0.8			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		9.8	11.0	15.5	9.1		19.4		19.1			
Incremental Delay (d_2), s/veh		0.0	0.1	0.2	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		9.8	11.2	15.7	9.1		19.4		19.1			
Level of Service (LOS)		A	B	B	A		B		B			
Approach Delay, s/veh / LOS	10.4	B		11.1	B		19.3	B		0.0		
Intersection Delay, s/veh / LOS	11.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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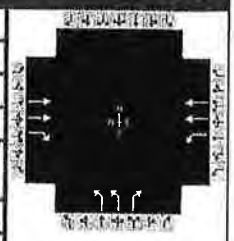
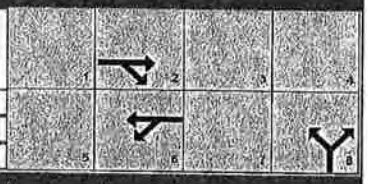
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:00
Intersection	MD 210 @ MD 225	File Name	MD210@MD225BackgroundAM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		330	101	53	454		316		35			

Signal Information					EB		WB			NB
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	40.0	40.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		45.0		45.0		45.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.1		3.1		3.1		
Queue Clearance Time (g_s), s		7.5		10.8		7.4		
Green Extension Time (g_e), s		2.5		2.4		0.9		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		367	112	59	504		351		39			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	1011	1773		1723		1579			
Queue Service Time (g_s), s		5.5	3.7	3.3	8.0		5.4		1.2			
Cycle Queue Clearance Time (g_c), s		5.5	3.7	8.8	8.0		5.4		1.2			
Green Ratio (g/C)		0.47	0.47	0.47	0.47		0.47		0.47			
Capacity (c), veh/h		1655	737	490	1655		1608		737			
Volume-to-Capacity Ratio (X)		0.222	0.152	0.120	0.305		0.218		0.053			
Back of Queue (Q), ft/ln (95 th percentile)		93.4	55.3	32.7	134.3		87.8		18.3			
Back of Queue (Q), veh/ln (95 th percentile)		3.7	2.2	1.3	5.3		3.5		0.7			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		14.3	13.8	16.9	14.9		14.3		13.1			
Incremental Delay (d_2), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		14.3	13.8	16.9	15.0		14.3		13.1			
Level of Service (LOS)		B	B	B	B		B		B			
Approach Delay, s/veh / LOS	14.2	B		15.2	B		14.2	B		0.0		
Intersection Delay, s/veh / LOS	14.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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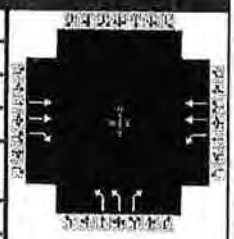
HCS 2010 Signalized Intersection Results Summary

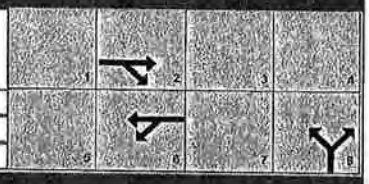
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.90
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:30
Intersection	MD 210 @ MD 225	File Name	MD210@MD225BackgroundPM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		698	462	181	457		143		34			

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	50.0	30.0	0.0	0.0	0.0	0.0
Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		55.0		55.0		35.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.3		3.3		3.1		
Queue Clearance Time (g_s), s		20.3		32.5		4.8		
Green Extension Time (g_e), s		6.6		5.8		0.4		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.03		0.17		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		776	513	201	508		159		38			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	693	1773		1723		1579			
Queue Service Time (g_s), s		10.6	18.3	19.9	6.3		2.8		1.4			
Cycle Queue Clearance Time (g_c), s		10.6	18.3	30.5	6.3		2.8		1.4			
Green Ratio (g/C)		0.58	0.58	0.58	0.58		0.36		0.36			
Capacity (c), veh/h		2049	912	398	2049		1225		561			
Volume-to-Capacity Ratio (X)		0.378	0.563	0.505	0.248		0.130		0.067			
Back of Queue (Q), ft/ln (95 th percentile)		164.1	240.9	132	97.7		48		22.7			
Back of Queue (Q), veh/ln (95 th percentile)		6.5	9.5	5.3	3.8		1.9		0.9			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		10.3	11.9	18.5	9.4		19.6		19.1			
Incremental Delay (d_2), s/veh		0.0	0.5	0.4	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		10.3	12.4	18.9	9.4		19.6		19.2			
Level of Service (LOS)		B	B	B	A		B		B			
Approach Delay, s/veh / LOS	11.1	B		12.1	B		19.5	B		0.0		
Intersection Delay, s/veh / LOS	12.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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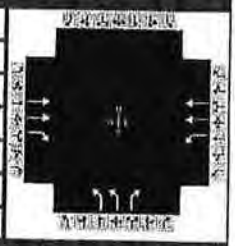
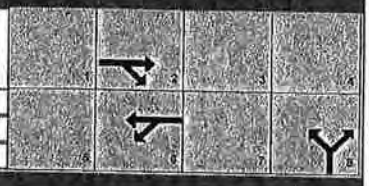
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:00
Intersection	MD 210 @ MD 225	File Name	MD210@MD225FutureAM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		372	117	53	463		319		35			

Signal Information					EB		WB		NB	
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	40.0	40.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		45.0		45.0		45.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.1		3.1		3.1		
Queue Clearance Time (g_s), s		8.3		11.8		7.5		
Green Extension Time (g_e), s		2.7		2.7		0.9		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.00		0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		413	130	59	514		354		39			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	969	1773		1723		1579			
Queue Service Time (g_s), s		6.3	4.3	3.5	8.1		5.5		1.2			
Cycle Queue Clearance Time (g_c), s		6.3	4.3	9.8	8.1		5.5		1.2			
Green Ratio (g/C)		0.47	0.47	0.47	0.47		0.47		0.47			
Capacity (c), veh/h		1655	737	464	1655		1608		737			
Volume-to-Capacity Ratio (X)		0.250	0.176	0.127	0.311		0.220		0.053			
Back of Queue (Q), ft/ln (95 th percentile)		107.1	65.1	33.5	137.9		88.9		18.3			
Back of Queue (Q), veh/ln (95 th percentile)		4.2	2.6	1.3	5.4		3.6		0.7			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		14.5	13.9	17.5	15.0		14.3		13.1			
Incremental Delay (d_2), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		14.5	14.0	17.5	15.0		14.3		13.1			
Level of Service (LOS)		B	B	B	B		B		B			
Approach Delay, s/veh / LOS	14.4	B		15.3	B		14.2	B		0.0		
Intersection Delay, s/veh / LOS	14.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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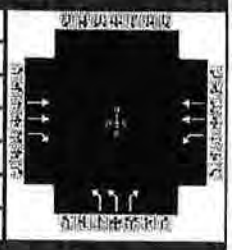
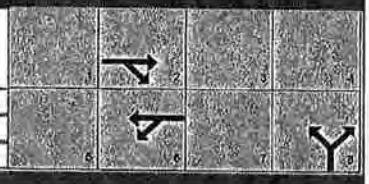
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.25
Analyst	C. Atkinson	Analysis Date	Nov 1, 2016	Area Type	Other
Jurisdiction		Time Period	PM Peak	PHF	0.90
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:30
Intersection	MD 210 @ MD 225	File Name	MD210@MD225FuturePM.xus		
Project Description	3297 - CIRI Property				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		717	470	181	496		158		34			

Signal Information					EB		WB		NB	
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	50.0	30.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		
Case Number		7.0		6.0		9.0		
Phase Duration, s		55.0		55.0		35.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (MAH), s		3.3		3.3		3.1		
Queue Clearance Time (g_s), s		20.8		33.6		5.1		
Green Extension Time (g_e), s		6.9		6.0		0.4		
Phase Call Probability		1.00		1.00		1.00		
Max Out Probability		0.05		0.21		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		797	522	201	551		176		38			
Adjusted Saturation Flow Rate (s), veh/h/ln		1773	1579	679	1773		1723		1579			
Queue Service Time (g_s), s		11.0	18.8	20.6	7.0		3.1		1.4			
Cycle Queue Clearance Time (g_c), s		11.0	18.8	31.6	7.0		3.1		1.4			
Green Ratio (g/C)		0.58	0.58	0.58	0.58		0.36		0.36			
Capacity (c), veh/h		2049	912	389	2049		1225		561			
Volume-to-Capacity Ratio (X)		0.389	0.573	0.517	0.269		0.143		0.067			
Back of Queue (Q), ft/ln (95 th percentile)		169.5	246.7	135.1	107.8		53.1		22.7			
Back of Queue (Q), veh/ln (95 th percentile)		6.7	9.7	5.4	4.2		2.1		0.9			
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		10.3	12.0	19.0	9.5		19.7		19.1			
Incremental Delay (d_2), s/veh		0.0	0.6	0.5	0.0		0.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		10.4	12.6	19.5	9.5		19.7		19.2			
Level of Service (LOS)		B	B	B	A		B		B			
Approach Delay, s/veh / LOS	11.2	B		12.2	B		19.6	B		0.0		
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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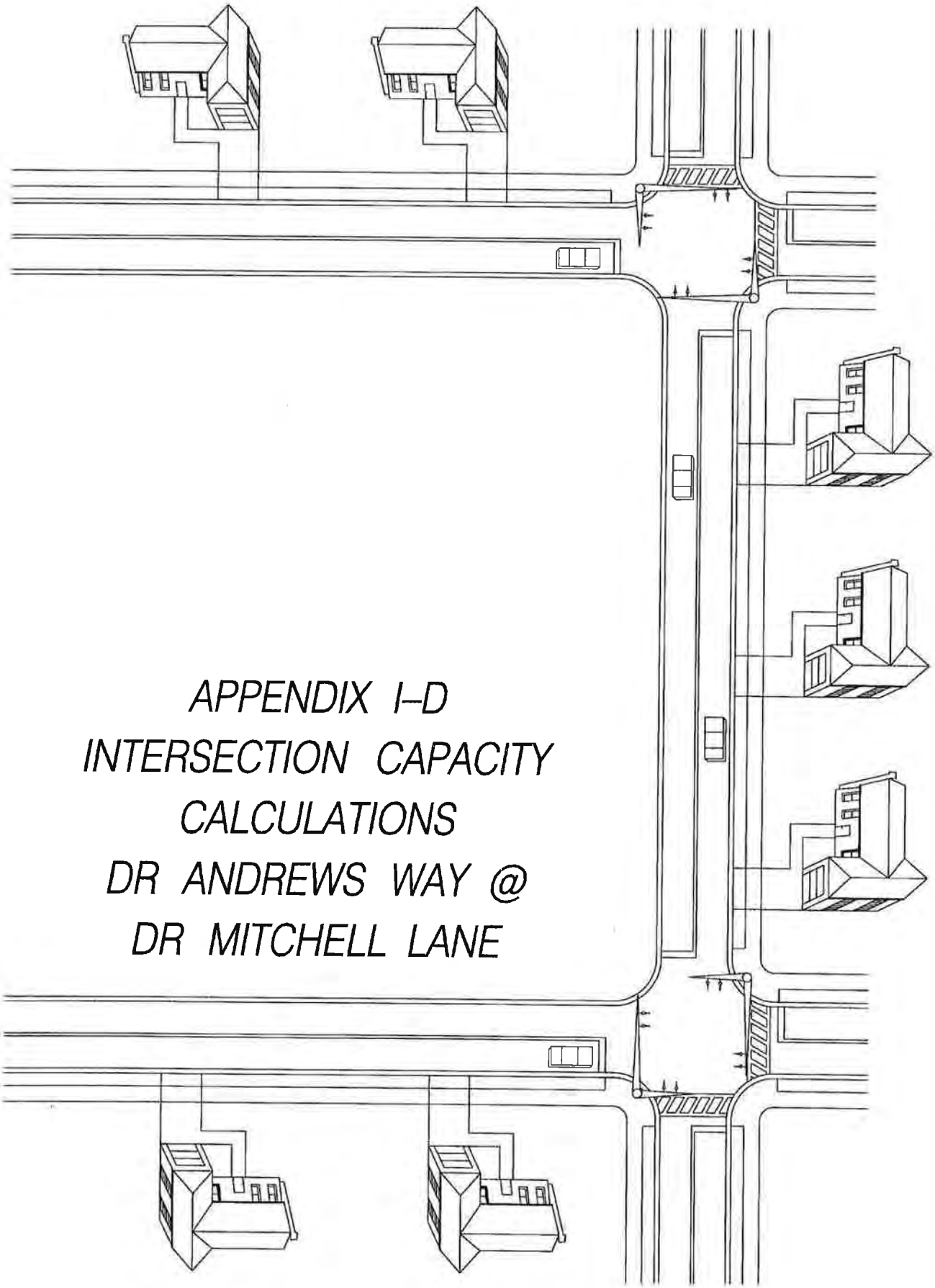
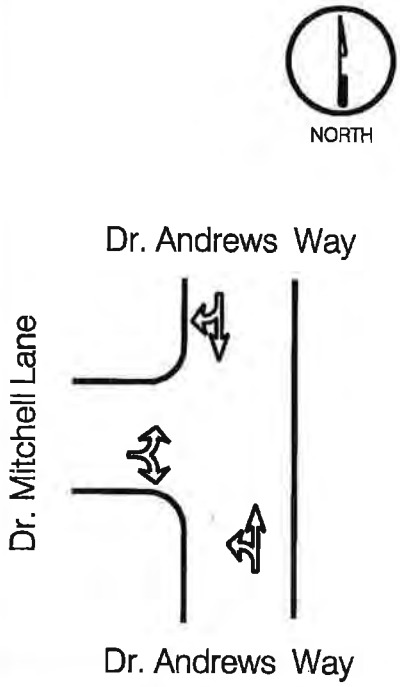


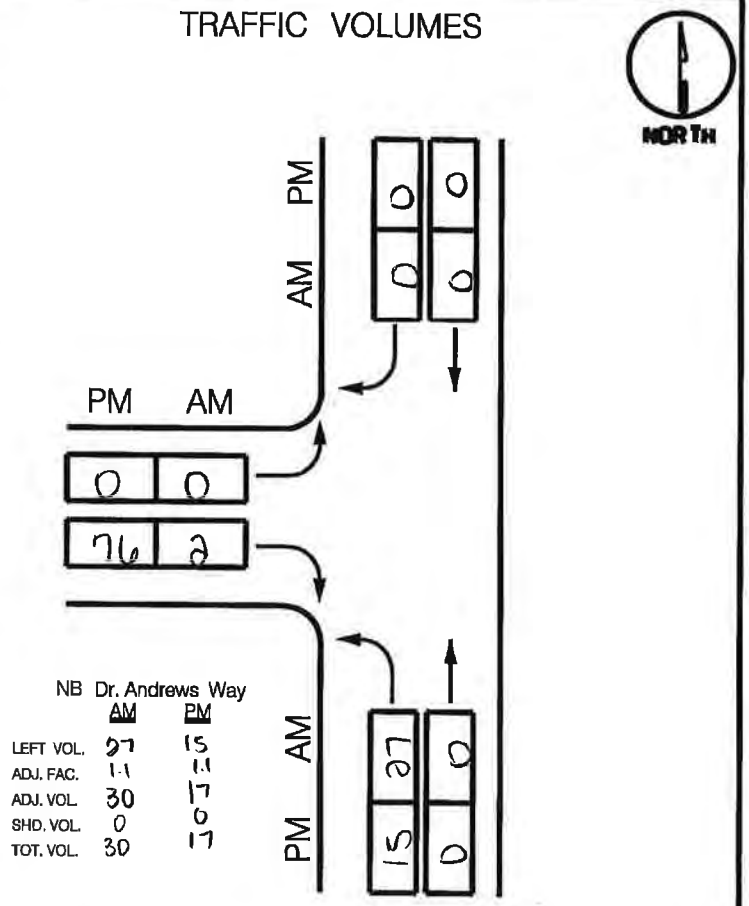
APPENDIX I–D
INTERSECTION CAPACITY CALCULATIONS
DR ANDREWS WAY @ DR MITCHELL LANE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



NB Dr. Andrews Way

	AM	PM
LEFT VOL.	27	15
ADJ. FAC.	1.1	1.1
ADJ. VOL.	30	17
SHD. VOL.	0	0
TOT. VOL.	30	17

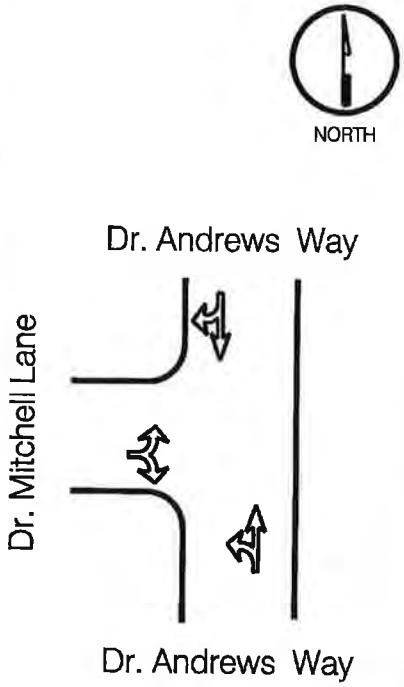
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	30 *1.0	30*	
	SB	0 *1.0 + 27 *1.0	27	
	EB	(0 + 2) *1.0	2*	A 32
	WB	—	—	
PM	NB	17 *1.0	17*	
	SB	0 *1.0 + 15 *1.0	15	
	EB	(0 + 76) *1.0	76*	A 93
	WB	—	—	

CRITICAL LANE ANALYSIS

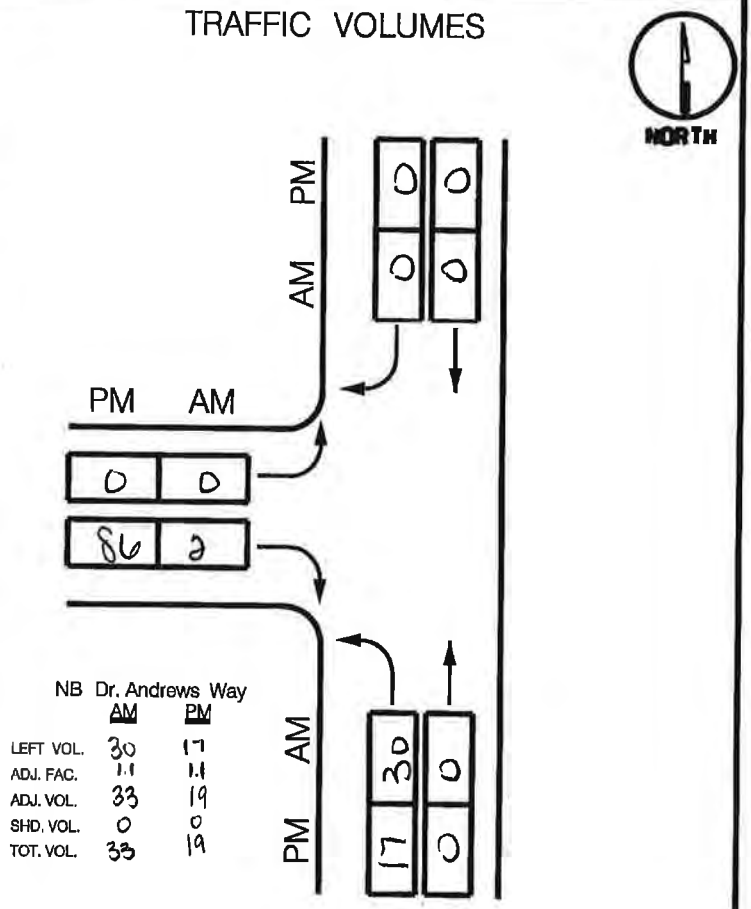
Prepared By: C. ATKINSON Condition: EXISTING

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



NB Dr. Andrews Way

	AM	PM
LEFT VOL.	30	17
ADJ. FAC.	1.1	1.1
ADJ. VOL.	33	19
SHD. VOL.	0	0
TOT. VOL.	33	19

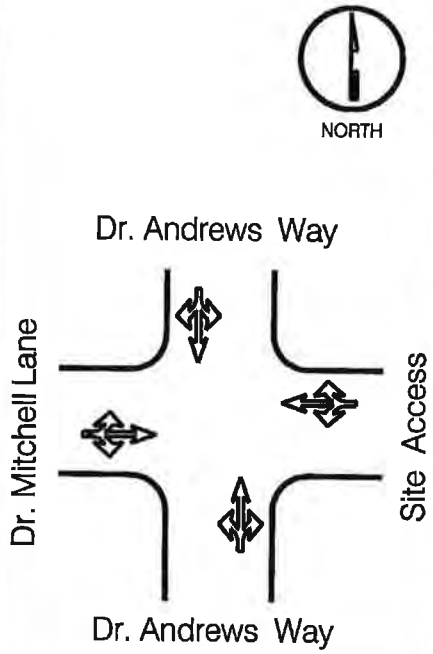
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	33 *1.0	33*	
	SB	0 *1.0 + 30 *1.0	30	
	EB	(0 + 2) *1.0	2*	A
	WB	—	—	3S
PM	NB	19 *1.0	19*	
	SB	0 *1.0 + 17 *1.0	17	
	EB	(0 + 86) *1.0	86*	A
	WB	—	—	10S

CRITICAL LANE ANALYSIS

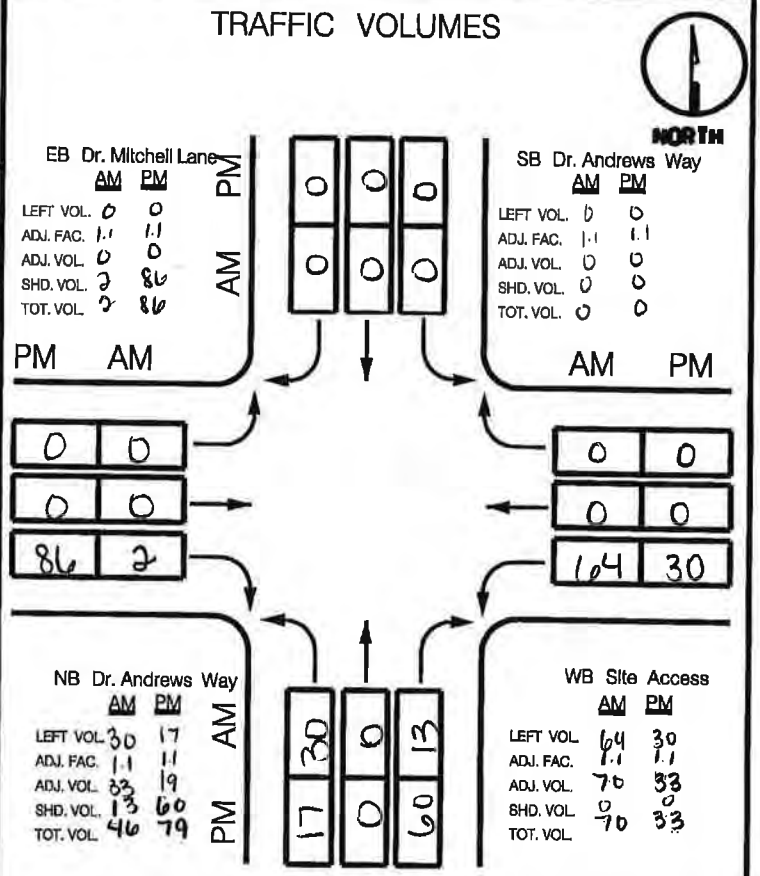
Prepared By: C. ATKINSON Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	46 * 1.0 + 0 * 1.0	46*	
	SB	0 * 1.0 + 30 * 1.0	30	
	EB	2 * 1.0 + 64 * 1.0	66	A
	WB	70 * 1.0 + 0 * 1.0	70*	116
PM	NB	79 * 1.0 + 0 * 1.0	79*	
	SB	0 * 1.0 + 17 * 1.0	17	
	EB	86 * 1.0 + 30 * 1.0	116*	A
	WB	33 * 1.0 + 0 * 1.0	33	195

CRITICAL LANE ANALYSIS

Prepared By: C. ATKINSON Condition: FUTURE

HCS 2010 Two-Way Stop Control Summary Report

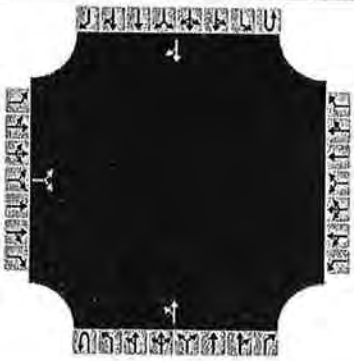
General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	11/1/2016
Analysis Year	2016
Time Analyzed	Existing - AM Peak
Intersection Orientation	North-South
Project Description	3297 - CIRI Property

Site Information

Intersection	Dr. Andrews @ Dr. Mitchel
Jurisdiction	Charles County, Maryland
East/West Street	Dr. MitchellLane/Site
North/South Street	Dr. Andrews Way
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		0		2						27	0				0	0
Percent Heavy Vehicles		2		2						2						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			2							30						
Capacity			1084							1622						
v/c Ratio			0.00							0.02						
95% Queue Length			0.0							0.1						
Control Delay (s/veh)			8.3							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	8.3								7.3							
Approach LOS	A															

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	11/1/2016
Analysis Year	2016
Time Analyzed	Existing - PM Peak
Intersection Orientation	North-South
Project Description	3297 - CIRI Property

Site Information

Intersection	Dr. Andrews @ Dr. Mitchel
Jurisdiction	Charles County, Maryland
East/West Street	Dr. MitchellLane/Site
North/South Street	Dr. Andrews Way
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes

Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		0		76						15	0				0	0
Percent Heavy Vehicles		2		2						2						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			84							17						
Capacity			1084							1622						
v/c Ratio			0.08							0.01						
95% Queue Length			0.3							0.0						
Control Delay (s/veh)			8.6							7.2						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	8.6								7.2							
Approach LOS	A															

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	11/1/2016
Analysis Year	2016
Time Analyzed	Background - AM Peak
Intersection Orientation	North-South
Project Description	3297 - CIRI Property

Site Information

Intersection	Dr. Andrews @ Dr. Mitchel
Jurisdiction	Charles County, Maryland
East/West Street	Dr. MitchellLane/Site
North/South Street	Dr. Andrews Way
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes

Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		0		2						30	0				0	0
Percent Heavy Vehicles		2		2						2						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			2							33						
Capacity			1084							1622						
v/c Ratio			0.00							0.02						
95% Queue Length			0.0							0.1						
Control Delay (s/veh)			8.3							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	8.3								7.3							
Approach LOS	A															

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	Dr. Andrews @ Dr. Mitchel
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	11/1/2016	East/West Street	Dr. MitchellLane/Site
Analysis Year	2016	North/South Street	Dr. Andrews Way
Time Analyzed	Background - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		0		86						17	0				0	0
Percent Heavy Vehicles		2		2						2						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			96							19						
Capacity			1084							1622						
v/c Ratio			0.09							0.01						
95% Queue Length			0.3							0.0						
Control Delay (s/veh)			8.6							7.2						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	8.6								7.2							
Approach LOS	A															

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HCS 2010 Two-Way Stop Control Summary Report

General Information

Analyst	C. Atkinson
Agency/Co.	Traffic Concepts, Inc.
Date Performed	11/1/2016
Analysis Year	2016
Time Analyzed	Future - AM Peak
Intersection Orientation	North-South
Project Description	3297 - CIRI Property

Site Information

Intersection	Dr. Andrews @ Dr. Mitchel
Jurisdiction	Charles County, Maryland
East/West Street	Dr. MitchellLane/Site
North/South Street	Dr. Andrews Way
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes

Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	0	2		64	0	0		30	0	13		0	0	0
Percent Heavy Vehicles		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			2				71			33				0		
Capacity			1084				916			1622				1603		
v/c Ratio			0.00				0.08			0.02				0.00		
95% Queue Length			0.0				0.3			0.1				0.0		
Control Delay (s/veh)			8.3				9.3			7.3				7.2		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)	8.3				9.3				5.1							
Approach LOS	A				A											

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HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	C. Atkinson	Intersection	Dr. Andrews @ Dr. Mitchel
Agency/Co.	Traffic Concepts, Inc.	Jurisdiction	Charles County, Maryland
Date Performed	11/1/2016	East/West Street	Dr. MitchellLane/Site
Analysis Year	2016	North/South Street	Dr. Andrews Way
Time Analyzed	Future - PM Peak	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	3297 - CIRI Property		

Lanes

Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	0	86		30	0	0		17	0	60		0	0	0
Percent Heavy Vehicles		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			96				33			19				0		
Capacity			1084				855			1622				1533		
v/c Ratio			0.09				0.04			0.01				0.00		
95% Queue Length			0.3				0.1			0.0				0.0		
Control Delay (s/veh)			8.6				9.4			7.2				7.3		
Level of Service (LOS)			A				A			A				A		
Approach Delay (s/veh)	8.6				9.4				1.7							
Approach LOS	A				A											

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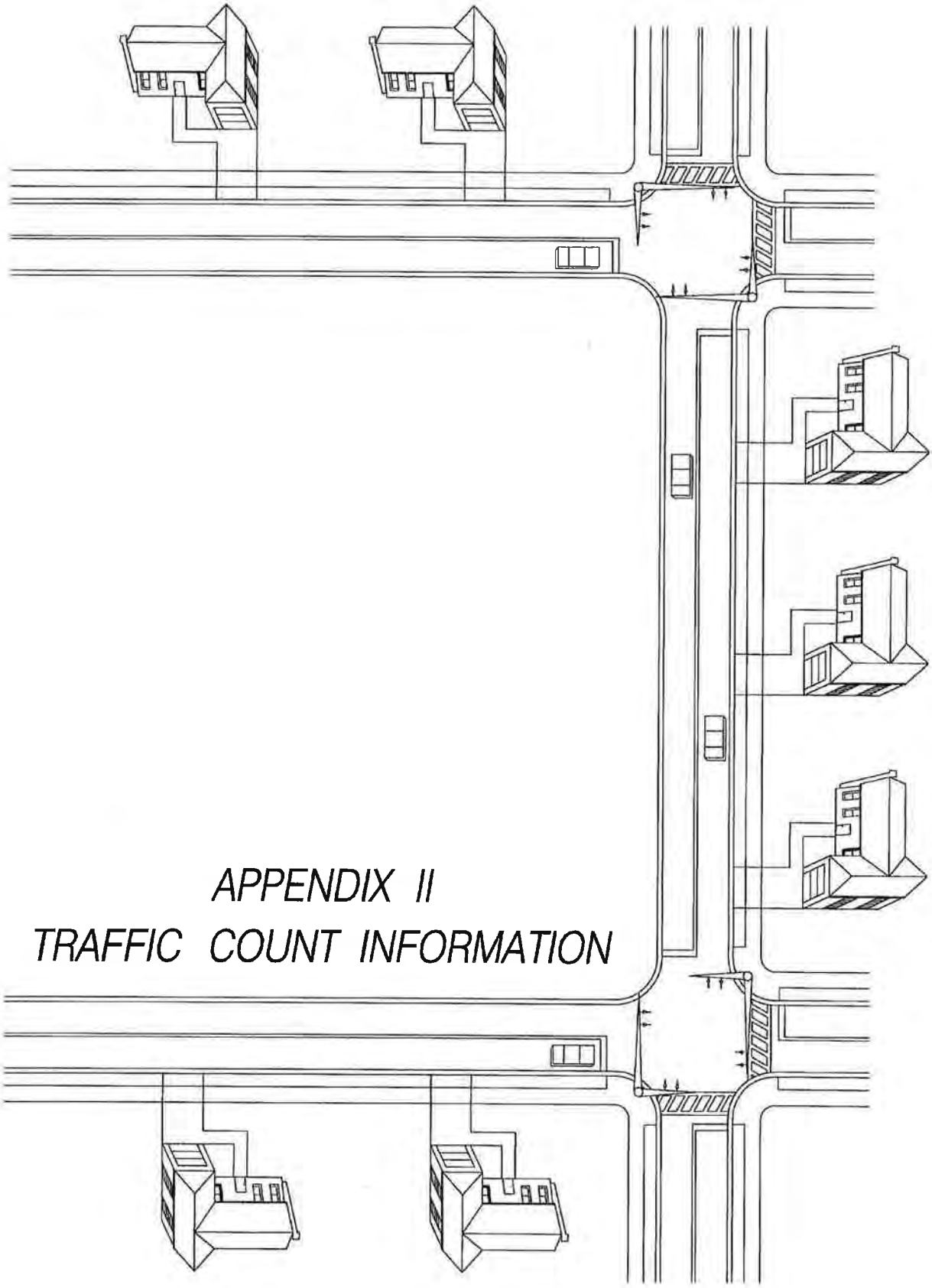

APPENDIX II
TRAFFIC COUNT INFORMATION

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 210 @ DR. ANDREWS WAY **COUNTY:** CHARLES

COUNT BY: J. JONES **DATE:** OCTOBER 19, 2016

WEATHER: CLEAR **DAY:** WEDNESDAY

	BUSINESS ACCESS/ INDIAN HEAD AVE NORTHBOUND			DR. ANDREWS WAY SOUTHBOUND			MD 210 EASTBOUND			MD 210 WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:30-6:45	2	0	2	7	0	0	1	24	0	1	93	2	132
6:45-7:00	0	0	5	10	0	1	1	14	2	2	136	2	173
7:00-7:15	1	0	8	4	1	0	0	27	0	1	150	0	192
7:15-7:30	2	0	4	5	0	0	0	18	2	4	158	0	193
7:30-7:45	6	0	5	5	0	1	0	19	0	5	144	2	187
7:45-8:00	2	1	8	5	0	0	0	15	1	2	119	3	156
8:00-8:15	2	0	7	9	0	0	0	38	0	3	119	3	181
8:15-8:30	2	0	5	5	0	0	0	30	1	4	102	3	152
8:30-8:45	1	0	4	4	0	1	0	36	2	2	89	5	144
8:45-9:00	7	0	2	1	0	0	4	33	0	2	112	14	175
PEAK HR 6:45-7:45 TOTALS	9	0	22	24	1	2	1	78	4	12	588	4	PHF 0.97
PM													
4:00-4:15	2	0	6	1	0	0	0	153	2	4	22	0	190
4:15-4:30	2	0	5	1	0	0	1	110	3	3	41	2	168
4:30-4:45	0	0	9	3	0	0	0	211	5	1	38	2	269
4:45-5:00	1	0	7	2	0	0	0	139	2	7	26	1	185
5:00-5:15	1	0	3	4	0	1	0	188	2	2	30	1	232
5:15-5:30	0	0	2	3	0	0	1	135	3	6	35	1	186
5:30-5:45	0	0	3	2	0	0	3	129	0	4	34	1	176
5:45-6:00	2	0	2	7	0	1	0	117	1	5	42	5	182
6:00-6:15	1	0	7	5	0	0	0	98	3	2	37	4	157
6:15-6:30	2	0	13	4	0	0	0	78	2	5	39	6	149
PEAK HR 4:30-5:30 TOTALS	2	0	21	12	0	1	1	673	12	16	129	5	PHF 0.81

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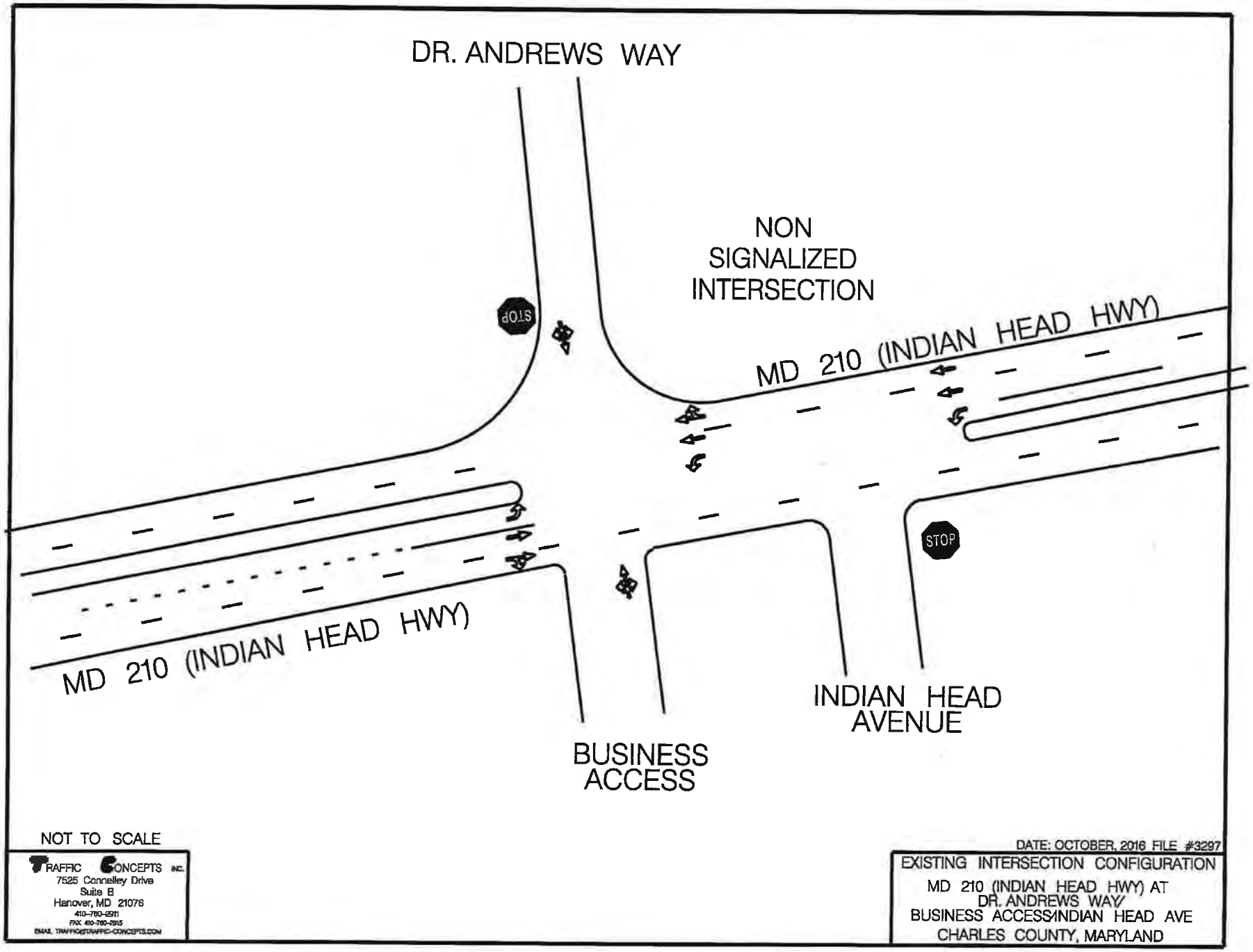
DR. ANDREWS WAY
NON
SIGNALIZED
INTERSECTION
STOP
MD 210 (INDIAN HEAD HWY)
STOP
MD 210 (INDIAN HEAD HWY)
INDIAN HEAD
AVENUE
BUSINESS
ACCESS
NOT TO SCALE
TRAFFIC CONCEPTS INC.
7525 Connelley Drive
Suite B
Hanover, MD 21076
410-760-2911
FAX 410-760-2915
EMAIL TRAFFIC@TRAFFIC-CONCEPTS.COM
DATE: OCTOBER, 2016 FILE #3297
EXISTING INTERSECTION CONFIGURATION
MD 210 (INDIAN HEAD HWY) AT
DR. ANDREWS WAY/
BUSINESS ACCESS/INDIAN HEAD AVE
CHARLES COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 210 @ RIVERWATCH BOULEVARD **COUNTY:** CHARLES

COUNT BY: J. JONES / T. SMITH **DATE:** OCTOBER 18, 2016

WEATHER: CLEAR **DAY:** TUESDAY

	NORTHBOUND			RIVERWATCH BLVD SOUTHBOUND			MD 210 EASTBOUND			MD 210 WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT		THRU	RIGHT	TOTAL
AM													
6:30-6:45				12		0	0	24			125	2	163
6:45-7:00				7		2	0	37			156	3	205
7:00-7:15				15		2	0	37			177	1	232
7:15-7:30				8		2	0	34			184	1	229
7:30-7:45				8		0	0	36			143	3	190
7:45-8:00				9		1	1	26			157	1	195
8:00-8:15				8		6	2	62			163	0	241
8:15-8:30				6		0	1	37			139	4	187
8:30-8:45				5		2	1	60			115	3	186
8:45-9:00				16		0	1	37			118	4	176
PEAK HR 6:45-7:45 TOTALS				38		6	0	144			660	8	PHF 0.92
PM													
4:00-4:15				1		0	0	190			58	5	254
4:15-4:30				5		0	2	123			42	9	181
4:30-4:45				8		0	1	253			36	6	304
4:45-5:00				9		0	0	161			54	4	228
5:00-5:15				4		1	0	221			44	13	283
5:15-5:30				4		0	0	154			54	5	217
5:30-5:45				5		1	1	149			47	9	212
5:45-6:00				1		1	2	109			58	17	188
6:00-6:15				5		0	0	107			55	12	179
6:15-6:30				6		1	0	106			52	8	173
PEAK HR 4:30-5:30 TOTALS				25		1	1	789			188	28	PHF 0.85

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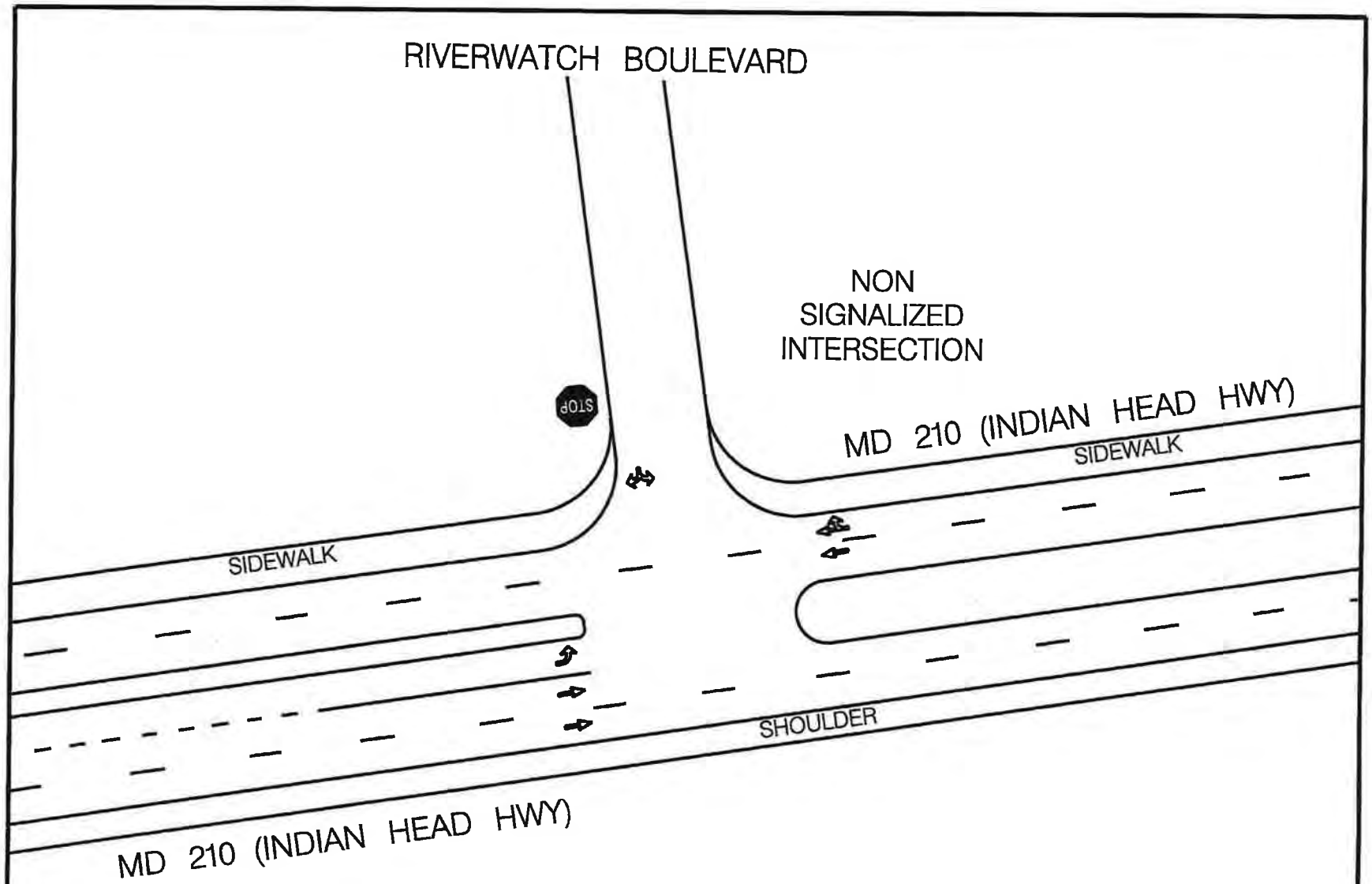

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DATE: OCTOBER, 2016 FILE #3297

EXISTING INTERSECTION CONFIGURATION

MD 210 (INDIAN HEAD HWY) AT
RIVERWATCH BOULEVARD

CHARLES COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 210 @ MD 225

COUNTY: CHARLES

COUNT BY: T. SMITH / J. JONES

DATE: OCTOBER 19, 2016

WEATHER: CLEAR

DAY: WEDNESDAY

	MD 225 NORTHBOUND			SOUTHBOUND			MD 210 EASTBOUND			MD 210 WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	U-TURN	TOTAL
AM													
6:30-6:45	51		10					70	13	6	83	0	233
6:45-7:00	56		8					62	10	8	88	0	232
7:00-7:15	68		3					72	34	24	107	0	308
7:15-7:30	85		7					59	16	5	87	0	259
7:30-7:45	54		10					74	19	6	88	1	252
7:45-8:00	61		11					72	13	9	96	2	264
8:00-8:15	70		11					81	26	11	73	1	273
8:15-8:30	31		13					75	25	21	67	0	232
8:30-8:45	52		6					61	28	18	76	0	241
8:45-9:00	31		6					68	24	8	85	1	223
PEAK HR 7:00-8:00 TOTALS	268		31					277	82	44	378	3	PHF 0.88
PM													
4:00-4:15	15		4					120	72	26	93	3	333
4:15-4:30	45		5					95	66	27	96	4	338
4:30-4:45	20		8					138	107	32	76	1	382
4:45-5:00	27		13					156	96	35	80	3	410
5:00-5:15	36		5					160	98	56	116	6	477
5:15-5:30	24		4					122	87	25	93	3	358
5:30-5:45	21		6					132	85	31	104	3	382
5:45-6:00	23		8					107	53	27	116	2	336
6:00-6:15	30		6					87	52	19	100	2	296
6:15-6:30	24		3					94	31	20	86	3	261
PEAK HR 4:30-5:30 TOTALS	107		30					576	388	148	365	13	PHF 0.85

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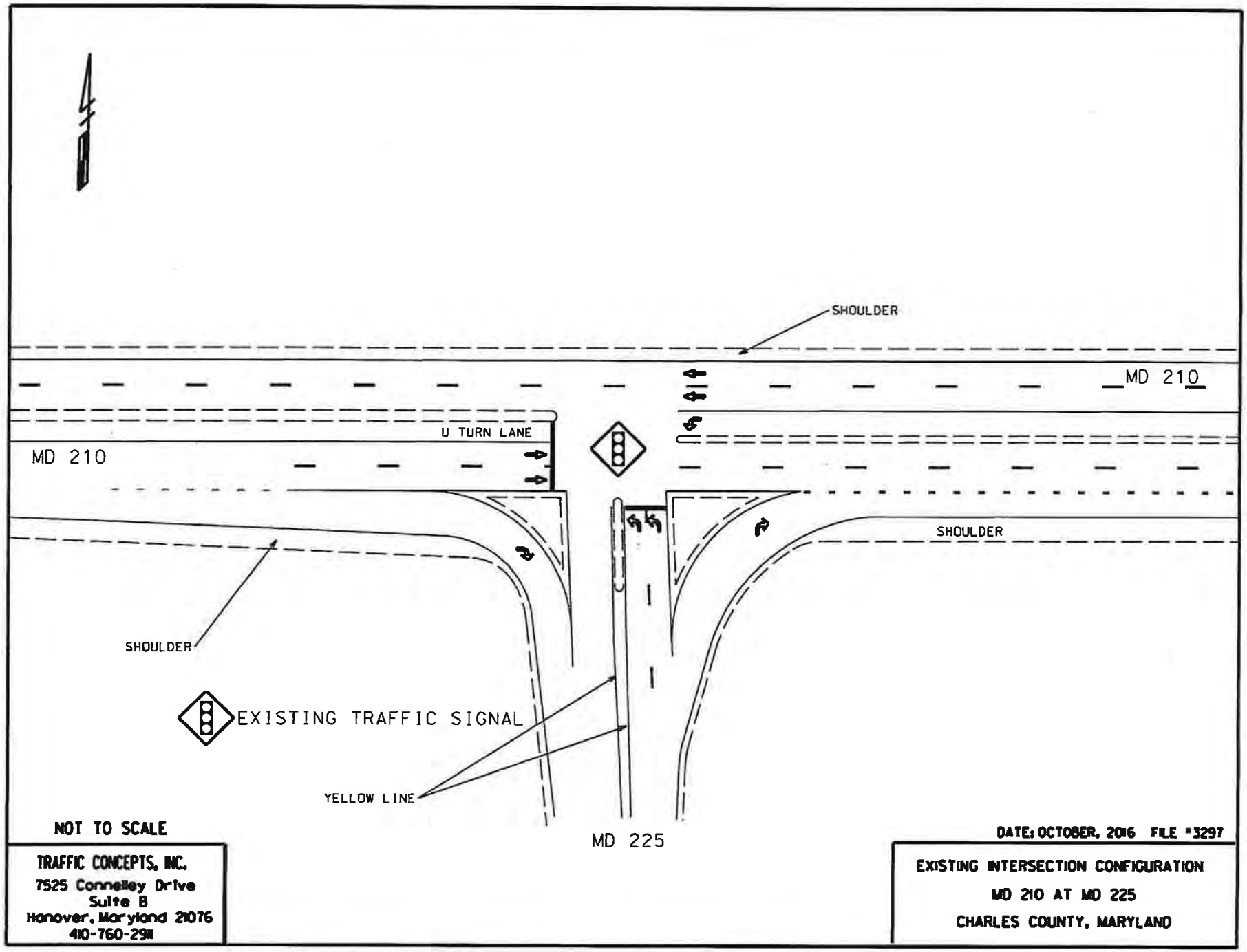
SHOULDER
MD 210
U TURN LANE
MD 210
SHOULDER
SHOULDER
EXISTING TRAFFIC SIGNAL
YELLOW LINE
MD 225
NOT TO SCALE
DATE: OCTOBER, 2016 FILE #3297
TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911
EXISTING INTERSECTION CONFIGURATION
MD 210 AT MD 225
CHARLES COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: DR. ANDREWS WAY @ DR. MITCHELL LANE

COUNTY: CHARLES

COUNT BY: T. SMITH

DATE: OCTOBER 27, 2016

WEATHER: AM - CLEAR PM - RAIN

DAY: THURSDAY

	DR. ANDREWS WAY NORTHBOUND			DR. ANDREWS WAY SOUTHBOUND			DR. MITCHELL LANE EASTBOUND			WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:30-6:45	2								1				3
6:45-7:00	2								1				3
7:00-7:15	4								0				4
7:15-7:30	9								0				9
7:30-7:45	4								3				7
7:45-8:00	3								1				4
8:00-8:15	3								1				4
8:15-8:30	0								0				0
8:30-8:45	3								1				4
8:45-9:00	21								0				21
PEAK HR 8:00-9:00 TOTALS	27								2				PHF 0.35
PM													
4:00-4:15	9								8				17
4:15-4:30	5								49				54
4:30-4:45	1								17				18
4:45-5:00	0								2				2
5:00-5:15	1								0				1
5:15-5:30	2								2				4
5:30-5:45	1								0				1
5:45-6:00	0								1				1
6:00-6:15	0								1				1
6:15-6:30	2								1				3
PEAK HR 4:00-5:00 TOTALS	15								76				PHF 0.42

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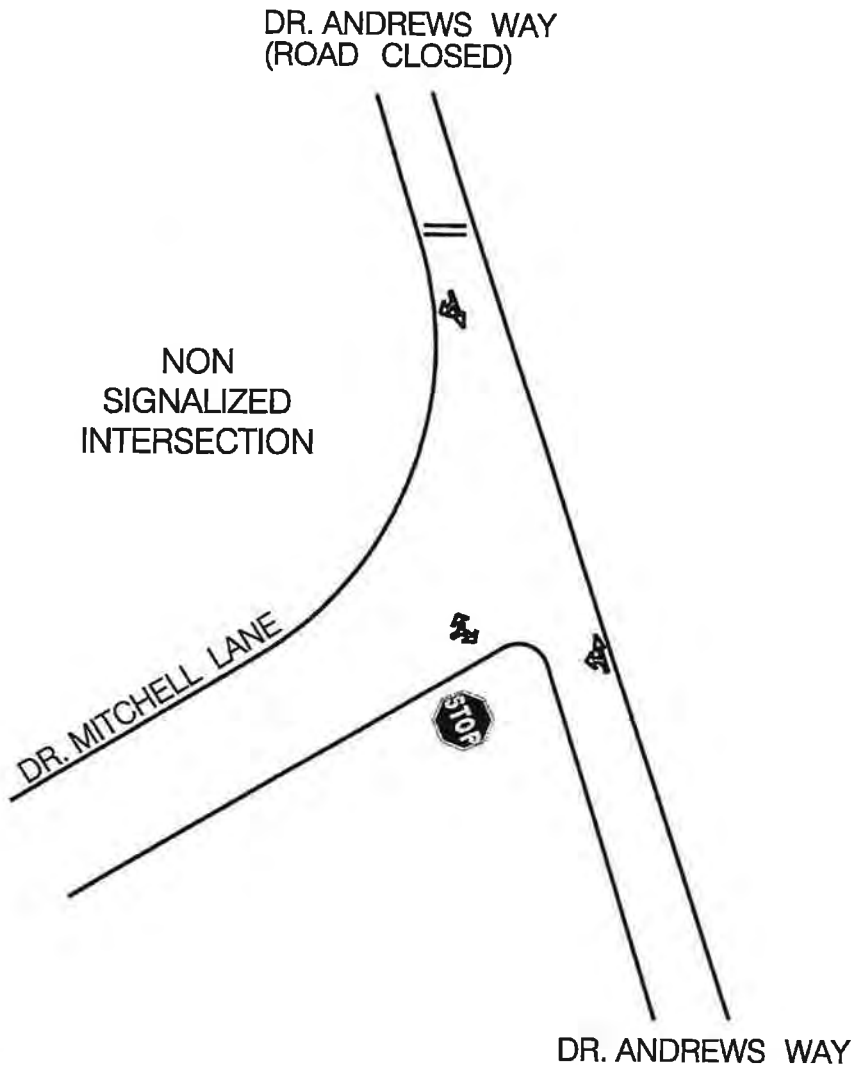

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410-760-2911
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DATE: OCTOBER, 2016 FILE # 3297

EXISTING INTERSECTION CONFIGURATION
DR. ANDREWS WAY AND
DR. MITCHELL LANE
CHARLES COUNTY, MARYLAND