October 10, 2005

TO: John Szerlag, City Manager

FROM: Brian P. Murphy, Asst. City Manager/Services
Steve Vandette, City Engineer
John K. Abraham, Traffic Engineer

SUBJECT: Agenda Item – Traffic Committee Recommendations – September 21, 2005

At the Traffic Committee meeting of September 21, 2005, the following recommendations were made for City Council approval:

1. To recommend no changes at Sandshores and Walker (Item 7).

2. To recommend that parking be prohibited on the east side of English from 30 feet south of the 5350 driveway to the 2687 driveway, between 7 a.m. and 4 p.m. school days only;
and
to recommend prohibiting parking on the east side of Blair north of the driveway at 2680 to English, between 7 a.m. and 4 p.m. school days only (Item 8).

3. To recommend NOT installing 3-way STOP signs at Heatherwood and Northfield Parkway, but to install an advisory sign on southbound Northfield Parkway indicating that there is a hidden intersection ahead, in a location north of the intersection to be determined by the traffic engineer. This request does not meet the MMUTCD warrants for all-way stop signs. (Item 9)

4. To recommend no changes to the Glyndebourne/Chalgrove/Dalesford intersection (Item 10).

5. To recommend that fire lanes/tow away zones shown in the attached sketch be established at Cambridge Crossing 1, Maple Road (Item 12).

6. To recommend that fire lanes/tow away zones shown in the attached sketch be established at Regents Park – Alisop (Item 13).

7. To recommend that fire lanes/tow away zones shown in the attached sketch be established at Regents Park – Melcombe (Item 14).

8. To recommend that fire lanes/tow away zones shown in the attached sketch be established at Rochester Commons Condos (Item 15).

TRAFFIC COMMITTEE MINUTES SEPTEMBER 21, 2005 DRAFT

A regular meeting of the Troy Traffic Committee was held Wednesday, September 21, 2005 in the Lower Level Conference Room at Troy City Hall. Jan Hubbell called the meeting to order at 7:30 p.m.

1. Roll Call

PRESENT: Ted Halsey
Jan Hubbell
Richard Kilmer
Richard Minnick
Peter Ziegenfelder
Katherine Tan, Student Representative

ABSENT: John Diefenbaker

Also present: John Abraham, Traffic Engineer
Sgt. Robert Redmond, Police Department
Lt. Robert Matlick, Fire Department

and Mary Ann and Ray Trepanier, 5331 Blair
Mike Johnson, 450 E. Square Lake
Murray Deagle, 328 Evaline
Kim Clark, 3330 Kilmer
Shane Diehl, 23201 Jefferson
Yolanda Ray, 5350 English
Michael Debs, 1501 Heatherwood
Deborah Miela, 2410 Dalesford
Gloria Gold, 2410 Dalesford

Resolution to Excuse Absent Members

RESOLUTION #2005-09-42
Moved by Kilmer
Seconded by Halsey

To excuse Mr. Diefenbaker.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

2. Minutes – July 20, 2005

RESOLUTION #2005-09-43
Moved by Kilmer
Seconded by Ziegenfelder

To approve the July 20, 2005 minutes as printed.

YES: All-5
NO: None
ABSENT: Diefenbaker

MOTION CARRIED

PUBLIC HEARINGS

3. Request for Sidewalk Waiver – 450 East Square Lake

Mike Johnson is requesting a waiver for the sidewalk at 450 East Square Lake. The sidewalk ordinance requires that sidewalk be installed in conjunction with the development of this parcel due to a recent lot split, combined and replatted. The Public Works Department recommends denial of this waiver request. Petitioner has signed an "Agreement for Irrevocable Petition for Sidewalks."

Petitioner states that there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing.

The Traffic Engineer received a letter from Tsan-Hai Chue, who strongly objects to the waiver.

Mr. Johnson pointed out that there is a sidewalk on the north side of Square Lake, and none on the south side except west of the school near Donaldson.

RESOLUTION #2005-09-44
Moved by Halsey
Seconded by Kilmer

1. WHEREAS, City of Troy Ordinances, Chapter 34, Section 8(D) allows the Traffic Committee to grant temporary waivers of the City of Troy Design Standards for Sidewalks upon a demonstration of necessity; and

   WHEREAS, Mike Johnson has requested a temporary waiver of the requirement to construct a sidewalk on the property because there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing; and

   WHEREAS, the Traffic Committee has determined the following:

   a. A variance will not impair the public health, safety or general welfare of the inhabitants of the City and will not unreasonably diminish or impair

established property values within the surrounding area, and

b. A strict application of the requirements to construct a sidewalk would result in practical difficulties to, or undue hardship upon, the owners, and

c. The construction of a new sidewalk on the property line would lead nowhere and connect to no other walk, and thus will not serve the purpose of a pedestrian travel-way.

NOW THEREFORE, BE IT RESOLVED that the Traffic Committee grants a two-year waiver of the sidewalk requirement for the property at 450 East Square Lake, which is owned by Mike Johnson.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

4. Request for Sidewalk Waiver – 1687 Westwood

Mike Johnson is requesting a waiver for the sidewalk at 1687 Westwood. The sidewalk ordinance requires that sidewalk be installed in conjunction with the development of this parcel due to a recent lot split, combined and replatted. The Public Works Department recommends denial of this waiver request. Petitioner has signed an "Agreement for Irrevocable Petition for Sidewalks."

Petitioner states that there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing.

Mr. Johnson said none of the residences on Westwood have sidewalks. There is a short stretch of sidewalk on both sides of Westwood in front of two commercial properties.

RESOLUTION #2005-09-45
Moved by Minnick
Seconded by Halsey

1. WHEREAS, City of Troy Ordinances, Chapter 34, Section 8(D) allows the Traffic Committee to grant temporary waivers of the City of Troy Design Standards for Sidewalks upon a demonstration of necessity; and

WHEREAS, Mike Johnson has requested a temporary waiver of the requirement to construct a sidewalk on the property because there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing; and

WHEREAS, the Traffic Committee has determined the following:

a. A variance will not impair the public health, safety or general welfare of the inhabitants of the City and will not unreasonably diminish or impair established property values within the surrounding area, and

b. A strict application of the requirements to construct a sidewalk would result in practical difficulties to, or undue hardship upon, the owners, and

c. The construction of a new sidewalk on the property line would lead nowhere and connect to no other walk, and thus will not serve the purpose of a pedestrian travel-way.

NOW THEREFORE, BE IT RESOLVED that the Traffic Committee grants a two-year waiver of the sidewalk requirement for the property at 1687 Westwood, which is owned by Mike Johnson.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

5. Request for Sidewalk Waiver – 3358 Kilmer

RWT Building is requesting a waiver for the sidewalk at 3358 Kilmer. The sidewalk ordinance requires that sidewalk be installed in conjunction with the development of this parcel due to a recent lot split, combined and replatted. The Public Works Department recommends denial of this waiver request. Petitioner has signed an "Agreement for Irrevocable Petition for Sidewalks."

Petitioner states that there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing.

Murray Deagle, representing RWT Building, said there are open ditches all along Kilmer. Mr. Haley asked if RWT would be building any other houses on Kilmer. Mr. Deagle said he might if one were for sale. He mostly does infill construction.

Kim Clark, 3330 Kilmer, doesn't want sidewalks. If sidewalks were put in along Kilmer, all the beautiful shade trees would have to be taken down.

RESOLUTION #2005-09-46
Moved by Halsey
Seconded by Kilmer

1. WHEREAS, City of Troy Ordinances, Chapter 34, Section 8(D) allows the Traffic Committee to grant temporary waivers of the City of Troy Design Standards for Sidewalks upon a demonstration of necessity; and

WHEREAS, RWT has requested a temporary waiver of the requirement to construct a sidewalk on the property because there are no other sidewalks

in the area, the sidewalk would lead nowhere and connect to nothing; and

WHEREAS, the Traffic Committee has determined the following:

a. A variance will not impair the public health, safety or general welfare of the inhabitants of the City and will not unreasonably diminish or impair established property values within the surrounding area, and

b. A strict application of the requirements to construct a sidewalk would result in practical difficulties to, or undue hardship upon, the owners, and

c. The construction of a new sidewalk on the property line would lead nowhere and connect to no other walk, and thus will not serve the purpose of a pedestrian travel-way.

NOW THEREFORE, BE IT RESOLVED that the Traffic Committee grants a two-year waiver of the sidewalk requirement for the property at 3358 Kilmer, which is owned by RWT Building.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

6. Request for Sidewalk Waiver – 1674 Van Courtland

RWT Building is requesting a waiver for the sidewalk at 1674 Van Courtland. The sidewalk ordinance requires that sidewalk be installed in conjunction with the development of this parcel due to a recent lot split, combined and replatted. The Public Works Department recommends denial of this waiver request. Petitioner has signed an "Agreement for Irrevocable Petition for Sidewalks."

Petitioner states that there are no other sidewalks in the area, the sidewalk would lead nowhere and connect to nothing. There are a few odd lots with sidewalks on the west side of the street. There are ditches along Van Courtland, and shade trees that would have to be destroyed to construct sidewalks.

RESOLUTION #2005-09-47
Moved by Halsey
Seconded by Kilmer

1. WHEREAS, City of Troy Ordinances, Chapter 34, Section 8(D) allows the Traffic Committee to grant temporary waivers of the City of Troy Design Standards for Sidewalks upon a demonstration of necessity; and

WHEREAS, RWT Building has requested a temporary waiver of the requirement to construct a sidewalk on the property because there are no other sidewalks in the area, the sidewalk would lead nowhere and connect

to nothing; and

WHEREAS, the Traffic Committee has determined the following:

a. A variance will not impair the public health, safety or general welfare of the inhabitants of the City and will not unreasonably diminish or impair established property values within the surrounding area, and

b. A strict application of the requirements to construct a sidewalk would result in practical difficulties to, or undue hardship upon, the owners, and

c. The construction of a new sidewalk on the property line would lead nowhere and connect to no other walk, and thus will not serve the purpose of a pedestrian travel-way.

NOW THEREFORE, BE IT RESOLVED that the Traffic Committee grants a two-year waiver of the sidewalk requirement for the property at 1674 Van Courtland, which is owned by RWT Building.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

REGULAR BUSINESS

Motion to Take Items Out of Order

RESOLUTION #2005-09-48
Moved by Halsey
Seconded by Kilmer

To take Items 8, 9, and 10 out of order.

7. Install YIELD Sign on Sandshores at Walker

Paul Clark, 1695 Three Lakes, requests a YIELD sign on Sandshores at Walker. Both ends of Sandshores run into Walker in two separate locations. There is currently a YIELD sign at the south end of Sandshores, and Mr. Clark wants another one installed at the north end of Sandshores to be consistent. Mr. Clark also mentioned that he sees some confusion from vehicles that exit Sandshores onto Walker drive.

Traffic volume on Sandshores was found to be around 200 vehicles in a day, and on Walker around 545 vehicles in a day. No significant sight obstructions were observed at the intersection. Traffic crash history shows no crashes in the past 3 years at the intersection. Traffic volumes on Troy residential streets range

between 300 and 5000 vehicles per day.

The petitioner did not attend the meeting, and the committee saw no necessity for a YIELD sign at this location

RESOLUTION #2005-09-49
Moved by Kilmer
Seconded by Minnick

Recommend no changes at Sandshores and Walker.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

8. Establish Parking Restrictions at the Curve on English at Blair

Mary Ann Trepanier, 5331 Blair, requests parking restrictions at the curve on English at Blair. Ms. Trepanier reports that vehicles parked on this curve serve as a sight obstruction to traffic on the roadway due to the curve and the intersection of Blair. She reported that she has seen several close calls when there are vehicles parked along the curve. This route also serves a lot of the school traffic and she feels it is prudent to restrict parking on this curve so that the area is safer. English runs from Dequindre and serves as a route to the school, and also connects to Highbury, which leads to the rest of the neighborhood.

Ms. Trepanier passed out drawings of the area. She reported that school children cross at this corner, and the big school buses often run over the curb trying to get around parked cars. She said there the same problem on Blair near the corner and would like parking prohibited there. Ray Trepanier says English is used as a shortcut to Dequindre, and would like to see no parking allowed in front of 2680 English.

Another citizen at 5350 reports that there is also a speed problem in the area. His daughter was a safety patrol person and found it very hard to help kids cross the street at this location. He would like to see a 3-way STOP there.

Sgt. Redmond said English is heavily traveled, and agrees with the parking restriction request in both areas. He did not recommend a 3-way STOP, but if there were a STOP sign installed, it should be on Blair only.

RESOLUTION #2005-09-50
Moved by Minnick
Seconded by Ziegenfelder

a. Recommend prohibiting parking on the east side of English from 30 feet south of the 5350 driveway to the 2687 driveway, between 7 a.m. and 4 p.m. school days only.

b. Recommend prohibiting parking on the east side of Blair north of the driveway at 2680 to English, between 7 a.m. and 4 p.m. school days only.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

9. Install 3-way STOP signs at Heatherwood and Northfield Parkway

Tom Cooper, 1493 Heatherwood, requests 3-way STOP signs at Heatherwood and Northfield Parkway. Mr. Cooper contacted Lt. McWilliams regarding an ALL-WAY STOP traffic control at this intersection in light of a recent crash at the intersection. Some of the concerns are that the intersection is located on a curve of Northfield parkway, and it is reported that oftentimes vehicles on Heatherwood cannot see oncoming traffic from southbound Northfield Parkway. There is a lot of traffic going to Hamilton Elementary school in the morning and at dismissal times; added to this is all the traffic trying to get to the major roads (Long Lake and Coolidge).

Michael Debs, 1501 Heatherwood, said there were two crashes in the last two months due to speeding on Northfield Parkway. He says there is also a blind spot looking north from Heatherwood at Northfield.

Sgt. Redmond said there is a 240 foot clear sight line looking north, and that is sufficient for safety. He said he is aware of one crash at this location, which is still under investigation, and that there is a possibility that the driver on Heatherwood failed to yield to Northfield traffic.

Katherine Tan said that her personal experience is that many students speed on Northfield going to school. Sgt. Redmond said his traffic studies do not indicate a speeding problem on Northfield. The 85th percentile is below the posted speed limit.

Mr. Ziegenfelder works in a building to the north and doesn't see a problem at this location.

The classification of Northfield Parkway is a "residential collector" street with a speed limit of 35 MPH. The primary function of a collector street is to "collect" traffic from the residential streets and lead them onto major roads. STOP signs are normally installed to assign right-of-way, and Heatherwood being a lower volume residential street has a STOP sign, so that Northfield Parkway has right-of-way at this intersection. A traffic volume study shows that Heatherwood carries around 1400 vehicles in a day while Northfield Parkway carries around 3600

vehicles in a day. There was a recent traffic crash at the intersection, however crash history since 2001 shows only 2 other crashes reported. As such, the 3-WAY STOP signs may not alleviate any traffic crash pattern.

Traffic volumes on Troy residential streets range between 300 and 5000 vehicles per day. For stop signs to be installed at Heatherwood and Northfield Parkway, one of the following conditions should be satisfied as per the Michigan Manual of Uniform Traffic Control Devices:

a. Intersection of a less important road with a main road, where application of a normal right-of-way rule is disruptive to capacity on the main road.

b. Street entering a through highway or street.

c. Unsignalized intersection in a signalized area.

d. Other intersections with a combination of high speed, restricted view and serious accident record.

None of the warrants for an ALL-WAY STOP-controlled intersection have been met for this intersection. It has been documented by different agencies that unwarranted STOP signs normally result in high violation rates and also promote general loss of credibility of all traffic control signs. Attached please find a research document that reviews 70 different articles and papers related to STOP signs that confirm that unwarranted STOP signs do not help traffic safety. This document is also available online at the Traffic Engineering section of the City's website.

RESOLUTION #2005-09-51
Moved by Halsey
Seconded by Kilmer

To recommend not installing 3-way STOP signs at Heatherwood and Northfield Parkway, but to install an advisory sign on southbound Northfield Parkway indicating that there is a hidden intersection ahead, in a location north of the intersection to be determined by the traffic engineer.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

10. Install STOP sign on Glyndebourne at Dalesford

This item was tabled by the committee at the May 18 meeting and reconsidered at the July 20 meeting. Jefree Vang, 2345 Dalesford, requested STOP signs on Glyndebourne at Dalesford. Mr. Vang thinks that this is a very unsafe intersection and does not really know what to do about it but something needs to be done. He said even though he does not know how to cure this problem, safety is the main issue.

This item has been considered by the Traffic Committee a number of times in the past. The present configuration has STOP signs on all approaches that have sight obstructions. Basically, this intersection has five approaches and only Glyndebourne does not have any traffic control. A traffic crash analysis shows no reported crashes in the past five years. Adding STOP signs on Glyndebourne will create more confusion, since this is a five-legged intersection. The only other option is to do some physical changes to the intersection so that a "T" intersection is created at Glyndebourne/Chalgrove, and a four-way intersection at Glyndebourne/Dalesford, as shown in the attachments. Field observations indicate that currently the intersection operates in such a way that there is the least confusion. Attached are copies of earlier items considered by the Traffic Committee on this matter.

Current traffic volumes on the streets entering the intersection in a day are: Dalesford from the east, 114 vehicles per day; Dalesford from the west, 66 vehicles per day; Chalgrove from the south, 257 vehicles per day; Chalgrove from the north, 83 vehicles per day; Glyndebourne from the north, 167 vehicles per day. Traffic volumes on Troy residential streets range between 300 and 5000, and the values observed at this intersection are in the low end of the usual residential traffic volumes.

Years ago a recommendation went to Council to enclose one side of the island so that it would create a three-way T-intersection at Chalgrove and Glyndebourne, and a four-way intersection at Dalesford, Chalgrove and Glyndebourne and was approved. However, one resident went to Council to oppose this and the decision was overturned. The concern with adding more STOP signs here it that a six-way stop-controlled intersection would be created and cause even more confusion.

Dr. Abraham would like the petitioner to talk to area residents and see if they would be receptive to blocking off the short street from Chalgrove to Dalesford and reconfiguring this intersection to make a 3-way T-intersection and a 4-way intersection. He says that reconfiguring is the best solution. A roundabout would work but would also be costly. The intersection of Dalesford and Glyndebourne will be 4-way and controlled by existing STOP signs on Dalesford. The intersection of Glyndebourne and Chalgrove will be 3-way controlled by the existing STOP sign on Chalgrove. The work will also involve widening the section of Glyndebourne between Dalesford and Chalgrove to accommodate two-way traffic.

In May Dr. Abraham requested a delay on any recommendations until he consulted with Engineering to see if this intersection could be reconfigured and how long it would take. The City Engineer indicated that the work involved could be added to one of the other City contracts and that the work could be completed this summer.

Deborah Miela, 2410 Dalesford, is in favor of the proposed changes. She feels southbound through traffic should stop.

Gloria Gold, 2410 Dalesford, wants STOP signs on Glyndebourne to slow down speeding traffic. Her cat was killed there. She questioned why the island would have to be removed. The Traffic Engineer explained that the island will not be removed. The portion of Glyndebourne between Dalesford and Chalgrove will be widened. Mr. Minnick suggested that widening Glyndebourne at the intersection could increase traffic speeds.

At the July meeting the two residents indicated that they would prefer a 4-way STOP.

This issue was considered by City Council at their July 18 meeting. At that time Ms. Miela and Ms. Gold indicated that they had changed their minds and did not support the resolution to modify the intersection. For that reason, Council referred the item back to the Traffic Committee for further review.

The petitioner attended the first Traffic Committee meeting only, and has not attended any subsequent meetings. Ms. Gold and Ms. Miela have attended all the meetings to express their concerns. Ms. Miela indicated that the current intersection is attractive and she wouldn't want the island removed, and she realizes that a STOP sign wouldn't solve the speed problems. Ms. Gold said widening that area of Charnwood would allow traffic to move even faster than it does now.

RESOLUTION #2005-09-52
Moved by Halsey
Seconded by Kilmer

To recommend no changes to the Glyndebourne/Chalgrove/Dalesford intersection.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

11. Establish Fire Lanes at Midtown Square Condos, Maple and Coolidge

Section 8.28, Chapter 106, Troy City Code, provides for the establishment of fire lanes on private property. The Fire Department recommends that the fire lanes shown on the attached sketch be provided to allow proper deployment of and travel by emergency vehicles (fire, police, medical).

Shane Diehl, representing the condominium association, asked for a variance on the number of signs required. The standards require 54 signs, 100 feet apart, at a total cost of about $5,000, and he feels that many signs would be unsightly. Mr. Deal requested signs every 150 feet, for a total of only 36 signs. Lt. Matlick and Mr. Deal will rework the plan and place the signs 150 feet apart, with closer spacing in problem areas.

RESOLUTION #2005-09-53
Moved by Kilmer
Seconded by Ziegenfelder

To table this item until the October meeting to give the Fire Department time to rework the fire lanes/tow away zones at Midtown Square Condos, Maple and Coolidge.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

12. Establish Fire Lanes at Cambridge Crossing 1, Maple Road

Section 8.28, Chapter 106, Troy City Code, provides for the establishment of fire lanes on private property. The Fire Department recommends that the fire lanes shown on the attached sketch be provided to allow proper deployment of and travel by emergency vehicles (fire, police, medical).

RESOLUTION #2005-09-54
Motion by Kilmer
Seconded by Ziegenfelder

Recommend that the fire lanes/tow away zones shown in the attached sketch be established at Cambridge Crossing 1, Maple Road.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

13. Establish Fire Lanes at Regents Park – Alisop

Section 8.28, Chapter 106, Troy City Code, provides for the establishment of fire lanes on private property. The Fire Department recommends that the fire lanes shown on the attached sketch be provided to allow proper deployment of and travel by emergency vehicles (fire, police, medical).

RESOLUTION #2005-09-55
Moved by Kilmer
Seconded by Ziegenfelder

Recommend that the fire lanes/tow away zones shown in the attached sketch be established at Regents Park - Alisop.

YES: All-5
NO: None

ABSENT: 1 (Diefenbaker)

MOTION CARRIED

14. Establish Fire Lanes at Regents Park – Melcombe

Section 8.28, Chapter 106, Troy City Code, provides for the establishment of fire lanes on private property. The Fire Department recommends that the fire lanes shown on the attached sketch be provided to allow proper deployment of and travel by emergency vehicles (fire, police, medical).

RESOLUTION #2005-09-56
Moved by Kilmer
Seconded by Ziegenfelder

Recommend that the fire lanes/tow away zones shown in the attached sketch be established at Regents Park - Melcombe.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

15. Establish Fire Lanes at Rochester Commons Condos

Section 8.28, Chapter 106, Troy City Code, provides for the establishment of fire lanes on private property. The Fire Department recommends that the fire lanes shown on the attached sketch be provided to allow proper deployment of and travel by emergency vehicles (fire, police, medical).

RESOLUTION #2005-09-57
Moved by Kilmer
Seconded by Ziegenfelder

Recommend that the fire lanes/tow away zones shown in the attached sketch be established at Rochester Commons Condos.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

16. Visitors' Time

No one else wished to address the committee.

17. Other Business

Ms. Hubbell welcomed Katherine Tan, the new student representative, to the Traffic Committee. Ms. Tan is a student at Troy High School.

Mr. Halsey mentioned that a landscaping truck parks partly in the road at Williard and English. It appears to belong to the homeowner, and its projection into the intersection is hazardous. Sgt Redmond will check.

Lt. Matlick reported that the traffic light at the turnaround on westbound Long Lake Road, east of Rochester, is not functioning properly. Dr. Abraham said the Road Commission for Oakland County is aware of the malfunction and has been working on it every day this week.

The Traffic Engineer will be out of the country until after the deadline for preparation of the November traffic agenda, and the recording secretary will be out of state for that meeting. The committee decided to cancel that meeting.

RESOLUTION #2005-09-58
Moved by Halsey
Seconded by Minnick

To cancel the November meeting.

YES: All-5
NO: None
ABSENT: 1 (Diefenbaker)

MOTION CARRIED

13. Adjourn

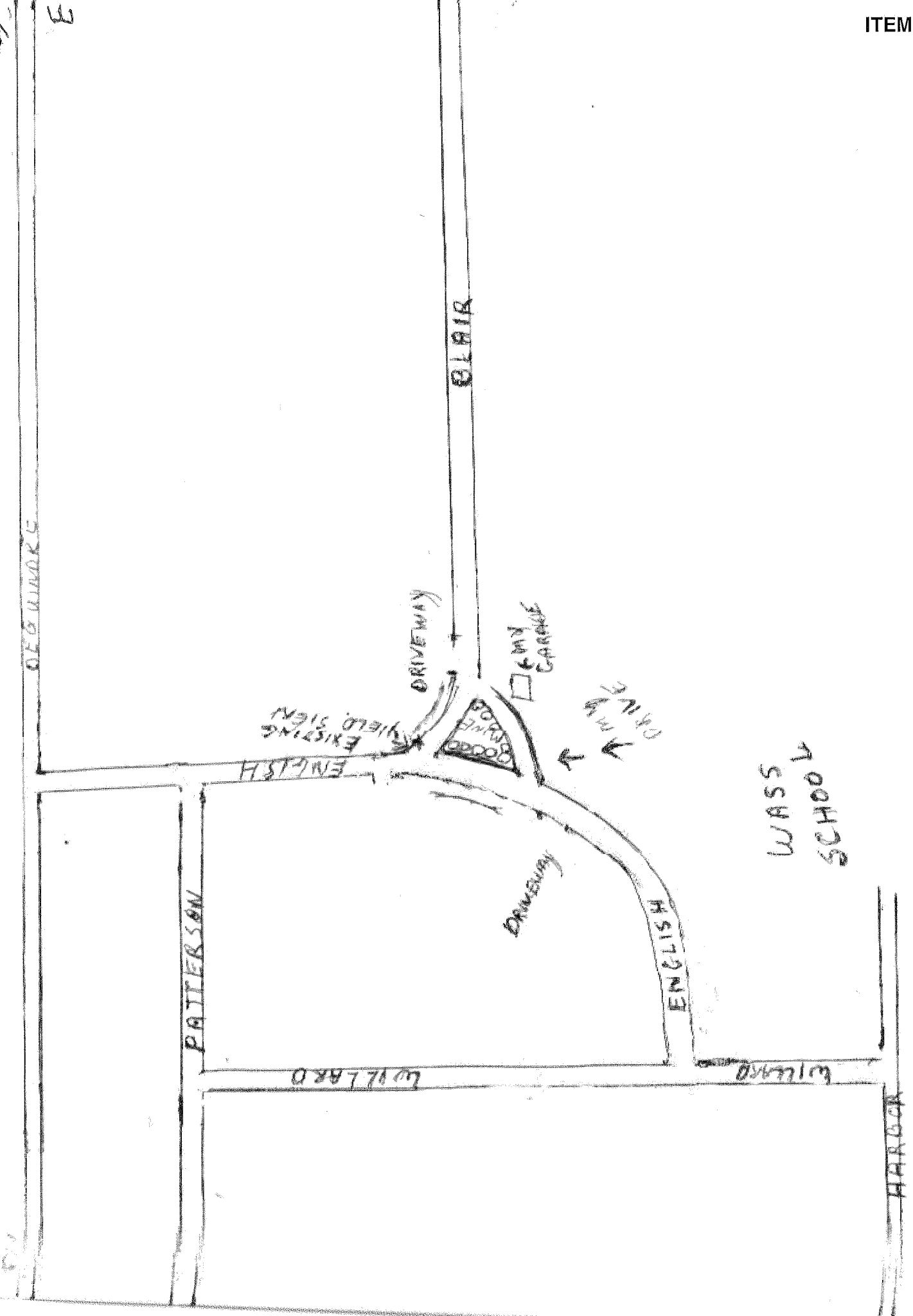
The meeting adjourned at 9:04 p.m.

The next meeting is scheduled for October 19, 2005.

Jan Hubbell
Vice Chair

Laurel Nottage
Recording Secretary

ITEM 3

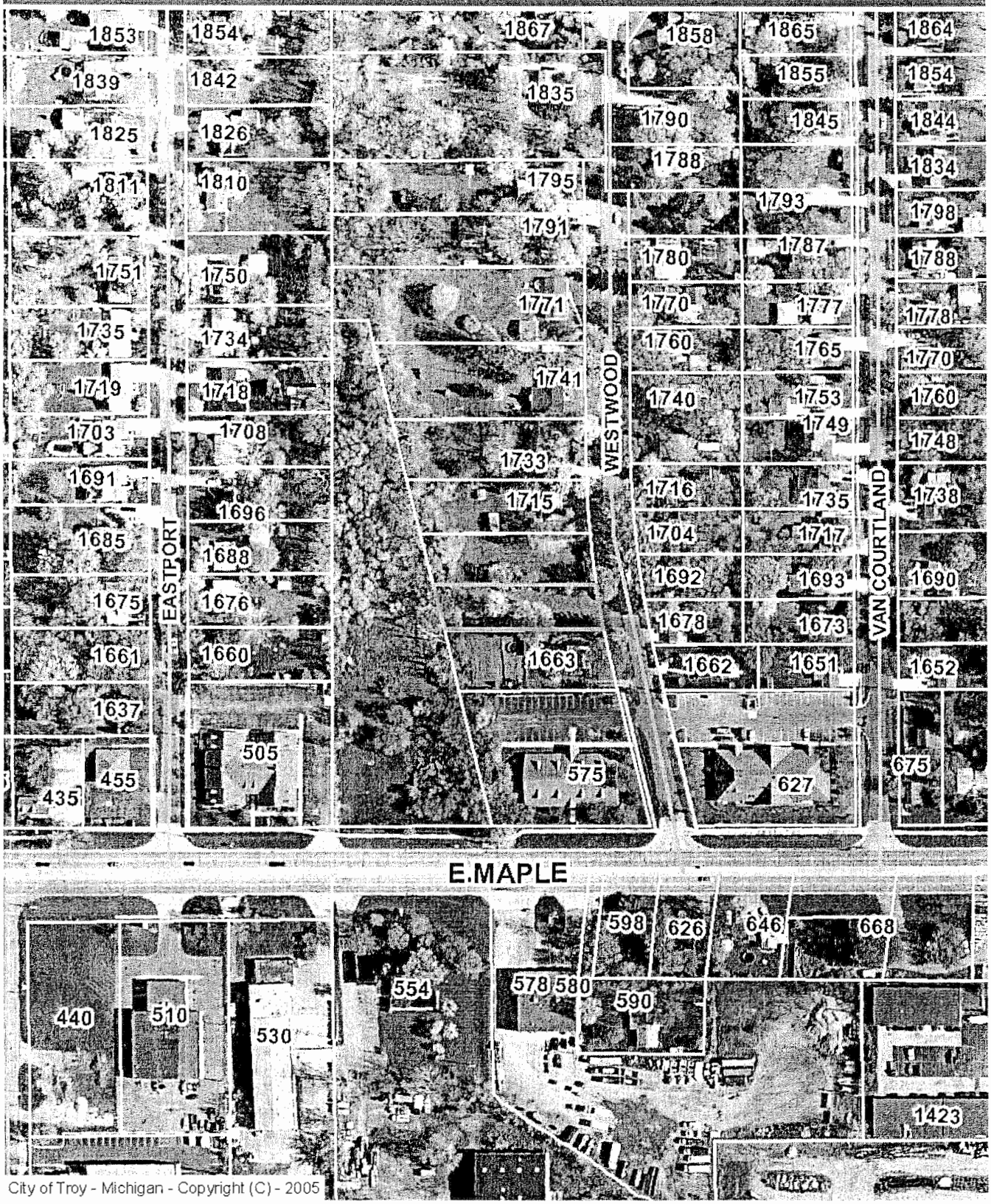

BLAIR
DRIVEWAY
MY GARAGE
EXISTING YIELD SIGN
ENGLISH
DRIVEWAY
WASS SCHOOL
PATTERSON
ENGLISH
WILLARD
WILLARD
HARBOR

City of Troy

Geographical Information Systems Online

Note: The information provided by this application has been compiled from recorded dee

City of Troy Geographical Information Systems Online



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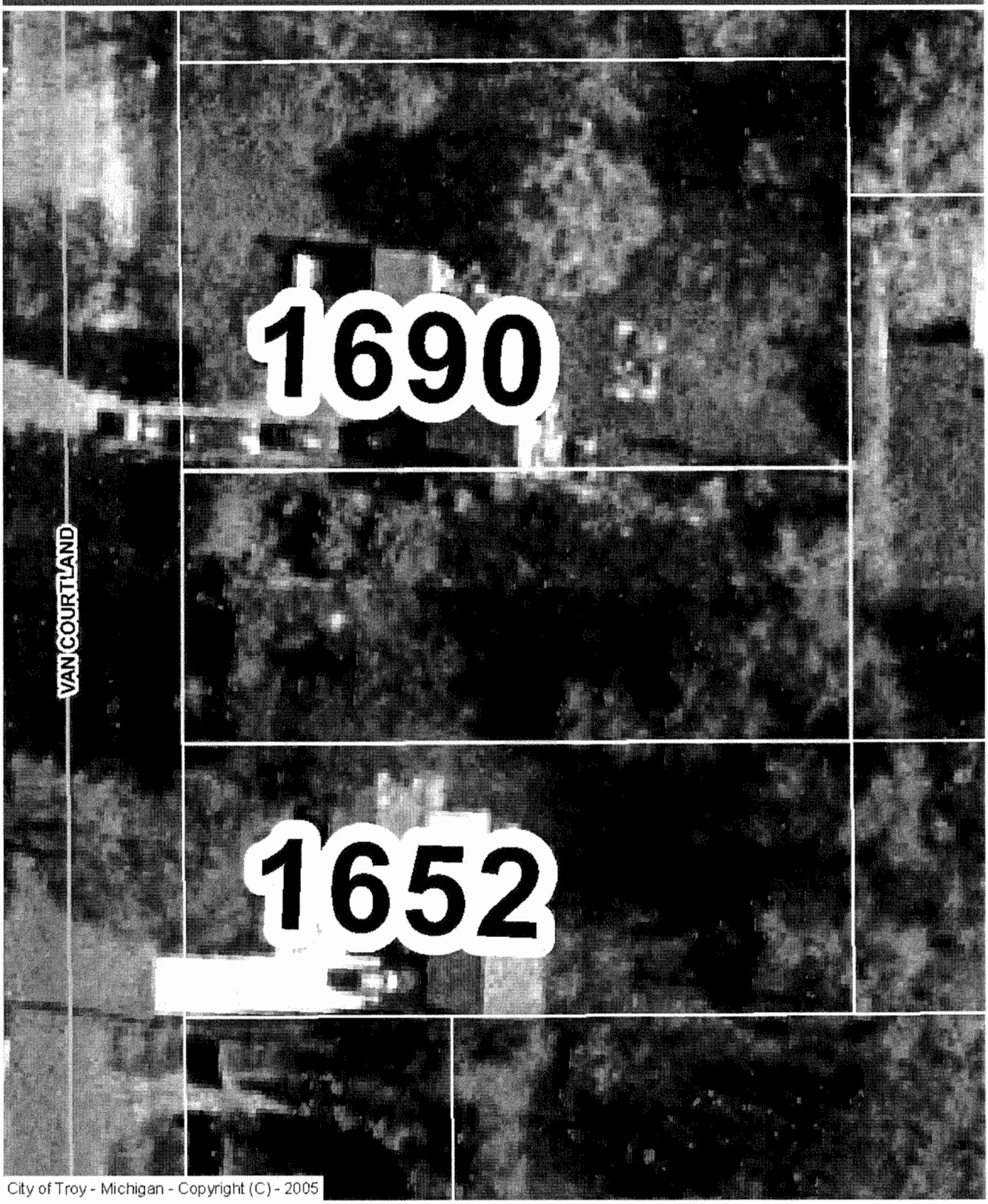
City of Troy

Geographical Information Systems Online



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Note: The information provided by this application has been compiled from recorded dee

ITEM 7

PEBBLE POINT
ATKINS
EMERALD LAKE
SANDY POINT
SANDSHORES
WALKER
DIANE
CONGRESS
0
95
190
380
570
760
Feet

ITEM 8

SANTIA
ENGLISH
PATTERSON
KNIGHT
BLAIR
0 40 80 160 240 320 Feet

ITEM 9

CAITLIN CT
WHITFIELD
WHITFIELD CT
WAVERLY
WYNNWOOD
HEATHERWOOD
NORTHFIELD PARKWAY
CORPORATE
N
0 85 170 340 510 680
Feet

Multi-way Stops - The Research Shows the MUTCD is Correct!

W. Martin Bretherton Jr., P.E.(M)

Abstract

This paper reviewed over 70 technical papers covering all-way stops (or multi-way stops) and their success and failure as traffic control devices in residential areas. This study is the most comprehensive found on multi-way stop signs

The study looked at how multi-way stop signs have been used as traffic calming measures to control speed. There have been 23 hypotheses studied using multi-way stop as speed control. The research found an additional 9 hypotheses studied showing the effect multi way stops have on other traffic engineering problems.

The research found that, overwhelmingly, multi-way stop signs do NOT control speed except under very limited conditions. The research shows that the concerns about unwarranted stop signs are well founded.

Introduction

Many elected officials, citizens and some traffic engineering professionals feel that multi-way stop signs should be used as traffic calming devices. Many times unwarranted stop signs are installed to control traffic. The Manual on Uniform Traffic Control Devices (MUTCD)(16) describes warrants for installing multi-way stop signs. However, it does not describe many of the problems caused by the installation of unwarranted stop signs. These problems include concerns like liability issues, traffic noise, automobile pollution, traffic enforcement and driver behavior.

This paper is a result of searching over 70 technical papers about multi-way stop signs. The study concentrated on their use as traffic calming devices and their relative effectiveness in controlling speeds in residential neighborhoods. The references found 23 hypotheses on their relative effectiveness as traffic calming devices. One study analyzed the economic cost of installing a multi-way stop at an intersection. The reference search also found 9 hypotheses about traffic operations on residential streets.

The literature search found 85 papers on the subject of multi-way stops. There are probably many more references available on this very popular subject. The seventy-one references are

shown in Appendix A. There was a problem finding the 14 papers found in literature searches. The 14 papers are listed in Appendix B for information only. Most of the papers were from old sources and are probably out of print.

Multi-Way Stop Signs as Speed Control Devices

A summary of the articles found the following information about the effectiveness of multi-way stop signs and other solutions to controlling speeds in residential neighborhoods.

1. Multi-way stops do not control speeds. Twenty-two papers were cited for these findings. (Reference 1, 2, 7, 8, 10, 12, 13, 14, 15, 16, 17, 19, 20, 39, 45, 46, 51, 55, 62, 63, 64, 66 and 70).

2. Stop compliance is poor at unwarranted multi-way stop signs. Unwarranted stop signs means they do not meet the warrants of the MUTCD. This is based on the drivers feeling that the signs have no traffic control purpose. There is little reason to yield the right-of - way because there are usually no vehicles on the minor street. Nineteen references found this to be their finding. (Reference 7, 8, 10, 12, 13, 14, 15, 17, 19, 20, 39, 45, 46, *51, 55,* 61, 62, 63 and 64).

3. Before-After studies show multi-way stop signs do not reduce speeds on residential streets. Nineteen references found this to be their finding. (Reference 19 (1 study), 55 (5 studies), 60 (8 studies) and 64(5 studies)).

4. Unwarranted multi-way stops <u>increased</u> speed some distance from intersections. The studies hypothesizing that motorists are making up the time they lost at the "unnecessary" stop sign. Fifteen references found this to be their finding.(Reference 1, 2, 7, 8, 10, 13, 14, 17, 19, 20,39, 45,46, 51, 55, 70 and 71).

5. Multi-way stop signs have high operating costs based on vehicle operating costs, vehicular travel times, fuel consumption and increased vehicle emissions. Fifteen references found this to be their finding. (Reference 3, 4, 7, 8, 10, 14, 15, 17, 45, 55 ,61, 62, 63, 67 and 68).

6. Safety of pedestrians is decreased at unwarranted multi-way stops, especially small children. It seems that pedestrians expect vehicles to stop at the stop signs but many vehicles have gotten in the habit of running the "unnecessary" stop sign. Thirteen references found this to be their finding. (References 7, 8, 10, 13, 14, 15, 17, 19, 20, 45, 51, 55 and 63).

7. Citizens feel "safer" in communities "positively controlled" by stop signs. Positively controlled is meant to infer that the streets are controlled by unwarranted stop signs. Homeowners on the residential collector feel safer on a 'calmed' street. Seven references found this to be their finding. (Reference 6, 14, 18, 20, 51, 58 and 66).

Hypothesis twelve (below) lists five references that dispute the results of these studies.

8. Speeding problems on residential streets are associated with" through" traffic. Frequently homeowners feel the problem is created by 'outsiders'. Many times the problem is the person complaining or their neighbor. Five references found this to be their finding. (References 2, 15, 45, 51 and 55).

9. Unwarranted multi-way stops may present potential liability problems for undocumented exceptions to accepted warrants. Local jurisdictions feel they may be incurring higher liability exposure by 'violating' the MUTCD. Many times the unwarranted stop signs are installed without a warrant study or some documentation. Cited by six references. (Reference 7, 9, 19, 46, 62 and 65).

10. Stop signs increase noise in the vicinity of an intersection. The noise is created by the vehicle braking noise at the intersection and the cars accelerating up to speed. The noise is created by the engine exhaust, brake, tire and aerodynamic noises. Cited by five references. (Reference 14, 17, 20, 45, 55).

11. Cost of installing multi-way stops are low but enforcement costs are prohibitive. many communities do not have the resources to effectively enforce compliance with the stop signs. Five references found this to be their finding. (Reference 1, 10, 45, 51, 55).

12. Stop signs do not significantly change safety of intersection. Stop signs are installed with the hope they will make the intersection and neighborhood safer. Cited by five references. (Reference 55, 60, 61, 62, 63).

Hypothesis seven (above) lists seven references that dispute the results of these studies.

13. Unwarranted multi-way stops have been successfully removed with public support and result in improved compliance at justified stop signs. Cited by three references. (Reference 8, 10, 12).

14. Unwarranted multi-way stops reduce accidents in cities with intersection sight distance problems and at intersections with parked cars that restrict sight distance. The stop signs are unwarranted based on volume and may not quite meet the accident threshold. Cited by three references. (Reference 6, 18, 68).

15. Citizens feel stop signs should be installed at locations based on traffic engineering studies. Some homeowners realize the importance of installing 'needed' stop signs. Cited by two references. (References 56, 57).

16. Multi-way stops can reduce cut-through traffic volume if many intersections along the road are controlled by stop signs. If enough stop signs are installed on a residential or

collector street motorists may go another way because of the inconvenience of having to start and stop at so many intersections. This includes the many drivers that will not stop but slowly 'cruise' through the stop signs. This driving behavior has been nicknamed the 'California cruise'. Cited by two references. (Reference 14, 61).

17. Placement of unwarranted stop signs in violation of Georgia State Law 32-6-50 (a) (b) (c). This study was conducted using Georgia law. Georgia law requires local governments to install all traffic controls devices in accordance with the MUTCD. This is probably similar to traffic signing laws in other states. Cited by two references. (Reference 19, 62).

18. Special police enforcement of multi-way stop signs has limited effectiveness. This has been called the 'hallo' effect. Drivers will obey the 'unreasonable' laws as long as a policemen is visible. Cited by two references. (Reference 39, 46).

19. District judge orders removal of stop signs not installed in compliance with city ordinance. Judges have ordered the removal of 'unnecessary' stop signs. The problem begins when the traffic engineer and/or elected officials are asked to consider their intersection a 'special case'. This creates a precedent and results in a proliferation of 'special case' all-way stop signs. Cited by two references. (Reference 59, 62).

20. Some jurisdictions have created warrants for multi-way stops that are easier to meet than MUTCD. The jurisdiction feel that the MUTCD warrants are too difficult to meet in residential areas. The reduced warrants are usually created to please elected officials. Cited by two references. (Reference 61 and 70).

21. Citizens perceive stop signs are effective as speed control devices because traffic "slows" at stop sign. If everybody obeyed the traffic laws, stop signs would reduce speeds on residential streets. Cited by one reference. (Reference 55).

22. Removal of multi-way stop signs does not change speeds but they are slightly lower without the stop signs. This study findings support the drivers behavior referenced in item #4, speed increases when unwarranted stop signs are installed. Speed decreases when the stop signs were removed! Cited by one reference. (Reference 64).

23. Multi-way stops degrade air quality and increase CO, HC, and Nox. All the starting and stopping at the intersection is bad for air quality. Cited by one reference. (Reference 68).

Speed Control Issues

24. There area many ways to "calm" traffic. Cited by twenty-two references. (Reference 1, 14, 20, 32, 33, 34, 35, 36, 37, 38, 40,41,42, 44, 45, 46, 47, 48, 50, 51, 53 and 66).

They include:

(a) Traffic Chokers
(b) Traffic Diverters
(c) Speed Humps
(d) Roundabouts
(e) Neighborhood Speed Watch
(f) Sidewalks and Other Pedestrian Solutions
(g) Neighborhood Street Design
(h) On-Street Parking
(i) One Way Streets
(j) Street Narrowing

25. Other possible solutions to residential speed. Most speeding is by residents - Neighborhood Speed Watch Programs may work. This program works by using the principle of 'peer' pressure. Cited by seven references. (Reference 2, 30, 31, 36, 42, 48 and 53).

26. Reduced speed limits are not effective at slowing traffic. Motorists do not drive by the number on the signs, they travel a safe speed based on the geometrics of the roadway. Cited by five references. (Reference 1, 20, 39, 46 and 69).

27. Local streets should be designed to discourage excessive speeds. The most effective way to slow down traffic on residential streets is to design them for slow speeds. Cited by two references. (Reference 43, 52).

28. Speeding on residential streets is a seasonal problem. This is a myth. The problem of speeding is not seasonal, it's just that homeowners only see the problem in 'pleasant' weather. That's the time they spend in there front yard or walking the neighborhood. Cited by one reference. (Reference 2).

29. Speed variance and accident frequency are directly related. The safest speed for a road is the speed that most of the drivers feel safest driving. This speed creates the lowest variance and the safest road. Cited by one reference. (Reference 47).

30. The accident involvement rate is lowest at the 85th percentile speed. The 85th percentile speed is the speed that most drivers feel comfortable driving. The lowest variance is usually from the 85th percentile speed and the 10 mph less. Cited by one reference. (Reference 47).

31. Psycho-perceptive transverse pavement markings are not effective at reducing the 85th percentile speed but do reduce the highest speed percentile by 5 MPH. Cited by one reference. (Reference 47).

32. The safest residential streets would be short (0.20 miles) non-continuous streets that are 26 to 30 feet from curb to curb width. The short streets make it difficult of drivers to get up to speed. Cited by one reference. (Reference 52).

Economics of Multi-Way Stop Signs

Studies have found that installing unwarranted stop signs increases operating costs for the traveling public. The operating costs involve vehicle operating costs, costs for increased delay and travel time, cost to enforce signs, and costs for fines and increases in insurance premiums.

The total costs are as follows (Reference 55):

Operating Costs (1990) ($.04291/Stop)	$ 111,737/year
Delay & Travel Costs (1990) ($.03401/Stop)	$ 88,556 /year
Enforcement Costs (1990)	$ 837/year
Cost of Fines (19 per year)	$ 1,045/year
Cost of 2 stop signs (1990)	$ 280
Costs of increased insurance (1990)	$ 7,606/year
Total (1990)	**$210,061/year/intersection**

The cost to install two stops signs is $280. The cost to the traveling public is $210,061 (1990) per year in operating costs. This cost is based on about 8,000 vehicles entering the intersection per day.

Another study (62) found that the average annual road user cost increased by $2,402.92 (1988 cost) per intersection when converting from two to four way stop signs for low volume intersections.

Summary of Stop Signs as Speed Control Devices

Researchers found that multi-way stop signs do not control speed. In analyzing the 23 hypotheses for multi-way stop signs, five were favorable and 18 were unfavorable toward installing unwarranted all-way stop signs. The Chicago study (6) was the only research paper that showed factual support for "unwarranted" multi-way stop signs. They were found to be effective at reducing accidents at intersections that have sight distance problems and on-street parking.

It is interesting to note that residential speeding problems and multi-way stop sign requests date back to 1930 (63). The profession still has not "solved" this perception problem.

Summary of Economic Analysis

Benefits to control speeds by installing multi-way stop signs are perceived rather than actual and the costs for the driving public are far greater than any benefits derived from the installation of the multi-way stop signs.

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Appendix A

References used in Research of Multi-Way Stop Signs

1. Gerald L. Ullman, "Neighborhood Speed Control - U.S. Practices", ITE Compendium of Technical Papers, 1996, pages 111- 115.

2. Richard F. Beaubein, "Controlling Speeds on Residential Streets", ITE Journal, April 1989, pages 37-39.

3. "4 Way Stop Signs Cut Accident Rate 58% at Rural Intersections", ITE Journal, November 1984, pages 23-24.

4. Michael Kyte & Joseph Marek, "Collecting Traffic Data at All-Way Stop Controlled Intersections", ITE Journal, April 1989, pages 33-36.

5. Chan, Flynn & Stocker, "Volume Delay Relationship at Four Way Stop Controlled Intersections: A Response Surface Model", ITE Journal, March 1989, pages 27-34.

6. La Plante and Kripidlowkdki, "Stop Sign Warrants: Time for Change", ITE Journal, October 1992, pages 25-29.

7. Patricia B. Noyes, "Responding to Citizen Requests for Multi Way Stops", ITE Journal, January 1994, pages 43-48.

8. Chadda and Carter, "Multi-Way Stop Signs - Have We Gone Too Far?", ITE Journal, May 1983, pages 19-21.

9. Gary Moore,"Gwinnett County Legal Opinions on Unwarranted Multi-Way Stops", March 6,1990.

10. Chadda and Carter, " The Changing Role of Multi-Way Stop Control", ITE Compendium of Technical Papers, 1983, pages 4-31 to 4-34.

11. Lovell and Haver, "The Safety Effect of Conversion to All-Way Stop Control", Transportation Research Record 1068, pages 103-107.

12. "Indiana Suggests Ways to Halt Stop Sign Misuse", Transafety Reporter, February 1989, page 7.

13. "Why Don't They Put in More Stop Signs?", Traffic Information Program Series, ITE, 1978.

14. "State of the Art: Residential Traffic Management", US DOT, FHWA/RD-80/092, December 1980, pages 63-65, 22-23.

15. Dick Williams, "A New Direction for Traffic Dispute", Atlanta Journal, January 14, 1988, Section E, page 1.

16. "Warrants for Multi-Way Stop Signs" (2B-6), Manual on Uniform Traffic Control Devices, US DOT , FHWA, pages 2B-3 to 2B-4.

17. "Stop and Yield Sign Control", Traffic Control Devices Handbook, US DOT, FHWA, 1983, pages 2-14 to 2-16.

18. La Pante & Kropidlowdki, "Stop Sign Warrants ", Presented at ITE Conference, San Diego, CA, September 18, 1989.

19. Walt Rekuc, "Traffic Engineering Study of Multi-Way Stop Signs", City of Roswell, February 15, 1988.

20. Homburger, etal, Residential Street Design and Traffic Control, ITE, Washington, DC, 1989.

21. Speed Zone Guidelines, ITE, Washington, DC, 1993.

22. A Policy on Geometric Design of Highways and Streets, AASHTO, Washington, DC, 1994.

23. A.J. Ballard, "Efforts to Control Speeds on Residential Collector Streets", ITE Compendium of Technical Papers, 1990, pages 445-448.

24. C.E. Walter, "Suburban Residential Traffic Calming", ITE Compendium of Technical Papers, 1994, pages 445-448.

25. K.L. Gonzalez, " Neighborhood Traffic Control: Bellevue's Approach", ITE Journal, Vol. 43, No.5, May 1993, pages 43-45.

26. Brian Kanely & B.E. Ferris, "Traffic Diverter's for Residential Traffic Control - The Gainesville Experience", ITE Compendium of Technical Papers, 1985, pages 72-76.

27. Marshall Elizer, "Guidelines for the Design and Application of Speed Humps", ITE Compendium of Technical Papers, 1993, pages 11-15.

28. T. Mazella & D. Godfrey, "Building and Testing a Customer Responsive Neighborhood Traffic Control Program", ITE Compendium of Technical Papers, 1995, pages 75-79.

29. W.M. Bretherton and J.E. Womble, "Neighborhood Traffic Management Program", ITE Compendium of Technical Papers, 1992, pages 398-401.

30. J.E. Womble, "Neighborhood Speed Watch: Another Weapon in the Residential Speed Control Arsenal", ITE Journal, Vol. 60, No. 2, February 1990, pages 1- 17.

31. Michael Wallwork, "Traffic Calming", The Genesis Group, unpublished.

32. Doug Lemov, "Calming Traffic", Governing, August 1996, pages 25-27.

33. Michael Wallwork, "Traffic Calming", The Traffic Safety Toolbox, ITE, Washington, DC, 1993, pages 234-245.

34. Ransford S. McCourt, Neighborhood Traffic Management Survey, ITE District 6, Technical Chair, unpublished, June 3, 1996.

35. Halbert, etal, "Implementation of Residential Traffic Control Program in the City of San Diego", District 6 Meeting, July 1993.

36. Anton Dahlerbrush, "Speed Humps & Implementation and Impact on Residential Traffic Control", City of Beverly Hills, California, District 6 Meeting, July 1993.

37. Firoz Vohra, "Modesto Speed Hump Experience", District 6, ITE Meeting, July 1993.

38. Patricia Noyes, "Evaluation of Traditional Speed Reduction in Residential Area", District 6 ITE Meeting, July 1993.

39. Cynthia L. Hoyle, Traffic Calming, American Planning Association, Report No 456, July 1995.

40. Sam Yager, Use of Roundabouts, ITE Technical Council Committee, 5B- 17, Washington, DC, February 1992.

41. Guidelines for Residential Subdivision Street Design, ITE, Washington, DC, 1993.

42. Residential Streets, 2nd Edition, ASCE, NAHB & ULI, 1990.

43. Traffic Calming, Citizens Advocating Responsible Transportation, Australia, 1989.

44. Traffic Calming in Practice, Department of Transport, etal, London, November 1994.

45. Todd Long, "The Use of Traffic Control Measures in the Prevention of Through Traffic Movement on Residential Streets", unpublished, Masters Thesis, Georgia Tech, September 1990.

46. Patricia Noyes, "Evaluation of Traditional Speed Reduction Efforts in Residential Areas", ITE Compendium of Technical Papers, District 6 Meeting, 1993, pages 61-66.

47. G.E. Frangos, "Howard County's Speed Control in Residential Areas Utilizing Psycho-perceptive Traffic Controls", ITE Compendium of Technical Papers, 1985, pages 87-92.

48. Halbert, etal, "Implementation of Residential Traffic Control Program in the City of San Diego", ITE Compendium of Technical Papers, District 6, 1993, pages 23-60.

49. Radwan & Sinha, "Gap Acceptance and Delay at Stop Controlled Intersections on Multi-Lane Divided Highways", ITE Journal, March 1980, page 38.

50. Borstel, "Traffic Circles : Seattle's Experience", ITE Compendium of Technical Papers, 1985, page 77.

51. D. Meier, "The Policy Adopted in Arlington County, VA, for Solving Real and Perceived Speeding Problems on Residential Streets", ITE Compendium of Technical Papers, 1985, page 97.

52. Jeff Clark, "High Speeds and Volumes on Residential Streets: An Analysis of Physical Characteristics as Causes in Sacramento, California", ITE Compendium of Technical Papers, 1985, page 93.

53. Wiersig & Van Winkle, "Neighborhood Traffic Management in the Dallas/Fort Worth Area", ITE Compendium of Technical Papers, 1985, page 82.

54. Improving Residential Street Environments, FHWA RD-81-031, 1981.

55. Carl R. Dawson, Jr., "Effectiveness of Stop Signs When Installed to Control Speeds Along Residential Streets", Proceedings from Southern District ITE Meeting, Richmond, Virginia, April 17, 1993.

56. Arthur R. Theil, "Let Baton Rouge's Traffic Engineers Decide Whether Signs Are Needed", State Times, LA, August 30, 1983.

57. Gary James, "Merits Being Totally Ignored in This Instance", Morning Advocate, Baton Rouge, LA, July 30,1983.

58. James Thomason, "Traffic Signs Allow Crossing", Morning Advocate, Baton Rouge, LA, July 30, 1983.

59. "City-Parish Must Move Stop Signs", Morning Advocate, Baton Rouge, LA, 1983.

60. Synthesis of Safety Research Related to Traffic Control and Roadway Elements, Vol. 2, FHWA Washington, D. C., 19982.

61. B.H. Cottrell, Jr.,"Using All-Way Stop Control for Residential Traffic Management", Report No. FHWA VTRC 96-R17, Virginia Transportation Research Council, Charlottesville, Virginia, January, 1996.

62. Eck & Diega, "Field Evaluation at Multi-Way Versus Four-Way Stop Sign Control at Low Volume Intersections in Residential Areas", Transportation Research Record 1160, Washington, DC, 1988, pages 7-13.

63. Hanson, "Are There Too Many Four-Way Stops?", Traffic Engineering, November 1957, pages 20-22, 42.

64. Beaubien, "Stop Signs for Speed Control", ITE Journal, November 1976, pages 26-28.

65. Antwerp and Miller, "Control of Traffic in Residential Neighborhoods : Some Considerations for Implementation", Transportation 10, 1981, pages 35-49.

66. Lipinski, "Neighborhood Traffic Controls", Transportation Engineering Journal, May 1979, pages 213-221.

67. Richardson,"A Delay Model for Multi-Way Stop Sign Intersections", Transportation Research Record 1112, Washington, DC, 1987, pages 107-114.

68. Briglin, "An Evaluation of Four-Way Stop Sign Control", ITE Journal, August 1982, pages 16-19.

69. Ullman and Dudek, "Effects of Reduced Speed Limits in Rapidly Developing Urban Fringe Areas", Transportation Research Record 1114, 1989, pages 45-53.

70. Robert Rees, "All-Way STOP Signs Installation Criteria", Westernite, Jan-Feb 1999, Vol 53, No. 1, pg 1-4.

71. Wes Siporski, "Stop Sign Compliance", posting on Traffic Engineering Council List Serve, Jan 15, 1999.

Appendix B

Additional References for Multi-Way Stop Signs

Not included in Analysis - Reports not available

1. Improving Traffic Signal Operations, ITE Report IR-081, August 1995.

2. Kunde, " Unwarranted Stop Signs in Cities", ITE Technical Notes, July 1982, page 12.

3. "In search of Effective Speed Control", ITE Technical Notes, December 1980, pages 12-16.

4. "Stop Signs Do Not Control Speed", ITE Technical Notes, July 1978, pages 6-7.

5. "An Evaluation of Unwarranted Stop Signs", ITE San Francisco Bay Area, February 1979.

6. "Cost of Unnecessary Stops", Auto Club of Missouri, Midwest Motorists, 1974.

7. Nitzel, Schatter & Mink, "Residential Traffic Control Policies and Measures", ITE Compendium of Technical Papers, 1988.

8. Weike and Keim, "Residential Traffic Controls", ITE Compendium of Technical Papers, Washington DC, August 1976.

9. Landom and Buller, "The Effects on Road Noise in Residential Areas", Watford, United Kingdom, October 1977.

10. Wells and Joyner, "Neighborhood Automobile Restraints", Transportation Research Record 813, 1981.

11. Byrd and Stafford, "Analysis of Delay and User Costs of Unwarranted Four Way Stop Sign Controlled Intersections", TRR 956, Washington, DC, 1984, pages 30-32.

12. Marconi, "Speed Control Measures in Residential Areas", Traffic Engineering, Vol. 47, No. 3, March 1977, pages 28-30.

13. Mounce, "Driver's Compliance with Stop Sign Control at Low Volume Intersections", TRR 808, TRB, Washington, DC, 1981, pages 30-37.

14. Orlob, "Traffic Diversion for Better Neighborhoods", Traffic Engineering, ITE, Vol. 45, No. 7, July 1975, pages 22-25.

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National SAFE KIDS Campaign

STOP SIGN VIOLATIONS PUT CHILD PEDESTRIANS AT RISK

A National Survey of Motorist Behavior at Stop Signs in School Zones and Residential Areas

October 2003

INTRODUCTION

Walking is a no-cost transportation option that allows parents and children to spend time together, get exercise and improve air quality by not creating vehicle pollutants. Unfortunately, recent evidence indicates that kids are walking less. In 1969, nearly half of elementary school students walked or biked to school.[1] By 1995, only 10 percent of children traveled by foot to school.[2] This decline can be attributed to many causes, including traffic danger and other hazards that make walking unsafe for children.[3]

Decreased walking has contributed to a significant decline in child pedestrian deaths and injuries. However, pedestrian injury remains a leading cause of unintentional injury-related death among children.[4] In 2000, 706 children ages 14 and under died[5], an estimated 47,300 were treated in hospital emergency rooms for pedestrian-related injuries in 2001.[6] Nearly 76 percent of these deaths and 73 percent of injuries were motor vehicle-related. The total annual cost of traffic-related pedestrian death and injury among children ages 14 and under is more than $7.2 billion.[7]

Speeding and other driver behaviors are a contributing factor to pedestrian-related injuries. In 1999, a National SAFE KIDS Campaign survey found that two-thirds of drivers exceeded the posted speed limit in school zones during the 30-minute periods before and after school.[8]

Each year, stop sign violations are associated with approximately 200 fatal crashes and 17,000 non-fatal injury crashes.[9] Children are at risk of injury when stop sign and pedestrian right-of-way laws are violated, yet studies investigating the rate of compliance with stop signs at intersections where children could be present have been lacking. Now SAFE KIDS and FedEx Express have closely examined driver behaviors at intersections in school zones and residential neighborhoods. This observational study determined the frequency of driver compliance with stop signs at unsignalized, marked and unmarked pedestrian crosswalks near schools and in residential areas.

METHODOLOGY

Data were collected by 72 SAFE KIDS coalitions, representing 39 states and the District of Columbia. Two hundred eighty-eight intersections were surveyed, using instruments and protocols developed by the National SAFE KIDS Campaign. A total of 25,660 vehicles were observed. All surveyed intersections were marked with stop signs and had no additional traffic control measures, such as crossing guards or flashing lights. All intersections were located in a school zone (52 percent) or a residential neighborhood with child pedestrian traffic (48 percent).

Each intersection was observed for 30 minutes by two observers who collected information about vehicle body type, stopping behavior, presence of pedestrians and whether pedestrians were crossing when the vehicle arrived at the intersection. Stopping behaviors were categorized as follows:

Stop before crosswalk – the wheels of the vehicle came to a complete stop before the crosswalk or stop sign (if crosswalk is unmarked)
Stop in or past crosswalk – the wheels of the vehicle came to a complete stop in or past the crosswalk (or past the stop sign if crosswalk is unmarked)
Rolling stop – the vehicle slowed at the crosswalk (marked or unmarked), but the vehicle wheels never came to a complete stop
No stop – the vehicle did not stop or slow significantly at the intersection

All coalitions submitted their surveys to the National SAFE KIDS Campaign for analysis. TELEform 7.0 software was used for data entry. Frequencies were generated using SPSS 8.0.

RESULTS

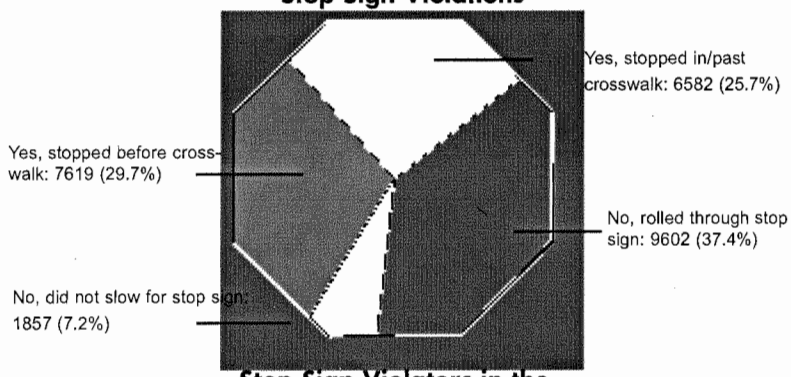
- Motorists did not obey stop signs, putting pedestrians and passengers in other vehicles at risk. Nearly half (45 percent) of vehicles surveyed violated the stop signs by not coming to a complete stop at intersections.
  - More than a third (37 percent) of motorists rolled through the stop signs.
  - Nearly a tenth (7 percent) of motorists did not even slow down for the stop signs.

- When a motorist completed a stop, the vehicle frequently stopped in or past the crosswalk, thus increasing the risk to pedestrians walking across the street. At intersections with marked crosswalks, one quarter (25 percent) of vehicles stopped in or past the crosswalks, impeding the pedestrian pathway.

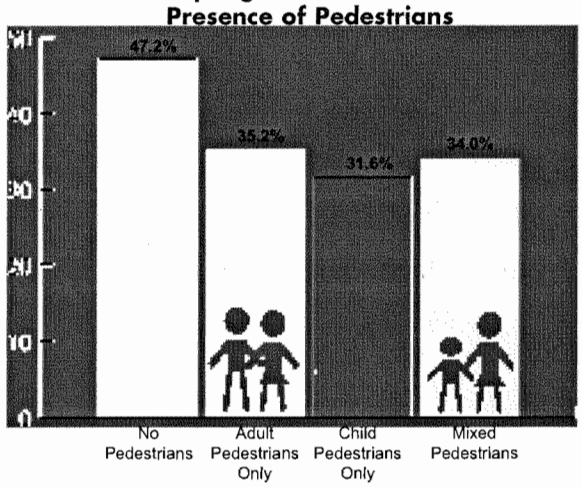
- Motorists were more likely to stop when pedestrians were present.
  - Nearly a third (32 percent) of motorists violated the stop signs when child pedestrians were present.
  - Nearly half (47 percent) of motorists violated the stop signs when no pedestrians were present.

- Drivers were more likely to stop for pedestrians who were crossing than for those waiting to cross.
  - Nearly a quarter (24 percent) of drivers did not come to a complete stop at intersections where pedestrians were crossing.
  - More than a third (36 percent) of motorists violated the stop signs when pedestrians were waiting to cross.

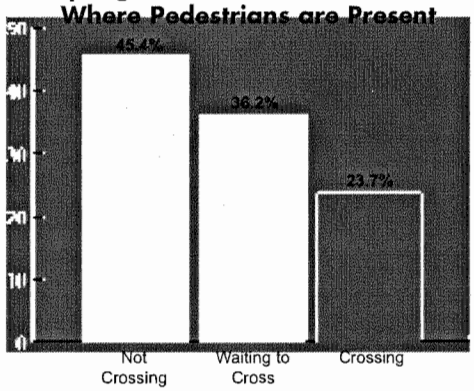
Observation of Stop Sign Violations



Stop Sign Violators in the Presence of Pedestrians



Stop Sign Violations at Intersections Where Pedestrians are Present



DISCUSSION

This observational survey of stop sign compliance in school zones and residential areas indicates that child pedestrians are at risk every day because of motorist behaviors. Child pedestrian safety must be a higher priority for our nation's drivers.

Teaching children pedestrian safety is not enough, especially since we know that children under age 10 are exposed to traffic threats that exceed their cognitive, developmental, behavioral, physical and sensory abilities. This is exacerbated by the fact that parents often overestimate their children's pedestrian skills.[10]

Child pedestrians cannot ensure their own safety, and parents cannot be sure their children are walking in a safe environment unless motorists – many of whom are also parents – respect traffic laws. Drivers need to be educated about the risks of traffic violations that they may consider to be minor, such as rolling through a stop sign. Enhanced awareness and enforcement of the laws being violated can save lives and create environments that are safe for child pedestrians.

CALL TO ACTION

Since 1999, SAFE KIDS and FedEx Express have teamed up to bring national and local attention to pedestrian safety issues. The two organizations launched the SAFE KIDS Walk This Way program, which has been instrumental in educating local communities about safe pedestrian behaviors and making school zones safer for child pedestrians. Now they are calling upon the 600 SAFE KIDS coalitions and chapters, concerned FedEx Express employees, other safety advocates, and transportation and law enforcement officials to heighten awareness in local communities about stop sign compliance and other safe driving behaviors.

Education

- Create and distribute public awareness tools like public service announcements and brochures to raise awareness of stop sign laws and penalties for violations
- Conduct media campaigns to help drivers learn about safe behaviors
- Encourage parents to walk or bike with their children to school, if possible, to decrease traffic congestion and increase safety
- Provide ongoing drivers' education through state motor vehicle departments
- Promote programs that encourage more walking and less driving, such as the Partnership for a Walkable America's International Walk to School Day
- Develop "walking school buses" or other programs that provide adult supervision along routes child pedestrians take to school

Enforcement and Enactment

- Conduct targeted stop sign enforcement campaigns regularly
- Establish new pedestrian right-of-way and jaywalking laws, and enforce existing ones
- Advocate for stricter penalties and increased fines for violators of stop sign and other traffic laws
- Support federal funding to support Safe Routes to School through the Pedestrian and Cyclist Equity Act of 2003

Engineering

- Dedicate more funds to slowing down cars and increasing the visibility of traffic signs and signals
- Evaluate effectiveness of existing traffic-calming markings, signals and signs
- Assess driving conditions in residential areas and near school zones and determine effective traffic-calming measures

References

[1] Beschen D. Nationwide personal transportation study: Transportation characteristics of school children. Washington (DC): U.S. Department of Transportation, Federal Highway Administration; 1972.

[2] Federal Highway Administration, U.S. Department of Transportation. Our nation's travel: 1995 NPTS early result report. Washington (DC): U.S. Government Printing Office; 1997. FHWA-PL-97-028.

[3] Centers for Disease Control and Prevention. Barriers to children walking and biking to school - United States, 1999. MMWR 2002;51:701-704.

[4] National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) Fatal injury reports [online]. 2001 [cited 2002 August 15]. Available from: URL: www.cdc.gov/ncipc/wisqars

[5] National Center for Health Statistics, Centers for Disease Control and Prevention. National Vital Statistics System. 2000 Mortality Data. Hyattsville (MD): National Center for Health Statistics; 2002.

[6] Center for Injury Prevention and Control, Centers for Disease Control and Prevention. 2002 Dec. Available from: URL: www.cdc.gov/ncipc/wisqars

[7] Economics and Insurance Resource Center, Children's Safety Network. December 2002. [Estimates based on 2001 dollars.]

[8] Taft CH, Kane BE, Mickalide AD, Paul HA. Child pedestrians at risk in America: a national survey of speeding in school zones. Washington (DC): National SAFE KIDS Campaign; October 2000.

[9] National Center for Statistics and Analysis, National Highway Traffic Safety Administration. FARS, NASS GES, 1998-2002. Washington (DC): U.S. Department of Transportation, 2003.

[10] Dunne RG, Asher KN, Rivara FP. Behavior and parental expectations of child pedestrians. Pediatrics 1992;89:486-90.

Suggested citation: Cody BE, Hanley MP. Stop sign violations put child pedestrians at risk: a national survey of motorist behavior at stop signs in school zones and residential areas. Washington (DC): National SAFE KIDS Campaign, October 2003.

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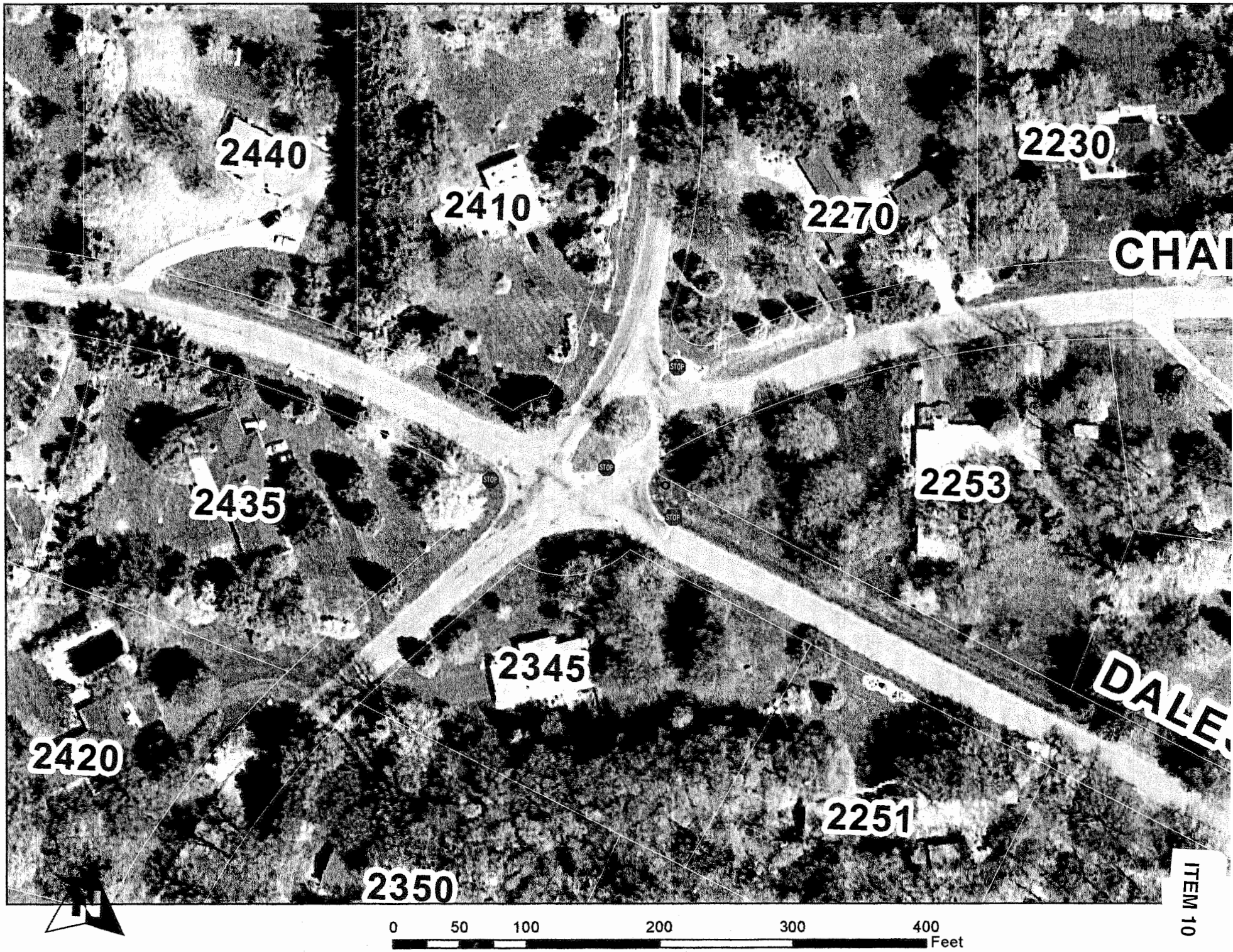
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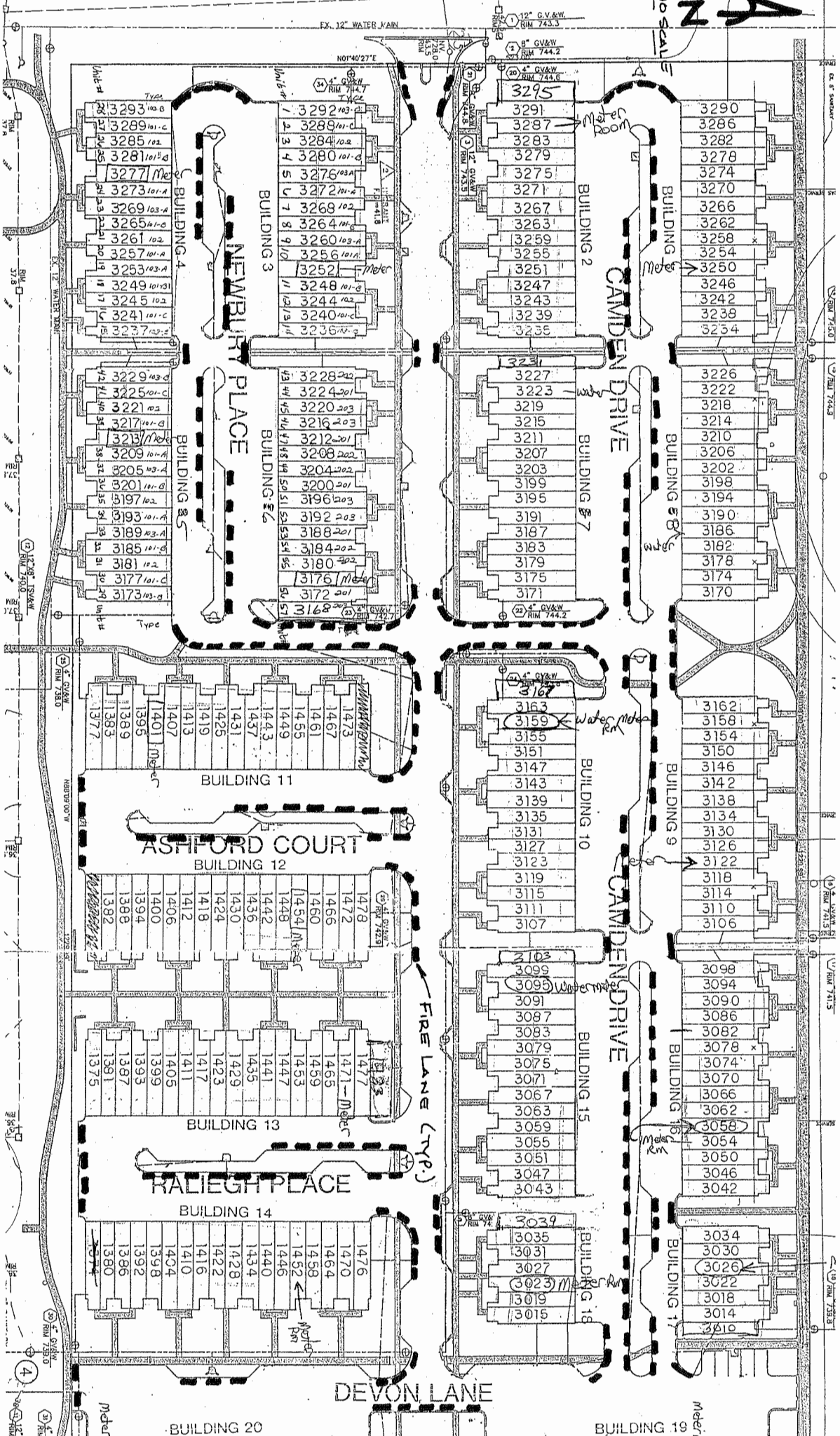
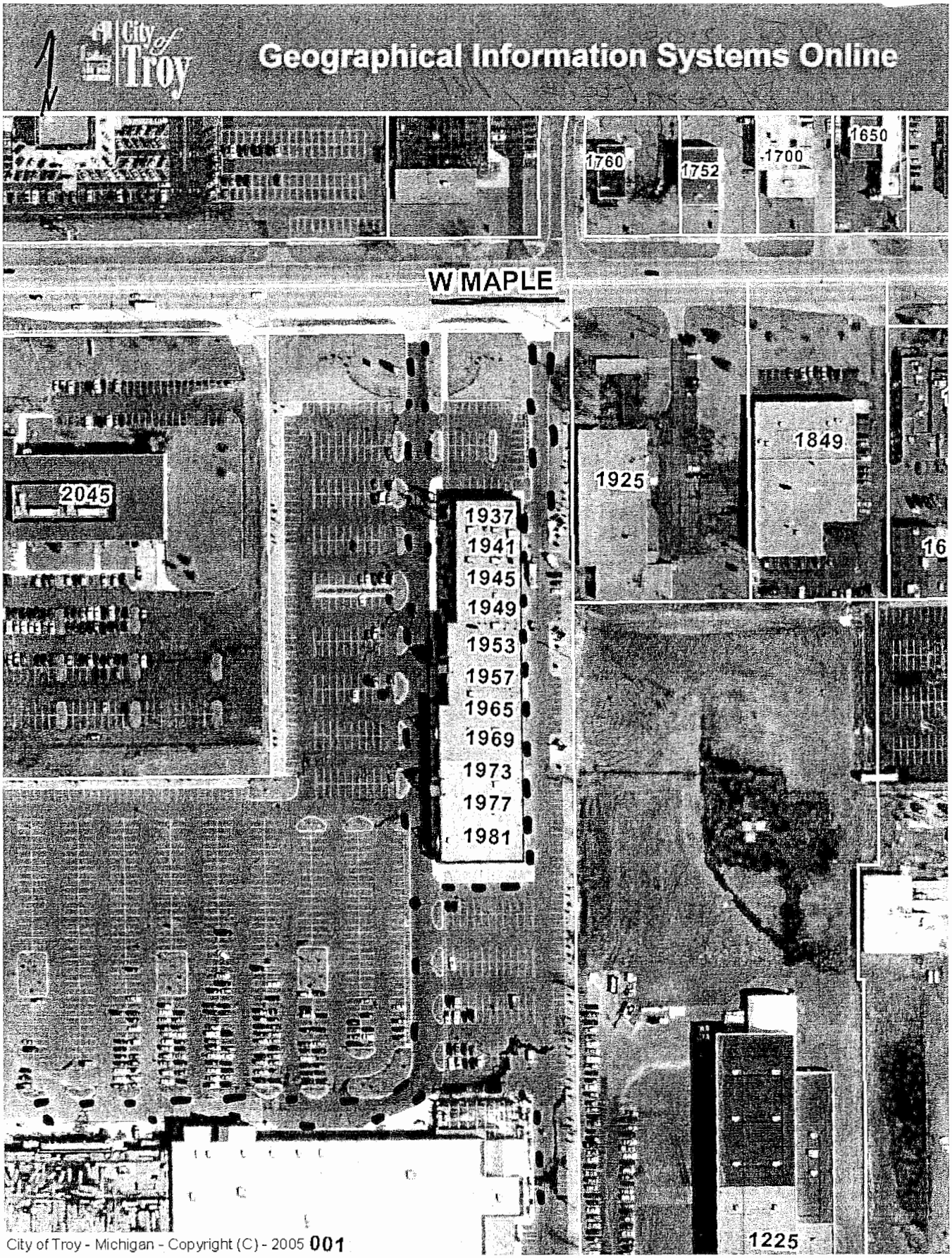
400
Feet

ITEM 10

ITEM 11



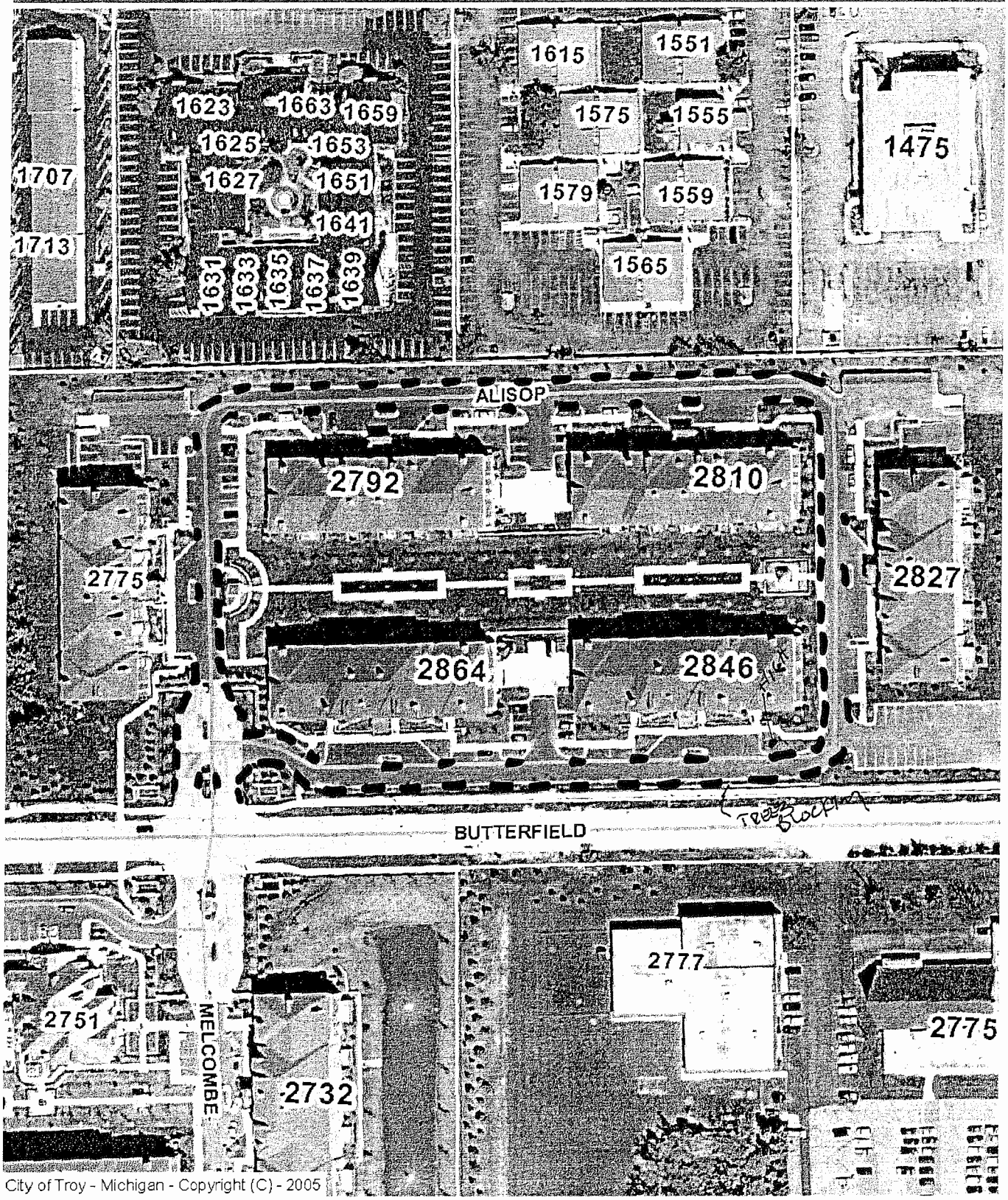
NEWBURY PLACE
CAMDEN DRIVE
ASHFORD COURT
RALIEGH PLACE
DEVON LANE
BUILDING 2
BUILDING 3
BUILDING 4
BUILDING 9
BUILDING 10
BUILDING 11
BUILDING 12
BUILDING 13
BUILDING 14
BUILDING 15
BUILDING 16
BUILDING 17
BUILDING 18
BUILDING 19
BUILDING 20
FIRE LANE (TYP.)
EX. 12" WATER MAIN
Meter Room
Water Meter Rm



Note: The information provided by this application has been compiled from recorded dee

ITEM 13

City of Troy Geographical Information Systems Online



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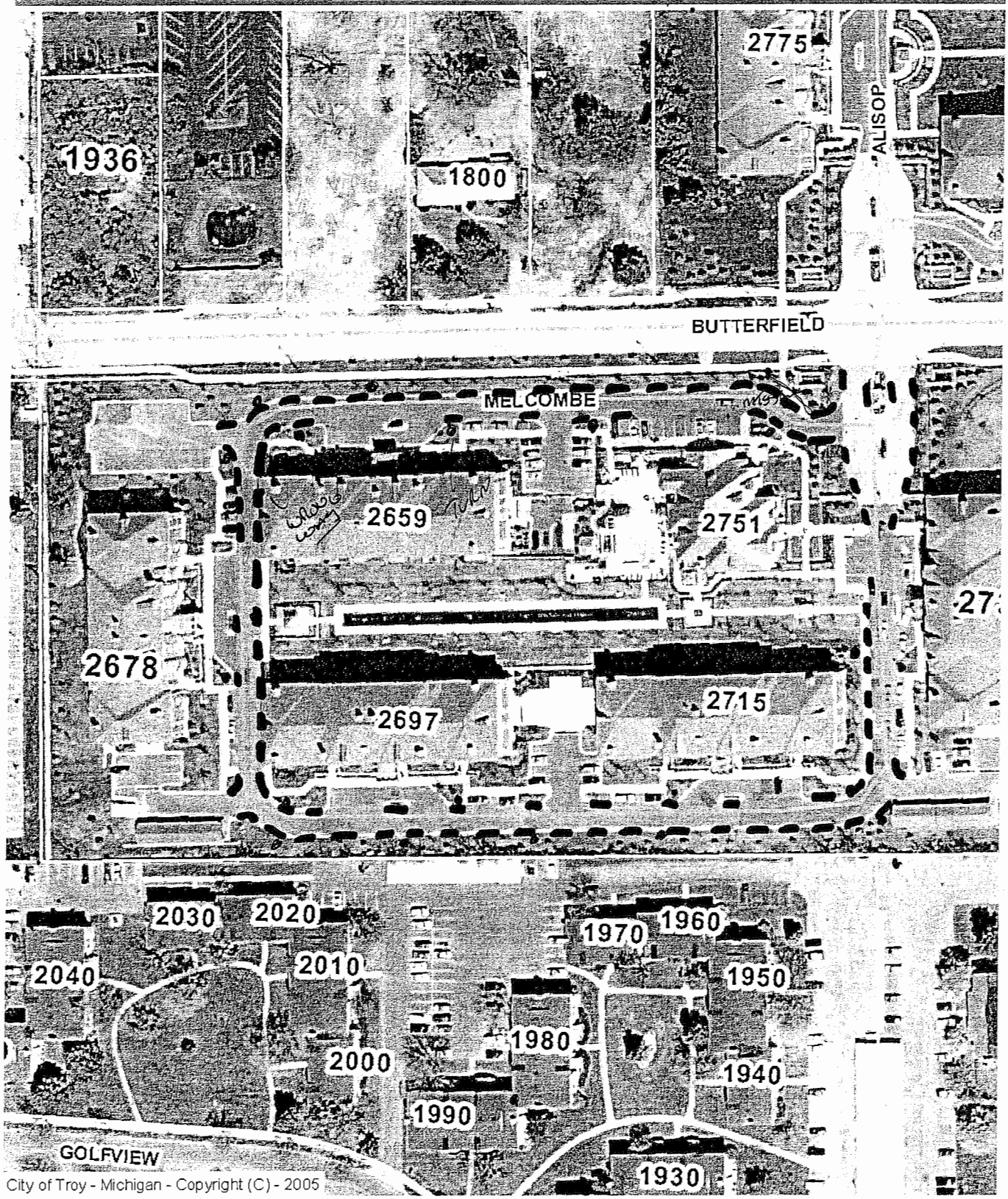
Note: The information provided by this application has been compiled from recorded dee

City of Troy Geographical Information Systems Online



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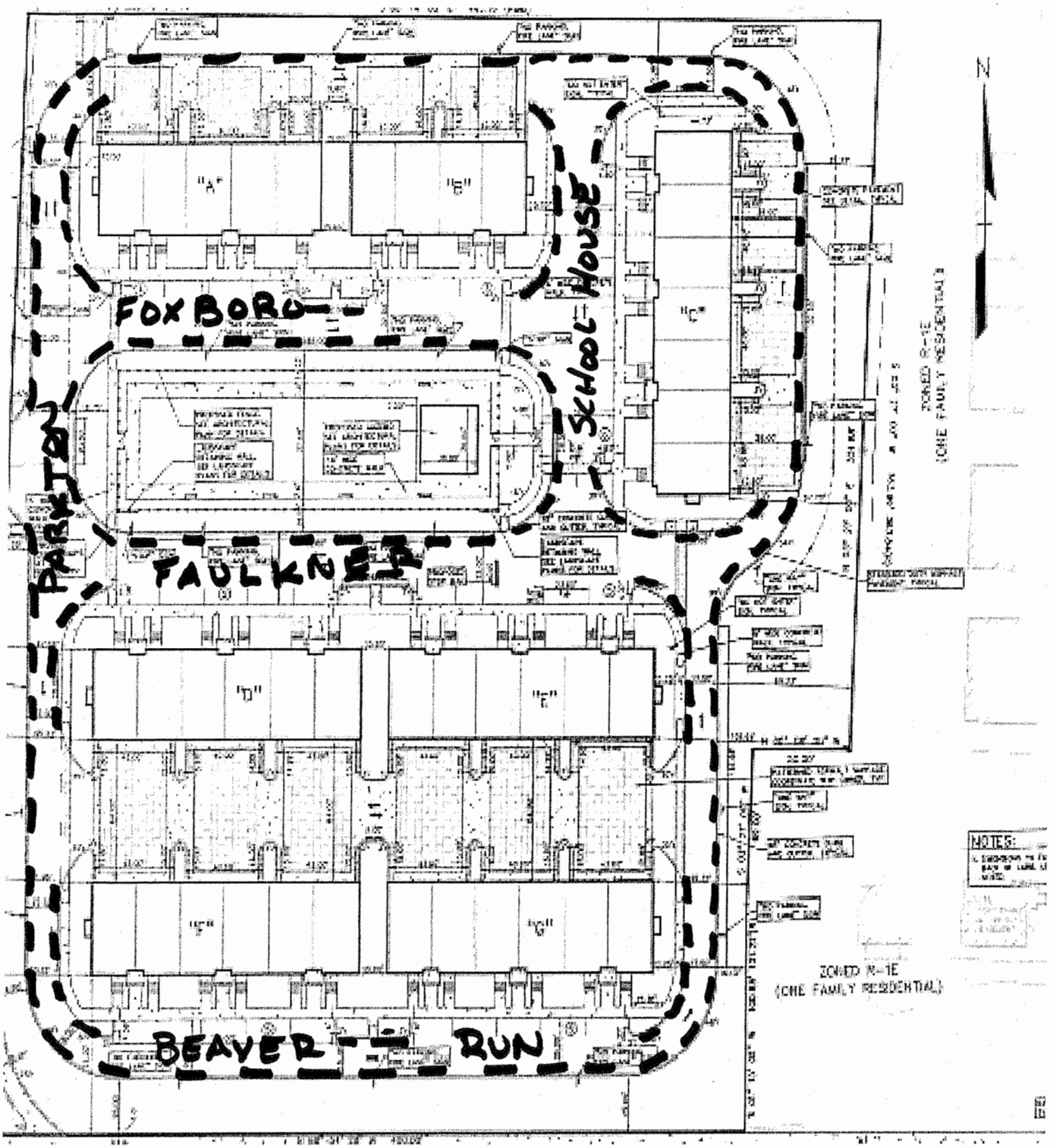
FOXBORO
PARKTON
FAULKNER
BEAVER RUN
School House
"A"
"B"
"C"
"D"
"E"
"F"
"G"
N
ZONED R-1E
(ONE FAMILY RESIDENTIAL)
NOTES: