

February 26, 2015

Mr. David Loy  
Permit Supervisor  
Arizona Department of Transportation (ADOT)  
Phoenix Maintenance District  
2140 West Hilton  
Phoenix, Arizona 85009



**RE: Request to Extend ADOT Permit #1208857 and #1207253 - Grand Ave. (US 60)  
at Primrose Street**

Dear Mr. Loy:

Please consider this letter and its three attachments as the City of El Mirage request for a three-year renewal of applicable permits for a fixed speed photo enforcement system at the intersection of Grand Avenue and Primrose Street. As requested by ADOT, the City of El Mirage has provided relevant and current information concerning ADOT permit #1208857 and #1207253. The location is within the City's jurisdictional limits and within ADOT's right-of-way, and is submitted in compliance with ARS §28-1206 and ADOT Policies, Guidelines and Procedures – Section 260, Photo Enforcement on State Highways (PGP-260).

The attachments are as follows:

- **Attachment 1** - The completed encroachment application form and justification
- **Attachment 2** – A traffic engineering study of the aforementioned intersection performed by G-Mar Engineering LLC
- **Attachment 3** – El Mirage City Council Resolution No. R15-02-02 which establishes, as a matter of public policy, the City's ongoing support for the use of fixed photo enforcement technology along Grand Avenue within the boundaries of El Mirage

## **BACKGROUND**

Grand Avenue is a limited access, controlled arterial roadway with a posted speed limit of 45 miles per hour (mph), carrying an average of 32,160 vehicles per day. The fixed speed photo enforcement system has provided a safe and effective way for the City to enforce the 45 mph speed limit imposed by ADOT.

The traffic engineering study commissioned by the City determined speed cameras have reduced the free flow speeds of vehicles in the area where the technology is currently deployed. In addition, residual vehicle speeds have been reduced in both downstream locations due to the presence of speed cameras.

The findings from the G-Mar study, based upon the complete crash data compilation obtained from City of El Mirage Police Department and ADOT Statewide accident database, indicate a downward trend in the overall number and severity of collisions along the monitored location. Moreover, the updated 2014 study continues to show a decline in injuries and non-incapacitating injuries resulting from collisions since automated photo enforcement was activated in August of 2011.

According to the Arizona Department of Public Safety (DPS), the City is responsible for providing police response along Grand Avenue. The roadway conditions, as they exist, create an unsafe situation for our law enforcement officers. These conditions include an extremely narrow safety lane on the north side, guard rails and a deep culvert on the south side, as well as a frontage road running parallel to Grand Avenue with a 35 mph speed limit due to the significant presence of residences and small businesses. Therefore, the use of technology to enforce safer speeds not only reduces the risk of crashes with injuries for the traveling public, but reduces the need to place the City's police officers in harm's way. Thanks to this technology, the City is able to commit vital police resources to other serious criminal activity including domestic violence and child abuse.

Between August 2011 and July 2012 – the first year speed cameras were utilized at Grand Avenue and Primrose Street - El Mirage processed 105,377 speed citations. The number of citations diminished by 26% to 78,333 between August 2012 and July 2013, and this continued with a 15.75% reduction between August 2013 and July 2014 with 66,003 citations processed.

While drivers are becoming more aware of the consequences of excessive speed through the intersection and traveling below the 11 mph flash threshold, there are still drivers significantly exceeding the 45 mph limit with 3,495 drivers traveling over 65 mph. Clearly, photo technology is a tool that needs to continue on this roadway to promote a safer roadway for the traveling public, police officers, and other public safety personnel.

The City Council, at its February 3, 2015 meeting, discussed and adopted Resolution No. R15-02-02. The resolution affirms the City's ongoing support for the use of fixed photo enforcement technology along Grand Avenue within El Mirage boundaries. The resolution specifically states, "...the City of El Mirage does hereby request the continued use of photo enforcement technology for the purpose of enhancing the public health, safety, and welfare of its citizens and the motoring public along Grand Avenue..." The resolution further asserts the City's view that photo enforcement "...promotes officer safety and allows the City to dedicate its limited resources toward improving neighborhood safety, preventing and investigating domestic violence, child abuse, and other crimes that require the focus of El Mirage peace officers."

The Resolution was passed based on the following facts: (1) a previous El Mirage City Council approved an agreement with Redflex Traffic Systems, Inc. to utilize photo enforcement technology at various locations including Grand Avenue; (2) Arizona Department of Transportation has significantly changed the El Mirage section of Grand Avenue as a result of a construction project that concluded in July 2011; (3) Arizona Department of Transportation establishes the speed limit along Grand Avenue, presently set at 45 mph; (4) it is proven that vehicle speeds continue to be in excess of 11 mph over the posted limit; (5) the current design does not provide a safe environment (i.e. adequate shoulder width) for conventional traffic safety enforcement by peace officers; and (6) the City of El Mirage is required to provide public safety services on Grand Avenue within the City boundaries under A.R.S. §41-1711 Section B.

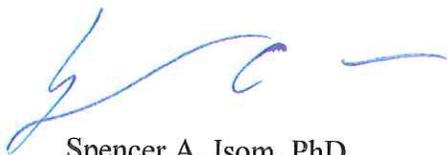
## SUMMARY

As you can see from the above and enclosed information, the Mayor and Council support the use of photo enforcement and take the matter very seriously. In fact, photo enforcement has been vetted across three El Mirage City councils. The City has not wavered in its position concerning the value of fixed photo enforcement technology as an effective way to slow speeds, thereby reducing the risk of crashes resulting in injury or death. Your ongoing support by approving this request for a three-year permit renewal is appreciated.

Please note Redflex is expected to deliver the required photo radar insurance certificate to ADOT on or before April 1, 2015.

If you have questions or need additional information to complete your review of the City's permit renewal request, please contact me at [sisom@cityofelmirage.org](mailto:sisom@cityofelmirage.org) or 623-203-5011.

Sincerely,



Spencer A. Isom, PhD  
City Manager



The Honorable Lana Mook  
Mayor

Attachments (3)

c: ADOT Director John S. Halikowski  
ADOT Phoenix Regional Traffic Engineer Mark J. Poppe, PE ✓  
ADOT Government Relations Assistant Director Kevin Biesty  
El Mirage Mayor Lana Mook  
El Mirage Director of Development and Community Services/City Engineer Jorge Gastelum  
El Mirage Police Chief Steven Campbell  
El Mirage Intergovernmental Relations Manager Amber Wakeman  
G-Mar, LLC Traffic Engineer Thomas Chlebanowski  
Redflex Traffic Systems

SAI/aw



## **Attachment One – ADOT Highway Encroachment Permit Application**



**ARIZONA DEPARTMENT OF TRANSPORTATION**  
**INTERMODAL TRANSPORTATION DIVISION**  
 Highway Encroachment Permit Application  
*(Application for Permission to Use State Highway Right-of-Way)*

**FOR ADOT USE** ADOT Agreement Number: \_\_\_\_\_  ECS  JPA  Other \_\_\_\_\_

PERMIT NUMBER: \_\_\_\_\_ ROUTE: \_\_\_\_\_ MILEPOST: \_\_\_\_\_

ADOT PROJECT NUMBER: \_\_\_\_\_ ADOT ENGINEERING STATION: \_\_\_\_\_

Name of Encroachment Owner:  
 City of El Mirage  
 Mailing Address of Owner:  
 12145 NW Grand Avenue  
 City:  
 El Mirage  
 State: AZ Zip: 85335  
 Phone:  
 (623) 876-2976  
 E-mail address:  
 jgastelum@cityofelmirage.org  
 Name of Local Point of Contact:  
 Mr. Jorge Gastelum  
 Phone Number for Local Point of Contact:  
 (623) 876-2976

Name of Authorized Agent / Applicant *(If other than the Encroachment Owner)*:  
 Mailing Address:  
 City:  
 State: Zip:  
 Phone:  
 Legal Relationship to Owner:  
 Contractor  Sub Contractor  Authorized Employee  
 Engineer  Attorney  Other:  
 E-mail Address:

City (in or near) El Mirage Side of Highway:  N  S  E  W (check one)  
 Highway Route # US 60 Approximately \_\_\_\_\_ Feet  N  S  E  W (check one) of Milepost # 145

Encroachment Owner's Project # or Property Parcel #: \_\_\_\_\_ Project Duration : 3 years

Description of the proposed work or activity in the right-of-way: Re: ADOT Permit # 1208857 and 1207253  
 As requested by ADOT, the City of El Mirage has provided more relevant and current information concerning ADOT permit #1208857 and 1207253.  
 A three (3) year renewal to continue to operate a photo enforcement system at the intersection of Grand Avenue (US 60) and Primrose Street in the City of El Mirage is requested.

**The Encroachment Owner will be the Permittee. By signing this application, the Encroachment Owner and the Owner's Agent acknowledge that the information given and statements made in this application are true and correct to the best of his/her knowledge. The Encroachment Owner agrees as the Permittee to accept the following General Obligations and Responsibilities as described on page 2 of the application. By accepting an approved encroachment permit, the Permittee agrees to the requirements described in the permit, to be responsible for all permit requirements, and to comply with ADOT's requirements as set out in the permit. An approved permit consists of but is not limited to this application and final supporting documentation approved by ADOT, and any requirements set by ADOT. NO WORK SHALL TAKE PLACE INSIDE THE RIGHT OF WAY WITHOUT AN APPROVED PERMIT ON SITE.**

Jorge Gastelum *Jorge Gastelum* 2-17-15  
 Encroachment Owner (Print Name and Sign) Date

Authorized Agent or Applicant: *If other than the Encroachment Owner (Print Name and Sign)* Date

**FOR ADOT USE**  
**PERMIT TO USE STATE HIGHWAY RIGHT-OF-WAY**

*This application is approved as a permit and a permit is issued to the Permittee. Construction is authorized only for the period indicated below.*

Authorized ADOT Name and Signature \_\_\_\_\_ Authorized ADOT Name and Signature \_\_\_\_\_

Issue Date \_\_\_\_\_ Permit work to be completed by: \_\_\_\_\_

## GENERAL OBLIGATIONS AND RESPONSIBILITIES

### THE PERMITEE SHALL:

1. Assume all legal liability and financial responsibility for the encroachment activity for the duration of the encroachment, including indemnify, defend, and save harmless ADOT and the State of Arizona and any of its agents, directors, officers, employees from and against any and all claims, demands, suits, actions, proceedings, loss, costs, damages of every kind, or expenses, including court costs, reasonable attorney's fees and/or litigation expenses, and costs of claim processing and investigation, arising out of bodily injury or death of any person, or tangible or intangible property damage, caused, or alleged to be caused, in whole or in part, by the negligent or willful acts, or omissions of the Permittee, any of its directors, officers, agents, employees, or volunteers, or its contractor or subcontractors. This indemnity includes any claim or amount arising out of or recovered under the Workers' Compensation Law or arising out of the contractor's failure to conform to any federal, state or local law, statute, ordinance, rule, regulation or court decree. Permittee agrees to provide ADOT with a certificate(s) of insurance consistent with the requirements stated in the ADOT Permit Insurance Matrix. Permittee is also obligated to provide certificates for its contractor(s), if any. The required insurance shall be kept in force by the permittee and its contractors for the term of the permit and shall not expire, be cancelled or materially changed to affect coverage available to the State without thirty (30) days written notice to the State. Automobile and worker's compensation coverage requirements are dependent upon the use of employees and autos for the encroachment activity. Please refer to the Matrix to determine requirements for coverage, limits, language and other insurance related items specific to each permit. Contractor's certificates shall include all subcontractors assureds under its policies, or Contractor shall collect from each of its subcontractors a certificate that meets or exceeds the requirements for a Contractor as outlined in the Matrix. Contractor agrees to maintain and make available to ADOT all subcontractors' certificates upon demand. ADOT reserves the right to require an increase or allow a decrease in insurance limits or coverage based on the risks and financial exposure arising out of the event or activity proposed in the permit application. The Encroachment Permit is issued upon the expressed condition that ADOT and The State of Arizona does not protect or insure against loss of personal property or improvements owned by Permittee. Permittee waives the right to claim damages from ADOT and the State of Arizona for any damage resulting to said property in the event that property is damaged or destroyed by fire or any other perils that is not the direct result of negligence by ADOT or the State of Arizona.
2. Comply with Environmental Laws.
  - A. Environmental Laws refers collectively to any and all federal, state, or local statute, law, ordinance, code, rule, regulation, permit, order, or decree regulating, relating to, or imposing liability or standards of conduct on a person discharging, releasing or threatening to discharge or release or causing the discharge or release of any hazardous or solid waste or any hazardous substance, pollutant, contaminant, water, wastewater or storm water, and specifically includes, but is not limited to: The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation and Liability Act, as amended; the Toxic Substances Control Act; the Clean Water Act (CWA); the Clean Air Act; the Occupational Safety and Health Act; the Arizona Water Quality Act Revolving Fund Act, the Arizona Hazardous Waste Management Act, any applicable National Pollutant Discharge Elimination System (NPDES) or Arizona Pollution Discharge Elimination System (AZPDES) permit, any applicable CWA Section 404 permit, or any local pretreatment or environmental nuisance ordinance.
  - B. Specifically agree that in the course of performing any activity for which this Permit is necessary:
    - i. To comply with any and all Environmental Laws;
    - ii. To ensure that no activity under this Permit shall cause ADOT to be in violation of any Environmental Laws;
    - iii. That if the Permittee fails or refuses to comply with any Environmental Laws, or causes ADOT to be in violation of any Environmental Laws, ADOT may at its sole and unreviewable discretion, (1) revoke this Permit; (2) require the Permittee to undertake corrective or remedial action to address any release or threatened release or discharge of the hazardous substance, pollutant or contaminant, water, wastewater or storm water; and (3) expressly consents to entry of injunctive relief to enforce any listed remedies.
    - iv. To indemnify ADOT for any losses, damages, expenses, penalties, liabilities or claims of any nature whatsoever suffered by or asserted against ADOT as a direct or indirect result of the disposal, escape, seepage, leakage, spillage, discharge, emission, or release of any hazardous waste, solid waste, hazardous substance, pollutant or contaminant, water, wastewater or storm water and losses, damages, expenses, penalties, liabilities and claims asserted or arising under the Environmental Laws, or for ADOT's costs in undertaking corrective action pursuant to an order of or settlement with a duly authorized regulatory agency or injured third party or for any penalties associated with Permittee's activities;
3. Be responsible for any repair or maintenance work and repair any aspect or condition of the encroachment that causes danger or hazard to the traveling public, for the duration of the encroachment and must perform such work under the appropriate encroachment permit authorization;
4. Comply with ADOT's traffic control standards with an ADOT approved traffic control plan;
5. Obtain written approval from the abutting property owner (and/or underlying fee owner where ADOT owns its right of way by easement) if the encroachment encroaches on abutting property owned by someone other than the permittee (and/or on underlying fee land owned by someone other than the permittee where ADOT owns its right of way by easement). In any case and at the Department's discretion; ADOT may require written approval from the abutting property owner prior to issuance of the encroachment permit.
6. ADOT reserves the right to require the permittee to perform any repairs necessary to the encroachment throughout the life of the encroachment;
7. Remove the encroachment and restore the right-of-way to its original or better condition if ADOT cancels the encroachment permit, and terminates all rights under the permit, or if the project terminates for any reason beyond ADOT's control;
8. Reimburse ADOT for costs incurred or deposit with ADOT money necessary to cover all costs incurred for activities related to the encroachment, such as inspections, restoring the right-of-way to its original or better condition, removing the encroachment, or repair encroachment to originally permitted condition and comply with ADOT's bond policy as applicable;
9. Notify a new owner to apply for an encroachment permit, as required by Arizona Administrative Rule R17-3-502(D);
10. Apply for a new encroachment permit if the use of the permitted encroachment or the use of adjoining property changes;
11. Keep a copy of the encroachment permit at the work site or site of encroachment activity;
12. Construct the encroachment according to attached Specifications, Standards and the plans approved by ADOT as part of the final permit; any changes shall be approved by ADOT prior to implementation;
13. Obtain all required permits from other government agencies or political subdivisions;
14. Remove any defective materials, or materials that fail to pass ADOT's final inspection, and replace with materials ADOT specifies.
15. Have the right to a hearing as prescribed in Arizona Administrative Code, R17-3-509 if the permit application is denied;
16. Understand that once issued, the permit is revocable and subject to modification or abrogation by ADOT at any time, without prejudice.

By accepting an approved encroachment permit, the Permittee agrees to the requirements described in the permit, to be responsible for all permit requirements, and to comply with ADOT's requirements as set out in the permit. NO WORK SHALL TAKE PLACE INSIDE THE RIGHT OF WAY WITHOUT AN APPROVED PERMIT ON SITE. I have read and understand the above requirements: Initial                      Date 2-17-15



## **Attachment Two – G-Mar Engineering LLC Study**

**AUTOMATED PHOTO ENFORCEMENT ADOT  
ENCROACHMENT PERMIT UPDATED STUDY**

**(POST 2013 PERMIT APPROVAL)**

**AT**

**NW GRAND AVENUE AND PRIMROSE STREET**

**CITY OF EL MIRAGE, ARIZONA**



**City of  
EL MIRAGE**

Arizona

**GRAND HERITAGE, BRIGHT FUTURE!**



Exp: 09-30-16

Reviewed with concurrence for compliance with ADOT PGP-260 Requirements  
G-Mar Engineering, LLC

Completed by:



Expires 03-31-16

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**TECHNICAL MEMORANDUM**  
**NW GRAND AVENUE AND PRIMROSE STREET AUTOMATED**  
**PHOTO ENFORCEMENT STUDY (UPDATED FROM DECEMBER 10,**  
**2013), CITY OF EL MIRAGE, ARIZONA**

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**TO:** STEVE CAMPBELL – CITY POLICE CHIEF  
JORGE GASTELUM, PE - CITY ENGINEER

**FROM:** THOMAS CHLEBANOWSKI, PE, PTOE, PTP – TRAFFIC ENGINEER

**DATE:** JANUARY 23, 2015

**SUBJECT:** **NW GRAND AVENUE AND PRIMROSE STREET AUTOMATED PHOTO ENFORCEMENT STUDY (UPDATED FROM DECEMBER 10, 2013), CITY OF EL MIRAGE, ARIZONA**

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G-Mar Engineering, LLC (G-mar) has been commissioned by the City of El Mirage to provide an updated traffic engineering study per one of the permit approval conditions contained within the correspondence (dated April 4, 2014) from ADOT Phoenix Regional Traffic Engineer – Mr. Mark J Poppe, PE. The updated study is intended to include provisions set forth by the Arizona Department of Transportation (ADOT) under the ADOT Policies, Guidelines and Procedures – Section 260 Photo Enforcement on State Highways (PGP-260).

The automated photo enforcement devices were installed August 31, 2011 after the completion of the two-year long, ADOT Grand Avenue Widening Project, which converted the facility from a two lane to a six lane arterial cross section, containing a nominal ten foot wide paved shoulder. In a meeting on October 30, 2014 with City Management, Redflex Traffic Systems, G-mar and ADOT Traffic/Safety Engineer, Mark J. Poppe, PE, a discussion regarding the update to the original study completed on December 10, 2013 reflected the intentions and content of the updated study as follows:

- (1) An updated study to be completed per the PGP-260 guidelines, however,
- (2) Requirements of the ADOT PGP would again be covered (as required by state statute) as part of the study but also considers (or at least comments on) a possibility of factors such as roadway geometrics, road side “friction” and possible environmental effects beyond the 85<sup>th</sup> percentile running speed identification.<sup>1</sup>
- (3) The collection methodologies used in the update would replicate the previous methodologies of speed data collected (i.e., radar and 24 hour daily speeds). However, two days of ADT data would be collected and seasonally factored from ADOT seasonal traffic factors obtained from mark catchpole at ADOT, Metropolitan Planning Division (MPD).

ADOT was aware of the challenges that were discussed and that the City would endeavor to earnestly meet the intent of the study requirements contained in the ADOT PGP-260 “Renewal of Existing Permits” §§1 (a), (b) and (c) accordingly.

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<sup>1</sup> It should be noted that discussions of analyses and methodologies for deeper evaluation of crash predictions and the development of performance functions, and statistical implications (i.e., possible regression to the mean crash values) as established in the latest edition of the Highway Safety Manual (HSM), pointed to more durational sampling along the Grand Avenue corridor at multiple locations. These aspects were thought to be in a study conducted by ADOT sometime in the future.

The results of the study, in accordance with the ADOT PGP 260 requirements are summarized as follows:

UPDATED STUDY -- 2014 YEAR					
LOCATION	'AWDT	'AADT	85 <sup>TH</sup> PERCENTILE	50 <sup>TH</sup> PERCENTILE	% OF VEHICLES TRAVELING > 45MPH
NORTHBOUND UPSTREAM	15861 VPD	14462 VPD	52 MPH	47 MPH	61.4%
NORTHBOUND AT PRIMROSE	15861 VPD	14462 VPD	51 MPH	47 MPH	59.0%
NORTHBOUND DOWNSTREAM	15984 VPD	14574 VPD	53 MPH	46 MPH	56.4%
SOUTHBOUND UPSTREAM	15360 VPD	14005 VPD	50 MPH	45 MPH	46.0%
SOUTHBOUND AT PRIMROSE	15360 VPD	14005 VPD	50 MPH	47 MPH	63.0%
SOUTHBOUND DOWNSTREAM	17114 VPD	15605 VPD	55 MPH	49 MPH	72.4%

<sup>1</sup>Reference Exhibit 1.3 for calculations related to conversion/adjustments of Average Annual Daily Traffic per ADOT Adjustments Factors.

ORIGINAL STUDY -- 2013 YEAR					
LOCATION	'AWDT	'AADT	85 <sup>TH</sup> PERCENTILE	50 <sup>TH</sup> PERCENTILE	% OF VEHICLES TRAVELING > 45MPH
NORTHBOUND UPSTREAM	15369 VPD	14012 VPD	60 MPH	52 MPH	83.1%
NORTHBOUND AT PRIMROSE	15369 VPD	14012 VPD	51 MPH	47 MPH	70.0%
NORTHBOUND DOWNSTREAM	15583 VPD	14207 VPD	55 MPH	50 MPH	73.6%
SOUTHBOUND UPSTREAM	16947 VPD	15451 VPD	58 MPH	52 MPH	85.3%
SOUTHBOUND AT PRIMROSE	16947 VPD	15451 VPD	51 MPH	47 MPH	63.0%
SOUTHBOUND DOWNSTREAM	16519 VPD	15060 VPD	51 MPH	44 MPH	40.7%

<sup>1</sup>Reference Exhibit 1.3 for calculations related to conversion/adjustments of Average Annual Daily Traffic per MAG Adjustments Factors.

**SUMMARY OF ADOT PGP-260 §1 (a)1, 2 RESULTS (SPEED AND TRAFFIC VOLUMES)**

The above summary data demonstrates after another year of ongoing automated speed enforcement (i.e., 2014 updated study) deployment that traffic speed cameras have contributed to ongoing trend of overall speed reductions. The free flow speeds upstream and downstream have appeared to have normalized since the roadway geometric and reconstruction improvements have been completed. Furthermore, vehicles traveling above 45 mph have shown a remarkable drop/change in speed trends, with the exception of the southbound downstream values on Grand Avenue. The end result is thought

that drivers now enjoy a more efficient facility where no longer are drivers speeding due to "impatience or frustration" with the facility.

The residual downstream effects appear to be somewhat realized. No explanation for why the uptick in 2014 southbound downstream speeds can be offered when compared to 2013. Perhaps more familiarity with the facility along with a newer, smoother facility that has a downgrade in the southbound direction towards the Agua Fria River. G-mar investigated and provided information on the specific impacts of the speeds and crash experiences that meets the intent of the PGP-260 "Renewal of Existing Permits" §§1 (a), (b) and (c) accordingly.

Year	ACCIDENT TYPE								Total Incidents
	Rear End	Left Turn	Angle	Sideswipe Same Direction	Single Vehicle	Rear to Rear	Other	Unknown	
2009	7	1	0	0	0	0	0	0	8
2010	6	2	1	1	2	0	0	0	12
2011	6	0	2	5	0	1	0	0	14
2012	11	2	2	1	2	0	1	1	20
2013	10	0	1	1	1	0	0	0	13
2014	9	0	1	1	0	0	0	0	11

<sup>2</sup>Yearly data begins on August 31st and ends on the following August 31st of the following year to coincide with photo enforcement installation and activation date as a point of reference for consistency in annual comparisons.

Year	SEVERITY TYPE					Total Incidents per Year
	Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	PDO (O)	
2009	0%	0%	25%	0%	75%	8
2010	0%	0%	8%	17%	75%	12
2011	0%	0%	7%	7%	86%	14
2012	0%	5%	0%	25%	70%	20
2013	0%	0%	0%	15%	85%	13
2014	0%	0%	0%	45%	55%	11

<sup>2</sup>Yearly data begins on August 31st and ends on the following August 31st of the following year to coincide with photo enforcement installation and activation date as a point of reference for consistency in annual comparisons.

### SUMMARY OF ADOT PGP-260 §1 (c) RESULTS (CRASH CHANGES)

The above summary crash data also demonstrates that one year after the initial study in 2013 that the deployment of automated speed enforcement cameras continue to remarkably show overall crash reductions along NW Grand Avenue at Primrose. In particular, above data continues to show no fatal, injury or non-incapacitating injury accidents. In 2014, this updated study impressively shows that the overall incidents per year continue a downward trend since just after the cameras were installed in late 2011.

The following technical study is offered in support of the conclusion that the 2014 updated automated photo enforcement at the study intersection has a continued ongoing speed reduction effects both at the intersection and some downstream locations along with remarkable reductions in crash experiences and severity.

Should you have any questions or clarifications, please feel free to contact me at 623-341-3580.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas Chlebanowski". The signature is written in a cursive style with a large initial 'T'.

Thomas Chlebanowski, PE, PTOE, PTP  
Traffic Engineer

## PURPOSE AND BACKGROUND

G-Mar Engineering, LLC (G-mar) has been commissioned by the City of El Mirage to provide an updated traffic engineering study per one of the permit approval conditions contained within the correspondence (dated April 4, 2014) from ADOT Phoenix Regional Traffic Engineer – Mr. Mark J Poppe, PE. The updated study is intended to include provisions set forth by the Arizona Department of Transportation (ADOT) under the ADOT Policies, Guidelines and Procedures – Section 260 Photo Enforcement on State Highways (PGP-260).

## EXISTING PHYSICAL CONDITIONS

A 2014 field review of existing field conditions indicate no remarkable changes to the area for the purposes of this updated study. However, for the purposes of record clarity and consistency with the previous 2013 completed study, the foregoing is a description of existing conditions.

The area of study is located within the Arizona Department of Transportation's right-of-way at the "Tee" intersection of NW Grand Avenue and Primrose Street, within the City jurisdictional limits of El Mirage. Primrose is a quasi urban collector street with two lanes of travel and ends at a four-way intersection/frontage road (couplet road) parallel to NW Grand Avenue by nominally forty feet.

The traffic control at Primrose and NW Grand/Frontage Road is a combination of signalization at NW Grand (north and south bound) and three-quarter stop control at Primrose and Frontage Road (with three approaches: north, east and west at Primrose and Frontage, being stop controlled such that traffic departing off of NW Grand has free flow on to Primrose Street). NW Grand Avenue is a limited access controlled, arterial functional classification roadway facility, with a posted speed limit of forty-five miles per hour and carries an average of 32,160 vehicles per day (a nominal increase in of 272 average daily traffic from the 2013 study).



## AUTOMATED PHOTO ENFORCEMENT INTERSECTION - PRIMROSE AND NW GRAND

## ADOT POLICIES GUIDELINES AND PROCEDURES AND STUDY CHALLENGES

The regulation of automated photo enforcement on ADOT rights of way is governed by the legislative acts of HB 2477 during the 2013 assembly session, thereby creating an amendment to the Arizona Revised Statutes, thus creating ARS 28-1206 - Photo enforcement systems; state highways; cities and towns. ARS 28-1206 relegates the photo enforcement on state roadways to the auspices of ADOT's jurisdiction for administration through the Arizona Policies Guidelines and Procedures - 260 and is summarized in the excerpts from the PGP-260 "Renewal of Existing Permits" §§1 (a)1,2, (b) and (c) below:

- (a) A traffic engineering study, signed and sealed by a Professional Engineer registered in Arizona, for the area covered by each proposed enforcement system. This study shall be performed at a time when the enforcement system is installed and fully operational.

This study shall also contain:

1. Current information on average annual daily traffic (AADT) by direction, or entering volumes and turning movement counts for systems located at intersections
  2. The current percentage of free-flow traffic that is traveling in excess of the current posted or statutory speed at that location
- (b) A list of all reported crashes occurring in the area covered by the enforcement system, encompassing a period of time of available report data when the enforcement system is installed and operational. If possible, this list should include a minimum of two years of crash data.
  - (c) An analysis of changes in the number and types of crashes since the installation of the enforcement system compared to the crashes occurring prior to installation of the enforcement system.

In a meeting on October 30, 2014 with City Management, Redflex Traffic Systems, G-mar and ADOT Traffic/Safety Engineer, Mark J. Poppe, PE, a discussion regarding the update to the original study completed on December 10, 2013 reflected the intentions and content of the updated study as follows:

- (1) An updated study to be completed per the PGP-260 guidelines, however,
- (2) Requirements of the ADOT PGP would again be covered (as required by state statute) as part of the study but also considers (or at least comments on) a possibility of factors such as roadway geometrics, road side "friction" and possible environmental effects beyond the 85<sup>th</sup> percentile running speed identification.<sup>2</sup>
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<sup>2</sup> It should be noted that discussions of analyses and methodologies for deeper evaluation of crash predictions and the development of performance functions, and statistical implications (i.e., possible regression to the mean crash values) as established in the latest edition of the Highway Safety Manual (HSM), pointed to more durational sampling along the Grand Avenue corridor at multiple locations. These aspects were thought to be in a study conducted by ADOT sometime in the future.

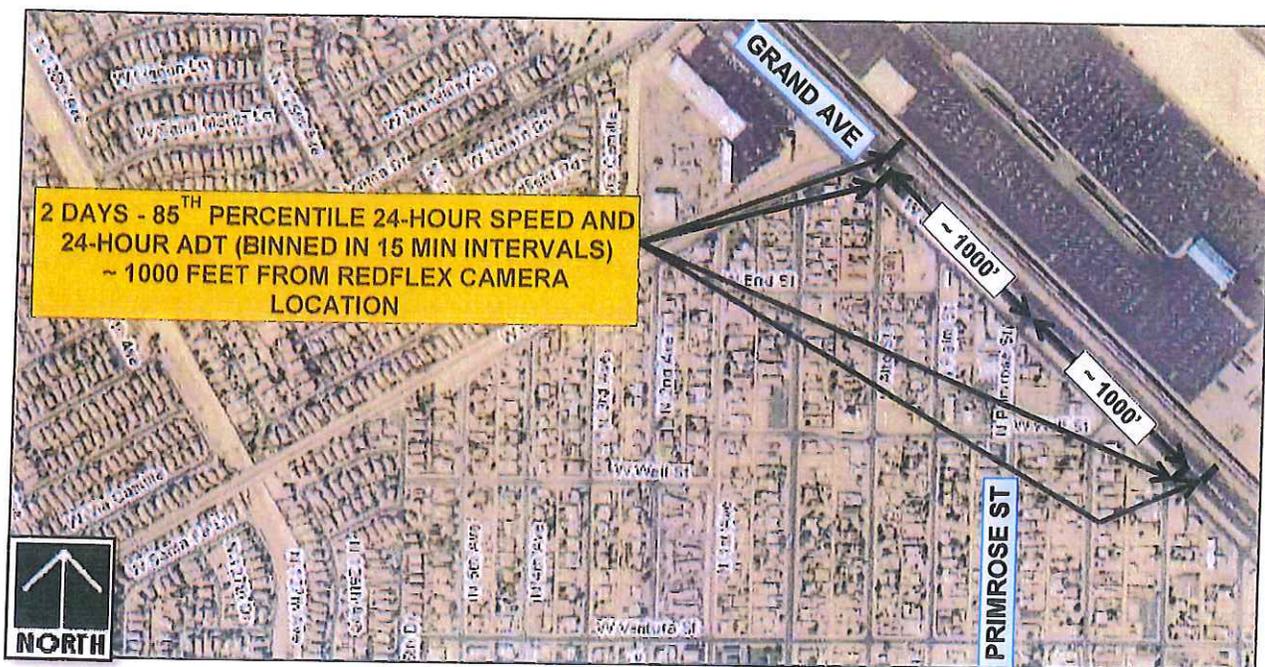
traffic factors obtained from mark catchpole at ADOT, Metropolitan Planning Division (MPD).

ADOT was aware of the challenges that were discussed and that the City would endeavor to earnestly meet the intent of the study requirements contained in the ADOT PGP-260 "Renewal of Existing Permits" §§1 (a), (b) and (c) accordingly and demonstrate the need for ongoing safety counter measures that automated photo enforcement provides.

### DATA COLLECTION PROCEDURES SUMMARY

Replicating the previous study data collection method for this updated study, G-mar worked to capture a reasonably accurate depiction of true free flow traffic speed operational conditions along the corridor at the photo enforced intersection area.

The general rule from traffic flow theory that as traffic density for a particular segment increases, the operational/running speeds decrease.<sup>3</sup> It is for this reason that G-mar formulated a speed data collection scenario/procedure/methodology to mitigate skewed free flow speed results such that, traffic speed/counter tubes were placed at locations nominally 1000 feet upstream and downstream (sufficiently far back from the intersection) to a location outside the intersection area of influence (approximately 350 feet)<sup>4</sup>; or away from the installed photo enforcement system so as to minimize the effects of peak hour congested flow or slowing/stopping vehicles at the traffic signal under a red light scenario (i.e., high density low speed conditions). See exhibit below.



### UPSTREAM AND DOWNSTREAM SPEED DATA LOCATIONS - PRIMROSE AND NW GRAND

<sup>3</sup>Traffic Engineering - McShane and Ross, Prentiss Hall, 1990. PP. 286-88

<sup>4</sup> Access Management Manual - Transportation Research Board, 2003. PP. 132-33  
(Includes 255 feet plus 100 foot entrance taper for right turn bays as first influences).

The challenge of up close effects of slowed or queued vehicles potentially skewing speed results was resolved by G-mar conducting radar spot speed data collection during off peak hours along NW Grand Ave in the north and southbound directions at about 200 feet before the stop bars at the intersection of

Primrose Street (on the paved shoulders of NW Grand Ave). Moreover, radar spot speeds were taken during green ball indications only after sufficient time into the green phase developed such that the stopped vehicle queues were dissipated and traffic flow was operating at free flow speed conditions. See exhibit below.



**UP CLOSE RADAR SPOT SPEED DATA LOCATIONS - PRIMROSE AND NW GRAND**

The following data collection methods, days, and duration were completed as follows:

**Field Data Services Sub-Consultant:**

1. January 13 and 14, 2015 and for 2 day duration, continuous data collection (pulse tube counters at 1000 feet, upstream and downstream from Primrose Street)
2. 85th percentile speed
3. 50th percentile speed
4. Average Weekday Daily Traffic (AWDT) used to covert to Average Annual Daily Traffic (AADT)
5. Percentage of traffic traveling above posted 45 mph speed

G-mar Engineering, LLC - Traffic Engineer Data Collection:

1. Off peak hour AM and PM radar spot speed data collection (100 samples) at 200 feet from stop bar upstream (at Primrose) per the following schedule:
  - Wednesday, January 14, 2015      9:45 am - 10:15 am, SB Grand Avenue
  - Wednesday, January 14, 2015      10:20 am - 10:50 am, NB Grand Avenue
  - Wednesday, January 14, 2015      1:45 pm - 2:10 pm, SB Grand Avenue
  - Wednesday, January 14, 2015      2:15 pm - 2:40 pm, NB Grand Avenue
2. 85th percentile speed
3. 50th percentile speed
4. Percentage of traffic traveling above posted 45 mph speed

Note: Average Annual Daily Traffic (AADT) is the same and carries over from upstream NB and SB locations (1000 feet locations) to Primrose intersection due to no access to Grand Avenue within those areas.

G-mar Engineering, LLC - Traffic Engineer Crash Data Collection:

G-mar coordinated with the City Engineer and City Police along with review of the ADOT statewide accident data base for the purposes of integrating the updated crash data (from August 31, 2013 to August 31, 2014) into the previous 2013 study in order to evaluate the combined updated impacts related to crashes and speed incidents at the study intersection.

**CONCLUSION - SPEED RESULTS**

Utilizing ADOT adjustment factors (obtained from ADOT Phoenix MPD offices) and converting a 2-day weekly traffic collection into AADT, the information in conjunction with speed data was analyzed in accordance with the ADOT PGP 260 requirements. The updated 2014 results are summarized as follows:

UPDATED STUDY -- 2014 YEAR					
LOCATION	<sup>1</sup> AWDT	<sup>1</sup> AADT	85 <sup>TH</sup> PERCENTILE	50 <sup>TH</sup> PERCENTILE	% OF VEHICLES TRAVELING > 45MPH
NORTHBOUND UPSTREAM	15861 VPD	14462 VPD	52 MPH	47 MPH	61.4%
NORTHBOUND AT PRIMROSE	15861 VPD	14462 VPD	51 MPH	47 MPH	59.0%
NORTHBOUND DOWNSTREAM	15984 VPD	14574 VPD	53 MPH	46 MPH	56.4%
SOUTHBOUND UPSTREAM	15360 VPD	14005 VPD	50 MPH	45 MPH	46.0%
SOUTHBOUND AT PRIMROSE	15360 VPD	14005 VPD	50 MPH	47 MPH	63.0%
SOUTHBOUND DOWNSTREAM	17114 VPD	15605 VPD	55 MPH	49 MPH	72.4%

<sup>1</sup>Reference Exhibit 1.3 for calculations related to conversion/adjustments of Average Annual Daily Traffic per ADOT Adjustments Factors.

ORIGINAL STUDY – 2013 YEAR					
LOCATION	<sup>1</sup> AWDT	<sup>1</sup> AADT	85 <sup>TH</sup> PERCENTILE	50 <sup>TH</sup> PERCENTILE	% OF VEHICLES TRAVELING > 45MPH
NORTHBOUND UPSTREAM	15369 VPD	14012 VPD	60 MPH	52 MPH	83.1%
NORTHBOUND AT PRIMROSE	15369 VPD	14012 VPD	51 MPH	47 MPH	70.0%
NORTHBOUND DOWNSTREAM	15583 VPD	14207 VPD	55 MPH	50 MPH	73.6%
SOUTHBOUND UPSTREAM	16947 VPD	15451 VPD	58 MPH	52 MPH	85.3%
SOUTHBOUND AT PRIMROSE	16947 VPD	15451 VPD	51 MPH	47 MPH	63.0%
SOUTHBOUND DOWNSTREAM	16519 VPD	15060 VPD	51 MPH	44 MPH	40.7%

<sup>1</sup>Reference Exhibit 1.3 for calculations related to conversion/adjustments of Average Annual Daily Traffic per MAG Adjustments Factors.

**SUMMARY OF ADOT PGP-260 §1 (a)1,2 RESULTS (SPEED AND TRAFFIC VOLUMES)**

The above summary data demonstrates that one year after the initial study in 2013 that the deployment of automated speed enforcement cameras continue to contribute remarkably to overall speed reductions along NW Grand Avenue at Primrose. The free flow speeds upstream and downstream have appeared to have normalized since the roadway geometric and reconstruction improvements have been completed.

Specifically, the speeds for the updated 2014 year, when compared with 2013, show continued drops in 85<sup>th</sup> and 50<sup>th</sup> percentile speeds with the exception of the southbound downstream values showing a nominal 5 mph uptick. Furthermore, vehicles traveling above 45 mph have shown a remarkable drop/change in speed trends, again with the exception of the southbound downstream values on Grand Avenue. This change in drop in is on the order over 0 to 20 percentage points (with the exception of SB Downstream location) which, intuitively, is substantial from a professional interpretation standpoint. The possible explanation for such observations are that traffic has since normalized along the facility from the time of construction improvements and people are not as psychologically "frustrated" with the congested/stop and go conditions. The end result is that drivers appear now enjoy a more efficient facility where no longer are drivers speeding due to impatience with the facility.

The residual downstream effects appear to be somewhat realized in the northbound direction. However, when compared to 2013, no explanation for why the uptick in 2014 southbound downstream speeds on Grand Avenue can be offered. Perhaps more familiarity with the facility along with a newer, smoother facility that has a downgrade in the southbound direction towards the Agua Fria River.

Additional data supplementation to the summary of results is provided graphically in Exhibits 1.1 and 1.2 included in the attachment section of this study.

## CONCLUSION - CRASH RESULTS

Crash data was provided by City of El Mirage, along with review of the ADOT statewide accident data base for the purposes of integrating the updated crash data (from August 31, 2013 to August 31, 2014) into the previous 2013 study. The results for 2013 in comparison with the updated 2014 crash data were summarized per accident type and total incidents, as depicted in the table below. It should be noted that automated enforcement devices were installed August 31, 2011 after the completion of the two-year long, ADOT Grand Avenue Widening Project.

<sup>2</sup> Year	ACCIDENT TYPE (UPDATED TO INCLUDE 2014)								Total Incidents
	Rear End	Left Turn	Angle	Sideswipe Same Direction	Single Vehicle	Rear to Rear	Other	Unknown	
2009	7	1	0	0	0	0	0	0	8
2010	6	2	1	1	2	0	0	0	12
2011	6	0	2	5	0	1	0	0	14
2012	11	2	2	1	2	0	1	1	20
2013	10	0	1	1	1	0	0	0	13
2014	9	0	1	1	0	0	0	0	11

<sup>2</sup>Yearly data begins on August 31st and ends on the following August 31st of the following year to coincide with photo enforcement installation and activation date as a point of reference for consistency in annual comparisons.

<sup>2</sup> Year	SEVERITY TYPE (UPDATED TO INCLUDE 2014)					Total Incidents per Year
	Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	PDO (O)	
2009	0%	0%	25%	0%	75%	8
2010	0%	0%	8%	17%	75%	12
2011	0%	0%	7%	7%	86%	14
2012	0%	5%	0%	25%	70%	20
2013	0%	0%	0%	15%	85%	13
2014	0%	0%	0%	45%	55%	11

<sup>2</sup>Yearly data begins on August 31st and ends on the following August 31st of the following year to coincide with photo enforcement installation and activation date as a point of reference for consistency in annual comparisons.

### SUMMARY OF ADOT PGP-260 §1 (c) RESULTS (CRASH CHANGES)

Similar to the speed data results, the above summary crash data also demonstrates that one year after the initial study in 2013 that the deployment of automated speed enforcement cameras continue to remarkably show overall crash reductions along NW Grand Avenue at Primrose. In particular, above data continues to show no fatal, injury or non-incapacitating injury accidents. In 2014, this updated study shows impressively that the overall incidents per year continue a downward trend since just after the cameras were installed in late 2011. Moreover, the general trend also is consistent with a downward trend in accident severity types, with crashes, when they occur, result in movement towards property damage only. The shift crashes do show an increase in "possibly injury" crashes at a tradeoff for lower property damage crashes. The possible injury is described typically as a case where an accident party refuses medical treatment.

The general trend is suggestive of a positive effect on driver behavior and associated crash experiences when crashes have occurred. The overall review of the crash data does not suggest a systemic cause to the crashes (i.e., non random crash causing effects such as geometrics, sight visibility, etc) except for the control benefits of the installed automated enforcement devices. Additional monitoring of NW Grand and Primrose intersection, subject to ADOT, may continue to show added improvements in driver behaviors that yield even more reductions in speed and crash activity.

## **ATTACHMENTS**

1. Percentile Speeds Exhibit 1.1
2. Study Segment Speed Variances Exhibit 1.2
3. Existing Conditions Traffic Data Summary Exhibit 1.3
4. UPDATED Crash Data Tables Summary 2008-2014
5. Field Data Services of Arizona Traffic Data Collection Results
6. Traffic Engineer Radar Spot Speeds Field Collection Data Sheets
7. ADOT ADT Adjustment Factors Table

**LEGEND**

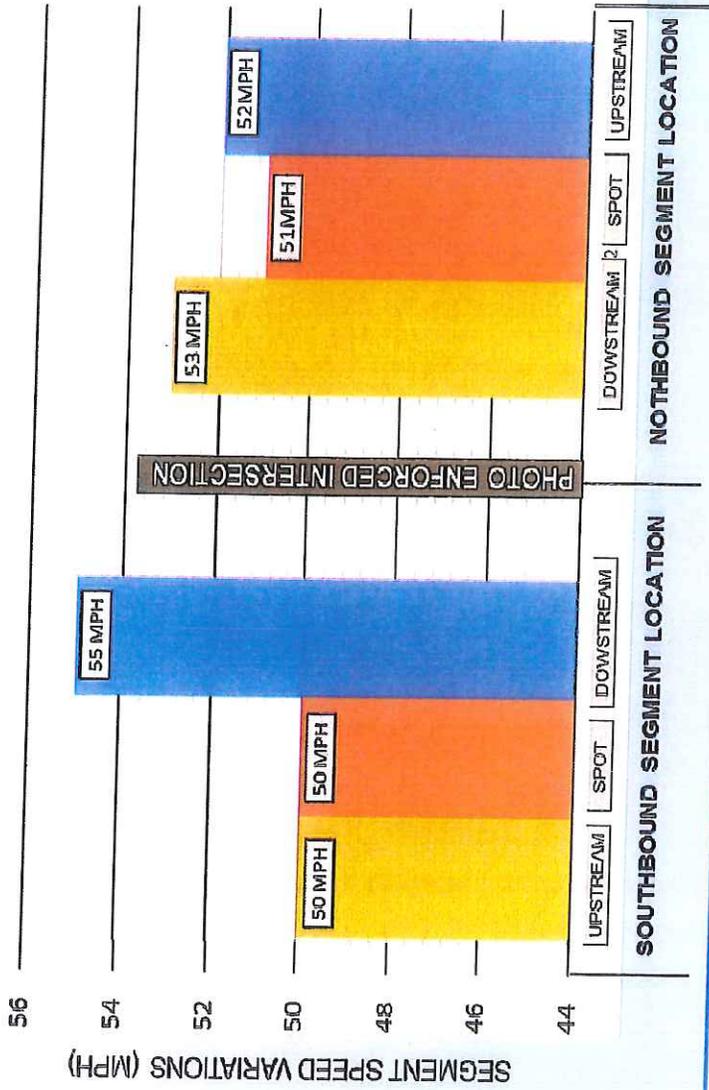
- ROADWAY POSTED SPEED LIMIT
- 85<sup>TH</sup> PERCENTILE SPEED FROM 2-DAYS SPEED DATA COLLECTION
- 85<sup>TH</sup> PERCENTILE SPEED FROM RADAR SPOT PEED DATA COLLECTION
- 50<sup>TH</sup> PERCENTILE SPEED FROM 2-DAYS SPEED DATA COLLECTION



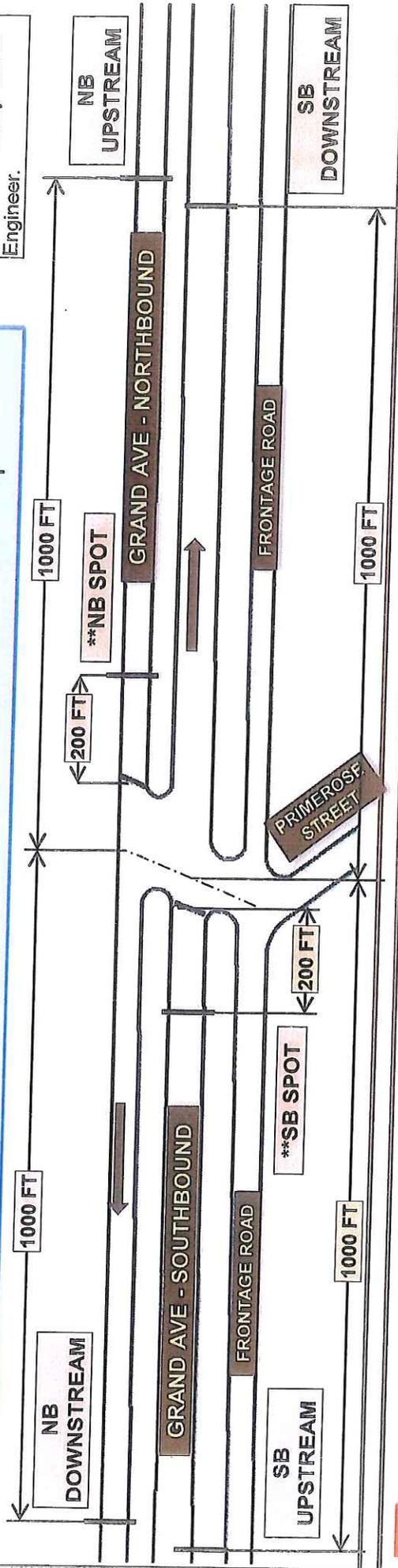
**85<sup>TH</sup> PERCENTILE SPEEDS - EXHIBIT 1.1**  
 REDFLEX CAMERA STUDY - CITY OF EL MIRAGE, ARIZONA



# REDFLEX CAMERA STUDY



\*\*\*Note: Radar Spot Speed samples taken by Traffic Engineer.



## STUDY SEGMENT SPEED VARIANCES - EXHIBIT 1.2

REDFLEX CAMERA STUDY - CITY OF EL MIRAGE, ARIZONA

Working in coordination with



LOCATION	AVERAGE WEEKDAY DAILY TRAFFIC (ADT)	AVERAGE ANNUAL DAILY TRAFFIC (AADT)	85 <sup>TH</sup> PERCENTILE	50 <sup>TH</sup> PERCENTILE	% OF VEHICLES TRAVELING > 45MPH
NORTHBOUND UPSTREAM	15861 VPD	14462 VPD	52 MPH	47 MPH	61.40%
NORTHBOUND AT PRIMROSE	15861 VPD	14462 VPD	51 MPH	47 MPH	59.00%
NORTHBOUND DOWNSTREAM	15984 VPD	14574 VPD	53 MPH	46 MPH	56.40%
SOUTHBOUND UPSTREAM	15360 VPD	14005 VPD	50 MPH	45 MPH	46.00%
SOUTHBOUND AT PRIMROSE	15360 VPD	14005 VPD	50 MPH	47 MPH	63.00%
SOUTHBOUND DOWNSTREAM	17114 VPD	15605 VPD	55 MPH	49 MPH	72.40%

**CALCULATION OF AVERAGE ANNUAL DAILY TRAFFIC (AADT)**

LOCATION	DT (VPD) <sup>1</sup> CUMMULATIVE 2-DAYS	ADT (VPD) <sup>2</sup> DT / 2-DAYS	AADT (VPD) <sup>3</sup> ADT * 0.94 * 0.97
NORTHBOUND UPSTREAM	31721	15861	14462
NORTHBOUND DOWNSTREAM	31968	15984	14574
SOUTHBOUND UPSTREAM	30720	15360	14005
SOUTHBOUND DOWNSTREAM	34228	17114	15605

**Footnotes:**

<sup>1</sup>Weekly counts from Field Data Services 2-days traffic data collection

<sup>2</sup>ADT is obtained by dividing DT by the total collection days (2-days)

<sup>3</sup>From ADOT Seasonal Factor (SF) and Axle Correction Factor (ACF) Tables for the month of January on El Mirage and Grand Ave (US60) - ADOT MPD (Mark Catchpole))  
Jan SF = 0.97 and Jan ACF = 0.94

**ABBREVIATIONS**

- DT -- WEEKLY DAILY TRAFFIC
- ADT -- AVERAGE DAILY TRAFFIC
- AADT -- ANNUAL DAILY TRAFFIC
- VPD -- VEHICLES PER DAY
- MPH -- MILES PER HOUR



# ACCIDENT SUMMARY AFTER REDFLEX CAMERA INSTALLATION (8-31-2011 TO 8-31-2014)

## INCIDENT SUMMARY 2011-2012

No	Incident ID	Date	Time	Type	ACCIDENT SEVERITY TYPE						
					Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	**PDO (O)		
1	2551239	9/16/2011	11:07 AM	Rear End	0	0	0	0	1	Daylight	Dry
2	2550006	9/28/2011	6:44 AM	Rear End	0	0	0	0	1	Daylight	Dry
3	2551237	9/29/2011	7:20 AM	Other	0	0	0	1	0	Daylight	Dry
4	2550004	9/30/2011	12:46 PM	Rear End	0	0	0	1	0	Daylight	Dry
5	2557388	10/12/2011	6:57 AM	Rear End	0	0	0	1	0	Daylight	Dry
6	2559467	10/26/2011	5:57 AM	Rear End	0	0	0	1	0	Dark/Lighted	Dry
7	2564788	10/26/2011	2:03 PM	Rear End	0	0	0	0	1	Daylight	Dry
8	2581792	1/19/2012	2:35 PM	Single Vehicle	0	0	0	0	1	Daylight	Dry
9	*120102140	1/27/2012	11:17 AM	Rear End	0	0	0	0	1	Daylight	Dry
10	2585178	1/29/2012	5:30 PM	Angle	0	0	0	0	1	Daylight	Dry
11	2589766	2/10/2012	2:15 PM	Angle	0	0	0	0	1	Daylight	Dry
12	2601633	4/2/2012	8:20 AM	Left Turn	0	0	0	0	1	Daylight	Dry
13	2610541	5/1/2012	3:12 PM	Unknown	0	0	0	1	0	Daylight	Dry
14	2618736	5/24/2012	8:55 AM	Rear End	0	0	0	0	1	Daylight	Dry
15	2620698	5/24/2012	11:26 PM	Rear End	0	0	0	0	1	Daylight	Dry
16	2620690	5/29/2012	9:04 AM	Rear End	0	0	0	0	1	Dark/Lighted	Dry
17	2619352	6/4/2012	7:25 AM	Sideswipe Same Direction	0	0	0	0	1	Daylight	Dry
18	2625104	6/23/2012	11:38 AM	Rear End	0	0	0	0	1	Daylight	Dry
19	2629169	7/12/2012	1:38 PM	Single Vehicle	0	0	0	0	1	Daylight	Dry
20	2647176	8/26/2012	11:07 AM	Left Turn	0	1	0	0	0	Daylight	Dry

Accident Summary from August 31, 2011 to August 31, 2012

Accident Type	Total
Rear End	11
Single Vehicle	2
Left Turn	2
Sideswipe Same Direction	1
Angle	2
Other	1
Unknown	1
<b>Total Incidents</b>	<b>20</b>

\*City of El Mirage Incident Number  
 \*\*Property Damage Only

Crash Data Summary	
Fatal (K)	0
Incapacitating (A)	1
Non-Incapacitating (B)	0
Possible Injury (C)	5
No Injury (**PDO) (O)	14
	70%

**INCIDENT SUMMARY 2012-2013**

No	Incident ID	Date	Time	Type	ACCIDENT SEVERITY TYPE						
					Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	**PDO (O)	Day/Night	Wet/Dry
1	2651287	9/19/2012	1:50 PM	Angle	0	0	0	0	1	Daylight	Dry
2	2670859	9/28/2012	5:19 AM	Rear End	0	0	0	0	1	Daylight	Dry
3	*E12100354	10/5/2012	12:55 PM	Rear End	0	0	0	1	0	Daylight	Dry
4	2658230	10/8/2012	1:08 PM	Sideswipe Same Direction	0	0	0	0	1	Daylight	Dry
5	2667644	10/23/2012	2:22 AM	Single Vehicle	0	0	0	0	1	Daylight	Dry
6	2664551	10/23/2012	2:40 PM	Rear End	0	0	0	0	1	Daylight	Dry
7	2667650	11/8/2012	8:58 AM	Rear End	0	0	0	0	1	Dark/Lighted	Dry
8	2670863	11/30/2012	10:02 AM	Rear End	0	0	0	0	1	Daylight	Dry
9	2676392	12/15/2012	5:30 PM	Rear End	0	0	0	0	1	Daylight	Dry
10	2678262	12/25/2012	10:00 AM	Rear End	0	0	0	0	1	Daylight	Dry
11	*E13021368	2/19/2013	6:41 PM	Rear End	0	0	0	0	1	Daylight	Dry
12	*E13042172	4/26/2013	11:18 AM	Rear End	0	0	0	0	1	Dawn	Dry
13	*E13060914	6/12/2013	8:24 AM	Rear End	0	0	0	0	1	Daylight	Dry
Accident Summary from August 31, 2012 to August 31, 2013											
					Accident Type	Total					
					Rear End	10					
					Single Vehicle	1					
					Sideswipe Same Direction	1					
					Angle	1					
					Total Incidents	13					

\*City of El Mirage Incident Number  
 \*\*Property Damage Only

Crash Data Summary	
Fatal (K)	0
Incapacitating (A)	0
Non-Incapacitating (B)	0
Possible Injury (C)	2
No Injury (**PDO) (O)	11
	85%



# ACCIDENT SUMMARY PRIOR TO REDFLEX CAMERA INSTALLATION (8-31-2008 TO 8-31-2011)

## INCIDENT SUMMARY 2008-2009

No	Incident ID	Date	Time	Type	ACCIDENT SEVERITY TYPE						
					Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	PDO (O)	Day/Night	Wet/Dry
1	2223312	12/12/2008	6:42 AM	Rear End	0	0	0	0	1	Dawn	Dry
2	2173417	12/27/2008	1:53 PM	Rear End	0	0	1	0	0	Daylight	Dry
3	2271761	2/16/2009	12:15 PM	Rear End	0	0	0	0	0	Daylight	Dry
4	2271506	2/23/2009	12:27 PM	Rear End	0	0	1	0	0	Daylight	Dry
5	2276041	3/3/2009	1:42 PM	Rear End	0	0	0	0	0	Daylight	Dry
6	2315914	6/6/2009	5:39 PM	Rear End	0	0	0	0	1	Daylight	Dry
7	*090601568	6/16/2009	10:30 PM	Rear End	0	0	0	0	1	Daylight	Dry
8	2320255	7/12/2009	6:55 PM	Left Turn	0	0	0	0	1	Dark	Dry
Accident Summary from August 31, 2008 to August 31, 2009											
				Accident Type	Total						
				Rear End	7						
				Left Turn	1						
				Total Incidents	8						

Crash Data Summary			
Fatal (K)			0
Incapacitating (A)			0
Non-Incapacitating (B)			2
Possible Injury (C)			0
No Injury (**PDO) (O)			6
**Property Damage Only			
			0%
			0%
			25%
			0%
			75%

## INCIDENT SUMMARY 2009-2010

No	Incident ID	Date	Time	Type	ACCIDENT SEVERITY TYPE						
					Fatal (K)	Injuries (A)	Non-Incapacitating Injuries (B)	Possible Injury (C)	PDO (O)	Day/Night	Wet/Dry
9	2339988	9/1/2009	7:26 PM	Left Turn	0	0	0	0	1	Daylight	Dry
10	2339991	9/1/2009	6:19 PM	Single Vehicle	0	0	0	1	0	Daylight	Dry
11	*090902761	9/25/2009	5:48 PM	Rear End	0	0	0	1	0	Daylight	Dry
12	2351472	10/6/2009	7:44 AM	Rear End	0	0	0	0	1	Daylight	Dry
13	2369709	12/11/2009	3:12 PM	Rear End	0	0	0	0	1	Daylight	Dry
14	2421759	6/13/2010	9:52 PM	Single Vehicle	0	0	0	0	1	Daylight	Dry
15	2421974	7/9/2010	11:50 AM	Rear End	0	0	0	0	1	Dark/Lighted	Dry
16	2436922	7/25/2010	6:41 PM	Rear End	0	0	1	0	0	Daylight	Dry
17	2453539	8/3/2010	8:08 PM	Left Turn	0	0	0	0	0	Daylight	Dry
18	2455623	8/6/2010	1:29 PM	Sideswipe Same Direction	0	0	0	0	1	Dark/Lighted	Dry
19	*100803055	8/29/2010	1:30 PM	Rear End	0	0	0	0	1	Daylight	Dry
20	2454581	8/17/2010	12:24 PM	Angle	0	0	0	0	1	Daylight	Dry
Accident Summary from August 31, 2009 to August 31, 2010											
				Accident Type	Total						
				Rear End	6						
				Single Vehicle	2						
				Left Turn	2						
				Sideswipe Same Direction	1						
				Angle	1						
				Total Incidents	12						

Crash Data Summary			
Fatal (K)			0
Incapacitating (A)			0
Non-Incapacitating (B)			1
Possible Injury (C)			2
No Injury (**PDO) (O)			9
**Property Damage Only			
			0%
			0%
			8%
			17%
			75%

\*City of El Mirage Incident Number

\*City of El Mirage Incident Number



# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Northbound Start Time	Latitude: 0' 0.000 Undefined												Total	Average (Mean)	85th Percent		
	0	11	16	21	26	31	36	41	46	51	56	61				66	71
1/13/15	10	15	20	25	30	35	40	45	50	55	60	65	70	71	98	47	54
01:00	0	0	0	4	1	0	6	21	26	12	2	0	0	0	72	45	51
02:00	0	0	0	0	0	0	1	28	35	14	6	0	0	0	84	48	53
03:00	0	0	0	0	0	0	1	15	33	19	4	0	0	0	79	48	53
04:00	1	2	0	0	0	1	9	63	54	50	7	0	0	1	187	48	54
05:00	4	1	0	0	0	1	36	115	156	83	11	2	2	1	411	47	53
06:00	1	3	1	0	0	2	56	186	170	116	20	2	2	1	560	46	53
07:00	2	4	0	4	5	7	84	282	224	124	18	8	3	1	765	46	52
08:00	0	3	1	0	0	0	11	351	222	96	24	6	0	4	809	45	51
09:00	5	0	1	0	2	30	185	283	289	114	14	4	0	0	822	46	51
10:00	5	0	2	1	1	24	121	368	216	62	7	1	0	4	881	43	49
11:00	1	0	1	1	2	21	94	460	266	87	14	6	0	2	989	44	50
12 PM	1	2	0	1	3	15	66	356	319	130	37	4	1	1	897	45	51
13:00	1	0	0	0	0	6	69	356	452	199	35	5	0	2	945	46	52
14:00	1	1	0	0	0	2	56	428	509	236	58	6	2	0	1128	47	52
15:00	1	2	2	0	0	14	122	376	543	239	48	11	2	3	1303	47	53
16:00	3	1	0	0	2	12	67	426	502	220	57	6	1	0	1368	47	52
17:00	1	2	0	1	0	11	109	332	322	162	37	3	0	2	1297	47	53
18:00	1	0	0	0	1	9	60	193	255	105	32	8	1	1	655	47	53
19:00	0	0	0	0	0	1	37	130	187	109	28	3	0	0	495	48	53
20:00	2	1	4	13	0	3	17	133	132	65	17	2	1	0	390	46	52
21:00	0	0	0	0	0	1	17	69	112	52	8	1	0	1	261	47	52
22:00	0	0	0	0	0	0	7	51	73	38	16	0	0	1	186	47	52
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	22	12	25	18	188	1420	5455	5345	2469	538	89	20	34	15664	48	54
Percent	0.2%	0.1%	0.1%	0.2%	0.1%	1.2%	9.1%	34.8%	34.1%	15.8%	3.4%	0.6%	0.1%	0.2%			
AM Peak	10:00	08:00	11:00	01:00	08:00	10:00	10:00	11:00	09:00	07:00	08:00	07:00	07:00	08:00	11:00		
Vol.	5	4	2	4	5	30	185	460	289	124	24	8	3	4	989		
PM Peak	17:00	13:00	21:00	13:00	13:00	12:00	16:00	15:00	16:00	16:00	15:00	16:00	14:00	16:00	16:00		
Vol.	3	2	4	13	3	21	122	428	543	239	58	11	5	8	1368		

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Northbound	0	11	16	21	26	31	36	41	46	51	56	61	66	71	71	Total	Average (Mean)	85th Percent
Start Time	10	15	20	25	30	35	40	45	50	55	60	65	70	71	71	136	48	54
1/14/15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	5	3	7	1	1	4	57	193	224	130	26	4	2	1	1	196	47	53
08:00	1	1	2	0	0	14	92	270	244	100	22	1	1	0	0	641	47	53
09:00	1	2	2	0	0	14	80	341	237	87	29	7	2	4	4	805	46	51
10:00	3	2	4	4	7	10	48	295	246	119	37	6	2	3	3	818	46	52
11:00	0	1	0	0	0	13	105	344	309	124	22	6	4	1	0	927	46	51
12 PM	1	1	0	0	0	6	102	373	369	147	36	8	3	1	1	1048	46	51
13:00	1	2	0	0	0	5	107	378	439	208	43	16	4	4	6	1057	46	52
14:00	3	1	0	0	0	6	70	381	543	300	57	15	1	3	6	1206	47	53
15:00	1	1	1	0	0	6	87	441	469	253	57	12	1	1	1	1428	48	53
16:00	3	0	1	0	0	15	56	374	588	308	68	15	1	4	4	1334	47	53
17:00	2	0	0	0	0	3	87	320	415	139	31	6	0	2	2	1005	46	51
18:00	1	0	1	0	0	5	44	218	278	149	31	4	0	3	3	738	47	53
19:00	0	0	2	0	0	12	30	138	186	97	24	1	2	1	1	501	47	53
20:00	1	0	0	0	0	2	22	94	200	87	17	3	0	0	0	426	48	53
21:00	0	0	0	0	0	2	13	63	89	66	26	3	2	3	3	267	49	55
22:00	0	0	0	0	0	1	9	45	77	48	11	1	1	0	0	193	48	54
23:00	29	18	24	11	32	163	1249	5198	5891	2864	634	120	30	41	41	16304	48	54
Total	0.2%	0.1%	0.1%	0.1%	0.2%	1.0%	7.7%	31.9%	36.1%	17.6%	3.9%	0.7%	0.2%	0.3%	0.3%			
Percent	0.2%	0.1%	0.1%	0.1%	0.2%	1.0%	7.7%	31.9%	36.1%	17.6%	3.9%	0.7%	0.2%	0.3%	0.3%			
AM Peak	07:00	07:00	07:00	10:00	10:00	09:00	11:00	11:00	11:00	10:00	09:00	08:00	10:00	08:00	08:00	11:00		
Vol.	5	3	7	4	7	19	105	344	309	141	37	7	4	4	4	927		
PM Peak	14:00	13:00	20:00	17:00	20:00	12:00	14:00	17:00	16:00	16:00	16:00	14:00	13:00	14:00	14:00	16:00		
Vol.	3	2	2	2	8	20	107	441	588	308	68	16	4	6	6	1428		
Total	58	40	36	36	50	351	2669	10653	11236	5333	1172	209	50	75	75	31968		
Percent	0.2%	0.1%	0.1%	0.1%	0.2%	1.1%	8.3%	33.3%	35.1%	16.7%	3.7%	0.7%	0.2%	0.2%	0.2%			

Statistics

10 MPH Pace Speed : 41-50 MPH  
 Number in Pace : 21889  
 Percent in Pace : 68.6%  
 Number of Vehicles > 45 MPH : 18000  
 Percent of Vehicles > 45 MPH : 56.4%  
 Mean Speed(Average) : 46 MPH

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Southbound Start Time	Latitude: 0' 0.000 Undefined															
	0	11	16	21	26	31	36	41	46	51	56	61	66	71	Average (Mean)	85th Percent
1/13/15	10	15	20	25	30	35	40	45	50	55	60	65	70	71	Total	Percent
01:00	0	0	0	0	1	1	1	26	49	18	2	0	0	0	60	46
02:00	0	0	0	0	0	0	3	56	58	23	4	3	1	0	101	47
03:00	3	0	0	0	0	1	17	74	103	46	4	0	0	0	148	52
04:00	8	0	1	1	0	1	33	158	215	89	18	2	0	0	248	52
05:00	19	3	2	0	0	6	76	327	334	163	17	3	0	1	526	46
06:00	26	2	4	0	5	10	109	452	414	157	22	5	0	2	955	45
07:00	22	5	3	6	4	19	107	410	413	152	7	1	2	2	1208	52
08:00	17	5	2	1	1	6	62	345	313	145	4	1	2	2	1153	45
09:00	19	1	5	3	5	8	109	305	253	88	16	5	1	3	928	45
10:00	4	0	1	4	9	30	171	389	249	84	9	3	1	2	822	44
11:00	26	1	4	1	4	8	117	372	244	78	7	0	0	1	955	44
12 PM	16	5	2	3	1	16	123	386	229	73	10	1	1	4	863	43
13:00	23	1	3	3	1	11	90	281	271	98	11	7	0	0	870	43
14:00	18	4	6	0	4	14	132	363	234	107	17	2	0	0	800	44
15:00	20	4	0	1	2	16	123	362	237	88	18	2	1	0	901	44
16:00	22	3	1	3	4	27	114	377	247	68	6	5	0	2	874	44
17:00	20	3	2	2	0	19	117	305	220	71	8	3	0	0	879	43
18:00	6	0	2	0	4	17	95	242	163	59	14	2	0	1	770	43
19:00	6	1	0	1	0	7	52	216	119	47	8	1	0	1	605	44
20:00	6	0	1	1	0	2	52	196	147	62	12	1	0	1	459	44
21:00	1	0	0	1	3	20	41	107	93	50	6	1	0	0	481	45
22:00	1	0	0	0	0	0	23	90	100	33	7	1	0	0	325	45
23:00	1	0	0	0	0	1	12	73	64	26	7	0	1	0	256	46
Total	284	42	39	33	48	240	1783	5936	4788	1838	297	52	11	20	15371	46
Percent	1.8%	0.3%	0.3%	0.2%	0.3%	1.6%	11.6%	38.6%	31.1%	12.0%	1.7%	0.3%	0.1%	0.1%		
AM Peak	06:00	05:00	09:00	07:00	10:00	10:00	10:00	06:00	06:00	05:00	08:00	06:00	07:00	08:00	06:00	
Vol.	26	7	5	6	9	30	171	452	414	163	23	5	2	3	1208	
PM Peak	13:00	12:00	14:00	12:00	14:00	16:00	14:00	12:00	13:00	14:00	15:00	13:00	12:00	12:00	14:00	
Vol.	23	5	6	3	4	27	132	386	271	107	18	7	1	4	901	

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Southbound	0	11	16	21	26	31	36	41	46	51	56	61	66	71	71	Total	Average (Mean)	85th Percent
Start Time	10	15	20	25	30	35	40	45	50	55	60	65	70	71	71			
1/14/15	0	0	0	0	0	1	5	25	29	8	1	0	0	0	0	69	46	50
01:00	0	0	0	0	0	0	2	20	21	17	1	0	1	0	0	62	48	53
02:00	0	0	0	0	0	7	7	31	41	15	2	2	0	0	0	105	46	51
03:00	1	0	0	0	0	3	13	71	76	42	5	1	0	0	0	212	47	52
04:00	2	0	1	1	0	1	32	160	212	102	11	3	0	0	0	525	47	52
05:00	15	5	0	1	2	9	67	297	356	181	24	1	0	1	1	959	46	52
06:00	14	3	0	0	3	4	98	572	455	152	10	0	0	1	1	1312	45	50
07:00	16	3	2	1	5	24	129	479	416	154	22	5	3	3	3	1262	45	50
08:00	31	6	1	2	1	12	107	316	280	107	16	4	0	2	2	885	44	50
09:00	18	1	1	3	2	23	104	348	213	93	9	3	0	5	5	823	44	50
10:00	27	5	2	3	1	30	88	275	225	80	18	4	0	4	4	762	43	50
11:00	18	1	1	1	1	2	65	301	277	121	25	4	0	1	1	818	45	52
12 PM	12	0	3	1	4	12	74	386	288	92	16	5	1	0	0	894	45	50
13:00	20	2	2	3	6	15	115	441	232	100	5	6	0	3	3	950	44	50
14:00	7	0	0	1	2	10	85	380	324	84	8	5	1	3	3	910	45	50
15:00	11	0	1	0	6	25	124	356	248	89	10	4	1	2	2	877	44	50
16:00	16	1	0	0	3	21	109	363	218	88	16	2	0	2	2	839	44	50
17:00	17	3	1	2	5	26	130	295	223	91	16	1	0	1	1	811	44	50
18:00	11	0	3	0	0	7	77	237	191	62	15	1	0	0	0	604	44	50
19:00	3	0	1	0	0	6	85	174	175	59	7	2	0	1	1	523	45	50
20:00	11	1	0	1	1	17	58	138	105	54	2	0	0	0	0	388	43	50
21:00	1	0	0	1	0	0	34	107	149	59	10	1	0	0	0	362	47	52
22:00	3	0	0	0	0	1	23	76	85	33	7	3	0	0	0	231	46	52
23:00	0	0	0	0	1	1	18	50	53	39	2	2	0	0	0	166	47	53
Total	254	31	19	21	43	257	1649	5898	4892	1932	258	59	7	29	29	15349		
Percent	1.7%	0.2%	0.1%	0.1%	0.3%	1.7%	10.7%	38.4%	31.9%	12.6%	1.7%	0.4%	0.0%	0.2%	0.2%			
AM Peak	08:00	08:00	07:00	09:00	07:00	10:00	07:00	06:00	06:00	05:00	11:00	07:00	07:00	09:00	09:00	06:00		
Vol.	31	6	2	3	5	30	129	572	455	181	25	5	3	5	5	1312		
PM Peak	13:00	17:00	12:00	13:00	13:00	17:00	17:00	13:00	14:00	13:00	12:00	13:00	12:00	13:00	13:00	13:00		
Vol.	20	3	3	3	6	26	130	441	324	100	16	6	1	3	3	950		
Total	538	73	58	54	91	497	3432	11834	9680	3770	515	111	18	49	49	30720		
Percent	1.8%	0.2%	0.2%	0.2%	0.3%	1.6%	11.2%	38.5%	31.5%	12.3%	1.7%	0.4%	0.1%	0.2%	0.2%			

Statistics  
 10 MPH Pace Speed : 41-50 MPH  
 Number in Pace : 21514  
 Percent in Pace : 70.1%  
 Number of Vehicles > 45 MPH : 14094  
 Percent of Vehicles > 45 MPH : 46.0%  
 Mean Speed(Average) : 45 MPH

**Field Data Services of Arizona**  
 21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Northbound, Southbound		Latitude: 0° 0.000 Undefined														
Start Time	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total	Average (Mean)	85th Percent
1/13/15	0	0	0	0	0	0	0	0	0	0	0	0	0	158	47	53
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	173	46	52
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	232	47	52
03:00	3	0	0	0	0	0	0	0	0	0	0	0	0	327	47	52
04:00	8	0	0	0	0	0	0	0	0	0	0	0	0	713	47	53
05:00	20	9	2	0	0	0	0	0	0	0	0	0	0	1366	46	52
06:00	30	3	4	4	6	4	4	4	4	4	4	4	4	1768	45	52
07:00	23	8	4	6	6	4	4	4	4	4	4	4	4	1918	45	51
08:00	19	9	9	2	5	6	6	6	6	6	6	6	6	1737	45	51
09:00	19	4	4	6	3	5	5	5	5	5	5	5	5	1644	45	50
10:00	9	0	0	2	4	11	60	356	510	165	146	146	146	1836	44	49
11:00	31	1	6	2	2	5	32	238	784	453	190	190	190	1852	44	50
12 PM	17	5	3	3	4	3	37	217	646	590	228	228	228	1767	44	50
13:00	24	3	4	4	4	4	26	156	590	590	228	228	228	1745	45	51
14:00	19	4	4	4	4	4	20	201	719	686	306	306	306	2029	46	52
15:00	21	5	1	1	1	2	18	179	790	746	324	324	324	2177	46	52
16:00	23	5	4	4	4	4	41	236	753	790	307	307	307	2247	45	51
17:00	23	4	4	2	2	2	31	184	731	722	291	291	291	2067	46	51
18:00	7	2	2	2	2	4	28	204	574	485	221	221	221	1587	45	51
19:00	6	1	1	1	1	1	16	112	399	374	152	152	152	1114	46	52
20:00	6	0	1	1	1	0	3	89	326	334	171	171	171	976	46	53
21:00	3	1	4	14	3	3	23	58	240	225	115	115	115	715	45	52
22:00	1	0	0	0	0	0	1	40	159	212	85	85	85	517	47	52
23:00	1	0	0	0	0	0	1	19	124	137	64	64	64	370	47	53
Total	313	64	51	58	66	66	428	3203	11391	10133	4307	795	141	31	54	31035
Percent	1.0%	0.2%	0.2%	0.2%	0.2%	0.2%	1.4%	10.3%	36.7%	32.7%	13.9%	2.6%	0.5%	0.1%	0.2%	0.2%
AM Peak	11:00	05:00	09:00	01:00	10:00	10:00	10:00	10:00	07:00	08:00	08:00	08:00	08:00	07:00	08:00	07:00
Vol.	31	9	6	6	6	6	60	356	832	637	276	47	10	5	7	1918
PM Peak	13:00	12:00	21:00	13:00	13:00	13:00	16:00	16:00	15:00	16:00	15:00	15:00	16:00	14:00	16:00	16:00
Vol.	24	5	6	14	4	4	41	236	790	790	324	76	16	5	10	2247

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 520.316.6745

Site Code: 15-1015-001  
 Station ID:  
 Grand Ave. south of Santa Fe Ln.

Northbound	Southbound	11	16	21	26	31	36	41	46	51	56	61	66	71	Total	Average (Mean)	85th Percent
Start Time	0	11	16	21	26	31	36	41	46	51	56	61	66	71	71	71	71
1/14/15	10	15	20	25	30	35	40	45	50	55	60	65	70	71	205	47	53
01:00	0	0	0	0	0	2	12	63	76	42	9	1	0	0	137	48	53
02:00	0	0	0	0	4	7	15	51	65	28	6	2	0	0	180	46	52
03:00	1	0	0	1	1	7	17	98	105	52	8	2	0	0	300	47	53
04:00	2	0	1	1	0	2	50	216	281	141	22	4	0	1	721	47	53
05:00	16	7	2	2	2	10	86	392	510	276	40	4	2	2	1351	46	53
06:00	16	4	0	0	3	8	155	765	679	282	36	4	0	1	1953	46	51
07:00	21	6	9	2	6	38	221	749	660	254	44	6	4	6	2026	45	51
08:00	32	7	3	2	1	26	187	657	517	194	45	11	2	6	1690	45	50
09:00	19	3	3	3	2	42	190	643	459	212	46	9	2	8	1641	45	51
10:00	30	7	6	7	8	40	136	530	520	221	43	10	4	5	1567	45	51
11:00	18	2	1	2	1	15	170	645	586	245	47	10	2	1	1745	46	51
12 PM	13	1	3	2	4	32	167	802	619	239	42	13	4	1	1942	45	51
13:00	21	4	2	3	11	21	217	814	601	247	41	14	4	7	2007	45	51
14:00	10	1	0	1	2	14	192	758	763	292	51	21	2	9	2116	46	51
15:00	12	1	2	0	6	31	194	737	791	389	67	19	2	5	2256	46	52
16:00	19	2	1	0	3	36	165	737	806	396	84	14	1	3	2267	46	52
17:00	20	3	2	4	8	32	217	736	692	344	73	8	1	5	2145	46	52
18:00	13	0	3	0	0	10	164	557	606	201	46	7	0	2	1609	46	51
19:00	4	0	2	0	4	11	129	392	453	218	38	6	0	4	1361	46	52
20:00	11	1	2	1	9	29	88	276	291	151	26	1	2	1	889	45	52
21:00	2	0	0	1	0	2	56	201	349	146	27	4	0	0	788	47	52
22:00	3	0	0	0	0	3	36	139	174	99	33	6	2	3	498	47	54
23:00	0	0	0	0	1	2	27	95	130	87	13	3	1	0	359	48	53
Total	283	49	43	32	75	420	2898	11096	10783	4796	892	179	37	70	31653		
Percent	0.9%	0.2%	0.1%	0.1%	0.2%	1.3%	9.2%	35.1%	34.1%	15.2%	2.8%	0.6%	0.1%	0.2%			
AM Peak	08:00	05:00	07:00	10:00	10:00	09:00	07:00	06:00	06:00	06:00	11:00	08:00	07:00	09:00	07:00	07:00	
Vol.	32	7	9	7	8	42	221	765	679	282	47	11	4	8	2026		
PM Peak	13:00	13:00	17:00	13:00	13:00	16:00	13:00	13:00	16:00	16:00	16:00	14:00	12:00	14:00	16:00		
Vol.	21	4	3	4	11	36	217	814	806	396	84	21	4	9	2267		
Total	596	113	94	90	141	848	6101	22487	20916	9103	1687	320	68	124	62688		
Percent	1.0%	0.2%	0.1%	0.1%	0.2%	1.4%	9.7%	35.9%	33.4%	14.5%	2.7%	0.5%	0.1%	0.2%			

Statistics

10 MPH Pace Speed : 41-50 MPH  
 Number in Pace : 43403  
 Percent in Pace : 69.4%  
 Number of Vehicles > 45 MPH : 32094  
 Percent of Vehicles > 45 MPH : 51.3%  
 Mean Speed(Average) : 46 MPH

15th Percentile : 41 MPH  
 50th Percentile : 46 MPH  
 85th Percentile : 51 MPH  
 95th Percentile : 55 MPH

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Northbound	Latitude: 0' 0.000 Undefined															
Start Time	0	11	16	21	26	31	36	41	46	51	56	61	66	71	Average (Mean)	85th Percent
1/13/15	0	0	0	0	0	1	2	3	3	2	1	2	0	0	109	48
01:00	0	0	0	1	0	0	0	21	25	13	3	1	1	0	67	48
02:00	0	0	0	0	0	0	3	21	34	17	3	0	0	0	78	48
03:00	0	0	0	0	0	0	2	22	32	16	5	1	0	0	78	48
04:00	0	0	0	0	0	0	8	52	41	17	2	0	0	0	172	48
05:00	0	2	0	0	0	0	6	75	149	94	28	3	1	1	359	49
06:00	0	1	0	0	1	4	17	153	207	138	37	8	2	0	568	48
07:00	0	0	0	0	0	3	26	191	291	195	74	23	4	2	809	49
08:00	1	0	0	0	2	13	40	206	330	178	67	13	4	2	856	48
09:00	1	1	1	1	0	18	81	238	266	140	35	10	1	2	795	47
10:00	0	0	1	0	0	30	131	349	255	106	21	13	1	3	910	45
11:00	0	0	1	1	15	21	98	389	287	134	32	3	1	1	983	45
12 PM	1	1	0	0	1	24	92	274	305	156	50	5	4	3	916	47
13:00	0	0	0	0	0	4	78	306	329	192	63	10	1	4	987	47
14:00	1	0	0	0	3	8	100	360	368	225	47	16	2	5	1135	47
15:00	1	1	0	2	6	18	90	302	499	282	65	8	0	0	1274	47
16:00	3	1	0	3	5	30	104	353	393	262	53	11	1	6	1222	47
17:00	4	3	0	0	10	20	78	428	496	261	72	11	1	1	1355	47
18:00	1	0	0	0	4	21	91	335	322	144	43	5	1	5	972	46
19:00	0	0	0	0	25	6	25	152	290	151	33	6	1	4	668	48
20:00	2	0	0	0	0	4	10	136	178	125	41	8	3	1	508	49
21:00	0	0	0	0	0	4	24	124	172	105	25	5	0	0	459	48
22:00	0	0	0	0	0	0	10	66	108	71	25	1	0	0	281	49
23:00	0	0	0	0	0	0	15	37	83	48	11	1	0	0	195	48
Total	15	10	3	8	47	229	1131	4623	5476	3118	861	166	29	40	15756	
Percent	0.1%	0.1%	0.0%	0.1%	0.3%	1.5%	7.2%	29.3%	34.8%	19.8%	5.5%	1.1%	0.2%	0.3%		
AM Peak	08:00	05:00	09:00	01:00	11:00	10:00	10:00	11:00	08:00	07:00	07:00	07:00	07:00	10:00	11:00	
Vol.	1	2	1	1	15	30	131	388	330	195	74	23	4	3	983	
PM Peak	17:00	17:00	16:00	16:00	17:00	16:00	16:00	17:00	15:00	15:00	17:00	14:00	12:00	16:00	17:00	
Vol.	4	3	3	3	10	30	101	428	499	282	72	16	4	6	1355	

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85136  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Northbound		Latitude: 0' 0.000 Undefined															
Start Time	11:00	15:00	16:00	20:00	21:00	26:00	31:00	36:00	41:00	46:00	51:00	56:00	61:00	66:00	71:00	Average (Mean)	85th Percent
1/14/15	0	0	0	0	0	0	1	3	40	49	33	11	2	0	0	139	48
01:00	0	0	0	0	0	0	0	2	23	29	17	4	0	0	0	75	48
02:00	0	0	0	0	0	0	0	6	30	29	9	1	0	0	0	75	46
03:00	0	0	0	0	0	0	0	2	22	34	14	7	1	1	0	81	49
04:00	0	0	0	0	0	0	0	12	42	66	45	10	1	0	1	177	48
05:00	0	0	0	0	0	0	0	16	71	132	106	24	7	0	0	356	49
06:00	0	0	0	0	0	0	1	30	179	227	145	28	10	2	0	622	48
07:00	3	0	0	0	1	0	3	42	216	258	192	68	19	2	3	807	48
08:00	1	0	0	0	0	0	5	28	194	321	220	70	13	3	2	857	49
09:00	4	1	0	0	0	3	2	37	228	304	130	48	9	6	4	776	47
10:00	0	0	1	1	1	0	7	21	220	301	204	57	13	2	3	830	48
11:00	0	0	0	0	0	0	6	52	216	350	234	73	9	3	1	944	48
12 PM	2	2	0	0	1	2	13	57	311	339	187	58	11	4	5	992	47
13:00	0	0	0	0	0	4	12	40	310	339	264	64	17	2	1	1053	48
14:00	6	4	0	0	11	8	20	123	328	298	185	41	7	5	1041	46	
15:00	2	0	0	0	0	9	53	102	404	409	216	48	20	3	3	1269	46
16:00	4	0	0	0	4	10	33	168	448	411	192	59	7	2	6	1344	46
17:00	0	0	0	0	0	4	25	139	467	414	206	42	7	2	3	1309	46
18:00	4	1	1	0	0	3	27	133	289	323	165	18	4	2	3	973	46
19:00	2	0	0	0	0	0	6	46	236	290	132	22	5	1	0	740	47
20:00	0	0	0	0	0	0	10	45	171	227	97	29	4	5	1	589	47
21:00	0	0	0	0	0	0	1	16	125	160	86	32	4	1	1	426	48
22:00	0	0	0	0	0	0	0	13	64	94	85	18	2	1	0	277	49
23:00	0	0	0	0	0	0	0	13	43	76	69	10	1	1	0	213	49
Total	28	8	2	18	18	43	225	1146	4677	5480	3233	842	173	48	42	15965	
Percent	0.2%	0.1%	0.0%	0.1%	0.1%	0.3%	1.4%	7.2%	29.3%	34.3%	20.3%	5.3%	1.1%	0.3%	0.3%		
AM Peak	09:00	10:00	10:00	10:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	07:00	09:00	09:00		
Vol.	4	1	1	7	7	52	228	350	234	73	19	6	4	4	4	11:00	
PM Peak	14:00	14:00	14:00	16:00	15:00	16:00	17:00	17:00	17:00	13:00	13:00	13:00	15:00	14:00	16:00	16:00	
Vol.	6	4	1	11	10	90	454	2277	9300	10956	6351	1703	339	77	6	1344	
Total	4/3	18	5	26	26	90	454	2277	9300	10956	6351	1703	339	77	6	1344	
Percent	0.1%	0.1%	0.0%	0.1%	0.1%	0.3%	1.4%	7.2%	29.3%	34.5%	20.0%	5.4%	1.1%	0.2%	0.3%		

**Statistics**

- 10 MPH Pace Speed : 41-50 MPH
- Number in Pace : 20256
- Percent in Pace : 64.0%
- Number of Vehicles > 45 MPH : 19426
- Percent of Vehicles > 45 MPH : 61.4%
- Mean Speed(Average) : 47 MPH

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Start Time	0	11	16	21	26	31	36	41	46	51	56	61	66	71	71	Average (Mean)	85th Percent	
1/13/15	10	15	20	25	30	35	40	45	50	55	60	65	70	71	71	69	49	55
01:00	0	0	0	0	0	0	0	6	34	15	5	1	0	0	0	61	50	54
02:00	0	0	0	0	0	0	2	11	31	34	12	6	0	0	0	96	51	57
03:00	0	0	0	0	0	0	5	25	65	67	25	5	3	0	0	195	51	56
04:00	0	0	0	0	0	2	6	63	172	148	78	21	2	2	0	494	51	57
05:00	0	0	0	1	7	8	17	144	406	304	126	54	5	4	0	1076	50	56
06:00	0	1	0	0	0	7	43	321	566	361	91	10	2	5	0	1407	49	54
07:00	0	0	0	2	10	12	105	304	533	311	86	18	7	3	0	1391	48	54
08:00	1	0	0	1	0	7	40	199	408	365	95	17	3	3	0	1139	49	55
09:00	0	1	0	0	2	12	45	211	331	254	108	9	7	1	0	981	49	55
10:00	1	0	0	1	8	11	95	321	344	174	56	10	2	1	0	1024	47	53
11:00	1	0	0	1	8	19	59	233	354	211	67	9	2	1	0	968	48	54
12 PM	0	1	1	2	11	16	79	266	359	203	60	8	3	0	0	1009	47	53
13:00	2	1	0	3	8	19	21	193	352	273	98	29	3	1	0	1003	49	55
14:00	0	0	0	2	5	23	63	345	297	297	99	21	5	3	0	1059	49	55
15:00	2	0	0	1	10	16	44	186	297	243	83	28	7	2	0	919	49	55
16:00	1	1	0	1	11	16	50	247	369	200	78	8	1	0	0	983	48	54
17:00	1	1	0	0	4	11	56	171	341	210	54	9	3	2	0	863	48	54
18:00	0	0	0	0	10	10	48	183	221	137	42	9	1	0	0	661	47	54
19:00	0	0	0	1	3	3	27	79	200	120	48	13	1	2	0	497	49	55
20:00	0	0	0	2	1	5	19	83	170	143	41	8	4	0	0	476	49	55
21:00	0	0	0	0	1	6	23	61	125	85	23	4	0	0	0	328	48	54
22:00	0	0	0	1	0	1	1	32	78	54	29	2	1	1	0	200	50	56
23:00	0	0	0	0	2	0	3	12	48	47	13	1	2	0	0	128	50	56
Total	10	5	1	19	102	205	853	3562	6168	4279	1425	300	67	31	0	17027		
Percent	0.1%	0.0%	0.0%	0.1%	0.6%	1.2%	5.0%	20.9%	36.2%	25.1%	8.4%	1.8%	0.4%	0.2%				
AM Peak	08:00	06:00		07:00	07:00	11:00	07:00	06:00	06:00	08:00	05:00	05:00	07:00	06:00	06:00			
Vol.	1	1		2	10	19	105	321	566	365	126	54	7	5	0	1407		
PM Peak	13:00	12:00	1	3	11	23	79	266	369	297	99	29	7	3	0	1059		
Vol.	2	1	1	3	11	23	79	266	369	297	99	29	7	3	0	1059		

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Southbound		Latitude: 0' 0.000 Undefined																	
Start Time	10	11	16	20	21	26	31	36	41	46	51	56	61	66	71	71	Total	Average (Mean)	85th Percent
1/14/15	0	15	0	0	0	0	2	2	15	30	19	10	1	0	0	0	79	49	55
01:00	0	0	0	0	0	0	0	0	11	18	21	13	3	0	0	0	66	51	57
02:00	0	0	0	0	0	0	0	3	11	28	21	6	2	0	0	0	71	49	55
03:00	0	0	0	0	0	1	0	7	20	69	58	27	10	0	0	0	192	51	57
04:00	0	0	0	0	0	0	0	10	55	155	172	68	22	3	3	3	488	51	57
05:00	0	0	0	0	0	0	0	18	174	344	353	121	32	4	4	4	1056	50	55
06:00	3	1	1	1	0	2	9	79	393	552	340	73	13	4	0	0	1470	48	54
07:00	1	0	0	0	0	11	5	61	369	470	357	132	32	3	2	2	1445	49	55
08:00	1	0	0	0	0	1	6	28	209	428	323	88	21	8	2	2	1115	49	55
09:00	1	0	0	0	2	2	4	31	152	361	289	98	28	2	1	1	969	50	55
10:00	0	0	0	0	0	2	6	23	199	396	299	90	22	6	3	3	973	50	55
11:00	0	0	0	0	3	2	7	27	152	360	299	90	22	6	3	3	973	50	55
12 PM	1	0	0	0	0	2	6	23	199	396	299	90	22	6	3	3	973	50	55
13:00	0	0	0	0	3	5	13	18	173	403	292	70	22	7	1	1	1008	49	55
14:00	1	0	0	0	1	5	24	25	276	379	246	62	16	4	1	1	1039	48	54
15:00	0	0	0	0	4	5	12	44	208	387	266	78	33	2	6	6	1046	49	55
16:00	0	0	0	0	6	8	20	55	248	321	213	63	18	6	2	2	960	48	54
17:00	2	0	0	0	1	7	26	57	209	311	235	65	28	8	1	1	948	48	55
18:00	0	1	0	0	0	9	41	85	225	308	175	55	11	0	2	2	913	47	53
19:00	0	0	0	0	0	9	7	39	162	264	150	37	8	3	1	1	681	48	54
20:00	0	0	0	0	0	1	8	16	99	208	153	64	9	1	5	5	564	49	55
21:00	0	0	0	0	0	7	8	40	87	122	122	34	5	2	0	0	427	48	55
22:00	1	0	0	0	2	8	2	8	60	111	129	36	13	5	1	1	367	50	55
23:00	0	0	0	0	0	6	5	6	29	62	66	23	5	0	0	0	197	50	55
Total	12	4	2	2	18	80	212	686	3555	6137	4576	1421	386	76	36	36	17201	51	57
Percent	0.1%	0.0%	0.0%	0.0%	0.1%	0.5%	1.2%	4.0%	20.7%	35.7%	26.6%	8.3%	2.2%	0.4%	0.2%	0.2%			
AM Peak	06:00	06:00	06:00	06:00	07:00	07:00	06:00	06:00	06:00	06:00	07:00	07:00	05:00	08:00	05:00	06:00			
Vol.	3	1	1	1	3	11	9	79	393	552	357	132	32	8	4	4	1470		
PM Peak	17:00	18:00	17:00	17:00	17:00	17:00	17:00	17:00	13:00	12:00	12:00	14:00	14:00	16:00	14:00	14:00			
Vol.	2	1	3	6	9	9	41	85	276	403	292	78	33	8	6	6	1046		
Total	22	9	3	3	37	182	417	1539	7117	12305	8855	2846	686	143	67	67	34228		
Percent	0.1%	0.0%	0.0%	0.0%	0.1%	0.5%	1.2%	4.5%	20.8%	36.0%	25.9%	8.3%	2.0%	0.4%	0.2%	0.2%			

Statistics

10 MPH Pace Speed : 46-55 MPH  
 Number in Pace : 21160  
 Percent in Pace : 61.9%  
 Number of Vehicles > 45 MPH : 24835  
 Percent of Vehicles > 45 MPH : 72.7%  
 Mean Speed(Average) : 49 MPH

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Northbound, Southbound		Latitude: 0' 0.000 Undefined																
Start Time	0	11	16	21	26	31	36	41	46	51	56	61	66	71	76	81	Average (Mean)	85th Percent
1/13/15	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	49	55
01:00	0	0	0	0	1	0	2	5	48	54	47	19	2	0	0	0	178	49
02:00	0	0	0	0	0	0	2	27	59	28	8	2	1	0	0	0	128	49
03:00	0	0	0	0	0	0	5	32	65	51	15	6	0	0	0	0	174	50
04:00	0	0	0	0	0	0	7	47	97	83	30	6	0	0	0	0	273	50
05:00	0	2	0	0	0	2	14	115	224	189	95	23	2	2	2	2	666	50
06:00	0	2	0	0	1	7	8	23	555	398	154	57	6	5	5	5	1435	50
07:00	0	0	0	2	10	15	60	474	773	499	128	18	4	5	5	5	1975	48
08:00	2	0	0	0	2	20	80	495	824	506	160	41	11	4	4	4	2200	48
09:00	1	2	1	1	2	30	126	449	738	543	162	30	7	5	5	5	1995	49
10:00	1	0	1	1	2	41	226	670	597	394	143	19	8	3	3	3	1776	48
11:00	1	0	1	2	8	40	157	622	641	345	99	23	3	4	4	4	1934	46
12 PM	1	2	1	2	12	40	171	540	664	359	110	13	6	2	2	2	1951	47
13:00	2	1	0	3	8	23	99	499	681	465	161	39	7	3	3	3	1925	47
14:00	1	0	0	2	8	31	163	556	713	522	146	37	4	5	5	5	1990	48
15:00	3	1	0	3	16	34	134	488	796	525	148	36	7	8	8	8	2194	48
16:00	5	1	0	4	16	46	151	600	762	462	131	19	2	2	2	2	2193	48
17:00	5	4	0	0	14	31	134	599	807	471	126	20	4	6	6	6	2205	47
18:00	1	0	0	0	14	31	139	518	543	281	85	14	4	3	3	3	2218	47
19:00	0	0	0	1	3	9	52	231	490	271	81	19	2	5	5	5	1633	47
20:00	2	0	0	2	1	9	29	219	348	268	82	16	2	6	6	6	1165	49
21:00	0	0	0	0	1	10	47	185	297	190	48	9	7	1	1	1	984	49
22:00	0	0	0	0	0	1	11	98	186	125	54	3	0	0	0	0	787	48
23:00	0	0	0	0	2	0	18	49	131	95	24	2	2	1	1	1	481	49
Total	25	15	4	27	149	434	1984	8185	11644	7397	2286	466	96	71	71	71	32783	49
Percent	0.1%	0.0%	0.0%	0.1%	0.5%	1.3%	6.1%	25.0%	35.5%	22.6%	7.0%	1.4%	0.3%	0.2%	0.2%	0.2%		
AM Peak	08:00	05:00	09:00	07:00	11:00	10:00	10:00	10:00	07:00	08:00	08:00	05:00	07:00	05:00	05:00	05:00		
Vol.	2	2	1	2	23	41	226	670	824	543	162	57	11	5	5	5	2200	07:00
PM Peak	16:00	17:00	12:00	16:00	15:00	16:00	12:00	16:00	17:00	15:00	13:00	13:00	12:00	14:00	14:00	14:00		
Vol.	5	4	1	4	16	46	171	600	807	525	161	39	7	8	8	8	2218	

# Field Data Services of Arizona

21636 N. Dietz Dr.  
 Maricopa, AZ 85138  
 (520) 316-6745

Site Code: 15-1015-002  
 Station ID: Tues 01/13/2015  
 Grand Ave. north of Verbena St.

Northbound, Southbound		Latitude: 0' 0.000 Undefined															
Start Time	10	11	16	21	26	31	36	41	46	51	56	61	66	71	76	81	85th Percent
1/14/15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
06:00	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	54
07:00	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	55
08:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
09:00	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
10:00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	55
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
12 PM	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
14:00	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
15:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
16:00	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
17:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
18:00	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
19:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
22:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
Total	40	12	4	36	123	437	1832	8232	11617	7809	2263	559	124	78	33166		
Percent	0.1%	0.0%	0.0%	0.1%	0.4%	1.3%	5.5%	24.8%	35.0%	23.5%	6.8%	1.7%	0.4%	0.2%			
AM Peak	09:00	06:00	06:00	10:00	07:00	10:00	06:00	07:00	06:00	07:00	07:00	07:00	08:00	10:00	07:00		
Vol.	5	1	1	4	11	14	109	585	779	549	200	51	11	6	2252		
PM Peak	14:00	14:00	18:00	14:00	15:00	15:00	16:00	17:00	12:00	13:00	12:00	14:00	12:00	14:00	16:00		
Vol.	7	4	1	15	17	73	225	692	742	510	128	40	11	11	2292		
Total	65	27	8	63	272	871	3816	16417	23261	15206	4549	1025	220	149	65949		
Percent	0.1%	0.0%	0.0%	0.1%	0.4%	1.3%	5.8%	24.9%	35.3%	23.1%	6.9%	1.6%	0.3%	0.2%			

Statistics

10 MPH Pace Speed : 41-50 MPH  
 Number in Pace : 39678  
 Percent in Pace : 60.3%  
 Number of Vehicles > 45 MPH : 44261  
 Percent of Vehicles > 45 MPH : 67.3%  
 Mean Speed(Average) : 48 MPH

SPOT SPEED STUDY FIELD DATA COLLECTION

Date	1/14/15	Start Time	2:15 PM			
Name	JC	Down Time				
Location	GILMAN AVE / WINTER ROSE ST	Weather	SUNNY			
Speed Limit	45 MPH	Direction of Travel	NB GILMAN AVE / WINTER ROSE ST			
Speed	Passenger Vehicles		Buses Vehicles		Trucks Vehicles	
	Record	No	Record	No	Record	No
20						
21						
22						
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65						

(WINTER ROSE ST) FROM X

50% →

65% →

49% > 45 MPH

SPOT SPEED STUDY FIELD DATA COLLECTION

Date	11/11/2015	Start Time	10:20 AM			
Name	T.C.	Down Time				
Location	BEARD AVE / IMPROVE	Weather	SUNNY			
Speed Limit	45 MPH	Direction of Travel	UP BEARD AVE NB			
Speed	Passenger Vehicles		Buses Vehicles		Trucks Vehicles	
	Record	No	Record	No	Record	No
10						
11						
12						
13						
14						
15						
16						
17						
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43						
44	-					
45	-					
46	-    -					
47	-    -					
48	-					
49	-					
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65						

195 (100%)  
100%

50% →

85% →

68% > 45 mph

SPOT SPEED STUDY FIELD DATA COLLECTION

Date	1/14/2015	Start Time	9:05 AM			
Name	T.C.	Down Time	10:15 AM			
Location	GRAND AVE / PARKWAY	Weather	SUNNY			
Speed Limit	45 MPH	Direction of Travel	SB GRAND AVE / PARKWAY			
Speed	Passenger Vehicles		Buses Vehicles		Trucks Vehicles	
	Record	No	Record	No	Record	No
10						
11						
12						
13						
14						
15						
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1105 (2011)  
1.11.X

50th% →

85% →

6290 > 45mph

Date	1/14/2015		Start Time	1:45 PM		
Name	T.C.		Down Time	2:10 PM		
Location	GRAND AVE & MINNIE		Weather	SUNNY		
Speed Limit	45 MPH		Direction of Travel	E.B. GRAND AVE 1/14/15 (2005) Court X		
Speed	Passenger Vehicles		Buses Vehicles		Trucks Vehicles	
	Record	No	Record	No	Record	No
10						
11						
12						
13						
14						
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50% →  
85% →

64% > 45mph

### Axle Factors

Group 4		2012															
Functional Class -		To Year															
From Year	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month	From Year	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month
Jan	0.96	0.94	0.94	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Feb	0.96	0.94	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Mar	0.96	0.94	0.93	0.94	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Apr	0.96	0.94	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
May	0.96	0.93	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Jun	0.96	0.93	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Jul	0.96	0.93	0.93	0.94	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Aug	0.96	0.93	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Sep	0.96	0.93	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Oct	0.96	0.94	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Nov	0.96	0.94	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Dec	0.96	0.95	0.94	0.94	0.94	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94
Day	0.96	0.94	0.93	0.93	0.93	0.94	0.96	0.94	0.96	0.96	0.94	0.93	0.93	0.94	0.94	0.96	0.94

USE ON US 60 (Grand Ave) in El Mirage

### Seasonal Factors

Group 1		2012															
Functional Class -		To Year															
From Year	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month	From Year	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month
Jan	1.29	1.04	0.97	0.96	0.94	0.89	1.04	1.00	1.29	1.04	0.97	0.96	0.94	0.89	1.04	1.00	1.00
Feb	1.18	0.97	0.94	0.92	0.90	0.85	0.97	0.95	1.18	0.97	0.94	0.92	0.90	0.85	0.97	0.95	0.95
Mar	1.18	0.95	0.94	0.92	0.88	0.83	0.97	0.94	1.18	0.95	0.94	0.92	0.88	0.83	0.97	0.94	0.94
Apr	1.20	0.97	0.96	0.94	0.91	0.86	1.04	0.96	1.20	0.97	0.96	0.94	0.91	0.86	1.04	0.96	0.96
May	1.25	1.06	0.99	0.98	0.94	0.87	1.06	1.00	1.25	1.06	0.99	0.98	0.94	0.87	1.06	1.00	1.00
Jun	1.29	1.04	1.01	0.99	0.97	0.92	1.11	1.03	1.29	1.04	1.01	0.99	0.97	0.92	1.11	1.03	1.03
Jul	1.31	1.05	1.01	1.08	0.99	0.95	1.14	1.06	1.31	1.05	1.01	1.08	0.99	0.95	1.14	1.06	1.06
Aug	1.34	1.04	1.03	1.01	0.98	0.90	1.12	1.04	1.34	1.04	1.03	1.01	0.98	0.90	1.12	1.04	1.04
Sep	1.33	1.13	1.04	1.01	0.98	0.93	1.11	1.07	1.33	1.13	1.04	1.01	0.98	0.93	1.11	1.07	1.07
Oct	1.23	1.02	1.00	0.98	0.94	0.89	1.04	1.00	1.23	1.02	1.00	0.98	0.94	0.89	1.04	1.00	1.00
Nov	1.22	1.00	0.97	0.92	0.99	0.91	1.04	0.99	1.22	1.00	0.97	0.92	0.99	0.91	1.04	0.99	0.99
Dec	1.24	1.07	1.06	0.95	0.92	0.89	1.02	1.00	1.24	1.07	1.06	0.95	0.92	0.89	1.02	1.00	1.00
Day	1.25	1.03	0.99	0.96	0.94	0.89	1.05	1.00	1.25	1.03	0.99	0.96	0.94	0.89	1.05	1.00	1.00

Use on US 60 (Grand Ave) in El Mirage



**Attachment Three – El Mirage City Council Resolution R-15-02-02**

RESOLUTION R15-02-02

**A RESOLUTION ACKNOWLEDGING THE CITY'S ON GOING SUPPORT FOR THE USE OF PHOTO ENFORCEMENT TECHNOLOGY AS A TOOL TO ENHANCE PUBLIC AND POLICE OFFICER SAFETY.**

WHEREAS, on January 8, 2009, a previous El Mirage City Council approved an agreement with Redflex Traffic Systems, Inc. to utilize photo enforcement technology at various locations including Grand Avenue, and

WHEREAS, the Arizona Department of Transportation has significantly changed the El Mirage section of Grand Avenue as a result of a construction project that concluded in July 2011, and

WHEREAS, the Arizona Department of Transportation establishes the speed limit along Grand Avenue, presently set at 45 mph, and

WHEREAS, it is proven that vehicle speeds continue to be in excess of 11 mph over the posted limit, and

WHEREAS, the current design does not provide a safe environment (i.e. adequate shoulder width) for conventional traffic safety enforcement by peace officers, and

WHEREAS, the City of El Mirage is required to provide public safety services on Grand Avenue within the City boundaries under A.R.S. §41-1711 Section B, and

WHEREAS, the City's photo enforcement permit with the Arizona Department of Transportation is up for renewal in April 2015, and

WHEREAS, in Governor Jan Brewer's 2013 Four Cornerstones of Reform agenda, Governor Brewer stated, "Historically, as the economy improves, more vehicles are on the road, resulting in increased numbers of fatalities and injuries. To reduce this consequence, I have directed my Office of Highway Safety to coordinate with the *Department of Transportation* in developing a joint action plan that focuses on enforcement, education and engineering...targeting the three leading causes of death from traffic accidents – exceeding the speed limit, alcohol impairment, and unrestrained occupants in vehicles...to improve overall highway safety."

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Council of the City of El Mirage as follows:

- Section 1. That the City of El Mirage does hereby request the continued use of photo enforcement technology for the purpose of enhancing the public health, safety, and welfare of its citizens and the motoring public along Grand Avenue, and
- Section 2. The City Council believes the continued use of photo enforcement promotes officer safety and allows the City to dedicate its limited resources toward improving neighborhood safety, preventing and investigating domestic violence, child abuse, and addressing other crimes that require the focus of El Mirage peace officers.

PASSED, ADOPTED AND APPROVED by the Mayor and Council of the City of El Mirage, Arizona, this 3<sup>rd</sup> day of February, 2015.

*Lana Mook*

\_\_\_\_\_  
Lana Mook, Mayor

ATTEST:

*Sharon Antes*  
\_\_\_\_\_  
Sharon Antes, Acting City Clerk

APPROVED AS TO FORM:

*Robert M. Hall*  
\_\_\_\_\_  
Robert Hall, City Attorney