

**CITY OF FARMINGTON  
CITY COUNCIL WORK SESSION AGENDA  
November 5, 2013 – 9:00 a.m.**

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**DEPARTMENT HEAD REPORTS**

1. Employee of the Month Award (Shannon Ben)
2. "Get Pinked" final tally and presentation of the trophies for the Decorating Contest (Mayor)
3. Update and direction to staff on the intersection of Piñon Hills Boulevard and Dustin Avenue (Nevin Harwick of Harwick Transportation Group)-----1
4. Presentation on the Drainage Master Plan (HDR Engineering)
5. Proposed loan from the Clean Water State Revolving Loan Fund administered by New Mexico Environment Department and the New Mexico Finance Authority for construction of a new medium rate activated sludge basin, final clarifier, solids handling facility and ultraviolet disinfection system at the wastewater treatment plant (Jeff Smaka)

Action Requested of Council:

Grant permission to draft an ordinance as required by the New Mexico Environment Department ("NMED") and the New Mexico Finance Authority.

Background/Rationale:

In 2004, the City completed the first two phases of a multi-phase expansion of the wastewater treatment plant as proposed in the Preliminary Engineering Report prepared by HDR Engineering Inc. and presented to Council in 1998. That phase of the plant expansion was financed by a loan from the Clean Water State Revolving Loan Fund ("CWSRF") program for \$14.18 million dollars for a term of 20 years at three-percent interest. The annual payment of principal and interest is \$952,998 through 2026.

In February 2013, NMED solicited applications for funding through CWSRF from communities throughout the state. In March 2013, the Public Works Department submitted a Uniform Funding Application for construction of a medium rate activated sludge basin, final clarifier, solids handling facility and an ultraviolet ("UV") disinfection system and was notified by NMED on September 4, 2013 that the application was approved.

The proposed construction will add redundancy and future capacity to the plant and will replace the existing chemical disinfection system with state-of-the-art green technology UV disinfection. The UV disinfection system will reduce chemical costs and eliminate the discharge of chemicals into the San Juan River. Estimated cost of project is \$10 million for construction. The

annual payment on a 20-year loan from the CWSRF program at three-percent interest will be approximately \$672,000.

Staff Recommendation:

Draft an ordinance as required for the loan application.

6. Bid for an 18-month contract for the purchase of transformers, non-VMI (Eddie Smylie) -----2

Action Requested of Council:

Approve recommendation for award.

Background/Rationale:

Bids opened October 22, 2013 with seven bidders participating.

Staff Recommendation:

Award the bid for an 18-month contract for the purchase of transformers, non-VMI (Electric Utility) to the lowest and best bidder based on total ownership cost per category after application of five percent in-state preference (Category 1 - McKinley Sales Company \$37,620; and Category 2 - Western United, Alternate Bid #3 \$286,438), and to reject the bids received from Central Maloney (Category 2) and from Western United Electric (Category 1, Alternate Bid #3) for being non-responsive.

Instructions Upon Approval:

Award contract.

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**COUNCIL BUSINESS**

7. Reappointment to the Metropolitan Redevelopment Agency Commission and appointment to the Planning and Zoning Commission (Mayor)

**AGENDA ITEM SUPPORT MATERIALS ARE AVAILABLE FOR INSPECTION AND/OR PURCHASE AT THE OFFICE OF THE CITY CLERK, 800 MUNICIPAL DRIVE, FARMINGTON, NEW MEXICO.**

**ATTENTION PERSONS WITH DISABILITIES: The meeting room and facilities are fully accessible to persons with mobility disabilities. If you plan to attend the meeting and will need an auxiliary aid or service, please contact the City Clerk's Office at 599-1106 or 599-1101 prior to the meeting so that arrangements can be made.**



## *Harwick Transportation Group, Inc.*

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October 21, 2013

Mr. Jeff Smaka  
Public Works Director  
City of Farmington  
800 Municipal Dr  
Farmington, NM 87401

**Re: Dustin Ave-Piñon Hills Blvd Traffic Assessment**

Dear Mr. Smaka:

The City of Farmington has requested an updated traffic engineering evaluation of the Piñon Hills Blvd/Dustin Ave intersection. A series of traffic investigations and analyses were conducted, and they included:

- Updated Data Collection
- Field Review and Observation Study
- Traffic Operations Analysis
- Safety Assessment (Crash Analysis)
- Signal Warrant Evaluations
- Mitigation Identification

The City of Farmington Traffic Engineering staff collected new traffic data for weekends and HTG staff collected weekday data. Data included traffic data for the operations and signal warrant evaluations, and crash data for the safety assessment. This report documents the results of the investigations, and makes recommendations for identified deficiencies.

Countermeasures were developed for noted and analyzed deficiencies. The countermeasures considered included:

Modified Traffic Control:

1. Signalization
2. All-way Stop Control
3. Roundabout

Operations Improvements

**TRAFFIC VOLUMES**

Turning movement count data was collected by the City of Farmington, Traffic Engineering Division in January 2011 and these counts were updated in October 2013. The turning

movement counts were collected to evaluate intersection operations during the peak commute periods. In addition, turning movement counts were collected in conjunction with the weekend church services. The results of the 2011 and 2013 data collection are contained in Tables 1 and 2.

**Table 1**  
**2011 AM and PM Peak Hour Turning Movement Volumes**

Intersection	Eastbound			Westbound			Northbound			Southbound		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
<i>AM Peak Hour</i>												
Dustin Ave	7	317	5	52	242	22	23	9	108	15	3	8
<i>PM Peak Hour</i>												
Dustin Ave	6	404	17	86	345	41	6	11	60	34	5	6
<i>Saturday Peak Hour</i>												
Dustin Ave	No Data											
<i>Sunday Peak Hour</i>												
Dustin Ave	4	177	7	51	149	21	5	7	40	238	49	32

**Table 2**  
**2013 AM and PM Peak Hour Turning Movement Volumes**

Intersection	Eastbound			Westbound			Northbound			Southbound		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
<i>AM Peak Hour</i>												
Dustin Ave	18	551	12	39	232	52	16	30	67	55	19	9
<i>PM Peak Hour</i>												
Dustin Ave	13	414	25	88	401	61	10	20	52	73	19	22
<i>Saturday Peak Hour</i>												
Dustin Ave	3	175	5	46	201	8	2	2	33	97	27	19
<i>Sunday Peak Hour</i>												
Dustin Ave	8	204	12	46	185	7	14	1	58	274	55	31

Comparing the two tables, it can be seen that there has been substantial growth in volumes at the intersection between 2011 and 2013. Total entering volumes increase by 35% during the AM peak hour and 17% during the PM peak. The Sunday peak hour entering volumes have increased by 15%.

The traffic volume data is appended at the end of this report.

### TRAFFIC OPERATIONS ANALYSES

Traffic analyses were performed for the existing condition (2013) at the intersection. Additional analyses were conducted for a signalized intersection. A roundabout would provide excellent operations; however, it was not specifically evaluated due to City Council's desire not to create a roundabout corridor for Piñon Hills Blvd. The results are summarized below.

Each operations analysis contains three intersection measures of effectiveness (MOEs) including the movement level of service [LOS], the average control delay by movement [Delay], and the 95<sup>th</sup> percentile queue length in feet [Queue]. Note: for unsignalized intersections, free through and right-turn movements are not included in the results as they are unrestricted and have no delay. Only approaches with left turns or stop/yield controlled movements are included in the unsignalized analyses results.

**Table 3**  
**2011 Unsignalized Intersection Levels of Service**

Intersection	AM Peak			PM Peak		
	LOS	Delay	Queue	LOS	Delay	Queue
<i>Piñon Hills Blvd @ Dustin Ave</i>	A	4 s		A	4 s	
Eastbound Left Turn	A	8 s	25'	A	8 s	0'
Westbound Left Turn	A	8 s	25'	A	9 s	25'
Northbound Left-Through	B	14 s	25'	<b>B</b>	15 s	25'
Southbound Left Turn	B	25 s	25'	E	39 s	50'
Southbound Through-Right	B	12 s	25'	C	17 s	25'

S – seconds

**Table 4**  
**2013 Unsignalized Intersection Levels of Service**

Intersection	AM Peak			PM Peak		
	LOS	Delay	Queue	LOS	Delay	Queue
<i>Piñon Hills Blvd @ Dustin Ave</i>	B	12 s		C	17 s	
Eastbound Left Turn	A	8 s	25'	A	9 s	25'
Westbound Left Turn	A	9 s	25'	A	9 s	25'
Northbound Left-Through	D	26 s	50'	C	24 s	50'
Southbound Left Turn	F	131 s	125'	F	187 s	175'
Southbound Through-Right	C	23 s	25'	C	23 s	25'

S – seconds

The traffic volume increase has led to significant operations degradation over the past few years. The 2013 analyses reflect operations observed during the counts, though the actual delays for the southbound left, while moderately long, likely were not as long as calculated.

Since signalization is a potential solution for degraded operations, and signal warrants are to be evaluated, signalized analyses were conducted. The signalized intersection analyses were summarized by intersection approach. The queue listed is the maximum design queue for each signalized approach.

**Table 5**  
**2013 Signalized Intersection Levels of Service**

Intersection	AM Peak			PM Peak		
	LOS	Delay	Max Queue	LOS	Delay	Max Queue
<i>Piñon Hills Blvd @ Dustin Ave</i>	A	8 s		A	8 s	
Eastbound Approach	A	7 s	200'	A	7 s	150'
Westbound Approach	A	4 s	75'	A	6 s	150'
Northbound Approach	B	16 s	50'	B	13 s	25'
Southbound Approach	B	17 s	50'	B	14 s	50'

S – seconds

Table 5 shows that there will be a significant overall operations improvement if the intersection would be signalized. It should be noted that the Piñon Hills Blvd approaches will have more delay, as well as moderate design queues. The unsignalized condition yields no delay or queuing except for the left-turn movements on Piñon Hills Blvd.

The two large churches located north of Piñon Hills Blvd are a concern with intersection operations following the weekend church services. City staff collected data on a Saturday and Sunday in October 2013 to evaluate the intersection demand. The Sunday volumes far exceeded the Saturday volumes, therefore only the Sunday peak hour was evaluated. Table 6 contains the 2013 unsignalized intersection results.

**Table 6**  
**Sunday Peak Hour Unsignalized Intersection Levels of Service**

Intersection	Sunday Peak		
	LOS	Delay	Queue
<i>Piñon Hills Blvd @ Dustin Ave</i>	F	40 s	
Eastbound Left Turn	A	8 s	25'
Westbound Left Turn	A	8 s	25'
Northbound Left-Through	B	13 s	25'
Southbound Left Turn	F	371 s	850'
Southbound Through-Right	C	18 s	50'

S – seconds

As observed in the field, this intersection fails during the Sunday peak period because of movements from the north leg of Dustin Ave. Church services are similar to special events,

and only portions of an hour have heavy movements. This creates a worst case scenario for traffic operations that are not sustained for a substantial time. Currently, public safety officers are employed to facilitate traffic operations following these services, resulting in better operations than identified above.

The intersection was also evaluated with a traffic signal. The operations were optimized and the results are in Table 7.

**Table 7**  
**Sunday Peak Hour Signalized Intersection Levels of Service**

Intersection	Sunday Peak		
	LOS	Delay	Max Queue
<i>Piñon Hills Blvd @ Dustin Ave</i>	B	11 s	
Eastbound Approach	B	14 s	125'
Westbound Approach	B	13 s	125'
Northbound Approach	A	5 s	25'
Southbound Approach	A	9 s	75'

S – seconds

Table 7 indicates that signalization would greatly improve operations. Timing plans will be required to accommodate the unbalanced flows.

#### **SAFETY ASSESSMENT**

Traffic safety was reviewed for the past 11 years. Since 2003, there have been 18 reported crashes at the Piñon Hills Blvd/Dustin Ave intersection. This has included 1 fatal, 8 injury and 9 property damage only crashes. The year with the highest number of crashes was 2010, with 5 total crashes. Over the 11 year period, 13 of the crashes reported were considered 'correctable' by signalization. A typical safety threshold is 5 correctable crashes within a 12 month period, and no 12 month period generated that number of correctable crashes. No unsafe conditions were identified.

The field review identified a number of minor modifications that could improve safety at the intersections. Those improvements are detailed in the study recommendations.

#### **TRAFFIC SIGNAL WARRANT EVALUATION**

##### **Methodology**

The Manual on Uniform Traffic Control Devices (MUTCD) currently has nine (9) traffic signal warrants in the 2009 manual. The MUTCD provides criteria reductions based upon location (rural vs. urban) and posted roadway speeds. Piñon Hills Blvd has a posted speed of



50 mph in the vicinity of the intersection indicating that the corridor is subject to application of the 70% factor, reducing the volume based traffic signal warrant requirements.

Complete descriptions of the traffic signal warrants are contained in the MUTCD. The nine (9) MUTCD warrants are listed below, and their applicability to this intersection is indicated.

**Table 8**  
**Signal Warrant Applicability**

<b>Warrant No.</b>	<b>Warrant Description</b>	<b>Applicable</b>
1	Eight-Hour Vehicular Volume	<b>Yes</b>
2	Four-Hour Vehicular Volume	<b>Yes</b>
3	Peak Hour	<b>Yes</b>
4	Pedestrian Volume	No
5	School Crossing	No
6	Coordinated Signal System	No
7	Crash Experience	<b>Yes</b>
8	Roadway Network	No
9	Intersection Near a Grade Crossing	No

Vehicle crash data were required to evaluate Warrant 7. The data discussed above were used to evaluate the crash portion of the warrant. The MUTCD warrant requires five (5) or more crashes within a 12 month period that are correctible by signalization to meet the warrant. Based on the number of crashes, Warrant #7 cannot be satisfied at this intersection.

#### Evaluation

The number of approach lanes and identification of the major and minor street must be defined for the analysis. Piñon Hills Blvd has a single lane in each direction, with left- and right-turn lanes on each approach. Dustin Ave has a single approach lane in each travel direction with a northbound right-turn lane and a southbound left-turn lane at the intersection. A single lane was assumed for each approach. The northbound right-turn lane volumes are not included in the analysis because that traffic experiences only minimal delay.

**Warrant 1 – Eight-Hour Vehicular Volume:** This signal control warrant is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The warrant has three (3) separate standards that can be met in order to satisfy the 8-hour vehicular volume count. The first warrant requires the following minimum vehicle volumes:



Condition A – Minimum Vehicular Volume

- 350 vehicles on the major roadway (both approaches)
- 105 vehicles in one direction of the minor roadway

Condition B – Interruption of Continuous Traffic

- 525 vehicles on the major roadway (both approaches)
- 53 vehicles in one direction of the minor roadway

Condition C – 80% Adjustment

- 280 vehicles on the major roadway (both approaches)
- 84 vehicles in one direction of the minor roadway
- and -
- 420 vehicles on the major roadway
- 42 vehicles in one direction of the minor roadway

Condition A is intended for application where considerable traffic volumes on both the major and minor streets are the principal reason to consider installing a traffic control signal.

Condition B is intended for application where traffic volume on a major street is heavy enough that traffic on a minor street suffers excessive delay in entering or crossing the major street. Condition C is where 80% of each Condition A and B are met, based upon unadjusted base traffic flows. Only one of the three conditions must be met for each of any eight hours of an average day to satisfy the warrant.

The number of hours that meet the warrants as compared to Conditions A, B, and C were as follows from 2010:

	<u>Major St</u>	<u>Minor St</u>
Condition A	13	1
Condition B	11	3
Condition C1	15	4
Condition C2	13	2

Turning movements from 2013 were entered to see if they would satisfy the warrants. Six and a half hours of data were collected, and only two of the hours would satisfy condition B, the two highest hours during the PM peak hour. Condition A was not satisfied. Because the turning movement volumes would not satisfy the warrant, additional data collection was not required. **The warrant for the eight-hour vehicular volume is not satisfied.**

**Warrant 2 – Four-Hour Vehicular Volume:** This warrant is intended for application where the volume of intersection traffic is the principal reason to consider installing a traffic control signal. The warrant requires that each of any four hours of an average day, the plotted points representing the vehicles per hour on the major street and the corresponding vehicles per hour

on the higher volume minor-street approach intersects above the applicable curve shown in MUTCD Figure 4C-2. The 2013 turning movement volumes had 4 hours that met that criteria, the 4<sup>th</sup> highest hour having 777 vehicles on Piñon Hills Blvd and 66 on the Dustin Ave. **The warrant for four-hour vehicular volume is satisfied.**

**Warrant 3 – Peak Hour:** This signal control warrant is intended for use at locations where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The standard requires the following criteria in either of the two categories be met:

Category A (All conditions must be met.)

- The total stopped time delay experienced by the traffic on one minor-street approach equals or exceeds 4 vehicle-hours for a one-lane approach, or 5 vehicle-hours for a two-lane approach.
- The volume on the minor-street approach equals or exceeds 100 vehicles per hour for a one-lane approach, or 150 vehicles per hour for two moving lanes.
- The total entering volume serviced during the hour equals or exceeds 800 vehicles per hour for intersections with four approaches.

Category B

- The plotted point representing the vehicles per hour on the major street and the corresponding vehicles per hour on the higher-volume minor-street approach for 1 hour or an average day falls above the applicable curve in Figure 4C-4 for the existing combination of approach lanes.

The approach described under Category B was investigated. Using MUTCD Figure 4C-4, one hour on a weekday exceeded the peak hour threshold during the PM peak hour. **The warrant for the peak hour vehicular volume is met.**

**Warrant 4 – Pedestrian Volume:** Not Applicable.

**Warrant 5 – School Crossing:** Not Applicable.

**Warrant 6 – Coordinated Signal System:** Not Applicable.

**Warrant 7 - Crash Experience:** This signal control warrant is intended for application where the severity of crashes are the principal reason to consider installing a traffic control signal, and signalization will lead to a reduction in angle accidents. The following criteria must be met to fulfill this standard:

- Five or more reported crashes of types susceptible to correction by a traffic control signal have occurred within a 12-month period.

The 18 crashes in 11 years do not meet the crash portion of the warrant. **This warrant is not met because the intersection does not demonstrate the accident history required to meet the standard.**

**Warrant 8 – Roadway Network:** Not Applicable.

**Warrant 9 – Intersection Near a Grade Crossing:** Not Applicable.

#### **FINDINGS AND CONSIDERATIONS**

The findings of this report are that volumes at the Dustin Ave-Piñon Hills Blvd intersection have increased significantly over the past few years. This volume increase has led to degradation of operations at the intersection. The increase has also allowed the intersection to satisfy the MUTCD warrant criteria for both a one-hour and four-hour warrant. Based upon these findings, *alternative traffic control should be considered.*

The alternative traffic control to consider includes signalization, all-way stop control and construction of a roundabout. All-way stop control was rejected as it would severely delay through traffic on Piñon Hills Blvd, impacting a route designed as a by-pass to benefit through traffic. An all-way stop is not consistent with the facility's purpose. A roundabout would provide good operations with minimal delay, but would be most applicable if it were part of a series of roundabouts along this corridor. City Council indicated that they would not support a roundabout at this location; therefore, it was not fully evaluated.

If the intersection is signalized, additional improvements should be considered. They should include:

1. Construct pedestrian facilities in each intersection quadrant. This may require modifications to the return radii.
2. Extend the sidewalk along Dustin Ave on the south side of Piñon Hills Blvd to match into existing sidewalk. This should be completed on at least one side of the street, both sides would be preferred.
3. Consider the need for right-turn channelizing islands. This could help reduce the width (north to south) of the intersection, and reduce phase lengths to accommodate pedestrians.
4. Develop timing plans to accommodate the special event nature of church services, especially on Sunday. Additional green time should be provided for the Dustin Ave approaches for short periods based upon the weekend counts conducted.

An observation study was conducted on October 2 and a field review conducted on October 4, 2013. The field review yielded four operations improvements that should be implemented.