



## Memorandum

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**Date:** October 3, 2014  
**To:** Ms. Lorraine Weiss  
**From:** Gary Black  
**Subject:** 2014 Update to the Station Park Green Traffic Analysis

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### Introduction

Hexagon Transportation Consultants, Inc. completed a traffic study for the proposed Station Park Green development in 2010. The project is now coming forward for site development approval and has changed slightly: the number of dwelling units is the same (599), the office size has increased by 1,000 square feet (10,000 to 11,000), and the retail size has decreased by 34,000 square feet (60,000 to 26,000) compared to the original project option 1 (maximum retail).

The purpose of this memorandum is to update the setting from our 2010 traffic study and to confirm that the current project would have the same or less impact than the approved project.

### Scope of Study

The updated study included the 6 intersections included in the 2010 study as well as the intersection of Delaware Street and Sunnybrae Boulevard, which would be influenced by any improvements made to the intersection of Delaware Street and 16<sup>th</sup> Avenue. Figure 1 shows the project location and 7 study intersections. The existing intersection levels of service were evaluated using current (2013-2014) traffic count data and compared to the levels of service reported in the 2010 study (based on 2007 counts). Trip generation estimates for the revised project were estimated and compared to the previous project description.

### Project Trip Generation

The magnitude of traffic added to the roadway system by the project was estimated by multiplying the applicable trip generation rates by the size of the development. The Institute of Transportation Engineers (ITE) manual entitled *Trip Generation, Ninth Edition* was used for the analysis. The trip generation rates used for the proposed development are based on the rates published for "Apartment" (ITE Code 220), "General Office Building" (ITE Code 710), and "Shopping Center" (ITE Code 820). Trip reductions were calculated using the same methodology as the 2010 report. Based on these rates and trip reductions, the revised project is estimated to generate a net increase of 79 trips during the AM peak hour and a net decrease of 148 trips during the PM peak hour (see Table 1).

The revised project is expected to generate fewer net trips compared to either option studied in the 2010 report (see Table 2 and Table 3). Compared to the previous options, the project would produce:

- 15 fewer AM and 57 fewer PM net trips than Option 1 (maximum retail), and
- 20 fewer AM and 13 fewer PM net trips than Option 2 (maximum office).

**Table 1**  
**Project Trip Estimates – Revised Project**

| Land Use  | Rate                                  | Daily Rate | Daily Trips    | AM Peak Hour   |             |             | PM Peak Hour |                |             |             |              |
|---|---------------------------------------|------------|----------------|----------------|-------------|-------------|--------------|----------------|-------------|-------------|--------------|
|   |                                       |            |                | Peak-Hour Rate | In          | Out         | Total        | Peak-Hour Rate | In          | Out         | Total        |
| <b>Proposed Project</b>   |                                       |            |                |                |             |             |              |                |             |             |              |
| Residential <sup>1</sup>  | 599 units                             | 6.65       | 3,983          | 0.51           | 61          | 244         | 305          | 0.62           | 241         | 130         | 371          |
| Retail <sup>2</sup>   | 26,000 sf                             | 42.70      | 1,110          | 0.96           | 16          | 9           | 25           | 3.71           | 46          | 50          | 96           |
|   | (Pass-By Trip Reduction) <sup>4</sup> | (34%)      | (377)          |                | (5)         | (4)         | (9)          |                | (16)        | (17)        | (33)         |
| Office <sup>3</sup>   | 11,000 sf                             | 11.03      | 121            | 1.56           | 15          | 2           | 17           | 1.49           | 3           | 13          | 16           |
|   | <b>Subtotal All Uses</b>              |            | <b>4,837</b>   |                | <b>87</b>   | <b>251</b>  | <b>338</b>   |                | <b>274</b>  | <b>176</b>  | <b>450</b>   |
|   | URBEMIS Trip Reduction <sup>5</sup>   | (32%)      | (1,548)        |                | (28)        | (80)        | (108)        |                | (88)        | (56)        | (144)        |
| <b>Existing Use (Current Occupancy)<sup>6</sup></b>   |                                       |            |                |                |             |             |              |                |             |             |              |
| Retail + Office + Gas Station   |                                       |            | 4,050          |                | 126         | 103         | 229          |                | 271         | 310         | 581          |
|   | (Pass-By Trip Reduction) <sup>4</sup> |            | <u>(1,025)</u> |                | <u>(41)</u> | <u>(37)</u> | <u>(78)</u>  |                | <u>(60)</u> | <u>(67)</u> | <u>(127)</u> |
| <b>Net New Trips Generated</b>  |                                       |            | <b>264</b>     |                | <b>-26</b>  | <b>105</b>  | <b>79</b>    |                | <b>-25</b>  | <b>-123</b> | <b>-148</b>  |
| <p><sup>1</sup> Trip rates (per dwelling unit) based on Institute of Transportation Engineers, <i>Trip Generation, Ninth Edition</i>, 2012. Apartment (220)</p> <p><sup>2</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, <i>Trip Generation, Ninth Edition</i>, 2012. Shopping Center (820)</p> <p><sup>3</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, <i>Trip Generation, Ninth Edition</i>, 2012. General Office Building (710)</p> <p><sup>4</sup> Pass-by trip rates based on Institute of Transportation Engineers, <i>Trip Generation Handbook, Second Edition: A Recommended Practice</i>, June 2004</p> <p><sup>5</sup> 32% trip reduction based on density, mix of uses, transit service, pedestrian/bicycle facilities, and affordable housing calculated by Nelson Nygaard (May 13, 2010).</p> <p><sup>6</sup> Existing site-generated traffic based on peak-hour driveway counts conducted in April 2007. Daily trips estimated based on peak-hour trips.</p> |                                       |            |                |                |             |             |              |                |             |             |              |

**Table 2  
Project Trip Estimates – Original Project Option 1, Maximum Retail**

| Land Use  | Rate                                  | Daily Rate | Daily Trips    | AM Peak Hour   |             |             | PM Peak Hour |                |             |             |              |
|---|---------------------------------------|------------|----------------|----------------|-------------|-------------|--------------|----------------|-------------|-------------|--------------|
|   |                                       |            |                | Peak-Hour Rate | In          | Out         | Total        | Peak-Hour Rate | In          | Out         | Total        |
| <b>Proposed Project</b>                             |                                       |            |                |                |             |             |              |                |             |             |              |
| Residential <sup>1</sup>                            | 599 units                             | 6.65       | 3,983          | 0.51           | 61          | 244         | 305          | 0.62           | 241         | 130         | 371          |
| Retail <sup>2</sup>                                 | 60,000 sf                             | 42.94      | 2,576          | 1.00           | 37          | 23          | 60           | 3.73           | 110         | 114         | 224          |
|   | (Pass-By Trip Reduction) <sup>4</sup> | (34%)      | (876)          |                | (13)        | (7)         | (20)         |                | (37)        | (39)        | (76)         |
| Office <sup>3</sup>                                 | 10,000 sf                             | 11.01      | 110            | 1.55           | 14          | 2           | 16           | 1.49           | 3           | 12          | 15           |
|   | <b>Subtotal All Uses</b>              |            | <b>5,793</b>   |                | <b>99</b>   | <b>262</b>  | <b>361</b>   |                | <b>317</b>  | <b>217</b>  | <b>534</b>   |
|   | URBEMIS Trip Reduction <sup>5</sup>   | (32%)      | (1,854)        |                | (32)        | (84)        | (116)        |                | (101)       | (70)        | (171)        |
| <b>Existing Use (Current Occupancy)<sup>6</sup></b> |                                       |            |                |                |             |             |              |                |             |             |              |
| Retail + Office + Gas Station                       |                                       |            | 4,050          |                | 126         | 103         | 229          |                | 271         | 310         | 581          |
| (Pass-By Trip Reduction) <sup>4</sup>               |                                       |            | <u>(1,025)</u> |                | <u>(41)</u> | <u>(37)</u> | <u>(78)</u>  |                | <u>(60)</u> | <u>(67)</u> | <u>(127)</u> |
| <b>Net New Trips Generated</b>                      |                                       |            | <b>914</b>     |                | <b>-18</b>  | <b>112</b>  | <b>94</b>    |                | <b>5</b>    | <b>-96</b>  | <b>-91</b>   |

<sup>1</sup> Trip rates (per dwelling unit) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. Apartment (220)  
<sup>2</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. Shopping Center (820)  
<sup>3</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. General Office Building (710)  
<sup>4</sup> Pass-by trip rates based on Institute of Transportation Engineers, *Trip Generation Handbook, Second Edition: A Recommended Practice*, June 2004  
<sup>5</sup> 32% trip reduction based on density, mix of uses, transit service, pedestrian/bicycle facilities, and affordable housing calculated by Nelson Nygaard (May 13, 2010).  
<sup>6</sup> Existing site-generated traffic based on peak-hour driveway counts conducted in April 2007. Daily trips estimated based on peak-hour trips.

**Table 3  
Project Trip Estimates – Original Project Option 2, Maximum Office**

| Land Use  | Rate                                  | Daily Rate | Daily Trips    | AM Peak Hour   |             |             | PM Peak Hour |                |             |             |              |
|---|---------------------------------------|------------|----------------|----------------|-------------|-------------|--------------|----------------|-------------|-------------|--------------|
|   |                                       |            |                | Peak-Hour Rate | In          | Out         | Total        | Peak-Hour Rate | In          | Out         | Total        |
| <b>Proposed Project</b>                             |                                       |            |                |                |             |             |              |                |             |             |              |
| Residential <sup>1</sup>                            | 599 units                             | 6.65       | 3,983          | 0.51           | 61          | 244         | 305          | 0.62           | 241         | 130         | 371          |
| Retail <sup>2</sup>                                 | 25,000 sf                             | 42.94      | 1,074          | 1.00           | 15          | 10          | 25           | 3.73           | 46          | 47          | 93           |
|   | (Pass-By Trip Reduction) <sup>4</sup> | (34%)      | (365)          |                | (5)         | (4)         | (9)          |                | (16)        | (16)        | (32)         |
| Office <sup>3</sup>                                 | 45,000 sf                             | 11.01      | 495            | 1.55           | 62          | 8           | 70           | 1.49           | 11          | 56          | 67           |
|   | <b>Subtotal All Uses</b>              |            | <b>5,187</b>   |                | <b>133</b>  | <b>258</b>  | <b>391</b>   |                | <b>282</b>  | <b>217</b>  | <b>499</b>   |
|   | URBEMIS Trip Reduction <sup>5</sup>   | (36%)      | (1,867)        |                | (48)        | (93)        | (141)        |                | (102)       | (78)        | (180)        |
| <b>Existing Use (Current Occupancy)<sup>6</sup></b> |                                       |            |                |                |             |             |              |                |             |             |              |
| Retail + Office + Gas Station                       |                                       |            | 4,050          |                | 126         | 103         | 229          |                | 271         | 310         | 581          |
| (Pass-By Trip Reduction) <sup>4</sup>               |                                       |            | <u>(1,025)</u> |                | <u>(41)</u> | <u>(37)</u> | <u>(78)</u>  |                | <u>(60)</u> | <u>(67)</u> | <u>(127)</u> |
| <b>Net New Trips Generated</b>                      |                                       |            | <b>295</b>     |                | <b>0</b>    | <b>99</b>   | <b>99</b>    |                | <b>-31</b>  | <b>-104</b> | <b>-135</b>  |

<sup>1</sup> Trip rates (per dwelling unit) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. Apartment (220)  
<sup>2</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. Shopping Center (820)  
<sup>3</sup> Trip rates (per 1,000 sq. ft.) based on Institute of Transportation Engineers, *Trip Generation, Eighth Edition*, 2008. General Office Building (710)  
<sup>4</sup> Pass-by trip rates based on Institute of Transportation Engineers, *Trip Generation Handbook, Second Edition: A Recommended Practice*, June 2004  
<sup>5</sup> 36% trip reduction based on density, mix of uses, transit service, pedestrian/bicycle facilities, and affordable housing calculated by Nelson Nygaard (May 13, 2010).  
<sup>6</sup> Existing site-generated traffic based on peak-hour driveway counts conducted in April 2007. Daily trips estimated based on peak-hour trips.

### Existing Traffic Volumes

The existing peak-hour traffic volumes for all but one study intersection were obtained from traffic counts conducted in September 2014. The PM peak-hour volumes for the intersection at Delaware Street and 19th Avenue were obtained from traffic counts conducted in the year 2013. The new counts are attached in the Appendix A. The new traffic counts were compared to the counts used in the 2010 Station Park Green traffic study. The volume differences between the new counts and the old counts are relatively small with minor increases at some intersections and minor decreases at other intersections.

### Existing Levels of Service

The results of the level of service analysis under existing conditions are summarized in Table 4. All of the study intersections currently operate within the City’s established level of service standards during both peak hours. The existing (2014) levels of service are the same as those reported in the previous 2010 study. Furthermore, the average intersection delays shown in Table 4 are within about two seconds more or less than those reported in 2010. The minimal change in existing delay between 2010 and 2014 would not alter the previous study conclusions regarding project impacts and mitigation measures. The level of service calculation sheets are included in Appendix B.

**Table 4  
Existing Levels of Service**

| Intersection                       | Existing Intersection Control | Peak Hour | Count Date | Avg. Delay <sup>1</sup> | LOS |
|------------------------------------|-------------------------------|-----------|------------|-------------------------|-----|
| 92 Ramps and Concar Drive          | Signal                        | AM        | 09/03/14   | 6.5                     | A   |
|                                    |                               | PM        | 09/16/14   | 9.6                     | A   |
| Delaware Street and 16th Avenue    | All-Way Stop                  | AM        | 09/03/14   | 13.7                    | B   |
|                                    |                               | PM        | 09/03/14   | 14.6                    | B   |
| Delaware Street and Garvey Way     | Two-Way Stop                  | AM        | 09/03/14   | 15.5                    | C   |
|                                    |                               | PM        | 09/03/14   | 18.0                    | C   |
| Delaware Street and Charles Lane   | Signal                        | AM        | 09/03/14   | 3.6                     | A   |
|                                    |                               | PM        | 09/03/14   | 3.9                     | A   |
| Delaware Street and Concar Drive   | Signal                        | AM        | 09/03/14   | 27.1                    | C   |
|                                    |                               | PM        | 09/03/14   | 31.2                    | C   |
| Delaware Street and 19th Avenue    | Signal                        | AM        | 09/03/14   | 24.7                    | C   |
|                                    |                               | PM        | 05/01/13   | 25.7                    | C   |
| Delaware Street and Sunnybrae Blvd | Two-Way Stop                  | AM        | 09/03/14   | 9.3                     | B   |
|                                    |                               | PM        | 09/03/14   | 10.8                    | C   |

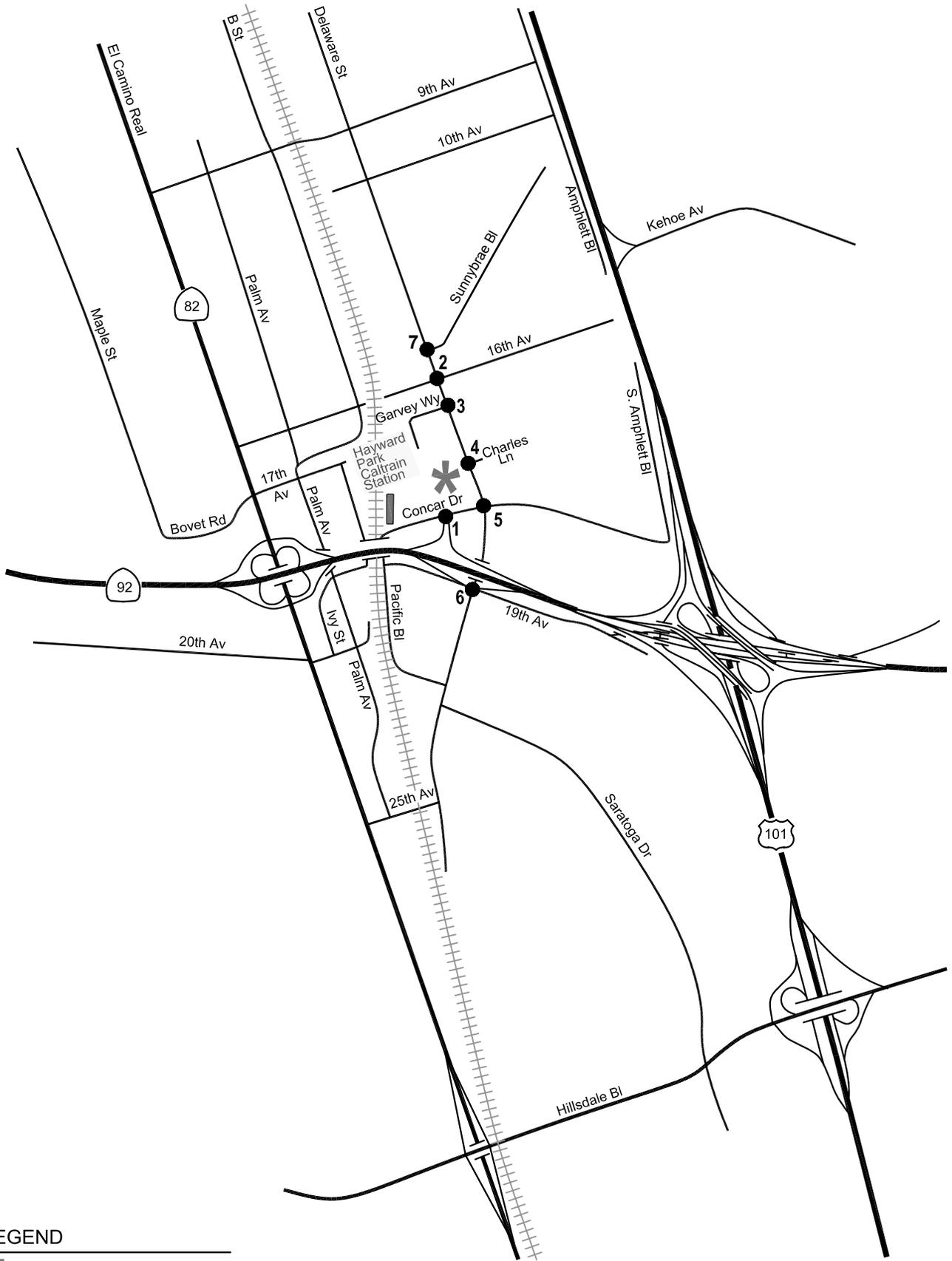
<sup>1</sup> Average delay includes all movements at signalized intersections and intersections under all-way stop control. At intersections under two-way stop control, average delay is reported for the worst stop-controlled lane group.

### Signal Warrant Analysis

A signal warrant analysis was performed for the stop-controlled intersection of Delaware Street and Sunnybrae Boulevard. The existing traffic volume at this intersection is fairly low and does not meet the peak-hour signal warrant (warrant 3). The intersection is not expected to warrant signalization even with the traffic generated by the proposed Station Park Green development.

## Conclusions

The revised Station Park Green development is expected to generate fewer net trips than either of the options studied in the 2010 traffic impact analysis. Intersection volumes and delays under existing (2014) conditions are very close to those reported in 2010. Peak-hour intersection levels of service are within acceptable levels and are unchanged from 2010. The existing traffic volume at Delaware Street and Sunnybrae Boulevard is fairly low and does not meet the peak-hour signal warrant. The intersection is not expected to warrant signalization even with the traffic generated by the proposed Station Park Green development. Based on these findings, we conclude that further analysis of the revised Station Park Green development is unnecessary.



LEGEND

-  = Site Location
-  = Study Intersection

**Figure 1**  
**Site Location and Study Intersections**