

**MEETING DATE:** 08/28/06

**AGENDA ITEM:** Consideration to authorize entering into a Professional Services Agreement with Katz, Okitsu & Associates (KOA) for the development and design of optimized signal timing plans at 26 signalized intersections along segments of the Jefferson Boulevard, Sepulveda Boulevard, Overland Avenue and Slauson Avenue corridors

**ATTACHMENTS**

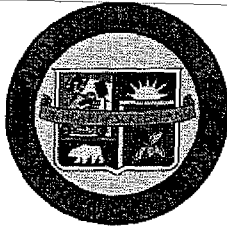
|   |                                                      | <u>Pages</u> |
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| 3 | Responding proposal from Wildan                      | 5-6          |
| 4 | Responding proposal from Katz, Okitsu & Associates   | 7-24         |

**MEETING DATE:** 08/14/06

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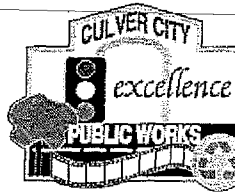
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# Culver CITY

PUBLIC WORKS DEPARTMENT

9770 Culver Boulevard, Culver City, California 90232



Charles D. Herbertson, P.E., LS  
Public Works Director and  
City Engineer

(310) 253-5600

Mate Gaspar, P.E.  
Engineering Services Manager

FAX (310) 253-5626

April 26, 2006

KOA  
17852 E. 17<sup>th</sup> Street, Suite 1002  
Tustin, CA 92780-2142

Subject: Request for Proposal – Traffic Signal Optimization Effort

The Public Works Department for the City of Culver City is seeking proposals from the traffic engineering consultants to provide professional services to the City for an operational analysis and optimization of the traffic signal timing, phasing, coordination and splits along corridor segments of Slauson Ave., Sepulveda Blvd., and Jefferson Blvd. This effort shall employ a computer simulation program such as synchro, corsim models to devise a timing strategy for improved traffic signal timing in the above mentioned corridors.

The following provides a scope of work for the request for proposal. Firms interested in performing this scope of work for the City must submit proposals by Wednesday, June 2, 2006, to:

Charles Herbertson, Public works Director  
Attn: Max Paetzold  
City of Culver City  
P.O. Box 507  
Culver City, CA 90232-0507

Phone (310) 253-5600

Thank you for your interest in this project.

Max Paetzold  
Interim Traffic Engineering Manager

Attachment (RFP)

## RFP

The Public Works Department, City of Culver City, is seeking a request for proposal to analyze the existing traffic signal and optimize the traffic signal timing, phasing coordination and splits in a segment of the Slauson Ave, Sepulveda – Jefferson corridor using a computer simulation program such as synchro, corsim, etc.

Intersections to be considered in the analysis:

1. Sepulveda Blvd. and Green Valley Circle. \*
2. Fox Hills Mall Driveway and Sepulveda Blvd. \*
3. **Sepulveda Blvd. and Slauson Ave. \***
4. **Sepulveda Blvd. and Playa St./Jefferson Blvd. \***
5. Sepulveda Blvd. and Berryman Ave.
6. **Sepulveda Blvd. and Jefferson Blvd./Sawtelle Blvd. (2070 Controller) \***
7. Sepulveda Blvd. and Machado Rd./Driveway \*
8. Jefferson Blvd. and Machado Rd./Driveway \*
9. Jefferson Blvd. and Cota St./Driveway shopping mall \*
10. Jefferson Blvd. and Kinston Ave.
11. Jefferson Blvd. and Overland Ave. (presently free operation) \*
12. **Jefferson Blvd. and Slauson Avenue \***
13. Fox Hills Mall Driveway and Slauson Ave.\*
14. Hannum Ave. and Slauson Ave. \*
15. Route 90 FWY and Slauson Ave. (179 State Controller) \*
16. Jefferson Blvd and Jordan Wy/Summertime Ln.
17. Jefferson Blvd and Indianwood Rd.
18. Jefferson Blvd and Raintree Rd.
19. Jefferson Blvd and Leahy St.
20. Jefferson Blvd and Pac-Bell/Storage Facility Driveways
21. Jefferson Blvd and Duquesne Ave. \*

### NOTE:

1. All traffic signal controllers are 170 except as noted
2. \* Indicates multiphase controllers
3. Intersections in bold type are designated anchor intersections

City to provide:

1. Current traffic signal timing charts for 170, 179 and a 2070 signalized locations listed herein.
2. Conduct a before and after one day peak hour(s) operating time/speed study on Sepulveda Blvd. between Green Valley Circle and Sawtelle / Sepulveda Blvd. and on Jefferson Blvd. between Duquesne Ave and Sawtelle / Sepulveda Blvd using the floating car methodology.
3. Centerline distances between each of the 21 intersections.
4. Lane configurations for each of the 21 intersections.

2



June 1, 2006

City of Culver City  
Charles Herbertson, Public Works Director  
P.O. Box 507  
Culver City, California 90232

ATTENTION: Mr. Max Paetzold

SUBJECT: **TRAFFIC SIGNAL OPTIMIZATION EFFORT**

Dear Sir:

Austin-Foust Associates, Inc. (AFA) is pleased to respond to your RFP dated April 26, 2006 to provide optimized signal timing for 21 locations 13 of which are multi-purpose intersections. Our understanding is that the consultant will prepare a computerized traffic flow simulation program which will, in turn, produce optimized signal timing patterns. The timing charts will be in the LADOT-ATSAC format. The consultant will be responsible for development and calibration of the model but the City will furnish the AM/PM and midday peak hour turning movement counts at the 13 multi phase locations along with existing timing charts. The signal optimization will be based upon existing intersection lane configurations and signal phasing – no new improvement to the existing geometry is planned. City Staff will install the recommended timing plans in the field controllers and the consultant shall evaluate the results and provide recommendations for any fine tuning that may be needed.

AFA's approach to this project is to utilize Synchro Software to provide the basic traffic flow simulation program. However, the key to success of any flow simulation is to properly calibrate the simulation model to accurately replicate existing conditions. Then after the model is calibrated it can be used to optimize signal timing patterns. In order to ensure proper calibration, AFA will conduct observations of start-up lost time, yellow extension, saturation flow rates and maximum back up queues at six of the 13 multi phase locations. The Synchro traffic flow simulation will be adjusted using the field measured parameters to produce model results similar to those observed in the field. Only after this thorough testing and calibration effort can the model be "trusted" to produce optimal and reliable future timing patterns.

AFA has used essentially this same calibration process for many signal timing optimization programs with the entire City of Aliso Viejo being our most recent project. Our approach there, as will be done here, was to calibrate the model, then optimize signal timing followed by field implementation and fine tuning. The only difference is AFA conducted the initial traffic counts as well as before and after floating car travel time runs.

06culvercityoptimization.doc

2223 Wellington Avenue, Suite 300 • Santa Ana, California 92701-3161

Tel: (714) 667-0496 Fax: (714) 667-7952

www.austinfoust.com

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Mr. Max Paetzold

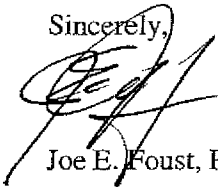
June 1, 2006

Page 2

Based on the City providing the traffic counts and floating car travel time data, AFA proposes to develop and calibrate the Synchro model, produce optimal timing patterns and perform an after field review for fine tuning purposes for a fixed fee of \$1,400 per intersection for a total cost of \$29,400.

I will be the Project Manager and you contact person. We realize it may be difficult to evaluate our proposal simply from the brief letter. Therefore, we would be pleased to demonstrate to you our typical Synchro traffic flow simulation (probably using our recently completed Aliso Viejo model) if you have the time and interest. If you have any questions, please feel free to call. We would like to talk more about our approach.

Sincerely,

A handwritten signature in black ink, appearing to read 'Joe E. Foust', written over the word 'Sincerely,'.

Joe E. Foust, P.E.

June 1, 2006

Mr. Charles Herbertson  
Public Works Director  
Attn: Mr. Max Paetzold  
City of Culver City  
9770 Culver Boulevard  
Culver City, CA 90232

Subject: Proposal for the Traffic Signal Optimization Effort

Dear Mr. Paetzold:

Willdan is pleased to submit this proposal for professional traffic engineering services to the City of Culver City to prepare a Traffic Signal Optimization Effort to analyze the existing traffic signals at various locations on Slauson Avenue, and the Sepulveda/Jefferson corridor. We understand that the City wants to optimize the signal timing, coordination phasing and splits to provide synchronization programs for 21 intersections using a computer simulation program.

### **SCOPE OF WORK**

The following tasks will be performed for the 21 intersections listed below.

1. Conduct turning counts during AM, midday, and PM peak traffic hours.
2. Meet with the City to finalize scope of work and obtain timing charts, centerline distances, lane configurations, and any available traffic signal plans.
3. Conduct computer simulation to optimize the coordination programs on Slauson Avenue, Jefferson Boulevard, and Sepulveda Boulevard utilizing Synchro 6 simulation software. Synchro 6 will analyze the data and optimize the cycle lengths, offsets, and splits for the AM, midday, and PM peak traffic hours.
4. Provide the City with completed Type 170 traffic signal timing charts with AM, midday, and PM coordination plans for each of the following intersections.

### **Intersections to be analyzed:**

1. Sepulveda Boulevard and Green Valley Circle
2. Fox Hills Mall Driveway and Sepulveda Boulevard
3. Sepulveda Boulevard and Slauson Avenue
4. Sepulveda Boulevard and Playa Street/Jefferson Boulevard
5. Sepulveda Boulevard and Berryman Avenue
6. Sepulveda Boulevard and Jefferson Boulevard/Sawtelle Boulevard
7. Sepulveda Boulevard and Machado Road/Driveway

8. Jefferson Boulevard and Machado Road/Driveway
9. Jefferson Boulevard and Cota Street/Driveway Shopping Mall
10. Jefferson Boulevard and Kinston Avenue
11. Jefferson Boulevard and Overland Avenue
12. Jefferson Boulevard and Slauson Avenue
13. Fox Hills Mall Driveway and Slauson Avenue
14. Hannum Avenue and Slauson Avenue
15. Route 90 Fwy. and Slauson Avenue
16. Jefferson Boulevard and Jordan Way/Summertime Lane
17. Jefferson Boulevard and Indianwood Road
18. Jefferson Boulevard and Raintree Road
19. Jefferson Boulevard and Leahy Street
20. Jefferson Boulevard and Pac-Bell/Storage Facility Driveways
21. Jefferson Boulevard and Duquesne Avenue

It is understood that all traffic signal controllers are Type 170 or 2070 and the entering of the timing plans into the intersection controllers is not included in this proposal. For purposes of this proposal, we are providing AM, midday, and PM peak timing plans. Should you require more or fewer than three timing plans, our proposed fee would be adjusted accordingly.

### SCHEDULE

Willdan estimates that the scope of work will be completed for City review within 6 weeks after receipt of notice to proceed. Final timing charts can be completed within 2 weeks after the receipt of City comments.

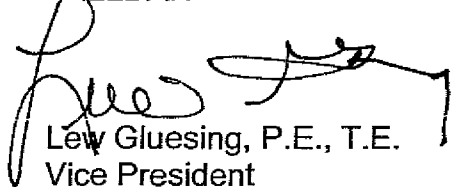
### FEE

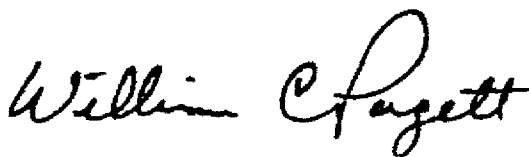
Wildman's lump sum fee to provide the above services is **\$31,500.00**, based on timing plans for AM, midday, and PM peak traffic hours.

Should you have any questions or require additional information, please contact Mr. Ken Hanson at (562) 908-6239 or Mr. Lew Gluesing at (562) 908-6291.

Respectfully submitted,

WILLDAN

  
Lew Gluesing, P.E., T.E.  
Vice President



William C. Pagett, P.E.  
Senior Vice President



**Katz, Okitsu & Associates**  
Planning and Engineering

June 2, 2006

17852 E. Seventeenth St.  
Suite 102  
Tustin, CA  
92780-2142

714.573.0317  
fax: 714.573-9534

koaoc@katzokitsu.com  
www.katzokitsu.com

Mr. Max Paetzold  
Traffic Engineer Manager  
City of Culver City  
9770 Culver Boulevard  
Culver City, California 90232

SUBJECT: **PROPOSAL FOR TRAFFIC SIGNAL COORDINATION & IMPLEMENTATION:  
for 21 Intersections along 3 Arterials in the City of Culver City**

Dear Mr. Paetzold:

Katz, Okitsu & Associates is pleased to receive a Request for Proposal from you to perform work in the City of Culver City. We are most interested in performing the necessary services and submit this proposal accordingly. The Project consists of the development and implementation of traffic signal timing plans for the retiming of 21 traffic signals along Sepulveda Boulevard (7 intersections), Jefferson Boulevard (11 intersections), and Slauson Avenue (3 intersections).

We have successfully completed numerous similar projects for communities throughout California. Recent projects include:

- Washington Boulevard Realignment and Signal Timing Improvement Study, City of Culver City
- Alessandro Boulevard Traffic Signal Timing Project, City of Moreno Valley
- El Cajon Signal Timing, City of El Cajon
- Euclid Street Traffic Signal Coordination Study & Implementation, City of Garden Grove

We have also earned a reputation for high quality work, fulfillment of deadlines, and reasonable costs. The firm has offices in Tustin, San Diego, Ontario, and Monterey Park. Our Tustin and Monterey Park offices will perform all work for this project.

Los Angeles  
323.260.4703  
fax: 323.260.4705

San Diego  
619.683.2933  
fax: 619.683.7982

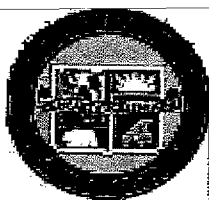
San Bernardino  
909.890.9693  
fax: 909.890.9694

Please contact me if you wish to discuss this proposal further, if you have questions, or if you wish to authorize us to proceed; I am authorized to bind Katz, Okitsu & Associates. We look forward to working with the City of Culver City on this important project. This proposal is valid for 120 days.

Sincerely,

Rock E. Miller, P.E.  
Vice President

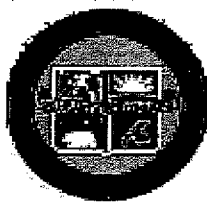
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**Proposal to the  
City of Culver City  
Traffic Signal Optimization Effort**

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## Proposal to the City of Culver City Traffic Signal Optimization Effort

# I – Approach

## 1.1 – PROJECT UNDERSTANDING

The City of Culver City has requested that Katz, Okitsu & Associates prepare traffic signal coordination timing plans for Sepulveda Boulevard from Green Valley Circle to Machado Road/Driveway (7 intersections), Jefferson Boulevard from Machado Road/Driveway to Duquesne Avenue (11 intersections), and Slauson Avenue from Jefferson Boulevard to Route 90 Freeway (3 intersections) for a total of 21 intersections (all intersection controllers are Type 170 unless otherwise named as seen below:

### Intersection

1. Sepulveda Boulevard and Green Valley Circle
2. Sepulveda Boulevard and Fox Hills Mall Driveway
3. Sepulveda Boulevard and Slauson Avenue
4. Sepulveda Boulevard and Playa Street /Jefferson Boulevard

### Type of Controller

Multiphase Controller  
Multiphase Controller  
Anchor Intersection/ Multiphase Controller  
Anchor Intersection/ Multiphase Controller

5. Sepulveda Blvd. and Berryman Avenue
6. Sepulveda Boulevard and Jefferson Boulevard / Sawtelle Boulevard
7. Sepulveda Boulevard and Machado Road/Driveway
8. Jefferson Boulevard and Machado Road/Driveway
9. Jefferson Boulevard and Cota Street /Driveway Shopping Mall
10. Jefferson Boulevard and Kinston Avenue
11. Jefferson Boulevard and Overland Avenue
12. Jefferson Boulevard and Slauson Avenue
13. Slauson Avenue and Fox Hills Mall Driveway
14. Slauson Avenue and Hannum Avenue
15. Slauson Avenue and Route 90 Freeway
16. Jefferson Boulevard and Jordan Way/Summertime Lane
17. Jefferson Boulevard and Indianwood Road
18. Jefferson Boulevard and Raintree Road
19. Jefferson Boulevard and Leahy Street
20. Jefferson Boulevard and Pac-Bell/Storage Facility Driveways
21. Jefferson Boulevard and Duquesne Avenue

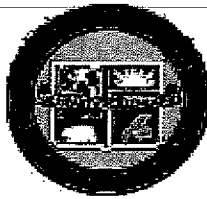
Anchor Intersection/ 2070 Controller /  
Multiphase Controller  
Multiphase Controller  
Multiphase Controller  
Multiphase Controller  
  
Multiphase Controller / Free Operation  
Anchor Intersection/ Multiphase Controller  
Multiphase Controller  
Multiphase Controller  
Multiphase Controller / 179 Controller

Multiphase Controller

## 1.2 – FIRM PROPOSING

Katz, Okitsu & Associates is a consulting engineering firm providing planning and engineering services to government and private sector clients. We have a staff of over 80 dedicated employees at our four offices, as follows:

|                       |                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tustin Office:        | 17852 East Seventeenth Street, Suite 102, Tustin, CA 92780<br>Phone (714) 573-0317, Fax (714) 573-9534, Email: <a href="mailto:Rmiller@katzokitsu.com">Rmiller@katzokitsu.com</a> |
| Monterey Park Office: | 1055 Corporate Center Drive, Suite 300, Monterey Park, CA 91754.<br>Phone (323) 260-4703, Fax (323) 260-4705, Email: <a href="mailto:Jlin@katzokitsu.com">Jlin@katzokitsu.com</a> |



## Proposal to the City of Culver City Traffic Signal Optimization Effort

San Diego Office: 2251 San Diego Avenue, Suite A-270, San Diego, CA 92110  
Phone (619) 683-2933, Fax (619) 683-7982, Email: [Jatorma@katzokitsu.com](mailto:Jatorma@katzokitsu.com)

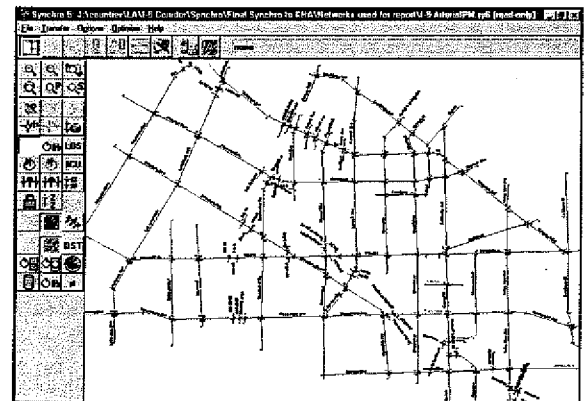
San Bernardino Office: 685 E. Carnegie Drive, Suite 205, San Bernardino, CA 92408  
Phone (909) 890-9693, Fax (909) 890-9694, Email: [Mahmed@katzokitsu.com](mailto:Mahmed@katzokitsu.com)

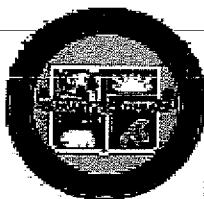
Our staff includes 13 registered civil engineers and/or registered traffic engineers. The company has strong expertise in transportation engineering and in project management. We have served in key roles on many of the largest transportation projects in Southern California. The company has applicable experience in project management and in all project phases where transportation expertise is required. We have strong CAD capabilities, using both AutoCAD and Intergraph MicroStation. The firm's capabilities and experience include a wide range of work for public agencies and private developments. Specific areas of expertise include:

|                                   |                                                   |
|-----------------------------------|---------------------------------------------------|
| ■ Traffic Engineering Design      | ■ Traffic Impact, Circulation, & Parking Analysis |
| ■ Highway & Infrastructure Design | ■ Signal Timing & Operations                      |
| ■ Traffic Signal Design           | ■ Intelligent Transportation Systems (ITS) Design |
| ■ Street Lighting Design          | ■ Traffic Calming & Pedestrian Safety Studies     |
| ■ Work Site Traffic Control       | ■ Geographic Information Systems (GIS)            |
| ■ Pedestrian & Bikeway Design     | ■ Engineering & Traffic Survey (Radar) Studies    |

### 1.3 - SOFTWARE SELECTION

The Katz, Okitsu & Associates team prefers the use of SYNCHRO as a tool for development of signal timing plans. We have been using this program nearly exclusively in our recent signal timing projects, and we have retimed nearly 1000 traffic signals using this program. SYNCHRO is a modern and easy-to-use windows-based program that has been designed to properly handle many of the common issues that cannot be analyzed with legacy programs, such as Passer2 or TRANSYT-7F. These include comparison between free vs. coordination operation, unequal cycle lengths, arterials and grid networks, and explicit handling of actuated controllers. The program has greatly improved our ability to deliver more properly fine tuned plans to the street. It has also provided a well-designed geographic database for maintenance of traffic volumes and signal timing parameters. Its companion program, SimTraffic, also allows for a very convenient and realistic real-time animation of simulated or existing timing plans and of the proposed, improved or optimized timing plans. This is very effective for analyzing over-saturated networks or unusual features that cannot be properly modeled by traditional software.





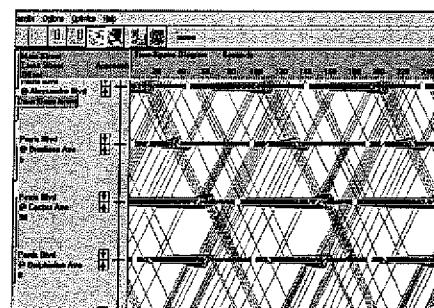
## Proposal to the City of Culver City Traffic Signal Optimization Effort

As seen, these two exhibits show the typical SYNCHRO printed reports, including an excerpt of a system, and a time space diagram. The program includes numerous other reports. The Katz, Okitsu & Associates team can also provide timing plans using Passer2, TRANSYT-7F, or other programs. However, we do not recommend use of these programs for this project. If the participating agencies were not familiar with SYNCHRO, we would request an opportunity to make a presentation of the program for your evaluation. We are confident that you will agree with our recommendations.



Sim Traffic Simulation

Signal timing software can provide valuable information; however, practical experience is also essential in a signal timing study. Traditional methods such as time-space diagrams are frequently as effective as computer generated solutions; also, knowledge of the practical limitations on maximum green intervals and judgment of pedestrian traffic actuations and their effects. Katz, Okitsu & Associates has extensive experience in signal timing that is used in all of our signal timing plan development activities. Fortunately, SYNCHRO also has a very convenient time space diagram display and editing feature that facilitates the manual adjustment of optimized timing plans, as well as the performance changes that result from those manual adjustments. The Time Space Diagram can be displayed in traditional band style or in a vehicular flow style that is becoming more and more popular in the Traffic community.

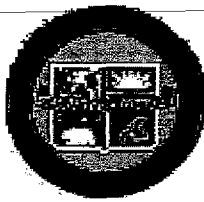


SYNCHRO Time-Space Diagram

Katz, Okitsu & Associates normally employs software as appropriate to assist in developing and evaluating traffic signal plans. This software is useful in identifying appropriate concept signal timing plans, cycle lengths, and splits for study networks. It is important to stress that we use this software as tools, not as mandates. In fact, we normally expedite timing plans onto the street, because study resources are often better spent in fine-tuning than in exercising software. This is particularly true for locations that are experiencing near-capacity conditions and severe congestion.

### 1.4 - EXPERIENCE AND REFERENCES

We are highly qualified to provide Culver City with the expertise necessary to conduct the necessary work for this project. Many of our projects are performed directly for public agencies or for other firms working directly for public agencies. We have extensive knowledge of the special needs and requirements of public agencies, and we approach all of our projects in the best interest of the public agency. We have completed numerous signal timing and other traffic engineering projects under direct contracts with many public agencies throughout Southern California.

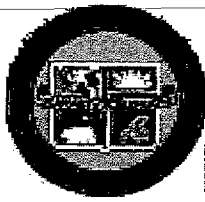


**Proposal to the  
City of Culver City  
Traffic Signal Optimization Effort**

**Table I – Traffic Signal Timing Projects**

| <i>City</i>           | <i>Lead Office</i> | <i>System Type</i> | <i>Timing<br/>Study</i> | <i>Full<br/>Implementation</i> | <i>Number of<br/>Signals</i> |
|-----------------------|--------------------|--------------------|-------------------------|--------------------------------|------------------------------|
| Alameda               | Orange             | Tranconex          | ✓                       |                                | <10                          |
| Alhambra              | Monterey Park      | LACO               |                         | ✓                              | <10                          |
| Anaheim               | Orange             | UTCS               | ✓                       |                                | 35                           |
| Carson                | Orange             | Econolite          | ✓                       | ✓                              | 9                            |
| Costa Mesa / Caltrans | Orange             | Caltrans           | ✓                       | ✓                              | 15                           |
| Culver City           | Orange             | ATSAC              | ✓                       | ✓                              | >10                          |
| Diamond Bar           | Orange             | LACO               | ✓                       | ✓                              | 66                           |
| El Cajon              | Orange/San Diego   | BiTran             | ✓                       | ✓                              | 27                           |
| Garden Grove          | Orange             | Econolite          | ✓                       | ✓                              | 12                           |
| Hesperia              | Orange             | Econolite          | ✓                       |                                | 15                           |
| Honolulu, Hawaii      | Orange             | BiTran             | ✓                       |                                | 320                          |
| Imperial Beach        | San Diego          | BiTran             |                         | ✓                              | 2                            |
| Irvine                | Orange             | Multisonics        | ✓                       | ✓                              | 20                           |
| La Fayette            | Orange             | BiTran             | ✓                       |                                | 5                            |
| Lemon Grove           | Orange/San Diego   | BiTran             | ✓                       | ✓                              | 20                           |
| Long Beach            | Orange             | BiTran             | ✓                       |                                | 120                          |
| Martinez              | Orange             | BiTran+C57         | ✓                       | ✓                              | 12                           |
| Montebello            | Monterey Park      | Econolite          |                         | ✓                              | >10                          |
| Monterey Park         | Monterey Park      | Econolite          |                         | ✓                              | 51                           |
| Moreno Valley         | Orange             | Tranconex          | ✓                       | ✓                              | 94                           |
| National City         | Orange/San Diego   | BiTran             | ✓                       | ✓                              | 25                           |
| Oakland               | Orange             | TCT                | ✓                       |                                | <10                          |
| Orange                | Orange             | Multisonics        | ✓                       | ✓                              | 20                           |
| Santee                | Orange/San Diego   | Econolite          | ✓                       | ✓                              | 44                           |
| San Clemente          | Orange             | IDC-OSAM           | ✓                       | ✓                              | 20                           |
| San Diego             | Orange/San Diego   | BiTran             | ✓                       |                                | >30                          |
| San Francisco         | Orange             | TCT                | ✓                       |                                | >27                          |
| San Leandro           | Orange             | Econolite          | ✓                       |                                | 8                            |
| San Ramon             | Orange             | Wapiti             | ✓                       | ✓                              | 63                           |
| Santa Maria           | Orange             | BiTran             | ✓                       |                                | 9                            |
| Santa Monica          | Monterey Park      | Econolite          |                         | ✓                              | 15                           |
| Solana Beach          | Orange/San Diego   | BiTran             | ✓                       | ✓                              | 5                            |
| South Gate            | Monterey Park      | Econolite          |                         | ✓                              | 52                           |
| Vista                 | Orange/San Diego   | BiTran             | ✓                       |                                | 29                           |
| West Hollywood        | Monterey Park      | BiTran             |                         | ✓                              | >10                          |
| Yucaipa               | Orange             | BiTran             |                         | ✓                              | 17                           |

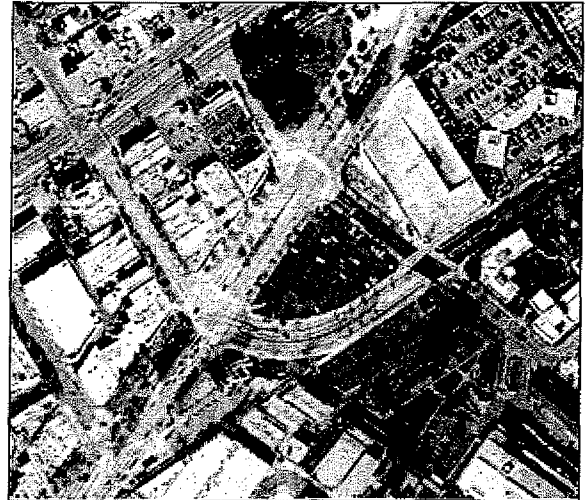
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## Proposal to the City of Culver City Traffic Signal Optimization Effort

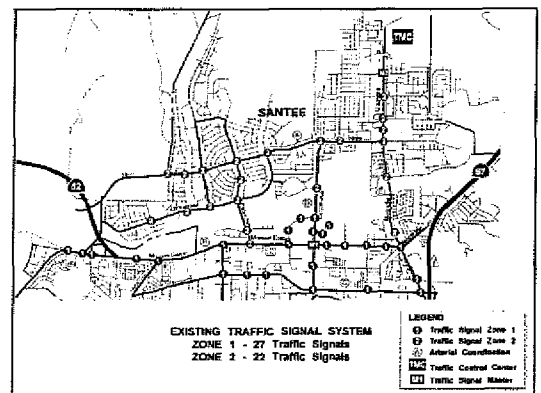
### Washington Boulevard Realignment Feasibility Study, Culver City, California (2005):

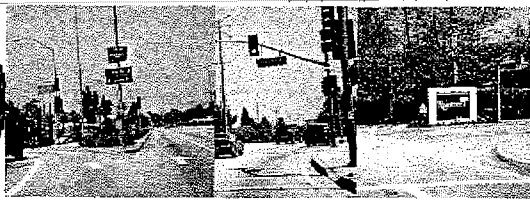
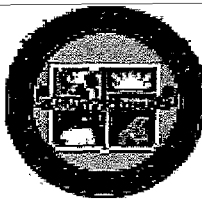
The City of Culver City has retained Katz, Okitsu & Associates to evaluate the feasibility of realigning Washington Boulevard from Ince Boulevard to its easterly intersection with Culver Boulevard. A goal of the project is to recover the land now dedicated to street use and to expand a pedestrian plaza or provide other amenities that are not now possible. Washington Boulevard would be realigned to intersect with Culver Boulevard near the existing Ince intersection, and Ince Boulevard would generally be incorporated into the realignment. Katz, Okitsu & Associates analysis focused on the significant and complex traffic operation issues in the study area due to the confluence of Culver Boulevard and Washington Boulevard and the heavy traffic flows that travel along Culver Boulevard between the easterly and westerly intersections. The City wished to maintain good pedestrian circulation in the downtown area, a goal that is difficult to achieve in conjunction with the traffic carrying function of Culver Boulevard. We evaluated existing conditions in the project vicinity to determine whether features of the existing circulation system are not functioning at optimum levels or as intended in studies completed in the past. In analyzing the alignment, we used the Synchro traffic signal simulation and optimization program to assess traffic conditions to determine whether existing conditions can be improved readily and simply by evaluation and retiming of the signal system. Through this an optimized timing plan was developed and implemented to greatly improve existing conditions. *Reference: Mr. Todd Tipton, City of Culver City, (310) 253-5783 or email: [todd.tipton@culvercity.org](mailto:todd.tipton@culvercity.org).*



### Santee Signal Timing, (2004):

Katz, Okitsu & Associates was retained by the City of Santee to create citywide traffic signal timing plans. The project area, which is completely within the City of Santee, consists of 44 existing traffic signals. The project deals with 44 intersections along eight arterials. Santee is the only City in San Diego County to own and operate an Econolite signal system. This makes the City very unique and requires a specialized knowledge of this type of signal system to properly time the traffic signals. The project included simulation and optimization model for the entire City of Santee including a 9-phase intersection with the ninth phase serving the San Diego Trolley traveling on street through the intersection of Mission Gorge and Cuyamaca Avenue. The system is comprised of an Econolite Aries system with AS2C system controllers. *Reference: Mr. Dennis Barnes, P.E., Senior Traffic Engineer, City of Santee, (619) 258-4100 x 189.*





## *Proposal to the City of Culver City Traffic Signal Optimization Effort*

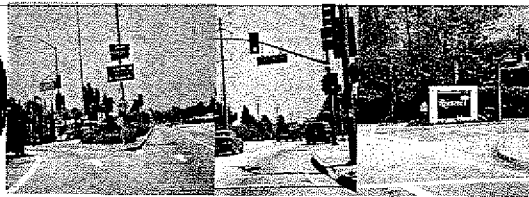
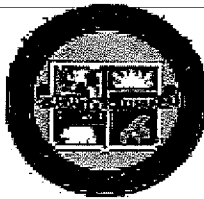
**Signal System Troubleshooting & Timing, National City, California (on-going):** Katz, Okitsu & Associates is currently working under an as-needed contract to provide traffic signal system support. The first task was to reassemble the BiTran server and restore communication to all interconnected intersections, including troubleshooting of fiberoptic modems. This task has been completed. The next phase was to restore operational coordination timing plans, where valid and compatible with existing signal designs. However, this phase determined that many of the existing plans are not compatible with recently modified signal phasing and others are not functional. As part of the final phase, new coordinated traffic signal timing will be implemented over the major corridors of the City using a Synchro network to be created. *Reference: Mr. Din Daneshfar City of National City (619) 336-4387.*

**Alessandro Boulevard Traffic Signal Timing Project, Moreno Valley, California (2004):** Katz, Okitsu & Associates conducted a traffic signal optimization study for the City of Moreno Valley on this heavily used east/west arterial that passes through the center of the City. This project was the fourth traffic signal optimization project undertaken by our firm for the City of Moreno Valley. In conjunction with coordination activities, pedestrian clearance intervals were modified to comply with new Federal guidelines and volume density settings were applied to actuated approaches. Corridor travel speeds along the arterial were increased by 20% to over 30 mph, average, for all time periods. *Reference: Mr. Alan Kashefi, Associate Traffic Engineer, City of Moreno Valley (909) 413-3145.*

**Euclid Street Traffic Signal Coordination Study & Implementation, Garden Grove, California (2003-2004):**

The City of Garden Grove obtained funding to retime the traffic signals along Euclid Street for its entire length within the City, from Orangewood Avenue to Westminster Boulevard. Katz, Okitsu & Associates was retained to conduct the timing study and to implement the final timing plans at the City Traffic Control Center and at intersection controllers. The corridor has 12 traffic signals including a ramp for the SR 22 Freeway. The signals use Econolite controllers and the Aries traffic management system. Katz, Okitsu & Associates used the Synchro program to establish timing plans and provided full implementation and fine-tuning services. The plans were developed to readily extend along crossing arterials that will be retimed in the future. The plans have been implemented for AM, PM, off peak, and weekends. The corridor now experiences travel times that are 25% better than base line conditions. *Reference: Mr. George Allen, City Traffic Engineer, City of Garden Grove (714) 741-5000.*





## Proposal to the City of Culver City Traffic Signal Optimization Effort

## 2 – Project Organization

This office will be the primary location where the majority of the day-to-day work will be accomplished. The primary contact will be Mr. Rock Miller, Vice President and Operations Manager for the Orange County office located in Tustin at 17852 East Seventeenth Street, Suite 102, Tustin, CA 92780; Phone (714) 573-0317, Fax (714) 573-9534, Email: [Rmiller@katzokitsu.com](mailto:Rmiller@katzokitsu.com).

### 2.1 – TEAM MEMBERS: KEY PERSONNEL

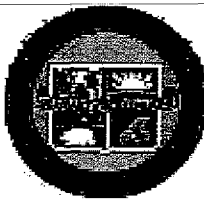
#### ROCK MILLER, P.E., P.T.O.E – PROJECT MANAGER

Our designated Project Manager is Rock Miller, P.E., P.T.O.E. Mr. Rock Miller is registered as a Traffic Engineer and Civil Engineer with 30 years of traffic engineering experience. He has extensive experience in conducting signal-timing studies. He will be responsible for all phases of the project, including coordination with the City, supervision of timing studies using software, evaluation and fine-tuning. Mr. Miller was responsible for traffic signal timing while serving as the City Traffic Engineer at the City of Costa Mesa, where he developed a unique and responsive approach to signal timing on high volume arterial streets. This approach was very similar to the Sydney (Australia) Coordinated Adaptive Traffic

(SCAT) signal timing system. Under Mr. Miller's approach, offsets were normally held constant, while signal splits were constantly adjusted based upon occupancy data from sampling detectors at critical intersections. This method allowed the signals to be much more responsive to frequent fluctuations in traffic volumes. Mr. Miller logged 100's of hours on the Costa Mesa's signal system.

|                                                                            |  |
|----------------------------------------------------------------------------|--|
| <b>Education</b>                                                           |  |
| MS, Civil Engineering, UC Davis (1976)                                     |  |
| BS, Civil Engineering, UC Davis (1973)                                     |  |
| <b>Registration</b>                                                        |  |
| Prof. Engineer, (Traffic) CA. #1139                                        |  |
| Prof. Engineer, (Civil) CA. #29493                                         |  |
| Prof. Traffic Operations Engineer, #205                                    |  |
| <b>Year Entered Profession</b>                                             |  |
| 1976                                                                       |  |
| <b>Affiliations</b>                                                        |  |
| Fellow, Institute of Transportation Engineers                              |  |
| Institute of Transportation Engineers, District 6, Int'l Director (2004-6) |  |
| Institute of Transportation Engineers, District 6, President (2000-2001)   |  |

Since leaving Costa Mesa, Mr. Miller has conducted timing studies for numerous public agencies. These include "hands on" timing studies for the Cities of Garden Grove, Irvine, Moreno Valley, El Cajon, National City, Carson, Long Beach, and San Clemente. For these studies, Mr. Miller and staff were responsible development and adaptation of software and for all activities required to establish timing plans, including input and fine-tuning of all timing parameters. References for these efforts are Mr. Allan Kashefi for the City of Moreno Valley, Mr. Ed Krulikowski of the City of El Cajon, and Mr. Ed Norris of the City of Long Beach. Mr. Miller recently completed a timing study analyzing the Metro Blue Line in the City of Long Beach to add a third car to the 2-car train in the downtown area. After the completion of this study Katz, Okitsu & Associates was retained to develop and implement new signal timing to incorporate transit priority for LRT vehicles. Mr. Miller is currently working closely with BiTran Systems, Inc., Los Angeles County MTA, and the City of Long Beach on this import project.

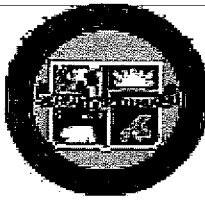


## *Proposal to the City of Culver City Traffic Signal Optimization Effort*

Mr. Miller will be responsible for the overall activities on this project. The work will be managed through correspondence, meetings, Email, telephone calls and other management techniques utilized for design projects. Meetings to provide updates to the participating agencies are anticipated for the preliminary submittal of timing plans, the final accepted timing plans and at the end of the project.

- **Instructor - Fundamentals of Traffic Engineering:** Katz Okitsu & Associates' Principal Mr. Rock Miller is retained by the University of California, Institute of Transportation Studies, to make presentations for this widely attended class that is presented several times each year throughout California. He is the lecturer for topics including Highway Capacity, Level of Service Analysis for highways and intersections, and Intelligent Transportation Systems.
- **Honolulu Phase I Signal Re-timing Project, Honolulu, Hawaii:** *Principal-in-charge.* The City and County of Honolulu, Hawaii is undertaking a three-year program to re-time and optimize all 700 traffic signals on the island of Oahu. Katz, Okitsu & Associates was retained to conduct a study to evaluate existing conditions and prepare plans for the re-timing of the first study phase, 300+ intersections. The Synchro program is being used for the first time in the State for this project. Study routes include the high volume route from the Airport to Waikiki Beach, as well as other major access routes to the downtown area. The routes are subject to heavy congestion, with backup through closely spaced intersections in many study areas.
- **Euclid Street Traffic Signal Coordination Study & Implementation, Garden Grove, California:** *Principal-in-Charge.* The City of Garden Grove obtained funding to retime the traffic signals along Euclid Street for its entire length within the City, from Orangewood Avenue to Westminster Boulevard. Katz, Okitsu & Associates was retained to conduct the timing study and to implement the final timing plans at the City Traffic Control Center and at intersection controllers. The corridor has 12 traffic signals including a ramp for the SR 22 Freeway. The signals use Econolite controllers and the Aries traffic management system. KOAA used the Synchro program to establish timing plans and provided full implementation and fine-tuning services. The plans were developed to readily extend along crossing arterials that will be retimed in the future. The plans have been implemented for AM, PM, off peak, and weekends. The corridor now experiences travel times that are 25% better than base line conditions.
- **Bay Area Regional Traffic Signal Optimization Project:** *Project Manager.* KOA was named to MTC's consultant bench for the RTSOP program in 2006. Mr. Miller is currently working on projects with the Cities of San Francisco, San Leandro, Lafayette, and San Ramon. The San Ramon project includes over 60 traffic signals and includes retiming of the Crow Canyon Road corridor that was timed by our firm in 2000. The San Francisco project includes the Market Street and Embarcadero corridors where transit priority will guide the signal timing efforts. KOA was selected to this bench based upon our strong qualifications and references that included signal timing projects for other Bay Area communities, including Oakland, Alameda, and Martinez.
- **Signal Timing for 5 Arterials, Moreno Valley, California:** *Project Manger.* Conducted a traffic signal timing study along 37 signalized intersections on Alessandro Boulevard, Perris Boulevard, Sunnymead Boulevard, Pigeon Pass Road, & Cactus Avenue in the City of Moreno Valley. Each corridor was conducted under a separate task order; the most recent is Alessandro Boulevard being

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## Proposal to the City of Culver City Traffic Signal Optimization Effort

done this year (2004). The traffic signals along each corridor were not operating in a coordinated mode prior to this timing study. Timing plans were prepared for all time periods using Synchro software. After Katz, Okitsu & Associates inputted the timing plans, in close cooperation with the City of Moreno Valley staff, the traffic along each arterial significantly improved.

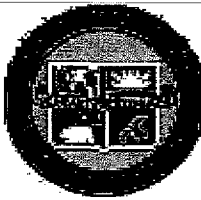
### STEPHEN S. CHANG, AICP – NETWORK DESIGNER

Mr. Stephen Chang, AICP, is an Associate Transportation Planner with over six years of experience involving transportation projects. He has excellent technical writing skills, and has prepared traffic impact analysis and circulation studies for private developments in many areas of Southern California. He experience includes: preparation of Caltrans-related studies including Project

Study Reports and warrant analysis; residential traffic calming projects in established communities; traffic modeling assessments; and private community evaluations. He is also proficient in the use of intersection capacity and signal timing software.

Education  
B.S., Urban & Regional Planning, California  
State Polytechnic University, Pomona (2000)  
Year Entered Profession  
2000  
Registration  
American Institute of Certified Planners

- **Crow Canyon Area Signal Re-timing Project, San Ramon, California:** *Network Designer.* Mr. Chang entered traffic volume peak hour data and set-up the Synchro Traffic Signal Timing model for over 30 intersections in the City of San Ramon, along an important commuter arterial. The project was conducted and managed at our Orange County office. The existing signal system is based upon Wapiti software for Model 170 controllers. This type of system is relatively rare in California. The results of optimization suggest that substantial traffic performance improvements will be attained during implementation.
- **Base Line Road Signal Timing Project, Highland, California:** *Network Designer.* Mr. Chang set-up the Synchro Traffic Signal Timing model for the City of Highland, Caltrans, and a private developer to provide signal re-timing and coordination services for Base Line at SR 30 Freeway ramps and two adjacent City intersections in the City of Highland. The ramp intersections experienced significant AM period congestion prior to study activities. The Synchro program was utilized for development of timing plans. The SimTraffic module of the program showed the dramatic effect of changing phase recall strategies upon congestion at the site.
- **Alhambra Avenue Signal Timing, Martinez, California:** *Network Designer.* Mr. Chang imputed the data and constructed the signal timing model for the study. Alhambra Avenue is an important north/south arterial providing access from the Route 4 Freeway to the traditional downtown and the John Muir Home Historical site. Katz, Okitsu & Associates prepared traffic signal timing for 9 intersections along Alhambra Avenue. Signal Timing plans took in consideration three new signals and revised striping in the project area. The project area also included two state highway on- and off-ramps intersections at the Route 4 Freeway. SYNCHRO software was used as a data manager and for optimization of traffic flows.
- **Perris Boulevard Signal Timing, Moreno Valley, California:** *Network Designer.* Mr. Chang set-up and entered the data for 11 signalized intersections on Perris Boulevard in the City of Moreno Valley.



## Proposal to the City of Culver City Traffic Signal Optimization Effort

The Firm also conducted travel time and delay studies along Perris Boulevard within the study limits before and after the timing activities. Timing plans were prepared for all time periods using Synchro software. After Katz, Okitsu & Associates inputted the timing plans, in close cooperation with the City of Moreno Valley staff, the traffic along Perris Boulevard significantly improved.

### 2.2 – QUALITY CONTROL

Katz, Okitsu & Associates is focused on *continuous improvement*. Consequently, the company has in place a formal Quality Assurance program for all of our engineering and planning projects. To ensure continuity and adherence to budget and schedule, a Project Manager and project team conducts the project from inception to the completion of the final engineering and/or planning documents. There is an ongoing focus to the fundamentals of technical management and design quality: field reviews and data collection, project planning, documentation, reviews, and milestone checkpoints. Formal quality control and ergonomic checklists are employed.

### 2.3 – AVAILABILITY OF PROJECT TEAM

The professionals proposed for this project have been identified first, for their ability to meet anticipated program needs, and second, for their ability to support the project's staffing requirements in a timely and through manner. The very nature of such programs requires that professionals assigned to the project work in a focused manner (100%) on the project at times, while at other times the support they need to provide is somewhat less. Indeed, successfully distributing multiple assignments over each professional in a consulting firm is how we can provide services to our clients on a cost-effective basis.

## Task 3 - Work Plan

### 3.1 – DETAILED WORK PLAN

#### Task 1 – Project Administration

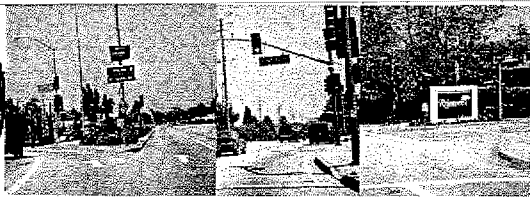
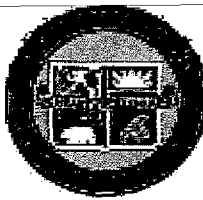
##### 1.1 - Pre-Project Coordination

Katz, Okitsu & Associates will attend a project initiation meeting at the start of the project. At this meeting, the project schedule would be finalized and the proposed approach to the project would be refined closely. We will also obtain information or discuss issues with the City regarding preferences for system signal timing, including signal phase sequence strategies, trade-offs between stops and delay, crossing arterial versus grid coordination, hours of signal coordination, and nighttime intersection operation. Special generators, concerns, or unique traffic patterns will be discussed that may not be apparent from traffic counts.

We understand that the City will provide the following materials at the start of the project:

- Current traffic signal timing charts for all signalized locations listed herein.

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## **Proposal to the City of Culver City Traffic Signal Optimization Effort**

- Conduct a before and after two day peak hour operating time/speed study within the “hourglass” configuration on Sepulveda Blvd. between Slauson Ave. and Sawtelle Blvd. using the floating car methodology.
- Centerline distances between each of the 21 intersections.
- Lane configurations for each of the 21 intersections.
- Vehicular ADT volume counts on all approaches at the designated anchor intersections. Other ADT counts that are on file will be included.
- City staff will install proposed signal timing changes and revisions resulting from fine timing efforts.

### *1.2 - Monthly Progress Reports*

Katz, Okitsu & Associates will provide a monthly progress report on all project activities. The progress will include task status, schedule progress, budget status, and unresolved issues. Review copies of work products, including signal-timing studies will also be included in the submittals. The progress report will be submitted at least two working days prior to any progress meeting.

Katz, Okitsu & Associates will also provide the meeting minutes following each progress meeting. The minutes will be completed and circulated within five (5) working days after each meeting. Email will be used for the progress reports and meeting minutes. We will also utilize Email, where appropriate, to resolve additional issues that may arise at other times.

### *1.3 – Contact Information*

Contact information is as follows: Katz, Okitsu & Associates, 17852 E. Seventeenth Street, Suite 102, Tustin, California 92780-2142, Tel: (714) 573-0317, Fax: (714) 573-9534, Email: [Rmiller@katzokitsu.com](mailto:Rmiller@katzokitsu.com).

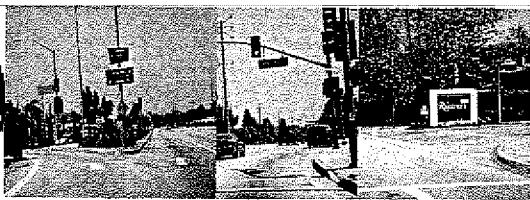
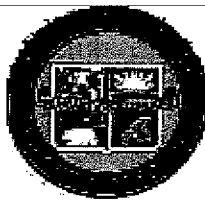
## **Task 2 - Existing Facilities Analysis & Data Collection**

### *2.1 - Crossing or Continuing Arterial Coordination*

Katz, Okitsu & Associates does not ignore existing signal timing plans on cross streets or extensions of study area streets while performing any timing project. Our normal approach is to identify existing crossing or continuing arterial coordination plans, if any, and build new plans around these intersections, where feasible or appropriate.

### *2.2 - Intersection Inventory*

An inventory of intersection physical conditions will be conducted for each location. This will include assessment of intersection configuration, peak hour traffic conditions, existing signal timing and phasing, intersection spacing, prevailing cruise speeds, and other traffic data. All information required to prepare and calibrate the proposed traffic signal timing software will be collected or evaluated from data or field inspections.



## *Proposal to the City of Culver City Traffic Signal Optimization Effort*

If permitted, we will propose to open each traffic signal controller cabinet briefly to inventory phase assignments and directions. This process often determines that signal phasing is not consistent with office records. By identifying proper phasing early, problems associated with implementation can be greatly reduced.

The precision of the traffic network is of critical importance. Lane groups will be established to capture all distinct movements at an intersection. Lane groups will include exclusive left- and right-turn lanes, through movements and shared movements as necessary.

### *2.3 - Traffic and Turning Movement Counts*

The Traffic Solution will provide two-hour traffic turning movement counts for the AM peak, the mid-day peak, and the PM peak for all locations for this project. These counts will be required to conduct traffic signal timing studies. The hour of counts will be 6:30-8:30 am, 11:30 am-1:30 pm, and 4:00 to 6:00 pm on weekdays.

### *2.4 - Speed and Delay Studies*

The City will be responsible for conducting floating car studies of speed and delay. This information is useful in evaluating the effectiveness of signal timing plans.

## **Task 3 - Development of Signal Timing Plans**

### *3.1 - Input Coding*

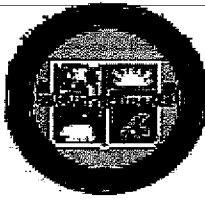
Katz, Okitsu & Associates will prepare Synchro models for all time periods for the study area. The network will be built upon a scale map of the study area. The map will show all arterial highways and signalized intersection locations, at minimum. Data required to operate Synchro will be coded to create model versions of the highway system. This includes geometric information, traffic volumes, and signal timing parameters.

The signal timing model will be calibrated to show existing traffic volumes, existing signal phasing, and existing traffic patterns. The results of the calibration will be carefully compared with existing conditions to insure that the current operation is closely replicated and that all model input parameters are accurate. The SimTraffic module of Synchro will assist in verifying the existing signal operation and roadway geometrics.

### *3.2 - Evaluate Phase Sequences and Strategies*

It is the objective of any traffic signal timing project to maximize green opportunities on major arterial roadways while minimizing delay on cross-street. In order to achieve this objective, Katz, Okitsu & Associates will evaluate existing traffic signal phasing and splits to determine if they optimize intersection and system-wide operations. Alternative signal phasings will be tested as the study evolves and as data suggests.





## ***Proposal to the City of Culver City Traffic Signal Optimization Effort***

Frequently, overall system timing can be improved through changes in existing conditions at selected intersections. This is particularly true when existing signal phasing or channelization results in the need for excessively long signal cycle lengths. Split phased intersections with pedestrian crossings on both legs are typical examples of locations that may dictate system cycle length requirements. Other channelization or signal control improvements at multi-phase intersections may reduce the need for traffic signal capacity for left-turn lanes. Katz, Okitsu & Associates will analyze existing conditions and prepare recommendations for potential minor signalization, timing, or channelization improvements that may be appropriate for implementation in conjunction with this project.

### ***3.3 - Preliminary Timing Plans***

After calibration is completed and pronounced final, Katz, Okitsu & Associates will use the Synchro program to develop optimized timing plans that will minimize overall system delay and also minimize stops along arterial through routes. The model is then fine tuned using the time space diagram editing procedures to insure smooth traffic flow without reducing system performance. The optimization procedure is repeated several times and the performance results are benchmarked. This helps to insure that the final plans are fully optimized, since Synchro often is unable to find a superior plan using its hill-climbing method unless its starting point is compatible for finding the best plan.

Frequently, a recommended timing plan can be prepared without use of alternative signal phasing strategies, such as lead/lag. This is clearly true for networks of two-phase signals and often true for signals at spacings of one-half mile or longer. However for closely spaced intersections (one-quarter mile or less) with left-turn phases, it is often possible to greatly reduce stops by utilizing alternative phasing strategies. We will work to be consistent with local preferences for special phase sequences, since they can generate confusion to some motorists. We will advise the City of situations where lead/lag phasing may be most effective.

The results of the signal timing runs will be discussed with the City for potential implementation. Data will be collected only for weekday AM, off peak, and PM; however, the proposed timing plans may be applicable or additional timing plans will be considered and generated for other study periods, using global adjustments to the collected data. Where system timing plans do not appear to be justified for all hours, isolated actuated operation will be recommended.

### ***3.4 - Final Timing Charts***

Katz, Okitsu & Associates will prepare timing charts showing all information that will be required for data entry and programming of existing signal controllers for system operation. Parameters or timing sheets will be provided in the format desired by the City (LADOT – ATSAC standards). Timing plans will be prepared for the AM Peak, PM Peak, Off-Peak. Suitable plans will also be prepared for weekend periods; however, weekend counts will not be obtained.



# Katz, Okitsu & Associates

Planning and Engineering

July 10, 2006

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92780-2142

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www.katzokitsu.com

Mr. Max Paetzold  
Traffic Engineer Manager  
City of Culver City  
9770 Culver Boulevard  
Culver City, California 90232

**Subject: COST PROPOSAL for Traffic Signal Optimization Effort**

Dear Mr. Paetzold:

Katz, Okitsu & Associates is pleased to present this Cost Proposal for the above-mentioned project. This cost proposal is submitted in conjunction with our technical proposal. It is submitted as a separate document to facilitate the City's evaluation of the proposals.

## Proposed Fee

The fee for the proposed scope of work is \$35,650 as described below: The cost is based upon per intersection price of approximately \$1,700.

### Cost Breakdown by Task

| Tasks / Activities                                | Principal<br>Engineer's<br>Hours | Associate<br>Planner's<br>Hours | Support<br>Personnel<br>hours | KOA<br>Total<br>Hours | Task Costs      |
|---------------------------------------------------|----------------------------------|---------------------------------|-------------------------------|-----------------------|-----------------|
| 1. Project Administration                         | 12                               | 10                              | 0                             | 22                    | \$3,240         |
| 2. Existing Facilities Analysis & Data Collection |                                  |                                 |                               |                       |                 |
| 2.1 Crossing or Continuing Arterial Coord.        | 0                                | 4                               | 42                            | 46                    | \$3,510         |
| 2.2 Intersection Inventory                        | 4                                | 4                               | 42                            | 50                    | \$4,290         |
| 2.3 Traffic & Turning Movement Counts             | 2                                | 2                               | 0                             | 4                     | \$570           |
| 2.4 Speed & Delay Studies                         | 0                                | 2                               | 0                             | 2                     | \$180           |
| 3. Development of Signal Timing Plans             |                                  |                                 |                               |                       |                 |
| 3.1 Input Coding                                  | 2                                | 8                               | 42                            | 52                    | \$4,260         |
| 3.2 Evaluate Phase Sequences & Strategies         | 8                                | 8                               | 0                             | 16                    | \$2,280         |
| 3.3 Preliminary Timing Plans                      | 6                                | 10                              | 0                             | 16                    | \$2,070         |
| 3.4 Final Timing Sheets                           | 10                               | 21                              | 0                             | 31                    | \$3,840         |
| 4. Implementation & Fine Tuning                   | 21                               | 42                              | 0                             | 63                    | \$7,875         |
| 5. Systems Evaluation                             | 6                                | 7                               | 0                             | 13                    | \$1,800         |
| 6. Final Reporting                                | 1                                | 6                               | 0                             | 7                     | \$735           |
| <b>TOTAL HOURS</b>                                | <b>72</b>                        | <b>124</b>                      | <b>126</b>                    | <b>322</b>            |                 |
| Hourly Costs                                      | \$195                            | \$90                            | \$75                          |                       |                 |
| Labor Costs                                       | \$14,040                         | \$11,160                        | \$9,450                       |                       | \$34,650        |
| Expenses                                          |                                  |                                 |                               |                       | \$1,000         |
| <b>TOTAL COSTS</b>                                | <b>\$14,040</b>                  | <b>\$11,160</b>                 | <b>\$9,450</b>                |                       | <b>\$35,650</b> |

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## Katz, Okitsu & Associates

Planning and Engineering

17852 E. Seventeenth St.  
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Tustin, CA  
92780-2142

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Invoices would be submitted monthly, based upon the billing rate for personnel used on the project and direct expenses, including plotting, blueprinting, and freight. Accounts are past due after 30 days. A finance charge of 1.5% per month after invoice date may be assessed on accounts more than 60 days past due.

### Hourly Rates Summary

These billing rates will be in effect for the duration of the contract. Our billing rates are generally based upon direct salaries, a 153.5% overhead, and a 10% profit.

| Classification                              | Rate       |
|---------------------------------------------|------------|
| CEO / President                             | \$205/hour |
| Firm Principal / Vice President             | \$195/hour |
| Senior Transportation Engineer / Designer   | \$155/hour |
| Associate Engineer                          | \$100/hour |
| Associate Designer / Planner                | \$90/hour  |
| Assistant Transportation Engineer / Planner | \$75/hour  |
| Draftsman (ink)                             | \$70/hour  |
| Technician                                  | \$60/hour  |
| Administrative Assistant                    | \$55/hour  |
| Messenger/Intern                            | \$35/hour  |

### General Provisions

Telephone, equipment, and fax are normally included in above hourly costs. Direct expenses including blacklines, blueprints, commercial CAD plotting, subconsultant expense, issuance of specially endorsed insurance certificate, and direct costs, are billed at cost plus 10% unless stated otherwise in the proposal. Printing is approximately \$75/black & white copy (bound study) or \$125/Color copy (bound study). Mileage is charged at the federally allowed rate. Additional public meetings and public hearings (outside the scope of services) will be billed as extra work at the rates above. There is a four-hour minimum for nighttime public hearings. The rates above do not represent expert witness testimony in court or at depositions. Annual adjustments in these fees of approximately 5% will be requested for each 12-month period following authorization. If the governing Agency prefers a constant hourly cost for a multi-year contract, a 10% increase from the fees indicated above will be requested.

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### Exclusions

These exclusions describe the situations that most frequently result in the need for extra work and additional compensation for signal timing studies.

- Attendance at additional meetings, except as specifically indicated in the Scope of Services, is billed up to \$195 per hour for a Firm Principal.

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- Collection of traffic turning movements or their analysis at locations that are not on roadways or specific times noted within the scope of services
- Design or implementation of minor improvements that are recommended by the study to improve traffic signal operation
- Full evaluation of all phase timings, actuated timings, and settings, however Katz, Okitsu & Associates will note or verify pedestrian clearance intervals where they appear to be unsuited to field conditions
- Our fee would exclude any costs paid to the City, Caltrans, utility companies, or any other agency (private or public) for plan checking, construction inspection, utility records, as-built records, or aerial maps.
- Any work requested by Caltrans is excluded.
- Any appropriate service not specifically included within our cost proposal can be negotiated as extra work, on a cost-plus-expenses basis.
- Katz, Okitsu & Associates shall not be held financially responsible for costs of legal delays that relate to our work, except in the case of sole and gross negligence on our part.

Katz, Okitsu & Associates is prepared to proceed with the proposed scope of services upon your authorization. If you have any questions, please contact me at (714) 573-0317. This proposal is valid for 120 days.

Sincerely,

Rock E. Miller, P.E.  
Vice President

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