

**COOPERATIVE AGREEMENT  
FOR FUNDING OPERATIONS OF OPERATION GREEN LIGHT  
TRAFFIC CONTROL SYSTEM**

THIS COOPERATIVE AGREEMENT FOR FUNDING OPERATIONS OF OPERATION GREEN LIGHT TRAFFIC CONTROLS SYSTEM (this "Agreement") is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2014 by and between Mid-America Regional Council (MARC) and the City of \_\_\_\_\_, Kansas, a Constitutionally Chartered Municipal Corporation (City).

**WHEREAS**, the Mid-America Regional Council performed a feasibility study “*Operation Green Light Feasibility Report, June 2000*” (hereafter, the "Feasibility Report"), which created a regional arterial traffic signal coordination system known as “Operation Green Light”, for the Kansas City Urban Area including facilities under the jurisdiction of the Missouri Department of Transportation, the Cities of Gladstone, Independence, Kansas City, Lee’s Summit, Liberty, North Kansas City, Raymore, Raytown in Missouri and the jurisdiction of the Kansas Department of Transportation, the Cities of Bonner Springs, Fairway, Lansing, Leavenworth, Leawood, Lenexa, Merriam, Mission, Mission Woods, Olathe, Overland Park, Prairie Village, Shawnee, Westwood and the Unified Government of Wyandotte County/Kansas City in Kansas (collectively, the Member Agencies); and

**WHEREAS**, the Strategic Plan 2013-2016 established the vision, mission, objectives and goals of the program; and

**WHEREAS**, improvement in traffic operational efficiency, air quality and monetary savings to the Member Agencies and the public can be realized from a consolidated management approach of coordinated traffic signal control along arterial corridors in the roadway systems of each Member Agency; and

**WHEREAS**, the Member Agencies in Kansas are authorized pursuant to the provisions of Section 12-2901 et. seq. of the Kansas Statutes Annotated, and the Member Agencies in Missouri are authorized pursuant to the provisions of Article VI, Section 9 of the Missouri Constitution and Sections 70.210 et. seq. of the Revised Statutes of Missouri to enter into cooperative agreements for the purpose of coordinating traffic signals between and within the Jurisdictional Boundaries of the Member Agencies; and

**WHEREAS**, each Member Agency has agreed to enter into an agreement to fund the cost of operating such a Regional Traffic Control System; and

**NOW, THEREFORE**, in consideration of the covenants and conditions herein set forth, MARC and the City (collectively, the "Parties") mutually agree as follows:

**Sec. 1. STATUTORY AUTHORITY.** Pursuant to the authority set forth in K.S.A. Section 12-2901 et. seq., the parties enter into this Agreement for the funding of the operations of the Regional Traffic Control System, hereinafter defined, for the purpose of coordinating traffic signals within the Jurisdictional Boundaries of the Member Agencies from a regional perspective. Pursuant to such authority, the City will file for recording an executed copy of this Agreement in the appropriate county in the state of Kansas and file a copy with the Kansas

Secretary of State.

**Sec. 2. DEFINITIONS.** As used in this Agreement, and Exhibit 1 through Exhibit 6, attached hereto and incorporated herein, the following words shall have the meanings set forth herein:

*Exhibit 1* – Steering Committee Document

*Exhibit 2* – Scope of Services

*Exhibit 3* – Compensation

*Exhibit 4* – Insurance Requirements

*Exhibit 5* – Ownership Matrix

*Exhibit 6* – Concept of Operations

*Communications Network* – All telecommunication infrastructure between Regional Traffic Management Centers, and Traffic Signal Controllers which are a part of the Regional Traffic Control System.

*Jurisdictional Boundaries* – the geographical boundaries of the governmental entities acting as political subdivisions of the states of Kansas and Missouri.

*Jurisdictional Control Center* – the site or location designated by the Member Agency containing various equipment, computer hardware and computer software capable of controlling and coordinating all Traffic Signal Controllers located within the Jurisdictional Boundaries of the Member Agency.

*Member Agencies* – Agencies that have entered into an agreement with MARC to participate in funding the cost of design, construction and operations of the Regional Traffic Control System.

*Private Firms* – any private firm or firms engaged by MARC to perform or provide any services, directly or indirectly, related to the operations of the Regional Traffic Control System (including, without limitation, design services provided for on-going operations), as more particularly set forth in Exhibit 2, attached hereto and incorporated herein by this reference.

*Regional Traffic Control System* - an array of components including Traffic Signal Controllers, wireless and wireline telecommunications equipment, interface units, computer hardware and software, digital storage media, operator's console, peripherals, and other related devices designed to monitor, control, and coordinate traffic movements at signalized intersections according to a given or developed plan.

*Regional Traffic Management Center* – the site or location designated by the Steering Committee containing various equipment, computer hardware and computer software capable of controlling and coordinating the Regional Traffic Control System. The Regional Traffic Management Center is sometimes referred to herein and in the Exhibits as the "TOC".

*Steering Committee* – that committee created for the purpose of assisting and advising MARC with respect to the plans, specifications, construction, installation and operation of the Regional Traffic Control System and consisting of voting representatives from the Member Agencies. The membership structure and policy are set forth in Exhibit 1, attached hereto and incorporated herein by this reference.

*Traffic Signal Controller* – a complete electrical mechanism responsible for traffic signal control and operation at an individual intersection.

**Sec. 3. RESPONSIBILITIES OF PARTIES.**

(a) MARC. MARC shall perform or cause to be performed the services set forth in Exhibit 2, which is attached hereto and incorporated herein by this reference.

(b) City. In addition to the obligations set forth in this Agreement, City, in its capacity as a Member Agency, shall also perform all the obligations set forth in the document entitled "OGL Concept of Operations: Roles and Responsibilities", which is attached hereto as Exhibit 6 and incorporated herein by this reference. Furthermore, City shall not interfere with MARC's exercise of its obligations under this Agreement, including, but not limited to MARC's deployment of the regional signal timing and on-going operations of the Regional Traffic Control System.

**Sec. 4. SHARE OF COSTS.** Subject to the conditions set forth in this Agreement, the City will pay MARC an amount not to exceed Seventy One Thousand, Six Hundred and 00/100<sup>th</sup> Dollars (\$71,600.00) representing the City's share of the cost for the maintenance and operation of the Regional Traffic Control System, as set forth in Exhibit 3, attached and incorporated herein by this reference. The "Operation Green Light Location/ Ownership Matrix" set forth in Exhibit 5 attached hereto and incorporated into this Agreement, identifies the location and ownership of the software, hardware and other components comprising the Regional Traffic Control System.

**Sec. 5. SHARING INFORMATION.** MARC shall share information related to the maintenance and operation of the Regional Traffic Control System with the City, and the City shall share information with MARC and the Member Agencies necessary for the on-going maintenance and operation of the Regional Traffic Control System.

**Sec. 6. SEVERABILITY.** Should any provision hereof for any reason be deemed or ruled illegal, invalid or unconstitutional by any court of competent jurisdiction, no other provision of this Agreement shall be affected; and this Agreement shall then be construed and enforced as if such illegal or invalid or unconstitutional provision had not been contained herein.

**Sec. 7. AUTONOMY.** No provision of this Agreement shall be constructed to create any type of joint ownership of any property, any partnership or joint venture, or create any other rights or liabilities except as may be otherwise expressly set forth herein.

**Sec. 8. EFFECTIVE DATE.** The effective date of this Agreement shall be upon complete execution by the Parties and written approval by the Office of the Attorney General of Kansas. In accordance with K.S.A. Section 12-2905, after receiving such written approval, the City shall

file for recording a fully executed copy of this Agreement with the Register of Deeds of the appropriate county in the state of Kansas and file a copy with the Kansas Secretary of State.

**Sec. 9. TERMINATION FOR CONVENIENCE.** Either party to this Agreement may terminate this Agreement by giving 180 days' notice to the other Party. Financial obligations will be honored up to the effective date of termination. An agency that terminates this agreement may no longer be granted access to the Regional Traffic Control System. Costs may be incurred by the agency terminating the agreement for MARC to uninstall or transfer ownership of network equipment owned by MARC.

**Sec. 10. MERGER.** This Agreement constitutes the entire agreement between City and MARC with respect to this subject matter.

**Sec. 11. INDEPENDENT CONTRACTOR.** MARC is an independent contractor and is not City's agent. MARC has no authority to take any action or execute any documents on behalf of City.

**Sec. 12. COMPLIANCE WITH LAWS.** MARC shall comply with and shall require its Private Firms to comply with all federal, state and local laws, ordinances and regulations applicable to the work and this Agreement.

**Sec. 13. DEFAULT AND REMEDIES.** If MARC shall be in default or breach of any provision of this Agreement, City may terminate this Agreement, suspend City's performance, withhold payment or invoke any other legal or equitable remedy after giving MARC written notice and opportunity to correct such default or breach within thirty (30) days of receipt of such notice; provided, however, if such default or breach cannot be cured within thirty (30) days, then MARC shall commence to cure within thirty (30) days.

**Sec. 14. WAIVER.** Waiver by City of any term, covenant, or condition hereof shall not operate as a waiver of any subsequent breach of the same or of any other term, covenant or condition. No term, covenant, or condition of this Agreement can be waived except by written consent of City, and forbearance or indulgence by City in any regard whatsoever shall not constitute a waiver of same to be performed by MARC to which the same may apply and, until complete performance by MARC of the term, covenant or condition, City shall be entitled to invoke any remedy available to it under this Agreement or by law despite any such forbearance or indulgence.

**Sec. 15. MODIFICATION.** Unless stated otherwise in this Agreement, no provision of this Agreement may be waived, modified or amended except in writing signed by City and MARC.

**Sec. 16. HEADINGS; CONSTRUCTION OF AGREEMENT.** The headings of each section of this Agreement are for reference only. Unless the context of this Agreement clearly requires otherwise, all terms and words used herein, regardless of the number and gender in which used, shall be construed to include any other number, singular or plural, or any other gender, masculine, feminine or neuter, the same as if such words had been fully and properly written in that number or gender.

**Sec. 17. AUDIT.** The City shall have the right to audit this Agreement and all books, documents and records relating thereto. MARC shall maintain all its books, documents and records relating to this Agreement and any contract during the period of this Agreement and for three (3) years after the date of final payment of the contract or this Agreement, which ever expires last. The books, documents and records shall be made available for the City's review within fifteen (15) business days after the written request is made.

**Sec. 18. AFFIRMATIVE ACTION; NON-DISCRIMINATION.**

(a) MARC shall require Private Firms to establish and maintain for the term of this Agreement an Affirmative Action Program in accordance with the provisions the Title VI of the Civil Rights Act of 1964, as amended. More specifically, any third party firm will comply with the applicable regulations of the U. S. Department of Transportation (USDOT) relative to non-discrimination in federally assisted programs of the USDOT, as contained in 49 CFR 21 through Appendix H and 23 CFR 710.405 which are herein incorporated by reference and made a part of this Agreement.

(b) During the performance of this Agreement or any subcontract resulting thereof, MARC, Private Firms and all subcontractors and vendors (the Private Firms, together with all subcontractors and vendors, shall for purposes of this Section 18 be collectively referred to as the "Other Contractor Parties") shall observe the provisions of the Kansas Acts Against Discrimination (K.S.A. 44-1001, et seq.) and Title VII of the Civil Rights Act of 1964 as amended and shall not discriminate against any person in the performance of work under the present Agreement because of race, religion, color, sex, national origin, age, disability, ancestry, veteran status, or low income. In all solicitations or advertisements for employees, the MARC and the Other Contractor Parties shall include the phrase "equal opportunity employer" or a similar phrase to be approved by the Kansas Human Rights Commission ("Commission"). If MARC fails to comply with the manner in which MARC reports to the Commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, or if MARC is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, MARC shall be deemed to have breached this Agreement, and this Agreement may be canceled, terminated or suspended, in whole or in part, by the City.

(c) MARC shall abide by the Kansas Age Discrimination In Employment Act (K.S.A. 44-1111 et seq.) and the applicable provision of the Americans With Disabilities Act (42 U.S.C. 12101 et seq.), as well as all other federal, state and local laws, ordinances and regulations applicable to this project, and shall furnish any certification required by any federal, state or local laws, ordinances and regulations applicable to this project and shall furnish any certification required by any federal, state or local governmental agency in connection therewith.

(d) MARC shall include the provisions of paragraphs (b) through (c) above in every subcontract so that such provisions will be binding upon such subcontractor or vendor.

**Sec. 19. ASSIGNABILITY OR SUBCONTRACTING.** MARC shall not subcontract, assign or transfer any part or all of MARC's obligations or interests without City's prior approval which shall not be unreasonably delayed or withheld. If MARC shall subcontract, assign, or transfer

any part or all of MARC's interests or obligations under this Agreement without the prior approval of City, it shall constitute a material breach of this Agreement.

**Sec. 20. CONFLICTS OF INTEREST.** MARC shall require its Private Firms to certify that no officer or employee of City, or no spouse of such officer or employee, has or will have a direct or indirect financial or personal interest in this Agreement or any other related agreement, and that no officer or employee of City, or member of such officer's or employee's immediate family, either has negotiated, or has or will have an arrangement, concerning employment to perform services on behalf of MARC or its Private Firms in this Agreement or any other related agreement.

**Sec. 21. RULES OF CONSTRUCTION.** The judicial rule of construction requiring or allowing an instrument to be construed to the detriment of or against the interests of the maker thereof shall not apply to this Agreement.

**Sec. 22. NOTICE:** Any notice to a party in connection with this Agreement shall be made in writing at the following address or such other address, as the party shall designate in writing:

City of Overland Park  
Attention: Director of Public Works  
8500 Santa Fe Drive  
OPKS 66212

MARC  
Attention: Director, Mid-America Regional Council  
600 Broadway, Suite 200  
Kansas City, Missouri 64105

**Sec. 23. GOVERNING LAW.** This Agreement shall be construed and governed in accordance with the law of the State of Kansas. Any action in regard to this Agreement or arising out of its terms and conditions must be instituted and litigated in the courts of the State of Kansas within Johnson County, Kansas, and in no other. The parties submit to the jurisdiction of the courts of the State of Kansas and waive venue.

**Sec. 24. GENERAL INDEMNIFICATION.**

(a) To the extent allowed by law and subject to the immunity and maximum liability provisions of the Kansas Tort Claims Act, MARC shall defend, indemnify, and hold harmless the City and any of its agents, officials, officers and employees from and against all claims, damages, liability, losses, costs and expenses, including reasonable attorney fees, arising out of or resulting from any negligent acts or omissions in connection with the services performed by MARC under this Agreement, caused by MARC, its employees, agents, subcontractors, or caused by others for whom MARC is liable. Notwithstanding the foregoing, MARC is not required under this section to indemnify the City for the negligent acts of the City or any of its agencies, officials, officers, or employees.

(b) To the extent allowed by law and subject to the provisions of the Kansas Tort Claims Act, including but not limited to the immunity and maximum liability provisions, City

shall defend, indemnify, and hold harmless MARC and any of its agents, officials, officers and employees from and against all claims, damages, liability, losses, costs and expenses, including reasonable attorney fees, arising out of or resulting from any negligent acts or omissions of the City, its employees, agents, subcontractors, or others for whom the City is liable in connection with the services performed by City under this Agreement. Notwithstanding the foregoing, the City is not required under this section to indemnify MARC for the negligent acts of MARC or any of its agencies, officials, officers, or employees

**Sec. 25. INDEMNIFICATION BY PRIVATE FIRMS.** MARC shall require its Private Firms (including, without limitation, any design professionals) to defend, indemnify, and hold harmless the City and any of its agencies, officials, officers, or employees from and against all claims, damages, liability, losses, costs, and expenses, including reasonable attorney fees, arising out of any negligent acts or omissions in connection with the services performed pursuant to this Agreement (including, without limitation, professional negligence), caused by a Private Firm, its employees, agents, contractors, or caused by others for whom the Private Firm is liable. Notwithstanding the foregoing, the Private Firm is not required under this section to indemnify the City for the negligent acts of the City or any of its agencies, officials, officers, or employees.

**Sec. 26. INSURANCE.** MARC and any Private Firms retained by MARC shall maintain the types and amounts of insurance set forth in Exhibit 4, which is incorporated herein by this reference; provided, however, the limits set forth in Exhibit 4 are the minimum limits and MARC may carry higher limits as it may deem necessary, in its discretion, or as may be required by other Member Agencies.

**Sec. 27 INITIAL TERM; RENEWAL OF TERM.** The initial term of this Agreement shall be two (2) years ("Term") unless sooner terminated in accordance with Section 9 of this Agreement. The Term of this Agreement shall automatically renew for one additional two (2) year period (the "Renewal Term") on the same terms and conditions as set forth herein; provided, the Term shall not automatically renew if City provides written notice to MARC of its intention not to renew within 180 days prior to the expiration of the Term.

**Sec. 28. NON-APPROPRIATIONS.** Notwithstanding anything to the contrary in this Agreement, in accordance with the Kansas Cash-Basis Law, specifically K.S.A. Section 10-1116b, the City is obligated only to pay the OGL Operating Costs required under this Agreement as may lawfully be made from (a) funds budgeted and appropriated for that purpose during the City's current budget year, calendar fiscal year, or (b) funds made available from any lawfully operated revenue-producing source. City represents and warrants that each year during the term of this Agreement, its chief administration office will submit to and advocate for approval by its governing body a budget that includes amounts sufficient to pay the City's share of the OGL Operating Costs required under this Agreement. City also represents and warrants that its governing body, each fiscal year during the term of this Agreement, will fully consider and make all good faith and reasonable efforts to adopt a budget, for each successive fiscal period during the term of this Agreement, that specifically identifies amounts sufficient to permit City to discharge all of its obligations under this Agreement.

**IN WITNESS WHEREOF**, each party hereto has executed this Agreement on the day and year herein written.

**MID-AMERICA REGIONAL COUNCIL**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**ACKNOWLEDGMENT**

STATE OF MISSOURI     )  
  ) ss  
COUNTY OF JACKSON    )

On this \_\_\_\_ day of \_\_\_\_\_, 2014, before me, the undersigned, a Notary Public, appeared \_\_\_\_\_, to me personally known, or proved to me on the basis of satisfactory evidence, who, being by me duly sworn, did say that he is the Executive Director of Mid-America Regional Council (MARC) and that this foregoing instrument was signed and sealed on behalf of MARC by authority of its Board, and said officer acknowledged said instrument to be executed for the purposes therein stated and as the free act and deed of MARC.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.

\_\_\_\_\_  
Printed Name \_\_\_\_\_  
Notary Public - State of Missouri  
Commissioned in Jackson County

My commission expires:  
\_\_\_\_\_



**CITY OF \_\_\_\_\_, KANSAS**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Attest:

\_\_\_\_\_  
**City Clerk**

Approved pursuant to K.S.A. §12-2904(g):

\_\_\_\_\_  
**Office of the Attorney General of Kansas**

**ACKNOWLEDGMENT**

STATE OF KANSAS                    )  
  ) ss  
COUNTY OF \_\_\_\_\_)

On this \_\_\_\_\_ day of \_\_\_\_\_, 2014, before me, the undersigned, a Notary Public, appeared \_\_\_\_\_, to me personally known, or proved to me on the basis of satisfactory evidence, who, being by me duly sworn, did say that he is the \_\_\_\_\_ of the City of \_\_\_\_\_, Kansas, and that the foregoing instrument was signed and sealed on behalf of the City of \_\_\_\_\_, Kansas, and said officer acknowledged said instrument to be executed for the purposes therein stated and as the free act and deed of said City.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.

\_\_\_\_\_  
Printed Name \_\_\_\_\_  
Notary Public - State of Kansas  
Commissioned in \_\_\_\_\_ County

My commission expires:

## EXHIBIT 1

### OPERATION GREEN LIGHT COMMITTEE

#### Role, Responsibility, and Organizational Structure

- 1.1.1 *Responsibilities: The Operation Green Light Steering Committee shall serve to approve budgets, procurement and staffing recommendations to the Mid-America Regional Council Board of Directors and to make other technical and policy decisions concerning the development, deployment and operation of the Operation Green Light regional traffic signal coordination program, including:* approve the program's upcoming annual budget during the final meeting of the calendar year. Purchases and contracts shall follow MARC's established threshold guidelines as well as the following: amounts of \$15,000-\$25,000 shall be reported to the committee; amounts of \$25,001 or more shall be voted on and approved by the Steering Committee before purchase or contract is sent to MARC's Board of Directors for approval.
- 1.1.2 Participate in program decision-making at key points by reviewing and providing comments on project deliverables and by approving or rejecting technical and policy recommendations;
- 1.1.3 Participate in the development of inter-jurisdictional agreements for the construction, operation, maintenance and other activities of the regional traffic signal coordination system; and
- 1.2 Call upon committee members to participate in Task Force work groups as technical issues arise requiring additional effort than time allows during a Steering Committee meeting. The Task Force shall submit to the Steering Committee recommendations based on its discussions.
- 1.3 Membership and Meetings: The Steering Committee shall be composed of representatives from participating agencies in the following manner:

(The following table is a current list as of September 2014.)

<b>Participating Agency</b> Non-Funding Agency in Bold	<b>Membership</b> <b>(voting)</b>
Bonner Springs	1
Fairway	1
FHWA – MO & KS	Ex Officio
Gladstone	1
Independence	1
Kansas City, MO	1
<b>KCScout</b>	Ex Officio
KDOT	1
Lansing	1
Leavenworth	1
Leawood	1
Lee's Summit	1
Lenexa	1
Liberty	1
MARC	1
Merriam	1
Mission	1
Mission Woods	1
MoDOT	1
North Kansas City	1
Olathe	1

Overland Park	1
Prairie Village	1
Raymore	1
Raytown	1
Shawnee	1
Unified Government/KCK	1
Westwood	1

Each representative shall have a designated alternate with full authority to act in the absence of the representative. The Steering Committee may be expanded to include other additional members as approved by majority vote of the members of the existing Steering Committee.

The Steering Committee shall meet minimally on a quarterly basis but may meet more frequently if the business of the Steering Committee necessitates. The final meeting of the calendar year shall be designed to report on the State of the Operation Green Light Program including Budget reporting and approval of the future budget and election of the next vice-chairperson.

The chairperson of the Steering Committee shall have the authority to call a meeting of the Committee with a minimum of seven (7) calendar days' notice to all the members. Notice is deemed to have occurred from the date that it is deposited with the United States Postal Service, postage prepaid; distributed via Facsimile; OR distributed via E-mail addressed to the members of the Steering Committee. The chairperson and vice-chairperson shall help develop meeting agendas prior to meeting notices and shall preside over the meetings.

1.4 Chairperson and Vice-Chairperson: The Steering Committee members shall elect by majority vote of all of the voting members of the Committee, from amongst the members of the Committee, a vice-chairperson who will serve a one-year term. Said election will occur at the final regularly scheduled meeting of the calendar year of the Steering Committee prior to the expiration of the chairperson's one-year term. The vice-chairperson shall assume the responsibilities of the chairperson at the end of the chairperson's term and any time the chairperson is unable to attend committee meetings. Kansas and Missouri shall be represented in these positions in alternating years.

1.5 Quorum and Voting: All members of the Steering Committee shall be entitled to one vote on all matters submitted to the Committee for vote.

Any **six** of the voting members of the Steering Committee, including at least **one** member from Kansas City, Missouri, the Missouri Department of Transportation, Unified Government/Kansas City, Kansas, or Overland Park, Kansas, (based on the four largest agencies by signal count at the beginning of the current Operations contract term) shall constitute the quorum necessary to convene the meeting of the Committee. All official actions by the Steering Committee shall require a majority vote of the members present at the meeting.

All votes shall be taken and recorded in the minutes by roll call. Each member shall have the ability to recall any matter voted upon during his or her absence providing said member notifies in writing the committee chairperson or co-chairperson within 7 calendar days of when the meeting minutes are posted to the MARC website and/or delivered to committee members via email. Within 3 business days of being notified, the chairperson or co-chairperson shall collaborate with OGL staff to present the issue for a reconsideration of the vote via email to all committee members who will be asked to respond within 10 calendar days. If a response is not received by close of business on the 10th day, the member's previously cast vote shall be counted in the same manner.

## **EXHIBIT 2**

### **SCOPE OF WORK**

#### **1. Project Management**

The Mid-America Regional Council (MARC) will provide staff time, equipment and materials, and contract services necessary to accomplish the following project management services:

- Arrange and conduct regular Steering Committee meetings to discuss and develop policies and procedures governing the development, implementation and on-going operation of the program;
- Arrange and conduct Technical Committee meetings as needed to discuss and develop recommendations concerning technical issues associated with the development, implementation and on-going operation of the project;
- Arrange and conduct other meetings with project participants as necessary to develop, implement and operate the project;
- Negotiate, execute and administer agreements with state and local governments to provide federal, state and local funding for the development, implementation and ongoing operation of the program;
- Develop and publish requests for proposals, consultant agreements and other procurement documents necessary to select and hire contractors to provide system integration services, telecommunications and traffic engineering design services, computer software, computer hardware, communications network, traffic signal equipment and other items necessary for the development, implementation and ongoing operation of the program;
- Negotiate, execute and administer agreements with private firms to provide system integration services, telecommunications and traffic engineering design services, computer software, computer hardware, communications network, traffic signal equipment and other items necessary for the development, implementation and ongoing operation of the program;
- Develop and maintain project budgets and schedules;
- Develop and maintain project databases;
- Publish and distribute project documents and other deliverables to participating state and local governments; and
- Perform other tasks necessary to manage and administer the program.

#### **2. Traffic Signal Timing**

MARC shall coordinate with agency staff or their delegates to develop and implement, with agency approval, the requisite signal timing plans for OGL intersections

### **3. Operations and Maintenance**

#### ***3.1. Computer Software and Databases***

MARC will procure all required software and may engage a private firm or firms selected by the project Steering Committee to provide technical support and maintain computer software and databases at the Operation Green Light Traffic Operations Center. MARC staff shall be responsible for providing day-to-day maintenance of the computer software and databases including but not limited to data entry, backups, upgrades, etc., at the Operation Green Light Traffic Operations Center.

#### ***3.2. Computer Network***

MARC will procure all required hardware and software. Any equipment (e.g. switches, routers, hubs, etc.) that is used for the field communication back bone will be considered part of the computer network. MARC may engage a private firm or firms selected by the Steering Committee to provide technical support and maintain the Operation Green Light computer network.

#### ***3.3. Field Communications System***

All field communications equipment purchased by MARC will be maintained by MARC. The city will maintain any pre-existing, city-owned equipment that is utilized as part of the OGL field communication system. MARC staff will monitor the field communication system through monitoring software which is purchased by MARC. MARC may engage a private firm or firms selected by the project Steering Committee to maintain the regional field communications system. The scope of services for this work will be developed with and approved by the Steering Committee.

#### ***3.4. Traffic Signal Controllers***

Each member agency shall be responsible for all maintenance to the traffic signal controllers. MARC responsibility will be limited to maintaining the regional field communication system and will terminate at the traffic controller unless otherwise specified. Traffic signal controllers and cabinets that have been purchased and/or installed as part of the OGL controller upgrade project will also be owned and maintained by the local jurisdiction once they have been received and/or accepted, and the local jurisdiction will be responsible for purchasing and installing replacement controllers that are compatible with the OGL system should the MARC-purchased controller fail.

**EXHIBIT 3**  
**COMPENSATION**

- A. The amount the City will pay MARC under this contract will not exceed **Seventy-One Thousand, Six Hundred and 00/100 Dollars (\$71,600.00)**. This amount represents the City share of the total project cost as shown in Table 1 of this Exhibit. City shall pay MARC, upon invoice, for the actual costs incurred for MARC on a yearly basis.

<b>Table 1</b>			
<b>Operation Green Light Program</b>			
<b>Annual Operations Costs</b>			
Annual Operating Cost per Signal			\$1,600
Total Agency Signals in OGL			44.75
Total Agency Unsubsidized Annual cost			\$71,600.00
<b>Cost per Year Subsidized</b>			
Year	Federal Percentage	Annual Cost	Local Agency Cost
2015	50%	\$71,600.00	\$35,800.00
2016	50%	\$71,600.00	\$35,800.00
<b>Total</b>			<b>\$71,600.00</b>

- B. It shall be a condition precedent to payment of any invoice from MARC that MARC is in compliance with, and not in breach or default of, all terms, covenants and conditions of this Contract. If damages are sustained by City as a result of breach or default by MARC, City may withhold payment(s) to MARC for the purpose of set off until such time as the exact amount of damages due City from MARC may be determined.
- C. No request for payment will be processed unless the request is in proper form, correctly computed, and is approved as payable under the terms of this Contract.
- D. City is not liable for any obligation incurred by MARC except as approved under the provisions of this Contract.

## Exhibit 4

### INSURANCE REQUIREMENTS

A. MARC shall procure and maintain and shall cause any Private Firm it engages to perform services under this Agreement to procure and maintain in effect throughout the duration of this Agreement, and for a period of two (2) years thereafter, insurance coverage not less than the types and amounts specified below. In the event that additional insurance, not specified herein, is required by the City during the term of this Agreement, MARC shall obtain and shall cause the Private Firms to obtain such additional insurance; provided, however, the cost of the additional insurance shall be paid by the City. MARC shall not accept insurance policies from any Private Firm containing a Self-Insured Retention.

1. **Commercial General Liability Insurance:** with limits of \$500,000 per occurrence and \$2,000,000 aggregate, written on an “occurrence” basis. The policy shall be written or endorsed to include the following provisions:

- a. Severability of Interests Coverage applying to Additional Insureds
- b. Contractual Liability
- c. Per Project Aggregate Liability Limit or, where not available, the aggregate limit shall be \$2,000,000
- d. No Contractual Liability Limitation Endorsement
- e. Additional Insured Endorsement, ISO form CG20 10, current edition, or its equivalent

2. **Workers’ Compensation Insurance:** as required by statute, including Employers Liability with limits of:

Workers Compensation Statutory  
Employers Liability  
\$100,000 accident with limits of:  
\$500,000 disease-policy limit  
\$100,000 disease-each employee

3. **Commercial Automobile Liability Insurance:** with \$100,000 per claim up to \$2,000,000 per occurrence, covering owned, hired, and non-owned automobiles. Coverage provided shall be on an “any auto” basis and written on an “occurrence” basis. The insurance will be written on a Commercial Business Auto form, or an acceptable equivalent, and will protect against claims arising out of the operation of motor vehicles, as to acts done in connection with the Agreement, by Design Professional.

4. **Professional Liability Insurance (only applicable for Private Firms that are design professionals or other types of professionals that can carry professional liability insurance):** with limits Per Claim/Annual Aggregate according to the following schedule:

<u>Professional Liability Minimum</u>	<u>Fee Minimum Limits</u>
Less than \$25,000	\$100,000
\$25,000 or more, but less than \$50,000	\$500,000
\$50,000 or more	\$1,000,000

B. The policies listed above may not be canceled until after thirty (30) days written notice of cancellation to MARC and the City, ten (10) days in the event of nonpayment of premium. The Commercial General and Automobile Liability Insurance specified above shall provide that MARC and the City and their agencies, officials, officers, and employees, while acting within the scope of their authority, will be named as additional insureds for the services performed under this Agreement. Private Firms engaged by MARC shall provide to MARC and the City at execution of this Agreement a certificate of insurance showing all required endorsements and additional insureds.

C. All insurance coverage must be written by companies that have an A.M. Best’s rating of “B+V” or better, and are licensed or approved by the State of Kansas to do business in Kansas and by the State of Missouri to do business in Missouri.

D. Regardless of any approval by MARC or the City, it is the responsibility of the Private Firms to maintain the required insurance coverage in force at all times; its failure to do so will not relieve it of any contractual obligation or responsibility. In the event of a Private Firm’s failure to maintain the required insurance in effect, MARC may order the Private Firm to immediately stop work, and upon ten (10) days notice and an opportunity to cure, may pursue its remedies for breach of this Agreement as provided for herein and by law.

**EXHIBIT 5**

**Operation Green Light Location / Ownership Matrix**

<b>Component</b>	<b>Location</b>	<b>Purchased By</b>	<b>Owned By</b>	<b>Maintained By</b>	<b>Comments</b>
<b>Software/Firmware</b>					
TransSuite & Associated Software	OGL TOC	MARC	MARC	MARC*	
Genetec Video System	OGL TOC	MARC	MARC	MARC*	Available for use by local agencies
Other software used by MARC staff	OGL TOC	MARC	MARC	MARC*	
<b>Computer Hardware</b>					
OGL TOC Servers	OGL TOC	MARC	MARC	MARC*	
OGL TOC Workstations	OGL TOC	MARC	MARC	MARC*	
Agency TOC Servers	Local Agency	Local Agency	Local Agency	Local Agency	
Agency TOC Workstations	Local Agency	Local Agency	Local Agency	Local Agency	
<b>Field Hardware</b>					
OGL Field Network Equipment	Field	MARC	MARC	MARC*	
Local Agency Field Network Equipment	Field	Local Agency	Local Agency	Local Agency	Extention of City network
Existing Closed-Loop fiber re-tasked to OGL Network	Field	Local Agency	Local Agency	Local Agency	OGL owns switches to manage
Traffic Signal Controllers	Field	MARC/Local Agency	Local Agency	Local Agency	OGL purchased controllers only for original build-out
OGL-purchased Closed Circuit Camera	Field	MARC	Local Agency	Local Agency	
<b>Miscellaneous</b>					
OGL TOC Office	MoDOT KC District	MoDOT	MoDOT	MoDOT	
OGL TOC Phone System	OGL TOC	MoDOT	MoDOT	MoDOT	
OGL TOC Office Furniture & Equipment	OGL TOC	MARC	MARC	MARC*	
OGL Vehicles & Mobile Equipment	OGL TOC	MARC	MARC	MARC*	

\* MARC maintained components to be maintained by joint-funded agreement



## **Exhibit 6**

# **OGL Concept of Operations: Roles and Responsibilities**

### **Introduction**

Operation Green Light (OGL) is a regional initiative to improve traffic flow and reduce vehicle emissions by coordinating traffic signals on major roadways in the Kansas City metropolitan area. OGL is a cooperative effort of the Mid-America Regional Council (MARC), state departments of transportation and local agencies working together to coordinate traffic signal timing plans and communication between traffic signal equipment across jurisdictional boundaries.

The concept of operations provides a high-level overview of the roles and responsibilities of the agencies participating in the operation and management of OGL. The concept of operations is intended to balance the need for standardization and uniformity of operations on OGL routes with the need to be responsive to the unique needs and circumstances of the agencies participating in OGL.

### **Signal Timing**

#### **Initial Deployment of Regional Timing Plans**

The member agencies will partner with MARC and each other in developing regional traffic signal timing plans. In order to facilitate this work each member agency will provide MARC traffic counts and other relevant, available data for traffic signals that are part of regionally significant traffic corridors that pass through adjacent cities. This information may include;

- Existing timing plans and data in the existing traffic controller (controller data sheets)
- Intersection geometry via aerial mapping
- Signal phasing information (or policy)
- Historical traffic count information available
- Approved yellow and all-red clearance intervals (or policy)
- Pedestrian timing (or policy)
- Signal phasing policy (lead only/lead-lag/vary lead-lag by time-of-day)
- Historical citizen complaints on the intersection operation as needed

After providing data to MARC, each member agency will then work with MARC to cooperatively develop regionally optimized timing plans. The member agency will continue to be responsible for maintenance of timing plans for traffic signals that lie wholly within the member agency's jurisdictional boundaries and are not on OGL corridors unless the member agency decides to contract this work to MARC. The steps involved in the development of regional timing plans are:

- The member agency will either collect traffic counts on the arterials for signals maintained by the member agency and provide this information to MARC OR will contract with MARC to collect traffic counts as needed.
- In conjunction with member agency staff, MARC will conduct travel-time studies and speed profile studies on the arterial prior to implementation of the timing plans
- MARC may hold design meetings with representatives from the member agencies and other impacted agencies. At the first of these meetings the following items will be established
  - Number of timing plans and time of use (i.e., am, noon, pm, off-peaks, etc.)
  - Critical intersections of a corridor
  - An initial common corridor cycle length for each of the plans identified (i.e. am,

pm, etc.) [Note: this cycle length may need to be revisited after developing the regional timing plan.]

- The member agency will then develop the following initial parameters for individual signals maintained by the member agency for each of the timing plans to be developed, and submit them to MARC for review and incorporation into regional plans for the OGL corridor;
  - phase sequencing
  - splits
  - offsets
- MARC will develop initial splits and offsets for any remaining signals and incorporate member agency developed timing plans into regional plans for the OGL corridor.
- MARC may then incorporate the regional plans into mutually agreed upon software as needed for review by the member agencies.
- At the second meeting, MARC and the member agencies will;
  - Review the regional timing plans developed
  - Review any software models developed
  - Determine if any changes to initial timings need to be made to optimize the operation of the corridor
- Once the member agencies have agreed on the different timing plans developed, they will download the timing plans into signal controllers maintained by each member agency OR will request MARC to provide signal timing plans and download to local controllers.
- In conjunction with member agency staff, MARC will field-monitor each arterial after a timing plan has been downloaded and will work with the member agency to make any additional changes to further optimize the flow of traffic if necessary.
- In conjunction with member agency staff, MARC will conduct travel-time and speed profile studies on arterials after implementation of the optimized signal timing plans

### **Providing Maintenance Timing Plans**

As part of a regional effort, MARC will on a regular basis, or as requested, examine the operations of signals that are part of regionally significant traffic corridors that pass through the member agency and adjacent cities and determine if optimization is necessary. If minor changes to splits and offsets are to be made to individual signals along an OGL corridor the following steps will be followed:

- In conjunction with MARC, member agency staff will field-monitor the affected corridor or intersection(s)
- MARC will meet with affected member agencies if needed
- MARC will collect traffic counts as necessary OR the member agency will collect traffic counts at member agency maintained traffic signals
- The member agency will develop timing plans for member agency maintained signals and download them to controllers as necessary in coordination with MARC OR MARC will develop and provide revised arterial timing plans as needed
- In conjunction with member agency staff, MARC will field-monitor each arterial after timing plan download and provide further optimization if necessary by submitting updated timing plans for agency consideration and download

If major changes, such as changes to cycle lengths, phase sequencing and major changes to splits, are to be made along an OGL corridor, the process described above for initial deployment of regional timing plans may be used.

### **Incident Management**

The member agency will work with MARC and other member agencies to identify locations along the regionally significant arterials and interstate highways where incidents are prone to happen and have major impact on traffic flow. These locations may be manually forced to run special plans when an incident is observed at the TOC. The following steps shall be followed for planned, recurring, and anticipated incident response:

- MARC and member agencies will identify incident-prone locations
- MARC will meet with affected member agencies to discuss solutions
- MARC will develop signal timing plans for the incident
- MARC will submit such plans for review by member agencies
- MARC and member agencies will jointly determine the parameters required for invoking such a plan by the TOC
- Once the plan has been invoked (when the required parameters are met) MARC will inform the affected agencies immediately
- After the incident has been cleared, MARC will put signals back on their regular plans and inform member agencies

The member agency will inform MARC about construction and roadway closures and may request signal timing plan adjustments. MARC will provide special timing plans when requested to optimize traffic flow for agency consideration and download.

### **Citizen Complaints**

Member agencies will route/report citizen complaints/requests on OGL signals to the TOC and MARC, in cooperation with the member agency, will respond to the complaint/request in a timely manner. MARC will also route/report received citizen complaints to the member agencies and maintain a response log.

### **Dispute Resolution**

In the event that satisfactory agreement cannot be reached between member agencies on timing plans or incident plans developed for OGL, the dispute will be referred to the OGL Steering Committee, which will provide recommendations for resolution. Unless the responsible engineer for a member agency determines that such plans will create an unsafe condition within their jurisdiction, the member agency will implement the plans recommended by the Committee

### **Emergency Provisions**

In the event of an emergency not already covered under a pre-arranged incident-management plan, the member agency will take any steps it considers necessary to manage traffic signals within its jurisdiction to ensure the safety of the traveling public. The member agency will notify MARC of any emergency changes made to OGL traffic signal timing plans in a timely manner and will work expeditiously with MARC to restore all OGL corridors within its jurisdiction to normal operation when the emergency subsides.

### **Field Communication Operation and Maintenance**

MARC will be responsible for maintenance and replacement of all wireless communication infrastructure that is installed as a result of OGL initiated construction projects. Member agencies that have the capability to maintain their own communication infrastructure may do by separate agreement with MARC.

### **Controller Upgrades and Work inside the Traffic Controller Cabinet**

MARC will, with the applicable member agencies, upgrade traffic controllers that are incapable of communicating with the central system software. When work is performed that involves the opening of a traffic controller cabinet, the member agency will coordinate with the contractor and have a representative in the field. The member agency will test and approve/disapprove the work performed by the contractor and inform MARC of the fact. MARC will be responsible for administration and final approval of all OGL initiated construction projects. Member agencies are responsible for notifying and coordinating with OGL when undertaking traffic signal system construction projects on OGL corridors.

### **Technical Support for OGL Computer Network**

MARC will provide technical support for the central system software and the laptop version of the central system software. MARC will also maintain the computer network hardware along with all network components such as network switches, routers, licensed and unlicensed radios, modems etc.

### **The Traffic Operations Center**

MARC will staff OGL operations at the Traffic Operations Center (TOC). The TOC is currently co-located with the KC Scout program and offices in the MoDOT KC District offices.

The TOC will be staffed as determined by MARC. MARC expects to coordinate with Kansas City Scout and use the video monitoring capabilities available at the KC Scout TOC to alleviate congestion along arterials. It is recommended that member agencies with traffic management centers, at a minimum, staff their centers to operate on a schedule concurrent with OGL.

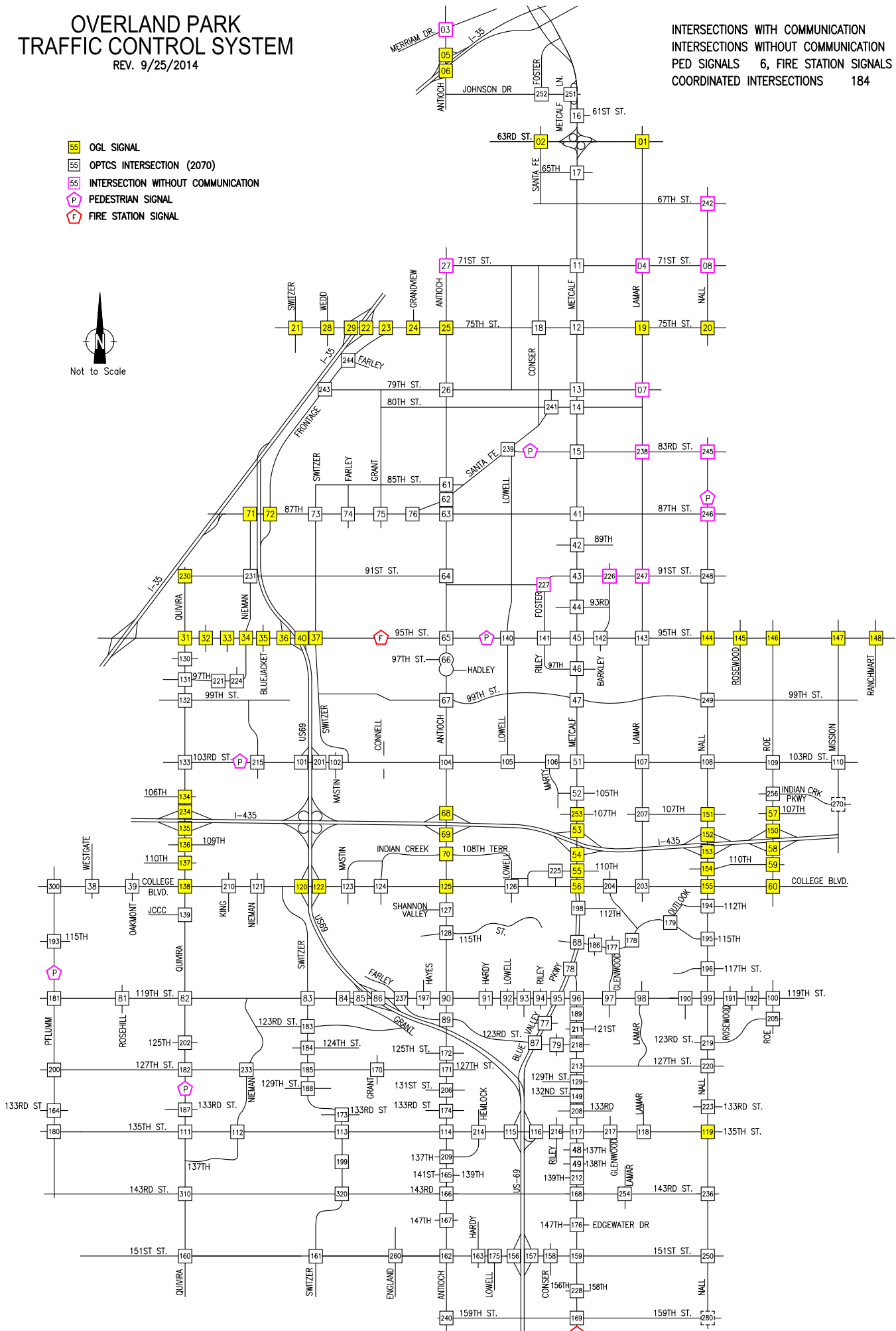
The staff will interact with citizens and the media and provide answers to traffic signal timing questions on OGL signals.

# OVERLAND PARK TRAFFIC CONTROL SYSTEM

REV. 9/25/2014

INTERSECTIONS WITH COMMUNICATION 234  
 INTERSECTIONS WITHOUT COMMUNICATION 12  
 PED SIGNALS 6, FIRE STATION SIGNALS 2  
 COORDINATED INTERSECTIONS 184

- 55 OGL SIGNAL
- 55 OPTCS INTERSECTION (2070)
- 55 INTERSECTION WITHOUT COMMUNICATION
- P PEDESTRIAN SIGNAL
- F FIRE STATION SIGNAL



## 2015-2016 Operation Green Light Fact Sheet – City of Overland Park

<http://marc.org/Transportation/Commuting>

### Regional Impacts

**Project Scope:** Coordinate the operation of nearly 700 intersections on high-volume, inter-jurisdictional arterial roadways in 24 cities throughout the Kansas City region. Provide and maintain real-time data communications with each intersection. Review and update timing plans at all intersections at least once every three years, or as needed. Coordinate operations of traffic signal system with Kansas City Scout freeway management system for traffic incident management.

### Regional Benefits:

- Improved regional traffic flow through reductions in unnecessary traffic signal delay
- Improved air quality through reductions in emissions due to excess signal delay

### Cost:

- Total annual operating costs estimated at \$1.1 million
- Federal Funds to subsidize 50% of operating costs through 2016

### Local Impacts

**Project Scope:** Coordinate the real-time operation of approximately 45 traffic signals in the City of Overland Park. These signals are currently on some of the most heavily traveled streets in the City of Overland Park including 135<sup>th</sup> Street, Shawnee Mission Parkway and near major freeway interchanges.

### Benefits to local agency:

- MARC will review and adjust timing plans on these corridors for the City of Overland Park at least every three years or as needed to ensure coordinated traffic flow on these corridors and efficient operation in general
- MARC will monitor operation of these intersections to ensure efficient service of traffic
- Serve as an extension of city staff to assist with signal timing issues
- MARC will maintain reliable communications to these signals to allow quick response to problems
- City will gain access to the regional license for TransSuite Advanced Traffic Management System software for local use on other intersections if desired
- Citizens will experience improved traffic flow and air quality on regional arterial routes

### Cost:

- \$71,600 per year unsubsidized, \$35,800 subsidized total (for a one year period)

### Basic Terms of Agreement:

- Identifies roles, responsibilities and costs for operations and maintenance of OGL
- Two year term beginning January 2015, renewable for one additional two-year period



## Operation Green Light Traffic Signal Coordination Summary Report 75th St - Lamar to Mission

### Introduction

Operation Green Light is a regional effort to improve traffic flow and reduce fuel consumption and vehicle emissions. Managed by the Mid-America Regional Council (MARC), Operation Green Light works with federal, state and local agencies to develop and implement a system that will coordinate traffic signal timing plans and communication between traffic signal equipment across jurisdictional boundaries.

### Corridor Activities

Through Operation Green Light new coordination plans were developed for 75th St from Lamar Ave to Mission Rd. The new plans were installed on the street in November and December of 2011 and they were evaluated for their effectiveness with before and after studies. See Figure 1 on the back of this report for a map of the study area. This corridor has an average daily traffic of approximately 19,000 vehicles.

### Results

The results for individual drivers will vary by origin and destination, time of day and direction, as well as other factors outside the scope of traffic signal timing. Table 1 below is a summary of the results.

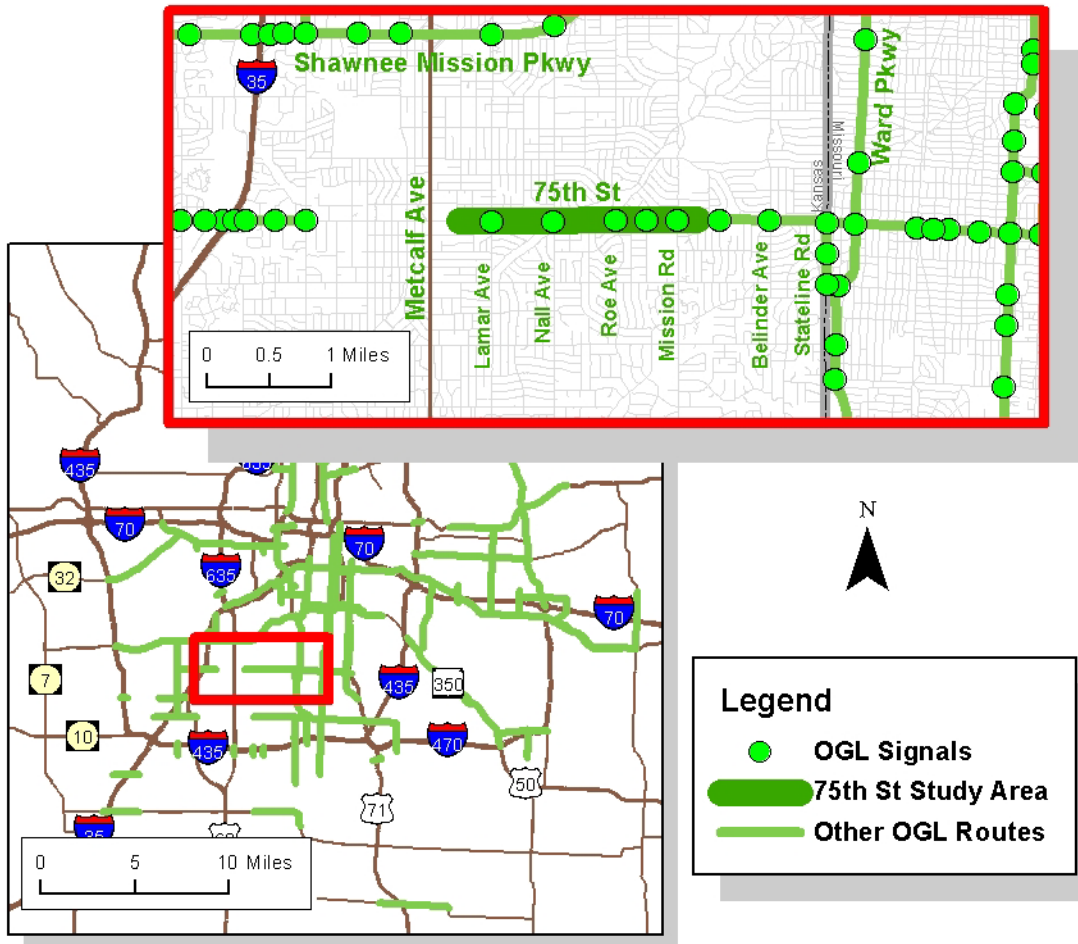
**Table 1. Summary of results for 75th St Project**

Improvement during morning, noon, and evening peak periods: (for drivers traveling the entire length of the corridor)				Approximate daily savings: (net change for all drivers impacted by the plans)	
Morning	Noon	Evening		Daily	
65.0%	79.4%	46.1%	less travel delay from signals	9	hours saved in travel time
66.8%	78.5%	56.8%	fewer stops	9700	fewer stops
13.3%	16.0%	14.4%	less fuel consumed	36	gallons of fuel saved
17.1%	24.4%	21.9%	fewer hydrocarbons emitted	7.4	kg less hydrocarbons emitted
11.1%	14.7%	17.7%	less carbon monoxide emitted	34.1	kg less carbon monoxide emitted
15.4%	28.6%	29.1%	less nitrous oxide emitted	7.7	kg less nitrous oxide emitted
<b>Approximate economic savings from reduced travel time and fuel consumption:</b>				<b>Per Day</b>	<b>Per Year</b>
				<b>\$255</b>	<b>\$63,800</b>

### Benefit to Cost Ratio

The continued operations of the OGL system will cost approximately \$1800 per signal per year. Thus the cost of keeping the 75th St corridor a part of OGL is \$9,000 per year for the five signals updated. Therefore the benefit to cost ratio for this re-timing project is **7.1 to 1**.

Figure 1. Map of the 75th St study area.



For more information and a more detailed report of this coordination project, please see:  
[www.marc.org/transportation/ogl](http://www.marc.org/transportation/ogl)



PUBLIC AGENCIES UNITED FOR A SEAMLESS REGIONAL TRANSPORTATION SYSTEM

**November 2007 Traffic Coordination Improvements  
 87th Street: Pflumm Rd to US-69**

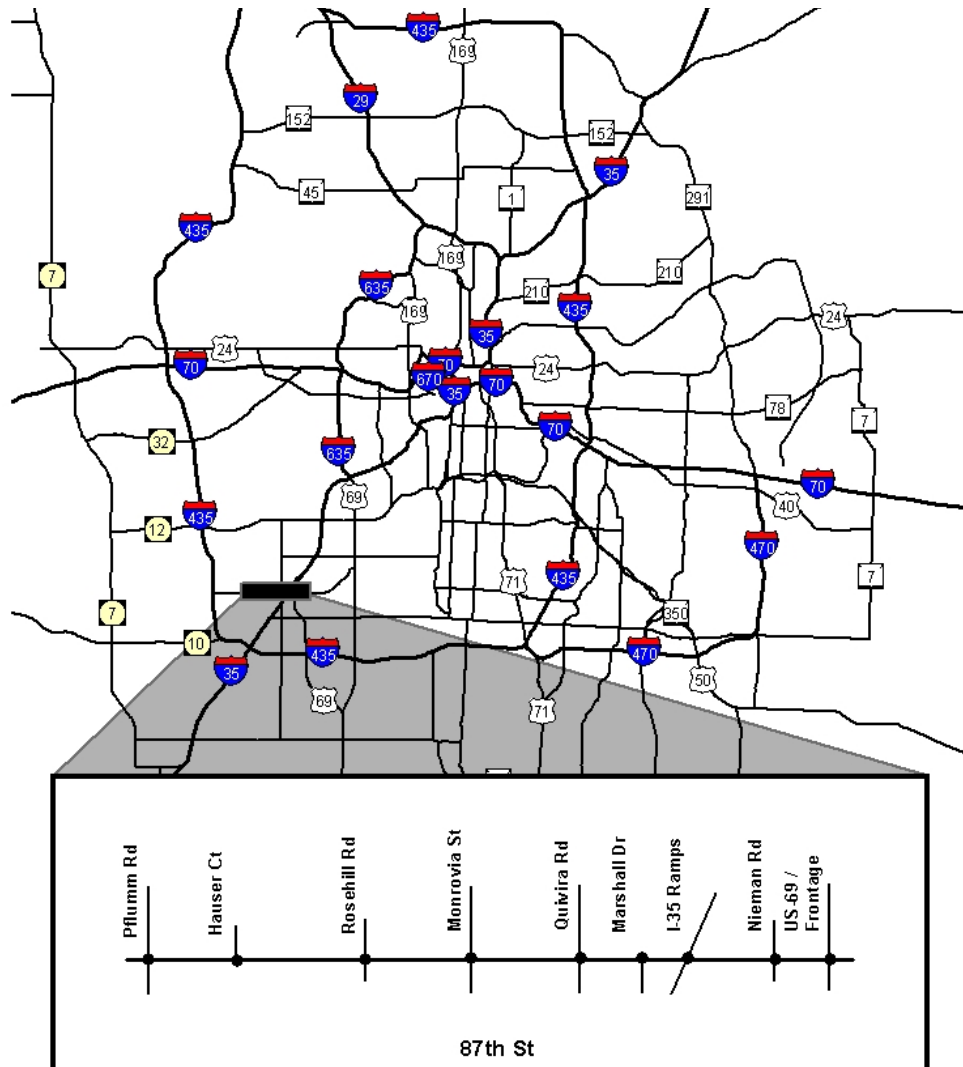
**Introduction**

Operation Green Light (OGL) exists to significantly reduce air pollution, stops, delays, driver frustration, and fuel consumption in the Kansas City area by optimizing the traffic signal coordination along arterial corridors.

**Project Description**

As a part of Operation Green Light, this project involved design and deployment of new coordination timing along 87th Street from Pflumm Rd to US-69, through the cities of Lenexa and Overland Park. The arterial corridor is 1.6 miles long with nine traffic signals. Seven signals are owned and operated by the city of Lenexa and two by the city of Overland Park. With approximately 20,000 vehicles traveling the length of the arterial every business day, signal coordination is an important part of the solution for better traffic flow.

**Project Map**



## Project Details

The seven signals in Lenexa are run by six model 170 controllers with Wapiti software. (Marshall Dr is run by the same controller as the I-35 ramps). These controllers are connected via fiber optics and microwave radios to the OGL Traffic Operations Center (TOC) in Lees Summit. The two signals in Overland Park are run by model 2070 controllers with Econolite software and are connected to the Overland Park TOC. Traffic Control Software at each TOC monitors the controllers to verify their operation and keeps their internal clocks accurate, which is necessary for the coordination plans to remain effective.

At the start of the project OGL staff collected intersection and corridor geometrics as well as traffic signal phasing details. Lenexa city staff provided some turning movement counts while a consultant collected the remaining counts needed.

Lenexa, Overland Park, and OGL staff then worked together to develop and deploy new traffic signal coordination plans for the morning peak (7:00 a.m. – 8:45 a.m.), evening peak (3:00 p.m. – 6:45 p.m.) and off-peak (all other times of the day). The peak plans have a cycle length of 120 seconds and the off-peak plan has a cycle length of 110 seconds.

## Results

OGL staff identified the improvements resulting from this project by performing travel studies in the field before and after the new coordination plans were implemented. The detailed statistics (graphed on the following page) are averages from eight runs in each direction of the corridor in a car equipped with travel profile measuring instruments.

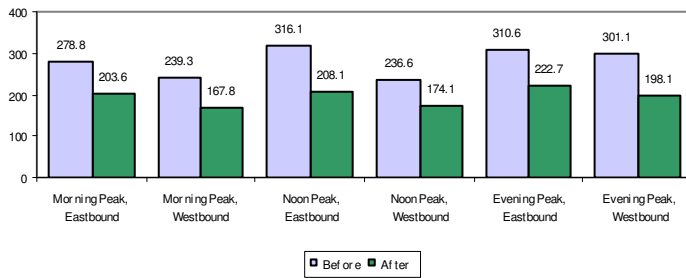
The per-vehicle figures are then weighted by the number of cars affected to give the daily benefits. The following table shows an estimate of daily and annual benefits of the project. The cost estimates assume that the driver's time is worth \$15 an hour and that the price of gasoline is \$2.90 per gallon. Annual Benefits assume 255 business days in a year.

## Estimate of Benefits

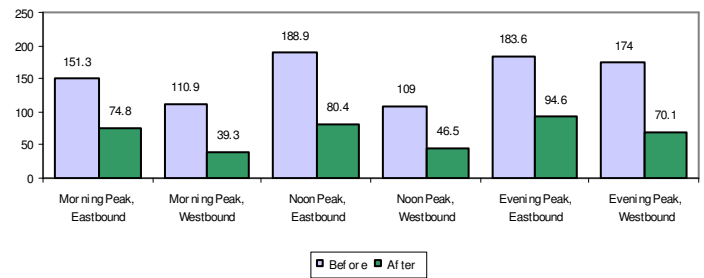
Performance Measures	Daily Benefits	Annual Benefits	
Travel time	243	62,000	Hours saved
Fuel consumption	188	48,000	Gallons saved
Time and fuel costs	\$4,190	\$1,070,000	Savings to region
Pollutant emissions	178	45,400	Kilograms saved

# Detailed Benefits

**Average Travel Time (sec)**

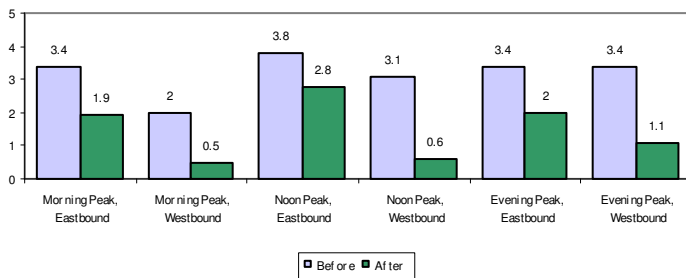


**Average Delay (sec)**

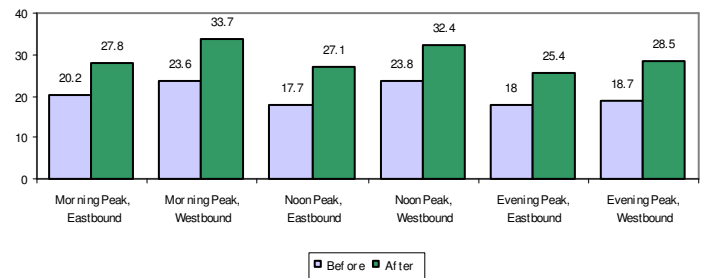


Travel time is simply the amount of time needed to traverse the corridor, while delay is the time taken due to the traffic signals, as compared to free-flowing traffic. When weighted by the number of cars affected by each plan, travel time decreased by 31% on average, while delay decreased by 56% on average.

**Average Number of Stops**

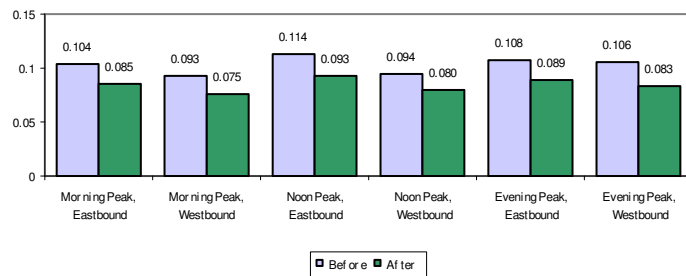


**Average Speed (mph)**

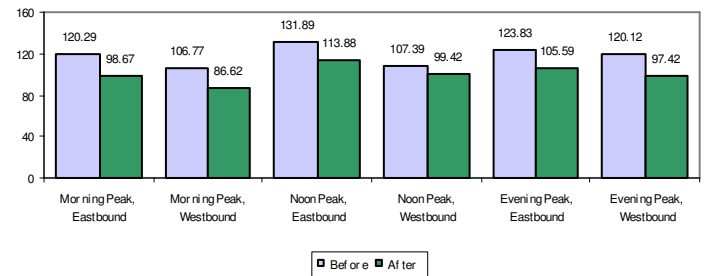


Average number of stops per vehicle and average speed along the corridor are graphed above. When weighted by the number of cars affected by each plan, stops decreased by 54% on average, and the average speed along the corridor increased by 44%.

**Fuel consumed Per Vehicle (gal)**



**Pollutant Emissions Per Vehicle (grams)**



Fuel consumed per vehicle and pollutant emissions per vehicle are shown above for each plan. When weighted by traffic volumes, the fuel consumed by the average vehicle decreased by 18%, and the emissions from the average vehicle decreased by 15%.



### About Operation Green Light

Operation Green Light works with federal, state and local agencies to develop and implement a system that will coordinate traffic signals across jurisdictional boundaries. Pilot projects have shown that this system will significantly improve traffic flow, decrease fuel consumption, and reduce air pollution.

OGL's vision is that traffic signals on regional corridors in the Kansas City area be timed and coordinated for the safe and efficient movement of people and goods across a seamless regional transportation system.

The proposed system, estimated to cost \$57 million, will be developed in phases. Phase One, started in 2002, will include a dedicated wireless communication system, a regional traffic operations center, and the replacement of some signal controllers. OGL staff will then develop, install, and maintain new timing plans on approximately 600 intersections in 17 jurisdictions.

### Glossary

**Arterial** – A main roadway. Built primarily to serve through traffic at moderately high speeds, an arterial generally extends many miles in length and has multiple through lanes.

**Controllers** – The devices which operate traffic signals (making them display green, yellow, red, etc. indications.)

**Signal Coordination** – The process of making multiple traffic signals work together to serve traffic more efficiently.

**Cycle length** – The total length of time required for the controller to serve all of the movements at the intersection.

**Timing Plans** – The set of signal timing parameters provided to the local intersection controllers and system control devices. Timing plans are developed with the objective of providing the most effective operations for a specific set of traffic conditions. Optimized timing plans minimize stopped delay, provide arterial progression and provide sufficient time for all traffic movements.

**Progression** – Traffic flow along an arterial with minimum stops.

**Wapiti Software** – A brand of software that runs on model 170 traffic controllers. It controls traffic signal operations and permits engineers to modify signal timing.

**Econolite Software** – A brand of software that runs on model 2070 traffic controllers. It controls traffic signal operations and permits engineers to modify signal timing.

For more information visit the OGL website at:

[www.marc.org/transportation/ogl](http://www.marc.org/transportation/ogl)

816-474-4240





# Operation Green Light Traffic Signal Coordination Summary Report Johnson Dr. - Merriam Dr. to Antioch Rd.

## Introduction

Operation Green Light is a regional effort to improve traffic flow and reduce vehicle emissions. Managed by the Mid-America Regional Council (MARC), Operation Green Light works with federal, state and local agencies to develop and implement a system to coordinate traffic signal timing plans and communication between traffic signal equipment across jurisdictional boundaries.

## Corridor Activities

Through Operation Green Light, new coordination plans were installed on Johnson Dr. from Merriam Dr. to Antioch Rd. in Merriam, KS. The new plans were installed on the street, observed and evaluated for their effectiveness in January of 2012. See **Figure 1** on the back of this report for a map of the study area. This corridor has an average daily traffic of approximately 18,000 vehicles.

## Results

The results for individual drivers will vary by origin and destination, time of day and direction, as well as other factors outside the scope of traffic signal timing. **Table 1** below is a summary of the results.

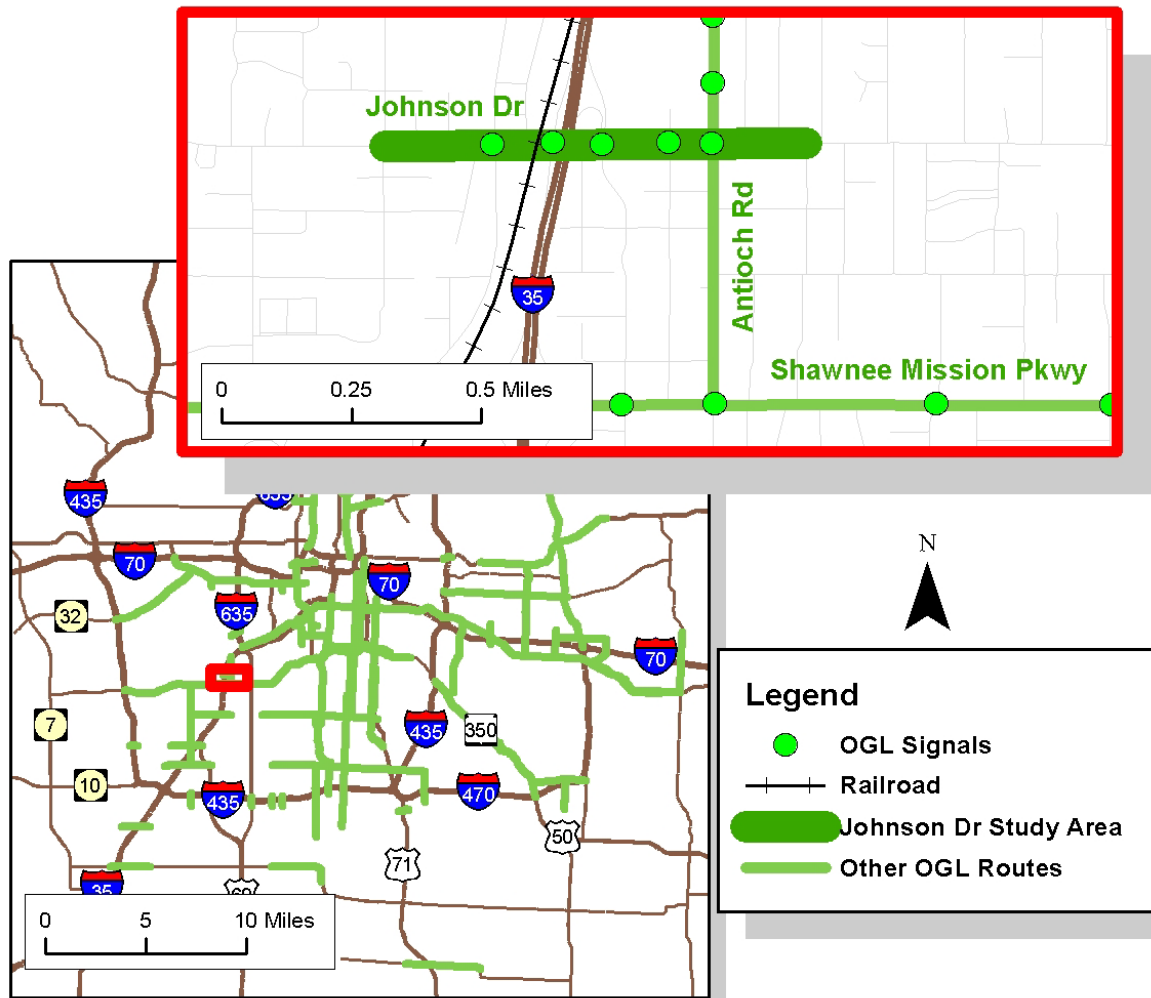
**Table 1. Summary of results for Johnson Dr. Project**

Improvement during morning, noon, and evening peak periods: <small>(for drivers traveling the entire length of the corridor)</small>				Approximate daily savings: <small>(net change for all drivers impacted by the plans)</small>	
Morning	Noon	Evening		Daily	
28.9%	45.2%	29.1%	less travel delay from signals	47	hours saved in travel time
41.4%	45.0%	12.4%	fewer stops	2200	fewer stops
6.0%	7.5%	13.8%	less fuel consumed	31	gallons of fuel saved
5.4%	6.6%	13.8%	fewer hydrocarbons emitted	3.2	kg less hydrocarbons emitted
-0.3%	0.0%	12.2%	less carbon monoxide emitted	22	kg less carbon monoxide emitted
0.9%	-3.2%	10.0%	less nitrous oxide emitted	0.8	kg less nitrous oxide emitted
<b>Approximate economic savings from reduced travel time and fuel consumption:</b>				<b>Per Day</b>	<b>Per Year</b>
				<b>\$816</b>	<b>\$204,000</b>

## Benefit to Cost Ratio

The continued operations of the OGL system will cost approximately \$1800 per signal per year. Thus the cost of keeping the Johnson Dr. corridor a part of OGL is \$9000 per year for the five signals updated. Therefore the benefit to cost ratio for this re-timing project is **23 to 1**.

**Figure 1. Map of the Johnson Dr. study area.**



For more information and a more detailed report of this coordination project, please see:  
<http://www.marc.org/Transportation/Commuting/Operation-Green-Light/About-OGL.aspx>



## Operation Green Light Traffic Signal Coordination Summary Report Shawnee Mission Pkwy-Middle Corridor, I-35 SB to Roeland Dr.

### Introduction

Operation Green Light is a regional effort to improve traffic flow and reduce vehicle emissions. Managed by the Mid-America Regional Council (MARC), Operation Green Light works with federal, state and local agencies to develop and implement a system that will coordinate traffic signal timing plans and communication between traffic signal equipment across jurisdictional boundaries.

### Corridor Activities

Through Operation Green Light, new coordination plans were installed on the Shawnee Mission Pkwy corridor from I-35 SB to Roeland Dr. The new plans were developed, installed on the street, observed and evaluated for their effectiveness in September of 2010. See Figure 1 on the back of this report for a map of the study area. This corridor has an average daily traffic of approximately 36,200 vehicles between Antioch Rd. and Metcalf Ave.

### Results

The results for individual drivers will vary by origin and destination, time of day and direction, as well as other factors outside the scope of traffic signal timing. Table 1 below is a summary of the results.

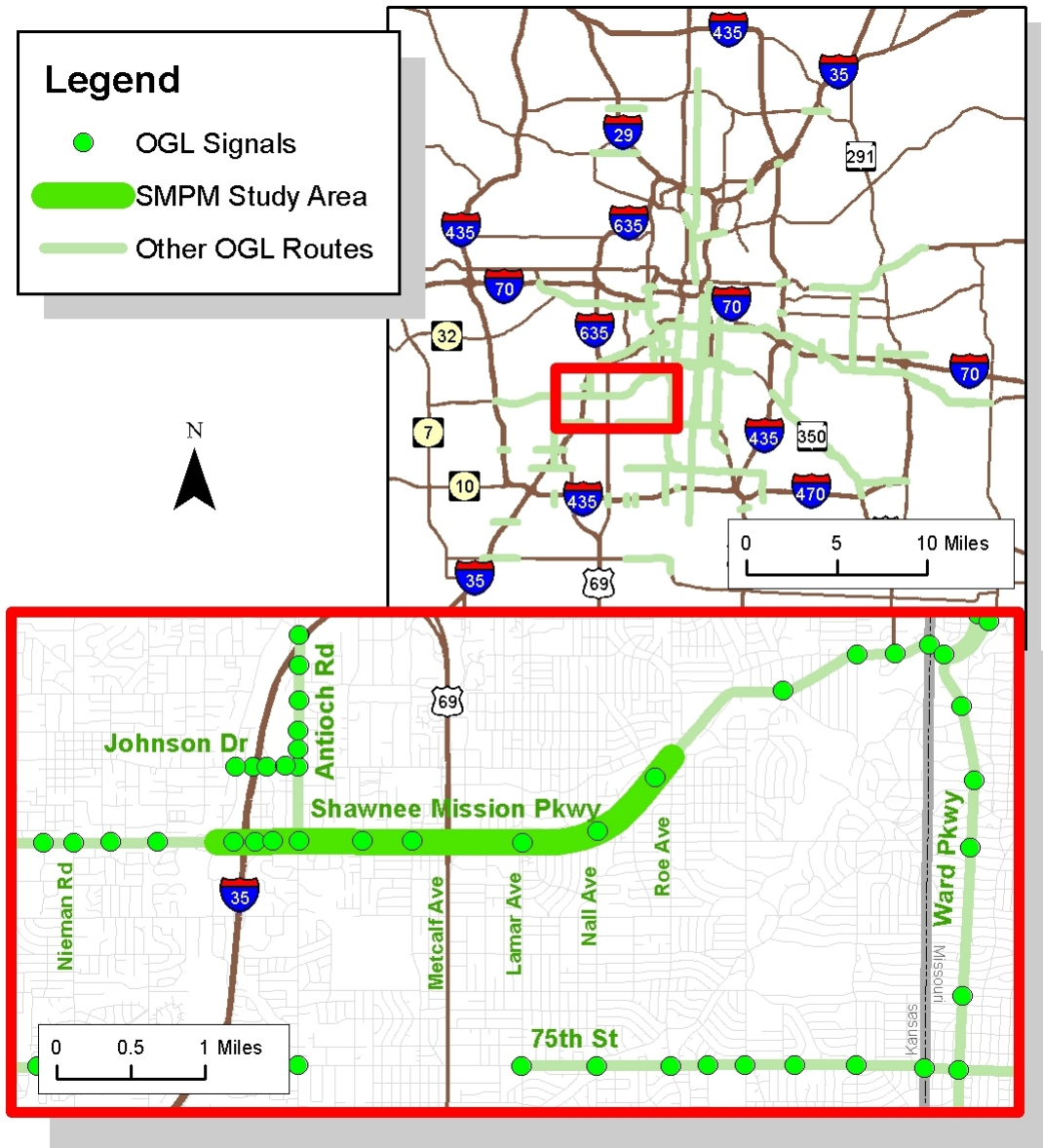
**Table 1. Summary of results for Shawnee Mission Pkwy-Middle Project**

Improvement during morning, noon, and evening peak periods: (for drivers traveling the entire length of the corridor)				Approximate daily savings: (net change for all drivers impacted by the plans)	
Morning	Noon	Evening		Daily	
55.7%	42.3%	20.5%	less travel delay from signals	217	hours saved in travel time
76.6%	36.0%	30.3%	fewer stops	17200	fewer stops
15.0%	9.4%	4.3%	less fuel consumed	200	gallons of fuel saved
26.4%	16.0%	4.0%	fewer hydrocarbons emitted	29.3	kg less hydrocarbons emitted
19.5%	10.0%	1.9%	less carbon monoxide emitted	210	kg less carbon monoxide emitted
32.1%	17.3%	1.7%	less nitrous oxide emitted	19.7	kg less nitrous oxide emitted
<b>Approximate economic savings from reduced travel time and fuel consumption:</b>				<b>Per Day</b>	<b>Per Year</b>
				<b>\$3,870</b>	<b>\$966,000</b>

### Benefit to Cost Ratio

The continued operations of the OGL system will cost approximately \$1800 per signal per year. Thus the cost of keeping the Shawnee Mission Pkwy-Middle corridor a part of OGL is \$16,200 per year for the nine signals included. Therefore the benefit to cost ratio for this corridor re-timing project is **60 to 1**.

Figure 1. Map of the Shawnee Mission Pkwy-Middle corridor study area.



For more information and a more detailed report of this coordination project, please see: [www.marc.org/transportation/ogl](http://www.marc.org/transportation/ogl)