Lexington-Fayette
Urban County Government

Request for Proposals

The Lexington-Fayette Urban County Government hereby requests proposals for **RFP #33-2025 Automated Traffic Signal Performance Measures (ATSPM) and Timing Optimization Solution** to be provided in accordance with terms, conditions and specifications established herein.

Sealed proposals will be received through Ion Wave until **2:00 PM**, prevailing local time, on **September 29, 2025.** All forms and information requested in RFP must be included and attached in Response Attachments tab in Ion Wave.

Proposals received after the date and time set for opening proposals will not be accepted. It is the sole responsibility of the Proposer to assure that his/her proposal is submitted in Ion Wave before the date and time set for opening proposals.

Proposals, once submitted, may not be withdrawn for a period of ninety (90) calendar days.

The Lexington-Fayette Urban County Government reserves the right to reject any or all proposals, and to waive technicalities and informalities when such waiver is determined by the Lexington-Fayette Urban County Government to be in its best interest.

Signature of this proposal by the Proposer constitutes acceptance by the Proposer of terms, conditions and requirements set forth herein.

Minor exceptions may not eliminate the proposal. Any exceptions to the specifications established herein shall be listed in detail on a separate sheet and attached hereto. The Lexington-Fayette Urban County Government shall determine whether any exception is minor.

The Lexington-Fayette Urban County Government encourages the participation of minority- and women-owned businesses in Lexington-Fayette Urban County Government contracts. This proposal is subject to Affirmative Action requirements attached hereto.

Please do not contact any LFUCG staff member or any other person involved in the selection process other than the designated contact person(s) regarding the project contemplated under this RFP while this RFP is open and a selection has not been finalized. Any attempt to do so may result in disqualification of the firm's submittal for consideration.

Laws and Regulations

All applicable state laws, municipal ordinances and regulations of all authorities having jurisdiction over the project shall apply to the contract, and shall be deemed to be incorporated herein by reference.

Equal Employment Opportunity

The Entity (regardless of whether construction contractor, non-construction contractor or supplier) agrees to provide equal opportunity in employment for all qualified persons, to prohibit discrimination in employment because of race, color, religion, sex (including pregnancy, sexual orientation or gender identity), national origin, disability, age, genetic information, political affiliation, or veteran status, and to promote equal employment through a positive, continuing program from itself and each of its sub-contracting agents. This program of equal employment opportunity shall apply to every aspect of its employment policies and practices.

Kentucky Equal Employment Opportunity Act

The Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any "county, city, town, school district, water district, hospital district, or other political subdivision of the state shall include in directly or indirectly publicly funded contracts for supplies, materials, services, or equipment hereinafter entered into the following provisions:

"During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, or national origin;

(2) The contractor will state in all solicitations or advertisements for employees placed by or on behalf of the contractors that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, or national origin;

(3) The contractor will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provision of the nondiscrimination clauses required by this section; and

(4) The contractor will send a notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding advising the labor union or workers'

representative of the contractor's commitments under the nondiscrimination clauses."

The Act further provides:

"KRS 45.610. Hiring minorities -- Information required

(1) For the length of the contract, each contractor shall hire minorities from other sources within the drawing area, should the union with which he has collective bargaining agreements be unwilling to supply sufficient minorities to satisfy the agreed upon goals and timetables.

(2) Each contractor shall, for the length of the contract, furnish such information as required by KRS 45.560 to KRS 45.640 and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with KRS 45.560 to 45.640 and such rules, regulations and orders issued pursuant thereto.

KRS 45.620. Action against contractor -- Hiring of minority contractor or subcontractor

(1) If any contractor is found by the department to have engaged in an unlawful practice under this chapter during the course of performing under a contract or subcontract covered under KRS 45.560 to 45.640, the department shall so certify to the contracting agency and such certification shall be binding upon the contracting agency unless it is reversed in the course of judicial review.

(2) If the contractor is found to have committed an unlawful practice under KRS 45.560 to 45.640, the contracting agency may cancel or terminate the contract, conditioned upon a program for future compliance approved by the contracting agency and the department. The contracting agency may declare such a contractor ineligible to bid on further contracts with that agency until such time as the contractor complies in full with the requirements of KRS 45.560 to 45.640.

(3) The equal employment provisions of KRS 45.560 to 45.640 may be met in part by a contractor by subcontracting to a minority contractor or subcontractor. For the provisions of KRS 45.560 to 45.640, a minority contractor or subcontractor shall mean a business that is owned and controlled by one or more persons disadvantaged by racial or ethnic circumstances.

KRS 45.630 Termination of existing employee not required, when

Any provision of KRS 45.560 to 45.640 notwithstanding, no contractor shall be required to terminate an existing employee upon proof that employee was employed prior to the date of the contract.

KRS 45.640 Minimum skills

Nothing in KRS 45.560 to 45.640 shall require a contractor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job."

It is recommended that all of the provisions above quoted be included as special conditions in each contract. In the case of a contract exceeding $250,000, the contractor is required to furnish evidence that his workforce in Kentucky is representative of the available work-force in the area from which he draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the contract.

LFUCG Non-Appropriation Clause

Contractor acknowledges that the LFUCG is a governmental entity, and the contract validity is based upon the availability of public funding under the authority of its statutory mandate.

In the event that public funds are unavailable and not appropriated for the performance of the LFUCG's obligations under this contract, then this contract shall automatically expire without penalty to the LFUCG thirty (30) days after written notice to Contractor of the unavailability and non-appropriation of public funds. It is expressly agreed that the LFUCG shall not activate this non-appropriation provision for its convenience or to circumvent the requirements of this contract, but only as an emergency fiscal measure during a substantial fiscal crisis, which affects generally its governmental operations.

In the event of a change in the LFUCG's statutory authority, mandate and mandated functions, by state and federal legislative or regulatory action, which adversely affects the LFUCG's authority to continue its obligations under this contract, then this contract shall automatically terminate without penalty to the LFUCG upon written notice to Contractor of such limitation or change in the LFUCG's legal authority.

Contention Process

Vendors who respond to this invitation have the right to file a notice of contention associated with the RFP process or to file a notice of appeal of the recommendation made by the Director of Central Purchasing resulting from this invitation.

Notice of contention with the RFP process must be filed within 3 business days of the bid/proposal opening by (1) sending a written notice, including sufficient documentation to support contention, to the Director of the Division of Central Purchasing or (2)

submitting a written request for a meeting with the Director of Central Purchasing to explain his/her contention with the RFP process. After consulting with the Commissioner of Finance the Chief Administrative Officer and reviewing the documentation and/or hearing the vendor, the Director of Central Purchasing shall promptly respond in writing findings as to the compliance with RFP processes. If, based on this review, a RFP process irregularity is deemed to have occurred the Director of Central Purchasing will consult with the Commissioner of Finance, the Chief Administrative Officer and the Department of Law as to the appropriate remedy.

Notice of appeal of a RFP recommendation must be filed within 3 business days of the RFP recommendation by (1) sending a written notice, including sufficient documentation to support appeal, to the Director, Division of Central Purchasing or (2) submitting a written request for a meeting with the Director of Central Purchasing to explain his appeal. After reviewing the documentation and/or hearing the vendor and consulting with the Commissioner of Finance and the Chief Administrative Officer, the Director of Central Purchasing shall in writing, affirm or withdraw the recommendation.

SELECTION CRITERIA:

The LFUCG's Selection Committee shall consider the following factors when it evaluates the proposals received:

1. Evaluation of the approach and methodology described in the submitted proposal (25%)
2. Specialized experienced and technical competence of the vendor, firm, or consultant (including a joint venture or association) with the type of service required (20%)
3. Familiarity with this or similar projects including those of similar scope, population size, traffic patterns, or traffic network layout (15%)
4. Past record and performance on contracts with LFUCG or other governmental agencies and private industry with respect to such factors as control of cost, quality of work and ability to meet scheduling (15%)
5. Content, quality, completeness and form of submitted proposal (15%)
6. Capacity of vendor, firm, or consultant to perform the work and in a timely manner (10%)

Proposals shall contain the appropriate information necessary to evaluate based on these criteria. A committee composed of government employees as well as representatives of relevant user groups will evaluate the proposals.

Questions regarding this RFP shall be addressed through: https://lexingtonky.ionwave.net

Affirmative Action Plan

All vendors must submit as a part of the proposal package the following items to the Urban County Government:

1. Affirmative Action Plan for his/her firm;
2. Current Work Force Analysis Form;

Failure to submit these items as required may result in disqualification of the submitter from award of the contract. All submissions should be directed to:

Director, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, 3rd Floor
Lexington, Kentucky 40507

All questions regarding this proposal must be directed to the Division of Central Purchasing, (859)-258-3320.

AFFIDAVIT

Comes the Affiant, Halle Van Scoy, and after being first duly sworn, states under penalty of perjury as follows:

1. His/her name is Halle Van Scoy and he/she is the individual submitting the proposal or is the authorized representative of Path Master, Inc., the entity submitting the proposal (hereinafter referred to as "Proposer").

2. Proposer will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.

3. Proposer will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.

4. Proposer has authorized the Division of Central Purchasing to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

5. Proposer has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky within the past five (5) years and the award of a contract to the Proposer will not violate any provision of the campaign finance laws of the Commonwealth.

6. Proposer has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as "Ethics Act."

Continued on next page

7. Proposer acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

Further, Affiant sayeth naught.

Halle Van Scoy

STATE OF Ohio

COUNTY OF Summit

The foregoing instrument was subscribed, sworn to and acknowledged before me by Ben A. Stidd JR on this the 29 day of September, 2025.

My Commission expires: 07/11/2030

BEN A. STIDD JR.
Notary Public, State of Ohio
My Commission Expires:
07/11/2030

NOTARY PUBLIC, STATE AT LARGE

EQUAL OPPORTUNITY AGREEMENT

Standard Title VI Assurance

The Lexington Fayette-Urban County Government, (hereinafter referred to as the "Recipient") hereby agrees that as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78Stat.252, 42 U.S.C. 2000d-4 (hereinafter referred to as the "Act"), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, (49 CFR, Part 21) Nondiscrimination in Federally Assisted Program of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the "Regulations") and other pertinent directives, no person in the United States shall, on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the U.S. Department of Transportation, including the Federal Highway Administration, and hereby gives assurance that will promptly take any necessary measures to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

The Law

- Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.

- Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and sub-contractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.

- Section 503 of the Rehabilitation Act of 1973 states:

  The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap.

- Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal contracts.

- Section 206(A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states:

  The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.

****

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors and all supervisory personnel. In following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination

in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractors may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, Vietnam veterans, handicapped and aged persons.

Halle Van Zoey
Signature

Path Master, Inc.
Name of Business

WORKFORCE ANALYSIS FORM

Name of Organization: Path Master, Inc.

Categories	Total	White (Not Hispanic or Latino)		Hispanic or Latino		Black or African-American (Not Hispanic or Latino		Native Hawaiian and Other Pacific Islander (Not Hispanic or Latino		Asian (Not Hispanic or Latino		American Indian or Alaskan Native (not Hispanic or Latino		Two or more races (Not Hispanic or Latino		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators	5	4	1													4	1
Professionals	14	12	1	1												13	1
Superintendents																	
Supervisors	2	2														2	
Foremen	1	1														1	
Technicians	6	4	2													4	2
Protective Service																	
Para-Professionals																	
Office/Clerical	3	1	2													1	2
Skilled Craft	1	1														1	
Service/Maintenance	3	1	1				1									1	2
Total:	35	26	7	1			1									27	8

Prepared by: Halle Van Scoy - Vice President **Date:** 9 / 29 / 25

(Name and Title)

Revised 2015-Dec-15

DIRECTOR, DIVISION OF PROCUREMENT
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 EAST MAIN STREET
LEXINGTON, KENTUCKY 40507

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITIES AND DBE CONTRACT PARTICIPATION

The Lexington-Fayette Urban County Government has a Certified Minority and Women Business Enterprise seventeen percent (17%) minimum goal including minimum subgoals of five percent (5%) for Minority Business Enterprises (MBE) and a subgoal of twelve percent (12%) for Women Business Enterprises (WBE); a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and/or Certified Service- Disabled Veteran Owned Businesses; and a goal of utilizing Disadvantaged Business Enterprises (DBE), where applicable, for government contracts.

For assistance in locating certified DBEs, MBEs, WBEs, VOSBs and/or VOSBs, contact Sherita Miller at 859/258-3320 or by writing the address listed below:

Sherita Miller, MPA, CPSD
Minority Business Enterprise Liaison
Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, Kentucky 40507
smiller@lexingtonky.gov
859-258-3323

Firm Submitting Proposal: Path Master, Inc.

Complete Address: 1960 Midway Drive (Street) Twinsburg (City) 44087 (Zip)

Contact Name: Hall Van Scoy Title: Vice President

Telephone Number: 330-425-4994 Fax Number: 330-425-9338

Email address: halle.vanscoy@pathmasterinc.com

LEXINGTON

MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA, CPSD
Minority Business Enterprise Liaison
Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507
smiller@lexingtonky.gov
859-258-3323

OUR MISSION: The mission of the Minority Business Enterprise Program (MBEP) is to facilitate the full participation of minority and women owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long- term economic viability of Lexington-Fayette Urban County Government.

To that end the urban county council adopted and implemented Resolution 272-2024 – a Certified Minority and Women Business Enterprise seventeen percent (17%) minimum goal including minimum subgoals of five percent (5%) for Minority Business Enterprises (MBE) and a subgoal of twelve percent (12%) for Women Business Enterprises (WBE); a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and/or Certified Service- Disabled Veteran Owned Businesses; and a goal of utilizing Disadvantaged Business Enterprises (DBE), where applicable, for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals:

Certified Disadvantaged Business Enterprise (DBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a person(s) who is socially and economically disadvantaged as define by 49 CFR subpart 26.*

Certified Minority Business Enterprise (MBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. Black American, Asian American, Hispanic American, Native American)*

Certified Women Business Enterprise (WBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a woman.*

Certified Veteran-Owned Small Business (VOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.*

Certified Service -Disabled Veteran Owned Small Business (SDVOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a disabled veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.*

The term "Certified" shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Procurement as having the appropriate credentials to make a determination as to the status of the business.
The following certifications are recognized and accepted by the MBEP:

Kentucky Transportation Cabinet (KYTC), Disadvantaged Business Enterprise (DBE)
Kentucky Minority and Women Business Enterprise (MWBE)
Women's Business Enterprise National Council (WBENC)
National Women Business Owners Corporation (NWBOC)
National Minority Supplier Development Council (NMSDC)
Tri-State Minority Supplier Development Council (TSMSDC)
U.S. Small Business Administration Veteran Small Business Certification (VetCert)
Kentucky Service- Disabled Veteran Owned Small Business (SDVOSB)

To comply with Resolution 272-2024, prime contractors, minority and women business enterprises, veteran owned small businesses, and service-disabled veteran owned small businesses must complete monthly contract compliance audits in the Diverse Business Management Compliance system, https://lexingtonky.diversitycompliance.com/

A list of organizations that certify and/or maintain lists of certified businesses (i.e. DBE, MBE, WBE, VOSB and/or SDVOSB) is available upon request by emailing, Sherita Miller, smiller@lexingtonky.gov.

LEXINGTON

LFUCG MWDBE PARTICIPATION FORM
Bid/RFP/Quote Reference # 33-2025 ATSPM

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to the Division of Procurement for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWBE Company, Name, Address, Phone, Email	DBE/MBE WBE/VOSB/SDVOSB	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1. N/A	N/A	N/A	N/A	N/A
2. N/A	N/A	N/A	N/A	N/A
3. N/A	N/A	N/A	N/A	N/A
4. N/A	N/A	N/A	N/A	N/A

The undersigned company representative submits the above list of MDWBE and veteran firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Path Master, Inc.
Company

9/29/2025
Date

Halle Van Scoy
Company Representative

Vice President
Title

LEXINGTON

LFUCG MWDBE SUBSTITUTION FORM
Bid/RFP/Quote Reference # 33-2025 ATSPM

The substituted MWDBE and/or veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to the Division of Procurement for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project. **Note: Form required if a subcontractor is being substituted on a contract.**

SUBSTITUTED DBE/MBE/WBE/VOSB Company Name, Address, Phone, Email	DBE/MBE/WBE/VOSB/SDVOSB Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1. N/A	N/A	N/A	N/A	N/A	N/A
2. N/A	N/A	N/A	N/A	N/A	N/A
3. N/A	N/A	N/A	N/A	N/A	N/A
4. N/A	N/A	N/A	N/A	N/A	N/A

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Path Master, Inc.
Company

9/29/2025
Date

Halle Van Scoy
Company Representative

Vice President
Title

LEXINGTON

DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS AND OUTREACH PLANS

As affirmed in Resolution Number 272-2024, the Urban County Council has adopted an annual aspirational goal of utilizing at least seventeen percent (17%) of public funds spend from certain discretionary agreements with certified Minority Business Enterprises (MBEs) and certified Woman Business Enterprises (WBEs); utilizing at least three percent (3%) of public funds from certain discretionary agreements with Certified Veteran-Owned Small Business and Certified Service-Disabled Veteran-Owned Small Businesses (VOSBs); and utilizing Disadvantaged Business Enterprises (DBEs) where applicable. Bidders should make every effort to achieve these goals.

Therefore, as an element of the responsiveness of the bid, all Bidders are required to submit documentation of their good faith and outreach efforts to ensure all businesses, including small and disadvantaged businesses such as minority-, woman-, and veteran-owned businesses, have an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement. Examples of good faith and outreach efforts that satisfy this requirement to encourage the participation of, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs include:

1. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women, and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to participate.

2. Attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year to meet new small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to partner with on LFUCG contracts and procurements.

3. Attended pre-bid/pre-proposal meetings that were scheduled by LFUCG to inform small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs of subcontracting opportunities.

4. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs.

5. Requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

6. Contacted organizations that work with small, DBE, MBE, WBE, and VOSB companies for assistance in finding certified DBEs, MBEs, WBEs, VOSB and/or SDVOSBs to work

on this project. Those contacted and their responses must be a part of the bidder's outreach efforts documentation.

7. Sent written notices, by certified mail, email, or facsimile, to qualified, certified small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

8. Followed up initial solicitations by contacting small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs via tailored communications to determine their level of interest.

9. Provided the interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs with adequate and timely information about the plans, specifications, and requirements of the contract.

10. Selected portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs in order to increase the likelihood of subcontracting participation. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate small, DBE, MBE, WBE, VOSB and/or SDVOSB participation, even when the prime contractor may otherwise perform these work items with its own workforce.

11. Negotiated in good faith with interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection must be so noted in writing with a description as to why an agreement could not be reached.

12. Included documentation of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs that were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

    a. Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a small business', DBE's MBE's, WBE's, VOSB's and/or SDVOSB's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy the participation goals.

13. Made an effort to offer assistance to or refer interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal.

14. Made efforts to expand the search for small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

15. Other – any other evidence that the bidder submits that may demonstrate that the bidder has made reasonable efforts to include small, DBE, MBE, WBE, VOSB and/or SDVOSB participation.

Bidder must document, with specificity, each of the efforts it made to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs as subcontractors in the procurement, including the date on which each effort was made, the medium through which each effort was made, and the outcome of each effort.

> **Note: Failure to submit the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to review by the MBE Liaison. Documentation of Good Faith and Outreach Efforts must be submitted with the Bid, regardless of the proposed level of small, DBE, MBE, WBE, VOSB and/or SDVOSB participation in the procurement. If the Good Faith and Outreach Effort documentation is not submitted with the bid response, the bid may be rejected.**

OUTREACH EFFORTS EVALUATION

Outreach efforts demonstrated by the bidder or respondent will be evaluated on a pass/fail basis.

ATTACHMENT A – SMALL AND DISADVANTAGED, MINORITY-, WOMEN-, AND VETERAN-OWNED BUSINESS OUTREACH PLAN

Proposer Name:	Path Master, Inc.	**Date:**	9/29/2025
Project Name:	ATSPM	**Project Number:**	33-2025
Contact Name:	Halle Van Scoy	**Telephone:**	330-425-4994
Email:	halle.vanscoy@pathmasterinc.com		

The mission of the Minority Business Enterprise Program is to facilitate the full participation of disadvantaged businesses, minority-, women-, veteran-, and service-disabled veteran-owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long -term economic viability of Lexington-Fayette Urban County Government.

To that end, small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, must have an equal opportunity to be utilized in the performance of contracts with public funds spent from certain discretionary agreements. By submitting its offer, Bidder/Proposer certifies that it has taken, and if there are further opportunities will take, reasonable steps to ensure that small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, are provided an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement.

The information submitted in response to this clause will not be considered in any scored evaluation. Failure to submit this form may cause the bid or proposal to be rejected.

Is the Bidder/ Proposer a certified firm? Yes ☐ No ☑

If yes, indicate all certification type(s):

DBE ☐ MBE ☐ WBE ☐ SBE ☐ VOSB/SDVOSB ☐

and supply a copy of the certificate and/or certification letter if not currently listed on the city's Minority Business Enterprise Program's (MBEP) certified list.

1. Include a list of firms that Bidder/ Proposer has had a contractual relationship with within the last two years that are minority-owned, woman-owned, veteran-owned or small businesses, regardless of their certification status.

Click or tap here to enter text.

2. Does Bidder/Proposer foresee any subcontracting opportunities for this procurement?

Yes ☐ No ☑

Flo Artificial Intelligence, Inc. DBA Flow Labs
6580 E. McDowell Rd. - Unit 2316
Scottsdale, AZ 85257

Key Cable and, Supply Co., Inc.
4037 Genoa Road, Perrysburg, OH, 43551

Keystone Industrial Sales & Service
808 North 4th Avenue, Altoona, PA, 16601

If no, please explain why in the field below. Do not complete the rest of this form and submit this first page with your bid and/or proposal. Click or tap here to enter text.

Material procurement only.

If yes, please complete the following pages and submit all pages with your bid and/or proposal.

Describe the steps Bidder/Proposer took to solicit small and disadvantaged businesses, including MBEs, WBEs, VOSBs, and SDVOSBs, for subcontracting opportunities for this procurement.

3. Check the good faith and outreach efforts the Bidder/Proposer used to encourage the participation of small and disadvantaged businesses including, MBEs, WBEs, VOSBs and SDVOSBs:

- ☐ Bidder placed advertisements in search of prospective small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs for the solicitation.
- ☐ Bidder attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year.
- ☐ Bidder attended pre-bid and/or pre-proposal meetings for this solicitation.
- ☐ Bidder sponsored an Economic Inclusion Outreach event.
- ☐ Bidder requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG.
- ☐ Bidder contacted organizations that work with small, DBE, MBE, WBE, VOSB and/or SDVOSB companies.
- ☐ Bidder sent written notices to certified small, DBE, MBE, WBE, VOSB and SDVOSB businesses.
- ☐ Bidder followed up to initial solicitations with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB.
- ☐ Bidder provided small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses interested in performing the solicited work with prompt access to the plans, specifications, scope of work, and requirements of the solicitation.
- ☐ Bidder made efforts to segment portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, including dividing sub-bid/partnership opportunities into economically feasible units/parcels, to facilitate participation.

☐ Bidder negotiated in good faith with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses.

☐ Bidder provided adequate rationale for rejecting any small business', DBEs, MBEs, WBEs, VOSBs or SDVOSBs for lack of qualifications.

☐ Bidder offered assistance in obtaining bonding, insurance, financial, equipment, or other resources to small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, in an effort to assist them in meeting project requirements.

☐ Bidder made efforts to expand the search for small businesses, DBEs MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

☐ Bidder made other reasonable efforts to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation.

4. Bidder/Proposer must include documentation, including the date each effort was made, the medium through which each effort was made, and the outcome of each effort with this form, regardless of the level of small, DBE, MBE, WBE, VOSB and/or SDVOSB participation. Examples of required documentation include copies of email communications, copies of newspaper advertisements, or copies of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs or SDVOSBs.

Click or tap here to enter text.

For detailed information regarding outreach efforts that satisfy the MBE Program's requirements, please see "Documentation Required for Good Faith Efforts and Outreach Plans" page.

Note: The Bidder/Proposer must be willing to report the identity of each subcontractor and the value of each subcontract to MBEP if awarded a contract from this procurement.

Failure to submit the documentation requested may be cause for rejection of the bid. Bidders may include any other documentation deemed relevant to this requirement, which is subject to review by the MBE Liaison. Documentation of Good Faith and Outreach Efforts must be submitted with the bid, regardless of the proposed level of SBEs, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation in the procurement. If the Good Faith and Outreach Effort Form and associated documentation is not submitted with the bid response, the bid may be rejected.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Path Master, Inc.	Halle Van Scoy
Company	**Company Representative**
9/29/2025	Vice President
Date	**Title**

4870-1925-6809, v. 1

GENERAL PROVISIONS

1. Each Respondent shall comply with all Federal, State & Local regulations concerning this type of service or good.

   The Respondent agrees to comply with all statutes, rules, and regulations governing safe and healthful working conditions, including the Occupational Health and Safety Act of 1970, *29 U.S.C. 650 et. seq.*, as amended, and KRS Chapter 338. The Respondent also agrees to notify the LFUCG in writing immediately upon detection of any unsafe and/or unhealthful working conditions at the job site. The Respondent agrees to indemnify, defend and hold the LFUCG harmless from all penalties, fines or other expenses arising out of the alleged violation of said laws.

2. Failure to submit ALL forms and information required in this RFP may be grounds for disqualification.

3. Addenda: All addenda and IonWave Q&A, if any, shall be considered in making the proposal, and such addenda shall be made a part of this RFP. Before submitting a proposal, it is incumbent upon each proposer to be informed as to whether any addenda have been issued, and the failure to cover in the bid any such addenda may result in disqualification of that proposal.

4. Proposal Reservations: LFUCG reserves the right to reject any or all proposals, to award in whole or part, and to waive minor immaterial defects in proposals. LFUCG may consider any alternative proposal that meets its basic needs.

5. Liability: LFUCG is not responsible for any cost incurred by a Respondent in the preparation of proposals.

6. Changes/Alterations: Respondent may change or withdraw a proposal at any time prior to the opening; however, no oral modifications will be allowed. Only letters, or other formal written requests for modifications or corrections of a previously submitted proposal which is addressed in the same manner as the proposal, and received by LFUCG prior to the scheduled closing time for receipt of proposals, will be accepted. The proposal, when opened, will then be corrected in accordance with such written request(s), provided that the written request is contained in a sealed envelope which is plainly marked "modifications of proposal".

7. Clarification of Submittal: LFUCG reserves the right to obtain clarification of any point in a bid or to obtain additional information from a Respondent.

8. Bribery Clause: By his/her signature on the bid, Respondent certifies that no employee of his/hers, any affiliate or Subcontractor, has bribed or attempted to bribe an officer or employee of the LFUCG.

9. Additional Information: While not necessary, the Respondent may include any product brochures, software documentation, sample reports, or other documentation that may assist LFUCG in better understanding and evaluating the Respondent's response. Additional documentation shall not serve as a substitute for other documentation which is required by this RFP to be submitted with the proposal,

10. Ambiguity, Conflict or other Errors in RFP: If a Respondent discovers any ambiguity, conflict, discrepancy, omission or other error in the RFP, it shall immediately notify LFUCG of such error in writing and request modification or clarification of the document if allowable by the LFUCG.

11. Agreement to Bid Terms: In submitting this proposal, the Respondent agrees that it has carefully examined the specifications and all provisions relating to the work to be done attached hereto and made part of this proposal. By acceptance of a Contract under this RFP, proposer states that it understands the meaning, intent and requirements of the RFP and agrees to the same. The successful Respondent shall warrant that it is familiar with and understands all provisions herein and shall warrant that it can comply with them. No additional compensation to Respondent shall be authorized for services or expenses reasonably covered under these provisions that the proposer omits from its Proposal.

12. Cancellation: If the services to be performed hereunder by the Respondent are not performed in an acceptable manner to the LFUCG, the LFUCG may cancel this contract for cause by providing written notice to the proposer, giving at least thirty (30) days notice of the proposed cancellation and the reasons for same. During that time period, the proposer may seek to bring the performance of services hereunder to a level that is acceptable to the LFUCG, and the LFUCG may rescind the cancellation if such action is in its best interest.

A. Termination for Cause

(1) LFUCG may terminate a contract because of the contractor's failure to perform its contractual duties

(2) If a contractor is determined to be in default, LFUCG shall notify the contractor of the determination in writing, and may include a specified date by which the contractor shall cure the identified deficiencies. LFUCG may proceed with termination if the contractor fails to cure the deficiencies within the specified time.

(3) A default in performance by a contractor for which a contract may be terminated shall include, but shall not necessarily be limited to:
   (a) Failure to perform the contract according to its terms, conditions and specifications;
   (b) Failure to make delivery within the time specified or according

to a delivery schedule fixed by the contract;

(c) Late payment or nonpayment of bills for labor, materials, supplies, or equipment furnished in connection with a contract for construction services as evidenced by mechanics' liens filed pursuant to the provisions of KRS Chapter 376, or letters of indebtedness received from creditors by the purchasing agency;

(d) Failure to diligently advance the work under a contract for construction services;

(e) The filing of a bankruptcy petition by or against the contractor; or

(f) Actions that endanger the health, safely or welfare of the LFUCG or its citizens.

B. At Will Termination

Notwithstanding the above provisions, the LFUCG may terminate this contract at will in accordance with the law upon providing thirty (30) days written notice of that intent, Payment for services or goods received prior to termination shall be made by the LFUCG provided these goods or services were provided in a manner acceptable to the LFUCG. Payment for those goods and services shall not be unreasonably withheld.

13. Assignment of Contract: The contractor shall not assign or subcontract any portion of the Contract without the express written consent of LFUCG. Any purported assignment or subcontract in violation hereof shall be void. It is expressly acknowledged that LFUCG shall never be required or obligated to consent to any request for assignment or subcontract; and further that such refusal to consent can be for any or no reason, fully within the sole discretion of LFUCG.

14. No Waiver: No failure or delay by LFUCG in exercising any right, remedy, power or privilege hereunder, nor any single or partial exercise thereof, nor the exercise of any other right, remedy, power or privilege shall operate as a waiver hereof or thereof. No failure or delay by LFUCG in exercising any right, remedy, power or privilege under or in respect of this Contract shall affect the rights, remedies, powers or privileges of LFUCG hereunder or shall operate as a waiver thereof.

15. Authority to do Business: The Respondent must be a duly organized and authorized to do business under the laws of Kentucky. Respondent must be in good standing and have full legal capacity to provide the services specified under this Contract. The Respondent must have all necessary right and lawful authority to enter into this Contract for the full term hereof and that proper corporate or other action has been duly taken authorizing the Respondent to enter into this Contract. The Respondent will provide LFUCG with a copy of a corporate resolution authorizing this action and a letter from an attorney confirming that the proposer is authorized to do business in the State of Kentucky if requested. All proposals must

be signed by a duly authorized officer, agent or employee of the Respondent.

16. Governing Law: This Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Kentucky. In the event of any proceedings regarding this Contract, the Parties agree that the venue shall be the Fayette County Circuit Court or the U.S. District Court for the Eastern District of Kentucky, Lexington Division. All parties expressly consent to personal jurisdiction and venue in such Court for the limited and sole purpose of proceedings relating to this Contract or any rights or obligations arising thereunder. Service of process may be accomplished by following the procedures prescribed by law.

17. Ability to Meet Obligations: Respondent affirmatively states that there are no actions, suits or proceedings of any kind pending against Respondent or, to the knowledge of the Respondent, threatened against the Respondent before or by any court, governmental body or agency or other tribunal or authority which would, if adversely determined, have a materially adverse effect on the authority or ability of Respondent to perform its obligations under this Contract, or which question the legality, validity or enforceability hereof or thereof.

18. Contractor understands and agrees that its employees, agents, or subcontractors are not employees of LFUCG for any purpose whatsoever. Contractor is an independent contractor at all times during the performance of the services specified.

19. If any term or provision of this Contract shall be found to be illegal or unenforceable, the remainder of the contract shall remain in full force and such term or provision shall be deemed stricken.

20. Contractor [or Vendor or Vendor's Employees] will not appropriate or make use of the Lexington-Fayette Urban County Government (LFUCG) name or any of its trade or service marks or property (including but not limited to any logo or seal), in any promotion, endorsement, advertisement, testimonial or similar use without the prior written consent of the government. If such consent is granted LFUCG reserves the unilateral right, in its sole discretion, to immediately terminate and revoke such use for any reason whatsoever. Contractor agrees that it shall cease and desist from any unauthorized use immediately upon being notified by LFUCG.

Halle Van Dorp
Signature

9/29/2025
Date

RISK MANAGEMENT PROVISIONS
INSURANCE AND INDEMNIFICATION

INDEMNIFICATION AND HOLD HARMLESS PROVISION

(1) It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "CONTRACTOR") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

(2) CONTRACTOR shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.

(3) In the event LFUCG is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.

(4) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.

(5) LFUCG is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

(6) Notwithstanding, the foregoing with respect to any professional services performed by CONTRACTOR hereunder (and to the fullest extent permitted by law), CONTRACTOR shall indemnify, save, hold harmless and defend LFUCG from and against any and all liability, damages and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees, for any damage due to death or injury to any person or injury to any property (including the loss of use resulting therefrom) to the extent arising out of, pertaining to or relating to the negligence, recklessness or willful misconduct of CONTRACTOR in the performance of this agreement.

FINANCIAL RESPONSIBILITY

BIDDER/CONTRACTOR understands and agrees that it shall demonstrate the ability to assure compliance with the above Indemnity provisions and these other risk management provisions prior to final acceptance of its bid and the commencement of any work or provision of goods.

INSURANCE REQUIREMENTS

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Required Insurance Coverage

BIDDER/CONTRACTOR shall procure and maintain for the duration of this contract the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to LFUCG in order to protect LFUCG against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by CONTRACTOR. The cost of such insurance shall be included in any bid:

Coverage	**Limits**
General Liability (Insurance Services Office Form CG 00 01)	$1 million per occurrence, $2 million aggregate or $2 million combined single limit
Auto Liability	$1 million per occurrence
Worker's Compensation	Statutory
Employer's Liability	$100K
Professional (E&O) Liability	$1 million per claim

The policies above shall contain the following conditions:

a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). LFUCG shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.

b. The General Liability Policy shall be primary to any insurance or self-insurance retained by LFUCG.

c. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.

d. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

Renewals

After insurance has been approved by LFUCG, evidence of renewal of an expiring policy must be submitted to LFUCG, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

Deductibles and Self-Insured Programs

IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of BIDDER/CONTRACTOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage

Safety and Loss Control

CONTRACTOR shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and LFUCG.

Verification of Coverage

BIDDER/CONTRACTOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

CONTRACTOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to insure compliance with these Insurance Requirements.

DEFAULT

BIDDER/CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging BIDDER/CONTRACTOR for any such insurance premiums purchased, or suspending or terminating the work.

LEXINGTON, KY
REQUEST FOR PROPOSAL
RFP #33-2025

Automated Traffic Signal Performance Measures (ATSPM) and Timing Optimization Solution

Tates Creek Road

Material procurement

Pa

Lexington-Fayette Urban County Government (LFUCG)

Division of TRAFFIC ENGINEERING (TE)

Project Description ...

The Lexington-Fayette Urban County Government, Division of Traffic Engineering (TE) desires a qualified consultant or technical vendor solution for Automated Traffic Signal Performance Measures (ATSPM) & Signal Timing Optimization for fourteen (14) intersections along the Tates Creek Road corridor in Lexington, Kentucky. The project spans approximately 3.0 miles and includes Tates Creek Road intersections beginning with Man o' War Blvd. and continuing north to the intersection with Alumni Drive (mile points KY1974 7.797 – 9.455 and CS7436 0.000-1.528).

This project will consist of the ongoing compilation of traffic data and analysis of ATSPMs, the initial development of traffic signal timing paraments, and evaluation of traffic flow at regular intervals that will include operational-based timing adjustment recommendations.

This will be a pilot project to include a minimum of 6 months of signal timing monitoring and adjustment recommendations following the initial signal timing implementation. The solution should be scalable with options to extend the time period and to increase the number of intersections that are being serviced.

Traffic responsive, traffic adaptive, or other related automatic solutions may be considered after careful evaluation and testing of procedures and implementation. Redundancies in communications would also be a requirement.

Intersections Included in this Project ...

Tates Creek Road (KY1974) – (14 intersections)

- Tates Creek Road at Alumni Drive
- Tates Creek Road at Old Mount Tabor Road
- Tates Creek Road at Albany Road
- Tates Creek Road at Lansdowne Drive
- Tates Creek Road at Dove Run Road/Lansdowne Shoppes
- Tates Creek Road at Malibu Drive/Merrick Drive
- Tates Creek Road at New Circle Road Inner Loop
- Tates Creek Road at New Circle Road Outer Loop
- Tates Creek Road at Gainesway Drive
- Tates Creek Road at Redding Road/Armstrong Mill Road
- Tates Creek Road at Laredo Drive/Old Tates Creek Road
- Tates Creek Road at Wilson Downing Road/Appian Way
- Tates Creek Road at Park Place Boulevard/Tates Creek Centre Drive
- Tates Creek Road at Man o' War Boulevard

Introduction and Objective ...

With the support of a dedicated portion of funds from the Surface Transportation Block Grant Program - Lexington (SLX), LFUCG TE has taken great effort to enhance and develop Lexington's Intelligent Transportation Technologies (ITS) and traffic management operations over the past few decades. TE's goals have always been to achieve greater transportation safety and efficiency while also reducing congestion and collisions. Lexington has invested in many key ITS projects that have produced significant improvements in our transportation system including better signal coordination and increased efficiency in identifying and resolving traffic issues. We continue to see advancements and technological growth partnered with increased valuable traffic and travel data that originates not only from our own ITS systems, but also from other sources including some of our third-party data vendors and even crowd-sourced travel information. This multitude of data will play an essential part going forward as we work to further improve traffic operations throughout the city. With this project, TE aims to capitalize on traffic system and travel data to evaluate and improve traffic flow and signal timing on an on-going basis.

Background ...

LFUCG TE is responsible for the maintenance of traffic signals at 387 intersections along with 14 lane use controllers. These include signals owned by Lexington and also signals along state routes owned by the Kentucky Transportation Cabinet (KYTC). All traffic signal controllers are 2070L typically housed inside 332 signal cabinets. 150 locations are equipped with AXIS traffic observation quad view cameras (models Q-6000-E and Q6010-E), 97 of which have an additional Pan, Tilt, and Zoom (PTZ) camera mounted (models Q-6055 and Q-6075-E). Vehicular detection consists mainly of magnetic loops, Iteris RZ4 cameras with Vantage Edge video processors, and Wavetronix Matrix and Advance radar units along with a few FLIR thermal detection cameras, Gridsmart video detection, Currux Vision video detection, ITS Plus video detection, and EVO radar detection units.

TE recently migrated its central traffic signal software to Q-Free's Mobility platform after adopting MaxView and then Kinetic Signals years previous. High Resolution data is collected at all signals. Signalized intersections run MaxTime traffic control software locally (current version 2.15.0).

Communications primarily consist of 100± miles of single mode fiber optic cable. This fiber along with last-mile radio and fixed wireless connections have afforded TE the benefits of fast and reliable data connection to 95% of the traffic signals operating in Lexington.

LFUCG has a subscription to Streetlight Data Insights that provides us with traffic turning movement counts along with other traffic system analytics. Lexington also partners with Waze. The use of this or other crowd-sourced data would be welcomed for incorporation into the project where applicable. TE desires to leverage its existing investment in ITS equipment data collection where practical, but also recognizes that gaps in this information need to be addressed for this project. Existing equipment will likely require additional calibration and setup to capture necessary data required for typical ATSPM and other related traffic reporting.

This project is partially funded by federal grant and must be in full compliance with all existing federal transportation requirements.

PROJECT INTERSECTION MAP & INFORMATION

Tates Creek Road (KY1974) – (14 intersections)
(with Existing Vehicle Detection Noted)

Vehicle Detection Key:

(*L*)	Loops
(*V*)	Video – Iteris (RZ4 cameras & Vantage Edge)
(R_M)	Radar – Wavetronix Matrix at Stop Bar
(R_A)	Radar – Wavetronix Advance

- Alumni Dr (*mainline thru & lefts: R_M, side streets: V*)
- Old Mount Tabor Rd (*mainline left & side street: V*)
- Albany Rd (*mainline lefts & side streets: V*)
- Lansdowne Dr (*mainline lefts & side streets: V*)
- Dove Run Rd (*OB left V, IB left & side streets: L*)
- Malabu Dr/Merrick Dr (*mainline lefts & WB: L, EB: V*)
- New Circle Rd Inner Loop) (*all movements: R_M*)
- New Circle Rd Outer Loop) (*all movements: R_M*)
- Gainesway Dr (*mainline left and side street: L*)
- Redding Rd (*IB thru & mainline lefts: L, EB thru&left:V*)
- Laredo Dr (*mainline lefts and side streets: L*)
- Wilson Downing Rd/Appian Way (*all movements: L*)
- Park Place Blvd (*all movements L, WB side street: V*)
- Man o' War Blvd (all movements: *R_M, with R_A IB & OB*)

Device Communications: Fiber Optic extends the length of Tates Creek Rd. & Man o' War Blvd. in this area.

Axis Quad View Traffic Observation Cameras
(additional **PTZ** cameras are noted):

- Tates Creek Rd and Alumni Dr
- Tates Creek Rd and Albany Rd
- Tates Creek Rd and New Circle Rd Inner Loop (**PTZ**)
- Tates Creek Rd and New Circle Rd Outer Loop (**PTZ)**
- Tates Creek Rd and Armstrong Mill Rd
- Tates Creek Rd and Wilson Downing Rd
- Tates Creek Rd and Man o' War Boulevard (**PTZ**)

Below locations are not within project limits but are adjacent

- Tates Creek Rd and Cooper Dr
- Tates Creek Rd and Rockbridge Rd
- Alumni Dr and Chinoe Rd
- Man o' War Blvd and Saron Dr
- Man o' War Blvd and Crosby Dr

General Requirements ...

1. ATSPM system capabilities and performance shall:
    a. Report operations and metrics for standard Purdue ATSPMs including at a minimum:
        i. intersection demand.
        ii. gap outs per intersection.
        iii. max outs per intersection.
        iv. force offs per intersection.
        v. average stop delay per approach per movement.
    b. Identify corridor operations and provide arrivals on green.
    c. Send email or software configurable alerts to users based on definable triggers.
    d. Send alerts when there are database errors or irregularities
    e. Be able to provide alerts on operational performances for intersections and the corridor.
    f. Identify hardware and software faults at each intersection.
    g. Be capable of identifying intersection operation problems including intersection delay, split failures and left turn gaps.
    h. Provide specific recommendations and signal timing adjustments to address intersection operation problems including intersection delay, split failures and left turn gaps.
    i. Be capable of identifying corridor operation problems including approach delay and coordination.
    j. Provide specific recommendations and signal timing adjustments to address corridor operation problems including approach delay and coordination.
    k. Be compatible with existing controllers, signal detection and cabinet hardware.
    l. Be capable of using multiple detection types for analysis including radar, video, and loops.
    m. Be scalable and capable of expansion to monitor up to 400 traffic signals
    n. Be ready as a completed product and not requiring additional major development.
    o. Provide signal timing information including splits, offsets, and coordinated phase detector actuation for each intersection.

Documents and Reports ...

2. ATSPM document and reports requirements shall include:
    a. Historical and real-time corridor operations reports and comparisons
    b. Reports of faults and alarms
    c. Reports of user modifications and activities.
    d. A log of software functions that shall be created and time stamped.
    e. Normal operational logs
    f. Reports of Measures of Effectiveness of the state of the controller at all times. Reports shall be stored and available for a minimum of 60 days and the number of days shall be user configurable depending on storage available to TE.
    g. Historical and real-time maintenance/downtime reports.
    h. Historical and real-time traffic condition reports.
    i. Historical and real-time system performance reports.
    j. Reports that are customizable by date and time, automated, and query specific
    k. Easily accessible storage of logs, alarms, and reports for TE's use.

l. Configurable data dashboards.
m. Configurable performance measures (e.g., approach delay, Purdue split failure, number of preemptions, etc.) shown on dashboards.
n. Intersection reports capable of providing a comparison of current operations with past performance.
o. Red light running reporting

Network and Access ...

3. The ATSPM solution shall:
    a. Have security management and administrative system that allows access and operational privileges to be assigned, monitored, and controlled by an administrator, and conform to LFUCG's technology and cybersecurity policies
    b. Maintain up-to-date security patches and updates where applicable.
    c. Allow remote access to ATSPM components.
    d. Allow access by up to 10 operators simultaneously.

Training ...

4. The vendor shall provide:
    a. Initial basic component training for the ATSPM for TE staff.
    b. Advanced training six to eight (6-8) weeks after the initial ATSPM training for up to five (6) of TE's staff. The number of hours committed to advanced training shall be set by the manufacturer and approved by the City.
    c. Three (3) hard copies and an electronic copy of the user manuals for the software that include set-up, configuration, and operations for any software component installed as part of this project.

Maintenance ...

5. The vendor shall:
    a. Provide maintenance support for the ATSPM software.
    b. Provide phone, email, or web-based electronic support for a minimum of one (1) year including cloud service (if required), maintenance, and troubleshooting.
    c. Notify TE when new software updates are available. Software updates shall be included for a minimum of one (1) year after final acceptance.
    d. TE shall be notified of any ATSPM software issues or failures.

Installation Requirements ...

6. All equipment and software for the ATSPM solution shall be installed according to the manufacturer's recommendations for a complete and operational system. The ATSPM shall not interfere with the existing traffic signal central software or local traffic signal controller software. All software must make every reasonable effort to conform to applicable LFUCG policies for technology and cybersecurity. This includes keeping security patches up-to-date.

Initial Signal Timing ...

7. Initial Signal Timing shall include:
    a. Timing pattern parameters that cover seven (7) days per week for all fourteen (14) intersections included in this project.
    b. Timing patterns that transition to address traffic patterns and volumes as they change throughout the day.
    c. A regularly expected schedule of beginning and ending times for each traffic pattern
    d. A sufficient number of different traffic patterns (or sets of traffic parameters) to accommodate observable and measurable differences in traffic flow throughout the day on normal weekdays, Saturdays, and Sundays.
    e. Timing pattern parameters that include values for the following criteria at a minimum:
        i. Cycle lengths
        ii. Offsets
        iii. Phase splits
        iv. Phase sequences
        v. Minimal disruption to traffic flow while transitioning between timing patterns or different timing parameters
    f. Timing pattern parameters to be used in case of disruption in operation if the solution includes any form of automatic traffic operation such as traffic adaptive or traffic responsive
    g. Timing pattern parameters *may* include the following criteria in addition to the above minimum criteria in (e.) to improve signal performance:
        i. Phase timing parameters available within MaxTime signal controller software.
        ii. Phase option parameters available within MaxTime signal controller software.
        iii. Coordination Parameters including coordination modes, max modes, coordination gap out, and force off modes available within MaxTime signal controller software.
        iv. Any other useful parameters to improve traffic flow that is available within MaxTime signal controller software.
    h. Implementation of all signal timing pattern parameters by a qualified professional engineer for all fourteen (14) intersections. Remote access to the project signals can be made available. Any deviations for this step should be discussed within the proposal. Note that TE staff can be available to assist or complete this step if needed and in which case, this should be reflected in the lump sum for the total project. TE also reserves the right to complete this programming implementation step based on costs, affordability, or available project funding.

Provided Information ...

8. TE can provide the following information upon request:
    a. Access to current traffic signal timing programming from MaxTime traffic signal controller software.
    b. Access to high resolution data from the 2070 traffic signal controllers.

c. Synchro (version 12.0) traffic model which includes signal timing parameters, geometry, and 2023 traffic turning movement count volumes from Lexington's Streetlight Data subscription. The model includes the traffic plans that operate during each time period throughout the day on all days of the week for all project intersections.

Type text her

d. Access to any available Streetlight Data information that may be obtained under Lexington's current subscription during the time of this project
e. A "suitcase tester" and signal controller can be made available to test timing parameters prior to implementation at the LFUCG TE offices.
f. A "sandbox" intersection for testing purposes can also be created and made available within the Mobility central signal software.
g. Note that all pedestrian and all clearance intervals were calculated and implemented as part of a previous city-wide project and therefore will not be part of the current project. This data is available within existing signal timing programming.

Proposal Requirements ...

9. Proposals shall include the following for consideration:

    a. A detailed description of your approach and plan of action to provide the ATSPM solution and signal timing optimization. This should also include the intervals that signal timing adjustments or automations will be made available and a description of the traffic timing parameters that will be included.
    b. A proposed timeline including milestones for completion of the project.
    c. Experience and background relevant to the project along with similar past projects with other municipalities.
    d. Project pricing should be included for budgeting purposes but will not be considered as part of the selection criteria. We also request that pricing be included for scalability such as cost for additional intersections along with costs for extended periods of signal timing adjustment recommendations.

Selection ...

10. Selection of the vendor or consultant for this project will be based on the following criteria:

    a. Evaluation of the approach and methodology described in the submitted proposal (25%)
    b. Specialized experienced and technical competence of the vendor, firm, or consultant (including a joint venture or association) with the type of service required (20%)
    c. Familiarity with this or similar projects including those of similar scope, population size, traffic patterns, or traffic network layout (15%)
    d. Past record and performance on contracts with LFUCG or other governmental agencies and private industry with respect to such factors as control of cost, quality of work and ability to meet scheduling (15%)
    e. Content, quality, completeness and form of submitted proposal (15%)
    f. Capacity of vendor, firm, or consultant to perform the work and in a timely manner (10%)

Measurement and Payment ...

11. The ATSPM solution shall be measured as a lump sum and will be paid monthly based on work completed. This will include ATSPM reporting functionality, work completed toward the initial signal timing, and provision of ongoing signal timing adjustment recommendations. The bid price shall include furnishing, installing, integrating, training, documentation, and testing of the ATSPM solution. The bid price should include initial signal timing plan development and six (6) months of signal timing adjustment recommendations. The bid price shall include all incidental items to provide and install the ATSPM solution as intended. Satisfactory completion of all testing requirements and all work, equipment and appurtenances as required for the functionality of the ATSPM solution is required. The bid price shall include all system documentation including operations and maintenance manuals, and other materials necessary to document the operation of the ATSPM system. The bid price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work.

    Payment for the ATSPM solution will be done monthly and will be based on work completed. It is the responsibility of the vendor to promptly invoice TE and details of work completed must be presented with each invoice.

Reservation of LFUCG Rights ...

A. LFUCG reserves the right, after scoring all proposals, to hold virtual or in-person interviews with top qualified vendors, firms, or consultants that would include presentations or demonstrations of their proposed solution.
B. LFUCG reserves the right to negotiate all elements of work that comprise the selected proposal. In the event an agreement/contract cannot be reached, LFUCG reserves the right to negotiate an agreement/contract with the next highest scoring qualified finalist.
C. LFUCG reserves the right to negotiate an agreement/contract for the this project with the next most qualified finalist if the successful finalist does not execute an Agreement/Contract within ten (10) business days after submission of an agreement to such offer.
D. LFUCG reserves the right to terminate the agreement if the vendor, firm, or consultant fails to commence the work described herein upon giving the Vendor a 30-day written Notice of Award.

LEXINGTON

RFP #33-2025 Automated Traffic Signal Performance Measures (ATSPM) and Timing

Optimization Solution

September 2025

September 29, 2025

Director, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, 3rd Floor Lexington, Kentucky 40507

Re: RFP #33-2025 Automated Traffic Signal Performance Measures (ATSPM) and Timing Optimization Solution

Dear Director of Procurement:

The City of Lexington is seeking a signalization solution to modernize and optimize traffic signal operations, reduce congestion and collisions, enhance corridor efficiency, and make use of their ITS investments while setting up a scalable pilot program that can expand citywide.

Path Master, Inc. is pleased and excited to provide this response to the request for procurement of Automated Traffic Signal Performance Measures (ATSPM) and Timing Optimization Solution. Path Master offers expertise, local knowledge, and a proven record of delivering Intelligent Transportation Systems (ITS) across Kentucky, Ohio, West Virginia, and Pennsylvania. Path Master has provided transportation solutions across our territory for decades, with many ATSPM and Optimizations solutions deployed, supported, and managed.

Path Master has partnered with Flow Labs and WSP to bring together a team with proven industry leadership, advanced technology solutions, and deep local engineering expertise. This partnership is built on shared values, innovation, agility, and a strong commitment to improving the safety and efficiency of transportation systems. We offer a comprehensive turnkey approach, designed to achieve the project's primary objectives while maintaining flexibility to support future goals. Our team's extensive knowledge of LFUCG as-built systems, combined with years of experience in deploying Automated Traffic Signal Performance Measures (ATSPM), and implementing timing optimization solutions, positions us as a trusted partner for this initiative. With a strong local presence, we are uniquely equipped to deliver consistent, hands-on support throughout the life of the project. From initial deployment through completion, our team will remain fully engaged to ensure project success and long-term value for LFUCG.

TABLE OF CONTENTS

Contents

SECTION 1 | PROJECT TEAM

Path Master has assembled a highly qualified project team to support LFUCG in achieving its project goals. Serving as the project manager and single point of contact, Path Master will ensure seamless coordination, clear communication, and successful project delivery.

As a leading Intelligent Transportation Systems (ITS) company, Path Master specializes in the deployment and operation of advanced transportation technologies, including centralized traffic management systems, signal optimization and adaptive signal control, communications infrastructure, connected vehicle technologies, emergency vehicle preemption, transit signal priority (TSP), detection solutions, and integrated ITS applications.

With 49 years of proven experience, Path Master has successfully delivered projects of all sizes—from targeted traffic signal upgrades to large-scale, technically complex ITS implementations. Our long-standing reputation is built on customer service and support, technical expertise, innovation, and a commitment to improving safety, efficiency, and mobility for the communities we serve.

As a teaming partner on the Tates Creek Road optimization project, Flow Labs is serving as the ATSPM and Optimization solution provider for this proposal and will be responsible for the delivery and deployment of *Luminus Plus* and *Optimus*—Flow Labs' advanced ATSPM and signal optimization platforms. This includes all system customizations, future enhancements, ongoing maintenance, as well as the provision of software and technical support services to project stakeholders. Flow Labs will also source and integrate new datasets to further expand platform functionality, ensuring a continuously evolving and future-ready solution for the City of Lexington.

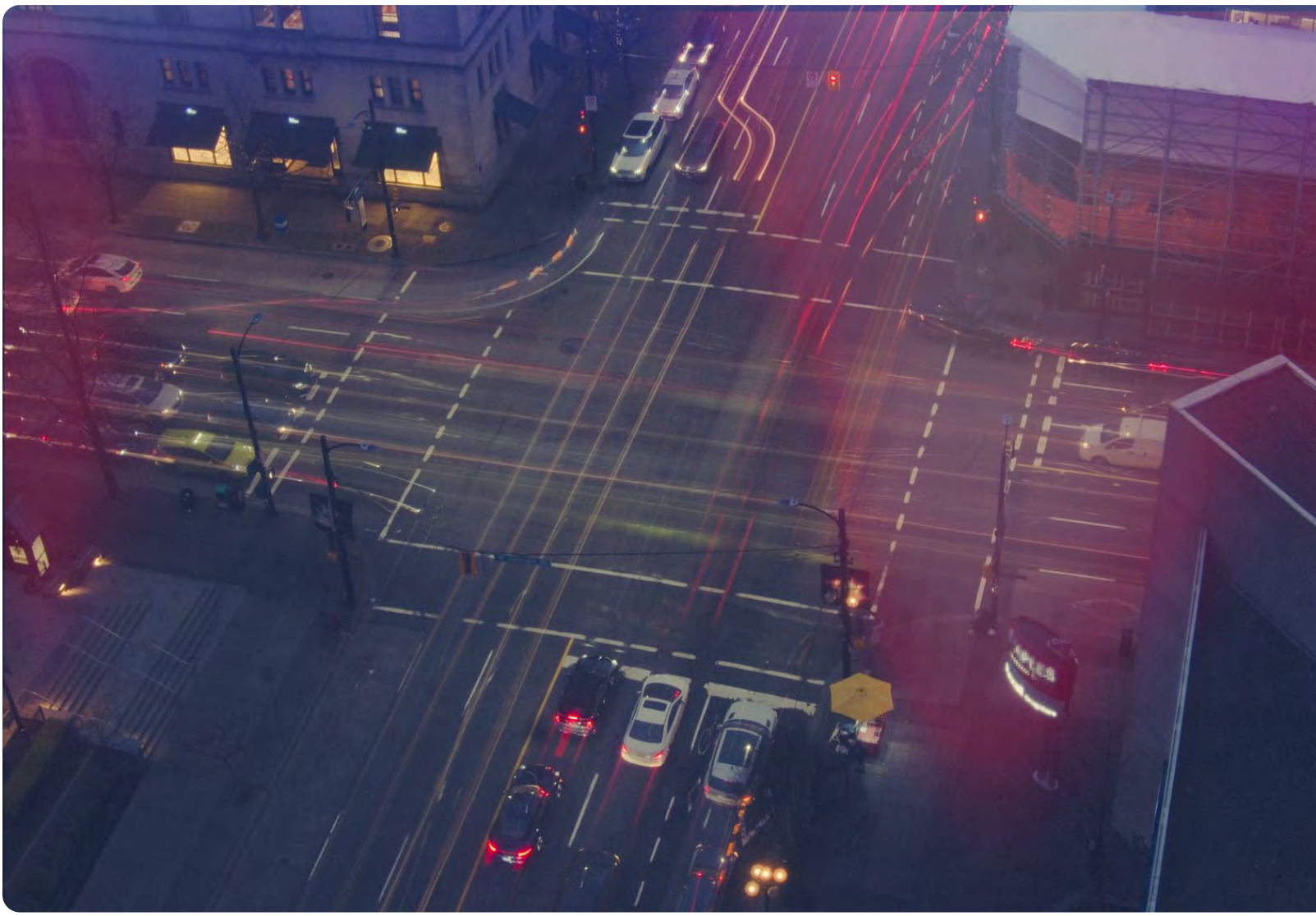
Founded in 2016 in Oakland, California, Flow Labs delivers cutting-edge, data-driven software solutions designed specifically for transportation agencies. Our expertise spans traffic signal optimization, artificial intelligence and machine learning, software platform development, geospatial data processing, connected vehicle data integration, decision support systems, and traffic signal control systems. The Flow Labs team is composed of academic researchers, software engineers, transportation technologists, and AI specialists, with over 50 years of combined experience in the design, development, and deployment of advanced traffic management solutions. Flow Labs is also supported by an advisory board that includes Malcolm Dougherty, former Director of Caltrans, and Scott Belcher, former CEO of ITS America—bringing nationally recognized leadership and domain expertise to our work.

Flow Labs excels in handling complex geospatial and crowd-sourced probe data, including systems integration, API development, and multi-source data processing. Leveraging artificial intelligence and machine learning, the team has developed industry-leading methods to cleanse and validate data, achieving 94.4% accuracy rates in verified studies. This high level of precision ensures that transportation agencies can trust the insights generated by Flow Labs' platforms, which form the foundation of mission-critical traffic signal performance measurement, monitoring, safety analytics, and optimization.

Flow Labs has pioneered the development of *Luminus Plus* and *Optimus* platforms that enable agencies to monitor, analyze, and optimize transportation networks without relying on in-field hardware—delivering cost-effective, scalable, and reliable solutions. These platforms have been validated extensively, most notably by the Florida Department of Transportation (FDOT). Following a rigorous evaluation, FDOT selected Flow Labs' *Luminus Plus* for deployment across 2,000 intersections, creating the largest integrated signal performance measures system in the United States. This proven record of large-scale, complex deployment underscores Flow Labs' ability to deliver transformative, high-impact transportation technology projects.

WSP is a global leader in engineering, design, and professional services, delivering innovative solutions across infrastructure, environment, energy, transportation, and the built environment. With roots dating back to the 1960s and headquartered in Montréal, Canada, the firm has grown into one of the world's premier consultancies, employing tens of thousands of professionals in more than 40 countries. Its growth has been driven by strategic acquisitions, including Parsons Brinckerhoff in 2014, that have expanded WSP's capabilities and positioned them as a trusted partner for complex, high-profile projects worldwide.

WSP's strength lies in combining global scale with deep local expertise. The company provides integrated engineering, advisory, and environmental services that help clients meet today's infrastructure and sustainability challenges. Known for its ability to manage technically demanding projects, WSP places strong emphasis on resilience, innovation, and climate-conscious design. Their commitment to sustainability and inclusive practices reinforces its reputation as a forward-thinking partner, capable of delivering solutions that balance technical excellence with social and environmental responsibility.



Flow Labs Proposed Solution

Introduction

The Lexington-Fayette Urban County Government (LFUCG) has made clear its commitment to advancing traffic management through data-driven, intelligent transportation solutions. The Division of Traffic Engineering's (TE) request for an Automated Traffic Signal Performance Measures (ATSPM) system builds on that foundation, seeking to expand visibility into signal operations, improve coordination, and deliver safer, more efficient travel for residents and visitors.

Flow Labs' Integrated Signal Performance Measures (ISPMs) platform, known as *Luminus Plus*, aligns directly with these objectives and even takes them a step further. ISPMs combine high-resolution controller event data (traditional ATSPMs) with high-penetration probe vehicle data (Probe-based SPMs) to provide a real-world, cross-validated single source of truth for signal performance. This best-in-class and one-of-a-kind approach enables LFUCG to continue its leadership in traffic signal management by delivering real-time & historic visibility, high-quality analytics & diagnostics, and easy-to-use reporting across the entire signal network. With *Luminus Plus*, LFUCG will be equipped to identify issues faster, validate improvements with confidence, and sustain the City's reputation for applying innovative, effective tools to achieve its transportation goals.

In addition to the ISPM solution, LFUCG has the option to leverage **Optimus**, Flow Labs' signal timing optimization platform, as a complementary tool. Flow Labs *Luminus Plus* solution can provide all of the data collection, analytics, and before-after reporting needed to support manual signal retiming studies, and Flow Labs is fully prepared to support LFUCG in this approach. However, Optimus offers a first-of-its-kind, AI-driven alternative that enables agencies to generate optimized timing plans in seconds and forecast outcomes using real world, real observed trajectory data points from probe vehicles and ATSPMs. To ensure a best-of-both-worlds solution, Flow Labs is comfortable with any deployment model LFUCG prefers—traditional, Optimus-driven, or hybrid. WSP, a trusted LFUCG partner, has been added to the Path Master and Flow Labs team and is fully capable of providing traditional signal retiming support. Additionally, in the hybrid approach, WSP can perform validation and benchmarking using established retiming methodologies, while Optimus accelerates plan generation and testing. This allows LFUCG to benefit from both the rigor of traditional engineering methods and the innovation of advanced optimization technology, with ISPMs serving as the foundation for continuous measurement and validation.

By integrating advanced performance measurements with automated optimization, Flow Labs ensures that the City of Lexington will not only have continuous visibility into how signals are performing today, but also the tools to proactively improve them tomorrow. The following section outlines our detailed approach and plan of action for delivering the requested ATSPM solution and signal timing optimization system, either via Optimus or through more traditional signal retiming efforts completed by WSP.

Approach and Plan of Action

Integrated Signal Performance Measures (ISPMs)

Flow Labs will provide the City of Lexington with a comprehensive ISPM solution through our *Luminus Plus* platform. Unlike traditional ATSPM systems that rely solely on controller or detection data, *Luminus Plus* **integrates controller-based ATSPM data with high-penetration probe vehicle data** to deliver a complete, validated view of signal performance. This cross-validated data approach ensures higher data accuracy than traditional SPM solutions and provides visibility in locations with detection gaps or degraded infrastructure.

Key elements of the ISPM approach include:

- **Unified Data Intelligence**: Combining controller logs and probe trajectories into a single platform for end-to-end visibility of signal operations.
- **Real-Time Performance Monitoring**: Detection of split failures, arrivals on green/red, queue lengths, red-light running, and delay in near-real time.
- **Automated Diagnostics**: Root-cause identification for degraded performance, including detection faults, coordination drift, or phase utilization issues.
- **Defensible Reporting**: Automated before-and-after evaluations to measure the impact of timing changes, capital projects, or corridor studies.

This unified approach reduces false alerts, accelerates diagnostics, and ensures the City has a single source of truth for both operational and strategic decision-making. Although *Luminus Plus* is a one-of-its-kind integrated SPM solution, it offers all the capabilities (and more!) of a traditional ATSPM platform. To best demonstrate this to LFUCG's TE, we've responded to each of the ATSPM requirements directly (highlighted in **blue**) and included screenshots of what these capabilities look like within *Luminus Plus*.

General Requirements

1. ATSPM system capabilities and performance shall:
   a. Report operations and metrics for standard Purdue ATSPMs including at a minimum:
      i. intersection demand. Figure 1.
      ii. gap outs per intersection. Figure 2.
      iii. max outs per intersection. Figure 2.
      iv. force offs per intersection. Figure 2.
      v. average stop delay per approach per movement. Figure 3.

      Flow Labs' *Luminus Plus* solution meets and exceeds the requirements to report operations and metrics for standard Purdue ATSPMs. A full list of operational performance metrics can be found in the List of Performance Measures document appended to this response. For each of the specific metrics above, a screenshot below has been provided. Figure numbers have been added alongside each for quick reference. Additionally, a number of ATSPM charts, including Purdue Coordination Diagrams (Figure 4), Phase Termination Diagrams (Figure 5), and Split Monitor Diagrams (Figure 6) are available.

Figure 1 - Intersection Demand. Collect vehicle turning movement counts, corridor volumes, and speed data with sub-1 minute latency and no additional infrastructure. Explore diagnostic histograms, time series charts, and TOD visuals to better understand why issues occur. Immediately identify non-recurring congestion, major queues, and incidents and alert/notify instantly when issues arise.

Figure 2 - Standard ATSPMs. As defined in Flow Labs Performance Measures appendix, ISPMs offer all the standard Purdue ATSPMs, including Gap-Outs, Max-Outs, Force-Offs, and Skips. Flow Labs provides diagnostic, time of day, and time series charts for each metric.

Figure 3 - Average Delay per Approach per Intersection. Flow Labs provides Average Delay and Median Delay per approach per intersection. This can be visualized via the cross-sectional chart (shown above) or on a time series or time of day chart. Users can also click into these individual phases to get a detailed diagnostic of LOS and delay on a per vehicle basis.

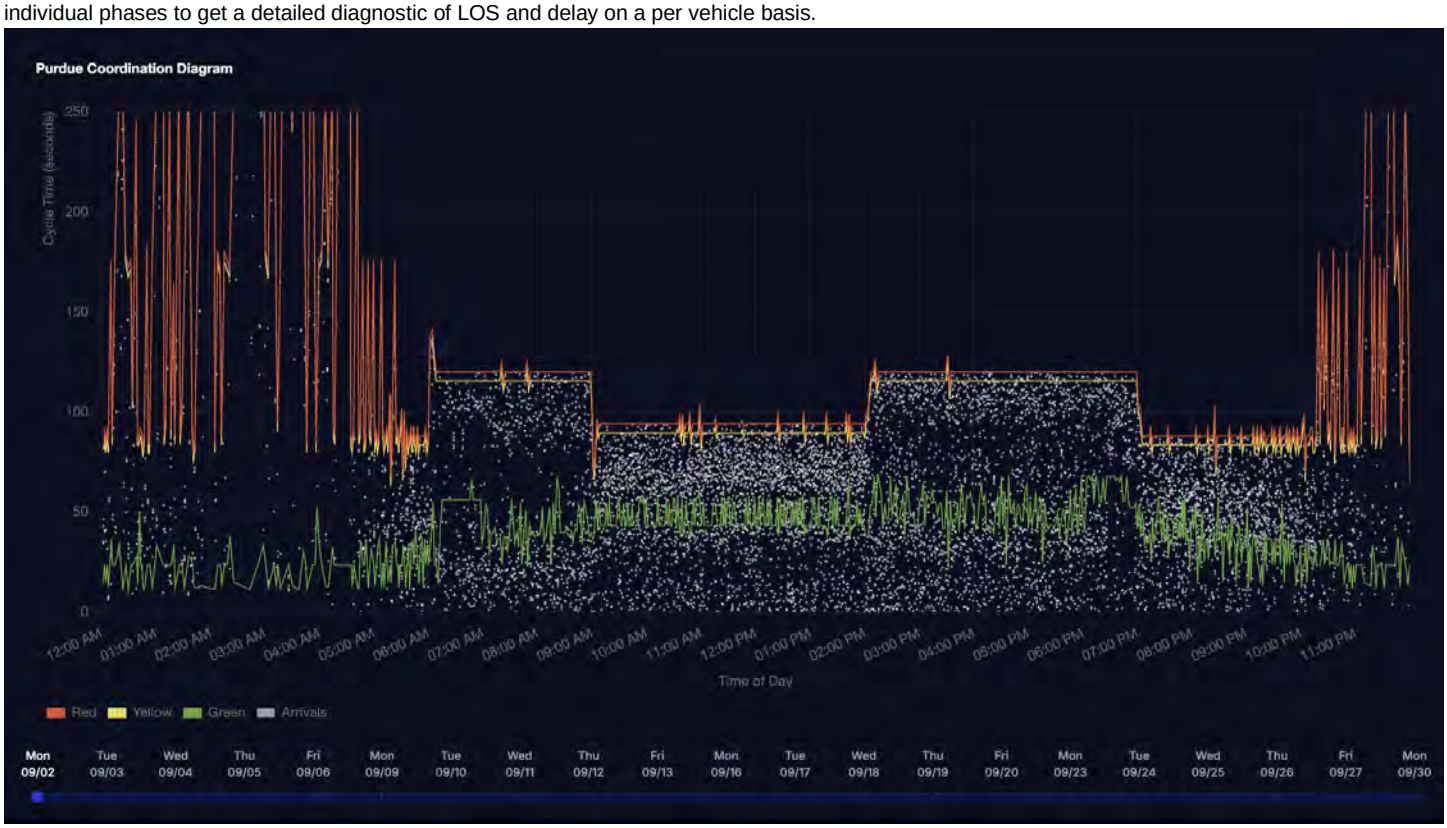


Figure 4 - Purdue Coordination Diagram. Flow Labs offers a new spin on traditional ATSPM charts such as Purdue Coordination Diagrams. Easily slide the scale from day to day to see changes in arrival patterns across weekdays, weekends, or specific days in time.

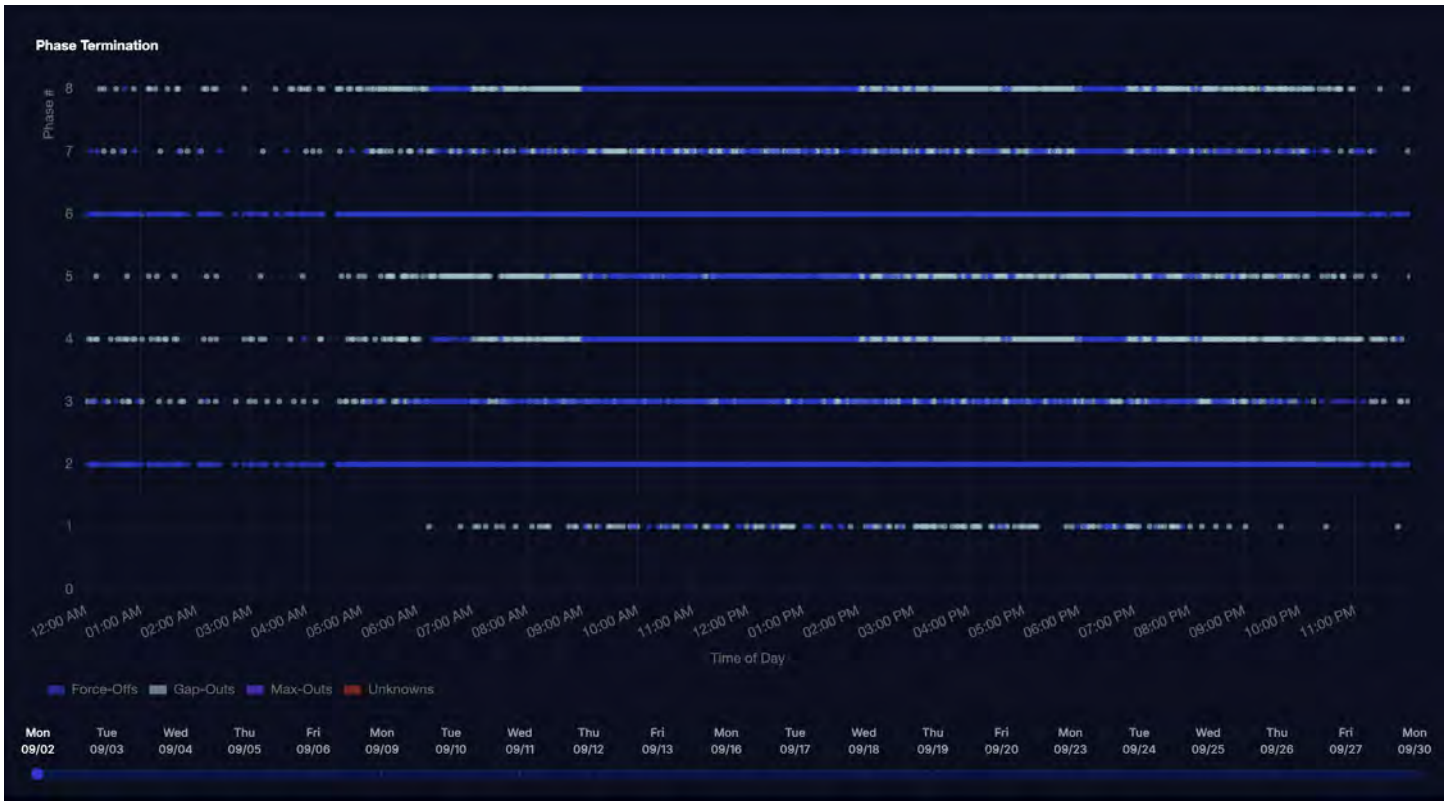


Figure 5 - Phase Termination Diagram.

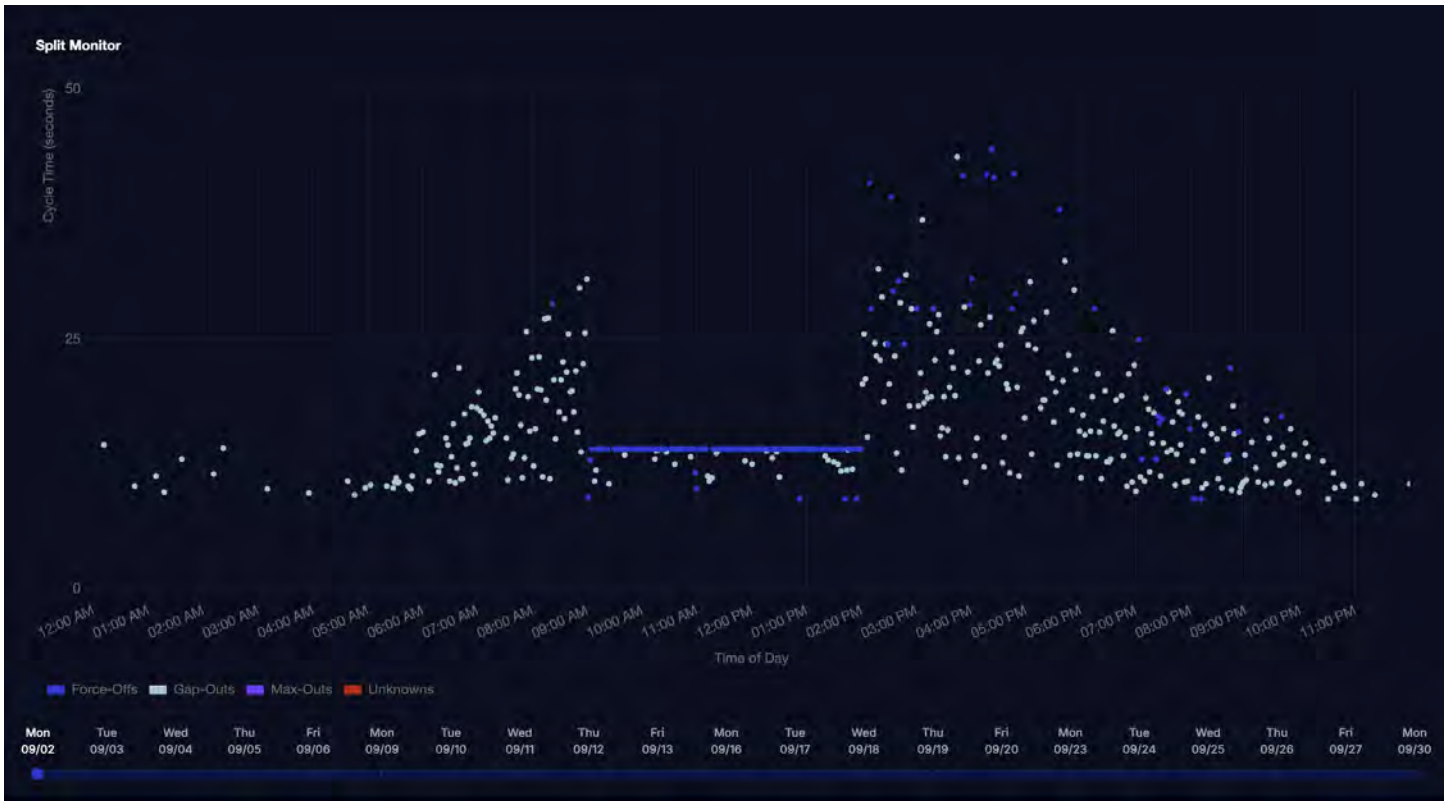


Figure 6 - Split Monitor.

b. Identify corridor operations and provide arrivals on green.

Luminus Plus offers unparalleled corridor operations and arrivals on green (AOG) diagnostics. Using the Cerberus proactive monitoring tool, Users can rank corridors, intersections, and individual phases using custom health scoring specific to the area of coverage. AOG is just one of the metrics that can be used to evaluate corridor performance (see Figure 7). Flow Labs' AOG visualizations come with cross-section, diagnostic, time series, and time of day graphs for easy evaluation (see Figure 8).

Figure 7 - Corridor Operations and AOG. Easily evaluate corridor operations and performance using a number of performance metrics including AOG. *Luminus Plus* visualizes these metrics using cross-section charts to easily see where AOG is the highest or lowest or if there are any outliers.

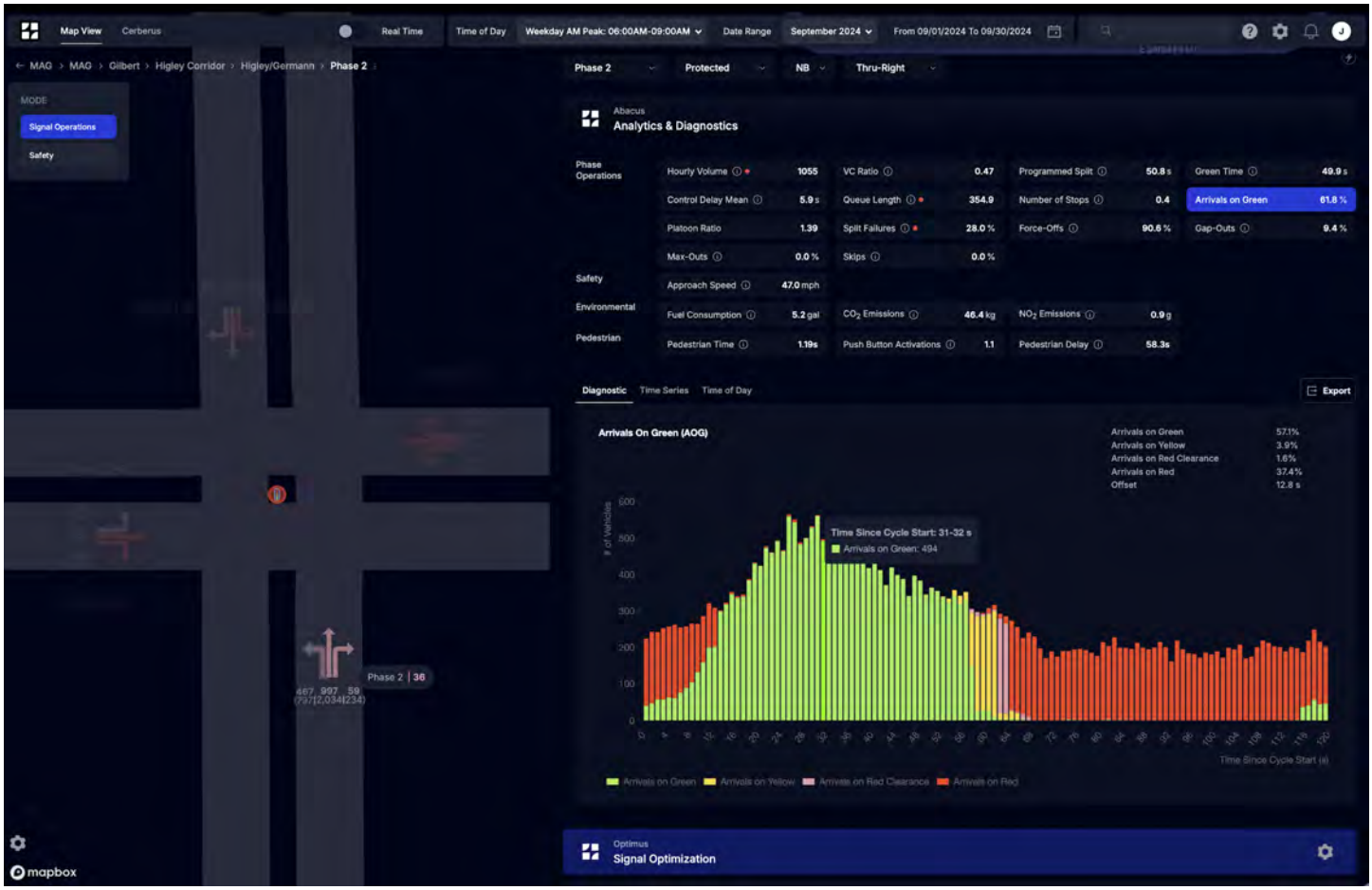


Figure 8 - Arrivals on Green. Drill down into an individual intersection and phase to see advanced AOG charts to better understand if the intersection is effectively handling high demand of vehicles on an ongoing basis. This one-of-its-kind diagnostic shows the number of vehicles and when they arrive at the intersection based on the Time Since Cycle Start**.** This is just one of the ways Engineers can understand approach delay and coordination.

c. Send email or software configurable alerts to users based on definable triggers.
Luminus Plus offers robust email and software configurable alerts to users based on a number of definable triggers (see Figure 9). Daily, weekly, monthly, etc. email reporting is also available and configurable.

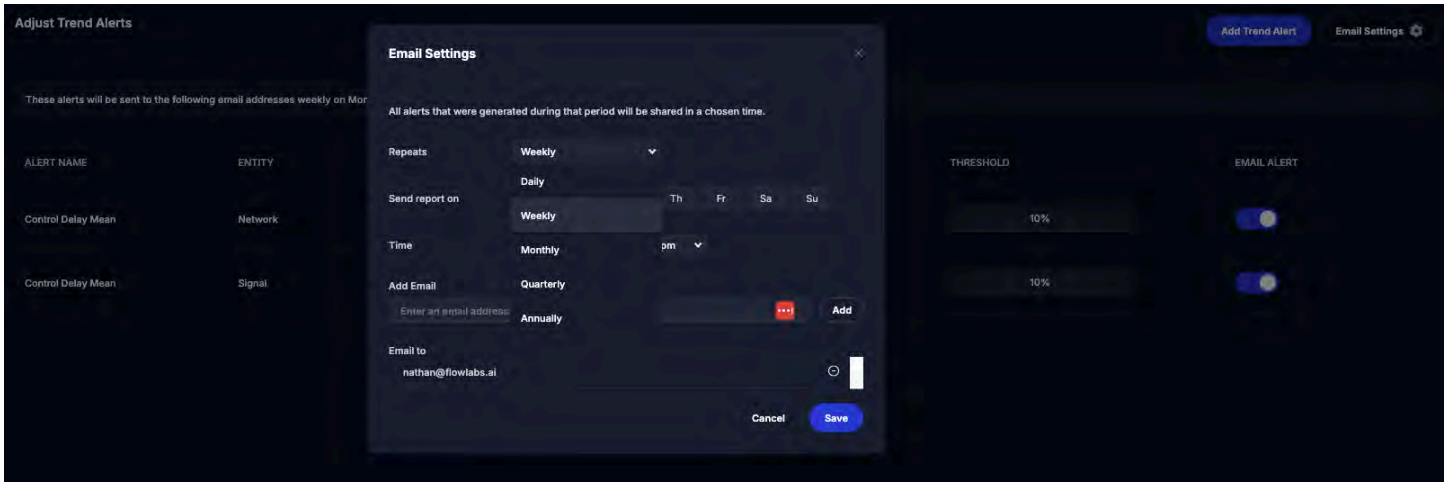


Figure 9 - Email Settings.

d. Send alerts when there are database errors or irregularities

Threshold alerts are generated whenever a metric deviates outside the user-defined thresholds. Users can define minimum and maximum thresholds for various metrics at the network, intersection, and phase level inside System Settings (see Figure 10).

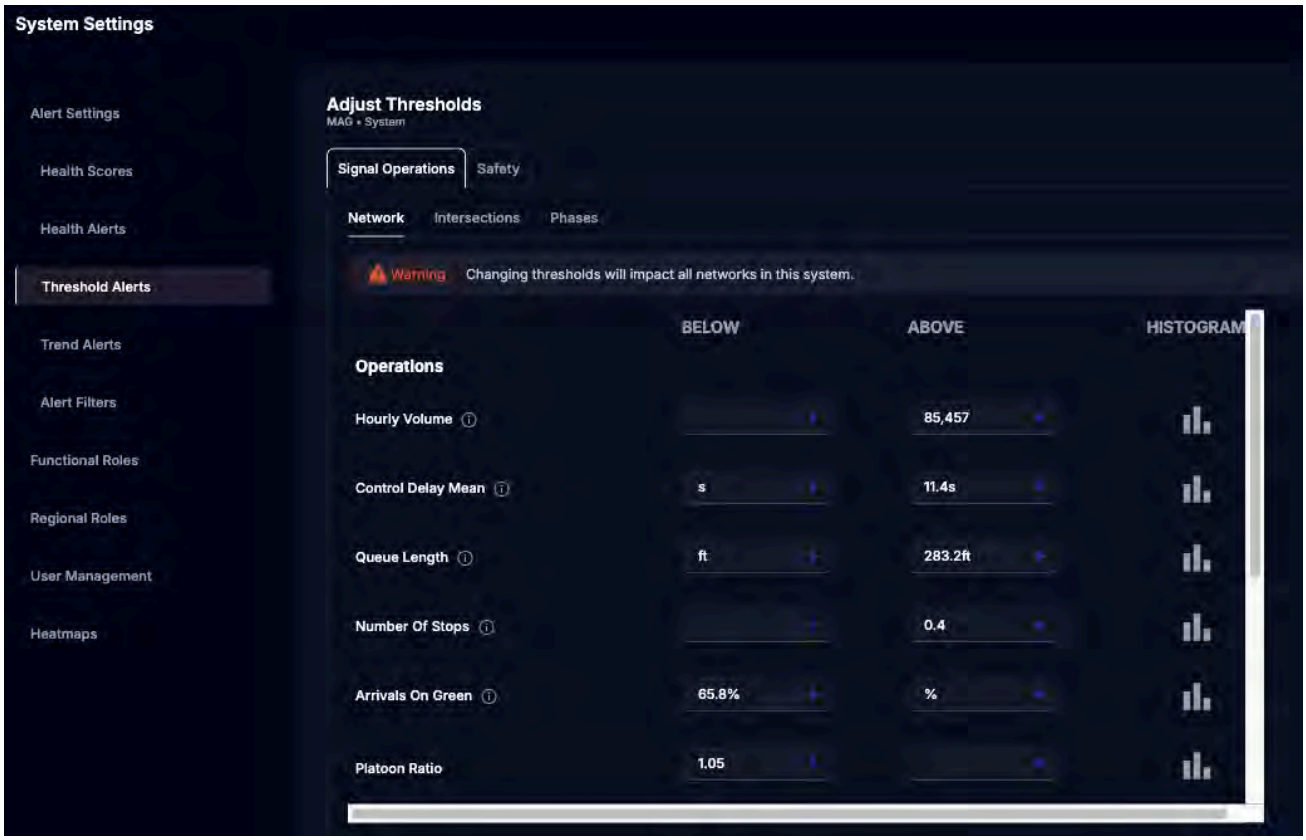


Figure 10 - Adjustable Thresholds.

e. Be able to provide alerts on operational performances for intersections and the corridor.
Health scores are generated for each entity in the Flow Labs Platform by assigning percentile values to each metric and multiplying by a user-defined weightage. Users can adjust the relative weightings of the metrics to influence the health scores and define how often and under what conditions they receive Health Alerts. Users can select:

- The time period over which Health Scores are tracked
- The threshold over which a change in Health Score will generate an alert

Flow Labs will provide an estimated daily number of alerts based on historical data to allow users to control their alert frequency (see Figure 11).

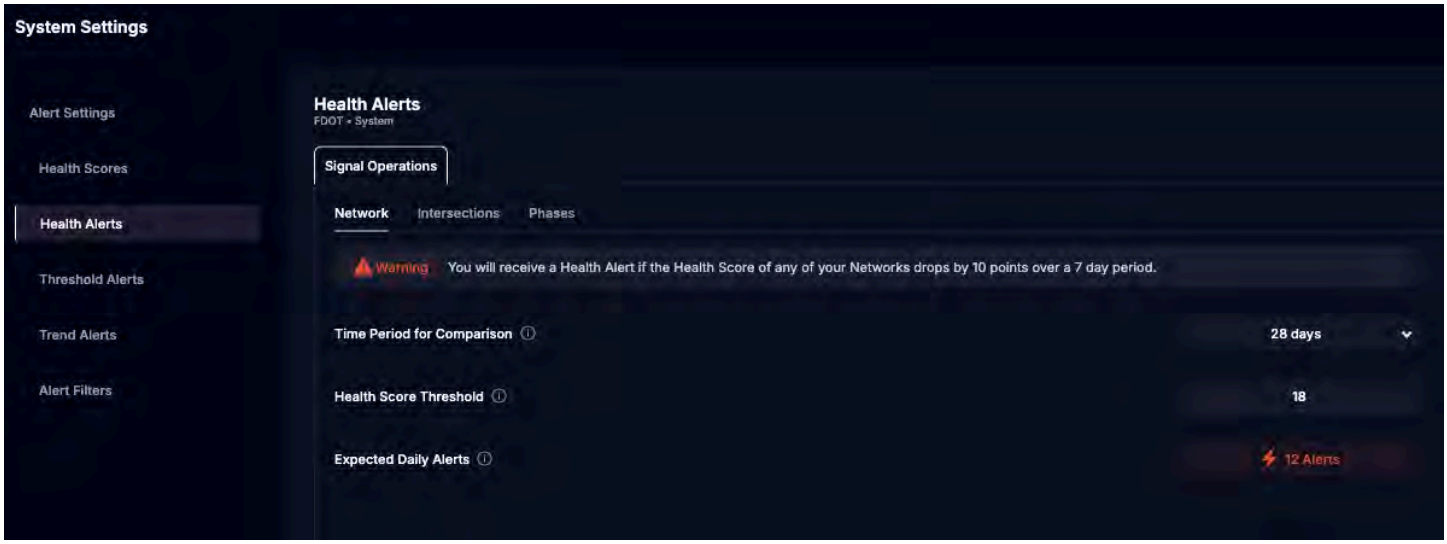


Figure 11 - Health Alerts.

f. Identify hardware and software faults at each intersection.
Luminus Plus provides unique hardware and software fault detection through its integrated data architecture, which combines probe vehicle data with ATSPM data. Beyond the standard fault alerts generated by ATSPMs, *Luminus Plus* tracks probe vehicles as they pass through detection zones to verify whether detectors are accurately registering them. This enables advanced detector health monitoring using metrics such as the correlation index, vehicle presence index, and consistency index (see Figure 12).

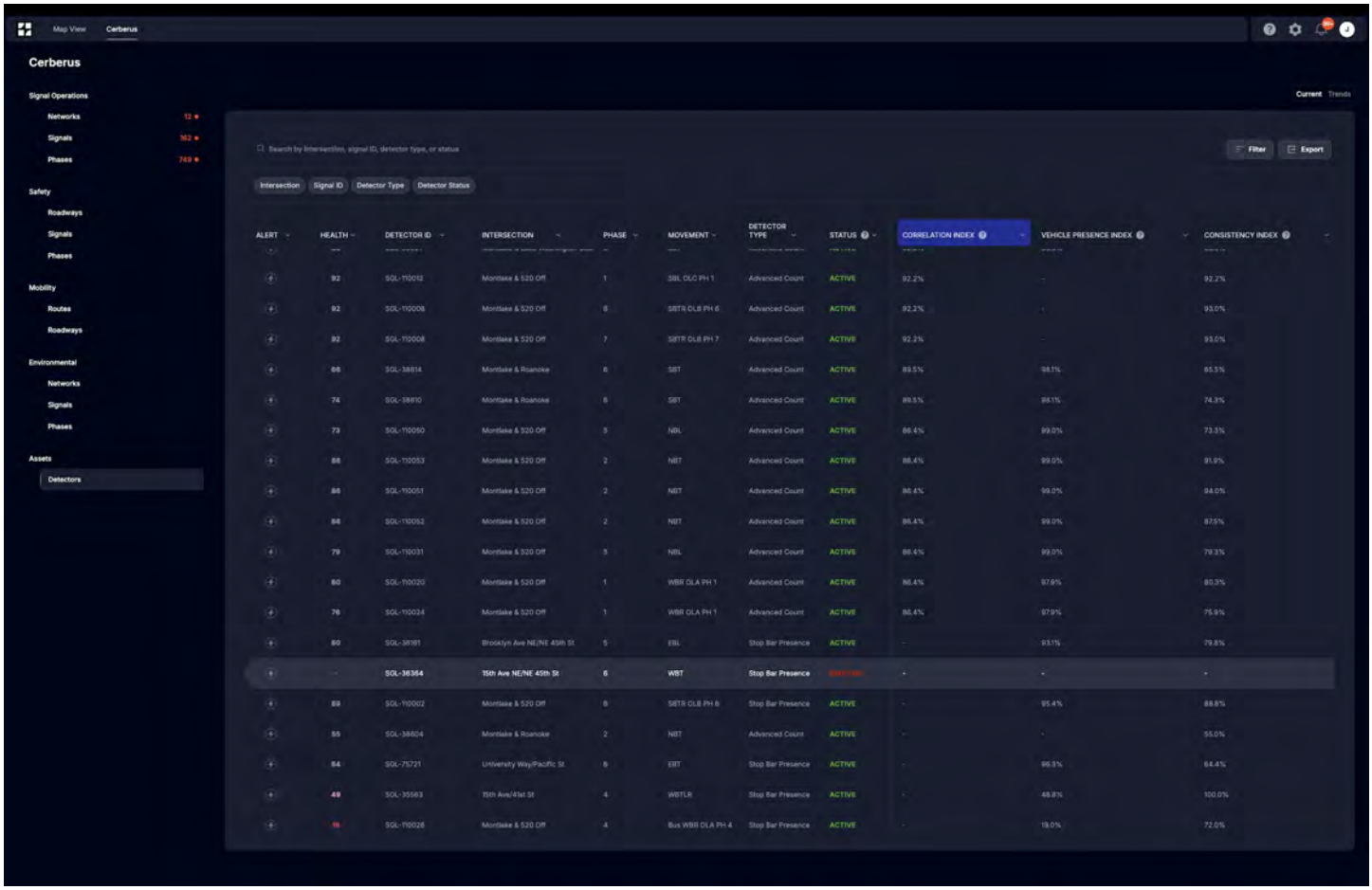


Figure 12 - Detector Health Monitoring. No other ATSPM platform offers the level of hardware and software fault detection that Flow Labs offers. Due to the integration of probe vehicle data with traditional ATSPMs, *Luminus Plus* offers advanced asset health metrics such as correlation index, vehicle presence index, and consistency index.

g. Be capable of identifying intersection operation problems including intersection delay, split failures and left turn gaps.
   Intersection delay, split failures, and left turn gaps are all metrics provided within the *Luminus Plus* solution (see Figure 2). As mentioned, a full list of Signal Performance Metrics available in the Flow Labs platform can be found in the attached Performance Measures appendix.
h. Provide specific recommendations and signal timing adjustments to address intersection operation problems including intersection delay, split failures and left turn gaps.
   This is a feature of Flow Labs *Optimus* solution, which is described below.
i. Be capable of identifying corridor operation problems including approach delay and coordination.
   Luminus Plus identifies corridor operation problems including approach delay and coordination. By combining controller event data with high-penetration probe data, the system measures delay at the intersection, phase, and movement level, and evaluates coordination through arrivals on green, queue length, number of stops, and progression quality. This unified approach ensures accurate detection of delay and coordination issues across corridors (see Figure 8).
j. Provide specific recommendations and signal timing adjustments to address corridor operation problems including approach delay and coordination.
   This is a feature of Flow Labs *Optimus* solution, which is described below.
k. Be compatible with existing controllers, signal detection and cabinet hardware.

Flow Labs platform is fully hardware agnostic and compatible with LFUCG's existing traffic infrastructure. The system can integrate directly with 2070L controllers and supports event log ingestion from controllers running MaxTime software. Alternatively, the system can also pull data from LFUCG's Q-Free's Kinetics Mobility platform, assuming LFUCG's instance has external APIs available (see Figure 13).

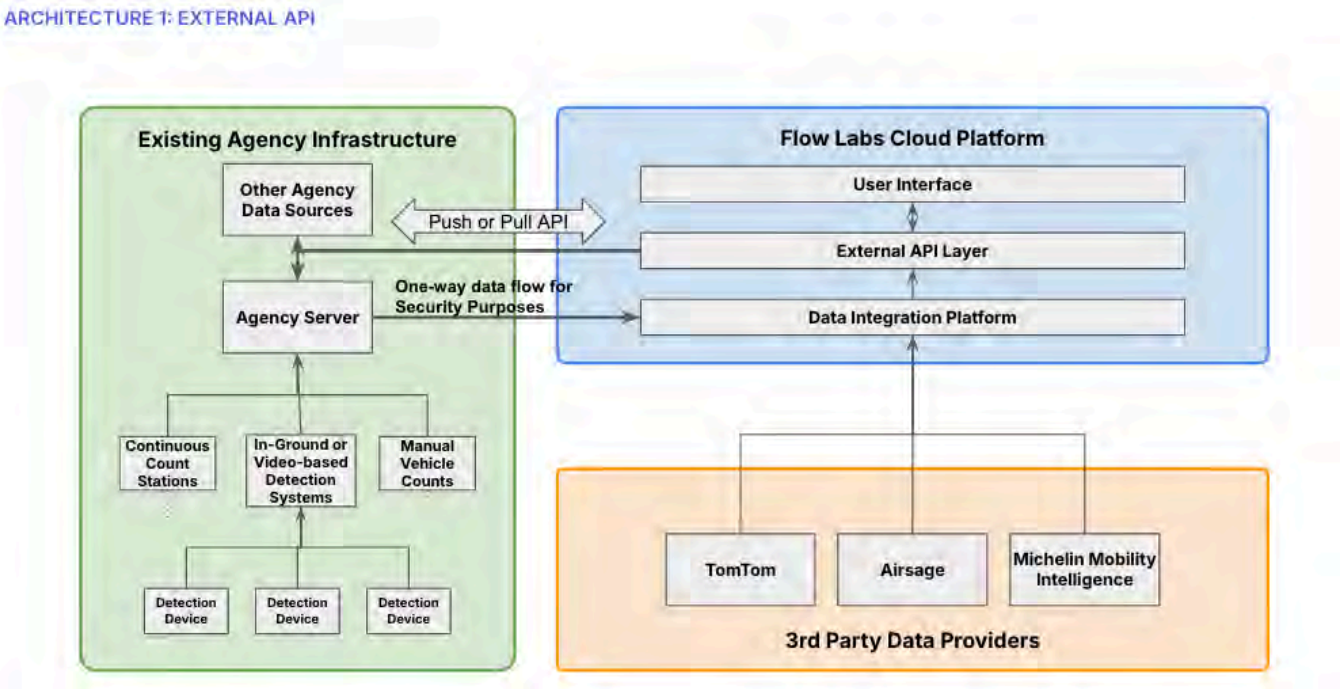


Figure 13 - Potential Data Integration Architecture. The Flow platform is completely flexible for MoDOT's needs for data integration for both first party data flowing into Flow Labs and Flow Labs traffic data flowing to the City's data infrastructure. Flow Labs can meet any security requirements for data flows as specified by the City and can ingest API data, VM polling, or another requested integration method.

l. Be capable of using multiple detection types for analysis including radar, video, and loops.
ISPMs can utilize processed data from the City's existing detection suite, including loops, Iteris video, Wavetronix Matrix and Advance radar, FLIR thermal, Gridsmart, Currux Vision, ITS Plus, and EVO radar detection.

m. Be scalable and capable of expansion to monitor up to 400 traffic signals
Flow Labs offers the most scalable ATSPM solution on the market, easily supporting 400 signals. Because of *Luminus Plus's* integrated architecture, the probe-based SPMs can be deployed days after NTP, giving LFUCG visibility into Signal Performance across all of its signals immediately. From there, integration with LFUCG's controllers can begin and ATSPMs can come online in parallel with the PBSPMs operating. For example, Florida Department of Transportation currently manages 2,000 signals using Flow Labs *Luminus Plus* solution.

n. Be ready as a completed product and not requiring additional major development.
Luminus Plus is a fully developed, web-based commercial off-the-shelf (COTS) solution that is ready for immediate deployment. Compared to traditional analytics platforms that can take months or even years to implement, Flow Labs delivers results in a matter of days or weeks—providing a lower-risk, lower-cost alternative.

o. Provide signal timing information including splits, offsets, and coordinated phase detector actuation for each intersection.

Luminus Plus captures phase splits, offsets, and coordinated phase detector actuations directly from Lexington's 2070L controllers running MaxTime. These measures are validated with probe data to show both programmed timing and real-world performance. Flow Lab's *Optimus* solution, which is described below, uses this information to identify the necessary baselines and constraints for its signal optimization recommendations.

Documents and Reports

2. ATSPM document and reports requirements shall include:
   a. Historical and real-time corridor operations reports and comparisons

   Luminus Plus delivers both real-time and historical corridor reports, showing arrivals on green, delay, queue lengths, and cost-of-delay. Engineers can compare current conditions or long-term trends and create custom Health Scores based on the thresholds and alerts described above (see Figure 14). Before-after reporting is robust and easy to configure, allowing Engineers to compare reference periods or specific incidents (see Figure 15).

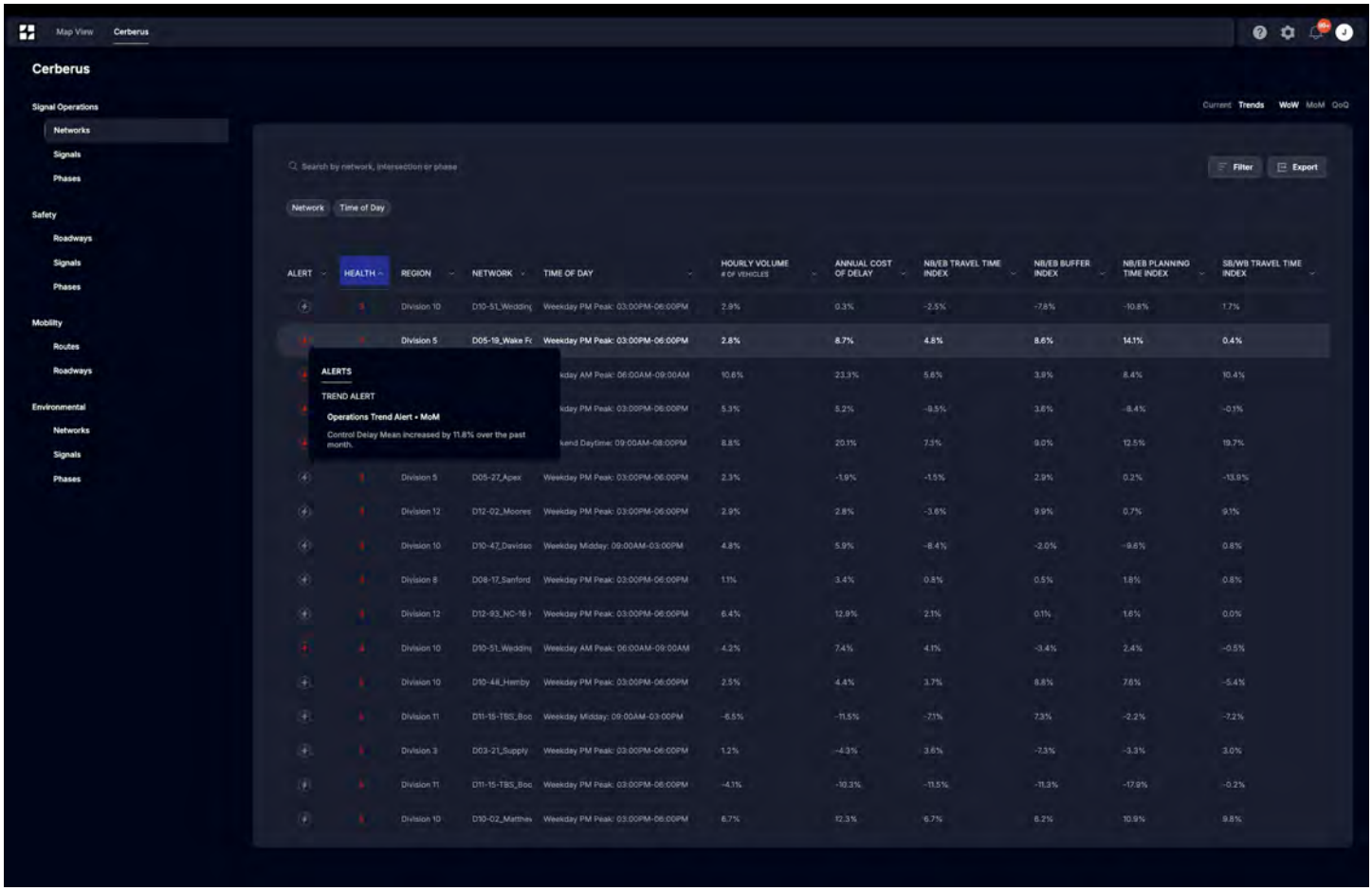


Figure 14 - Corridor Reporting and Comparisons. Rank, filter, sort, corridors, individual intersections, or even individual phases across the system. Review current conditions or WoW, MoM, QoQ trends for comparative analysis.

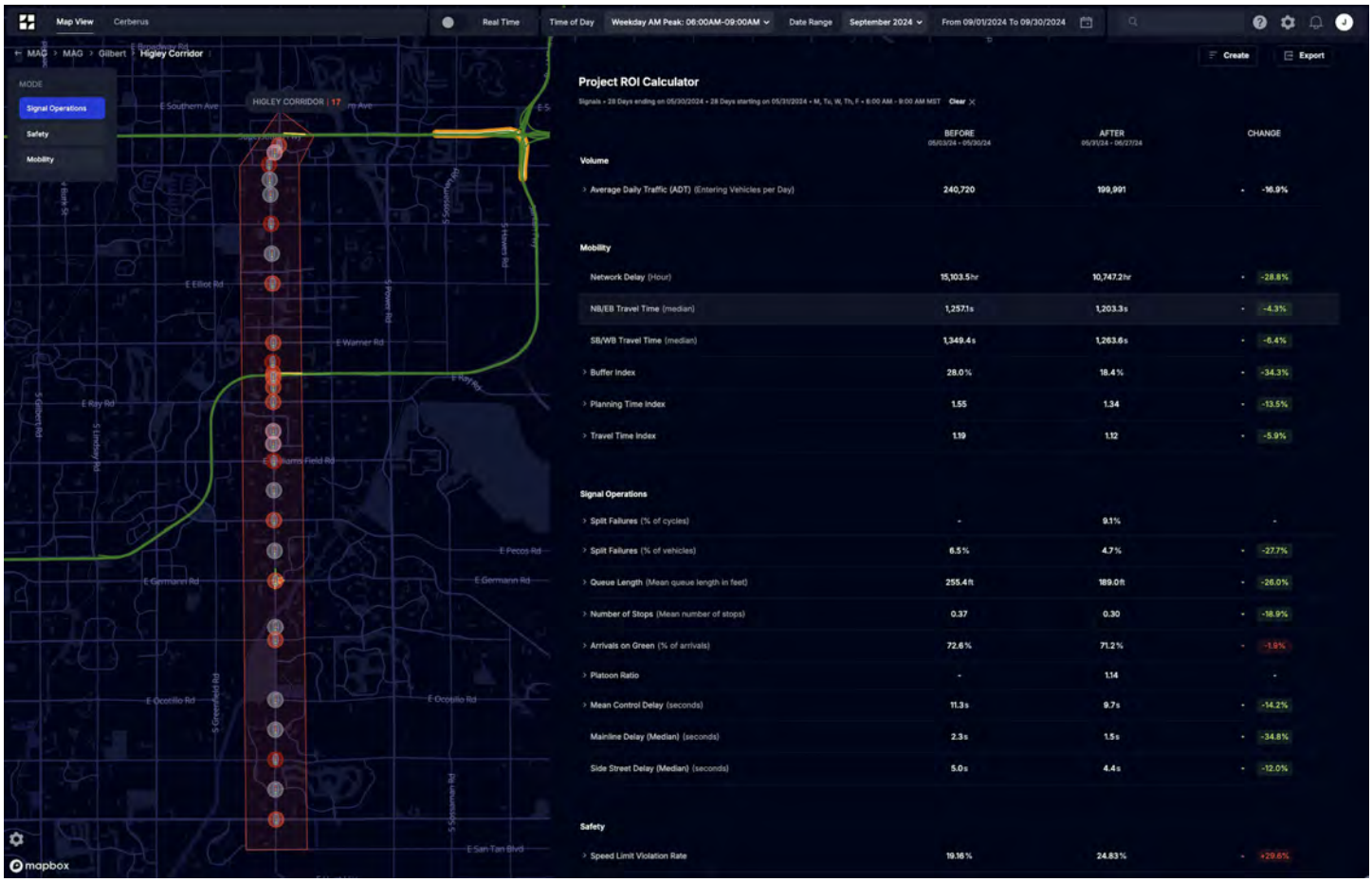


Figure 15 - Before-After Reporting. Compare two reference time periods or an incident day quickly and easily using *Luminus Plus*.

b. Reports of faults and alarms

The same dashboard tool within *Luminus Plus* that allows you to monitor, report, and compare conditions also allows you to monitor asset and detector health. See General Requirements 1.f above for more information.

c. Reports of user modifications and activities.

Flow Labs offers comprehensive User Management settings based on functional and regional roles. Reports of user modifications and activities can be made available.

d. A log of software functions that shall be created and time stamped.

Flow Labs platform is a fully web-based, COTS solution that does not require these types of logs. Logs from the controllers and/or detection systems can be made available through direct integration.

e. Normal operational logs

Operation logs are available, and logs from controllers and detection systems can be delivered through direct system integration.

f. Reports of Measures of Effectiveness of the state of the controller at all times. Reports shall be stored and available for a minimum of 60 days and the number of days shall be user configurable depending on storage available to TE.

These reports can be made available through direct integration.

g. Historical and real-time maintenance/downtime reports.

Asset and Detector health reports are exportable through the platform (see Figure 12). Platform maintenance/downtime reports can be made available.

h. Historical and real-time traffic condition reports.
   Flow Labs' Real-Time Probe Based SPMs offer sub- 1 minute latency traffic condition data (see Figure 1). All the visualizations, metrics, and conditions information from *Luminus Plus* are exportable in csv, excel, jpeg, and pdf formats.
i. Historical and real-time system performance reports.
   All the visualizations, metrics, and conditions information from *Luminus Plus* are exportable in csv, excel, jpeg, and pdf formats. Platform performance reports
j. Reports that are customizable by date and time, automated, and query specific
   All the tools within *Luminus Plus* are customizable by date and time, filterable, searchable, and query specific.
k. Easily accessible storage of logs, alarms, and reports for TE's use.
   All of this can be made available.
l. Configurable data dashboards.
   Luminus Plus is made to be configurable based on the uniqueness and nuances of each individual region it supports. Configurability shows up throughout the figures provided above.
m. Configurable performance measures (e.g., approach delay, Purdue split failure, number of preemptions, etc.) shown on dashboards.
   See the Performance Measures Appendix for a full list of the configurable performance measures within *Luminus Plus*. All these metrics are shown on dashboards, many of which are shown in the figures above.
n. Intersection reports capable of providing a comparison of current operations with past performance.
   Luminus Plus offers before and after reporting capabilities, allowing Engineers to compare current operations with past performance. This can be done with reference period vs reference period or reference period vs incident day as described in Documents and Reports 2.a above.
o. Red light running reporting
   Luminus Plus reports red light running (RLR) events by integrating controller event logs with high-penetration probe vehicle data. The system identifies and quantifies instances where vehicles enter during the red phase, providing both counts and percentages by approach or movement. Advanced diagnostic charts (see Figure 16), time series, and time of day charts are available.

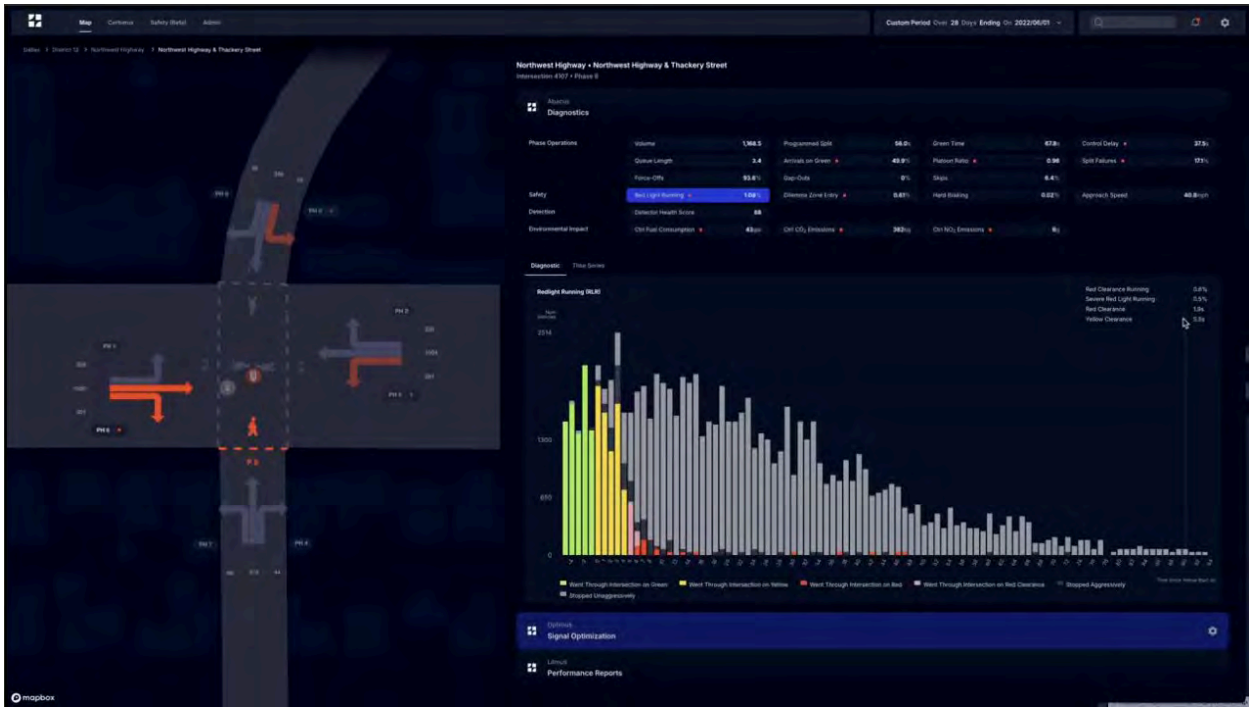


Figure 16 - Red Light Running.

Network and Access

3. The ATSPM solution shall:
   a. Have security management and administrative system that allows access and operational privileges to be assigned, monitored, and controlled by an administrator, and conform to LFUCG's technology and cybersecurity policies.
      As outlined in Documents and Reporting 2.c, Flow Labs provides functional and regional user access controls. The platform can be configured to align with LFUCG's technology and cybersecurity policies as required.
   b. Maintain up-to-date security patches and updates where applicable.
      Flow Labs maintains all platform components with regular security patches and updates to ensure compliance with industry cybersecurity standards. Updates are applied promptly as they become available, keeping the system protected against emerging threats while aligning with LFUCG's technology and cybersecurity policies.
   c. Allow remote access to ATSPM components.
      Flow Labs allows remote access to ATSPM components through data export and download from its platform. "Raw" ATSPM logs can be made available.
   d. Allow access by up to 10 operators simultaneously.
      Flow Labs does not charge per user nor limit the number of users that can operate the platform simultaneously.

Training

4. The vendor shall provide:
   a. Initial basic component training for the ATSPM for TE staff.
      Flow Labs prides itself on its support. Along with a dedicated Customer Success Manager, TE staff will receive unlimited training (within reason). This can include group training, individual one-on-one training, use case implementation, joint configuration sessions, etc. as appropriate.

b. Advanced training six to eight (6-8) weeks after the initial ATSPM training for up to five (6) of TE's staff. The number of hours committed to advanced training shall be set by the manufacturer and approved by the City.
See previous response.

c. Three (3) hard copies and an electronic copy of the user manuals for the software that include set-up, configuration, and operations for any software component installed as part of this project.
Luminus Plus requires no set-up or configuration—Flow Labs manages all intersection modeling, data ingestion, and related processes. However, hard and electronic copies of the support guide, data dictionary, user manual, and other documentation can be provided as needed.

Maintenance

5. The vendor shall:
   a. Provide maintenance support for the ATSPM software.
   Flow Labs is a fully turnkey solution, offering ongoing no-cost maintenance, support, and upgrades to the platform throughout the term.

   b. Provide phone, email, or web-based electronic support for a minimum of one (1) year including cloud service (if required), maintenance, and troubleshooting.
   Flow Labs provides a dedicated Customer Success Manager who is available to LFUCG's TE via phone, email, and chat for the entire term. Flow Labs also offers phone and email support as well as a Support Page with Support Guide, Feature Explainers, Training Videos, and CSM contact info built into the platform for easy access.

   c. Notify TE when new software updates are available. Software updates shall be included for a minimum of one (1) year after final acceptance.
   As part of Flow Labs' SaaS turnkey offering, software updates, product enhancements, and security patches are always available and made continually throughout the term. As long as LFUCG has access to the Flow Labs platform, they will receive these updates and enhancements.

   d. TE shall be notified of any ATSPM software issues or failures.
   Flow Labs will notify TE of any ATSPM software issues or failures. Flow Labs offers a data monitoring toolset to ensure that the connection between controllers, detection devices, and the front-end software stays up & operational as much as possible. The platform itself has an uptime of 99.5%.

Signal Timing Optimization (Optimus)

For signal timing optimization, Flow Labs will deploy *Optimus*, the industry's first hardware-free **AI-powered signal timing optimization engine**. *Optimus* is an add-on to *Luminus Plus* and uses ISPM signal controller data, real-world traffic data and predictive analytics to automatically generate, evaluate, and refine timing plans.

Optimization features include:

- **Simple Timing Plan Generation**: Automated optimization of cycle length, phase splits, and offsets with a single click.
- **Objective-Based Planning**: Plans can be tailored by an Engineer to mobility, safety, emissions, or combined outcomes. For example, *Optimus* can target travel time reductions, minimize red-

light running, or reduce emissions by prioritizing arrivals on green, dilemma-zone entry, target vehicle speed, and more.

- **Predictive Modeling**: Each plan is accompanied by projections of delay, queue length, stops, travel time reliability based on the historical trajectories of the probe vehicle data.
- **Interactive Time-Space Diagrams**: Engineers can visualize corridor progression and test scenarios virtually before implementation.
- **Continuous Improvement**: *Optimus* leverages machine learning to refine predictions and optimizations over time, ensuring timing plans stay aligned with evolving traffic patterns.

Optimus is designed to be engineer-controlled, offering full transparency and configurability rather than operating as a "black box" like many AI systems. It is intuitive to use, simple to configure, and straightforward to implement. Flow Labs also recognizes that *Optimus* represents a first-of-its-kind, hardware-free optimization engine, and may be a new concept for LFUCG. To demonstrate how *Optimus* aligns with the City's goals, we have responded directly to each of the Initial Signal Timing requirements (highlighted in blue) and included screenshots illustrating these capabilities within the platform. In addition, we have addressed bullet points h and j from the ATSPM general requirements, showing how *Optimus* supports a comprehensive and compliant solution.

General Requirements

h. Provide specific recommendations and signal timing adjustments to address intersection operation problems including intersection delay, split failures and left turn gaps.
Flow Labs' *Optimus* generates actionable timing plan recommendations—adjusting cycle length, phase splits, and offsets—to reduce intersection delay and correct split failures and left-turn gaps. Engineers set bounds on each parameter (e.g., minimum green, minimum split, yellow, red-clearance, pedestrian time) so *Optimus's* recommendations remain controller-safe and standards-compliant. Plans are created with a single generate step and returned with a complete, reviewable timing table. Each plan includes predicted performance for delay, queue length, arrivals on green, and reliability—shown before vs. after—so staff can verify that recommended split and offset changes alleviate delay "hot spots," resolve split failures, and improve left-turn service prior to deployment. Engineers can fine-tune any movement (e.g., increase left-turn split, adjust offset) and re-optimize as needed.

j. Provide specific recommendations and signal timing adjustments to address corridor operation problems including approach delay and coordination.
Building on the information above, *Optimus* produces corridor-level timing plans that target approach delay and improve coordination by optimizing cycle lengths, splits, and offsets across successive signals. Engineers review and refine recommendations using time–space and bandwidth visualizations, then deploy with full before/after performance predictions (delay, arrivals on green, reliability) to confirm improved progression. ISPMs through *Luminus Plus* (prerequisite) supply the live and historical coordination evidence—e.g., arrivals on green and delay—used to validate *Optimus's* corridor recommendations.

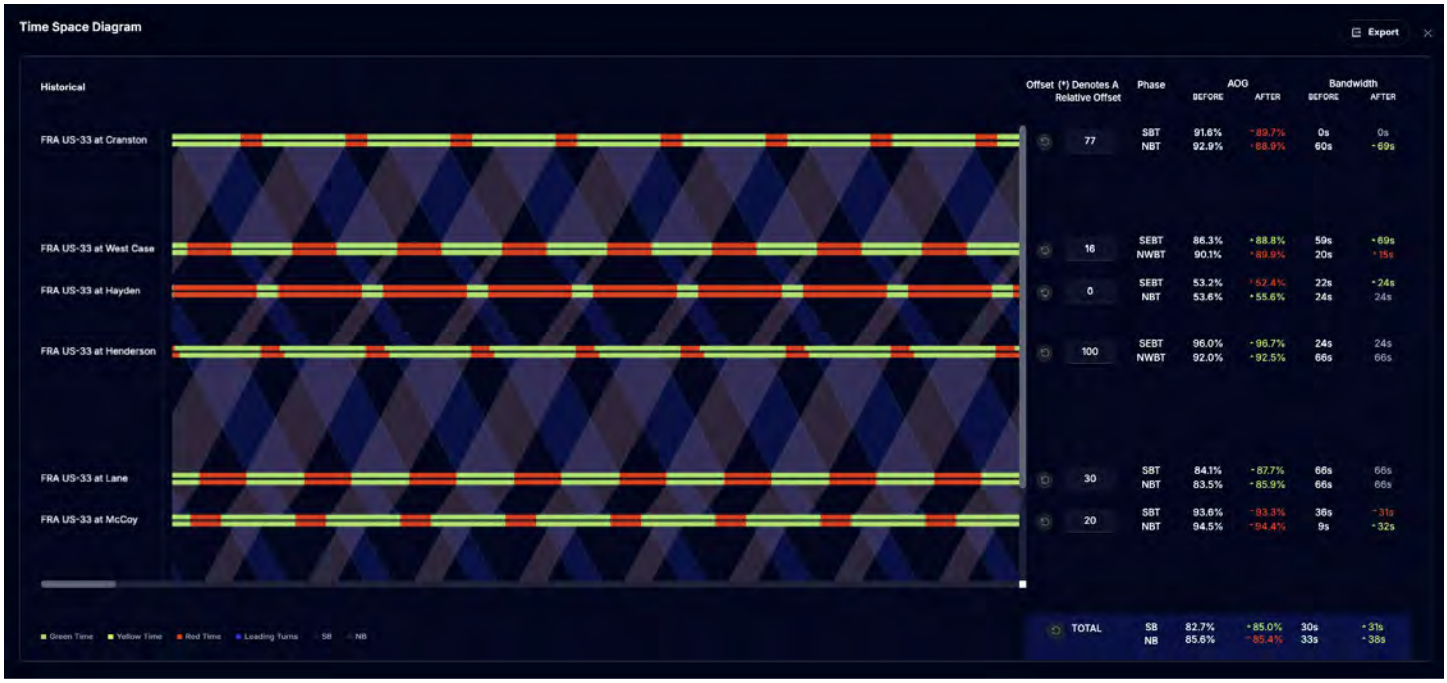


Figure 17 - Optimus Time Space Diagram. Visualize bandwidths across the corridor using Flow Labs' TSD functionality. Quickly revert back and forth between the old timing plan and the new optimized timing plan to see exactly where Optimus is recommending changes be made.

Initial Signal Timing

6. Initial Signal Timing shall include:
   a. Timing pattern parameters that cover seven (7) days per week for all fourteen (14) intersections included in this project.
   b. Timing patterns that transition to address traffic patterns and volumes as they change throughout the day.
   c. A regularly expected schedule of beginning and ending times for each traffic pattern
   d. A sufficient number of different traffic patterns (or sets of traffic parameters) to accommodate observable and measurable differences in traffic flow throughout the day on normal weekdays, Saturdays, and Sundays.

   To best respond to these first four requirements, we've combined our responses. *Optimus* supports **three tiers of update intervals**:

   On-Demand Adjustments – Engineers may generate or modify timing plans at any time using *Optimus*. Timing plans can be downloaded or exported directly into controllers based on existing Time-of-Day schedules covering seven days per week for all fourteen intersections included (see Figure 18).

   Scheduled Updates – Timing plans can be pre-developed based on time-of-day, day-of-week, or seasonal traffic patterns, ensuring proactive alignment as traffic patterns volumes change throughout the day as well as with recurring conditions (e.g., school schedules, game days, or downtown events) (see Figure 19).

   Automated Intervals – Using integrated real-time ISPM data, the platform can flag degraded coordination or performance and recommend optimized plans. *Optimus* can support automation cycles as frequently as daily or weekly, based on Lexington's operational preferences.

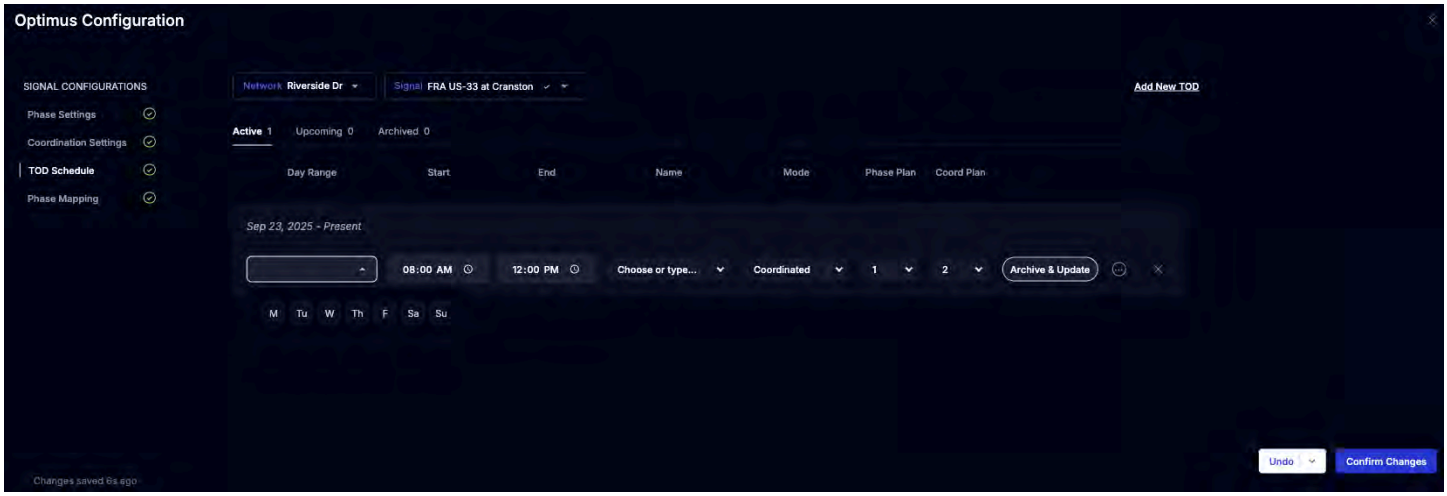


Figure 18 - *Optimus* TOD Schedule Configuration. Create timing plans for any time of day, day of the week, weekday vs weekend, or traffic pattern identified by *Luminus Plus* as needing to be optimized. This gives Engineers complete control on how they retime signals across the corridor.

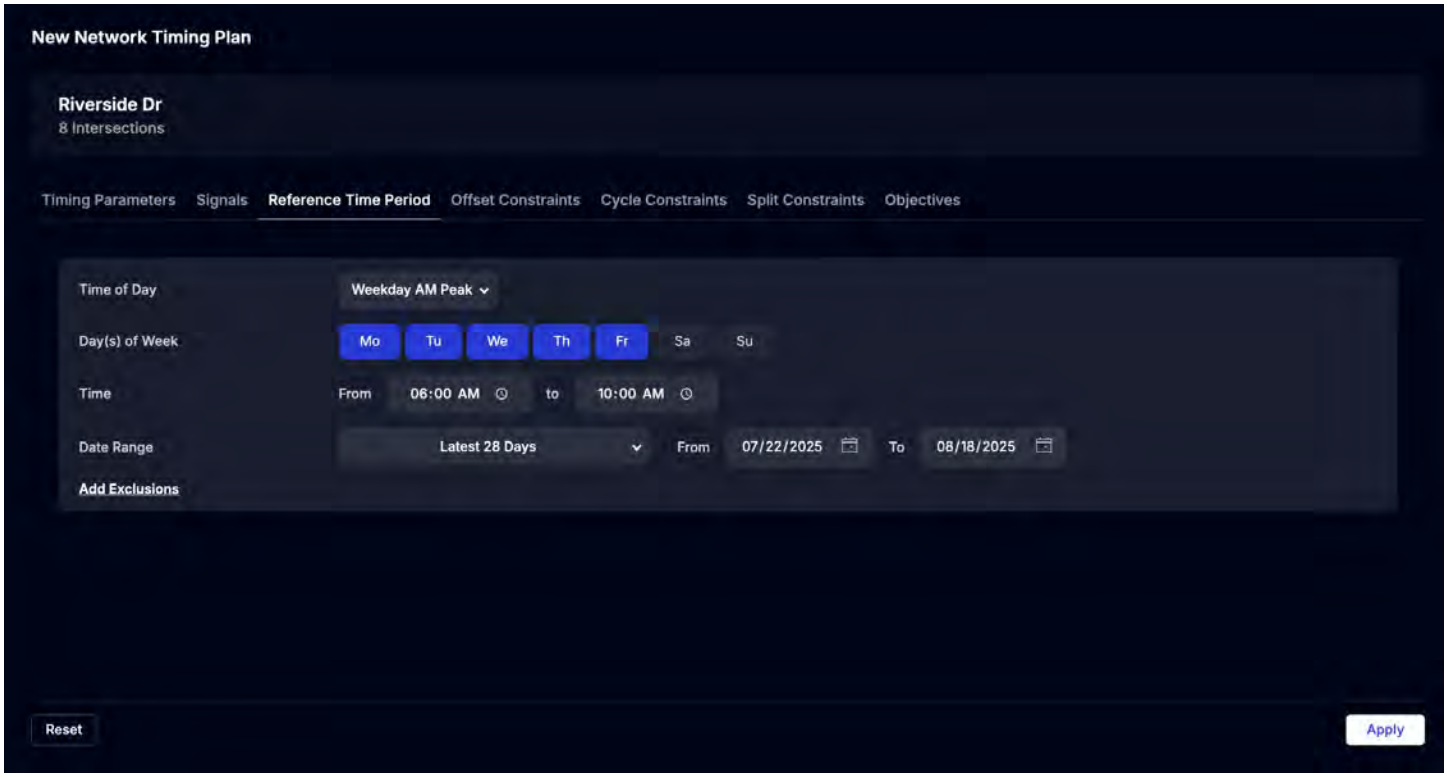


Figure 19 - *Optimus* Reference Time Period Configuration. Use any historical time frame available within *Luminus Plus* for the training data for *Optimus*, ensuring that the signal timing plans created are accurate to the time period that needs to be retimed.

e. Timing pattern parameters that include values for the following criteria at a minimum:
   i. Cycle lengths
   ii. Offsets
   iii. Phase splits
   iv. Phase sequences
   v. Minimal disruption to traffic flow while transitioning between timing patterns or different timing parameters

Optimus supports cycle length, offsets, and phase split optimization out-of-the-box (see Figure 20). Phase Sequences are in active development and beta testing, with anticipated release on the

platform within 1–3 months, subject to the outcomes of the beta phase. *Optimus* generates timing plans with built-in transition logic to ensure minimal disruption when switching between patterns or parameters. Engineers can define constraints on offsets, splits, and cycle lengths so that changes respect controller safety rules and maintain coordination continuity. *Optimus's* predictive outcomes (delay, arrivals on green, queue length) allow staff to preview transition effects in advance, ensuring that timing updates can be deployed with smooth phase transitions and minimal disturbance to traffic flow.

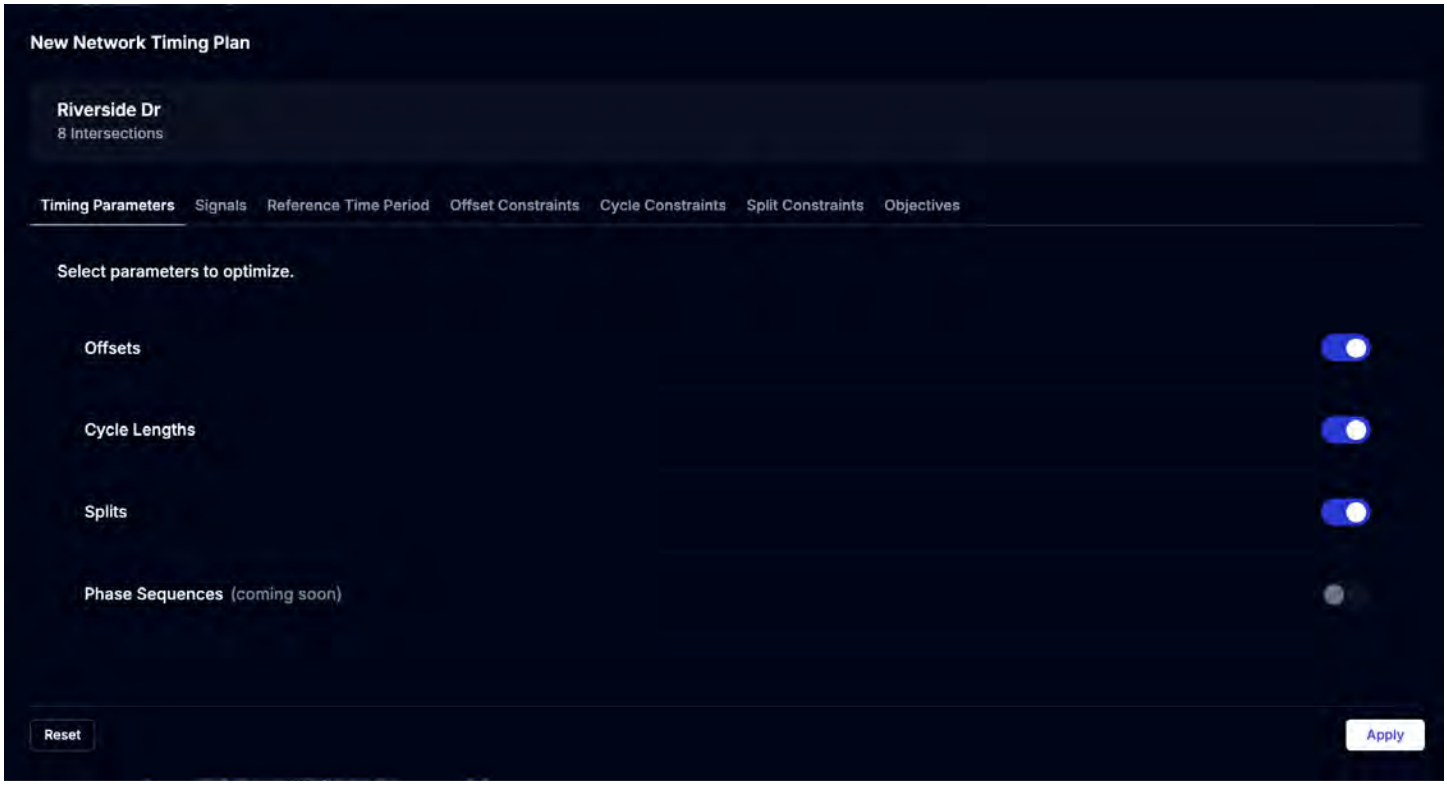


Figure 20 - *Optimus* Timing Optimization Parameters. *Optimus* supports Offsets, Cycle Lengths, and Phase Splits optimization today. Phase sequences optimization is still in development but is coming soon and should be available in the next 1 - 3 months.

f. Timing pattern parameters to be used in case of disruption in operation if the solution includes any form of automatic traffic operation such as traffic adaptive or traffic responsive.
Optimus is designed as an engineer-controlled optimization tool, not an unattended adaptive or responsive system. In the event of a disruption, Lexington's controllers will continue to operate using their existing programmed timing patterns (cycle lengths, splits, offsets, and sequences), which remain stored locally in the 2070L/MaxTime controllers. *Optimus*-generated plans are delivered as complete, standards-compliant timing tables, ensuring that all transitions back to base plans occur seamlessly and without loss of coordination. This approach guarantees operational continuity while still allowing Lexington to benefit from *Optimus'* rapid optimization capabilities.

g. Timing pattern parameters may include the following criteria in addition to the above minimum criteria in (e.) to improve signal performance:
   i. Phase timing parameters available within MaxTime signal controller software.
   ii. Phase option parameters available within MaxTime signal controller software.
   iii. Coordination Parameters including coordination modes, max modes, coordination gap out, and force off modes available within MaxTime signal controller software.

iv. Any other useful parameters to improve traffic flow that is available within MaxTime signal controller software.

Because *Luminus Plus* is the foundation of *Optimus*, all available MaxTime controller parameters (phase timing, phase options, and coordination settings) are automatically ingested into the Flow Labs platform. This ensures *Optimus* has a complete, up-to-date baseline of each intersection's programmed parameters when generating new timing plans. Engineers can then choose to either:

Allow *Optimus* to incorporate these parameters directly into optimized timing plan recommendations, or

Manually adjust or input parameters themselves within the platform prior to re-running optimization (see Figures 21-23).

This dual approach guarantees that all MaxTime capabilities—such as coordination modes, max modes, gap outs, and force offs—are preserved and configurable. *Optimus* thus combines automation with full engineering oversight, ensuring that optimized plans remain both standards-compliant and aligned with Lexington's operational preferences.

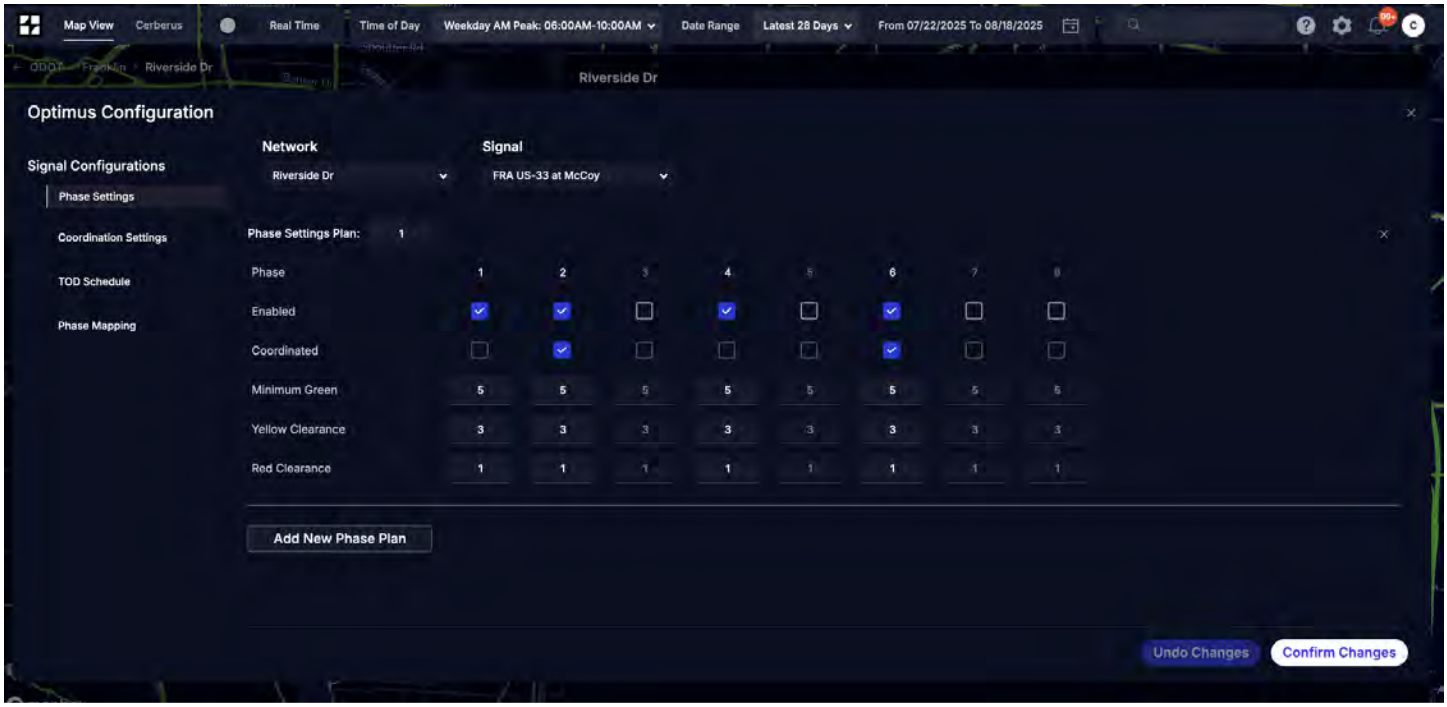


Figure 21 - *Optimus* Phase Settings Parameters. Although *Optimus* can pull phase settings directly from the controllers using *Luminus Plus*, an engineer can also manually enter the data using the *Optimus* Configuration wizard.

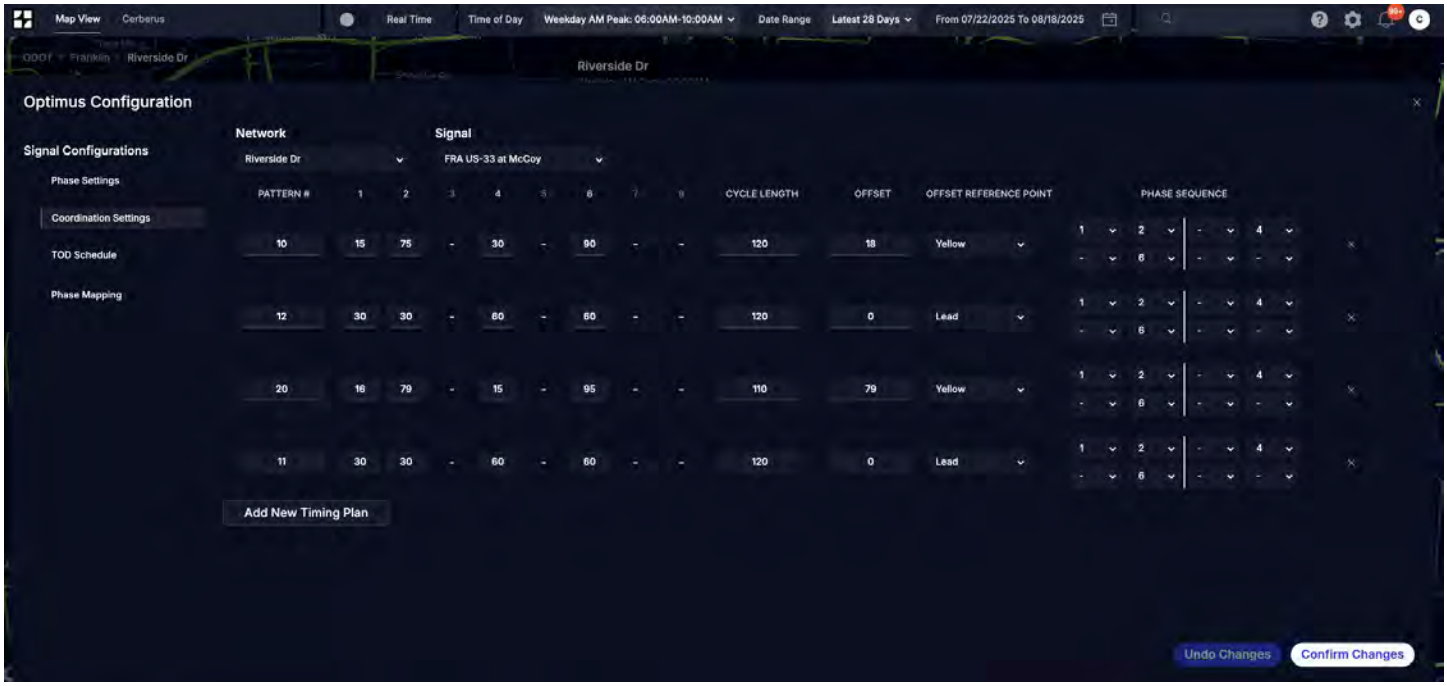


Figure 22 - *Optimus* Coordination Settings Parameters.

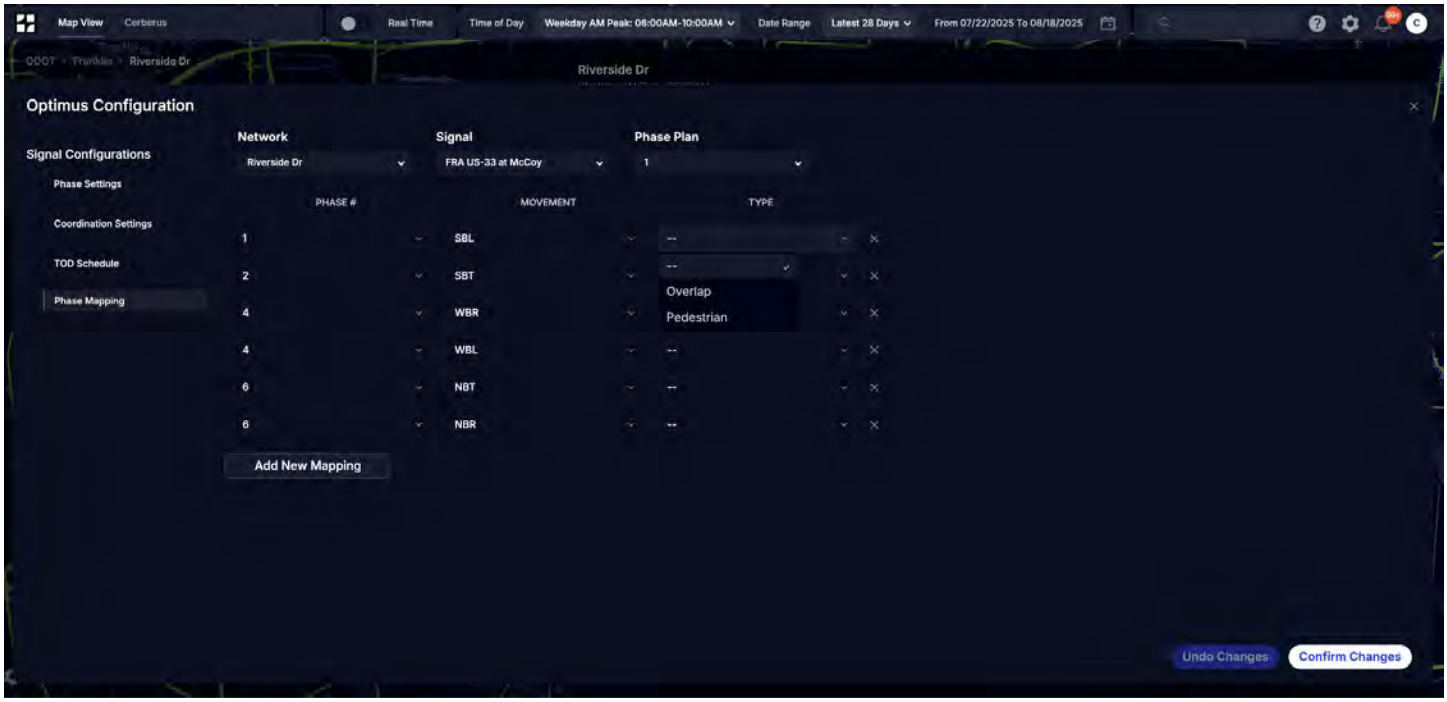


Figure 23 - *Optimus* Phase Mapping Parameters.

h. Implementation of all signal timing pattern parameters by a qualified professional engineer for all fourteen (14) intersections. WSP will review optimized timing plans generated by Flow Labs and implement these new timing plans for the first time after careful engineering review. WSP will perform in field analysis of the new timing plans to verify accuracy and efficiency of the new timing plans. Any minor modifications they deem necessary will be made following the initial retiming

LFUCG has set a clear vision for advancing traffic signal management through data-driven, innovative, and scalable solutions. Flow Labs' *Luminus Plus* (ISPMs) and *Optimus* directly align with that vision by

delivering a platform that combines best-in-class performance measurement with the industry's first hardware-free optimization engine. Together, these solutions give LFUCG the flexibility to continue leveraging traditional engineering workflows while also embracing a new generation of AI-driven capabilities—supported by full transparency, engineer control, and rigorous validation.

By deploying *Luminus Plus*, LFUCG will gain a real-time, validated source of truth for signal performance that eliminates blind spots and accelerates diagnostics. With *Optimus*, the City has the option to go further—generating optimized plans in seconds, forecasting outcomes across safety, mobility, and emissions, and ensuring timing adjustments can be scheduled, automated, or implemented on demand. Flow Labs' approach ensures Lexington is equipped not only to identify problems today, but also to proactively improve operations tomorrow, all while minimizing disruption to existing infrastructure and preserving the City's reputation for leadership in intelligent traffic management.

WSP Signal Timing Approach

WSP, and part of the project team, provide extensive experience in the development of signal timing and operations using Q-Free's MaxTime in Lexington. WSP has five local Traffic Engineers dedicated to progressing Kentucky's signal infrastructure and network operations. The team also consists of multiple national experts – in the field of signal operations and ATSPMs – who have invested several years supporting Kentucky agencies, including LFUCG. WSP's role in the project will be to observe conditions throughout the process, review and implement the proposed timing from the Flow Labs system, and support the evaluation of improved operations.

WSP will conduct preliminary observation of Tates Creek Road, supplying oversight of operations before, during, and after signal timing updates. During this observational period, WSP will identify and provide recommendations for intersection specific optimization. This will consist of observing and identifying operations at each intersection along the corridor and providing recommendations for intersection operation or efficiency. The local knowledge and technical signal timing expertise WSP offers will be used to supplement the automated traffic reporting metrics with a quick, contextual engineering judgement recommendation to provide improvements in signal operations.

The WSP team has experience coding directly in MaxTime signal databases for the city of Lexington. They will review and implement the timing plans proposed by the Flow Labs analytic solution. After proposed timing plans have been implemented, WSP will deploy a team of engineers to observe operations along the corridor, verify signal operations, fine-tune signal timing, and validate that signals along the corridor are operating efficiently at initial implementation. WSP has conducted field fine-tuning for dozens of signal corridors around Kentucky, including three in Lexington.

The collective project team will then enter the signal timing maintenance and improvement phase of the project, comprising of iterative steps, alternating between evaluation of signal/corridor operations and re-implementing proposed timing changes. LFUCG can have confidence that the local knowledge and proximity of WSP will maintain the primary goals for improving Tates Creek Road and maintain operational alignment with intersecting arterials.

SECTION 3 | IMPLIMENTATION TIMELINE

Our implementation plan follows a proven three-phase structure:

- Phase 1: Discovery and Configuration
  - LFUCG signal data (controller inventories, intersection lists, GIS shapefiles) is reviewed and configured into the platform.
  - Regional and district-level views, alert thresholds, and user roles are tailored to LFUCG's organizational structure.
  - Q-Free MaxTime review
  - Phasing
  - Any Goofy stuff
  - No clearance intervals
  - Field fine tuning
  - Clearance Intervals
  - Pedestrian Intervals
  - Existing Timing Plans
  - Field Review of Cabinet and Comm Status
  - Check detectors and ped
  - Ground truth data, ATR, 24-hour count from camera
  - Controller and detection integration support and data pull
  - Historical data ingestion (where available) begins during this phase for backloading analytics.
- Phase 2: Integration and Validation
  - Flow Labs integrates live signal performance data using available sources: ATSPM feeds, high-resolution controller logs, and detection systems.
  - Live probe vehicle data from Flow Labs trusted data partners is activated to cross validate the ATSPM data (as described in the *Luminus Plus* section above).
  - Validation testing ensures intersection layouts, signal phases, and performance metrics are correctly mapped.
- Phase 3: Launch and Optimization
  - LFUCG users gain access to a fully operational dashboard with real-time signal metrics, system alerts, and diagnostic views.
  - Training is conducted virtually and/or on-site by Flow Labs' Customer Success Team.
  - Early use cases (e.g., high-priority corridors, pilot districts) are prioritized to accelerate value.
  - *Optimus* is configured, tested, and signal timing plans are deployed by WSP.

Flow Labs strives to provide a fully turnkey solution, with minimal direct effort from the LFUCG TE staff until it is time for implementation. Flow Labs is committed to implementing *Luminus Plus* across the initial 14 intersection corridor in under 8 weeks, with *Optimus* timing plans being generated and deployed by Week 12.

Week 1–2: Kickoff & Work Plan Approval

- Meeting with all key stakeholders, including the full LFUCG TE Team, to confirm the work plan and address any outstanding questions and issues.
- Flow Labs' dedicated Customer Success Manager operates as Project Manager, ensuring the work plan, timeline, and deliverables are followed and met.

Week 3–8: Implementation of *Luminus Plus*

- Flow Labs performs intersection modeling, data ingest pipeline setup, ATSPM data integration, and internal quality assurance. Flow Labs handles the whole configuration, setup, and implementation process from start to finish.
- The Customer Success Manager provides ongoing check-ins to make sure LFUCG TE is fully aware of the status of the implementation.

Week 9-10: *Luminus Plus* Platform Access + Initial Training

- Flow Labs provides platform access to LFUCG TE and conducts training session(s) for all users.

Week 10-12: Onboarding Follow-Up & Implementation of Optimus

- Typically, End User Agencies like to have a week or two to use and get comfortable with *Luminus Plus* before *Optimus* is implemented.
- In this time, Flow Labs will conduct additional technical support sessions to address use-case, workflow, or technical questions/needs.
- Once LFUCG is comfortable with *Luminus Plus*, *Optimus* will be implemented. Existing timing plan settings (phase settings, coordination settings, TOD schedules, phase mappings, etc.) are automatically ingested into *Optimus* using the *Luminus Plus* integration.

Week 12: Optimization Plans Delivered

- Flow Labs will work with WSP and the LFUCG TE team to understand their signal timing preferences, specific issues, including key constraints and objectives.
- Flow Labs will walk the signal timing engineers through the full *Optimus* configuration, including setting up constraints, reference periods, and optimization objectives.
- On acceptance by the engineering team, these can be uploaded to the signal controllers in the field by WSP.
- Flow Labs will work with WSP to evaluate the performance of the timing plan including identifying key performance metrics.

Week 14 and beyond: Continued Support

- As previously described, Flow Labs aims to provide best-in-class support both through the platform implementation process and ongoing after deployment.
- LFUCG's dedicated Customer Success Manager will be available to support whenever & however needed. The CSM will continue to check on the success of the project and allow for ongoing support, training, feedback sessions, etc. as LFUCG sees fit.

SECTION 4 | QUALIFICATIONS AND EXPERIENCE

This project team brings extensive experience across the full traffic signal management life cycle—including data acquisition, software analytics, signal timing plan optimization, monitoring services, and engineering support. This expertise ensures the platform will meet LFUCG's current and future needs while also creating opportunities for continued expansion to further enhance signal performance across the region.

Flow Labs

Flow Labs is the ATSPM and Optimization solutions provider on this proposal and will be responsible for delivery and deployment of *Luminus Plus* and *Optimus*, the ATSPM and signal optimization platform, including all customizations, future developments, and maintenance. Flow Labs will also be responsible for providing software and technical support services to users, and sourcing new datasets for further expansion of functionalities.

Founded in 2016 in Oakland, California, Flow Labs provides data-driven software solutions for transportation agencies. Relevant areas of expertise include, but are not limited to, traffic signal optimization, artificial intelligence and machine learning, software platform development/deployment, geospatial data processing, connected vehicle data processing, decision support systems, and traffic signal control systems. Flow Labs offers an experienced, multi-disciplinary team of academic researchers, software platform engineers, traffic management technologists, and artificial intelligence researchers. The team has over 50 years of combined experience in the design, development, and deployment of cutting-edge traffic management solutions and large-scale project delivery. Flow Labs is also backed by an experienced advisory board consisting of Malcolm Dougherty (former Director of Caltrans), and Scott Belcher (former CEO of ITS America). The team offers deep domain expertise in the area of traffic signal control including signal performance measurement, signal monitoring, signal safety analytics, and signal optimization.

The Flow Labs team consists of experts in geospatial data, including crowd-sourced and probe-based data, systems integration, API development, data processing, and data integration. They have the capabilities to efficiently process large datasets from multiple sources to meet the needs of this project. Furthermore, the team is experienced in the use of Artificial Intelligence and Machine Learning to cleanse data, providing highly accurate (verified and validated as being 94.4% accurate, which is industry leading), trustworthy data that forms the foundation of mission-critical decision support systems including for traffic signal control decisions.

The Flow Labs team has pioneered the development of the *Luminus Plus* and *Optimus*, each a novel architecture that allows transportation agencies to monitor, analyze, and optimize their transportation systems without the use of in-field hardware offering a cost-effective and reliable approach suitable to any transportation agency. This platform was validated extensively by Florida Department of Transportation (FDOT), among others. FDOT, after validating *Luminus Plus*, chose to deploy it across 2,000 intersections, the single largest integrated signal performance measures system in the United States.

Relevant Projects

Florida Department of Transportation D5 "HIEDI" Integrated SPM District-wide Deployment

This project involves the deployment of the *Luminus Plus* platform with Florida Department of Transportation District 5 across 2,000 intersections. The platform leverages historical, and real-time data roadway and traffic signal data from third party probe vehicle data, and includes an ATSPM integration component for advanced signal performance measurement. A highly detailed technical report was published based on this project, which can be found in the Appendix section below.

The platform was used for multiple applications including real-time volume generation, traffic signal analytics, and proactive monitoring. It aligns directly with the capabilities that LFUCG is looking for from an ATSPM system. It also shows scalability, as this project was scaled up to 2,000 intersections in under 4 months.

CLIENT: Florida Department of Transportation District Five (FDOT D5)
PERIOD OF PERFORMANCE: 6/30/2023 - 03/31/2027
OWNER: Jeremy Dilmore, District 5 TSM&O Program Engineer, Florida City of Transportation (FDOT). 386-943-5360. jeremy.dilmore@dot.state.fl.us
LEVEL OF EFFORT: $500,000

Ohio Department of Transportation Signal Performance Measurement and Optimization

This project involves the deployment of the Flow Labs *Luminus Plus* and *Optimus* platform with Ohio Department of Transportation (ODOT) across 8 signals in Columbus, OH. The platform leverages historical, and real-time traffic signal data from probe vehicle data. It uses this data combined with signal timing configuration data (phase settings, coordination settings, TOD schedules, and phase mappings) through *Optimus* to retime this corridor with Flow Labs' hardware-free AI Optimization engine. ODOT was able to achieve ~$1M reduction in Annual Cost of Delay to Road Users by implementing Optimus optimized timing plans.

The platform was used for multiple applications including traffic signal analytics, and signal timing optimization. It aligns directly with the capabilities that LFUCG is looking for from an optimization tool. ODOT's goals for signal timing optimization are the same as LFUCG's.

CLIENT: Ohio Department of Transportation (ODOT)
PERIOD OF PERFORMANCE: 2/1/2025 - 12/31/2025
OWNER: Charlie Fisher, Statewide Traffic Signal Engineer, Ohio Department of Transportation (ODOT). 614-644-0270. Charles.Fisher@dot.ohio.gov
LEVEL OF EFFORT: $20,000

City of Seattle Department of Transportation

This project involves the deployment of the *Luminus Plus* platform with the City of Seattle across 34 intersections in the region. The platform leveraged data from probe vehicle data to generate accurate signal performance metrics and included direct integration with multiple signal controller types & firmware.

The platform was used to integrate with all the signal controllers to capture low and hi-resolution data logs, lane configurations, detection layouts, signal phasing. It aligns directly with the capabilities that LFUCG is looking for from an ATSPM solution. Through this project, Flow Labs proved their ability to integrate directly with Q-Free controllers if an ATMS integration is not available.

CLIENT: City of Seattle
PERIOD OF PERFORMANCE: 12/01/2023 - 12/01/2025
OWNER: Jeffrey Conor, SDOT, Transportation Operations.
206-684-5379. Jeffrey.Conor@seattle.gov
LEVEL OF EFFORT: $50,000

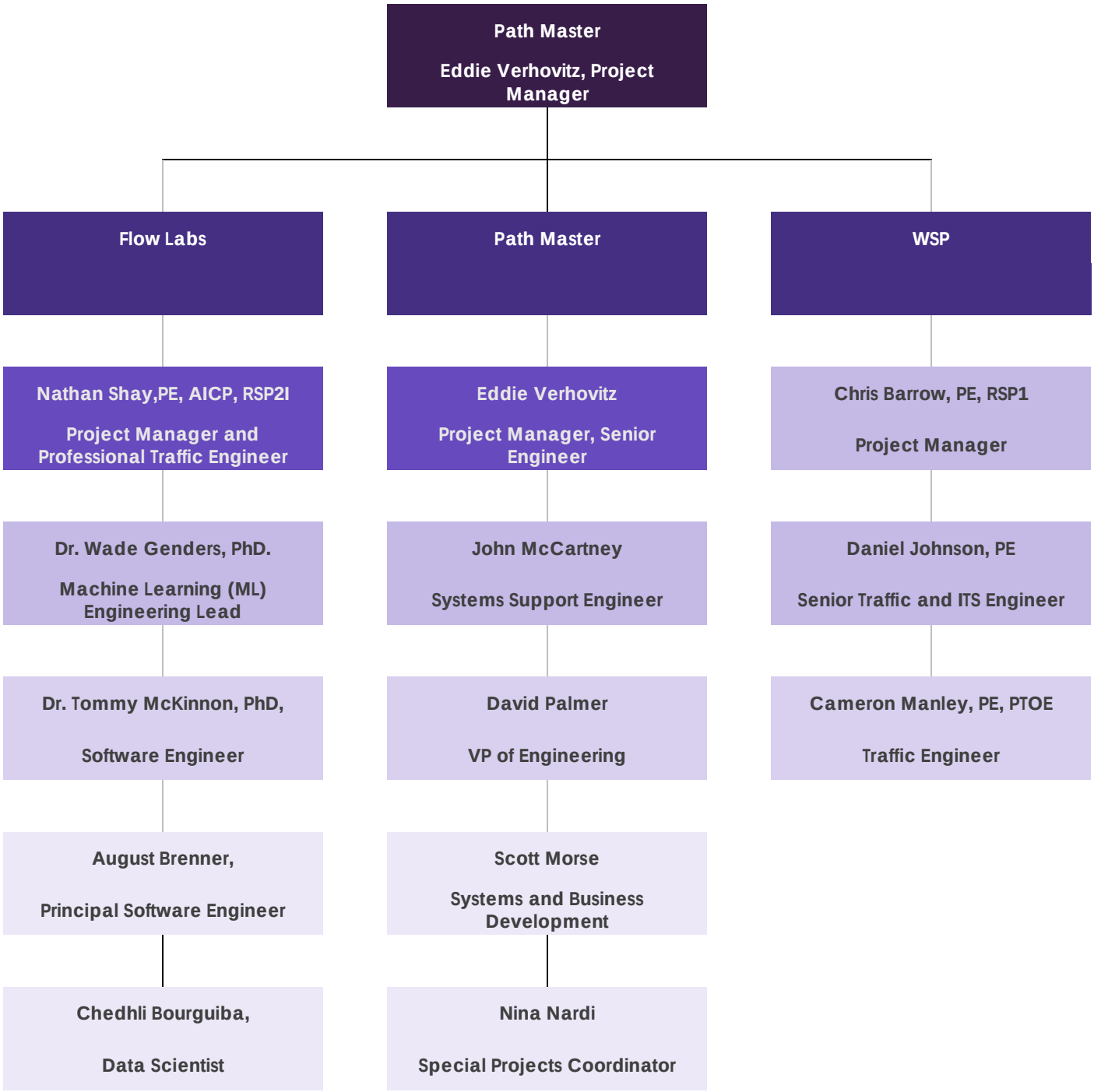
North Carolina Department of Transportation (NCDOT)

This project involves the deployment of the *Luminus* platform across the entire state of North Carolina, covering 2,500 signals. The platform leveraged data from probe vehicle data to generate accurate signal performance metrics and enabled NCDOT to prioritize all the corridors for retiming, using a data-driven approach.

The platform was used for multiple applications including traffic signal analytics, proactive corridor monitoring, TMC data collection, and before-after analysis. It aligns directly with the capabilities that LFUCG is looking for from an ATSPM solution, as it shows scalability. Flow Labs was able to deploy across 2,500 signals in under 3 months.

CLIENT: North Carolina Department of Transportation
PERIOD OF PERFORMANCE: 5/01/2025 - 8/31/2026
OWNER: Meghan LeBlanc, State Signal Systems Engineer, North Carolina Department of Transportation (NCDOT).
919-814-4977. meleblanc@ncdot.gov
LEVEL OF EFFORT: $650,000

SECTION 5 | ORGANIZATIONAL CHART



SECTION 6 | TEAM BIOGRAPHIES

Name: Chris Barrow, PE, RSP1

Title: Project Manager

Office Location: Lexington, KY

Background: With 15+ years at WSP and the State of Georgia's Atlanta Transportation Management Center (TMC), Chris provides experience from both sides of consulting. As a result, he understands the importance of quality work and a great working relationship with the project team. His work encompasses traffic engineering, electrical construction inspection, roadway lighting design, regional traffic signal operations, and Intelligent Transportation Systems (ITS) device applications.

Relevant Projects:

- **LFUCG, Hamburg Weekend Signal Retiming Project, Lexington, Ky**: Development of signal timing plans, Tru-Traffic model development and calibration, and field fine tuning for Man O' War Blvd, Sir Barton Way and Winchester Rd.
- **KYTC, Statewide and District 7 Traffic Engineering, Statewide, KY:** Through the two traffic engineering on-calls, Chris has managed and developed a multitude of signal operation improvements across Kentucky. From optimizing Wapiti signal databases to implementing advanced coding features in MaxView, Chris has been a vital contributor in the progression of Kentucky signal operations. Chris continues to provide valuable expertise as the state moves forward into automated traffic signal solutions.
- **KYTC, Statewide Traffic Engineering & TSMO, Statewide, KY:** Project manager of a pioneering research and demonstration project of national ATSPM vendors. Chris managed the compilation of potential fits with KYTC. Chris helped KYTC determine best possible opportunities for KYTC to test and, eventually, implement systems in Kentucky on local and statewide levels to gain the greatest value from potential system upgrades.
- **KYTC, Statewide Alternative Delivery, Statewide, KY**: Chris has served as Project Manager for WSP in this pilot program aimed at detecting and deterring wrong-way incidents by alerting the wrong-way driver, other drivers, and emergency responders while fostering interagency collaboration. Chris is partnering with LFUCG to upgrade cameras at the Tates Creek Road and KY 4 ramp intersections.

Education

M.S. & B.S (Civil Engineering)
Georgia Institute of Technology
Atlanta, Ga – 2009, 2010

Years of Experience

15 years

Core Competencies

- Project management
- Traffic operations
- Traffic signal timing
- Traffic signal and electrical inspection
- ITS planning

Name: Cameron Manley, PE, PTOE

Title: Traffic Engineer

Office Location: Lexington, KY

Background: Cameron has 9 years of experience as a traffic engineering consultant in Lexington, KY. He has cornered the signal timing and operations space at WSP and across Kentucky. Cameron specializes in optimizing signal timing and analyzing corridor/signal operations. Across LFUCG, KYTC, and Louisville Metro, he has converted more than 200 signal databases to MaxTime and created optimized signal plans for nearly 100 signals across more than 20 corridors in seven KYTC districts, as well as three corridors in LFUCG. He currently operates as the Deputy Project Manager of three active Traffic Engineering On-Call contracts.

Relevant Projects:

- **LFUCG, Hamburg Weekend Signal Retiming Project, Lexington, KY**: Development of signal timing plans, Tru-Traffic model development and data collection, and field fine-tuning for Man O' War Blvd, Sir Barton Way and Winchester Rd.
- **KYTC, Statewide and District 7 Traffic Engineering, Statewide, KY:** Multiple traffic signal timing projects including database conversions, travel time data collection, onsite and offsite bench testing, signal timing development and field fine-tuning.
- **KYTC, Statewide Traffic Engineering & TSMO, Statewide, KY:** Traffic Engineer responsible for evaluating the capabilities of nearly a dozen national ATSPM vendors. The research and demonstration project required the team to compare the alignment of vendor software, reporting capabilities, and infrastructure needed to the purpose and needs of KYTC.

Education

B.S. (Civil Engineering)
University of Kentucky,
Lexington, KY – 2015

Years of experience

9 years

Core Competencies

- Traffic signal timing
- ATSPM data analysis
- Traffic controller and detection system troubleshooting
- Traffic management and real-time operations

Name: Daniel Johnson, PE

Title: Senior Traffic and ITS Engineer

Office Location: Charlotte, NC

Background: Daniel has over 20 years combined public service and private consulting experience. He works as an Electrical Engineer within the transportation industry, experienced in the design, construction, operation, and maintenance of arterial traffic signal and intelligent transportation systems. Specialized experience in advanced applications of traffic signal controllers and cabinet hardware, signal timing and optimization, detection systems, fiber optic and wireless communication systems, and IP network switching and devices. Works directly with state, county, and local government staff providing technical knowledge, support, and direction in the selection, implementation, and utilization of traffic signal and ITS solutions.

Relevant Projects:

- **LFUCG, Hamburg Weekend Signal Retiming Project, Lexington, Ky**: Development of signal timing plans, Tru-Traffic model development and calibration, and field fine tuning for Man O' War Blvd, Sir Barton Way and Winchester Rd.
- **KYTC, Statewide and District 7 Traffic Engineering, Statewide, KY:** Multiple traffic signal timing projects including database conversions, onsite and offsite bench testing, signal timing development and field fine tuning.
- **NCDOT, I-77/I-40 System to System Turbine Interchange Design Build (I-3819), Statesville, NC,** Signal Timing development, implementation, and field fine tuning for two traffic signal systems upgraded as part of the project.
- **NCDOT, I-540 Expressway Design Build (I-2828), Raleigh, NC.** Signal timing development, implementation, and field fine tuning for two traffic signal systems upgrade as part of the project.
- **VDOT, Traffic Signal Timing Training (Synchro and Tru-traffic), Statewide, VA.** Developed training materials and performed presentation of traffic signal timing training for statewide VDOT staff.
- **City of Concord, Signal Timing and Active Traffic Management, Concord, NC.** Worked as Traffic Engineer, Signal Operations Manager, and continued as a consultant, for Concord. Signal timing development, modeling, active traffic management, real-time special events management for NASCAR events, concerts, and heavy consumer areas.

Education

B.S. (Electrical Engineering)
North Carolina State
University, Raleigh, NC – 2003

Years of Experience

20+ years

Core Competencies

- Traffic signal timing
- Traffic signal and ITS design
- Traffic controller and detection system troubleshooting
- Traffic management and real-time operations

Name: David W. Palmer

Title: VP of Engineering

Office Location: Twinsburg, OH

Project Responsibilities and Role: For this project, David will oversee system integration, ensuring seamless implementation and technical excellence.

Upon graduation in 1984, David joined Path Master, Inc. as an Electrical Engineer, where he took on responsibilities including the design, building, testing, and troubleshooting of traffic control cabinets, traffic signal controllers, systems, and associated equipment.

Since then, David has been involved in the design, development, implementation, and training of various traffic signal systems. This includes working on some of the first closed-loop systems ever deployed in the 1980s, through current and modern-day state-of-the-art IP-based central systems such as Econolite's Centracs system.

Most recently, David has worked on the development and implementation of connected vehicle technologies, Automated Traffic Signal Performance Measures (ATSPM), and mobility projects, demonstrating his ongoing commitment to improving transportation infrastructure.

Education

B.S. (Electrical Engineering) – University of Akron, Ohio – 1984

Professional Affiliations

- Institute of Traffic Engineers (1984 – Present)
-

Years of experience

40+ years

Core Competencies

- Traffic control system design and implementation
- Connected vehicle technology development

Name: Eddie Verhovitz

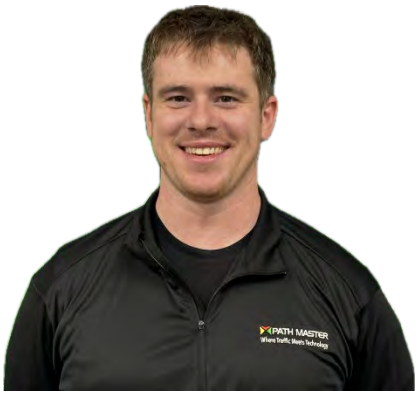
Title: Senior Engineer

Office Location: Twinsburg, OH

Project Responsibilities and Role: Eddie will act as the lead Project Manager for this project. Managing the project on behalf of Path Master, Eddie will take the lead in overseeing every aspect of the deployment to ensure successful and seamless project execution. As Senior Engineer, Eddie plays a critical role in ensuring the success of Path Master's technical operations. He is responsible for understanding the technical and operational requirements of the company's complete product portfolio, enabling him to provide support to Field Engineering Services and customers. Eddie also provides process documentation and implements improvements for Production and Field Services, enhancing overall efficiency and effectiveness.

With a background in product development and team management across both the Telecommunications and Intelligent Transportation Systems (ITS) sectors, Eddie brings a wealth of knowledge and experience to his role. His expertise in Computer Science allows him to deeply analyze product functionality, ensuring that all solutions meet stringent compliance standards and align with customer expectations.

Eddie's ability to bridge technical insights with operational needs makes him a key contributor to Path Master's mission of delivering high-quality, innovative solutions to the transportation industry.



Education

B.S. (Computer Science) – University of Toledo, Ohio – 2014

Years of Experience

10+ years

Core Competencies

- Bare Metal firmware and Full-Stack software development for Industrial ITS products
- Full-cycle product design management
- Customer-focused training
- Field Support

Name: John McCartney

Title: Systems Support Engineer

Office Location: Twinsburg, OH

Project Responsibilities and Role: For this project, John will provide technical support and system implementation services, applying his extensive experience to guide traffic signal deployments and ensure system functionality.

John is a Systems Support Engineer with over 20 years of experience in the transportation industry, including more than 19 years at Path Master. He specializes in providing technical support and training for traffic controllers, detection systems, and management technologies to industry professionals.

John's day-to-day activities include overseeing the implementation of Econolite's Centracs and Mobility systems within Path Master's territory, troubleshooting software, electrical, and communication issues, and ensuring the successful completion of traffic signal projects.

One of the career highlights for John McCartney came in the fall of 2018, when he led the effort to migrate the city of Delaware, OH from Eagle controllers and TACTICs management software to Econolite EOS controllers and Centracs ATMS. This was a unique situation since the Ethernet network was already in place, this allowed for zero downtime for controller communication.

The effort started by hand-programming 36 EOS Cobalt controllers from EPAC .pdf timing sheets supplied by the city. Then the Centracs servers were stood up alongside TACTICS. When the controller got replaced in the field, it immediately started to communicate with Centracs. Issues encountered included cabinet modifications to correctly report flash and battery backup status from unfamiliar cabinets and inverters. Each location verified and tested alongside city personnel to ensure a fully operational system from the get-go.

Education

B.S. (Mechanical Engineering Technology) –
University of Toledo, Ohio – 2002

Years of Experience

20+ years

Core Competencies

- Technical support
- Traffic controller and detection system troubleshooting
- Training on traffic management technology
- Connected vehicle technology development

Name: Scott Morse

Title: Systems and Business Development Manager

Office Location: Twinsburg, Ohio

Background: For this project, Scott will assist in leading the team assembled to bid on the **LFUCG** Project and provide strategic support throughout its implementation.

Scott is a seasoned professional with 14 years of experience in the transportation industry, specializing in the sales and implementation of advanced traffic management technologies. A graduate of Ashland University with a Bachelor of Science in Business Administration, Scott is dedicated to introducing and delivering innovative solutions that enhance traffic infrastructure and improve operational efficiency for Path Master and its clients.

Throughout his career, Scott has played a pivotal role in introducing cutting-edge technologies to Path Master's portfolio, helping customers adopt advanced systems for traffic management, preemption, signal performance metrics, and communications. He oversees sales initiatives for major customers within the company's territory, ensuring tailored solutions and exceptional service.

Relevant Projects:

- **ODOT:** Mobility Optimization projects, Path Master has implemented multiple Optimization systems for ODOT throughout the state of Ohio. Scott has sold these systems, performed cabinet assessments, helped with detection set up, set up and attended all training classes for ODOT and supported all systems from a sales perspective once turn over the ODOT.

- **Avon Ohio:** Centracs Mobility Optimization and Edaptive system. Worked with Avon to do all field work to verify controller and detection set up. Helped in the training of Avon and continue to work with them to keep system operating 100%. We have now installed PTV Flows that allows Avon to monitor freeways and main arterials for incidents, and stopped traffic, once detected traffic responsive will select a new traffic pattern to help keep traffic moving on main arterials.

Education
Bachelor of Science in Business Administration (BSBA)
Ashland College, Ohio – 1989

Years of Experience
14+ years

Core Competencies
- Inter-agency communication
- Client relation management
- Connected vehicle technology
- Large-scale ITS traffic management systems
- Preemption and priority systems
- Communications solutions
- Government grants
- Project management

Name: Nina M Nardi

Title: Project Coordinator

Office Location: Twinsburg, Ohio

Project Responsibilities and Role: For this project, Nina will oversee scheduling, meeting coordination, and vendor communications.
Nina began her career at Path Master by joining the Inside Sales team and soon after assumed the position of Project Coordinator. She is responsible for scheduling field service, gathering necessary project information, responding to customer needs, and organizing meetings.

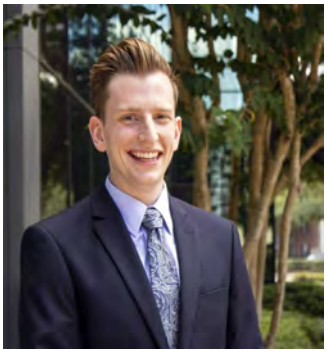
Staring in Inside Sales allowed her to gain knowledge in quoting and processing orders, as well as developing relationships with our customers and vendors. Her current role has allowed her to work closely with the Engineering team to see projects through from planning and execution to completion.

Nina has worked on many projects involving the implementation of connected vehicle technologies and central system communication.

Education
B.S. (Aerospace Engineering)
The Ohio State University
2021

Years of Experience
1+ years

Core Competencies
- Project Management
- Scheduling of Field Engineers
- Communication with customers
- Organization
- Time Management



Nathan Shay, PE, AICP, RSP2I Flow Labs, Project Manager and Professional Traffic Engineer

Nathan Shay is a Solutions Engineer at Flow Labs where he works with customers through the entire technical journey from introductory demonstrations to custom implementation and ongoing support. Nathan has a diverse background with 8+ years of experience in the transportation industry. His experience includes graduate research in discrete choice analysis and innovative origin-destination estimation methods; work in the public sector as a travel demand modeler and transportation planner; work as a consultant including data-driven analysis of safety, congestion, and reliability; and work for transportation big data analytics firms helping customers select, adopt, and implement tools to make their work more data-driven and efficient.

Functional Responsibilities

- **Project Management**
- **User Training**
- **Implementation Support**
- **Ongoing Support**

Relevant Project Experience

Texas Department of Transportation Planning Consulting

As a transportation planning consultant Nathan supported various projects throughout the state. Some of his work includes the I-10 Pendale Interchange Study, Dyer Street Safety Study, and 4-year District Safety Plan in the El Paso District; FM 2271 Extension Regional Feasibility Study in the Waco District; and Houston Urban Core Planning Study in the Houston District. Contributions were varied but included:

- Using big data analytics tools to analyze recurring and non-recurring congestion and mobility impacts of crashes
- Development and implementation of methods to generate the required traffic volume, turning movement, routing, speed, and queuing data to support an Interstate Access Justification Report from big data analytics tools
- Multi-scale multi-resolution model validation and scenario analysis for a district wide mesoscopic model
- Implementation and automation of data-driven safety analysis using both location-specific and systemic methods for network screening, diagnosis, counter-measure selection, benefit-cost analysis, and prioritization

Mid-Ohio Regional Planning Commission

Serving as a MPO staff Data Analyst included forecasting traffic and land use for the Greater Columbus Metropolitan Area using an activity-based model. Work included conducting subregional traffic studies from start to finish including land use forecast review and revision and network coding, scenario development and forecasting,

and summarizing results in maps, tables, text, and oral presentations. Designing and adapting methods for conflation, verification, and correction of socioeconomic and development data. Improving the regional land use allocation model including creating a Monte Carlos simulation model to stochastically allocate county control total forecasts of population and employment growth to traffic analysis zones according to various indicators of development attractiveness and capacity consistent with local land use plans.

Flow Labs

Dr. Wade Genders, PhD. Flow Labs, Machine Learning (ML) Engineering Lead

Dr. Wade Genders is the Machine Learning Lead at Flow Labs where he researches and develops novel artificial intelligence (AI) and machine learning (ML) techniques to process connected vehicle data, generating high-accuracy models which are used to analyze, predict, and optimize traffic safety. Dr. Genders has an academic research background, completing a Ph.D. at McMaster University in using deep reinforcement learning for traffic signal control optimization. Dr. Genders is a globally renowned expert who has published over a dozen research papers cited more than 575 times.

Education

PhD, Civil Engineering, McMaster University, Hamilton, ON, Canada

MSCE, McMaster University, Hamilton, ON, Canada

B. Eng, (Software) & Society, McMaster University, Hamilton, ON, Canada

Work History

Flow Labs, Machine Learning Engineering Lead (June 2019 - Present)

University of Toronto, Intelligent Transportation Systems Lab Manager (June 2019 - Present)

Relevant Project Experience

Maricopa Association of Governments (MAG)

This project involves the deployment of the Flow Labs platform with Maricopa Association of Governments (MAG) across 60 intersections in the region with a population of ~5m. The platform leveraged data from multiple sources including probe data to generate signal performance metrics including mobility, signal operations, and safety metrics. The platform was used for multiple applications including: performance analysis of a newly deployed adaptive traffic control system identifying safety performance impacts, live analytics of multiple corridors, proactive monitoring and problem identification, detector health monitoring, and signal optimization including optimization for safety. Wade was responsible for the development of the simulation-based optimization system, the modeling of the signal networks, and the algorithms for data processing.

FDOT D5 Hi-Definition Engineering (HEIDI)

This project involves the deployment of the Flow Labs platform with Florida Department of Transportation District 5 across over 2000 intersections. The platform leverages historical, and real-time data roadway and traffic signal data from TomTom and includes an ATSPM integration component for advanced signals. The platform was used for multiple applications including real-time volume generation, traffic signal analytics, and proactive monitoring. Wade was responsible for intersection modeling and the development of real-time processing algorithms to generate accurate, real-time performance measures and turning movement count estimates.

Seattle Department of Transportation Traffic Signal Analytics

This project involves the deployment of the Flow Labs platform with Seattle Department of Transportation across 34 intersections in the University District. The platform leverages historical, data roadway and traffic signal data from TomTom and includes an ATSPM integration component. This deployment additionally included the integration of crash and fatality data from state databases, and the integration of near-miss event data from Michelin Safety Insights. Wade was responsible for intersection modeling, the development of data processing algorithms for signal performance measures and safety measures.

Signal Coordination using AI and Machine Learning

This project involved the design, development, and deployment of a world-first system that processed connected vehicle data at scale; integrated it with signal control system and detection data; produced comprehensive safety, operations, mobility, and environmental metrics; provided proactive safety monitoring; and provided decision support for traffic signal timing. The system was deployed across 48 intersections in the largest deployment globally of its kind, delivering signal timing plans optimized for mobility, safety, and environmental impact. This project involved the real world deployment of a system for connected vehicle processing, safety analytics, diagnostics, proactive safety monitoring, and decision support.

Project Manager ITS Academia-Industry Partnership

Served as Senior Research Associate Project Manager for a multi-million dollar partnership between the University of Toronto's Civil Engineering Intelligent Transportation Systems (ITS) Centre and Testbed and a leading global technology partner. The partnership consisted of nine projects which applied AI and ML for ITS applications. Served as technical advisor on four AI and ML projects and provided technical contributions on two adaptive traffic signal control projects. This project demonstrates experience in real world applications for AI and ML, technologies which are a necessity for the data processing required for this project.

City-Scale AI Adaptive Signal Control

Completed a Ph.D. thesis which culminated in the development of a system which could simultaneously train hundreds of deep reinforcement learning agents in simulation as adaptive traffic signal controllers to reduce travel time and delay. This system was tested on a model of the City of Luxembourg and is made freely available to the research community on GitHub.

Dr. Tommy McKinnon, PhD, Flow Labs, Software Engineer

Dr. Tommy McKinnon is a Software Engineer at Flow Labs where he is responsible for the connected vehicle data ingest pipeline, metric calculations, vehicular volume estimates, and maintaining the virtual infrastructure. He holds a PhD in Physics from Simon Fraser University and has published several scientific research articles in peer reviewed journals. Dr. McKinnon holds a US patent (US9449979B2) for a novel ferroelectric based solid state memory technology that he developed. Dr. Mckinnon has over 15 years of experience as a full stack software engineer using many languages from C to Python. Dr. Mckinnon has over 5 years of experience in machine learning and has developed novel regression techniques and reinforcement learning based models using both Tensorflow and PyTorch. At Flow Labs, Dr. McKinnon researched the statistical distribution of connected vehicles in order to derive mathematically correct models that are used to calculate volume estimates, uncertainties, and confidence intervals. He also developed the platform's detector health analytics, which are used to determine which detectors are broken or malfunctioning.

Education

PhD, Physics, Simon Fraser University, Burnaby, BC, Canada

BSc Honors Physics, Simon Fraser University, Burnaby, BC, Canada

Patents

US patent (US9449979B2), a novel ferroelectric based solid state memory technology

Relevant Project Experience

Maricopa Association of Governments (MAG)

This project involves the deployment of the Flow Labs platform with Maricopa Association of Governments (MAG) across 60 intersections in the region with a population of ~5m. The platform leveraged data from multiple sources including probe data to generate signal performance metrics including mobility, signal operations, and safety metrics. The platform was used for multiple applications including: performance analysis of a newly deployed adaptive traffic control system identifying safety performance impacts, live analytics of multiple corridors, proactive monitoring and problem identification, detector health monitoring, and signal optimization including optimization for safety. Wade was responsible for the development of the simulation-based optimization system, the modeling of the signal networks, and the algorithms for data processing.

FDOT D5 Hi-Definition Engineering (HEIDI)

This project involves the deployment of the Flow Labs platform with Florida Department of Transportation District 5 across over 2000 intersections. The platform leverages historical, and real-time data roadway and traffic signal data from TomTom and includes an ATSPM integration component for advanced signals. The platform was used for multiple applications including real-time volume generation, traffic signal analytics, and proactive monitoring. Wade was responsible for intersection modeling and the development of real-time processing algorithms to generate accurate, real-time performance measures and turning movement count estimates.

Seattle Department of Transportation Traffic Signal Analytics

This project involves the deployment of the Flow Labs platform with Seattle Department of Transportation across 34 intersections in the University District. The platform leverages historical, data roadway and traffic signal data from TomTom and includes an ATSPM integration component. This deployment additionally included the integration of crash and fatality data from state databases, and the integration of near-miss event data from Michelin Safety Insights. Wade was responsible for intersection modeling, the development of data processing algorithms for signal performance measures and safety measures.

Signal Coordination using AI and Machine Learning

This project involved the design, development, and deployment of a world-first system that processed connected vehicle data at scale; integrated it with signal control system and detection data; produced comprehensive safety, operations, mobility, and environmental metrics; provided proactive safety monitoring; and provided decision support for traffic signal timing. The system was deployed across 48 intersections in the largest deployment globally of its kind, delivering signal timing plans optimized for mobility, safety, and environmental impact. This project involved the real world deployment of a system for connected vehicle processing, safety analytics, diagnostics, proactive safety monitoring, and decision support.

August Brenner, Flow Labs, Principal Software Engineer

August Brenner is the Principal Software Engineer at Flow Labs where he is responsible for leading the software engineering team. August has 12+ years of experience building scalable, reliable analytics software platforms across multiple industries, including leading the development and technical deployment of the Flow Labs platform, including defining the platform's core architecture and developing new features including the analytics user interface.

Education

B.S. in Chemical Engineering, University of California, San Diego

Relevant Project Experience

Maricopa Association of Governments (MAG)

This project involves the deployment of the Flow Labs platform with Maricopa Association of Governments (MAG) across 60 intersections in the region with a population of ~5m. The platform leveraged data from multiple sources including probe data to generate signal performance metrics including mobility, signal operations, and safety metrics. The platform was used for multiple applications including: performance analysis of a newly deployed adaptive traffic control system identifying safety performance impacts, live analytics of multiple corridors, proactive monitoring and problem identification, detector health monitoring, and signal optimization including optimization for safety. Wade was responsible for the development of the simulation-based optimization system, the modeling of the signal networks, and the algorithms for data processing.

FDOT D5 Hi-Definition Engineering (HEIDI)

This project involves the deployment of the Flow Labs platform with Florida Department of Transportation District 5 across over 2000 intersections. The platform leverages historical, and real-time data roadway and traffic signal data from TomTom and includes an ATSPM integration component for advanced signals. The platform was used for multiple applications including real-time volume generation, traffic signal analytics, and proactive monitoring. Wade was responsible for intersection modeling and the development of real-time processing algorithms to generate accurate, real-time performance measures and turning movement count estimates.

Seattle Department of Transportation Traffic Signal Analytics

This project involves the deployment of the Flow Labs platform with Seattle Department of Transportation across 34 intersections in the University District. The platform leverages historical, data roadway and traffic signal data from TomTom and includes an ATSPM integration component. This deployment additionally included the integration of crash and fatality data from state databases, and the integration of near-miss event data from Michelin Safety Insights. Wade was responsible for intersection modeling, the development of data processing algorithms for signal performance measures and safety measures.

Signal Coordination using AI and Machine Learning

This project involved the design, development, and deployment of a world-first system that processed connected vehicle data at scale; integrated it with signal control system and detection data; produced comprehensive safety, operations, mobility, and environmental metrics; provided proactive safety monitoring; and provided decision support for traffic signal timing. The system was deployed across 48 intersections in the largest deployment globally of its kind, delivering signal timing plans optimized for mobility, safety, and environmental impact. This project involved the real-world deployment of a system for connected vehicle processing, safety analytics, diagnostics, proactive safety monitoring, and decision support.

Flow Labs

Chedhli Bourguiba, Flow Labs, Data Scientist

Chedhli Bourguiba is a data scientist at Flow Labs, where he developed a big data pipeline that ingests and manipulates vast quantities of multi-sensor data to create realistic transportation models which are used to optimize traffic signal timings. He also designed a series of traffic pattern algorithms to produce signal timing plans which have reduced travel times by 24% and emissions by 21%, saving Utah's citizens over 30 million in opportunity costs and removing over 23 million pounds of carbon dioxide from the atmosphere.

Education

Master of Science in Civil Engineering Systems, University of California, Berkeley, Berkeley, CA

Master's in Operations Research, University of Paris-Saclay, Paris, France

Bachelor of Science in Applied Mathematics, Ecole polytechnique, Palaiseau, France

Relevant Project Experience

Maricopa Association of Governments (MAG)

This project involves the deployment of the Flow Labs platform with Maricopa Association of Governments (MAG) across 60 intersections in the region with a population of ~5m. The platform leveraged data from multiple sources including probe data to generate signal performance metrics including mobility, signal operations, and safety metrics. The platform was used for multiple applications including: performance analysis of a newly deployed adaptive traffic control system identifying safety performance impacts, live analytics of multiple corridors, proactive monitoring and problem identification, detector health monitoring, and signal optimization including optimization for safety. Wade was responsible for the development of the simulation-based optimization system, the modeling of the signal networks, and the algorithms for data processing.

FDOT D5 Hi-Definition Engineering (HEIDI)

This project involves the deployment of the Flow Labs platform with Florida Department of Transportation District 5 across over 2000 intersections. The platform leverages historical, and real-time data roadway and traffic signal data from TomTom and includes an ATSPM integration component for advanced signals. The platform was used for multiple applications including real-time volume generation, traffic signal analytics, and proactive monitoring. Wade was responsible for intersection modeling and the development of real-time processing algorithms to generate accurate, real-time performance measures and turning movement count estimates.

Seattle Department of Transportation Traffic Signal Analytics

This project involves the deployment of the Flow Labs platform with Seattle Department of Transportation across 34 intersections in the University District. The platform leverages historical, data roadway and traffic signal data from TomTom and includes an ATSPM integration component. This deployment additionally included the integration of crash and fatality data from state databases, and the integration of near-miss event data from Michelin Safety Insights. Wade was responsible for intersection modeling, the development of data processing algorithms for signal performance measures and safety measures.

Signal Coordination using AI and Machine Learning

This project involved the design, development, and deployment of a world-first system that processed connected vehicle data at scale; integrated it with signal control system and detection data; produced comprehensive safety, operations, mobility, and environmental metrics; provided proactive safety monitoring; and provided decision support for traffic signal timing. The system was deployed across 48 intersections in the largest deployment globally of its kind, delivering signal timing plans optimized for mobility, safety, and environmental impact. This project involved the real world deployment of a system for connected vehicle processing, safety analytics, diagnostics, proactive safety monitoring, and decision support.

SECTION 8 | APPENDIX

Full List of Flow Labs Signal Performance Measures
Flow Labs - Performance Measures

Florida Department of Transportation Validation Report (Technical Version)
Flow Labs - FDOT HEIDI Phase1 Final Report.pdf

Using PBSPMs and ATSPMs White Paper
Flow Labs - Using PBSPMs and ATSPMs - White Paper (1).pdf

Andy Beshear
GOVERNOR

TRANSPORTATION CABINET
200 Mero Street
Frankfort, Kentucky 40601

Jim Gray
SECRETARY

September 19, 2025

Jatish Patel
Flo Artificial Intelligence, Inc. DBA Flow Labs
6580 E McDowell Rd
Unit 2316
Scottsdale, AZ 85257

Jatish Patel:

We are pleased to inform you that the Kentucky Transportation Cabinet's Office for Civil Rights and Small Business Development has certified Flo Artificial Intelligence, Inc. DBA Flow Labs as a Disadvantaged Business Enterprise (DBE).

The following table lists the North American Industry Classification System (NAICS) code(s) and description(s) that have been assigned to your business in accordance with the service(s) it renders.

NAICS: Specialty Description
NAICS 541511: CUSTOM COMPUTER PROGRAMMING SERVICES

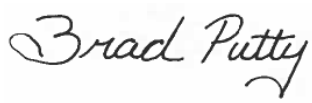
Certification is continuous; however, it is contingent upon the firm maintaining its eligibility annually through this office. The firm is required by the eligibility criteria set forth in U.S. Department of Transportation, Code of Federal Regulations Title 49 Part 26, annually, to submit a signed “Declaration of Eligibility” with supporting documentation. The annual documentation is due each year. The firm’s next annual information is due by June 30, 2026. It is your responsibility to notify this office in writing within 30 days of any changes. Failure to do so may result in decertification of your business.

It is the KYTC's policy to conduct a review process for all certified firms. A review of the certified firm will be performed every three (3) years of certification beginning from the date of the initial notice of certification. Absent a finding of regulatory non-compliance, a change in the majority ownership and/or control, or a successful third-party challenge, this certification will be eligible for review on June 30, 2028.

We have also added your firm to the KYTC directory, which can be accessed at http://kytc.gob2g.com.

If you have any questions regarding your certification, please feel free to contact this office at (502) 564-3601 or 1-800-928-3079.

Sincerely,



Brad Putty
Staff Assistant & DBE Liaison Officer
Office for Civil Rights & Small Business Development