Hamilton
Public Works

TRAFFIC OPERATIONS & ENGINEERING
Corporate Assets & Strategic Planning Division

Advance Traffic Management System (ATMS) Central Software Evaluation Overview and Technical Recommendation

December 17, 2014

Contents

Background:

The City of Hamilton's Traffic Management Centre will be the collaborative space from which the City of Hamilton's Advance Traffic Management System (ATMS) will be monitored and controlled via the ATMS central software package. Therefore, the ATMS software will be the central nervous system of the Traffic Management Centre. Traffic Operations and Engineering has retained the services of PARSONS a consulting firm on the PW roster to serve as technical advisors during the ATMS central software evaluation and to validate the software selection. Upon approval of this report, PARSONS will be preparing an ATMS software specification with input from City of Hamilton staff.

In order to turn the software evaluation into an impartial scientific exercise and to avoid any potential pitfalls, a rating system was developed that awarded weighted scores for various standard that are expected from ATMS central software as well as unique City of Hamilton requirements. The City of Hamilton ATMS Central Software Selection Criteria was based on projected system needs for the next 15 years and City of Hamilton unique ATMS requirements. The weighted scores in the rating system where tuned for requirements that are particularly important to a Hamilton ATMS deployment. Please note that, the need to implement an ATMS system before the 2015 PAN AM Games has also been factored into the equation.

As part of the justification process, PARSONS will also prepare an independent report explaining the selection process and validating the final technical recommendation. Provided that the technical recommendation contained in this report is accepted, PARSONS will begin working on an ATMS software specification document immediately after a notice to proceed. The specification document will be used to negotiate a contract with the successful software provider. It should be noted that in order to successfully implement an ATMS central software before PAN AM, it is estimated that software implementation and system integration should begin no later than February 2015.

Benefits of PEEK 3000E Compatibility:

It is important to stress the value of choosing a software package that can readily interface with our legacy PEEK 3000E Traffic Signal controllers. The replacement of controllers on a system wide scale would represent an estimated cost of at least 1.8 million dollars if all controllers were to be replaced today. Even on the smaller PAN AM scale, we would have to payout an estimated $300,000.00 dollars extra to replace between 80-100 controllers on the PAN AM corridor alone. Furthermore, the cost does not stop at hardware acquisition but would also include labor-cost for field deployment as well as staff down time due to training.

On the topic of training, it should also be noted that we do not currently have the staff resources to tackle the ATMS project implementation while trying to learn how to use a new traffic signal controller at the same time. Therefore, backwards compatibility with our legacy PEEK 3000E signal controllers is a critical requirement for an ATMS deployment and system integration in 2015. PEEK 3000E backwards compatibility affords us the time to develop a new ATC controller specification and to carefully choose a controller that best fits our ATMS central software selection at a hardware and firmware level.

Agnostic Compatibility with Multiple ATC Controller Brands:

One of the key guiding principles of this software evaluation was to select an agnostic system not specifically designed for a "X" brand of controllers. The goal was to select a software package that can interface with multiple brands of ATC signal controllers in order to provide more flexibility in our controller procurement. Agnostic system capability not only opens the door to more competitive pricing from controller manufacturers but also increases the options in terms of controller features that maybe desirable in the future. All top-4 software options were selected largely in part due to their agnostic system design and the fact that the software developer did not have an affiliation with a controller manufacturer. The evaluation process also looked for companies that already had at least three compatible ATC controllers certified for use on their system which will reduce the cost of controller integration services. In this report it is important to remember that agnostic compatibility is a key requirement for the evaluation process and that it represents one of the most significant benefits of selecting one of these systems.

Software Evaluation Process:

The software evaluation process involved extensive data collection from 12 potential software providers. Each software provider was given an opportunity to populate the main evaluation matrix (41 variables) and to present their solution to City of Hamilton staff via face-to-face and/or online meetings. Furthermore, the top four software providers were also required to conduct a live or remote demo of their software in order to remain included in the evaluation process.

The software evaluation process included a 2-level decision matrix system which allowed us to narrow down the options progressively as we moved through the process. The matrix system was based on the City of Hamilton's ATMS Central Software Selection Criteria (Please see Appendix "A"). The level-1 matrix looked at a wide range of requirements that are expected from a modern ATMS system as well as specific requirements unique to a City of Hamilton ATMS deployment (Please see Appendix "B"). Level-1 evaluation was designed to narrow down the options and eliminate those options that do not fit the City of Hamilton's current and future ATMS needs for a projected 15 year system life span.

Level-2 evaluation took the top 4 systems from Level-1 and refined the evaluation process by targeting critical requirements needed for a successful and quick system deployment for 100 signals before the 2015 PAN AM games (Please see Appendix "C").

Please keep in mind that Level-2 does not only look at software features and compatibility with legacy equipment but digs deeper into company resources and capabilities as well as key software features that are designed to expedite the system implementation process. Level-2 also looks at key display and user interface features which we believe are critical for presenting a modern and state-of-the-art video wall display. Please note that getting the right user interfaces and graphics will be extremely important to the operation of the Traffic Management Centre. Well-designed user interfaces and graphics will not only look right on the video wall but will allow users to use system data efficiently.

Top-2 Runner-Up Software Options – TransSuite and SCATS:

All top-4 software options are well regarded in the Traffic Industry and are backed by well-established companies. However, there are significant differences in the way these software packages operate which make these two options less desirable for implementation in the City of Hamilton. For example, there were significant concerns about the ease of integration and level of support available for SCATS. Furthermore, North American compatibility in terms of meeting NTCIP and ATC controller standards was also questionable for the SCATS option. Out of these two options SCATS noticeably dropped out of the equation due to its complexity of implementation and lack of compliance with North American Standards.

On the other hand TransSuite was able to deliver a solid score in our Level-2 evaluation matrix but lost significant points due to its dated graphics as well as less user friendly interface. The TransSuite demo exposed a number of issues related to the ease of system setup and substandard graphical interfaces. In a nutshell, TransSuite's user interface current design does not fit our vision for the TMC's video wall. In terms of basic functionality, TransSuite could have been an adequate option but a significant compromise would have been made in terms of video wall display expectations. Delivering a functional and state-of-the-art video wall display was considered a major requirement of our software evaluation process.

At the end of the day, although both SCATS and TransSuite are solid options they were less compatible with our ATMS vision and the need for a quick system deployment before the 2015 PAN AM Games. Both options lost significant ground in the Level-2 evaluation as they failed to fulfill a number of key City of Hamilton requirements. The top 2 runner-up options are as follows:

3) **TransSuite by Transcore (Score – 60 Points out of 100)**
4) **SCATS by ATC-Australia (Score – 30 Points out of 100)**

Please note that SCATS is unfortunately not a viable option due its complexity of implementation and the fact that it would represent too big a departure from our current practices. Nevertheless, it is a powerful system with a different approach to signal timings and optimization which is used extensively around the world. However, SCATS is a high risk option for Hamilton and the option with the steepest learning curve.

Top-2 Software Options – KITS-Kadence and Eco-TraffiX:

The top-2 options are well regarded in the Traffic Industry and are backed by well-established companies that have the resources to provide integration services and support for their products. The systems are highly comparable in terms of features and their modern design and graphics.

The features found in both software packages fit our vision for an integrated ATMS solution which is not just a traffic signal control software but a multi-module solution that can monitor and control other ITS devices and systems. The top-2 software options are as follows:

1) **KITS-Kadence by Kimley-Horn and Associates (Score - 100 Points out of 100)**
2) **Eco-TraffiX by Schneider Electric/TELVET (Score – 75 Points out of 100)**

On paper both companies have the resources and knowledge to support our ATMS project and should be able to deliver a solution before PAN AM. However, Kimley-Horn staff has demonstrated a higher level of service quality and knowledge throughout the evaluation process. Furthermore, there are a number of unique features in KITS-Kadence that have played a role in setting the two top options apart.

One of these options is the use of High Resolution Data Logging from Purdue University which is only found in KITS-Kadence. Purdue University High Resolution Data Logging has been picking up a lot of attention in the industry and is very likely to become an industry standard. We believe that choosing a system that can use Purdue University High Resolution Data Logging will future proof our software selection. Furthermore, High Resolution Data Logging leverages the use of video detection by utilizing the full extent of our video detection equipment's functionality and our ability to place detection zones anywhere in the field of view including upstream and downstream detection.

Kimley-Horn has incorporated High Resolution Data Logging Reports into KITS-Kadence to provide new tools for measuring intersection and arterial performance. These tools allow users to use High Resolution detector data to measure intersection and arterial performance with a higher degree of accuracy. The data provided helps users better predict arrivals on green at intersections which in turn is used to fine tune traffic signal progression and to optimize green times. High Resolution Data Logging will be facilitated by our video detection systems which can provide unlimited detection zones within the field-of-view and thus making the cost of installing vehicle detectors less cost prohibited.

KITS-Kadence also has as suite of traffic congestion management tools which are superior to those found in Eco-TraffiX. These congestion management tools are important to the future development of the City's ATMS system and can be used in a small scale during the 2015 PAN AM Games. Some of these tools include features such as:

1. **Responsive time of day plan selection based on historical conditions.**
2. **Traffic queue management based on upstream and downstream traffic monitoring.**
3. **Priority route pre-emption module.**
4. **Real time intersection malfunctioning/erratic-operation monitoring and alarms.**
5. **Reversible lane control module.**

On the other hand the demo for both software packages was not equally successful as one demonstrated a minor edge over the other. Eco-TraffiX is based on MIST which is a well stablished software package; however the new user interface was just launched at the Detroit ITS World Congress in September 2014. The software demo exposed a number of software bugs which are typical in any new software release. Although the interface looks and works almost as good as the KITS-Kadence user interface, the KITS-Kadence demo was flawless which is indicative a more mature software package. Given our tight time line for implementation, we believe there is a great need to minimizing the risk of

delays during implementation. Therefore, based on software demo observations, it is our opinion that Eco-TraffiX would be a higher risk option.

Finally, we have the intangible element of perceived knowledge and level of support from each of these companies. This is very difficult to measure and quantify between two large companies such as Schneider Electric and Kimley-Horn and therefore this becomes a question of whether or not we feel that the implementation team has the competence and right attitude to get the job done. Based on our dealings with both teams the Kimley-Horn team has demonstrated a high-energy attitude coupled with obvious experience and knowledge that makes us feel more comfortable about tackling this project with Kimley-Horn. They have also demonstrated ample staff resources by continuously tapping into different resources from multiple offices across the US.

PEEK 3000E Lab Testing:

All top-4 software providers were asked the same questions regarding compatibility with our legacy signal controllers the PEEK 3000E. They all responded with various degrees of detail and basically said that they could communicate with the PEEK 3000E. However, it was clear that in most cases there would be a need to do some controller lab testing to find out exactly the level of compatibility and how much additional integration would be required. Kimley-Horn was the only company to offer lab testing of the PEEK 3000E to identify the exact level of compatibility with KITS-Kadence which they conducted in record time at our request. Their lab testing has confirmed that KITS-Kadence is over 95% compatible with the 3000E and that all minimum ATMS requirements can be met with our legacy traffic signal controllers.

Non-Disclosure Agreement with PEEK:

When asked if a non-disclosure agreement had been executed with PEEK to interface with their 3000E(s) controller, only Kimley-Horn was able to verify the existence of an agreement. The other companies expressed verbal confidence that PEEK would be willing to work with them but were not willing to backup those statements with a letter of commitment. The absence of an existing non-disclosure agreement to interface with PEEK 3000E controllers is a potential show stopper as negotiations with PEEK would get in the way of commencing system deployment and integration. Therefore, the existing agreement between PEEK and Kimley-Horn significantly reduces the risk of delays during a potential KITS-Kadence deployment.

Kimley-Horn Company Specifics:

Kimley-Horn was founded in 1967 and is a Fortune 100 engineering consulting firm that currently has 70 offices across the US and 2,000 employees. The agency has an intelligent transportation group who are the creators of KITS-Kadence which has been in development for over 25 years and has a total of 30 deployments in North America. Please find below a list of notable deployments across North America:

1) **City of Philadelphia – 3000 Signals**
2) **Miami-Dade County – 2800 Signals**
3) **City of Austin – 700 Signals**

4) **Los Angeles County – 600 Signals**
5) **City of Tallahassee – 340 Signals**
6) **City of Windsor(Canada) – 340 Signals**

The firm has its roots in transportation engineering and has become a major player in intelligent transportation systems in the US. We feel confident that Kimley-Horn is a reputable and stable company that can provide the right knowledge base and resources to execute our ATMS software deployment.

Risk Management:

Throughout the evaluation process we have manage potential risk by making sure that our technical recommendation is based on a technically strong and in-depth evaluation process. However, with any major system implementation risk cannot be completely avoided due to the large number of unknown variables and parties involved. In the case of our ATMS project the biggest concern is limited time for implementation and the need for future staff resources to operate the new ATMS system. Nevertheless, we have eliminated a lot of the risk in the software selection process by conducting a detailed analysis of software features versus City of Hamilton system requirements.

We also have done our homework in terms of selecting a solid partner that has resources and the knowledge to support this project from a deployment and integration stand point.

Technical Recommendation – KITS-Kadence Brand of ATMS Central Software:

At the end of the day both of the top-2 options earned their place in our final raking and are definite heavy weight contenders for a Hamilton ATMS system implementation. However, based on the overall evaluation results/scores and the demonstrated level of knowledge and support from each team, we recommend KITS-Kadence by Kimley-Horn as our new ATMS Central Software System. Please take into consideration that this recommendation is being made not only based on the hard numbers from the scoring system but also on the demonstrated ability by the Kimley-Horn team to get the job done. Given our aggressive time table for implementation before PAN AM, we need a company that can hit the ground running and believes the project is doable.

APPENDIX "A" – SELECTION CRITERIA

City of Hamilton
ATMS Central Software Rating System
Guiding Principles for ATMS Software Selection

PRIORITY 1

- System interoperability with various ITS peripheral devices and data exchange with other ATMS systems (C2C).

- Component exchangeability, meaning that the system was designed on a hardware agnostic platform.

- Real-time-system, capable of second by second monitoring, alarms and central command upon input from field.

- System modularity must allow for features to be added on an as need basis.

- Capable of leveraging existing City ITS infrastructure such as video detection cameras and Spread Spectrum radio network.

- Compatible with legacy equipment (Peek 3000E) through NTCIP communication protocol or RCU unit.

- System software developer must have the resources and know how to deliver a turnkey solution for 100 signals within 3-4 months.

- System software must be compatible with City of Hamilton's IT network infrastructure, operating systems, architecture and communication limitations.

- System software must provide real time congestion management tools that can be used to demonstrate system benefits.

- System software provider must have the ability to provide remote or on-site support during TMC operating hours.

- 3000E solution delivers intersection monitoring, full upload/download, timer clock update and detector data.

PRIORITY 2

- Software supplier must have a minimum of 20 successful deployments and 2-3 customer references.

- System software must offer adaptive control either built-in or in the form of a firmware upgrade on ATC controllers.

- Software must be based on an open source model with access to an API programming layer.

- System software must be capable of remote TSP command, programming and monitoring.

- System software solution must be compatible with recent software developments trends such as thin clients, virtual server and WBM

- Core software cost and all additional modules should not exceed the Video Detection and ITS annual budget amount.

APPENDIX "B"- LEVEL 1 MATRIX

**City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation**

Ranking

Rank	Software Package	Score
1	MIST / Eco Traffic	95
2	KITS-KADENCE	90
3	TransSuite	90
4	SCATS-ATC	77.5
5	SCATS-Transcore	70
6	ARIA	50
7	TACTICS	47.5
8	CENTRACS	47.5
9	ATMS.NOW	45
10	PC-SCOOT (Stratos)	42.5
11	MAXVIEW	30
12	Transparity TMS – *Withdrew from evaluation*	0

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: ARIA

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	N	5	0
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Not Disclosed	5	0
H	20+ Deployments	N	2.5	0
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	Y	2.5	0
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	In Development	2.5	0
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	50

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: ATMS.NOW

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	N	5	0
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Synchro Green	5	0
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	N	2.5	0
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	Y	-10	-10
	Total		100	45

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: CENTRACS

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	N	5	0
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	N	2.5	0
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	N	2.5	0
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	Y	-10	-10
	Total		100	47.5

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: KITS-KADENCE

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	Y	20	20
B	Previous 3000E Deployment	Lab Tested	10	0
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	Y	2.5	2.5
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	90

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: MAXVIEW

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	N	5	0
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	N	5	0
H	20+ Deployments	N	2.5	0
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	N	10	0
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	N/A	5	0
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	N	2.5	0
O	Open Source Model (API)	Y	2.5	2.5
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	Y	-10	-10
	Total		100	30

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: MIST / Eco TraffiX

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	Y	20	20
B	Previous 3000E Deployment	Y	10	10
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	N	5	0
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	Y	2.5	2.5
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	95

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: PC-SCOOT (Stratos)

#	Requirement — Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	N	5	0
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	Y	2.5	0
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	N	5	0
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	N	2.5	0
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	Y	-10	-10
	Total		100	42.5

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: SCATS - ATC

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	Y	20	20
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	N	5	0
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	Y	2.5	0
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	Y	2.5	2.5
P	BING Maps/Open Street Maps Compatible	N	2.5	0
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	N	2.5	0
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	77.5

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: SCATS - TRANSCORE

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	Y	20	20
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	N	5	0
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	N	5	0
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	Y	2.5	0
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	N	2.5	0
R	Thin Client Available	N	2.5	0
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	70

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: TACTICS

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	N	20	0
B	Previous 3000E Deployment	N	10	0
C	3+ Compatible NEMA-ATC Controllers	N	5	0
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	N	5	0
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	Y	2.5	2.5
O	Open Source Model (API)	N	2.5	0
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	Y	2.5	2.5
S	Real Time Congestion Management Tools	Y	5	5
T	Company Produces or Represents Own North American Controller	Y	-10	-10
	Total		100	47.5

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: Transparity TMS – *Withdrew from Evaluation*

#	Description	Compliance (Y/N)	Points	Score
	Requirement			
A	Compatible with 3000E Controller	-	20	0
B	Previous 3000E Deployment	-	10	0
C	3+ Compatible NEMA-ATC Controllers	-	5	0
D	Real Time Monitoring and Alarms	-	5	0
E	Real Time Centrally Commanded	-	5	0
F	Real Time System Message Audit and Logging	-	5	0
G	Core System Software Cost and Additional Modules is Below $400,000,00	-	5	0
H	20+ Deployments	-	2.5	0
I	NTCIP Compliant	-	5	0
J	Adaptive Control is Available	-	10	0
K	RCU Required To Interface with Field Controllers	-	2.5	0
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	-	5	0
M	Remote Monitoring and Programming of TSP	-	2.5	0
N	Adaptive Leverages use of Video Detection (Upstream)	-	2.5	0
O	Open Source Model (API)	-	2.5	0
P	BING Maps/Open Street Maps Compatible	-	2.5	0
Q	Center to Center Compliant	-	2.5	0
R	Thin Client Available	-	2.5	0
S	Real Time Congestion Management Tools	-	5	0
T	Company Produces or Represents Own North American Controller	-	-10	0
	Total		100	0

City of Hamilton
ATMS Central Software Rating System
Level 1 Evaluation

Software Package: TransSuite

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Compatible with 3000E Controller	Y	20	20
B	Previous 3000E Deployment	Y	10	10
C	3+ Compatible NEMA-ATC Controllers	Y	5	5
D	Real Time Monitoring and Alarms	Y	5	5
E	Real Time Centrally Commanded	Y	5	5
F	Real Time System Message Audit and Logging	Y	5	5
G	Core System Software Cost and Additional Modules is Below $400,000,00	Y	5	5
H	20+ Deployments	Y	2.5	2.5
I	NTCIP Compliant	Y	5	5
J	Adaptive Control is Available	Y	10	10
K	RCU Required To Interface with Field Controllers	N	2.5	2.5
L	Adaptive Can be Added to ATC Controller With Firmware or Communication Card	Y	5	5
M	Remote Monitoring and Programming of TSP	Y	2.5	2.5
N	Adaptive Leverages use of Video Detection (Upstream)	N	2.5	0
O	Open Source Model (API)	Y	2.5	2.5
P	BING Maps/Open Street Maps Compatible	Y	2.5	2.5
Q	Center to Center Compliant	Y	2.5	2.5
R	Thin Client Available	N	2.5	0
S	Real Time Congestion Management Tools	N	5	0
T	Company Produces or Represents Own North American Controller	N	-10	0
	Total		100	90

APPENDIX "C" – LEVEL 2 MATRIX

City of Hamilton
ATMS Central Software Rating System
Level 2 Evaluation

Ranking

Rank	Software Package	Score
1	KITS-KADENCE	100
2	MIST/Eco-Traffix	75
3	TransSuite	60
4	SCATS-ATC	30

City of Hamilton
ATMS Central Software Rating System
Level 2 Evaluation

Software Package: KITS-KADENCE

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Software Developer is an Engineering Services Company That Can Customize Solutions for Customers	Y	5	5
B	Software Demo Successfully Conducted	Y	5	5
C	2-3 References Successfully Checked	Y	2.5	2.5
D	List of Three Compatible NEMA-ATC Controllers has been Provided	Y	5	5
E	Support is Available During EST Hours from Multiple Offices	Y	2.5	2.5
F	Software Developer has Recourses to Deliver Turn-Key Solution in 3-4 Months	Y	10	10
G	Controller Integration Free of Charge if Solution Already Developed for Other Customers	Y	7.5	7.5
H	Examples Provided of Successful Transit Priority Deployments	Y	2.5	2.5
I	Traffic Responsive Control can be Developed for 3000E With Congestion Management Tools	Y	2.5	2.5
J	Software Graphics Are Modern and Deliver a State of The Art System Map(s)	Y	7.5	7.5
K	Current Ability to Use High Definition Logging Data from Purdue University	Y	7.5	7.5
L	Preliminary Proposal Submitted for System Integration Including System Block Diagram	Y	2.5	2.5
M	System License has no Limit on Number of Intersections and is Limited by Hardware Only	Y	5	5
N	Can be Made Compatible with Existing Stock of (30) ATC-1000 Controllers with Minimum Controller Integration	Y	2.5	2.5
O	3000E Solution Can be Developed with IQ Connect Translator Card (NTCIP)	Y	5	5
P	Nondisclosure Agreement with PEEK has been Executed	Y	7.5	7.5
Q	Software has a Reversible Lane Control Module	Y	5	5
R	System Interface Has Advance Communication Trouble Shooting Tools Optimized for Wireless	Y	5	5
S	System Setup and Configuration is Intuitive and Reduces Implementation Times	Y	5	5

Requirement		Compliance (Y/N)	Points	Score
#	Description			
T	Software Solution Delivers City of Hamilton Minimum System Requirement with 3000E Controllers	Y	2.5	2.5
U	Estimated Annual System Maintenance Cost is Less than$50,000	Y	2.5	2.5
V	Current System User Interface has been in Production for Less Than 1-Year (Deduction)	N	-5	0
		Total	100	100

KITS-KADENCE

City of Hamilton
ATMS Central Software Rating System
Level 2 Evaluation

Software Package: MIST/Eco-TraffiX

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Software Developer is an Engineering Services Company That Can Customize Solutions for Customers	Y	5	5
B	Software Demo Successfully Conducted	Y	5	5
C	2-3 References Successfully Checked	Y	2.5	2.5
D	List of Three Compatible NEMA-ATC Controllers has been Provided	Y	5	5
E	Support is Available During EST Hours from Multiple Offices	Y	2.5	2.5
F	Software Developer has Recourses to Deliver Turn-Key Solution in 3-4 Months	Y	10	10
G	Controller Integration Free of Charge if Solution Already Developed for Other Customers	Y	7.5	7.5
H	Examples Provided of Successful Transit Priority Deployments	Y	2.5	2.5
I	Traffic Responsive Control can be Developed for 3000E With Congestion Management Tools	Y	2.5	2.5
J	Software Graphics Are Modern and Deliver a State of The Art System Map(s)	Y	7.5	7.5
K	Current Ability to Use High Definition Logging Data from Purdue University	N	7.5	0
L	Preliminary Proposal Submitted for System Integration Including System Block Diagram	Y	2.5	2.5
M	System License has no Limit on Number of Intersections and is Limited by Hardware Only	Y	5	5
N	Can be Made Compatible with Existing Stock of (30) ATC-1000 Controllers with Minimum Controller Integration	Y	2.5	2.5
O	3000E Solution Can be Developed with IQ Connect Translator Card (NTCIP)	N	5	0
P	Nondisclosure Agreement with PEEK has been Executed	N	7.5	0
Q	Software has a Reversible Lane Control Module	Y	5	5
R	System Interface Has Advance Communication Trouble Shooting Tools Optimized for Wireless	Y	5	5
S	System Setup and Configuration is Intuitive and Reduces Implementation Times	Y	5	5

#	Requirement	Compliance (Y/N)	Points	Score
	Description			
T	Software Solution Delivers City of Hamilton Minimum System Requirement with 3000E Controllers	Y	2.5	2.5
U	Estimated Annual System Maintenance Cost is Less than$50,000	Y	2.5	2.5
V	Current System User Interface has been in Production for Less Than 1-Year (Deduction)	Y	-5	-5
		Total	100	75

MIST/Eco-TraffiX

City of Hamilton
ATMS Central Software Rating System
Level 2 Evaluation

Software Package: SCATS-ATC

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Software Developer is an Engineering Services Company That Can Customize Solutions for Customers	N	5	0
B	Software Demo Successfully Conducted	Y	5	5
C	2-3 References Successfully Checked	N	2.5	0
D	List of Three Compatible NEMA-ATC Controllers has been Provided	N	5	0
E	Support is Available During EST Hours from Multiple Offices	N	2.5	0
F	Software Developer has Recourses to Deliver Turn-Key Solution in 3-4 Months	Y	10	10
G	Controller Integration Free of Charge if Solution Already Developed for Other Customers	N	7.5	0
H	Examples Provided of Successful Transit Priority Deployments	Y	2.5	2.5
I	Traffic Responsive Control can be Developed for 3000E With Congestion Management Tools	N	2.5	0
J	Software Graphics Are Modern and Deliver a State of The Art System Map(s)	N	7.5	0
K	Current Ability to Use High Definition Logging Data from Purdue University	N	7.5	0
L	Preliminary Proposal Submitted for System Integration Including System Block Diagram	Y	2.5	2.5
M	System License has no Limit on Number of Intersections and is Limited by Hardware Only	Y	5	5
N	Can be Made Compatible with Existing Stock of (30) ATC-1000 Controllers with Minimum Controller Integration	N	2.5	0
O	3000E Solution Can be Developed with IQ Connect Translator Card (NTCIP)	N	5	0
P	Nondisclosure Agreement with PEEK has been Executed	N	7.5	0
Q	Software has a Reversible Lane Control Module	N	5	0
R	System Interface Has Advance Communication Trouble Shooting Tools Optimized for Wireless	N	5	0
S	System Setup and Configuration is Intuitive and Reduces Implementation Times	N	5	0

Requirement		Compliance (Y/N)	Points	Score
#	Description			
T	Software Solution Delivers City of Hamilton Minimum System Requirement with 3000E Controllers	Y	2.5	2.5
U	Estimated Annual System Maintenance Cost is Less than$50,000	Y	2.5	2.5
V	Current System User Interface has been in Production for Less Than 1-Year (Deduction)	N	-5	0
		Total	100	30

SCATS-ATC

City of Hamilton
ATMS Central Software Rating System
Level 2 Evaluation

Software Package:　　　TransSuite

#	Requirement Description	Compliance (Y/N)	Points	Score
A	Software Developer is an Engineering Services Company That Can Customize Solutions for Customers	Y	5	5
B	Software Demo Successfully Conducted	Y	5	5
C	2-3 References Successfully Checked	Y	2.5	2.5
D	List of Three Compatible NEMA-ATC Controllers has been Provided	Y	5	5
E	Support is Available During EST Hours from Multiple Offices	Y	2.5	2.5
F	Software Developer has Recourses to Deliver Turn-Key Solution in 3-4 Months	Y	10	10
G	Controller Integration Free of Charge if Solution Already Developed for Other Customers	Y	7.5	7.5
H	Examples Provided of Successful Transit Priority Deployments	Y	2.5	2.5
I	Traffic Responsive Control can be Developed for 3000E With Congestion Management Tools	N	2.5	0
J	Software Graphics Are Modern and Deliver a State of The Art System Map(s)	N	7.5	0
K	Current Ability to Use High Definition Logging Data from Purdue University	N	7.5	0
L	Preliminary Proposal Submitted for System Integration Including System Block Diagram	Y	2.5	2.5
M	System License has no Limit on Number of Intersections and is Limited by Hardware Only	Y	5	5
N	Can be Made Compatible with Existing Stock of (30) ATC-1000 Controllers with Minimum Controller Integration	Y	2.5	2.5
O	3000E Solution Can be Developed with IQ Connect Translator Card (NTCIP)	Y	5	5
P	Nondisclosure Agreement with PEEK has been Executed	N	7.5	0
Q	Software has a Reversible Lane Control Module	N	5	0
R	System Interface Has Advance Communication Trouble Shooting Tools Optimized for Wireless	N	5	0
S	System Setup and Configuration is Intuitive and Reduces Implementation Times	N	5	0

Requirement		Compliance (Y/N)	Points	Score
#	Description			
T	Software Solution Delivers City of Hamilton Minimum System Requirement with 3000E Controllers	Y	2.5	2.5
U	Estimated Annual System Maintenance Cost is Less than$50,000	Y	2.5	2.5
V	Current System User Interface has been in Production for Less Than 1-Year (Deduction)	N	-5	0
		Total	100	60

TransSuite