
TOWN OF LITTLETON, MASSACHUSETTS

PEER REVIEW OF TRAFFIC IMPACT & ACCESS STUDY (TIAS)



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NOVEMBER 10, 2011



GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS, WESTFORD, MA



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November 10, 2011

Littleton Town Offices
Town Administrator's Office
Room No. 309
37 Shattuck Street
Littleton, MA 01460

Subject: Peer Review of Traffic Impact & Access
(TIAS), 15 Great Road LLC, A
Comprehensive Permit Development
Proposed in Littleton, MA

Ladies/Gentlemen:

Green International Affiliates, Inc. (Green) is pleased to submit our proposal for the above referenced project. Green is a multi-disciplined civil and structural engineering firm with over 65 professionals, located in Westford, Massachusetts. Green's Transportation Engineering Division offers a variety of traffic engineering services that are directly related to this project. The services include peer reviews, traffic impact studies, intersection studies and design, traffic signal system analyses and design, safety analysis and expert testimony. We have provided similar peer review services to the Towns of Wilmington, Natick, Marshfield, North Reading, Ludlow and to the City of Chicopee. In addition, Green has provided a wide variety of traffic engineering services to many Massachusetts state agencies and municipalities for more than 55 years.

Green has thoroughly reviewed the materials provided by the Town of Littleton (the Town) and performed an investigation of the proposed development. As a result, we have developed a solid understanding of our roles on this project. We are very interested in the opportunity to once again work for the Town and provide a thorough review of the Applicant's Traffic Impact & Access Study, perform an independent analysis when necessary and provide our professional opinion when requested.

We have reviewed all requirements in the Request for Proposals (RFP) and meet or exceed all requirements as listed in the RFP. Green possesses all necessary current licenses and registrations and if selected will provide appropriate Certificates of Insurance.

As Principal-in-Charge, I am committing myself and our entire Project Team to complete all of the required services for this project to the Town of Littleton's satisfaction, as we have demonstrated on past and ongoing projects. Our enthusiasm, commitment, professionalism and experience will provide the Town of Littleton with the most cost-effective solutions, completed on time and within budget. Should you have any questions regarding this proposal, please do not hesitate to contact me.

Sincerely,

Green International Affiliates, Inc.

Ko Ishikura
Ko Ishikura, P.E.
President

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FIRM QUALIFICATIONS

Green International Affiliates, Inc. (Green) is a civil and structural engineering firm located in Westford, Massachusetts with a staff of more than 65 professionals. Established in 1954, Green has performed a wealth of civil and structural engineering services for more than 55 years to both private and public sector clients throughout New England. Our business approach is centered on being available and responsive to our clients at all times and providing quality service by assigning experienced and committed professionals to best meet our client's needs and goals. Our client and project commitment, along with our innovative designs and attention to costs, detail and quality have been the stepping-stones in our continued growth and distinguished reputation. With a successful track record as a Prime Consultant and a leading Subconsultant on prominent and successful design teams, Green provides a full range engineering services through our four (4) Engineering Divisions: Transportation Engineering, Structural Engineering, Water Resources Engineering and Civil/Site Engineering. In support of all four divisions, our in-house capabilities also include Land Surveying, Landscape Architecture and Construction Inspection services.

Green is consistently ranked among the top firms for engineering design contracts by the Massachusetts Department of Transportation (MassDOT) and departments of transportation throughout New England. As Prime Consultant and subconsultant, Green has had the good fortune to work on many diverse and notable transportation engineering projects throughout New England, contributing to many millions of dollars in transportation related construction.

Green is currently providing design and construction services to the Town of Littleton for the Reconstruction of Bruce Street and Whitcomb Avenue and the replacement of a culvert on Nagog Hill Road. In addition, Green has provided peer review services to the Planning Board for preliminary plan submission for Constitution Avenue.

Green is also currently providing services to the Planning Board for the review of the current subdivision regulations. Green will recommend and ultimately prepare modifications to the current

regulations to provide the Town with a more clear and enforceable set of regulations.

Transportation Engineering Division

Green's Transportation Engineering Division provides a broad range of design services for highways, urban and rural roadways, traffic signals, traffic studies and peer reviews. Our Transportation Division also draws on resources from our other Divisions to provide additional design services for water, sewer and drainage improvements, utility relocations, landscaping, environmental permitting and structural evaluations.

Green's Transportation Division offers the following specialized services:

- Peer Review of Traffic Studies
- Traffic Impact Studies and Reports
- Roadway Intersection Design
- Traffic Signal Design
- Public Hearings and Meetings
- Highway and Urban Street Design
- Multi-Use Path Design
- Parking Structures and Other Facilities
- Right-of-Way Taking Documents
- Specification and Cost Estimates
- Preparation of Bid Documents
- Construction Services



As part of a peer review for the Town of Wilmington, MA, Green recommended geometric improvements be made to safely accommodate truck turning movements at the intersection of Eames Street and Main Street (pictured above).

KEY PERSONNEL

Ko Ishikura, P.E. Principal-in-Charge

Mr. Ishikura has more than 26 years of professional experience and has been instrumental in the completion of many assignments throughout New England. He has directed and supervised all phases of transportation projects including: peer reviews, traffic studies, signal design, roadway design, utility design, the public participation process, survey and environmental documentation. Mr. Ishikura's communication skills, technical knowledge, creativity and ability to keep projects on schedule and within budget through early anticipation of potential design concerns has earned him a reputation of excellence with MassDOT, VTrans, RIDOT and many Massachusetts municipalities.

Mr. Ishikura served on the Transportation Advisory Committee for the Town of Acton for more than 10 years, including two years as Chairman. While serving on the Committee he reviewed many traffic impact studies and provided his professional opinion to the Board of Selectmen.

Mr. Ishikura completed a number of traffic impact studies and provided traffic engineering peer review services to the Towns of Wilmington, Natick, Marshfield, North Reading, Ludlow and the City of Chicopee. For the Town of Marshfield Board of Health, he served as a traffic engineering expert witness at depositions related to a proposed waste transfer station.

Erik C. Atkins, P.E. Project Manager

Mr. Atkins has 15 years of experience in a variety of transportation projects. He serves as Project Manager for many of Green's important transportation projects such as the proposed intersection improvements at Route 9 and Oak Street in Natick, MA for MassDOT; intersection improvements at Glen Road and Route 62 in Wilmington, MA for the town of Wilmington and has overseen all of the peer review projects completed for MassDOT.

He has a thorough knowledge of MassDOT design guides and standards, including roadway design, traffic signal improvements, hydrologic/hydraulic design and stormwater management policies. Mr.

Atkins also has an in depth understanding of all of the major design polices and guidelines including MassDOT's Project Development and Design Guide, AASHTO's Green Book and Roadside Design Guide, MUTCD and various ITE manuals.

Mr. Atkins serves as Project Manager for numerous projects for the Town of Littleton. Mr. Atkins is the Project Manager for the Bruce Street and Whitcomb Avenue Reconstruction Project which is currently under construction. Mr. Atkins worked closely with the Town and the abutters to address concerns relating to impacts from the proposed project.

Mr. Atkins also served as Project Manager for a Peer Review conducted for the Littleton Planning Board on the Constitution Avenue preliminary site plans.

In addition, he serves as Project Manager assisting the Littleton Planning Board with the review and modifications to the existing Subdivision of Land Regulations. The goal is to strengthen the regulations using current standards of practice, and through the use of the major design guides and policies, standardize the requirements to make them more enforceable.

Wing Wong, E.I.T. Traffic Engineer

Mr. Wong is a Traffic Engineer at Green and has served a critical role for many of Green's transportation projects. His transportation experience includes: peer review of traffic studies, traffic impact studies, traffic data collection, crash analysis, capacity analysis, roadway and intersection geometry improvements, sign and pavement marking design, traffic signal design and design of traffic management plans. Mr. Wong also has a thorough understanding of Green Book, MUTCD, HCM, ITE manuals and the design guidelines referenced in the RFP.

Mr. Wong recently served as Traffic Engineer for a peer review for the Town of Wilmington, MA. He reviewed traffic volume data, trip generation and distribution analyses, proposed routes to and from the site, safety analysis, capacity analysis and the conclusion of the traffic study. Mr. Wong also reviewed the existing conditions of two intersections directly impacted by the site development and provided recommendations for geometric and safety improvements. In addition, Mr. Wong presented his findings of the peer review at a Zoning Board of Appeals meeting and answered questions from the Board regarding the peer review.



RELEVANT PROJECT EXPERIENCE

Peer Review- Traffic Study for 90 Eames Street Wilmington, MA

Green performed a peer review for the Town of Wilmington on a traffic study which was prepared by a developer's traffic consultant to address the impacts of additional truck traffic generated by a site development project. The traffic data and analyses reviewed by Green included traffic volume data, trip generation and distribution analysis, proposed truck routes to and from the site, safety analysis, capacity analysis and the conclusion of the traffic study. As requested by the Town, Green also reviewed the existing conditions of two intersections directly impacted by the site development and provided recommendations for possible geometric and safety improvements at those locations. Additionally, Green attended a Zoning Board of Appeals meeting to present the findings of the peer review and to answer questions that the Board had regarding the peer review.

Reference:

Carole Hamilton
Director of Planning & Conservation
Town of Wilmington
Tel: (978) 658-8238

Key Personnel Involved:

- Ko Ishikura, P.E.
- Wing Wong, E.I.T.



***The Intersection of Eames Street and Main Street
(Route 38) in Wilmington, MA***

Traffic Consulting Services, Marshfield Board of Health, Marshfield, MA

Mr. Ishikura testified on behalf of the Marshfield Board of Health related to traffic issues for a proposed transfer station in Marshfield. Mr. Ishikura assisted the Town Counsel at depositions by reviewing proponent's technical documents, preparing technical documents and testifying as an expert witness.

Reference:

Robert Marzelli
Town Counsel
Town of Marshfield
Tel: (781) 837-3636

Key Personnel Involved:

- Ko Ishikura, P.E.

Traffic Consulting Services, Town of Natick Planning Board, Natick, MA

Green provided consultation regarding traffic issues for the Natick Planning Board. Green analyzed traffic impacts on surrounding roadway network by proposed development and reported the analyses to the Planning Board at public hearings. Green was responsible for developing traffic counting programs, data analysis, review of studies and plans and recommendations. Review also included access and safety issues to ensure safety of residents and roadway users. Green advised the Board with our recommendations at Board hearings. Representative projects included Jordan's Furniture and a pair of residential developments.

Reference: Mark Coviello, P.E.

Town Engineer
Town of Natick
Tel: (508) 647-6551

Key Personnel Involved:

- Ko Ishikura, P.E.

Shawinigan Drive Reconstruction & Environmental Impact Report (EIR), Chicopee/Ludlow, MA

Green was selected by the City of Chicopee to design the reconstruction of Shawinigan Drive and the replacement of the bridge over Fuller Brook. The project included 1.6 miles of roadway, a box culvert, and 9,000 feet of closed drainage piping 12 to 24



inches in size. The project coincided with an adjoining project in Ludlow being designed by another engineering firm. Green was commissioned to prepare the Environmental Impact Report (EIR) for the project in both municipalities.

The Traffic segment of the EIR was conducted to address the impacts of new roadway construction to the surrounding roadway network. An extensive traffic count program was conducted to develop a travel demand forecasting model. Once the travel demand forecasting model was developed, "Existing", "Build" and "No-Build" conditions were analyzed using "The Highway Emulator (THE)" computer program. For each condition, capacity analyses for surrounding intersections were performed and mitigative improvements were developed for each intersection.

Reference: Stanley Kulig, P.E.
Superintendent
Chicopee DPW
Tel: (413) 594-3558

Key Personnel Involved:
▪ Ko Ishikura, P.E.

Traffic Consulting Services- 50 Mt. Vernon Street Peer Review, North Reading, MA

Green performed peer review of the Haverhill Street plan and profile near the driveway for property at 50 Mt. Vernon Street (40B Development in 2005, North Reading, MA). We reviewed roadway vertical curve data for the selected design speed, determined the required stopping sight distance at intersection and provided comments and recommendations to the Town and Design Engineer. Our comments and recommendations were relative to the geometric design (both vertical and horizontal) alignments of Haverhill Street near the intersection with Mt. Vernon Street to ensure the safety of motorists and pedestrians. We based our review of the design plan and profile on AASHTO "Green Book" Guidelines.

Reference: Michael Soraghan, P.E.
North Reading Town Engineer
Tel: (978) 664-6026

Key Personnel Involved:
▪ Ko Ishikura, P.E.

Whitcomb Avenue and Bruce Street Repairs, Littleton, MA

Green completed the design for the reconstruction of Whitcomb Avenue and Bruce Street in Littleton, Massachusetts. The total project length of the two roadways is approximately 1.25 miles. The project included the realignment and minor widening of each roadway to meet current MassDOT and AASHTO requirements for their respective design speeds and functional classifications. Each roadway is approximately 18 to 20-feet wide and is abutted by environmentally sensitive features such as wetlands, matured trees and stone walls all under the jurisdiction of the Town Conservation Commission or Planning Board.

Before reconstruction, the roadway pavement was in poor condition, having deteriorated due to repeated forces from frost action and lack of maintenance. Substandard roadside safety, width and alignments in addition to the poor pavement conditions made driving on this road extremely dangerous. Green delivered engineering services that addressed all aspects of the project and allowed the project to be built in a timely manner.

Green began the design of the project in the summer of 2010 and conducted numerous public hearings throughout the design process with the abutters, Planning Board and Conservation Commission to ensure the project could be designed and constructed in a timely and cost effective manner and still meet the abutters concerns and the regulatory requirements. The project was advertised and awarded for construction in June of 2011.

Reference: James E. Clyde
Highway Department Operations
Manager
Town of Littleton
Tel: (978) 540-2670

Key Personnel Involved:
▪ Ko Ishikura, P.E.
▪ Erik Atkins, P.E.
▪ Wing Wong, E.I.T.



INTRODUCTION

Fifteen Great Road, LLC (Applicant) is proposing a residential development on a 23± acre parcel of land located on Great Road in the Town of Littleton. The project consists of the development of 200 new residential apartments and the associated parking spaces. The project is proposing to provide access to and from the site from Great Road (Route 2A/119) and Grist Mill Road. The Applicant has submitted an application for a comprehensive permit to the Town for review. The Town of Littleton Zoning Board of Appeals is seeking professional traffic peer review services from a qualified consultant to assist in their review of the application package.

In the preparation of this proposal, Green International Affiliates, Inc. (Green) has become very familiar with the project area, application documents and the Zoning By-Laws. Based on our review of the Request for Proposals and the submitted documents, it is our understanding that the Town of Littleton is seeking professional engineering services to perform a peer review of any traffic-related reports or documents submitted in connection with the application for a comprehensive permit and to provide an independent analysis of the ***Traffic Impact and Access Study (TIAS)*** submitted to the Town's Zoning Board of Appeals for this project.

Green is currently providing design and construction services to the Town of Littleton for the Reconstruction of Bruce Street and Whitcomb Avenue and the replacement of a culvert on Nagog Hill Road. In addition, Green has provided peer review services to the Planning Board for preliminary plan submission for Constitution Avenue.

Green is also currently providing services to the Planning Board for the review of the current subdivision regulations. Green will recommend and ultimately prepare modifications to the current regulations to provide the Town with a more clear and enforceable set of regulations.

Working primarily for public sector clients such as the Town of Littleton and other municipalities, MassDOT, VTrans and RIDOT Green has extensive roadway and traffic design experience. We bring a public sector orientated perspective to all of our projects and we understand the concerns and needs

of our clients which enables us to provide high quality design and consulting services.

Green employs numerous engineers who have been trained by MassDOT to perform detailed peer reviews of projects. We have performed more than a dozen peer reviews for MassDOT in that capacity. In addition to our peer review experience with MassDOT, Green provides peer review services to many municipalities including the Town of Littleton and the Towns of Wilmington, Natick, Marshfield and North Reading.

SCOPE OF SERVICES

Based on our understanding of the project and the RFP package, Green has developed the following Scope of Services.

INITIAL REVIEW PHASE

SITE REVIEW

Green will perform a field visit at Great Road and Grist Mill Road in the vicinity where access to the project site is proposed to verify existing roadway conditions and traffic operations such as: posted speed, travel speed, existing roadway geometry, pedestrian and vehicle movements, adjacent street/driveway openings, sight restrictions, topography and the surrounding land use. We will observe the existing traffic patterns and operations and will note any existing conditions and traffic operations that may be negatively impacted by the proposed site access points and the proposed changes to traffic patterns and operations as they relate to pedestrian and traffic safety, operations and accessibility.

TRAFFIC STUDY REVIEW

Green has performed a preliminary review of the traffic data and analyses provided in the TIAS, prepared by Land Strategies, LLC dated October 19, 2011 which was submitted in connection with the application for a comprehensive permit to the Zoning Board of Appeals.

Green will review the TIAS for conformance with the standard TIAS requirements as defined in the latest edition of the Manual of Transportation of Engineering Studies by ITE. Green will promptly provide a written memorandum to the Board summarizing additional information needed to comply with the standard TIAS requirements.



We will review the existing traffic volume data and note any inconsistencies or concerns with the methodology and procedures of how, where and when the data was collected. We will review the traffic volume adjustments and growth factors that they have applied to the traffic volumes for appropriateness and ensure that sufficient considerations were made for potential future growth within the Route 2A corridor and the surrounding neighborhoods. Included in the review of the traffic volumes will be a detailed review of the trip generation and distribution assumptions that the study used. Specifically we will include a review of the assumed distribution of traffic volume exiting to Grist Mill Road and Route 2A to ensure that this assumption will reflect actual conditions.

The submitted spot speed study will be reviewed and we will observe the existing speeds to substantiate the validity of the speed study. The use of the results from the speed study, which is lower than the posted speed limit in this segment (especially as it applies to the westbound movements on Route 2A), will also be reviewed. We will note any concerns with the speed data and also review their proposal for how the speed data effects considerations for stopping sight and intersection sight distance, passing sight distances within the current passing zone, gaps in traffic, appropriate accommodations for turning traffic and provisions for safe deceleration and acceleration areas for the Route 2A approaches. We will note any deficiencies.

We will review the capacity and queue analyses submitted and verify that standards of practice were used in the analysis and that the appropriate volumes were used in the analyses. We will review the analysis for proper lane configuration assignments and assumptions consistent with the study. We will develop an independent analysis using Synchro by Trafficware (the same program the Applicant used) to verify the results of the analyses. We will review the Level of Service (LOS) results and future traffic impacts for both built and no-built conditions. We will note any deficiencies or corrections that should be made to the analysis.

Green will review the traffic data collection process and the various analyses mentioned above for applicability, adequacy and conformance with current best practices and standards of practice with the applicable design standards and manuals such as the Manual on Uniform Traffic Control Devices

(MUTCD), Trip Generation Manual by the Institute of Transportation Engineers (ITE), Highway Capacity Manual (HCM) and A Policy on Geometric Design of Highways and Streets, 5th Edition by AASHTO (Green Book). With the exception to the Green Book, Green will coordinate with the Town to determine which edition of the manual was agreed upon between the Town and the Applicant for use during the design process. The applicable edition will be used during Green's review.

Green will review the applicants proposed traffic mitigation, thoroughly evaluate the need for additional traffic mitigation measures to minimize traffic impacts and provide recommendations for additional traffic mitigation as necessary to offset additional traffic volumes.

Green will identify any deficiencies found in the traffic data and analyses during the review and provide recommendations for addressing those deficiencies.

As noted above, Green has performed a preliminary review of the TIAS during the preparation of this proposal. The study indicated that the traffic volume at the intersection of Great Road and the Site Driveway is not large enough to warrant signalization of the intersection. However, a traffic signal warrant analysis was not included in the study. Furthermore, it appears that the accident data compiled in the study were taken from MassDOT records only. Green will recommend that a signal warrant analysis be performed and provided as part of their application and that additional accident data be obtained from the Littleton Police Department for review in the memorandum mentioned above. Green will review the requested additional analysis and data during the Initial Review Phase. Green will confirm whether the applicant's assertion that a signal is not warranted is correct and if needed, we will provide a recommendation as to whether a signal is warranted at this location based on the signal warrant analysis.

PRELIMINARY SITE DEVELOPMENT PLANS REVIEW

Green will review the traffic, site access/egress, and site safety related design elements provided in the **Preliminary Site Development Plans**, prepared by Places Associates, Inc. dated July, 2011 submitted in connection with the application for a comprehensive permit.



Based on our site observations and the site plans, Green will evaluate whether the location and alignment of the proposed access/egress to Great Road and Grist Mill Road provide adequate operations and safety. We will review accommodations for pedestrians, the on-site vehicle circulation plan and parking layout, provisions for emergency access/egress, provisions for school bus access/egress, including pickup and drop-off locations and turnaround areas and proposed signs and pavement markings as they pertain to current best practices and compliance with the relevant design guidelines. We will review the interaction between all of these elements for implications to safety and traffic operations.

Green will review the above items for applicability, adequacy, and conformance with the applicable design standards and manuals, such as the MUTCD, Green Book, and any applicable Town regulations and bylaws, including the Town's Zoning Code.

Great Road is owned and maintained by MassDOT, if permitted by MassDOT Green will review the MassDOT Access Permit for this project for consistencies between the permit and the various traffic-related design elements. In addition, although MassDOT has the ultimate authority to grant permission to create the access to Route 2A, MassDOT may require the applicant to provide evidence of acceptance by the Town. We will assist the Town with coordinating with MassDOT regarding this process if required.

In addition, Green will analyze vehicle turning movements within the entire project site with AUTOTURN using the Town of Little Fire Department's preferred design vehicle. We will coordinate with the Fire Department to confirm their requirements. We will also confirm that the applicant has provided sufficient accommodations for the turning movements of anticipated delivery vehicles which may have more stringent requirements than the Town's fire truck. We will make recommendations for revisions when required.

Green will identify any traffic-related design element deficiencies found in the Preliminary Site Plans during the review and provide recommendations for addressing those deficiencies in the Preliminary Report.

PRELIMINARY REPORT

After the initial review of the applicable documents, Green will prepare a Preliminary Report to the Board. The Preliminary Report will summarize the findings of the peer review and our site observations performed as described above. The report will identify and detail all traffic-related issues/concerns and deficiencies that were noted during our review. The report will include specific comments that the Board should require the applicant to address. If necessary, the report will also include a discussion of all recommended additional traffic mitigation measures the applicant should provide if necessary. Green will provide 15 copies and one electronic copy of the Preliminary Report to the Board.

PUBLIC HEARING #1

Green will attend a Public Hearing to present the findings of the Preliminary Report and respond to questions raised at the public hearing.

FINAL REVIEW PHASE

PUBLIC HEARING #2

Green will prepare a memorandum of responses to written comments if any, submitted by the Applicant in response to the Preliminary Report. If necessary, Green will review additional traffic-related information/data submitted by the Applicant to address the issues/concerns and deficiencies presented in the Preliminary Report. Green will attend one meeting with the Applicant and/or their consultant to review and discuss issues/concerns to be resolved. Additional meeting(s) with the Applicant will be considered as additional services and will be included under a supplemental agreement.

Green will attend a second Public Hearing and present Green's responses to written comments submitted by the Applicant in response to the Preliminary Report.

FINAL REPORT

We understand that it is possible negotiations between the Board and the Applicant will occur during the review process, which may result in revisions to the Preliminary Site Plans and the associated traffic-related design elements; Green will review the revised traffic-related design elements for the project and identify any



issues/concerns and deficiencies associated with the revisions. It is assumed that Green will review the final revisions that occurred after Public Hearing #2. Green will attend one meeting with the Applicant and/or their consultant to review and discuss issues/concerns to be resolved. Additional meeting(s) with the Applicant will be considered as additional services and will be included under a supplemental agreement.

Green will prepare a Final Report that summarizes any traffic-related design element changes for the project, traffic-related issues/concern and deficiencies associated with the revisions and make specific recommendations to the Board in such cases. The report will also summarize any outstanding items resolved and/or to be resolved since the submittal of the Preliminary Report. Green will provide fifteen copies and one electronic copy of the Preliminary Report to the Board.

PUBLIC HEARING #3

Green will attend a final Public Hearing to present the findings of the Final Report and respond to questions raised at the public hearing.

FINAL REVIEW PROCESS

It is anticipated that Green will attend two meetings with the Town staff and/or the Applicant's design team during the final review process to assist the Town in the review of traffic-related design elements. Additional meeting(s) will be considered as additional services and will be included under a supplemental agreement.

ANTICIPATED SCHEDULE

Based on a review of the Town's public hearing dates, Green has developed the following project schedule with the assumption that the Contract will be awarded after the upcoming Zoning Board of Appeal meeting:

- Anticipated Contract Award Date – November 18, 2011
- Preliminary Report Submittal Date – December 16, 2011
- Public Hearing #1 – January 19th, 2012 (assumed date)
- Public Hearing #2 – February 16th, 2012 (assumed date)

- Final Report Submittal Date – March 8th, 2012 (a week prior to the third public hearing)
- Public Hearing #3 – March 15th, 2012 (assumed date)



Traffic Engineering Services

Engineer's Man-hour and Fee Schedule

**Town of Littleton Zoning Board of Appeals
Traffic Study Peer Review
15 Great Road**

1 - INITIAL REVIEW PHASE

TASK

Task No.	Task Description	In Charge	Manager	Engineer	Total Labor	Travel	Copies	Misc	Total Expenses
Task 1.1 Initial Review									
1.1.1	Site Review	0	4	4	8	500	\$	-	\$ 5.00
1.1.2	Traffic Study Review	2	4	32	38	\$	-	\$	-
1.1.3	Preliminary Site Plans Review	2	4	20	26	\$	-	\$	-
Total Task 1.1 Initial Review									
									\$ 5.00
Task 1.2 Preliminary Report									
1.2.1	Prepare Preliminary Report	2	4	24	30	\$	-	\$ 15.00	\$ - \$ 15.00

Task 1.2 Preliminary Report

Task 1.3 Public Hearing #1
1.3.1 Attend Public Hearing

PHASE 1 TOTALS

TOTAL PHASE 1 LABOR COST	\$ 11,478.72
TOTAL PHASE 1 EXPENSES	\$ 25.00
TOTAL PHASE 1 INITIAL REVIEW COST	\$ 11,503.72

Prepared by: Green International Affiliates, Inc.

Traffic Engineering Services

Engineer's Man-hour and Fee Schedule

Town of Littleton Zoning Board of Appeals Traffic Study Peer Review 15 Great Road

2-FINAL REVIEW

TASK No.	TASK DESCRIPTION	PRINCIPAL IN CHARGE	PROJECT MANAGER	STAFF ENGINEER	TOTAL LABOR	TRAVEL	COPIES	MISC	TOTAL EXPENSES
Task 2.1 Public Hearing #2									
2.1.1	Responses to Comments by the Applicant		1	2	10	13	\$	-	\$ -
2.1.2	Review Additional Traffic-related Information/data Submitted by the Applicant	0	2	12	14	\$	-	\$ -	\$ -
2.1.3	Attend One Meeting with the Applicant's Consultant	3	3	5	11	\$ 5.00	\$ -	\$ -	\$ 5.00
2.1.4	Attend Public Hearing #2	6	6	10	22	\$ 5.00	\$ -	\$ -	\$ 5.00
	Subtotal (hours)	10	13	37	60				
	Labor Cost (refer to labor rates in headings)	\$ 510.00	\$ 559.00	\$ 1,147.00	\$ 2,216.00				
	Overhead @ 140.00%	\$ 714.00	\$ 782.60	\$ 1,605.80	\$ 3,102.40				
	Subtotal	\$ 1,224.00	\$ 1,341.60	\$ 2,752.80	\$ 5,318.40				
	Profit @ 10%	\$ 122.40	\$ 134.16	\$ 275.28	\$ 531.84				
	Totals	\$ 1,346.40	\$ 1,475.76	\$ 3,028.08	\$ 5,850.24	\$ 10.00	\$ -	\$ -	\$ 10.00
	Total Task 2.1 Public Hearing #2	\$ 5,880.24							
Task 2.2 Final Report									
2.2.1	Review Revised Traffic-related Design Elements	0	2	8	10	\$	-	\$ -	\$ -
2.2.2	Attend One Meeting with the Applicant's Consultant	3	3	5	11	\$ 10.00	\$ -	\$ -	\$ 10.00
2.2.3	Prepare Final Report	2	2	12	16	\$ -	\$ 15.00	\$ -	\$ 15.00
	Subtotal (hours)	5	7	25	37				
	Labor Cost (refer to labor rates in headings)	\$ 255.00	\$ 301.00	\$ 775.00	\$ 1,331.00				
	Overhead @ 140.00%	\$ 337.00	\$ 421.40	\$ 1,085.00	\$ 1,863.40				
	Subtotal	\$ 612.00	\$ 722.40	\$ 1,860.00	\$ 3,194.40				
	Profit @ 10%	\$ 61.20	\$ 72.24	\$ 186.00	\$ 319.44				
	Totals	\$ 673.20	\$ 794.64	\$ 2,046.00	\$ 3,513.84	\$ 10.00	\$ 15.00	\$ -	\$ 25.00
	Total Task 2.2 Final Report	\$ 3,538.84							
Task 2.3 Public Hearing #3									
2.3.1	Attend Public Hearing #3	6	6	10	22	\$ 5.00	\$ -	\$ -	\$ 5.00
	Subtotal (hours)	6	6	10	22				
	Labor Cost (refer to labor rates in headings)	\$ 306.00	\$ 258.00	\$ 310.00	\$ 874.00				
	Overhead @ 140.00%	\$ 428.40	\$ 361.20	\$ 434.00	\$ 1,223.60				
	Subtotal	\$ 734.40	\$ 619.20	\$ 744.00	\$ 2,097.60				
	Profit @ 10%	\$ 73.44	\$ 61.92	\$ 74.40	\$ 209.76				
	Totals	\$ 807.84	\$ 681.12	\$ 818.40	\$ 2,307.36	\$ 5.00	\$ -	\$ -	\$ 5.00
	Total Task 2.3 Public Hearing #3	\$ 2,312.36							
Task 2.4 Final Review Process									
2.3.1	Attend Two Meetings with Town Staff and/or the Applicant's Design Team	6	6	12	24	\$ 10.00	\$ -	\$ -	\$ 10.00
	Subtotal (hours)	6	6	12	24				
	Labor Cost (refer to labor rates in headings)	\$ 306.00	\$ 258.00	\$ 372.00	\$ 936.00				
	Overhead @ 140.00%	\$ 428.40	\$ 361.20	\$ 520.80	\$ 1,310.40				
	Subtotal	\$ 734.40	\$ 619.20	\$ 892.80	\$ 2,246.40				
	Profit @ 10%	\$ 73.44	\$ 61.92	\$ 89.28	\$ 224.64				
	Totals	\$ 807.84	\$ 681.12	\$ 982.08	\$ 2,471.04	\$ 10.00	\$ -	\$ -	\$ 10.00
	Total Task 2.4 Final Review Process	\$ 2,481.04							
PHASE 2 TOTALS									
	TOTAL PHASE 2 LABOR COST	\$ 14,142.48							
	TOTAL PHASE 2 EXPENSES	\$ 50.00							
	TOTAL PHASE 2 FINAL REVIEW COST	\$ 14,192.48							
TOTALS FOR ALL PHASES									
	TOTAL LABOR COST	\$ 25,621.20							
	TOTAL EXPENSES	\$ 75.00							
	TOTAL COST	\$ 25,696.20							



Project Role

Principal-in-Charge/Traffic Engineering

Education

Bachelor of Science in Civil Engineering, Osaka University, Japan, 1983

Licenses

Professional Engineer MA, RI, VT, ME, CT

Professional Affiliations

ACEC/MA Board of Directors, Director

National Society of Professional Engineers, Member

Institute of Transportation Engineers, Member

New England Water Works Association, Member

Experience

Mr. Ishikura, as President of Green, is responsible for the management and technical aspects for all of the firm's design projects. Mr. Ishikura's technical ability, ability to keep projects on schedule and budget, anticipation of potential design concerns and ability to create proper recommendations and solutions has earned him a reputation of excellence with the Massachusetts Department of Transportation, the Rhode Island Department of Transportation, the Vermont Agency of Transportation and many Massachusetts municipalities Department of Public Works agencies. Relevant projects demonstrating Mr. Ishikura's recent experience are included below:

Marshfield Board of Health, Traffic Consulting Services, Marshfield, MA

Mr. Ishikura testified as an expert witness on traffic engineering on behalf of the Marshfield Board of Health related to traffic issues for a proposed waste transfer station in Marshfield. He has assisted the Town Counsel at public hearings by reviewing proponent's technical documents, preparing technical documents and provided his opinion as an expert witness.

Town of Natick Planning Board, Traffic Consulting Services, Natick, MA

Mr. Ishikura served as a traffic consultant for the Natick Planning Board and reviewed site developments as they related to traffic issues. He has evaluated traffic impact studies prepared by proponents and advised the Board with his recommendations at Board hearings.

Shawinigan Drive Environmental Impact Report and Design, Chicopee, MA

Mr. Ishikura served as a Project Manager on this City of Chicopee and MassDOT project to prepare an Environmental Impact Report (EIR) and to design reconstruction of a major collector for a length of 2 miles in Chicopee, MA. He was responsible for all aspects of the EIR preparation including traffic counting program, development of No-Build and Build traffic volumes, safety analyses and capacity analyses as well as preliminary and final design of the roadway reconstruction and preparation of all environmental permits. The project was successfully constructed in 2004.

Butcher Boy Market Environmental Report, North Andover, MA

Mr. Ishikura served as a Project Manager to address traffic impacts and prepare an Environmental Impact Report (EIR) on this development located on Route 125 in North Andover. He was responsible for a traffic counting program, development of No-Build and Build traffic volumes, capacity analyses and mitigation of the traffic impacts. He was also responsible for obtaining Access permit from the Massachusetts Highway Department which has a jurisdiction over Route 125, State maintained highway.

Traffic Impact Study, Spot Pond Pipeline Improvements, Stoneham/Medford/Malden, MA

Mr. Ishikura has completed a traffic report addressing impacts to the traffic of the area which may result from the proposed pipeline work. In the report, he recommended various mitigative measures to minimize the impacts including various detours, staged construction at rotaries, temporary bypass



Project Role

Principal-in-Charge/Traffic Engineering

road, signing and striping. The report was submitted to applicable municipalities and the DCR, and necessary permits were obtained.

Traffic Impact Study, Southern High Service Pipeline Improvements, Boston, MA

Mr. Ishikura completed a traffic report addressing impacts to the area traffic which may be caused from the proposed pipeline work along Jamaicaway, Arborway and Morton Street in Jamaica Plain, DCR maintained roadways. The report included traffic volume data and capacity analyses at signalized intersections and roadway segments as required by DCR. The report addressed various mitigative measures to minimize the construction impacts including bypass detours, lane reduction method, staged construction at a rotary, sign and pavement markings.

Traffic Impact Study, Sections 95 and 100 Water Transmission Mains, Brookline, MA

Mr. Ishikura completed a traffic report addressing impacts to vehicular and pedestrian traffic which may be caused from the proposed water main work along West Roxbury Parkway, a DCR maintained roadway in Brookline. The traffic report was prepared in an expeditious manner after all of the design work has been completed in response to the DCR's requirements for traffic impact analyses. The report identified traffic volumes and capacity of roadway segments and signalized intersections and addressed traffic control set-up, signing, work hour restriction and pedestrian protection at each segment, intersection and rotary. MWRA submitted the report to DCR and successfully obtained the DCR permit.

Traffic Impact Study, Sections 13 and 64 Water Transmission Mains, Stoneham, MA

Mr. Ishikura completed the Traffic Impact Study for cleaning and lining and valve replacement on Ravine Road, a DCR maintained roadway in Stoneham, MA. As part of the study, Mr. Ishikura completed a traffic report and identified the impacts of the Ravine Road closure onto an adjacent roadway system.

Safety and Traffic Improvements, Route 9 at Oak Street and Overbrook Drive, Natick, Wellesley, MA

Mr. Ishikura is the Principal-in-Charge for design services for this project. Currently Green is preparing 100% Design Submittal materials in accordance with MassDOT requirements. Route 9 is a major arterial with over 60,000 ADT, serving commuters to Boston. The proposed design includes the widening of Route 9 to six lanes from four lanes. The Oak Street intersection will be completely redesigned with new geometry. The proposed design also includes signal timing and signal coordination at Overbrook Drive to improve the operation of the Route 9 corridor.



Project Role	Experience
Project Manager/Traffic Engineering	Mr. Atkins has 15 years of experience in a variety of transportation projects. He has served the role of Project Manager for Green's recent transportation projects. He has a thorough knowledge of MassDOT design guides and standards, including roadway design, hydrologic/hydraulic design and stormwater management policies. Mr. Atkins was the Project Manager for two recent major roadway projects for the State of Vermont that were both successfully constructed. He presently is the Project Manager for MassDOT Roadway Reconstruction and Safety Improvements, Route 2 Farley Section, Erving, MA and the Safety and Traffic Improvements, Route 9 at Oak Street and Overbrook Drive, Natick, Wellesley, MA. Relevant projects demonstrating Mr. Atkins' recent experience are included below:
Education	
Bachelor of Science in Civil Engineering, Northeastern University, 1996	
Licenses	
Professional Engineer (Civil) Massachusetts	Whitcomb Avenue and Bruce Street Repairs, Littleton, MA Mr. Atkins served as Project Manager for this project. Green completed the design for the reconstruction of Whitcomb Avenue and Bruce Street in Littleton, Massachusetts. The total project length of the two roadways is approximately 1.25 miles. The projects included the realignment and minor widening of each roadway to meet current MassDOT and AASHTO requirements for their respective design speeds and functional classifications. Each roadway is approximately 18 to 20-feet wide and is abutted by environmentally sensitive features such as wetlands, matured trees and stone walls all under the jurisdiction of the Town Conservation Commission or Planning Board. Before reconstruction, the roadway pavement was in poor condition, having deteriorated due to repeated forces from frost action and lack of maintenance. Substandard roadside safety, width and alignments in addition to the poor pavement conditions made driving on this road extremely dangerous. Green delivered engineering services that addressed all aspects of the project and allowed the project to be built in a timely manner. Green provided a full range of services to the Town of Littleton in the project in addition to the roadway design including complete survey and base mapping; wetland flagging and environmental permitting; bid phase services and full-time construction resident engineer services.
Professional Affiliations	
<ul style="list-style-type: none">• American Society of Civil Engineers - Member• Boston Society of Civil Engineers - Member	
	Safety and Traffic Improvements, Route 9 at Oak Street and Overbrook Drive, Natick, Wellesley, MA Mr. Atkins is the Project Manager for design services to the Town of Natick to improve the safety and traffic operations along Route 9 at Oak Street intersection and Route 9 at Overbrook Drive intersection. The project will improve safety and traffic operations along Route 9 at Oak Street and Overbrook Drive Intersections and is being designed in accordance with MassDOT standards. Route 9 is a major arterial with over 60,000 ADT, serving commuters to Boston. The proposed design includes the widening of Route 9 to six lanes from four lanes. The Oak Street intersection will be completely redesigned with new geometry. The proposed design also includes signal timing and signal coordination at Overbrook Drive to improve the operation of the Route 9 corridor.



Project Role

Project
Manager/Traffic
Engineering

Roadway and Bridge Reconstruction, Route 1A (Main Street), Walpole, MA

This project includes reconstruction/rehabilitation of approximately 1.9 miles of Route 1A (Main Street) from just north of the Route 27 intersection to the Norwood Town Line. In addition to the roadway reconstruction, the project includes new and reconstructed sidewalks. The project also includes surveying services, traffic engineering, drainage improvements, and the reconstruction of a bridge over waterway.

Intersection Improvements, Washington Street, Allens Lane & Hingston Street, Peabody, MA

Mr. Atkins, as Project Manager, was responsible for overall project oversight and for coordination with the City of Peabody as the project progressed from preliminary design through construction. He was responsible for the development of contract documents for the roadway reconstruction and the traffic signal improvement phases of the project. The project included construction of AAB/ADA compliant sidewalks and ramps at the intersection and the installation of new traffic signals. Mr. Atkins worked closely with the City during the design development and construction, overseeing the design and providing assistance during construction to ensure design compliance.

MassDOT, Washington Street Bridge over MBTA, Chelsea, MA

Mr. Atkins completed 25% of the highway design plans for this MassDOT bridge project. Mr. Atkins oversaw the design of the bridge approaches in this compact urban setting which required a profile design to accommodate a two foot elevation increase. With over 15,000 ADT, the proposed bridge replaces an existing bridge over an active railroad. The design process has required close coordination with MassDOT and MBTA to ensure the construction will not impact the railroad. The City of Chelsea required that two-way traffic be maintained during construction. To accommodate this, Mr. Atkins oversaw the development of a three phased traffic management plan. The traffic management plans coordinated the bridge construction staging with complex utility relocations which included the relocation of two large below grade fiber optic duct banks carried on the bridge.

Roadway Reconstruction and Safety Improvements, Route 2 Farley Section, Erving, MA

Mr. Atkins is the Project Manager for this project. The primary purpose of the project is to address safety concerns for Route 2 in the Farley Section of Erving between Mile Marker (MM) 60 and MM 62, a distance of 2 miles. Project issues include safety concerns relating to sight distance deficiencies, pedestrian safety deficiencies, poor intersection alignment and excessive traffic speeds. Mr. Atkins is also responsible for traffic engineering services, new signage and striping, drainage design, overseeing the environmental permitting, surveys/ROW, culvert design, construction phasing and the design of a scenic parking/police turnout area.



Project Role	Experience
Traffic Engineering	Mr. Wong is a Civil/Traffic Engineer at Green and has served a critical role for many of Green's transportation projects. His transportation experience includes: traffic data collection, crash analysis, capacity analysis, roadway and intersection geometry improvements, sign and pavement marking design, traffic signal design and design of traffic management plans. His expertise in CADD programs includes MicroStation and InRoads; he is also well versed in various CAD standards and procedures which allows Green to complete projects accurately and on time for transportation agencies throughout New England. He has a thorough knowledge of MassDOT design guidelines and standards including roadway design, hydrologic/hydraulic design and stormwater management policies. He is proficient in numerous traffic engineering computer applications including Synchro and SimTraffic. Relevant projects demonstrating Mr. Wong's recent experience are included below:
Education	
Bachelor of Science in Civil Engineering Technology, Wentworth Institute of Technology, 2003	
Licenses	
Engineer-in-Training - Massachusetts	
Professional Affiliations	Peer Review – Traffic Study for 90 Eames Street, Wilmington, MA
• Boston Society of Civil Engineers, Transportation Technical Group – Member	Mr. Wong was a Staff Civil/Traffic Engineer for this project. He performed a peer review for the Town of Wilmington on a traffic study which was prepared by a developer's traffic consultant to address the impacts of additional truck traffic generated by a site development project. The traffic data and analyses reviewed by Mr. Wong included traffic volume data, trip generation and distribution analysis, proposed truck routes to and from the site, safety analysis, capacity analysis and the conclusion of the traffic study. As requested by the Town, Mr. Wong also reviewed the existing conditions of two intersections directly impacted by the site development and provided recommendations for possible geometric and safety improvements at those locations. Additionally, Mr. Wong attended a Zoning Board of Appeals meeting to present the findings of the peer review and to answer questions that the Board had regarding the peer review.
	Safety and Traffic Improvements, Route 9 at Oak Street and Overbrook Drive, Natick/Wellesley, MA
	Mr. Wong is a Traffic Engineer for this project to improve the safety and traffic operations at the Route 9 intersections at Oak Street and Overbrook Drive. Currently Green is preparing 75% design in accordance with the MassDOT requirements. The proposed design includes widening Route 9 to six lanes from four. The Oak Street intersection will be redesigned with new geometry. The proposed design includes signal timing/coordination at Overbrook Drive to improve the operation of the Route 9 corridor.
	Intersection Improvements, Route 62/Glen Road, Wilmington, MA
	Mr. Wong is serving as the Project Engineer on this project to improve safety and traffic operational conditions in Wilmington, MA. His work on this project included extensive traffic/safety evaluation and analysis to develop two options to improve safety and traffic operational conditions: roundabout and traffic signalization. The town opted to proceed with traffic signalization after public review. Mr. Wong was responsible for design of geometric improvements and a new traffic signal system at this intersection.



Project Role

Traffic Engineering

Intersection Improvements, Washington Street/Allens Lane/Hingston Street, Peabody, MA

Mr. Wong was a Staff Civil Engineer for this project to improve the safety and operational deficiencies at the intersection of Washington Street/Allens Lane/Hingston Street. This project also included roadway reconstruction along Allens Lane, minor intersection geometry modifications, and new sidewalks. Mr. Wong performed capacity analysis in accordance with the Highway Capacity Manual (HCM) using the Highway Capacity Software (HCS); assisted in the development of Traffic Signal Plans, which depict the proposed signal hardware, signal timing and new pavement markings; reviewed traffic signal shop drawings; and performed punch list and final traffic signal inspections in the field.

MassDOT, Roadway/Bridge Reconstruction, Route 1A (Main Street), Walpole, MA

Mr. Wong is responsible for all aspects of traffic design for the project. Road reconstruction is 2.1 miles. Traffic and safety improvements include installation of new traffic signals at the North Street, Fisher Street, and the Bullard/Willett Street intersections; signal equipment upgrades at Stop N' Shop intersection; and geometry modifications at the North Street and Fisher Street intersections, which includes a new exclusive left-turning lane for the Route 1A northbound approaches. The signals within the project limits will be coordinated such that optimized traffic operation along the Route 1A corridor is provided. He also evaluated existing and future traffic conditions in the study area using Synchro/SimTraffic computer software.

Roadway Reconstruction, Front Street, Chicopee, Massachusetts

Green International Affiliates was responsible for the design and engineering services for the Front Street Reconstruction Project. Responsibilities included pavement structure rehabilitation and/or reconstruction, sidewalks, curbing, drainage improvement, utility relocations, right-of-way easements, and/or acquisitions, geometric and traffic flow improvements, including replacement and/or modifications to the existing signal systems, signing and pavement marking. The project limits are from Front Street from the western end of the roadway to the eastern end at Grove Street, a distance of approximately 1.9 miles. The project is presently under construction. Mr. Wong was a Staff Civil Engineer for the project, assisting Green's Project Engineer on all design aspects of the project.

The Intersection of I-89 NB Exit 15 and VT Rte. 15 Winooski, VT

Mr. Wong is a Staff Civil Engineer for this project. Work under this project includes: widening and realignment of Ramp "B"; geometric modifications along VT 15; traffic signal timing modification at the intersection of Ramp "B" and VT 15 and traffic signal timing coordination with an adjacent traffic signal system; pavement marking and signing; stormwater management; permitting; and traffic management plans.

CERTIFICATE OF COMPLIANCE WITH TAX LAWS

Pursuant to Commonwealth of Massachusetts General Laws, Chapter 62C, Section 49A, I certify
under the pains and penalties of perjury that, Green International Affiliates, Inc.
(Contractor)

has filed all Commonwealth of Massachusetts state tax returns, has complied with all
Commonwealth of Massachusetts laws relating to taxes, and has paid all Commonwealth of
Massachusetts State Taxes required under law.

Green International Affiliates, Inc.
(Contractor)

By: 

Contractor's Federal Tax I.D. No. 04-2175284

END OF DOCUMENT

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under the pains and penalties of perjury that this contract has been obtained in good faith and without collusion or fraud with any other person. As used in this certification, the word 'person' shall mean any natural person, business, partnerships, corporation, union, committee, club, or other organization, entity, or group of individuals.

Name of Business: Green International Affiliates, Inc.

Signature: Ko Ishikura

Name of Person signing Bid: Ko Ishikura, P.E., President

END OF DOCUMENT