PROPOSAL FOR TRAFFIC PEER REVIEW SERVICES

Fifteen Great Road
Littleton, Massachusetts

Prepared for:
TOWN OF LITTLETON, MASSACHUSETTS

NOVEMBER 10, 2011

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Rd., Suite 280 | Marlborough, MA 01752 | 508-303-0370 | Fax: 508-303-0371 | www.mdmtrans.com

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MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

November 10, 2011

Town of Littleton Board of Appeals
c/o Mr. Keith A. Bergman, Town Administrator
Littleton Town Offices, Room 306
37 Shattuck Street
Littleton, MA 01460

Subject: Proposal for Transportation Peer Review Services
Comprehensive Permit Development - 15 Great Road, Littleton, MA

Dear Board Members:

MDM Transportation Consultants, Inc. (MDM) is pleased to submit this proposal for Professional Traffic Peer Review Services relative to the comprehensive permit application filed for 15 Great Road in Littleton, MA.

We believe our firm is uniquely qualified to work with you for the following reasons:

First: MDM has provided traffic peer review services on more than 50 land development projects for over a dozen Massachusetts communities, including Westford, Sudbury, Weston, Billerica, and Westborough, within the past few years. While we have reviewed projects that range in size from a two-bay carwash to a one million square-foot industrial park, we regularly review residential and retail development projects for local Planning Boards, Zoning Boards of Appeals and Public Works Departments. As demonstrated by the attached qualifications, we have extensive experience with site access design to public roadways, traffic operation analyses, site circulation and parking issues.

Second: This past year, MDM celebrated its eighth anniversary of providing full-service transportation consulting to municipal clients and private-sector development clients. We are proud to say that over the eight years, we have maintained our focus, which is to provide high level transportation planning, permitting, design and construction phase services to our clients. MDM provides a complete range of planning and engineering services required for successful transportation projects, from start to finish. We offer reliable, expert services from the initial project feasibility to concept design; local and state permitting; as well as engineering design and construction inspection. Our expertise spans both the public sector and private land development markets, with an emphasis on facilitating, permitting and implementing complex transportation projects. Our solid approach results in viable, cost-effective transportation solutions for every type and size project.

Third: MDM Transportation Consultants, Inc. has six professional staff in all disciplines appropriate to transportation projects, such as transportation planners, traffic engineers and civil engineers. Our transportation staff includes three (3) registered *Professional Engineers*, two (2) of whom are certified *Professional Traffic Operations Engineers*, which is a distinction held by less than 2,500 transportation engineers worldwide. Five (5) members of our staff are active members of the Institute of Transportation Engineers, two (2) of which are certified *Traffic Signal Inspectors*. Since we are a relatively small, well-rounded firm, you will be in contact with our top management throughout the review and can depend on personalized service to meet the needs of your community.

Fourth: As a Principal of MDM, I will serve as Project Manager. Having prepared and reviewed numerous traffic studies for residential developments, including several 40B projects, I am extremely familiar with residential type traffic and parking characteristics and required access designs. I will oversee the project, from the review of the study area to final recommendation of conditional mitigation measures. Over my 17 years of experience, I have directed and participated in over 300 studies identifying traffic impacts, access designs, traffic safety issues and appropriate transportation mitigation measures.

Fifth: The development will seek access to Route 2A/119, a State Highway. MDM is a MassDOT prequalified firm and enjoys a strong working relationships with MassDOT and members of other public agencies and municipalities. We encourage you to contact the references provided to hear first hand about MDM's competency and experience with respect to traffic engineering services and our ability to complete the requested services in a professional and timely manner.

Sixth: MDM would work with the Town to develop an appropriate transportation mitigation package, as needed, to offset transportation impacts. The level of mitigation improvements would be based on roadway/intersection capacity, accident experience, pedestrian and vehicular safety, physical deficiencies, sight distance restrictions, environmental and right-of-way impacts, abutter impacts and community desires. We will apply our extensive and diversified traffic engineering experience to help shape the development project in a manner consistent with the Town's goals.

Seventh: MDM's current workload allows for responsive peer review services to be provided to the Town of Littleton. From our past experience, MDM understands the importance of timely reviews so that Board Members have sufficient time to review project materials.

In closing, we believe our staff has the expertise, experience, and proven track record to provide the Town of Littleton with the type of transportation consulting services the Town expects and deserves to properly assess the impacts associated with the proposed residential development.

Our personal reputations are well established and our references will attest to our professionalism and performance. We invite you to contact our references to discuss our qualifications in greater detail.

We are enthusiastic and eager to provide Professional Peer Review Services to the Town of Littleton and thank you for considering MDM for this important assignment.

Very truly yours,

Daniel J. Mills

Daniel J. Mills, P.E., PTOE
Principal

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CONTRACT FOR SERVICES

TOWN: The Town of Littleton

TOWN'S REPRESENTATIVE: _____

VENDOR: MDM Transportation Consultants, Inc.

PROJECT: Engineering Review Services for Board of Appeals

SITE: **15 Great Road, Littleton, MA**

DATE: November 10, 2011

BUDGET: $7,700 + Meetings and Follow-on Services

The Town hereby accepts the Vendor's proposal to perform services ("Services") in connection with the Project in accordance with and subject to: (i) the Terms and Conditions attached hereto as **Exhibit A**; (ii) Scope of Service attached hereto as **Exhibit B;** and (iii) the salary or hourly rate attached hereto as **Exhibit C**. Collectively, these documents constitute this Agreement.

COMMENCEMENT OF WORK (check applicable box):

[X] This Agreement constitutes a notice to proceed with services.
[ ] Services shall not be performed under this Agreement until the Town so advises the Vendor in writing.

INSURANCE:	**MINIMUM INSURANCE LIMITS**
General Liability (Bodily Injury & Property Damage):	$1,000,000.00
General Liability – Aggregate:	$2,000,000.00
Worker's Compensation:	$ (as required by law)
Automobile Liability:	$1,000,000.00
Umbrella Liability:	$2,000,000.00
Umbrella Liability – Aggregate:	$2,000,000.00
Professional Liability (Errors & Omissions):	$1,000,000.00
Professional Liability – Aggregate:	$2,000,000.00

TOWN:

_____

By: _____

Title: _____

Date Signed: _____

Approved as to availability of funds:

_____

By: _____

Title: _____

Approved as to form by Town Counsel – DATE

VENDOR:

MDM Transportation Consultants, Inc.

By: David J Mills

Title: Principal

Date Signed: November 10, 2011

EXHIBIT A

CONTRACT TERMS AND CONDITIONS OF AGREEMENT

The engagement of MDM Transportation Consultants, Inc. (MDM) by the Town of Litttleton, Massachusetts is under the following terms and conditions and is an integral part of the collective Agreement between the Town of Littleton and MDM.

TO BE DETERMINED BASED ON TOWN OF LITTLETON STANDARD CONSULTANT AGREEMENT AS MODIFIED AND MUTUALLY AGREED BETWEEN MDM AND TOWN OF LITTLETON.

SCOPE OF SERVICES

The Vendor and its personnel will serve as agents to the Town of Littleton. The peer review will examine all documents and data submitted and obtained in connection with the comprehensive permit application by 15 Great Road LLC (the "Applicant") and will opine on issues related to background growth; site-generated traffic; trip distribution; traffic operation analysis; accident data, methodologies employed by the Applicant; and the validity of the findings and conclusions advanced by the Applicant.

The Vendor is expected to be familiar with the submission requirements and procedures for comprehensive permit applications and relevant local regulations and bylaws. Employees involved personally in reviews shall include at least one Professional Engineer licensed in the Commonwealth of Massachusetts. The engineer may be requested to attend evening meetings.

The engineer will be expected to review the materials for conformance with good engineering practices, the local regulations relevant to the application, and any relevant state, federal or local law or regulation.

The engineer will be expected to review materials submitted to the Board of Appeals, make an initial report to the Board prior to its public hearing on the matter, and review additional information submitted and/or follow up on outstanding items for the Board during the approval process. The engineer will also be expected to meet with the Applicant and/or their consultants on occasion to review materials and issues to be resolved during the review and approval process. Reports to the Board of Appeals must identify areas of concern and/or problems, reasons why they are of concern/issues, and make specific recommendations to the Board in such cases. Reports must be submitted to the Board in a timely manner, no later than 15 business days following receipt of review materials, although earlier is preferred so that the Applicant can work to address the outstanding items prior to the meeting date. The Board of Appeals' Comprehensive Permit Rules further describes the consultant review process.

EXHIBIT B (continued)

SCOPE OF SERVICES

Under the terms of this Contract, MDM shall provide Transportation Peer Review Services to the Town of Littleton, Massachusetts. Services to be provided by MDM shall include the following:

- Conduct a site visit to verify existing conditions and gain an understanding of traffic operations, intersection and roadway geometry, pedestrian and vehicle movements, traffic control devices (including signs and pavement markings), driveway curb cuts, sight lines, and access/egress locations.

- Provide a technical review of the following studies and plans prepared for the project. The review will include an initial assessment to determine the completeness of the traffic study submitted for the project and a follow-up review of the study's conformance with industry guidelines and traffic modeling protocols. A final review will be conducted in the event that supplemental analyses are provided by the Applicant and/or site plan modifications that respond to Town or MDM comments and significantly affect traffic-related matters.

  ◊ *Traffic Impact and Access Study, proposed Residential Development, Great Road, Littleton, Massachusetts*, prepared by Land Strategies, LLC, dated October 19, 2011.

  ◊ *Preliminary Subdivision Plans for Fifteen Great Road, Littleton, Massachusetts*, prepared by Places Associates, Inc., dated May 5, 2011.

  <u>The above material will be reviewed with regard to the following:</u>

  1. Existing traffic volume, seasonal adjustment and travel speed data for study area locations.

  2. Historical data, past studies and record plans as provide by the Town and Applicant.

  3. Vehicle crash data results and MassDOT District and State-wide average crash rates.

  4. Future (2016) No-build traffic volumes including traffic growth rates, background traffic and other traffic projection assumptions.

  5. Future (2016) Build traffic volumes including trip generation and trip distribution assumptions used to estimate traffic generated by the proposed 200 residential apartment units.

  6. Intersection capacity and queue analysis results for Existing, No-build and Build condition.

  7. Future traffic impacts, with and without the proposed development.

SCOPE OF SERVICES (cont'd)

8. Sight distance measurements, including Stopping Sight Distance, Intersection Sight Distance and Passing Sight Distance, if applicable, for conformance with State and Federal standards.

9. Review site development plans relative to access/egress to public roadways and on-site parking configuration and circulation patterns, including Applicant's AUTOTURN analysis for emergency apparatus, school bus and service vehicles.

10. Review site layout for pedestrian mobility and designated bus stop locations, if necessary.

11. Assess proposed traffic mitigation measures and need for additional measures, including installation of turn lanes, traffic signals, signs and pavement markings.

- MDM will summarize findings and recommendations in written reports according to the schedule below.

SCHEDULE

MDM will provide an initial assessment to determine the completeness of the traffic study submitted for the project within five (5) business days of official Notice-to-Proceed. A follow-up review of the study's conformance with industry guidelines and traffic modeling protocols will be provided within fifteen (15) business days of receiving supplemental traffic analyses and/or data.

A final review will be conducted in the event that additional analyses are provided by the Applicant and/or site plan modifications in response to Town or MDM comments affect traffic-related matters.

TOWN-FURNISHED INFORMATION

It is understood that MDM will perform services under the sole direction of the TOWN. In the performance of these services, MDM will coordinate its efforts with other project team members, and other consultants, as required. The TOWN shall provide MDM with project-related technical data including, but not limited to, the following:

▪ Traffic study submittals for the proposed development including technical appendices.
▪ Site development plans for the proposed development.

MDM will rely upon the accuracy and completeness of Town-furnished information in connection with the performance of services under this proposal.

EXHIBIT C

COMPENSATION & PRICING SCHEDULE

We have calculated a lump sum fee of SEVEN THOUSAND SEVEN HUNDRED DOLLARS ($7,700.00), including direct expenses, for the services described above.

MEETINGS

In addition to the above work, MDM will attend and participate in meetings with staff, design team and/or for public presentations with local officials as requested by the Town. Each meeting is to be billed at a lump sum of six hundred fifty dollars ($650) per meeting including direct expenses.

FOLLOW-ON SERVICES

Follow-on services, including the review of any additional or revised documents (traffic study, response to comments, site plans, analysis, etc.) generated as a result of MDM's preliminary peer review and/or Town comments will require additional compensation. Follow-on services will be billed on a time and materials basis consistent with MDM standard hourly billing rates as outlined below:

NAME	TITLE	HOURLY RATE
Ronald D. Desrosiers, P.E., PTOE	Project Advisor/Managing Principal	$150
Daniel J. Mills, P.E., PTOE	Project Manager/Principal	$135
Daniel A. Dumais, EIT	Transportation Engineer	$110

REIMBURSABLES

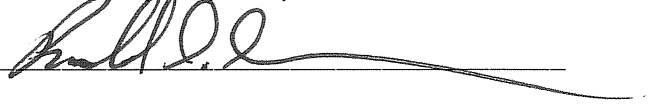
MDM shall be reimbursed for labor (time) charges incurred specifically for this project in accordance with the billing rate schedule outlined above. In addition to the above labor compensation, MDM shall be reimbursed for expenditures made specifically for the project, such as printing and reprographics, travel and sustenance, data collection, photo documentation, telephone charges, shipping, postage, courier service charges, purchase of maps and similar documents, etc. The direct expenses associated with the initial services described above are included in the above stated lump sum fee.

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, MDM Transportation Consultants, 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.

MDM Transportation Consultants, Inc.
(Contractor)

By: 

Contractor's Federal Tax I.D. No. 38-3685764

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: MDM Transportation Consultants, Inc.

Signature: 

Name of Person signing Bid: Daniel J. Mills

END OF DOCUMENT

EQUAL OPPORTUNITY/AFFIRMATIVE ACTION POLICY

MDM Transportation Consultants, Inc. (MDM) is committed to equal employment opportunity to all persons without discrimination on the basis of race, creed, color, religion, sex, age, national origin or handicap. The policy is extended beyond the recruiting process to our personnel policies and procedures. MDM complies with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction.

MDM complies with the provisions of the Commonwealth of Massachusetts Executive Order No. 143 entitled "Equal Employment Opportunity for the Handicapped." Where applicable federal and Massachusetts requirements differ, the stricter requirements shall govern.

In connection with the performance of work under this Contract, MDM shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, sage, sex or handicap. The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion or transfer, recruitment advertising, recruitment layoff, termination, rates of pay or other form of compensation, conditions or privileges of employment, and section for apprenticeship.

MDM shall undertake in good faith administrative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age or sex, and to eliminate and remedy any effects of such past discrimination.

MDM shall post in conspicuous places, available for employees and applicants for employment notice, setting forth the provisions of the Fair Employment Practices Law of the Commonwealth, Massachusetts General Laws, Chapter 151B.

ABOUT OUR FIRM

MDM Transportation Consultants, Inc. (MDM) is a full-service transportation engineering and planning firm led by Managing Principals Ronald D. Desrosiers, P.E., PTOE and Robert J. Michaud, P.E. Through their diverse and complementary experience, MDM is prepared to guide any project, from small to large, through the state and local permitting process, into design and ultimately construction. We offer responsive, comprehensive and cost effective solutions to our public and private sector Clients. We recognize that every Client has unique needs, schedules and budget constraints. As such, we pride ourselves on meeting these objectives to develop strategic "real world" solutions to today's challenging transportation infrastructure needs.

Since our founding in June of 2003, MDM has provided transportation services on over 500 individual projects ranging from peer reviews for Cities and Towns to major infrastructure improvements for public and private sector Clients. MDM provides a complete range of planning and engineering services required for successful transportation projects, from start to finish. We offer reliable, expert services from the initial project feasibility to concept design, local and state permitting, as well as engineering design and construction services. Our expertise spans both the public sector and private land development markets, with an emphasis on facilitating, permitting and implementing complex transportation projects. Our solid approach results in viable, cost-effective transportation solutions for every type and size project.

REPRESENTATIVE PLANNING & ENGINEERING SERVICES

- Independent Traffic Assessments & Design Reviews
- Traffic Impact & Access Studies
- Environmental Impact Assessments
- Parking Studies & Design Layout
- Transportation Master Planning
- Transportation Demand Management
- Public Presentations & Consensus Building
- Transportation Air Quality Modeling

- Highway Engineering & Intersection Design
- Advanced Traffic Signal System Design
- Traffic Signal Equipment Evaluations
- Traffic Calming Studies & Design
- Traffic Management Planning & Design
- Construction Management & Monitoring
- Federal and State Construction Funding Assistance
- Expert Witness Testimony

PEER REVIEW EXPERIENCE

MDM has provided traffic peer review services on more than 50 land development projects for over a dozen Massachusetts communities within the past seven years. While we have reviewed projects that range in size from a two-bay car wash to one million square-foot office complex and retail centers, we regularly review various sized residential and retail/commercial development projects for local Zoning Boards of Appeals, Planning Boards and Public Works Departments. The following list provides a sample of communities that have retained our peer review services for various land development projects.

NAME	PROJECT TYPE	SIZE	LOCATION
Woodlands at Laurel Hill	Residential (40B) – Apartments	352 units	Westford/Acton, MA
Tadmuck Meadows	Residential (40B) – Sr. Community	41 units	Westford, MA
Westford Crossing	Residential (40B) – Townhouse	28 units	Westford, MA
Summer Village	Residential – Seasonal Cottages	213 units	Westford, MA
Hawk Ridge	Residential – Condominiums	28 units	Westford, MA
Westboro Village	Residential (Transit Oriented)	350 units	Westborough, MA
Washington Hills	Residential – Senior Community	66 units	Holliston, MA
Sudbury Village	Residential (40B) – Townhouses	72 units	Sudbury, MA
Grouse Hill	Residential – Senior Community	52 units	Sudbury, MA
Village Crossing	Residential – Townhouses	61 units	Billerica, MA
Lakeview Estates	Residential (40B) – Mixed	164 units	Bellingham, MA
North Woods	Residential - Single Family	21 units	Bellingham, MA
Crystal Springs (Phase III)	Residential - Condominiums	20 units	Bellingham, MA
Westinghouse Redev.	Retail – Shopping Center	470,000 sf	Springfield, MA
Baystate Commons	Retail – Shopping Center	360,000 sf	Westborough, MA
Quarry Place	Retail – Shopping Center	210,000 sf	Milford, MA
Wal-Mart Plaza	Retail – Shopping Center	238,500 sf	Leicester, MA
BMW Dealership	Retail – Automobile Dealership	80,000 sf	Sudbury, MA
Green Street Development	Office	570,000 sf	Weston/Waltham, MA
Westford Tech. Park - West	Office	970,000 sf	Westford, MA
Best Buy Distribution Ctr.	Warehouse	238,500 sf	Bellingham, MA
Walgreens Pharmacy	Pharmacy with Drive-Through	14,700 sf	Bellingham, MA
Dunkin Donuts	Fast-food Restaurant	2,800 sf	Dracut, MA
Mobil-on-the-Run	Gas Station/Convenience Store	10 vfp	Billerica, MA

KEY PERSONNEL

MDM Transportation Consultants, Inc. has a full complement of professional staff in all disciplines appropriate to transportation projects, such as traffic engineers, civil engineers and transportation planners. The following provides an overview of key staff assigned to this project.

Ronald D. Desrosiers, P.E., PTOE (MA #39712, NH #10700, ME #7974)

Mr. Desrosiers is a managing principal in charge of MDM's Traffic Engineering Division and has over 20 years of experience in roadway design, specializing in unsignalized and signalized intersections operations as well as roadway reconstruction. He is responsible for supervision and administration of all traffic engineering projects. Mr. Desrosiers has previously managed over 100 transportation projects, many in communities situated along the I-495 corridor, including Westford, Billerica, Lowell, Methuen, Sudbury, Holliston, Westborough, Milford and Bellingham. Working on both public and private transportation and development projects, Mr. Desrosiers has demonstrated his in depth knowledge of local permitting procedures and State and Federal regulations, standards and codes.

Daniel J. Mills, P.E., PTOE (MA #41753)

Mr. Mills is a principal of the firm with over 15 years of traffic engineering experience. He has completed conceptual and final design plans and related documents for numerous intersection and roadway improvement projects throughout Massachusetts. Mr. Mills has conducted intersection operation and crash analyses, speed studies, truck route assessments, traffic impact assessments, corridor studies and independent peer reviews. He has also prepared traffic impact studies, planning studies and design reports for various public and private development projects. Mr. Mills' experience includes the preparation of a Corridor Master Plan for Route 110 in Westford, MA and Route 126 in Ashland, MA and ongoing independent traffic peer review services for the Towns of Bellingham, Westborough and Weston.

Daniel A. Dumais, EIT (MA #20140)

Mr. Dumais has conducted numerous traffic impact and access studies related to residential, office and retail developments. He has also assisted in providing independent peer review services to the Towns of Bellingham, Billerica, Dracut, Springfield and Westborough. Mr. Dumais is experienced with all aspects of traffic studies including safety analysis, site trip generation and distribution and intersection capacity and queuing analysis.

Further information regarding MDM's key personnel for this project is provided on the following pages.

Ronald D. Desrosiers, P.E., PTOE

Position: Managing Principal and Founding Partner

Years of Professional Experience: 23

Education: Wentworth Institute of Technology, B.S.C.E., 1988
Georgia Institute of Technology, Traffic Signal Operation at Local Intersections
Electric Light Company, Inc., Advanced Traffic Controller Operation and Programming
Electric Light Company, Inc., Closed Loop and Traffic Responsive Operation
Electric Light Company, Inc., NEMA TS2 Controller Programming and Troubleshooting
Viggen Corporation, Advanced Corsim for Coordinated Signal Systems

Registration: Professional Engineer: Massachusetts #39712; New Hampshire #10700; Maine #7974
Registered Professional Traffic Operations Engineer #756
IMSA Certified Traffic Signal Inspector #SI_40347

Description of Experience:

Mr. Desrosiers has over 23 years of experience and expertise in Transportation Planning and Engineering. His vast experience includes peer review services for Cities and Towns, roadway and intersection reconstruction for public and private sector clients, transportation master plans, signal system evaluations, private development permitting for implementation of transportation mitigation on both the State and Local levels, truck exclusion studies, construction management and assistance in securing State and Federal construction funds for safety improvement projects. Mr. Desrosiers has significant expertise in preparing context sensitive designs particularly as they relate to securing design waivers for projects that lie within a historic district, along a scenic roadway or are adjacent to sensitive environmental resources. Mr. Desrosiers relevant experience as it relates to transportation consulting and project management is listed below.

Relevant Experience:

Representative Peer Review Projects

- Woodlands at Laurel Hill Residential Development (352 units) - Westford/Acton, MA
- Sudbury Village Residential Development (72 units) – Sudbury, MA
- Grouse Hill Senior Residential Development (52 units) – Sudbury, MA
- Village Crossing Senior Residential Development (61 units) – Billerica, MA
- Tadmuck Meadows Senior Residential Development (40 units) - Westford, MA
- Foreign Motors West BMW Auto Dealership - Sudbury, MA
- Quarry Place (210,000 SF Shopping Center) – Milford, MA
- Target (106,000 SF Mixed Use Retail Shopping Center) – Milford, MA
- Westford Technology Park –West (1.0 Million SF Office Park) - Westford, MA
- Primrose Place (225,000 SF mixed use retail development) - Westford, MA
- Bulk Transfer Facility - Westborough, MA
- Dunkin Donuts - Dracut, MA
- Nashua Road/Mammoth Road/Meadowview Drive Intersection – Dracut, MA
- Town Center (Billerica Mall Redevelopment) - Billerica, MA
- Town Fair Tire (Retail Tire Center) – Billerica, MA
- Mobil-on-the-Run – Billerica, MA
- Walgreen's – Bellingham, MA
- South Main Street/Penny Lane/Bellingham Shopping Center – Bellingham, MA

Ronald D. Desrosiers, P.E., PTOE (continued)

Representative Transportation Engineering Projects

- Town Center Signal Improvements (Historic District) – Billerica, MA
- Town Center Transportation Improvements (Historic District) – Westborough, MA
- Brigham Street, Union Street and Cottage Street Reconstruction (Historic District) – Westborough, MA
- Arlington Street/Montaup Avenue (Town Center) – Dracut, MA
- Reconstruction of North Street (Scenic Road) – Bellingham, MA
- Reconstruction of Concord Road and Charnstaffe Lane (Scenic Road and Historic District) – Billerica, MA
- Concord Road/Middlesex Turnpike (Scenic Road) – Billerica, MA
- West Street/South Street (Scenic Road and Historic District) – Reading, MA
- Reconstruction of Washington Street (Historic District) – Westwood, MA
- Nashua Road (Route 4)/Treble Cove Road - Billerica, MA
- North Main Street (Route 58) Improvements – Carver, MA
- Reconstruction of Arlington Street – Dracut, MA
- Broadway Road (Route 113)/Jones Avenue/Wheeler Road – Dracut, MA
- Reconstruction of Pond Street and Old West Central Street – Franklin, MA
- Central Street (Route 12)/Lancaster Street Intersection Signalization – Leominster, MA
- Marion Road (Route 6) Transportation Improvements – Wareham, MA
- South Street (Route 1A)/Premium Village Outlets/Mobil-on-the-Run – Wrentham, MA
- Cambridge Road (Route 3)/Bedford Road Safety Improvements – Woburn, MA

Representative Corridor Studies and Master Planning Projects

- Littleton Road (Route 110) Corridor Study and Master Plan – Westford, MA
- Littleton Road (Route 110) Master Plan – Westford - MA
- Route 225 By-Pass Road Study – Westford, MA
- Mechanic Street (Route 140) Corridor Study and Master Plan – Bellingham, MA
- Town Center Transportation Master Plan – Bellingham, MA
- Transportation Master Plan – Franklin, MA

Representative Construction Management and Monitoring Projects

- Washington Street (Route 53) Transportation Improvements – Hanover, MA
- Town Center Interim Signal Improvements (Historic District) – Billerica, MA
- Concord Road/Middlesex Turnpike Intersection Improvements (Scenic Road) – Billerica, MA
- North Main Street (Route 58) Transportation Improvements – Carver, MA
- Nashua Road/Mammoth Road/Meadowview Drive Intersection – Dracut, MA
- State Road (Route 6)/Dartmouth Mall Site Driveway – Dartmouth, MA
- North Bedford Street (Route 18) Transportation Improvements – East Bridgewater, MA
- Central Street (Route 12)/Lancaster Street Intersection Signalization – Leominster, MA
- Grafton Street/Waverly Street/Penn Avenue Intersection Improvements – Worcester, MA
- Grove Street (Route 122A)/West Boylston Street Intersection Improvements – Worcester, MA
- North Main Street (Route 126) Resurfacing – Bellingham, MA
- Marion Road (Route 6) Improvements – Wareham, MA

Daniel J. Mills, P.E., PTOE

Position: Principal and Founding Partner

Years of Professional Experience: 17

Education: Merrimack College, B.S.C.E., 1994

Registration: Registered Professional Engineer: Massachusetts #41753
Registered Professional Traffic Operations Engineer #1065
IMSA Certified Traffic Signal Inspector / Level I Signal Technician #72129

Description of Experience:

During his 17 years in the transportation engineering profession, Mr. Mills has prepared numerous traffic impact studies for a wide variety of developments in Massachusetts. Projects range in size from a 3,000 square foot fast-food restaurant in the Town of Swansea to a 714,000 square foot regional shopping center in the City of Everett. Additional land uses studied include, public school, office park, residential development, car wash, nursing home, bank, public golf course, pharmacy, hotel, medical office, casino and supermarket. Mr. Mills has performed parking and circulation studies, conducted speed studies, and prepared truck route assessments. He has provided impartial traffic peer review services to municipalities and the DCR (former Metropolitan District Commission).

Mr. Mills has designed improvements for over seventy-five intersections throughout Massachusetts, including projects in the City of Boston and for MassDOT. Many of these improvement projects have abutted residential neighborhoods, historic districts, institutional facilities, downtown businesses, and environmentally sensitive resource areas. Mr. Mills is experienced in all design aspects including, highway capacity modeling and simulation, roadway and intersection geometry, traffic signal system design, and sign and pavement marking layout. He is also experienced in construction related services including shop drawing review, work zone traffic management and final inspection procedures. Mr. Mills relevant experience as it relates to transportation consulting is listed below.

Relevant Experience:

Representative Peer Review Projects

- Lakeview Estates (40B) Residential Development (164 units) – Bellingham, MA
- Westboro Village (Transit-Oriented) Residential Development (350 units)– Westborough, MA
- Summer Village Seasonal Residences (277 units) – Westford, MA
- Washington Hills Senior Residential Development (66 units) – Holliston, MA
- North Woods Residential Development (21 units) – Bellingham, MA
- Bay State Commons (360,000 sf mixed-use retail) – Westborough, MA
- Chipotle Mexican Grill (Restaurant) - Westborough, MA
- Shoppes at Bellingham (550,000 sf retail) – Bellingham, MA
- Best Buy Distribution Center (238,500 sf warehouse) – Bellingham, MA
- Dave & Buster's Restaurant (697 seats) – Burlington, MA
- Bank with Drive-thru/Commercial Development (7,000 SF) – Bellingham, MA
- Automatic Car Wash (2 bays) – Bellingham, MA
- Cumberland Farms (Convenience Store/Gas Station) – Bellingham, MA
- Indoor/Outdoor Athletic Facility (8 Fields) – Bellingham, MA
- Motocross Complex (68,400 sf indoor facility) – Bellingham, MA

Daniel J. Mills, P.E., PTOE (continued)

Representative Transportation Planning Projects

- Lafayette Tides Residential Development – Marblehead, MA
- Arboretum Village Residential Development - Worcester, MA
- Chrysler Apartments Residential Development - Natick, MA
- Putnam Farm Senior Residential Development - Sutton, MA
- Emerald Pines Residential Development/Golf Course - Methuen, MA
- Webster Triathlon Traffic Management Plan – Webster, MA
- Patriot Plaza (250,000 sf mixed use retail development) – Templeton, MA
- Concrete Facility - Wilmington, MA
- Lincoln Square Gas Station Redevelopment – Weymouth, MA
- South Adams Savings Bank – Lee, MA
- Medical Center/Industrial Development – East Bridgewater, MA
- Walgreens Pharmacy Development - Lakeville, MA
- Twin City Plaza Parking Study – Somerville, MA
- Shaw's Supermarket – Carver, MA
- Price Chopper Supermarket – Shrewsbury, MA
- Town-wide Traffic Signal Evaluation - Greenfield, MA
- Low Street Traffic Calming Measures – Newburyport, MA

Representative Transportation Engineering Projects

- Town Center Signal Improvements – Billerica, MA
- Reconstruction of Concord Road and Charnstaffe Lane – Billerica, MA
- Concord Road/Middlesex Turnpike – Billerica, MA
- West Street/South Street – Reading, MA
- Main Street (Route 122A)/Holt Road/Boyden Road – Holden, MA
- Central Street (Route 12)/Lancaster Street Intersection Signalization – Leominster, MA
- Morton Street Corridor Traffic Signal Upgrades - Dorchester, MA
- Western Avenue Roadway Reconstruction - Lynn, MA
- Grafton Street (Route 122)/Waverly Avenue/Penn Avenue – Worcester, MA
- West Boylston Street (Route 12)/Grove Street – Worcester, MA
- Gold Star Boulevard (Route 12)/Distributor Road – Worcester, MA
- Route 3A/Evergreen Street Intersection Improvements - Kingston, MA
- Route 27/Brockton Mall Intersection Improvements – Brockton, MA

Representative Corridor Studies and Master Planning Projects

- Pond Street (Route 126) Corridor Study and Master Plan – Ashland, MA
- Littleton Road (Route 110) Corridor Study and Master Plan – Westford, MA
- Mechanic Street (Route 140) Corridor Study and Master Plan – Bellingham, MA
- Charlton Road (Route 20) Corridor Study – Sturbridge, MA

Professional Affiliations:

American Society of Civil Engineers
Institute of Transportation Engineers
Boston Society of Civil Engineers
International Municipal Signal Association

Daniel A. Dumais, EIT

Position: Senior Transportation Engineer

Years of Professional Experience: 10

Education: University of Massachusetts - Amherst, B.S.C.E., 2001

Registration: Engineer-in-Training: Massachusetts #20140

Description of Experience:

During his ten years in the transportation engineering profession, Mr. Dumais has prepared numerous traffic impact and access studies for projects throughout Massachusetts, both in the public and private sectors. Mr. Dumais has also worked on many peer review projects for municipalities. Mr. Dumais has worked on developments of various sizes and land uses, including but not limited to office buildings, residential, pharmacies, banks, fast-food restaurants, hotels, assisted living and retirement facilities, retail, gasoline service stations, health clubs, auto dealership and garden centers. Mr. Dumais has conducted a variety of studies, including traffic impact studies, parking studies, speed studies, corridor studies, master plans, route assessments and functional design reports.

Mr. Dumais is experienced in a variety of design aspects including, highway capacity modeling and simulation, roadway and intersection geometry, traffic signal system design, traffic calming, sign and pavement marking layout and multi-use path design. He is also experienced in construction related services including traffic management plans and resident field inspection services.

Relevant Experience:

Representative Peer Review Projects

- North Woods Residential Development – Bellingham, MA
- Lakeview Estates 40B – Bellingham, MA
- Crystal Springs Residential Development, Phase III – Bellingham, MA
- Westinghouse Re-development (470,000 SF shopping center) – Springfield, MA
- Asphalt Plant – Westford, MA
- Walgreens Pharmacy – Billerica, MA
- Dave & Buster's – Burlington, MA
- CVS Pharmacy – Dracut, MA
- KSA Camp Facilities – Monterey, MA
- CSX Terminal Facility – Westborough, MA
- Dunkin Donuts – Westborough, MA
- Xtramart/ Dunkin Donuts w/ Drive Thru – Westborough, MA
- Boch Honda Automobile Dealership – Westford, MA
- Gas Station Re-development w/ Dunkin Donuts – Weston, MA

Daniel A. Dumais, EIT (continued)

Representative Transportation Planning Projects

- Fisherville Terrace Subdivision 40B – Grafton, MA
- Landham Crossing 40B Residential Project (32- units) – Sudbury, MA
- Oak Hill Road 40B – Southborough, MA
- Staples Corporate Headquarters Parking Expansion Project – Framingham, MA
- Patriot Plaza (250,000 sf mixed use retail development) – Templeton, MA
- FM Global Expansion (160,000 sf office/ medical office) – Norwood, MA
- Massachusetts College of Pharmacy Expansion – Worcester, MA
- Cape Cod Lumber (Office, Showroom, Warehousing, & Lumber Yard) – Abington, MA
- Day Care Facility (282 children, 40 staff) – Acton, MA
- Pioneer Renewable Energy Facility (50 megawatts (MW)) – Greenfield, MA
- Mixed-Use Development (retail/ medical office, residential) – Groton, MA
- Stop & Shop Gas Station – Hudson, MA
- Walmart Expansion – Hudson & Northborough, MA
- Sysco Boston (706,000 sf warehouse/ office) – Lakeville, MA
- KIPP Academy (750 students grades 5-12) – Lynn, MA
- Mixed-Use Development (office, retail , restaurant, and bank) – Marblehead, MA
- Island Racquet Club (Tennis Club w/ Restaurant), Nantucket, MA
- On-Island Gas Expansion Project (Gas, Convenience, and Retail)– Nantucket, MA
- Riverbend School, Phase I (Pre-School) – Natick, MA
- McDonald's renovations (Route 44 & Route 138)– Raynham, MA
- MATCH Schools – Roxbury & Jamaica Plain, MA
- The Shoppes at Harrington Farms (Retail, Restaurant, and Grocery Store) – Shrewsbury, MA
- Lincoln Square Mixed-Use Fuel Facility – Weymouth, MA
- Extended Stay Hotel Development (124 rooms) – Worcester, MA
- Webster Five Cents Savings Bank (3,000 sf w/ 3 drive-thru lanes) – Worcester, MA

Representative Transportation Engineering Projects

- Arlington Street – Dracut, MA
- Lakeview Traffic Signal Coordination – Dracut, MA
- Manhan Rail (Bicycle) Trail/ Norwottuck Rail Trail – Easthampton & Northampton, MA
- John Fitch Highway/ Ashby State Road (Route 31) Roundabout – Fitchburg, MA
- Central Street (Route 12)/Willard Street Intersection Signalization Improvements – Leominster, MA
- Brewers Corner Re-Design – Quincy, MA
- Littleton Road (Route 110)/Tadmuck Road – Westford, MA

Representative Corridor Studies and Master Planning Projects

- Town of Agawam Master Plan – Agawam, MA
- Route 126 Corridor Master Plan – Ashland, MA
- Kringle Candle Master Plan – Bernardston, MA
- Industrial Park Master Plan (715,000 sf) – East Bridgewater, MA
- White City Plaza Master Plan – Shrewsbury, MA

REFERENCES

We have established strong working relationships with members of many public agencies, municipalities and Town Counsels. The following references can attest to MDM Transportation Consultants, Inc.'s competency and experience with respect to traffic engineering review services and ability to complete the requested services in a professional and timely manner.

Mr. James E. Robbins
Town Planner
Town of Westborough
45 West Main Street
Westborough, MA 01581
(508) 366-3055

Mr. Paul Starratt, P.E.
Town Engineer
Town of Westford
28 North Street
Westford, MA 01886
(978) 692-5520

Ms. Stacey Wetstein
Town Planner
Town of Bellingham
2 Mechanic Street
Bellingham, MA 02019
(508) 657-2892

Mr. Norman Khumalo
Town Manager
Town of Hopkinton
18 Main Street
Hopkinton, MA 01748
(508) 497-9700

Ms. Kristin E. Hoffman-Kassner, AICP
Senior Planner
Town of Burlington
25 Center Street
Burlington, MA 01803
(781) 270-1645

Mr. Joseph Frawley
District Traffic Engineer
MassDOT, District 3
403 Belmont Street
Worcester, MA 01604
(508) 929-3916

Mr. John Livsey, PE
Town Engineer
Town of Lexington
201 Bedford Street, Rm 202
Lexington, MA 02420
(781) 274-8300 x8305

Mr. Neil Boudreau
State Traffic Engineer
MassDOT, Main Office
10 Park Plaza
Boston, MA 02116
(617) 973-8211

Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Jeffrey B. Mullan, Secretary & CEO
Luisa Palewonsky, Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

Architects and Engineers Review Board - Prequalification

Effective: January 7, 2011

Expires: January 6, 2013

MDM Transportation Consultants, Inc.
28 Lord Road, Suite 280
Marlborough MA 01752

You are Prequalified in the following Disciplines:

☐	Environmental Studies	☐	Landscape Architecture
☑	Basic Roadway Design	☐	Photogrammetry
☑	Intermediate Roadway Design	☐	Intelligent Transportation System
☐	Complex Roadway Design	☐	Transit and Rail Systems Design
☐	Basic Bridge Design/Ratin	☐	Materials Inspection and Testin
☐	Intermediate Bridge Design/Ratin	☐	Cultural Resources
☐	Complex Bridge Design/Ratin	☐	Hazardous Waste - Site Investigation and Assessment
☐	Bridge Inspection	☐	Hazardous Waste - Remediatio
☐	Moveable Bridge Design/Ratin	☐	Wetlands - Delineation and Assessment
☐	Moveable Bridge Inspection	☐	Wetlands - Mitigation
☑	Traffic Operations Studies & Design	☐	Water Quality - Assessment
☐	Geotechnical Engineering Including Soils & Foundation Studies	☐	Water Quality - Mitigation
☐	Construction Contracts Assistance	☐	Air Quality
☐	Hydraulics and Hydrology	☐	Noise Studies
☐	Transportation Planning	☐	Ecology
☐	Architectur		

MassDOT will retain this rating on its list of prequalified firms until the Expiration Date shown above. Your firm is required to submit a new or updated ADM-016 Form on or before the Expiration Date if you wish to continue to be considered for new services by the Department. Revised ADM-016 Forms may also be submitted at any time prior to the Expiration Date. **Failure to furnish an updated ADM-016 Form prior to the Expiration Date will result in your firm being removed from the Department's approved list.** This will disqualify you from being selected for new services by the Department until an upated form is submitted and the A&E Board has issued a new rating.

Sincerely,

Peter VanBuskirk, Secretary
Architects & Engineers Review Board

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 617-973-7000, TDD: 617-973-7306
www.mass.gov/massdot

SAMPLE PEER REVIEW REPORTS

A copy of five (5) independent peer review reports are provided below as an example of the peer review services MDM has provided to other communities.

We also offer peer review of design documents (plans, specifications, construction cost estimates, etc.) and construction observation services which complement our traffic study peer reviews. Typically, these services are provided as "Follow-On Services" since they provide consistency of knowledge relative to initial peer reviews and provide a continuous level of review for communities that lack the capability or expertise to ensure that transportation mitigation commitments are constructed in accordance with Town approvals.

Peer Review Sample #1

Proposed CSX Bulk Transfer Facility
Westborough, Massachusetts

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

January 21, 2011

Mr. James E. Robbins
Town Planner
Forbes Municipal Building
45 West Main Street
Westborough, MA 01581

Dear Mr. Robbins:

Subject: Transportation Peer Review
Proposed CSX Bulk Transfer Facility
1 Walkup Drive; Westborough, MA

In accordance with our contract to conduct peer review services for the above referenced project, MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following comments. These comments have been prepared based on our field inspection of the site and study area, our December 9, 2010 meeting with the Applicant and review of the documents identified below.

DOCUMENTS REVIEWED

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Traffic Study, Flanders Road/Walkup Drive Intersection, Westborough, Massachusetts, prepared by EMHT, October 19, 2010.*

- *Traffic Management Plan (TMP), TRANSFLO Terminal Services, Inc., 1 Walkup Drive, Westborough, Massachusetts by TRANSFLO, October 27, 2010.*

PROJECT DESCRIPTION

The proposed Bulk Transfer Facility, to be operated by Transflo Terminal Services, Inc., is located at the end of Walkup Drive on the eastern side of Westborough. The site is comprised of an existing rail yard that had previously been utilized as an automobile transfer facility and is now proposed for use a bulk transfer facility for various goods. Access to and from the transfer facility will be via Walkup Drive to Flanders Road.

A Traffic Study (TS) and Traffic Management Plan (TMP) was submitted as part of the local approval process and is the primary focus of our review. Based on the TS and TMP, the development is anticipated to generate approximately 104 vehicle trips over a twelve (12) hour period during a normal weekday, as reported by the Applicant. Of the 104 daily trips, 60 are related to the staggered arrival and departure of semi-tractor trailers. Forty four (44) trips are related to employee and terminal related services, including equipment repair/maintenance, parts and document delivery (UPS, Fed Ex, etc.,), trash removal, etc..

STUDY AREA

MDM has reviewed the study area relative to the proposed development, which consists of the following roadways and intersections:

- Intersection; Flanders Road at Walkup Drive
- Roadway Segment; Flanders Road from Walkup Drive to Route 9.

Since the development's potential impact to local roadways is primarily concentrated along Flanders Road and at the Flanders Road/Walkup Drive intersection, MDM finds the study area acceptable.

FIELD RECONNAISSANCE

To gain an understanding of the characteristics of the roadways and intersections servicing the project site, a site visit was conducted on Tuesday, January 11, 2011. The purpose of the field inspection was to observe traffic operating conditions, record pavement width, pavement markings and signs, review horizontal and vertical alignment, conduct preliminary sight distance measurements and review the physical condition of the surface infrastructure.

In general, the physical condition of the intersection infrastructure was in fair to poor condition. The existing roadway pavement on Walkup Drive was in poor condition with significant cracking, signifying the pavement structure is failing. Stormwater conveyance away from the intersection is accomplished by way of overland flow along the edge of the roadway on a fairly flat grade. A closed drainage system does not exist within the intersection, which is a likely contributor to the failing pavement condition. Lane configurations consist of approximately 16 foot wide approach lanes on Flanders Road and a 24 foot wide approach lane on Walkup Drive. A 4 foot wide raised island separates the approach and departure lanes on Walkup Drive. Pavement markings consist of a double yellow center line on Flanders Road. No pavement markings are present on Walkup Drive. Sidewalks for safe pedestrian mobility do not exist along Flanders Road or Walkup Drive.

The following presents our findings relative to the submitted documents.

CRASH HISTORY

A review of the previously referenced documents indicates that an analysis of crash trends was not included in the TS or TMP. To develop an understanding of the intersection and roadway segment crash history and trends, MDM recommends that the Applicant conduct a crash analysis, including crash rate calculations and collision diagrams in MassDOT format for the intersection of Flanders Road/Walkup Drive as well as the Flanders Road roadway segment between Walkup Drive and New Flanders Road. The crash history should cover the study period of 2006 through 2008, the most current three-year period available from MassDOT. Since State and Local accident records don't always correlate, MDM also recommends that the Applicant obtain the official crash reports from the Town of Westborough Police Department to cover an overlapping and expanded study period from 2006 through 2010. Said crash reports, crash rate calculations and collision diagrams should be forwarded to MDM for review.

VEHICLE SPEEDS

In order to evaluate the Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) at the Flanders Road/Walkup Drive intersection, a speed study should be conducted to determine the 50th and 85th percentile running speeds along Flanders Road. The speed study shall be conducted on the eastbound and westbound approaches to the Walkup Drive Intersection during an average weekday and during non-peak traffic periods. The speed study shall be accomplished using an ATR or by the enoscope methodology which measures travel time over a measured distance. If the enoscope methodology is utilized, a minimum sample of 100 observations per travel direction shall be obtained for analysis. Said speed study data and associated calculations should be forwarded to MDM for review.

SIGHT DISTANCE

The proposed site driveway is located at the end of Walkup Drive with primary access/egress to the site via the Walkup Drive/Flanders Road intersection. MDM notes that the TS includes an evaluation for Intersection Sight Distance based on a posted travel speed of 40 MPH, but does not include an evaluation of the Stopping Sight Distance. MDM recommends that the Applicant revise the TS to provide an analysis of existing Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) as they relate to the Flanders Road/Walkup Drive intersection. MDM recommends that the Applicant compare the existing SSD and ISD to minimum recommended distances published by the American Association of State Highway and Transportation Officials (AASHTO) based on the 85th percentile running speed along Flanders

Road. If AASHTO recommendations are not met, MDM recommends that the Applicant propose measures to improve sight lines. To clarify the difference between SSD and IDS, the following descriptions have been provided.

Stopping Sight Distance

The American Association of State Highway and Transportation Officials (AASHTO) *"A Policy on Geometric Design of Highways and Streets"* 2004 edition, makes reference to Stopping Sight Distance which is relevant to Flanders Road at its intersection with Walkup Drive. In general, sight distance is the length of roadway ahead which is visible to the driver. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near the 85th percentile ambient travel speed, to stop safely before reaching a stationary object in its path. Sight distance at every point along a roadway should be at least that required for a vehicle to stop safely to avoid striking an object in its travel lane. Stopping Sight Distance (SSD) criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD includes the length of roadway traveled during the perception and reaction time of a driver to an object, and the distance traveled during brake application. For this evaluation, SSD should be considered for vehicles traveling along Flanders Road and approaching Walkup Drive. SSD along a roadway is considered the minimum criteria for acceptable sight distance since it provides a distance in which drivers traveling along the major road (Flanders Road) perceives something in the roadway (a turning vehicle) and have enough time to react and brake so as not to cause a collision. SSD is generally measured along the roadway centerline with an eye height of 3.5 feet and an object height of 2.0 feet.

Intersection Sight Distance

AASHTO makes reference to Intersection Sight Distance (ISD) which is relevant to intersections on rural and urban roadways. In general, ISD is defined as the distance required to permit a vehicle on the minor street (Walkup Drive) of the intersection to cross the traveled way, enter the traffic steam and accelerate to the average running speed without requiring the approaching through vehicle (Flanders Road) to slowdown significantly. Intersection Sight Distance is generally measured 14.5 feet back from the existing edge of traveled way on the major road with an eye height of 3.5 feet on the minor street and an object height of 3.5 feet on the major street for an approaching vehicle. Per AASHTO and MassDOT, ISD should meet or exceed SSD criteria, at a minimum.

Existing Sight Distance Restrictions

MDM notes that the TS identifies existing fixed objects and topography which restrict sight distance from Walkup Drive. This sight distance restriction imposes an undesirable safety condition which could result in future accidents and poor traffic operations. MDM recognizes that removal of parked vehicles parked in private lots may be beyond the Applicants control; however MDM recommends that the Applicant make a reasonable attempt to eliminate the proposed sight distance restrictions to the greatest extent possible.

TRAFFIC VOLUMES

MDM has reviewed the existing traffic volume networks and methodology for obtaining the existing traffic volumes as presented in the TS. MDM notes that traffic volumes were collected for the Flanders Road/Walkup Drive intersection on Wednesday, September 29, 2010 for the weekday morning (6:00 AM to 9:00 AM), midday (11:00 AM to 3:00 PM) and evening (4:00 PM to 6:00 PM) peak periods. However, to validate the peak hours as well as understand the classification of vehicles and total volume on Flanders Road, MDM recommends that an automatic traffic recorder (ATR) count be conducted for a 48 hour period on typical weekdays (Tuesday, Wednesday, and Thursday). The ATR should collect data in 15 minute increments and by vehicle classification. The Applicant should summarize the daily traffic volume data graphically, preferably using a bar chart, for each hour of a typical weekday. The bar charts should clearly indicate hourly fluctuations in traffic during each 24 hour weekday period, differentiating between passenger vehicles and heavy vehicles. The ATR should be conducted along Flanders Road west of Walkup Drive.

SEASONAL ADJUSTMENT

A review of the TS does not indicate if a seasonal adjustment factor was or was not applied to the existing traffic volumes. Since no adjustment for seasonality was referenced in the TS, MDM conducted our own independent research based on a nearby MassDOT permanent count Station #307 on Route 9. Based on our review of the permanent count station data, September is an average travel month. Therefore, no seasonal adjustment of the existing traffic volumes or further analysis under this task is required.

NO-BUILD AND BUILD TRAFFIC VOLUMES

MDM has reviewed the TS and notes that a projection of future year volumes was not included as part of the TS or TMP for the Flanders Road/Walkup Drive intersection. To develop an understanding of future traffic operations with and without the project in place, a five (5) year

No-Build and Build projection of traffic should be included. To develop the future No-Build and Build traffic volumes, the use of a general background growth rate should be applied to the existing traffic volumes. Based on our review of historical growth trends in the region, MDM recommends that a minimum background growth rate of 1 percent per year be applied to existing volumes as a component to projecting future traffic volumes.

In addition to the background growth rate, traffic associated with planned and/or permitted site-specific development projects should be included to project future No-Build and Build traffic volumes. MDM is aware that EMC has been approved on the Local and State level to construct approximately 2.2 million square feet (sf) of Office and Research/Development space in close proximity to the CSX project. The build-out of this project is likely to generate additional traffic along Flanders Road and thus affect traffic operations at the Flanders Road/Walkup Drive intersection. The Applicant should contact the Planning Departments for the Town of Westborough and Town of Southborough to determine if there are any additional planned or permitted area developments likely to affect the study area.

Given the current economic downturn, MDM recommends the Applicant investigate the vacancy for existing office, commercial and industrial space along Walkup Drive and Flanders Road. Since many existing office, commercial and industrial buildings appear to be vacant, the Applicant should document said land uses and apply an appropriate trip generation rate to the vacant space. The resultant background trips related to the unoccupied space should be added to the existing volumes as a component to developing the No-Build volumes. The vacancy investigation should be summarized in a table format that includes, at a minimum, the location of the vacant space, land use, amount of vacant space (sf) and trips associated with the vacant space. Supporting trip generation calculations and network distribution figures for each land use should also be provided to MDM for review.

Additionally, MDM notes that trip assignment networks for traffic associated with background development projects should be provided to MDM for review to support the future AM and PM peak hour No-Build and Build traffic volumes.

TRIP GENERATION

Trip generation estimates for the project were based on data referenced by the Applicant, Transflo Terminal Services Inc., since appropriate trip rates for similar facilities are not published by the Institute of Transportation Engineers (ITE). According to the TS and TMP, the proposed terminal facility is expected to generate approximately 104 vehicle trips during an average 12 hour weekday. Nine (9) trips are expected to be generated during the morning and evening peak hour. Since no supporting empirical data was provided in the submitted

documents, it is difficult to determine if the trip generation for the facility is appropriate or not. To clarify the issue, MDM recommends that applicant provide empirical data from similar facilities to support the trip generation estimates. Without supporting empirical data, the determination of expected vehicle trips will depend wholly on the unsubstantiated description of facility operations and information provided by the Applicant.

TRIP DISTRIBUTION

The directional distribution of development-generated trips is generally a function of a number of variables, including available travel routes, traffic congestion, physical condition of the roadway network and existing travel patterns. The TS and TMP base the directional distribution on an understanding that all truck traffic will be restricted from traveling to/from the east on Flanders Road as a condition of project approval. Thus, the distribution of traffic reflects that 100% of the site related traffic will travel to and from the west via Flanders Road to Route 9. MDM agrees with the trip distribution and finds that restricting semi-tractor trailer traffic to/from the ease via Flanders Road to be appropriate, thus no additional analysis under this task is required.

TRAFFIC OPERATIONS ANALYSIS

MDM has reviewed the Level of Service (LOS) analysis contained in the TS and determined that several issue need to be addressed in order for the capacity analysis to be in conformance with standard traffic engineering practice. A review of the capacity analysis worksheets indicates that a default peak hour factor (PHF) of 0.90 was used in the analysis instead of the actual calculated PHF for each intersection approach. MDM also notes that the Walkup Drive approach was analyzed as a single lane approach and not as a two lane approach. Based on our field review, the Walkup Drive approach is approximately 24 feet wide which is wide enough to operate as a two lane (left and right turn) approach. Based on the above, MDM recommends that the capacity analysis be revised to reflect the above comments. In addition, MDM recommends that capacity analysis be provided for the No-Build and Build scenarios based on a five (5) year horizon. The No-Build and Build analysis shall be provide for the AM and PM peak hours of operation at the Flanders Road/Walkup Drive intersection. MDM will reserve further comment on the capacity analyses until the revised analyses have been provided in written form to MDM for review. The Applicant should also document and provide mitigation measures to offset project related impacts with respect to level of service and delay, as appropriate.

TRUCK TURN ANALYSIS

In order to evaluate the ability of semi-tractor trailers to negotiate turns at the Flanders Road/Walkup Drive intersection without encroachment, MDM recommends that the Applicant perform a truck turn analysis using AutoTURN® software. Since Transflo does not have fleet control over the independent truckers that will be servicing the site terminal, MDM recommends that the AutoTURN analysis be provided based on the use of a WB-65 design vehicle. This design vehicle is considered the industry standard for use when evaluating or designing intersection geometry for semi-tractor trailers and is the preferred design vehicle by MassDOT for intersection design.

The AutoTURN analysis should be provided for semi-tractor trailer movements from Flanders Road eastbound to Walkup Drive and from Walkup Drive to Flanders Road westbound. If the intersection geometry cannot accommodate WB-65 semi-tractor trailer movements without encroachment into opposing lanes or by traversing the existing curb/edge of pavement, the Applicant should propose mitigation measure to improve the obsolete geometry.

MITIGATION

MDM notes that there is a limited mitigation program outlined for the proposed project and has several concerns as outlined above. The Applicant should provide a mitigation commitment that addresses the project impacts and the concerns of the Town. Mitigation may include, but is not limited to the following:

- The Applicant has indicated that they will fund the installation of two "Truck Crossing" signs with flashing yellow warning lights to raise driver awareness of semi-tractor trailers. It is MDM's opinion that the installation of an overhead intersection control beacon with static warning signs would be more appropriate and in compliance with the Manual on Uniform Traffic Control Devices (MUTCD), thus MDM would recommend this mitigation commitment be revised.

- Currently, the existing infrastructure at Flanders Road/Walkup intersection is in fair to poor condition and in need of significant improvements. The following deficiencies warrant reconstruction of the intersection:

    - The existing pavement is cracked and failing,
    - A closed drainage system does not exist at the intersection to convey stormwater,

- The intersection grading reflects a generally flat grade the is not conducive to effectively conveying stormwater away from the intersection, resulting in stormwater ponding on the Walkup Drive approaches,
- Based on existing traffic volumes and criteria outlined by MassDOT, the installation of an exclusive left turn on the Flanders Road westbound approach to the intersection is warranted,
- Sight distance is restricted by fixed objects and existing topography,
- The installation of a traffic signal at the Flanders Road/Walkup Drive intersection may be warranted under the Build condition. The determination shall be based on the Build volumes that include, historical growth, site specific traffic and re-occupancy of existing vacant space along the project corridors.

It is MDM's recommendation that the Applicant reconstruct the Flanders Road/Walkup Drive intersection to address the safety and operational deficiencies outlined above since said intersection provides the primary access to the proposed site. The specific improvements to be implemented should be documented in a formal Concept Plan following resolution of the outstanding traffic study issues.

SUMMARY

We believe the above issues should be addressed and provided to MDM in order for us to complete a comprehensive review. As always, we are available to discuss these comments in greater detail at your request.

Very truly yours,

Ronald D. Desrosiers, P.E., PTOE
Managing Principal

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Peer Review Sample #2

Proposed Dave & Buster's Restaurant
Burlington, Massachusetts

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

December 28, 2010

Mr. D. Anthony Fields, AICP
Planning Director
Town Hall Annex
25 Center Street
Burlington, MA 01803

Subject: Transportation Peer Review Comments
Proposed Dave & Buster's
90 Middlesex Turnpike – Burlington, MA

Dear Mr. Fields:

In accordance with our contract to conduct peer review services for the above-referenced project, MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following comments. These comments have been prepared based on our field inspection of the site and study area in December 2010 and review of the documents identified below.

DOCUMENTS REVIEWED

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Traffic Impact Study, 90 Middlesex Turnpike, Burlington, Massachusetts,* prepared by BSC Group, dated March 2009.
- *Supplemental Traffic Data - 90 Middlesex Turnpike, Burlington, Massachusetts,* prepared by BSC Group, dated July 6, 2009.
- *Proposed Dave & Buster's 90 Middlesex Turnpike, Traffic Evaluation,* prepared by Vanasse Hangen Brustlin, dated July 8, 2010.
- *Proposed Dave & Buster's 90 Middlesex Turnpike, Supplemental Traffic Memorandum ("Generator Peak" Analysis),* prepared by Vanasse Hangen Brustlin, dated September 16, 2010.
- *Proposed Dave & Buster's 90 Middlesex Turnpike, Updated Traffic Evaluation,* prepared by Vanasse Hangen Brustlin, dated December 9, 2010.
- *Site Plans, Dave & Buster's 90 Middlesex Turnpike, Burlington, Massachusetts,* prepared by Vanasse Hangen Brustlin, date issued July 7, 2010 (latest issue November 19, 2010).
- *The Commonwealth of Massachusetts Traffic Signal Improvement Project, Middlesex Turnpike, Burlington, Massachusetts 75%/100% Design Submission,* prepared by Vanasse Hangen Brustlin, dated May 24, 2006.
- *90 Middlesex Turnpike, Warrant Article #17 Town Meeting Information Packet,* dated September 2009.

BACKGROUND

The project site is located at 90 Middlesex Turnpike in Burlington, Massachusetts and was previously occupied by a 27,000± sf automotive dealership which closed in the spring of 2008. The site was rezoned from a General Industrial (IG) designation to a Planned Development District (PDD) at the September 2009 Town Meeting, which limits development to 80,000 sf of permitted uses with a maximum retail component of 55,000 sf.

PRIOR TRAFFIC STUDIES

As identified above, several traffic studies have been submitted as part of the site rezoning and redevelopment efforts and several more (not identified above) for the numerous development projects proposed along the Middlesex Turnpike corridor. Below is a summary of the key traffic studies prepared for the proposed site redevelopment.

PDD Traffic Study (BSC Group)

The initial traffic studies prepared by BSC Group (BSC) in March and July 2009 for site rezoning evaluated traffic impacts associated with a hypothetical 51,400 sf retail building since a specific use was not known at the time and retail "results in the greatest traffic impacts during the critical peak periods in the corridor"[1]. The PDD studies accounted for significant traffic growth and transportation improvements including those associated with the redevelopment of 43/63 South Avenue and Northwest Park. The overall findings of the PDD studies indicate that 1) the 90 Middlesex Turnpike redevelopment will have no significant impact on traffic operations along Middlesex Turnpike and 2) that traffic movements at several intersections will operate over capacity (Level of Service F) even with the implementation of transportation mitigation measures planned for the corridor[2]. The studies also state that "a master plan type of study is required to look at the proposed build-out in the study area and all of the associated mitigation commitments to date to ensure that together these measures would improve traffic flow in the area"[3].

MDM is not aware of any study that clearly defines the planned mitigation measures, expected level of improvement, scheduling and responsible party for the commitments along the corridor. We recommend that a master plan be provided in order to understand how 90 Middlesex Turnpike fits into the corridor, including how potential access improvements (i.e., connector road) tie into the corridor and how u-turns are to be accommodated by future traffic improvements at the Middlesex Turnpike/I-95 Northbound Ramp/Wheeler Road intersection.

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[1] Traffic Impact Study, 90 Middlesex Turnpike, Burlington, Massachusetts, prepared by BSC Group, dated March 2009, Executive Summary

[2] Traffic Impact Study, 90 Middlesex Turnpike, Burlington, Massachusetts, prepared by BSC Group, dated March 2009, p.25-26

[3] Supplemental Traffic Data - 90 Middlesex Turnpike, Burlington, Massachusetts, prepared by BSC Group, dated July 6, 2009, p.2

D&B Traffic Study (Vanasse Hangen Brustlin)

Subsequent to Town Meeting's approval of the PDD, the property owner has requested consideration by the Planning Board for the development of a 43,000 sf/697-seat restaurant/entertainment facility known as "Dave & Busters" (D&B) with 400 proposed on-site parking spaces. Access to the development is proposed by way of two "right-in, right-out" driveways located along Middlesex Turnpike.

Vanasse Hangen Brustlin, Inc. (VHB), the Applicant's engineer, prepared three traffic memoranda evaluating the facility's traffic impacts. The initial traffic study prepared for D&B reviewed the project's impacts relative to the prior PDD traffic analyses. Consistent with BSC's analyses, VHB determined that the D&B project would have no significant impact on corridor traffic operations. Similarly, VHB's study indicates that traffic movements at several intersections will operate over capacity (Level of Service F) even with the implementation of transportation mitigation measures planned for the corridor[4].

It is clear from these reports that the mitigation identified for the overall corridor development does not resolve all traffic issues within the study area; many traffic movements will remain at LOS F condition. It is evident that further evaluation is needed in order to resolve these issues and to ensure that constrained conditions are not exacerbated by development of 90 Middlesex Turnpike.

TRAFFIC ANALYSIS REVIEW

The following presents a detailed review of VHB's traffic analyses submitted in support of the D&B facility.

Study Area

MDM has reviewed the study area relative to the proposed D&B development, which includes the following three critical signalized intersections:

1. Middlesex Turnpike at South Avenue/Burlington Mall Driveway
2. Middlesex Turnpike at I-95 Southbound Ramps
3. Middlesex Turnpike at I-95 Northbound Ramps/Wheeler Road

In addition, the study area includes evaluation of the two proposed site driveways located along Middlesex Turnpike.

[4] Proposed Dave & Buster's 90 Middlesex Turnpike, Updated Traffic Evaluation, prepared by VHB, dated 12/9/2010, p. 11-12.

Given that the majority of site traffic is expected to be destined to/from I-95, MDM generally concurs with the selection of these locations. Evaluation of additional intersections is not required at this time.

Existing Traffic Volumes

Manual turning movement (MTM) traffic volume data has been presented for peak traffic periods including the weekday evening commuter peak period (4:00 PM to 6:00 PM), weekday peak restaurant period (6:00 PM to 11:00 PM) and Saturday midday periods (12:00 PM to 3:00 PM) which are generally consistent with standard-industry practice. Additionally, daily traffic volumes along Middlesex Turnpike were collected using an automated traffic recorder (ATR) for a weekday and a Saturday.

Weekday morning peak period (7:00AM to 9:00 AM) traffic volumes were presented for the initial PDD traffic assessment prepared by BSC, however, the proposed restaurant will not be open until 11:00 AM; therefore, no weekday morning peak hour analysis has been provided for the D&B proposal.

With regards to the weekday evening traffic volumes, the latest turning movement counts conducted by VHB in November 2010 are approximately 5% lower than volumes originally evaluated by BSC for the PDD study. Traffic volumes for that study were collected in September 2006. The most significant volume reductions for the weekday evening analysis occurred at the I-95 southbound off ramp right-turn, the I-95 northbound off ramp right-turn and the Middlesex Turnpike southbound left-turn to I-95 southbound.

Supporting data for BSC's Saturday traffic volumes was not provided to MDM therefore a review relative to VHB's Saturday traffic data could not be conducted.

MDM requests that Saturday traffic data collected in September 2006 be provided for comparison purposes.

Intersection Crash Analyses

Intersection crash analyses were not conducted for the D&B proposal. Crash summaries and rate calculations were, however, provided in the prior PDD study and were based on MassDOT data for the 2005 through 2007 period. The PDD study notes a near average crash rate for the Middlesex Turnpike/I-95 northbound ramp intersection and an above average crash rate for the Middlesex Turnpike/I-95 southbound ramp intersection, although no specific calculation was provided in the study. The study also notes that 39 crashes occurred in close proximity to the

two intersections but were not assigned to either location due to insufficient information[5]. If a portion of these crashes were assigned to either one of the intersections, the crash rate would likely increase dramatically, indicating possible safety deficiencies.

MDM recommends that intersection crash analyses be updated to include the latest available data from MassDOT, resolve unassigned crash data and evaluate the rear-end crash patterns at the I-95 northbound and southbound ramp intersections with Middlesex Turnpike for potential safety-related improvements.

No Build Traffic Volumes

A historical growth rate of 1.0 percent per year was utilized in the study to develop future year traffic volume networks. The 1.0 percent per year increase appears reasonable given that a significant number of specific background development projects have been taken into consideration, including a separate set of analyses incorporating the Northwest Park and 43/63 South Avenue redevelopment projects.

MDM notes that a number of local development projects cited as "planned" in the PDD study are now built and occupied. These projects include Wayside Commons, Border Café and Burlington Mall Expansion. Actual trip generation from these "background" projects is now reflected in the traffic counts conducted in November 2010.

MDM generally concurs with the development of No-Build traffic volume networks.

Trip Generation

Trip generation estimates presented in the traffic study are based on an empirical trip generation methodology. MDM generally concurs with the use of empirically-derived trip generation in cases where no directly applicable land use code exists in the ITE Trip Generation manual. However, the Applicant should provide additional supporting information for trip generation estimates as follows:

1. It is not clear whether the trip rates are based on national D&B data or just the Providence, RI location. A more detailed discussion of the empirical rate calculation should be provided for clarification. Monthly patron data should also be provided to understand typical monthly fluctuations as the D&B patron data was collected in February which is generally considered a below average sales month for full-service restaurants.

[5] Traffic Impact Study, 90 Middlesex Turnpike, Burlington, Massachusetts, prepared by BSC Group, dated March 2009, p.7.

2. The patron data provided for the Providence D&B does not capture the Saturday peak traffic hour of Middlesex Turnpike which falls between 2:00 PM and 3:00 PM. Additional patron data should be collected.

3. Saturday hourly traffic volumes shown for Middlesex Turnpike with and without D&B (Figure 4 of VHB's 9/16/2010 memo) indicate a 262 vehicle increase during the roadway peak hour, yet Saturday trip generation estimates indicate only a 100 vehicle increase during the peak hour. This discrepancy should be explained.

4. Due to the uniqueness of both the D&B facility and of the Providence Place location, MDM recommends that the Bostonville Grille located on Route 1 in Lynnfield, MA be surveyed on a Thursday from 4:00 PM to 6:00 PM and on a Saturday from 1:00 PM to 4:00 PM for comparison purposes. While the Bostonville Grille may not be as refined as a D&B facility, it has many of the same offerings, including an arcade gaming area as well as a bar area and function rooms. Furthermore, it is a freestanding facility in a similar environment and adjacent to a heavily traveled roadway in a commercialized suburban area.

5. Vehicle occupancy rates applied to the Providence D&B facility range from 1.0 on a weekday evening to 2.0 for Saturday. The Applicant should provide supporting data for these values.

MDM recommends that the trip generation estimates be reevaluated based on the above comments.

Trip Distribution and Assignment

MDM has the following comments with regards to the trip distribution estimates.

1. The study states that travel time adjustments were made to area population densities however no specific adjustments appear to be applied in the trip distribution gravity model. Populations from Lynn, Revere and Chelsea appear to be weighted the same as populations in nearby Woburn and Waltham.

2. According to the study, approximately half of the patrons traveling southbound on I-95 will use Burlington Mall Road via Exit 33 (Cambridge Street) to access the site while the remaining half would use Exit 32 (Middlesex Turnpike). MDM would expect most, if not all patrons originating from I-95 north of Burlington, to use Exit 32 to access the site due to the delay associated with the eight traffic signals located along Burlington Mall Road. MDM suggests that travel time runs be conducted for the two travel routes with adjustments made to the trip distribution based on the findings.

3. The population in Burlington swells to approximately 150,000[6] during the day due to numerous office and retail opportunities within the community. The trip distribution gravity model should take into consideration the effects of this phenomenon.

MDM recommends that the trip distribution assumptions be reevaluated based on the above comments.

Intersection Capacity and Queue Analysis

The methodology used to evaluate intersection and driveway operations is generally consistent with industry practice. Based on our review, there are significant operating constraints for the critical Middlesex Turnpike southbound left-turn movement to I-95 northbound under 2010 Existing peak hour conditions, 2015 No Build peak hour conditions and 2015 Build peak hour conditions even when planned mitigation measures by both Northwest Park and 43/63 South Avenue redevelopments are taken into consideration. The analysis also shows that vehicle queues for this movement will extend well beyond available storage area at various times thereby impacting the adjacent southbound through movement.

MDM recommends that alternate points of egress be thoroughly explored (as discussed below) so as to limit the amount of additional traffic volume for the Middlesex Turnpike southbound left-turn/u-turn movement at the I-95 northbound ramp. The Applicant should identify any intersection improvements that could be expedited and/or suggest alternative improvements that would reduce traffic constraints for this location.

Traffic analyses should be updated to reflect adjustments to trip generation and/or trip distribution as a result of the above comments.

The Applicant should provide tabular summaries of all analysis results, including vehicle delay and queue length values for each intersection movement, so that operational constraints and project impacts are more readily apparent.

Site Access/Egress and Circulation

MDM has the following comments with regards to site access and circulation.

1. The traffic volume data collected indicates illegal U-turn maneuvers occurring on the Middlesex Turnpike northbound approach at the I-95 southbound ramp intersection even with the site vacant. The presence of a site driveway in the vicinity of the I-95

[6] Burlington, Massachusetts at a Glance, prepared by Office of the Town Clerk, May 2010, p.1.

southbound ramp will likely attract more illegal u-turn maneuvers. In addition, MDM has been made aware of illegal left-turn maneuvers occurring from the site's northerly driveway while operating as an automobile dealership.

The Applicant has proposed sign and pavement marking modifications to address illegal u-turn maneuvers at the Middlesex Turnpike/I-95 southbound ramp intersection. MDM suggests that physical elements be considered to the greatest extent as practical to further discourage illegal movements at this intersection.

2. Two "right-in, right-out" driveways are proposed to provide access to/from Middlesex Turnpike. The Applicant should provide justification for the two access driveways along Middlesex Turnpike. Current trip generation estimates do not appear to warrant two driveway locations. A raised channelizing island should also be considered to reinforce the right-in/right-out operation and to separate access/egress movements.

3. The site plan provides a limited amount of storage area for the northerly driveway, between Middlesex Turnpike and the access to the adjacent parking field. This portion of the main travel aisle has the potential to block entering traffic, resulting in back-ups onto Middlesex Turnpike. MDM recommends that a combination of turn restrictions and one-way configurations be reviewed for the travel aisle and parking areas to minimize the potential for back-ups onto Middlesex Turnpike.

4. The concept of a roadway connecting the I-95 southbound off-ramp, 90 Middlesex Turnpike and South Avenue should be further evaluated to determine its feasibility given the terrain, presence of wetlands, encroachment into 98 Middlesex Turnpike (Barnes & Noble) and other impacts. Preliminary analysis of the connector road concept conducted by VHB should also be revisited given that it does not show the favorable traffic operation results that were likely anticipated.

5. The Applicant should provide an update on the status of a cross-connection to 98 Middlesex Turnpike and should simultaneously pursue an internal connection to South Avenue from the rear parking area. Should the formal connector roadway not be feasible, these internal connections may still prove beneficial to the site and corridor operations.

6. MDM recommends that the Applicant perform a truck turn analysis using AutoTURN® software or equivalent techniques to determine whether or not the site circulation aisles and site access can adequately accommodate the largest truck anticipated to access the facility, including Town emergency (fire) apparatus.

7. The Applicant should indicate whether or not valet parking will be provided at the facility.

8. The Applicant should identify a suitable drop-off/pick-up area that does not interfere with parking, travel aisles and fire lanes.

9. The compact parking spaces located to the rear of the site appear to be in a remote location with limited benefit to patrons. The Applicant should indicate whether or not this area is intended to be designated for employee parking.

Proposed D&B Traffic Mitigation

The D&B traffic study recommends minor modifications to the I-95 northbound ramp traffic island to better accommodate the Middlesex Turnpike southbound u-turn movement.

The design vehicle capable of making this maneuver with and without the modification should be identified by the Applicant through the use of AutoTURN® software or equivalent techniques.

Corridor Mitigation (By others)

As discussed above, transportation mitigation measures are proposed as part of the 43/63 South Avenue and Northwest Park development projects. Based on the traffic analyses provided in the D&B study, several traffic movements will remain at LOS F condition even when the planned mitigation measures are taken into consideration.

We recommend that a master plan be provided in order to understand how 90 Middlesex Turnpike fits into the corridor, including how potential access improvements (i.e., connector road) tie into the corridor and how u-turns will be accommodated by future traffic improvements at the Middlesex Turnpike/I-95 Northbound Ramp/Wheeler Road intersection.

In summary, it is the opinion of MDM that the D&B traffic study generally conforms to standard traffic engineering practice. However, there are several analysis elements that require further supporting data or revisions to ensure that a comprehensive review of the project and its potential impacts is performed. We are available to discuss these comments in greater detail at your request.

We appreciate the opportunity to provide Transportation Planning & Engineering Services to the Town of Burlington. If you have any questions or concerns, please feel free to contact this office.

Very truly yours,

Daniel J. Mills, P.E., PTOE
Principal

Peer Review Sample #3

Proposed Office/Storage Facility
Bellingham, Massachusetts

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

August 10, 2010

Ms. Stacey Wetstein
Town Planner
Town of Bellingham
2 Mechanic Street
Bellingham, MA 02019

Dear Ms. Wetstein:

Subject: Transportation Peer Review Comments
Proposed Lot 2 - Bellingham Commons II
191 Mechanic Street (Route 140) – Bellingham, MA

In accordance with our contract to conduct peer review services for the above-referenced project, MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following comments. These comments have been prepared based on our field inspection of the site and study area on August 2, 2010 and review of the documents identified below.

DOCUMENTS REVIEWED

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project.

- *Traffic Impact and Access Study – TMC Services Relocation and Expansion,* prepared by Ron Muller & Associates, dated July 27, 2010.
- *Development Plan Approval Set,* Lot 2 – Bellingham Commons II, 191 Mechanic Street, Bellingham, Massachusetts, prepared by Meridian Associates, Inc., dated July 20, 2010.
- *Conceptual Floor Plan & Elevation Plan,* prepared by Richard P. DeCoste Architect, LLC, dated July 30, 2010

PROJECT DESCRIPTION

The proposed site development, to be located along the southerly side of Mechanic Street (Route 140) in Bellingham, MA, consists of a project change at the site to replace an approved but un-built 62,000 square foot (sf) self-storage facility on Lot 2 of the existing Bellingham Commons II site, located at 191 Mechanic Street, with a proposed 25,000 sf building. The building is proposed as the relocated headquarters for TMC Services, Inc. which is currently

operating at 1 William Way in Bellingham. As currently proposed, TMC Services plans to use 10,000 sf of the building for general office uses with the remaining 15,000 sf planned for storage/repair uses. In addition, storage of materials and fueling of fleet vehicles will be accommodated on-site.

Two full access/egress driveways are proposed to connect Lot 2 with the internal roadway system for Bellingham Commons II. Proposed access to the adjacent public roadway system will be via the existing full-access/egress driveway for Bellingham Commons II located along Mechanic Street (Route 140).

A Traffic Impact and Access Study (TIAS) was submitted as part of the Planning Board Application and is the primary focus of our review. Based on the TIAS, the development is expected to generate approximately 44 vehicle trips during the weekday morning peak hour, 46 vehicle trips during the weekday evening peak hour and 462 vehicle trips on a weekday (24-hour) basis. The facility is generally closed on weekends, with the exception of responses to emergency situations.

STUDY AREA

The Mechanic Street (Route 140)/Bellingham Commons II Driveway intersection was selected for study based on the Applicant's consultation with the Bellingham Planning Department and MDM and preliminary review of trip generation and distribution data. Based on our review, incremental traffic impacts will generally be limited to the Bellingham Commons II site driveway; as such, no additional intersections require analysis.

TRAFFIC VOLUMES

MDM has reviewed the existing traffic volume data collected for the project. The existing manual turning movement counts were conducted on July 13, 2010 for the weekday morning and weekday evening peak periods. The TIAS also indicates that automatic traffic recorder (ATR) counts were conducted over a 24 hour period on July 13, 2010 along Route 140 and at the existing TMC Services, Inc. driveway located at 1 William Way. In general, the Route 140 traffic volumes are consistent with volumes collected for previous traffic studies for this area. No further analysis is required.

SEASONAL ADJUSTMENT

MDM has reviewed the seasonal adjustment factors presented in the TIAS which were based on MassDOT permanent count station data. A seasonal adjustment factor of 1.02 was applied to

traffic volumes collected in July to represent average season conditions. While MDM generally recommends using more than 1 year worth of data, the seasonal adjustment factor appears reasonable for this application. No further analysis is required.

VEHICLE SPEEDS

MDM has reviewed the vehicle speed measurements provided in the TIAS. Vehicle speeds along Route 140 in the site vicinity provide a basis for determining sight distance requirements at the site driveway intersection with Route 140. The results presented in the report indicate that the 85th percentile travel speeds along Route 140 are 37 mph eastbound and 40 mph westbound. These speeds are notably lower than the 45 mph speed limit posting in the area. MDM generally agrees with the vehicle speeds presented in the TIAS, however, it is our opinion that 45 mph is the appropriate design speed to review sight distance requirements given the presence of the regulatory speed limit in the area. No further analysis is required.

INTERSECTION CRASH DATA

MDM notes that no crash analysis was provided for the study intersection.

MDM recommends that the Applicant obtain local crash records for the Route 140/Bellingham Commons II driveway from the Bellingham Police Department and provided a detailed analysis to the Planning Board. Safety deficiencies, if any, should be noted and corrective measures should be recommended where applicable.

SIGHT DISTANCE ANALYSIS

The Applicant's Sight Distance Analysis indicates that clearing of existing vegetation to the west of the Bellingham Commons II driveway is required in order to meet minimum safe stopping and intersection sight distances for travel along Route 140. According to the American Association of State Highway and Transportation Officials' (AASHTO)[1], the industry standard for roadway and intersection design, the minimum stopping sight distance (SSD) for a 45 mile per hour condition is 360 feet. While it is desirable to have a greater distance for intersection sight distance (ISD) where feasible, MDM recommends that the Applicant commit to providing a minimum of 360 feet of ISD for the Bellingham Commons II driveway. Greater ISD should be provided where opportunities permit.

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[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2004.

It is suggested that as a condition of the approval of the Project, the Applicant's engineer should certify that adequate intersection sight distance has been attained for the Bellingham Commons II driveway along Route 140 prior to the issuance of a Certificate of Occupancy.

MDM further recommends that no new plantings, signs or physical landscape features be located to the west of the Bellingham Commons II driveway and that a maintenance plan is in place to ensure that clear sight lines are provided at all times.

BACKGROUND GROWTH/NO-BUILD CONDITION

MDM has reviewed the TIAS traffic projection assumptions for conditions expected in the study area by the year 2015 without the proposed development, including general traffic growth trends and traffic growth due to other specific area development projects. The TIAS presents a general traffic growth rate of 1.5 percent per year which is consistent with the original traffic study for the Bellingham Commons.

Through a scoping meeting between the Applicant, Bellingham Planning Department and MDM, two planned and approved projects in the area were identified which are anticipated to generate a significant volume of traffic on study area roadways within the next five years. These projects were accounted for in the traffic study and include a recreational facility on Maple Street and the build-out of the remaining vacancies at the Bellingham Commons II site. MDM generally agrees with this methodology. No further analysis is required.

TRIP GENERATION

Trip generation estimates for the 25,000 sf facility were based on empirical trip generation rates developed from the traffic counts conducted at the existing TMC Services facility located at 1 William Way in Bellingham. According to the TIAS, 44 vehicle trips will be generated during the weekday morning peak hour, 46 vehicle trips will be generated during the weekday evening peak hour and 462 vehicle trips will be generated on a weekday (24-hour) basis. The Applicant also provided a trip generation comparison with trip rates for similar land uses published by the Institute of Transportation Engineers (ITE), including General Light Industrial and Single Tenant Office Building. As indicated by the Applicant and concurred by MDM, the ITE trip rates would produce similar or less traffic generation than use of the empirical trip rates observed at the existing TMC Services Building. MDM generally agrees with the trip generation methodology based on empirical trip rates.

To understand the significance of the change in use from a 62,000 sf self storage facility to the 25,000 sf TMC Services facility, MDM prepared the following trip comparison table

which shows the projected increases for the weekday daily, weekday morning and weekday evening peak hours.

TABLE 1
Trip Generation Comparison

Period/Direction	Site Trips: Approved Self StorageUse[1] (62,000 sf)	Site Trips: Proposed TMC Services Use[2] (25,000 sf)	Net Difference
Weekday Morning Peak Hour:			
Entering	5	36	+31
Exiting	4	8	+4
Total	9	44	+35
Weekday Evening Peak Hour:			
Entering	8	8	0
Exiting	8	38	+30
Total	16	46	+30
Weekday Daily (24-Hour)	156	462	+306

Source: ITE *Trip Generation,* Eighth Edition; 2008.
[1] Based on ITE LUC 151 trip rates applied to 62 ksf of mini- warehouse (self-storage facility).
[2] Based on empirical trip generation rates developed by Ron Muller & Associates.

As summarized in Table 1, the proposed project has been shown to result in an increase of between 30 and 35 trips during the peak hours and approximately 300 daily trips compared to the approved self storage facility. No further review is required.

TRIP DISTRIBUTION

The directional distribution of development-generated trips on the roadway network is a function of a number of variables, including where the employees live, available travel routes, traffic congestion and existing travel patterns. MDM generally agrees with the overall trip distribution presented by the Applicant; specifically, that trips made to and from the site will be primarily based on where current employees live and the most direct route to the site. The Applicant provided a summary of current employee residences and their expected travel routes, which generally indicated a 60/40 split on Route 140 east and west, respectively. No further review is required.

BUILD CONDITIONS

MDM has reviewed the Build traffic networks and concludes that the development of Build networks generally follow industry standards. No further review is required.

MEPA THRESHOLDS

MDM has reviewed the MEPA thresholds section of the traffic study.

MDM suggests that the Applicant consult with MEPA and MassDOT to determine the need for a Notice of Project Change (NPC), Environmental Impact Report (EIR) or amended Highway Access Permit based on the change of use at the site.

TRAFFIC OPERATIONS ANALYSES

MDM has reviewed the Level of Service (LOS) analysis contained in the TIAS and determined that it has generally been prepared in conformance with standard traffic engineering practice. While there are some technical issues regarding the "gap acceptance" methodology used in the TIAS, MDM concurs with the overall analysis indicating LOS F operation during the weekday morning and weekday evening peak hours. While not desirable, this LOS is consistent with the LOS projected for the previously approved development which has been accepted by MassDOT. Long delays will generally affect left turn movements exiting the site during the peak hours with minor impact to Route 140 operation. As a result of the prior Bellingham Commons II approval, the site driveway has features to reduce delay, including separate left and right turn lanes on the site driveway and an exclusive left turn lane on Route 140. No further review is required.

ON-SITE CIRCULATION AND PARKING

MDM has reviewed the Lot 2 site plan prepared by Meridian Associates, Inc. and offers the following comments:

- The parking calculations for the office space indicate that 50 spaces are required for the 10,000 sf office space; however, only 49 spaces are provided in the front (north side) of the building. It appears that sufficient area exists to provide an additional parking space to satisfy the zoning requirement.

- There appears to be a typo in the Zoning Summary Chart on Sheet 3 of the plan set for Maximum Building Coverage; the values listed do not appear to be applicable.

- The gates provided between the front and rear portions of the site should be revised to relocate all posts out of the travel way.

- The southwest corner of the building has little to no buffer and will likely obstruct the sight line for vehicles traveling around the building to other vehicles or pedestrians; especially to those exiting the proposed "Wash Bay". MDM suggests that a 15 to 20 foot long raised island, extending from the corner of the building outward toward the fueling facility, be provided. The Applicant should also consider implementing a general policy for requiring one-way counter-clockwise circulation around the proposed building.

- The 9'x 36' (dimensioned as 21' + 15') parking spaces in the southwest corner of the site require clarification. The spaces appear to be only 35 feet deep while the ones abutting the "gravel material storage area" are only 17 feet deep. Consideration should also be given to revising the dead-end parking aisle design by providing a turn-around area or secondary access.

MITIGATION MEASURES

While it is unclear if the project will undergo additional MEPA review or if MassDOT will require an amended highway access permit for site access onto Route 140, we believe the following measures should be considered so as to address the traffic impacts and safety issues related to the change in use of Lot 2 at Bellingham Commons II.

Route 140 at Site Driveway – MDM recommends as a condition of the approval of the Project, the Applicant's engineer should certify that adequate intersection sight distance has been attained for the Bellingham Commons II driveway along Route 140 prior to the issuance of a Certificate of Occupancy.

MDM further recommends that no plantings, signs or physical landscape features be located to the west of the Bellingham Commons II driveway and that a maintenance plan is in place to ensure that clear sight lines are provided at all times.

Route 140/Maple Street/South Maple Street – The Applicant should consider a $6,000 fair share contribution to the Town towards the design and construction of long-term improvements to the Route 140/Maple Street/South Maple Street intersection in light of the

estimated 300 additional daily trips due to the change in use on Lot 2. As a point of reference, the land owner, 191 Mechanic Street LLC, originally proposed a fair share contribution of $40,000 based on traffic projections for the retail space, self-storage facility and free-standing restaurant. Based on a recalculation of the fair share methodology[2] to account for the proposed change for Lot 2, the "fair share" contribution would now be $46,000. As such, MDM suggests that the current Applicant contribute the balance, that is, $6,000 toward local roadway improvements.

SUMMARY

We believe the above issues should be addressed and provided to the Town and MDM for review. We are available to discuss these comments in greater detail at your request. If you have any questions or concerns, please feel free to contact this office.

Very truly yours,

MDM Transportation Consultants, Inc.

Daniel J. Mills, P.E., PTOE
Principal

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[2] *Mitigation Contributions Memorandum* from MAI to Town of Bellingham dated 5/2/2006 (revised 5/9/2006).

Peer Review Sample #4

Proposed Residential Development (Sight Distance)
Bellingham, Massachusetts

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

July 28, 2010

Ms. Stacey Wetstein
Town Planner
Town of Bellingham
2 Mechanic Street
Bellingham, MA 02019

Dear Ms. Wetstein:

Subject: Transportation Peer Review Comments – Sight Distance Evaluation
Proposed Crystal Springs – Phase III
Mechanic Street (Route 140) – Bellingham, MA

In accordance with our contract to conduct peer review services for the above-referenced project, MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following comments. These comments have been prepared based on our independent review of sight distance analysis provided by the Applicant's consultant and our field inspections of the site and study area.

DOCUMENTS REVIEWED

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining whether minimum sight distance requirements are met.

- *Technical Memorandum – Mechanic Street, Bellingham, Sight Distance,* prepared by Gillon Associates, dated March 6, 2010.
- *Site Development Plan,* Crystal Springs – Phase III, Bellingham, Massachusetts, prepared by Allen Engineering LLC., dated May 20, 2010.

MEASURED TRAVEL SPEEDS

As part of the sight distance analysis, vehicle speed data was provided for Mechanic Street (Route 140) in the site vicinity and indicates that the majority of motorists are traveling at or below 44 miles per hour (mph). Based on our own data, collected on July 13, 2010, and the presence of a 45 mph posted speed limit sign along Route 140, MDM generally concurs with the measured speeds. For a slightly more conservative analysis, we recommend that 45 mph, instead of 44 mph, be used as the design speed for reviewing sight distance requirements.

ROADWAY GRADES

As part of the sight distance analysis, roadway grades were reported as being a 3% downgrade in the westbound direction and a 2% downgrade in the eastbound direction. Based on our field measurement with an electronic Smart Level, we recommend that downgrades of 4% in the westbound direction and 3% in the eastbound direction be used for reviewing sight distance requirements.

SIGHT DISTANCE ANALYSIS

MDM conducted an independent evaluation of sight lines to determine whether minimum recommended sight distances will be available to and from the proposed site driveway located along Route 140. The American Association of State Highway and Transportation Officials' (AASHTO) standards[1] reference two types of sight distance which are relevant for the proposed driveway: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD). Both SSD and ISD are described in detail below.

Stopping Sight Distance (SSD)

Sight distance is the length of roadway visible to the motorist to a fixed object. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near a regulatory speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle exiting from the site driveway onto Route 140. The SSD criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD consists of the length of roadway traveled during 1) the perception and reaction time of a driver to an object, and 2) during brake application on wet level pavement. Adjustment factors are applied to account for roadway grades, as is applicable for this project.

SSD was estimated in the field using AASHTO standards for drivers approaching the site driveway from the east and west along Route 140. **Table 1** presents a summary of the available SSD as it relates to vehicles traveling along Route 140 and AASHTO's recommended SSD.

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[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2004.

TABLE 1
STOPPING SIGHT DISTANCE SUMMARY

Direction	Available Stopping Sight Distance	AASHTO Recommended[1] for 45 mph[2]	Criteria Met
Traveling Eastbound	>600 Feet	380	Yes
Traveling Westbound	450± Feet[3]	385	Yes

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet adjusted for roadway grade.
[2]Posted speed limit and 85th percentile travel speed.
[3]A retaining wall located along the northerly side of Route 140 is the restricting factor.

As summarized in **Table 1**, analysis results indicate that the existing available sight lines exceed AASHTO's recommended SSD criteria for both travel directions along Route 140 for the design speed of 45 mph. With respect to SSD, MDM is in general agreement with the Applicant's findings.

Intersection Sight Distance (ISD)

AASHTO's Intersection Sight Distance (ISD) criteria are defined into several "cases". In this case, the proposed site driveway approach to Route 140 is proposed to be under STOP control and the ISD in question relates to the ability to turn left and right onto Route 140. As stated by AASHTO "*...If the available sight distance for an entering ...vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to avoid collisions...To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.*"

Available ISD was estimated in the field using AASHTO standards for drivers exiting the site and their ability to see approaching vehicles traveling along Route 140. **Table 2** presents a comparison of the available ISD for the departure from the proposed site driveway onto Route 140 and AASHTO's minimum recommended ISD.

TABLE 2
INTERSECTION SIGHT DISTANCE SUMMARY

View Direction From Proposed Site Driveway	Available Intersection Sight Distance	AASHTO Minimum Recommended[1] for 45 mph[2]	Criteria Met
Looking East	300± Feet[3]	380	No
Looking West	>600 Feet	385	Yes

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 3.5 feet adjusted for roadway grade.
[2]Posted speed limit and 85th percentile travel speed.
[3]Roadside vegetation located to the east of the site driveway is the restricting factor.

The results of the ISD analysis presented in **Table 2** indicate that the available sight distance does not meet the minimum recommended standard due to the presence of vegetation located to the east of the site driveway. MDM believes, however, that the minimum sight distance standards can be achieved through selective trimming and clearing of the vegetation. As such, the Applicant should provide a plan which identifies areas (i.e., sight triangles) to be selectively cleared of existing vegetation and kept free of new landscaping, walls, fencing, signs and other such obstructions to obtain AASHTO's minimum recommended sight distances. MDM recommends that the vegetation in the southeast quadrant be trimmed back 15 feet from the roadway, though the Planning Board and Applicant should consult with the Conservation Commission as this vegetated area is likely to be under their jurisdiction.

It should also be noted that the tree located to the west of the driveway is just beyond the clear zone required to provide adequate sight distance to the west. Nevertheless, MDM recommends the removal of this tree to enhance the sight line looking west from the proposed site driveway.

Pedestrian Crossing

It should be noted that the Applicant's sight distance assessment did not review any aspect of the potential pedestrian crossing from the existing sidewalk along Route 140 to the site driveway. While not proposed as part of this Project, a marked pedestrian crossing (i.e., crosswalk) should not be provided at the site driveway unless desired by the Town and upon completion of an engineering study to fully evaluate safety aspects of the crossing area. Preliminary field observations indicate an apparent sight restriction when crossing from the northerly side of Route 140.

SUMMARY

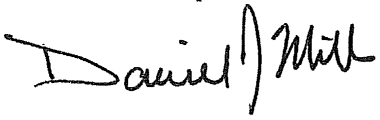
MDM believes that acceptable sight distance to and from the proposed site driveway can be achieved through selective trimming and clearing of vegetation located to the east of the proposed site driveway. The Applicant should provide a plan which identifies areas (i.e., sight triangles) to be selectively cleared of existing vegetation and kept free of new landscaping, walls, fencing, signs and other such obstructions to obtain AASHTO's minimum recommended sight distances. MDM also recommends the removal of the tree located to the west of the site driveway in order to enhance sight lines.

It is suggested that as a condition of the approval of the Project, the Applicant's engineer should certify that adequate intersection sight distance has been attained for the proposed site driveway prior to the issuance of a Certificate of Occupancy.

We are available to discuss these comments in greater detail at your request. We appreciate the opportunity to provide Transportation Peer Review Services to the Town of Bellingham. If you have any questions or concerns, please feel free to contact this office.

Very truly yours,

MDM Transportation Consultants, Inc.



Daniel J. Mills, P.E., PTOE
Principal

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Peer Review Sample #5

Proposed CVS Pharmacy
Dracut, Massachusetts

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
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April 17, 2009

Mr. Glen A. Edwards
Assistant Town Manager/Town Planner
Town of Dracut
62 Arlington Street
Dracut, MA 01826

Subject: Transportation Peer Review Comments
Proposed CVS Pharmacy
Broadway Road (Route 113) – Dracut, MA

Dear Mr. Edwards:

In accordance with our contract to conduct peer review services for the above-referenced project, MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following comments. These comments have been prepared based on our field inspection of the site and study area on March 26, 2009, meeting on April 1, 2009 with Town staff and review of the documents identified below.

DOCUMENTS REVIEWED

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Traffic Impact and Access Study, Proposed CVS Pharmacy, Broadway Road, Dracut, Massachusetts,* prepared by Vanasse Hangen Brustlin, Inc. (VHB), and dated March 2009.
- *Variance Plan, Proposed CVS/Pharmacy, 4 Broadway Road and Arlington Street, Dracut, Massachusetts,* prepared by VHB, and dated January 8, 2009.

PROJECT DESCRIPTION

The proposed site development, as presented in the Traffic Impact and Access Study (TIAS) and the Variance Plan, is comprised of a 12,900 square-foot (sf) CVS Pharmacy to be located in the northwest quadrant of the Broadway Road (Route 113)/Arlington Street intersection in Dracut, Massachusetts. MDM notes that in the Trip Generation section of the TIAS, the Applicant states that the development size is a total of 14,593 sf with 12,900 sf of retail space and 1,693 sf of non-sales mezzanine space.

As currently proposed, access/egress to the site is via a full access/egress driveway along Broadway Road (Route 113) and a full entrance/right-turn-only egress driveway along Broadway Road (Route 113). Said driveways are located approximately 90 feet and 260 feet south of the existing retail plaza driveway to the north of the site, respectively (centerline of driveway to centerline of driveway). In addition, a cross-connection driveway between the proposed development and the retail plazas at 14 Broadway Road and 34 Broadway Road is proposed. The site is currently an undeveloped parcel of land which has previously been cleared and rough graded.

STUDY AREA

MDM has reviewed the study area relative to the proposed project development, which consists of the following roadways and intersections:

- Broadway Road (Route 113) at Arlington Street and Willard Street (Signalized)
- Broadway Road (Route 113) at Loon Hill Road (Unsignalized)
- Broadway Road (Route 113) at Broadway Plaza South Driveway (Unsignalized)
- Broadway Road (Route 113) at Proposed Site Driveways (Unsignalized)

Based on our review of the project area, MDM generally concurs with the selection of the above study area intersections. However, due to the proposed cross-connection between the site and the retail plazas to the north and the current capacity/operational issues at the intersection of Arlington Street (Route 113) and Bridge Street (Route 38), MDM recommends that the Applicant also study the following intersections for potential project impacts:

- Broadway Road (Route 113) at Broadway Plaza Central Driveway
- Broadway Road (Route 113) at Broadway Plaza North Driveway
- Bridge Street (Route 38) at Arlington Street (Route 113)/Pleasant Street (Route 113)

MDM notes that turning movement count (TMC) data and some capacity analyses are provided for the Broadway Plaza Central Driveway. However, neither the traffic volumes nor the capacity analyses are discussed in the TIAS.

In summary, MDM generally concurs with the study area presented in the TIAS. However, MDM recommends that the Applicant update the study area to include the additional intersections, in particular the intersection of Bridge Street (Route 38) at Arlington Street (Route 113)/Pleasant Street (Route 113) were approximately 32 percent of the proposed CVS traffic is expected to travel through.

EXISTING TRAFFIC VOLUMES

MDM has reviewed the existing traffic volume networks and methodology for obtaining the existing traffic volumes as presented in the TIAS. MDM notes that traffic volumes were collected for the weekday evening (4:00 PM to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours as presented in the TIAS. Additionally, daily traffic volumes were collected along Broadway Road (Route 113) on a typical weekday (Thursday) and a typical Saturday.

Average daily traffic volumes collected on Thursday, November 13, 2008 on Broadway Road (Route 113) to the north of Arlington Street presented in the TIAS were reviewed and compared to traffic volumes collected at the same location on Thursday, July 10, 2003 as part of the TIAS prepared by MDM for the proposed Civic Village residential development. A comparison of the traffic counts are presented in **Table 1**.

TABLE 1
TRAFFIC VOLUME SUMMARY
Broadway Road (Route 113) North of Arlington Street

Weekday Daily Volume (vpd)[1]	Weekday PM Peak Hour Volume (vph)[2]	Percent of Daily Traffic[3]	Peak Flow Direction[4]
Thursday, July 10, 2003			
18,450	1,515	8%	51% SB
Thursday, November 13, 2008			
14,200	1,210	9%	51% NB

[1]Two-way daily traffic expressed in vehicles per day (no seasonally adjustment).
[2]Two-way peak-hour volume expressed in vehicles per hour.
[3]The percent of daily traffic that occurs during the peak hour.
[4]NB = northbound SB = southbound

As summarized in **Table 1**, the weekday evening peak hour volumes collected in November 2008 along Broadway Road (Route 113) north of Arlington Street were approximately 20 percent lower than the volumes collected in July 2003. Over a 24 hour period, the weekday daily traffic volumes collected in November 2008 were noted to be approximately 23 percent lower than the volumes collected in July 2003.

In addition, MDM reviewed the weekday peak hour turning movement counts at the intersection of Broadway Road (Route 113)/Arlington Street as it relates to the July 2003 data

and November 2008 data. The data indicated that the total volume entering the intersection in November 2008 was approximately 11 percent lower than the volumes collected in July 2003.

In order to present a more conservative analysis; MDM recommends that the Applicant revise their traffic volume networks to provide an appropriate adjustment to the 2008 traffic volumes taking into account the historical traffic data.

SEASONAL ADJUSTEMENT

A seasonal adjustment factor was not applied, as it was deemed by the Applicant that November is an above-average travel month based on MassHighway 2006 Weekday Seasonal Factors. Since no back-up materials were provided in the TIAS to support this assumption, MDM conducted our own independent research based on nearby MassHighway permanent count stations. Based on our review of MassHighway permanent count station data for the area, November is a slightly below-average travel month (approximately 3 percent lower than average). Therefore, MDM recommends that the Applicant revise the traffic volumes presented in the TIAS to reflect a seasonal adjustment factor which is consistent with permanent count station data in the area.

ACCIDENT HISTORY

MDM has reviewed the accident summary and crash rate calculations provided in the TIAS which presented a study period of 2004 through 2006. MDM notes that, at the time the TIAS was completed; MassHighway had published crash data through 2007. Since standard-industry practice indicates that the latest three-year study period should be analyzed, MDM recommends that the Applicant revise the crash analysis to include crash data through 2007. MDM also notes that the traffic volumes used in the crash rate calculation presented in the TIAS for the Broadway Road (Route 113)/Loon Hill Road intersection include traffic from the Broadway Plaza central driveway. MDM generally concurs with this methodology. However, MDM recommends that the Applicant revise the crash analysis to include the intersection of Bridge Street (Route 38)/Arlington Street (Route 113)/Pleasant Street (Route 113) intersection as well as an accident summary of all accidents that occurred at the three Broadway Plaza driveways.

MDM will reserve further comment on the crash analysis until the Applicant has revised the study period to include data through 2007 and has included the intersection of Bridge Street (Route 38) at Arlington Street (Route 113)/Pleasant Street (Route 113). Crashes data should also be included for the three Broadway Plaza driveways along Broadway Road (Route 113), however crash rate calculations are not required for the driveways.

HISTORICAL TRAFFIC GROWTH

MDM has reviewed the use of an historical growth rate of 1 percent per year as reported in the TIAS which was based on growth rates used in other traffic studies in the area. Since no back-up materials were provided in the TIAS, MDM has conducted our own review of historical traffic growth trends. Traffic growth trends published by the Northern Middlesex Council of Governments (NMCOG) in their Regional Traffic Volume Report: 2008 Edition indicate that traffic growth for the Town of Dracut is approximately 1 percent per year. MDM concurs with the use of a 1 percent historical growth rate.

SITE –SPECIFIC GROWTH

According to the TIAS, the Applicant contacted the Planning Department for the Town of Dracut to determine if there are any planned or proposed area developments likely to affect the study area. One project was identified and found to be applicable for the study:

- Broadway Village: 278 Apartment units (341 Broadway Road)

MDM generally concurs with the use of this background project. No further analysis is required.

SITE–GENERATED TRAFFIC VOLUMES

Trip generation estimates for the site were based on trip rates published by the Institute of Transportation Engineers (ITE) – 8th Edition for land use code (LUC) 881 – Pharmacy/Drugstore with Drive-Through Window (for weekday daily and peak hour trip generation) and trip generation ratios using LUC 820 – Shopping Center (for Saturday daily and midday peak hour trip generation). These trip rates were applied to a 14,593 sf CVS Pharmacy with Drive-Through Window.

MDM notes that, as stated in the TIAS, the Applicant obtained the Saturday daily and Saturday midday peak hour trip generation by applying a ratio of weekday to Saturday trip generation from LUC 820. MDM generally concurs with this methodology as it results in generally conservative results for Saturday daily and Saturday midday peak hour trip generations.

In summary, MDM generally concurs with the methodology used for estimating the trip generation for the proposed pharmacy. No further analysis is required.

TRIP DISTRIBUTION AND ASSIGNMENT

While the TIAS makes general statements about the expected trip distribution, no back-up materials were provided to support the estimations. MDM does requests the Applicant provide the supporting materials on the trip distribution in written form to MDM for review.

To facilitate our review, MDM has conducted our own independent review of existing travel patterns and competing markets in the area and believes that the trip distribution provided in the TIAS by the Applicant is reasonable. Therefore, it is the opinion of MDM that the trip distribution provided by the Applicant is appropriate for the project.

TRAFFIC OPERATIONS ANALYSIS

MDM has reviewed the Level of Service (LOS) analysis contained in the TIAS and determined that it has generally been prepared in conformance with standard traffic engineering practice. MDM notes that the signal timing used in the capacity analysis does not match the actual signal timing programmed into the traffic signal controller. MDM recommends that the Applicant revise the capacity analyses for the Broadway Road (Route 113)/Arlington Street intersection to reflect the actual timing programmed in the traffic signal controller. MDM also recommends that a Table be provided that presents the average (50th percentile) and maximum (95th percentile) queues for the Existing, No-Build and Build conditions for all intersections studied.

In addition, it is recommended that the Applicant provide capacity and queuing analyses for the additional study intersections previously outlined in the *Study Area* section. Capacity and queuing analysis should be provided by the Applicant for the weekday evening and Saturday midday peak hour for the Broadway Road (Route 113)/Broadway Plaza North Driveway, the Broadway Road (Route 113)/Broadway Plaza Central Driveway as well as the Bridge Street (Route 38)/Arlington Street (Route 113)/Pleasant Street intersection. Additionally, MDM recommends that the Applicant revise the capacity analyses in the TIAS to reflect adjustments to the traffic volumes previously recommended by MDM in this comment letter. MDM will reserve further comment on the capacity analyses until the revised analyses have been provided in written form to MDM for review. The Applicant should also document and provide appropriate mitigation measures to offset project related impacts with respect to queuing, level of service, and delay.

ACCESS/EGRESS DRIVEWAYS

MDM has reviewed the proposed access and egress driveways for the proposed site and, in general, does not support the locations of the two proposed driveways along Broadway Road (Route 113). A discussion of the two proposed driveway are described separately below.

Southerly Site Driveway

Observations made by MDM on March 26, 2009, indicate that existing vehicle queues in the southbound approach to the Broadway Road (Route 113)/Arlington Street/Willard Street intersection extend beyond the proposed southerly site driveway during the weekday evening peak period blocking access/egress to and from the site. Field observations of existing roadway geometry also indicated that there is a limited useable shoulder on Broadway Road (Route 113) just north of Arlington Street for through traffic to by-pass left turn traffic destine to the site. It is MDM's opinion that the proposed southerly site driveway be relocated to the channelized right-turn lane along Broadway Road (Route 113). The relocation of the southerly site driveway would restrict left-turn movements to and from Broadway Road (Route 113) from this driveway. Relocation of the southerly driveway would also prevent the possibility of vehicles queuing back into the signalized intersection and disrupting traffic operations as a result of left turn vehicles waiting in a stopped position for a gap in the opposing traffic stream. The relocated southerly driveway should be restricted to a right-in/right-out driveway and signed/marked accordingly.

Northerly Site Driveway

MDM notes that as currently designed the proposed CVS driveway and the southern Broadway Plaza driveway do not meet the Town of Dracut Zoning By-laws which state that *"Entrance or exit centerlines shall not fall within 50 feet of an intersection of street sidelines or within 150 feet of the centerline of any other parking area entrance or exit on the same side of the street, whether on the same parcel or not, if serving 20 or more spaces. Users shall arrange for shared egress if necessary to meet these requirements."* MDM recommends that the Applicant explore the following two access alternatives for the northerly site driveway in an effort to reduce curb cuts and improve traffic operations along Broadway Road (Route 113):

Access/Egress Alternative 1 – Provide a shared driveway for the proposed northerly site driveway for the CVS with the southern driveway for Broadway Plaza. The shared driveway would provide full access/egress to the northerly portion of the proposed CVS site and southerly portion of the existing Broadway Plaza site. The shared driveway could straddle the common property line and provide improved sight distance to the north as well as perpendicular alignment to Broadway Road (Route 113).

Access/Egress Alternative 2 - Close the proposed northern CVS driveway as well as the central and southern Broadway Plaza driveways and provide a single shared full access/egress driveway across from Loon Hill Road. Under this alternative, the intersection of Broadway Road (Route 113)/Loon Hill Road/Proposed Site Drive would be signalized and coordinated

with the existing traffic signal at the Broadway Road (Route 113)/Arlington Street/Willard Street intersection. Access/egress between the CVS site and new driveway opposite Loon Hill Road would be provided via an easement over the Broadway Plaza parcel.

It is our understanding that the property owner of the proposed CVS site also owns the Broadway Plaza property which should make either of the recommended driveway consolidations possible. MDM recommends that the Applicant summarize the operational benefits of these two alternatives along with any additional alternatives the Applicant may want the Town to consider. Should Alternative 1 or a similar alternative be preferred, the Applicant should confirm that said alternative will not restrict or adversely impact the future signalization of the Broadway Road (Route 113)/Loon Hill Road intersection which is considered priority issue for the Town of Dracut.

SIGHT DISTANCE

Upon performing a field inspection of the project site on March 26, 2009, MDM's review of the available intersection sight distance (ISD) at the site driveways indicates that adequate sight distance is provided at both proposed driveways for the observed 85th percentile travel speeds (32 mph southbound and 30 mph northbound) with the exception of looking left (north) from the northerly site driveway. ISD appears to be restricted to approximately 295 feet at the current location of the northerly site driveway by a commercial sign and two utility poles located adjacent to one another. MDM also notes that Section 3.10.41 of the Town of Dracut Zoning Bylaws state that *"egressing vehicles shall have 400 feet line of sight visibility in each travel direction as measured four feet above the pavement."*

In general, it is MDM's opinion that the sight distance assessment outlined in the TIAS, conforms to the standards recommended by the American Association of State Highway Transportation Officials (AASHTO). In addition, it is MDM's recommendation that the Applicant review all proposed landscaping plantings within fifteen feet (15') of the curb line on Broadway Road (Route 113) to ensure that the proposed landscape plantings do not restrict sight distance relative to the final approve driveway locations. Plantings within this area should generally be low-growing plants that will not exceed twenty four (24") in height when fully mature. Additionally, proposed on-site objects (i.e., signage, fencing, etc) along Broadway Road (Route 113) should not restrict sight lines. MDM recommends that the Applicant graphically provide the ISD line of sight (sight triangles) for both travel directions on the plans relative to the final driveway locations on Broadway Road (Route 113). Said sight lines should be provided for each driveway with planting restricted to low growing species.

LOADING AREAS/TRUCK CIRCULATION

MDM has reviewed the loading area as presented in the Variance Plan. The loading area is proposed to be located in the rear of the proposed CVS building and oriented for access in clockwise fashion. MDM notes that the Variance Plan shows a semi-tractor trailer (WB-62) delivery vehicle traveling clockwise around the proposed building which is against the one-way counterclockwise flow of traffic proposed by the Applicant to the rear of the building. MDM recommends that the Applicant revise the delivery truck circulation to move in a manner consistent with the on-site one-way traffic pattern. Additionally, MDM notes that the site layout and access does not appear to adequately accommodate delivery vehicle maneuverability as shown on the Variance Plan. For example, when the delivery vehicle exits the site, it needs to cross directly into the oncoming northbound travel lane on Broadway Road (Route 113) in order to exit the site from the proposed northerly site driveway.

PEDESTRIAN ACCESS/MOBILITY

MDM has reviewed the pedestrian access and mobility of the CVS site as it related to sidewalks within the project area. As you are aware, there is currently a continuous sidewalk located on Arlington Street (Route 113) just west of the site along Arlington Street which terminates at the westerly property line of the Dentist office (Dr. Jason Pujo) located at 144 Arlington Street. It is our understanding that the extension of said sidewalk to the easterly property line and directly in front of 144 Arlington Street will be complete by the proponent for the Dentist office. To complete the link and provide pedestrian access to the CVS site, it is recommended that the sidewalk be extended along Arlington Street/Broadway Road from the easterly property line to the westerly property line at Broadway Plaza. MDM notes that the Applicant has currently proposed the construction of a partial sidewalk along the northerly frontage of the site.

In addition, the Town is in the process of making a major upgrade to Arlington Street from Willard Street to Methuen Street. This project is being funded by MassHighway and includes a continuous sidewalk along the northerly side of Arlington Street throughout the project limits. As currently planned, the sidewalk begins east of the Broadway Road (Route 113)/Arlington Street/Willard Street intersection, but does not include access across said intersection. To provide pedestrian access from the easterly leg of Arlington Street to the proposed CVS site, it is recommended that the Applicant complete the missing link by extending the sidewalk through the Broadway Road (Route 113)/Arlington Street/Willard Street intersection to the proposed sidewalk along the CVS frontage. Sidewalk improvements within the intersection would likely include traffic signal modifications necessary to provide pedestrian indications and an exclusive pedestrian phase to cross Broadway Road (Route 113). Other improvements would include

ADA compliant handicap ramps, marked crosswalks, signs and installation of vertical granite curb for pedestrian protection adjacent to the roadway. These improvements will provide an important link to the site in terms of pedestrian accessibility as well as continue the Town's initiative to increase pedestrian mobility throughout the project area.

The Applicant notes that Dracut is a member of the Lowell Regional Transit Authority (LRTA), which provides fixed-route bus service to Lowell, Billerica, Chelmsford, Dracut, Tewksbury, and Tyngsborough. Currently, the LRTA bus route #1 runs through the study area. The Applicant should consider additional methods to promote and support alternative transportation to the site including but not limited to the use of bicycle racks.

MITIGATION

MDM notes that there is no mitigation program outlined for the proposed project and has several concerns as outlined above. The Applicant should provide a mitigation commitment that addresses the project impacts and address the Town's concerns. Mitigation may include, but is not limited to the following:

- The traffic signal equipment at the intersection of Broadway Road (Route 113) and Arlington Street is somewhat outdated and may require some upgrades. The Applicant should consider upgrading portions of the existing traffic signal equipment at this intersection to current standards. The improvements should include, but not be limited to, pedestrian push buttons and indications to accommodate an exclusive pedestrian phase, emergency pre-emption on all approaches and alternative timing plans for different peak hour periods.

- Currently there is a lack of sidewalks for pedestrian mobility to the site. The Applicant should extend the existing sidewalks as outlined above.

- The Applicant needs to demonstrate that the project will be designed in a manner to accommodate future widening of Broadway Road as development and regional growth occurs in the project area. Future improvements to Broadway Road (Route 113) will likely require roadway widening to accommodate additional lanes and the installation of a traffic signal at the Broadway Road (Route 113)/Loon Hill Road intersection. Past studies related to the Civic Village parcel indicate these improvements will be required at a future time.

SUMMARY

MDM believes that the TIAS prepared by the Applicant generally conform to standard traffic engineering practice. However, some elements of the TIAS are either missing or require further explanation to provide a comprehensive review of the project and its potential impacts. We believe the above issues should be addressed in written format and provided to MDM for review.

We are available to discuss these comments in greater detail at your request. We appreciate the opportunity to provide Transportation Planning & Engineering Services to the Town of Dracut. If you have any questions or concerns, please feel free to contact this office.

Very Truly Yours,

Ronald D. Desrosiers, P.E., PTOE
Managing Principal

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