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Nitsch Engineering Markup
by: Jeffrey T. Bandini, P.E., PTOE, LEED Green Associate
Date: September 15, 2014

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
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June 30, 2014

Jeffrey Brem, PE
Meisner Brem Inc.
142 Littleton Road, Suite 16
Westford, MA 01886

Subject: Proposed Lifetime Green Homes (40B Residential), Carlisle, MA

Dear Jeff:

MDM Transportation Consultants, Inc. (MDM) is pleased to submit this proposed Scope of Services for preparing a traffic impact and access study (TIAS) for the proposed 40B residential development (Lifetime Green Homes) to be located at Long Ridge Road in Carlisle, Massachusetts.

Study Area

The following intersections will comprise the proposed study area, and represent locations where a measurable increase in trip activity is expected:

- Long Ridge Road at Nowell Farme Road
- Nowell Farme Road at River Road and Skelton Road
- Bedford Road (Route 225) at Skelton Road
- Bedford Road (Route 225) at River Road

TIAS Protocols

MDM will prepare a Traffic Impact and Access Study (TIAS) for the proposed development in accordance with EEA/MassDOT guidelines and industry standards for preparation of traffic impact studies. MDM will perform the following tasks in conjunction with the preparation of the TIAS:

- **Existing Traffic Conditions**: Gather physical and operating information for area roadways, which includes traffic volumes, roadway geometrics, and traffic operating parameters. Manual turning movement counts (TMCs) shall be conducted at Study Area intersections for a weekday AM (7-9 AM) and weekday PM (4-6 PM) period under normal area traffic conditions with schools in session. Applicable seasonal correction factors shall be applied to perk hour count data to represent average peak hour conditions, consistent with industry practice.

  Nitsch Engineering recommends that continuous Automatic Traffic Recorder (ATR) counts be collected that include Speed Data along Bedford Road (Route 225), River Road, Skelton Road and Long Ridge Road to yield Average Daily Traffic (ADT) numbers and to properly asses Sight Distance Criteria using 85th percentile speeds.

- **Accident Analysis.** Research MassDOT accident data for study area intersections, Nowell Farme Road, River Road and Long Ridge Road for the latest available 3-year period, calculate crash rates, and summarize in tabular format. Local police records will also be requested and evaluated to augment MassDOT records.

- **No-Build Traffic Volumes:** Estimate and verify future No-Build traffic volumes from historical traffic counts and from information on recently approved or proposed projects, as identified in consultation with the Town and review of MEPA files. Increases in background traffic growth will then be established and applied to the existing traffic flow networks to develop the base future No-Build analysis networks. A 5-year horizon will be used to develop No Build traffic volume networks, consistent with industry practices. Nitsch Engineering recommends that the consultant contact the Town of Bedford in addition to the Town of Carlisle due to the proximity of the project to the Town of Bedford and easy accessibility via Bedford Road (Route 225).

- **Build Traffic Volumes Estimates:** Estimate traffic generated by the project alternative using Institute of Transportation Engineers (ITE) trip rates and methodology. The applicable ITE land use code (LUC) for the subject property is LUC 210 – single family home. Nitsch Engineering recommends a full assessment of multimodal transportation within the study area, including local bus, bicycle and pedestrian accommodations.

- **Build Traffic Volume Networks:** Regional trip distribution for project-generated trips will be estimated based on existing travel patterns, US Census Journey-to-Work data and area population. Site-generated trips will be added to the No-Build networks to develop the Build condition traffic volume network for each analysis period (weekday morning and weekday evening).

- **Capacity Analysis:** The following analysis conditions will be evaluated using EEA/MassDOT approved methods:

    - Existing/baseline 2014 conditions
    - Future conditions *without* the proposed project (2019 No-Build condition)
    - Future conditions *with* the proposed project (2019 Build condition)

If the consultant recommends any improvements within the study area, the future conditions with the proposed project incorporating the improvements should be analyzed.

Access and Circulation Review

MDM will review site access and circulation for consistency with applicable industry standards and criteria including sight lines, emergency and service vehicle accessibility, and roadway layout/dimensions. Proposed Site roadway design and layout will be compared to minimum recommended criteria published by the American Association of State Highway Officials (AASHTO), Institute of Transportation Engineers (ITE) and other relevant professional standards. Specific tasks shall include the following:

- **Sight Line Evaluation.** Evaluate stopping sight distance (SSD) and Intersection Sight Distance (ISD) requirements for the site driveway based on regulatory travel speeds based on criteria published by the American Association of State Highway Officials (AASHTO). Nitsch Engineering recommends that SSD and ISD requirements also be assessed using the 85th percentile speeds, which would be collected as part of the ATR volumes, as previously recommended.
- **Site Circulation Review.** Conduct AutoTurn® vehicle turn analysis of proposed Site roadway to ensure proper dimensioning for emergency response vehicles and delivery vehicles. Nitsch Engineering recommends that the buses to be used by the Town of Carlisle school system also be assessed for proper dimensioning.
- **Roadway Layout and Dimensions.** Expanded discussion relative to recommended roadway width, grades and curvature will also be provided based on AASHTO criteria for very low volume local roadways and/or *Residential Streets* published by the ITE.

Sincerely,

MDM TRANSPORTATION CONSULTANTS, INC.

Robert J. Michaud, P.E.
Managing Principal