

MEMORANDUM

TO: Tom Burnham, MnDOT
FROM: Lev Khazanovich, UMN
DATE: March 24, 2014
SUBJECT: Task 1 deliverable, TPF-5(269)

Due to late approval of the contract (in late June 2013) and delays in the subcontract between the University of Minnesota and the University of Pittsburg, the official end of Task 1 has been difficult to gauge. However, the ongoing Task 1 work has been very productive, and the following memorandum summarizes the work of the first five months of the project, which represent the work of Task 1.

The research team met with the TAP on three occasions thus far. In December 2012, while the project was in the early work plan approval stages, the research team met with members of the TAP at MnROAD to discuss TAP perspectives on overlay design, construction, and overall use for their associated DOT. Later, in November 2013, the research team met with representatives of MnDOT and Minnesota industry to discuss the long term performance of existing UBOL in the state of Minnesota. Finally, in December 2013, the research team presented a summary of ongoing Task 1 work to the TAP via online teleconference (due to inclement weather) and addressed TAP questions and concerns during that teleconference.

The remainder of this memo summarizes the full draft of the Task 1 reporting, which is under review by key members of the research team. While the Task 1 reporting follows the presentation of December 2013, it contains additional information on data analysis and the completed surveys, which have gradually accumulated in the interim and are briefly referred to below.

1. Literature review

The research team conducted a literature review accounting for structural models of unbonded overlays (UBOL), existing design procedures for UBOL, the use of separation layers in UBOL construction and design, and case studies detailing UBOL performance. The literature review currently accounts for over 60 papers, articles, and reports.

2. Performance data

After the November 2013 meeting with Minnesota DOT and industry representatives, the research team collected performance data on UBOL in Minnesota. The dataset obtained by the research team described the condition of 619 sections in Minnesota, with section data extending as far as 26 years. The final Task 1 reporting details some of the ongoing analysis using this dataset. One major focus of the analysis was to identify outliers in the dataset whose performance A) did not follow the general trend in surface ratio degradation or B) included low surface ratio measurements immediately after UBOL construction.

3. Survey of performance of experimental/in-service UBOL projects

In November and December 2013, the research team developed and sent surveys (via email) to members of the TAP on the performance of UBOL in their states. In addition to the survey, the research team requested from those members any relevant state reporting on unbonded overlays. Of the members contacted, four states responded to the survey in full. Repeated reminders were sent to obtain a complete response, and while two additional states committed to providing information, no additional responses have been received at this time. Of the states that responded, one state (Kansas) has not yet constructed any overlays. The research team the information received from each state. This information will be used to determine what types of overlays are constructed in each state and which states would be good sources of field data.

4. Identifying other sources of UBOL data

The work of Task 1 also included the identification of other resources of UBOL data for the project work. Two major resources were identified. The American Concrete Paving Association (ACPA) National Concrete Overlay Explorer was used to determine UBOL projects available to the research team. While the Overlay Explorer identifies almost 1200 overlays, only 472 of those overlays are unbonded concrete overlays of concrete pavements. In addition, the LTPP GPS-9 sections will be a valuable resource for the project work. The creation of the LTPP InfoPave website has made this data much easier to access and manipulate.