CENTER FOR
PORTLAND CEMENT CONCRETE
PAVEMENT TECHNOLOGY

Portland Cement Concrete Patching Techniques vs. Performance and Traffic Delay

Final Report
January 2004

IOWA STATE UNIVERSITY

About the PCC Center/CTRE

The Center for Portland Cement Concrete Pavement Technology (PCC Center) is housed at the Center for Transportation Research and Education (CTRE) at Iowa State University. The mission of the PCC Center is to advance the state of the art of portland cement concrete pavement technology. The center focuses on improving design, materials science, construction, and maintenance in order to produce a durable, cost-effective, sustainable pavement.

PORTLAND CEMENT CONCRETE PATCHING TECHNIQUES VS. PERFORMANCE AND TRAFFIC DELAY

Final Report
January 2004

Principal Investigator
James K. Cable
Associate Professor
Department of Civil, Construction and Environmental Engineering, Iowa State University

Co-Principal Investigator
Kejin Wang
Assistant Professor
Department of Civil, Construction and Environmental Engineering, Iowa State University

Research Assistants
Sara J. Somsky
Jera Williams

Authors
James K. Cable, Kejin Wang, Sara J. Somsky, and Jera Williams

Prepared for
the American Concrete Pavement Association
and the Iowa Concrete Paving Association

A report from
Center for Portland Cement Concrete Pavement Technology
Iowa State University
2901 South Loop Drive, Suite 3100
Ames, IA 50010-8634
Phone: 515-294-8103
Fax: 515-294-0467
www.ctre.iastate.edu

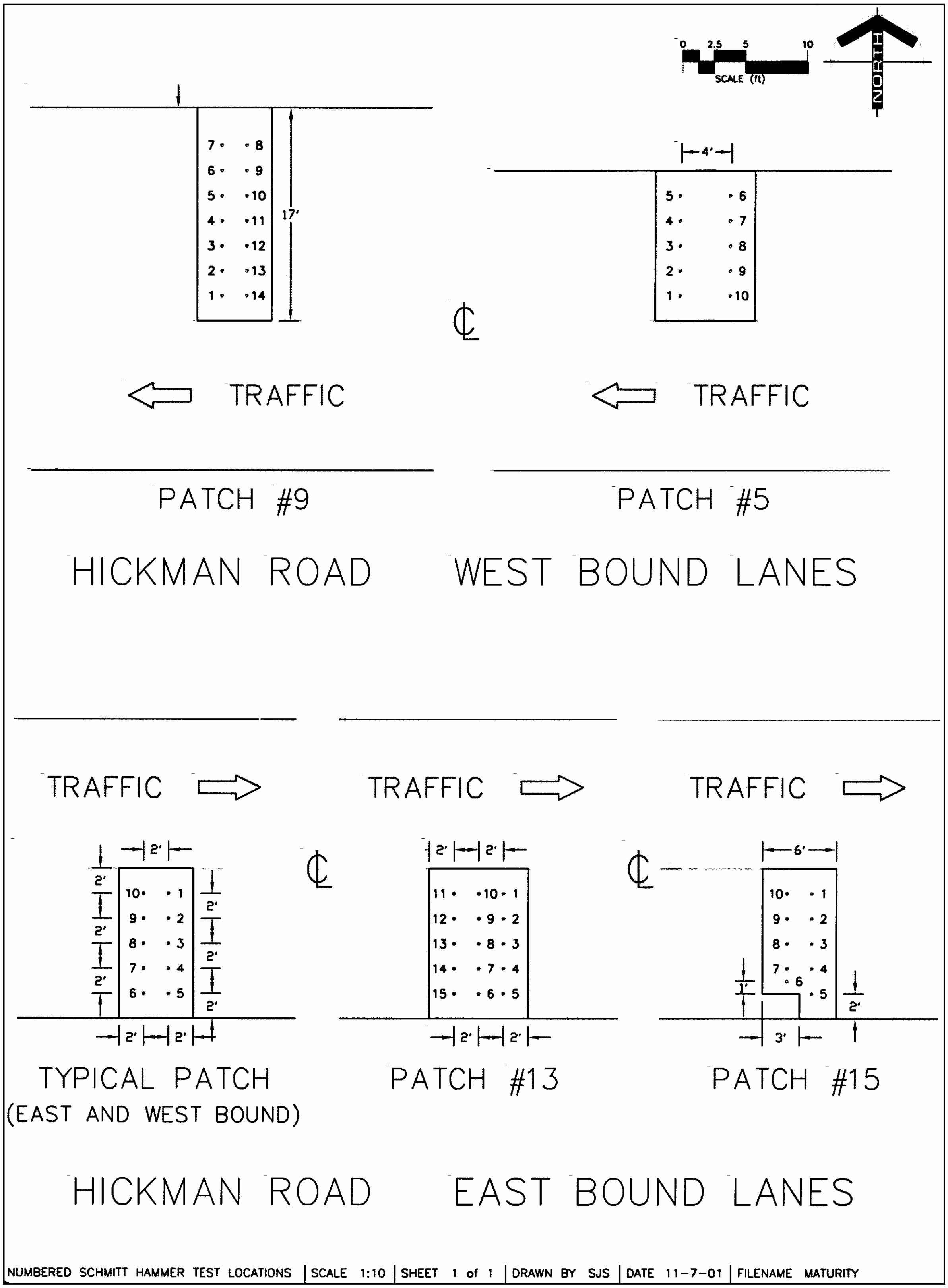

Figure 2. Schmidt hammer plunger layouts

The effects of concrete mix, patch thickness, and time patches were opened to traffic on rebound numbers are shown in Figures 3 and 4. The data points in the figures represent the average rebound values of tested patches. The rebound readings for all tested patches are presented in Appendix D. The average values were calculated based on the following rules: (1) if a reading differed by more than seven units from the average of all readings obtained from a tested patch, this reading was discarded and a new average was computed based on the remaining readings; and (2) if more than two out of ten readings differed from the average by seven units, the entire set of readings was discarded.

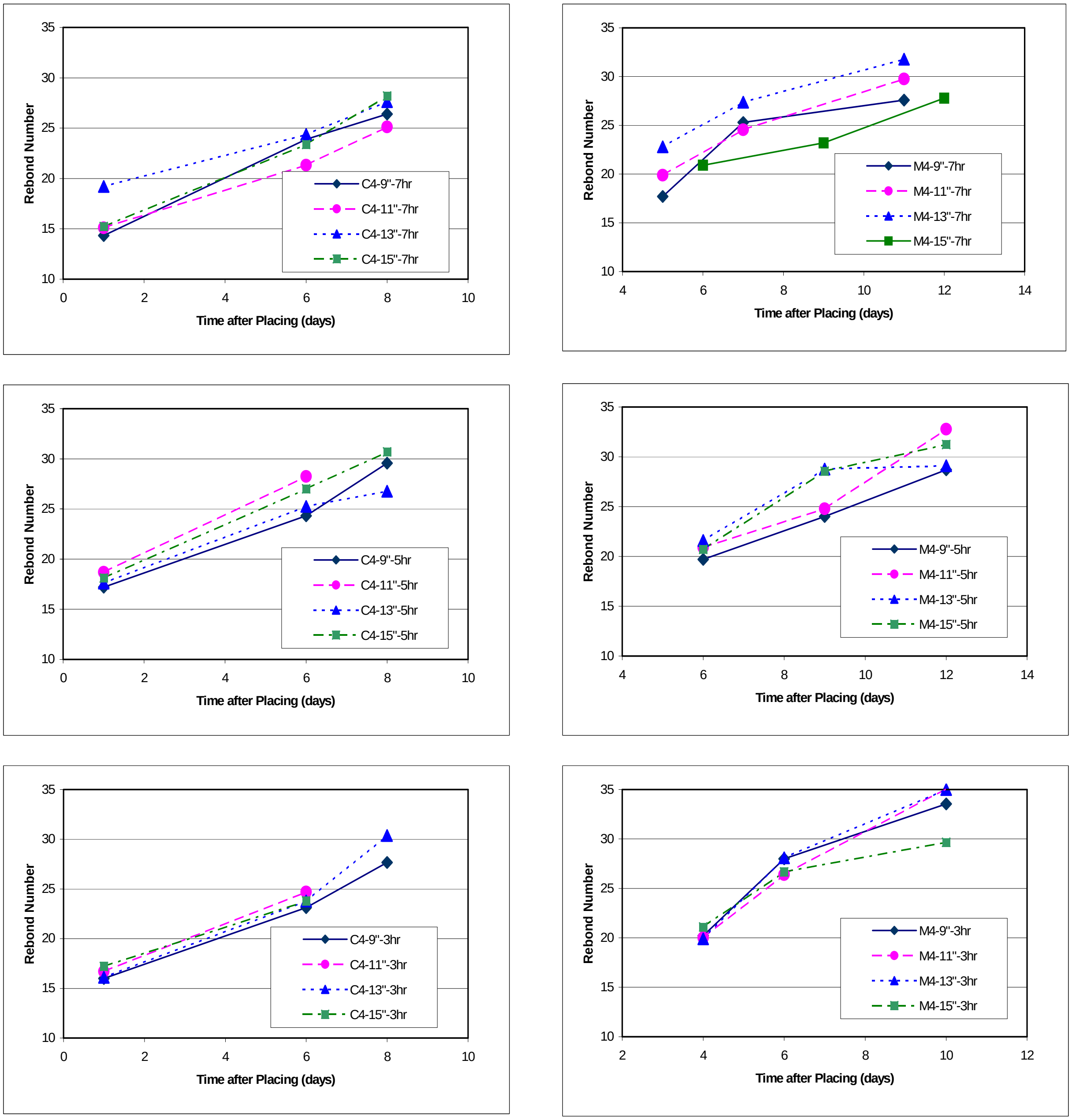

Figure 3. Effect of patch thickness on rebound numbers

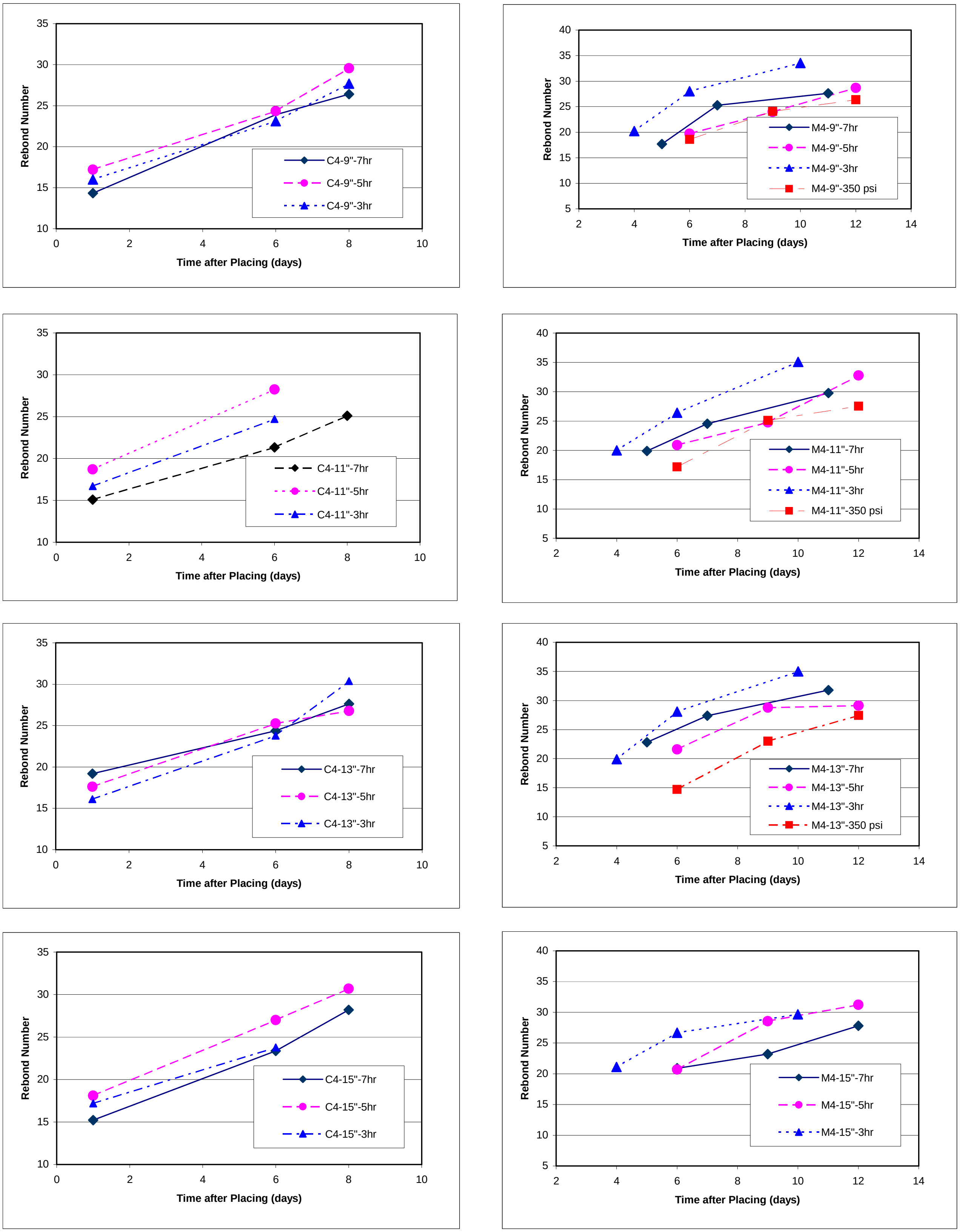

Figure 4. Effect of opening time on rebound numbers

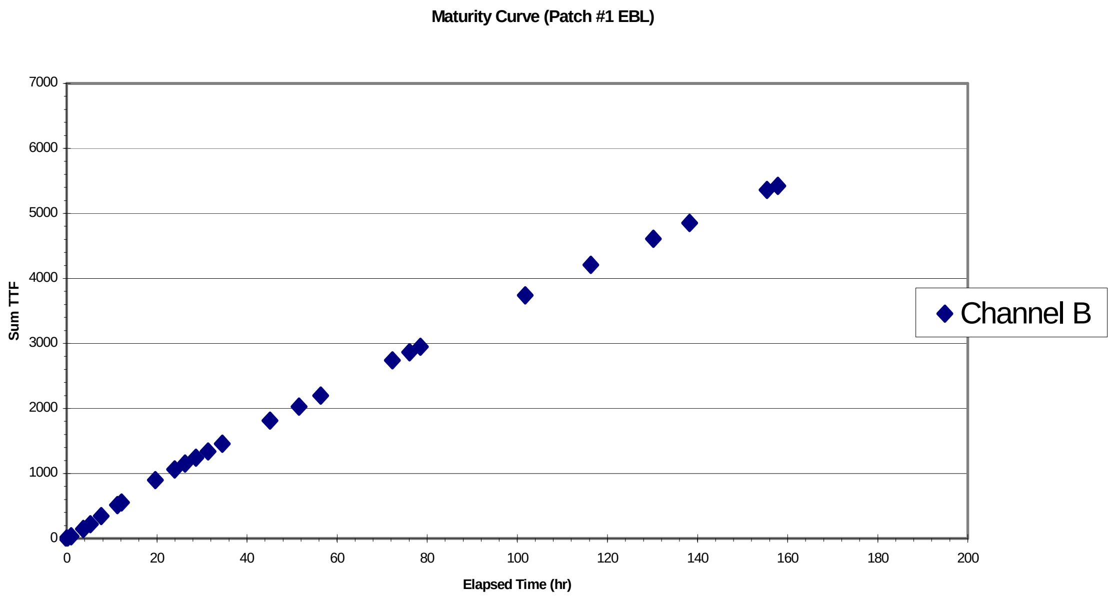

Figure 5. Maturity curve for Patch 1, eastbound lane

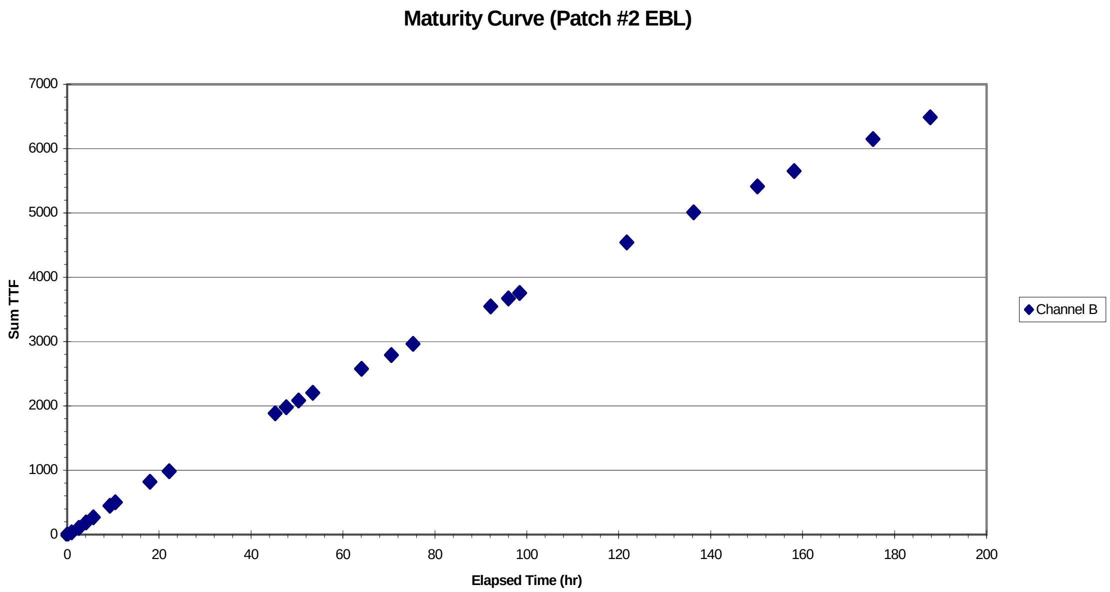

Figure 6. Maturity curve for Patch 2, eastbound lane

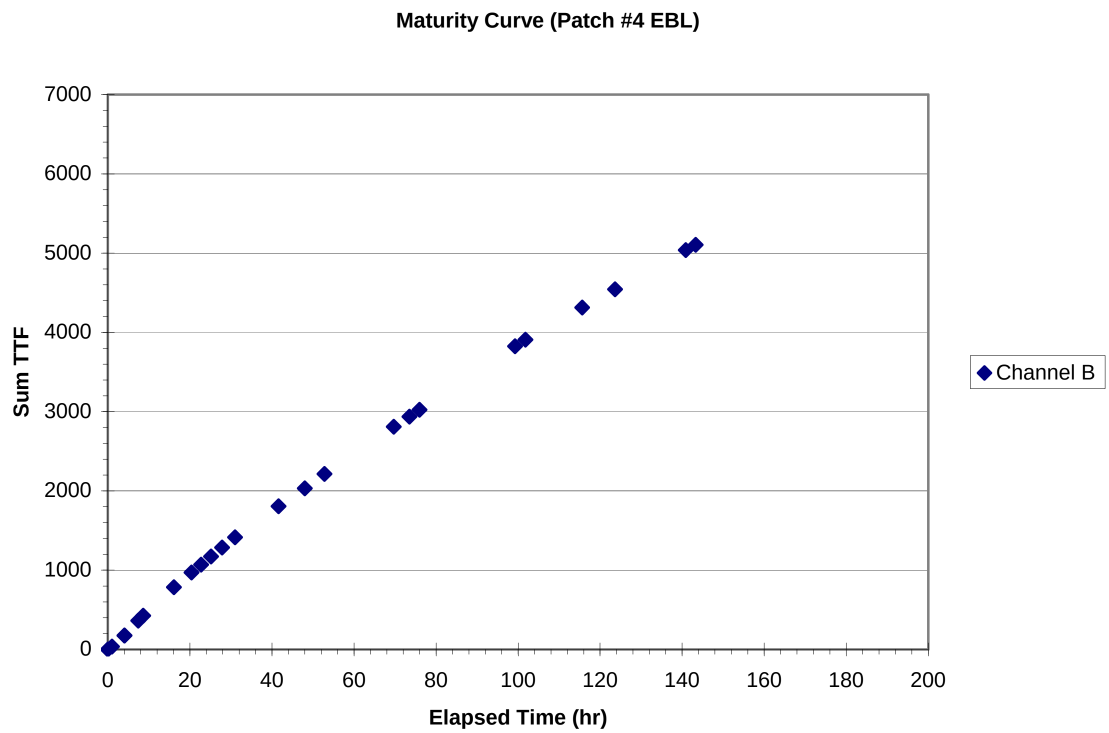

Figure 8. Maturity curve for Patch 4, eastbound lane

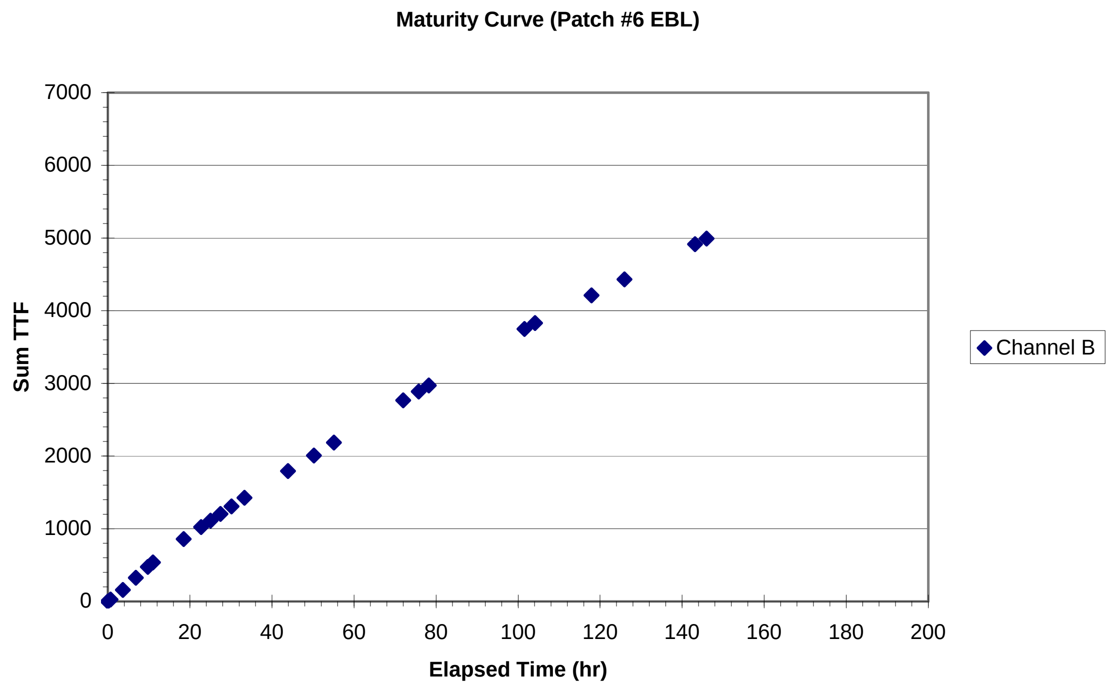

Figure 10. Maturity curve for Patch 6, eastbound lane

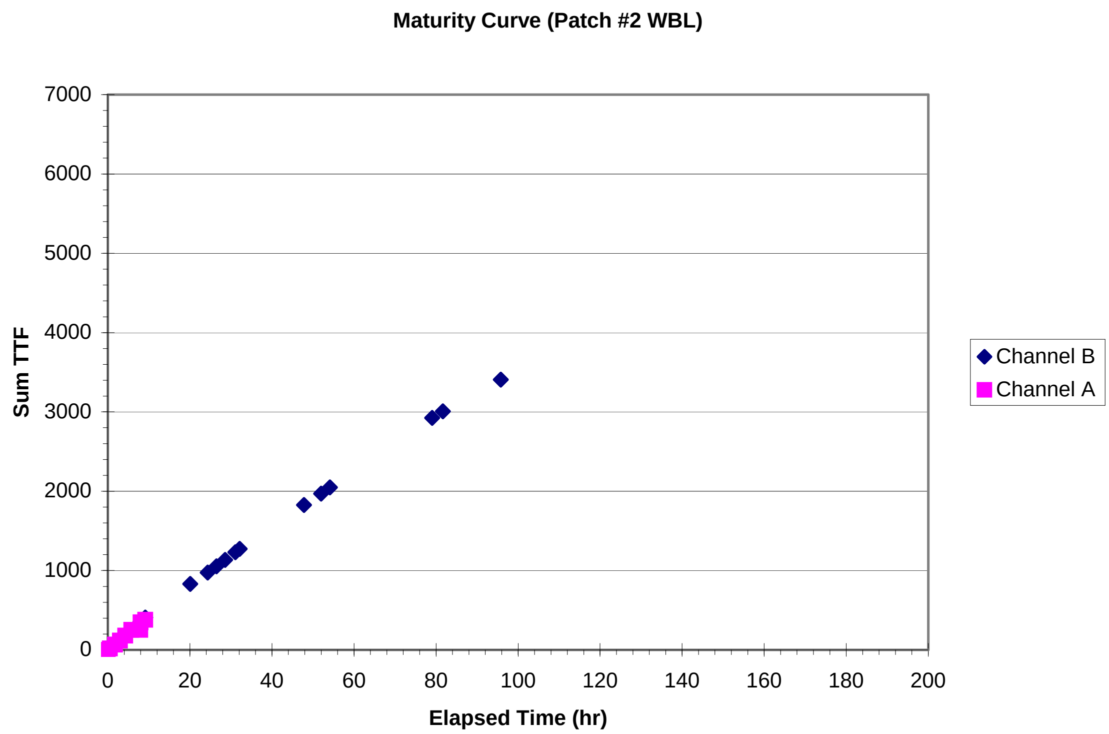

Figure 21. Maturity curve for Patch 2, westbound lane

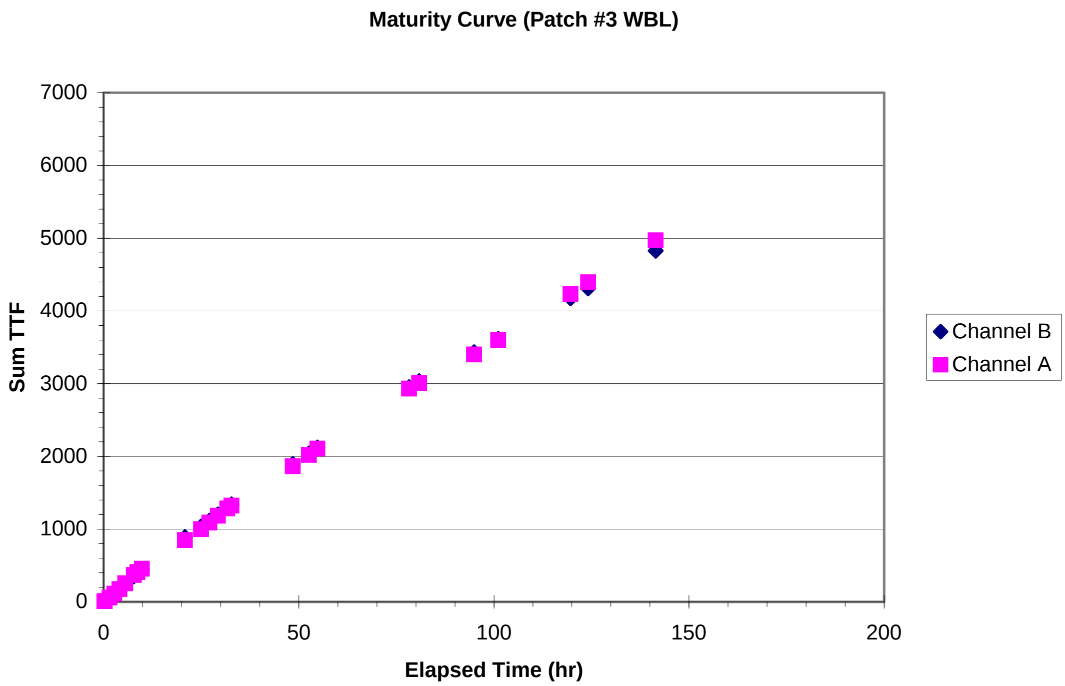

Figure 22. Maturity curve for Patch 3, westbound lane