



**AGENDA**

Fleming Road  
Country Club Road to Illinois Route 120  
McHenry County

Date: February 16, 2012  
1:00 p.m. to 3:00 p.m.

**Community Advisory Group (CAG) Meeting #6**

- I. Introductions
- II. Cold In-Place Recycling Discussion
- III. CAG questions regarding memo
- IV. CAG input regarding recommendations listed in the memo
- V. Next Steps

**(CAG Meeting Adjourned)**

- VI. Public Comments

## Attendance Roster - CAG Members

Community Advisory Group Meeting #6

Fleming Road Study: Country Club Road to Illinois Route 120

1:00 p.m. to 3:00 p.m.

MCDOT, Conference Room



	CAG Member	Community/Group	Email Address
1	Virginia Peschke	County Board, District 5	vpeschke@illinoiscccs.org
2	Randy Donley	County Board, District 6	RXDonley@co.mchenry.il.us
3	Emily Berendt	Village of Bull Valley	eberendt@yahoo.com
4	Robert Pierce, Supervisor	Dorr Township	dorrone@sbcglobal.net
5	Don Goad, Highway Commissioner	Greenwood Township	dtgoad@sbcglobal.net
6	Lisa Rhoades	Fleming Road Alliance	lisa@therhoadesgroup.com
7	Kevin Keesee	Fleming Road Alliance	kevin.keesee@manleyflm.com
8	Eberhard Veit, President	McHenry County Bike Advocates	eberhard.veit@eisenmann.com
9	Linda Fierla, President	Bull Valley Riding Club	monza302@sbcglobal.net
10	Nancy Jung	Bull Valley Garden Club	nancy-jung@sbcglobal.net
11	Ed Ellinghausen	Boone Creek Watershed Alliance	edellinghausen@gmail.com
12	Lori McConville	Environmental Defenders of McHenry County	lori.j.mcc@gmail.com
13	McHenry County Sheriff	McHenry County Sheriff	kagroves@co.mchenry.il.us
14	Woodstock Fire Rescue	Woodstock Fire and Rescue Department	rwebster@wfrd.org
15	Beverly Dye, Postmaster	Woodstock Postmaster	beverly.a.dye@usps.com
16	Nick Chirikos	McHenry County Historic Preservation	nick@housewrightdb.com
17	Jeffrey Young, Assistant County Engineer	McHenry County Division of Transportation	jryoung@co.mchenry.il.us
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# Attendance Roster - CAG Alternates

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	CAG Member	Community/Group
1		County Board, District 5
2		County Board, District 6
3	Brian Miller	Village of Bull Valley
4	Tom Thurman, Highway Commissioner	Dorr Township
5	Barbara Klasen, Supervisor	Greenwood Township
6	Mary Moltmann	Fleming Road Alliance
7	Ed Bennett	Fleming Road Alliance
8		McHenry County Bike Advocates
9		Bull Valley Riding Club
10	Judith Reilly	Bull Valley Garden Club
11	Dennis Dreher	Boone Creek Watershed Alliance
12	Jim Wigman	Environmental Defenders of McHenry County
13		McHenry County Sheriff
14		Woodstock Fire and Rescue Department
15	Tracy Hall	Woodstock Postmaster
16		McHenry County Historic Preservation



# Technical Memorandum

TranSystems

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## **FLEMING ROAD INTERIM IMPROVEMENTS**

McHenry County Division of Transportation

February 7, 2012

In December 2009 the project team developed a goal for the Fleming Road project study that summarized the objectives:

*The goal of the project is to develop a preferred plan for Fleming Road which replaces the deteriorated pavement, improves safety, maintains the character of the corridor, while minimizing the disturbance to adjacent property owners.*

In early January 2012 the County Board directed staff to modify the project goal such that it is now to rehabilitate and/or reconstruct Fleming Road within the existing footprint. This technical memorandum summarizes three available rehabilitation/reconstruction methods and recommends an interim improvement for Fleming Road.

### **Interim Rehabilitation Methods**

Three interim improvement options are:

1. Milling, Patching and Resurfacing
2. Cold In-Place Recycling
3. Reconstruct within Existing Footprint

#### **1. Milling, Patching and Resurfacing: Interim 1**

This option requires the contractor to mill and remove 2" of asphalt surface, patch the pavement base, and pave a 2" lift of asphalt surface course to match existing grades. This is not a good option, as the existing pavement is in a poor, deteriorating condition, and introducing heavy construction equipment for patching and resurfacing operations onto an even thinner pavement section is likely to cause base failure at many locations. The life expectancy of this interim improvement is between 3 and 6 years at a cost of approximately \$750,000 assuming 15% patching.

#### **2. Cold In-Place Recycling: Interim 2**

Cold In-Place Recycling is a pavement rehabilitation strategy that re-uses the existing pavement to reduce the cost of transporting and disposing material outside the project limits. Cold In-Place Recycling is similar to Pulverization and Full-Depth Recycling in



that the existing pavement is pulverized and re-used as a base for the new roadway, but the three strategies are different in other ways. Pulverization turns the existing asphalt pavement into a granular base and paves new asphalt on top of the granular base. Cold in-place recycling pulverizes most of the existing pavement depth without reaching the sub-base level and adds an asphalt emulsion that provides a stabilized base. New asphalt is paved on top of the recycled lift. Full-depth recycling pulverizes the existing pavement, combines it with a specified depth of the underlying granular sub-base, adds an asphalt emulsion to stabilize the base, and paves new asphalt on top.

Pulverization projects are generally for facilities with lower traffic volumes such as Township roads. Full-depth recycling requires a significant depth of granular sub-base to be successful. As part of the County roadway system, Fleming Road carries more traffic than Township roads, therefore pulverization is not recommended. Additionally, the lack of granular sub-base depth keeps it from being a candidate for full-depth recycling. Of the three pavement rehabilitation strategies, cold in-place recycling is the only viable alternate.

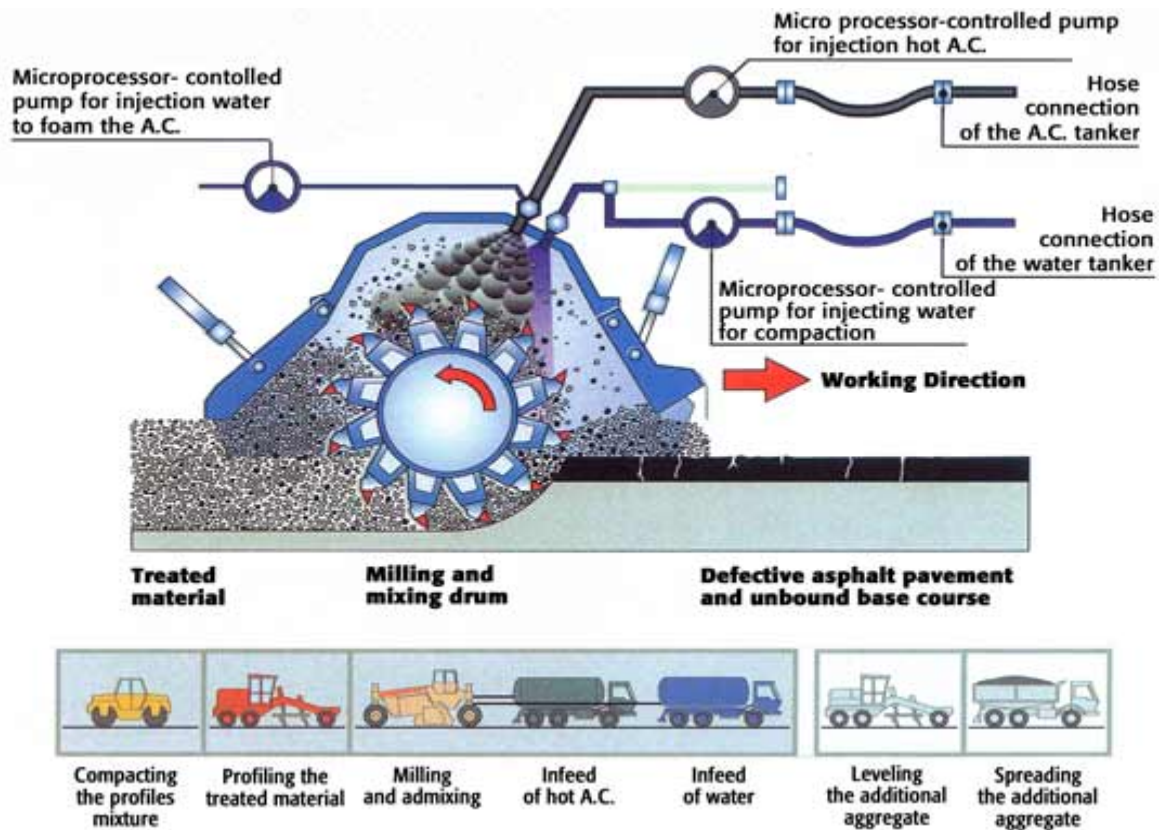
TranSystems project team consulted with various resources for this type of improvement. Project team member Bill Vavrik, PhD, PE with Applied Research Associates, Inc., Jeff Blue - County Engineer for Champaign County, Michael Pedigo – County Engineer for Mason County, and Phil Koeberlein with Cummins Engineering and former County Engineer for Sangamon County all have experience with projects having used cold in-place recycling. Mr. Vavrik, Mr. Blue and Mr. Koeberlein all sat on a technical review panel for “Cold In-Place Recycling and Full-Depth Recycling with Asphalt Products,” a publication by the Illinois Center for Transportation in March 2009. Kevin Burke with the IDOT Bureau of Local Roads and Streets chaired the technical panel.

IDOT recently announced that it will soon approve cold in-place recycling as eligible under the federal Local Agency Pavement Preservation Policy (LAPP) program. Kevin Burke anticipates a draft version of specifications for cold in-place recycling being available for review shortly, finalized, and issued for use by early 2012.

Cold in-place recycling steps are generally as follows:

- A. Mills and removes the existing asphalt surface course
- B. Pulverize the existing asphalt pavement with minimal penetration into the granular sub-base
- C. Injects an asphalt emulsion into the milling and mixing process to coat the existing pulverized material
- D. Loads the material into a paver and paves the recycled mix
- E. Compacts the material into a stabilized base
- F. Constructs a new asphalt surface lift after allowing the emulsified recycled mix to cure for a minimum of two weeks
- G. Matches the existing grade and requires minor aggregate shoulder restoration

Cold In-Place Recycling Process





The success of cold in-place recycling is dependent on the depth of the existing pavement and the depth of the underlying granular sub-base. Pavement cores were taken along Fleming Road every 1,000 feet. The average depth of pavement is about 6", but the thinnest pavement core shows only a 4.5" depth. The cold in-place recycling process will require milling and removing 2", recycling 4", and constructing a new 2" asphalt surface course.

The total 6" depth to be removed will extend below the pavement and into the underlying granular sub-base in some locations, and it will be critical to confirm that there is enough granular material for the recycled mix. If the recycling process incorporates soils other than granular material, the recycled mix may quickly fall apart rendering it useless.

In other locations where the existing pavement is thicker than average depth, the 6" depth to be removed will leave some of the existing pavement untreated by the cold in-place recycling operation. This relatively thin layer of remaining asphalt is subject to damage from the weight and operation of the cold in-place recycling train of equipment. The undesirable damaged asphalt remaining between the new cold in-place recycling lift and the subsurface soils will likely provide an unstable base.

Cores and borings taken by Wang Engineering during the geotechnical investigation for the Fleming Road project study showed the presence of a granular sub-base; however, the limited number of samples taken doesn't provide a great degree of certainty throughout the project. We recommend taking additional cores every 250 feet throughout the project and compiling the pavement and granular sub-base depths to confirm whether or not the depths are suitable for cold in-place recycling. Wang has provided soil borings, pavement cores and infiltration testing services to date and has enough fees left in their current contract to take the additional cores (estimated to cost an additional \$50,000), provided other scope items in the geotechnical contract are not completed. If these items are desired at a later date, the existing pavement core work would be added by supplement.



Costs for rehabilitating Fleming Road with this strategy are estimated to be:

Pavement Area = 31,000 square yards	
Mill 2" depth of Existing Pavement - \$3.50/square yard:	\$110,000
Cold In-Place Recycling 4" - \$6.00/square yard:	\$185,000
Bituminous Prime Coat:	\$5,000
Proposed 2" bituminous surface course - \$80/ton:	\$280,000
Aggregate Shoulder Restoration:	\$10,000
Temporary and Permanent Pavement Marking:	\$50,000
Traffic Control:	\$80,000
Contingency:	<u>\$70,000</u>
TOTAL	\$790,000

Cold in-place recycling has an advantage over traditional milling, patching and resurfacing in that nearly the entire base is rehabilitated. Existing pavement not patched in traditional resurfacing is subject to stresses during construction from heavy equipment that may compromise the structural support for traffic. Aside from compromising the structural integrity, costs to construct cold in-place recycling would be nearly equivalent to traditional milling, patching 15% of the roadway and resurfacing. Cold in-place recycling for Fleming Road would provide an 8-10 year life expectancy compared to 3-6 years for traditional resurfacing.

Cold in-place recycling can be done repeatedly but would not likely be needed for each rehabilitation cycle. Cold in-place recycling will be necessary when alligator cracking or other structural failures become the primary distress mechanism. Maintaining the current posted weight restrictions on Fleming Road would require cold in-place recycling every other rehabilitation cycle, but lifting the weight restrictions will require more structural improvement to the pavement than cold in-place recycling can provide.

IDOT now prequalifies contractors for cold in-place recycling construction, and the following contractors are prequalified in Illinois as of January 23, 2012:

- Central Blacktop – LaGrange
- Dunn Company – Decatur
- Peter Baker & Sons – Lake Bluff
- R.L. Brink Corp. – Quincy
- Payne & Dolan, Inc. – Waukesha, WI
- Rieth-Riley Construction Co. – Goshen, IN

Cold in-place recycling rehabilitation is well suited to maintain traffic since the roadway does not need to be constructed in stages. During the day, traffic is flagged around the



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train of construction equipment as it progresses along the roadway. A one-way detour may be necessary for a few days to allow the recycled mat to cool and set, but once the equipment train is removed from the roadway, traffic is allowed to resume normal operations. In the interim two weeks that the recycled asphalt emulsion is curing, traffic is allowed to drive on the recycled surface until the new surface course is constructed.

Milling, Patching and Resurfacing: Interim 1 versus Cold In-Place Recycling: Interim 2

Given that cold in-place recycling has a longer life expectancy and assuming additional cores confirm that there is sufficient sub-base granular depth, we recommend using cold in-place recycling as an interim rehabilitation improvement rather than milling, patching, and resurfacing.

**3. Reconstruct within Existing Footprint: Alternative #5**

Given the County Board direction to rehabilitate/reconstruct the roadway within the same footprint at the same grades, a roadway reconstruction alternative was developed to meet these criteria. We do not recommend this alternative since it is a substandard design, requires many atypical design variances, does not address identified problem areas, and has other concerns from a logistics standpoint.

Alternative #5 (reconstruct the Fleming Road pavement within the edge lines only and maintain the existing profile) is similar to Alternative #4, but does not correct cross slopes. If you recall, Alternate #4 involved reconstructing Fleming Road with 11' lanes, a 2' shoulder width, and incorporated adjustments to address sight distance issues and pavement cross slope issues. Alternative #5 could also be constructed in two stages with one-way traffic. The cost of this alternative is less than Alternatives #1 and #2 (which involved reconstruction of the pavement utilizing 4' shoulders and various opportunities for the use of curb and retaining walls to reduce the limits of grading), since there is 2' less shoulder, less grading, and no curb or retaining walls. The cost is slightly less than Alternative #4 since there is no shoulder regrading required to correct deficient cross slopes. Planning level estimates for each alternative are shown in Table I below.

Table I

<u>Alternative #</u>	<u>Planning Level \$</u>	<u>Description</u>
1	\$3,000,000	Reconstruct with 4' shoulders without curb & gutter and retaining walls
2	\$4,200,000	Reconstruct with 4' shoulders, curb & gutter, and retaining walls
3	\$1,200,000	Resurface with 4' shoulders
4	\$2,750,000	Reconstruct maintaining profile with 2' shoulders without curb & gutter and retaining walls
5	\$2,500,000	Reconstruct maintaining profile and cross slopes with 2' shoulders without curb & gutter and retaining walls
Interim 1	\$750,000	Resurface with existing 2' shoulders maintaining profile and cross slopes
Interim 2	\$790,000	Cold-In-Place Recycling maintaining profile and cross slopes

The design criteria governing a reconstruction project are not the same as the design criteria for a resurfacing/rehabilitation project. These projects are essentially temporary fixes that allow substandard conditions to remain in place until such time that a reconstruction project can correct those conditions. Several design variances would be required from IDOT to construct this reconstruction alternative. The County Engineer



could ask IDOT to consider these variances but it is highly unlikely that they would all be approved. The clear zone, side slope, and cross slope variances are atypical requests for a reconstruction project and do not have sufficient justification on why they cannot be achieved. The required variances and unaddressed problem areas are shown below.

Substandard Design Elements Requiring a Variance

- 11' lanes vs. 12' lanes
- 2' shoulder vs. 4'-8' shoulder
- 4' clear zone (obstruction free area) vs. 14' clear zone
- 1:1 side slopes without protection vs. 1:3 side slopes
- Profile: Vertical curve (hills) sight distance lengths
- Cross slopes along straight-a-ways and curves

Identified Problem Areas not Addressed:

- #2 Profile: vertical curve (hills) sight distance lengths
- #4 Cross Slopes: roadway cross slopes along straight-a-ways and curves
- #5 Surface Drainage: standing water on the pavement
- #6 Clear Zone: fixed objects within the clear zone

Given that this solution does not meet the original goals outlined for the project and that the County Board has directed that this project remain within the edge lines and maintain the existing profile, this alternative is not feasible.



### Summary of Recommendations

Meeting the objectives of the original project goal can only be achieved by extending the limits of an improvement beyond the existing gravel shoulder edges, and our recommendation is to ultimately provide an improvement that addresses the identified problem areas. This ultimate improvement as previously presented would achieve these goals.

Given the revised goals of the project as established by the County Board, the alternatives that are available are summarized below in Table 2:

Table 2

<b>Improvement Type</b>	<b>Life Expectancy</b>	<b>Estimated Cost</b>	<b>Notes</b>
Milling, Patching, Resurfacing	3 to 6 Years	\$750,000 (15% patching)	Maintain Posted weight restrictions
Cold In Place Recycling*	8 to 10 years	\$790,000 (+ \$50K for cores)	Maintain Posted weight restrictions
Reconstruction**	20+ years	\$2,500,000	Remove posted weight restrictions

\* Pending testing results of additional pavement cores

\*\* Included for comparative purposes only

At this time, cold in-place recycling is recommended as the interim improvement, provided there is sufficient sub-base granular depth (which would need to be confirmed by additional geotechnical analysis). If cold in-place recycling is determined not to be feasible, then a standard resurfacing project could be considered. It should be noted that the interim improvement only addresses one problem area, poor pavement conditions.